Caltech is the destination of choice for scholars who dream of changing the world. Scientists and engineers, students and faculty alike, know that the Institute provides the inspiring intellectual environment and unfettered support to realize their dreams. Small and selective by design, the Institute invests heavily in extraordinary individuals and focuses on areas of untapped opportunity. The Institute’s scholars – faculty, students, staff, and alumni – create new fields of inquiry and aim to transform science, technology, and society.

You are part of one of the great universities of the world! One hears a good deal from afar about how Caltech is different, how its intimacy and intensity hasten innovation. As a new arrival myself, I can tell you that Caltech is different. The drive to define new directions is palpable, from unlocking the secrets of the quantum world to understanding life on earth, from creating the smallest implantable medical devices to leading the effort to develop the world’s largest telescope.

At the same time, the Institute provides an exceptionally warm and welcoming community. Learn from your professors, but even more importantly, get to know and learn from your fellow students. Venture out of the classroom and into the laboratory. Problems may not have complete solutions, but you will be part of a team working together to reshape and redefine the boundaries. Explore new intellectual realms, but also explore the Pasadena environs and LA’s cultural destinations. Master not only biology and mechanical engineering, but also inhabit poetry and economics, so you can develop an elasticity of thought and familiarity of experience not fully your own. The genius of Caltech is its fearlessness to try new ideas. We must all be willing to absorb risk and even fail if the potential is transforming discovery.

Welcome to the 2015-2016 academic year. I wish you a year of accomplishment and fulfillment, a year of friendships and transformation.

Thomas F. Rosenbaum
President
Sonja and William Davidow Presidential Chair and Professor of Physics
Techers,

Welcome (and welcome back). This is where I get to tell you my insight on Caltech, but to be completely honest, I don’t think I’m qualified enough to do so. I’m going into my sophomore year, and I still have lots to learn. The real advice is in the little t. That being said, I do have some things I wish to share to the incoming class.

Fail sometimes. At Caltech, 50% of you are below average (or above average if you’re a glass half-full kind of person). You won’t meet a more talented group of people anywhere else in the world, and, as a result, you’ll no longer be the best at everything. You won’t get every position you run for, and you won’t get 100% of the answers right on every set. And guess what – that’s okay!

Failure should never be the end. It should be a stepping stone. For all you scientists and engineers out there, treat your time at college like an experiment. Revise your hypothesis, set up a different reaction, and never stop your research. Try something new, have lunch with professors outside of your major, and expand your horizons at every opportunity. Join water polo without knowing how to swim or apply to edit the little t on a whim. (Oh wait, that’s just me.)

Be prepared for your beliefs to be challenged. People and classes will all offer you new insight. Whether your new best friend from across the country pushes the limits of your political beliefs or you literally compose a proof on the limit of some crazy Ma1A problem and don’t feel like what you did was actually math, expect a wild ride from start to finish.

I leave you with some words from my late piano teacher. “I do not wish you luck, I wish you success. You only need luck if you’re not prepared.” Every single one of you is ready. You’ve got this – and I wish you all success.

But, be careful. If you do things too well, it all backfires, and you’ll be forced to write a letter that a couple hundred of your peers will read.

Ciara Ordner

little t Editor-in-Chief
What is this book?
The little t is an undergraduate handbook for the California Institute of Technology. We’re an ASCIT publication; it’s written in the bylaws that this book be published each year (and contain a hard copy of the bylaws). Beyond the ASCIT bylaws, our content is not mandated by ASCIT, and it has varied a lot over its history. For the past few years, though, it’s been a general collection of information useful to Caltech undergrads.

How should I use it?
We suggest you skim the entirety of the book, reading section headings and marking down things that seem useful (yes, feel free to write inside). You should also read the sections “Glossary to Life at Tech” and “How-To” all the way through because everything in those two sections is either funny or useful. There is also an academic calendar (if you turn the page), an abridged copy of the honor code handbook, and other useful references throughout the book.

How accurate is all of the information?
As of somewhere between mid-June and August 2015.

What if I find a mistake?
Email the editor at littlet@donut.caltech.edu.

What if I want to help edit next year’s book?
Email the editor at littlet@donut.caltech.edu. Any and all help is appreciated!

What are useful websites for me to know about?
In no particular order, we suggest that you bookmark and/or memorize the URLs of the following websites:
• arc.caltech.edu, the ARC
• donut.caltech.edu, the ASCIT homepage, containing stalker (undergrad directory service) and a lot more
• directory.caltech.edu, the Caltech directory
• software.caltech.edu, a software site
• msdnaa.caltech.edu, dreamspark software
• ihc.caltech.edu, the IHC
• access.caltech.edu, basically everything administrative
• regis.caltech.edu, the registrar’s homepage
• catalog.caltech.edu, the catalog
• courses.caltech.edu, the moodle page
• deans.caltech.edu, contains the Honor Code Handbook and more
• oof.caltech.edu, contains a list of faculty-student committees and their members
• isthecstoreopen.caltech.edu, self-explanatory
• isthemeshopopen.caltech.edu, self-explanatory, again
ABOUT CAMPUS
ACADEMIC CALENDAR

FALL TERM 2015

- International Student Pre-Orientation: September 16 (W)
- New Student Check-in: September 20 (Su)
- UASH Meeting: September 24 (Th)
- Beginning of Instruction (8am): September 28 (M)
- Add Day (Last day to remove Es and Is): October 16 (F)
- Midterms: October 28 (W)-November 3 (T)
- Midterm Deficiency Notices Due: November 9 (M)
- Drop Day (Last day to P/F or section change): November 18 (W)
- Registration for Winter Term: November 19 (Th)-December 4 (F)
- Thanksgiving (Institute Holiday): November 26 (Th)-27 (F)
- Last Day of Classes: December 4 (F)
- Study Period: December 5 (Sa)-8 (T)
- Final Exams: December 9 (W)-11 (F)
- Winter Recess: December 12 (Sa)-January 3 (Su)
- Instructors' Final Grade Reports Due: December 16 (W)

WINTER TERM 2016

- Beginning of Instruction (8am): January 4 (M)
- UASH Meeting: January 5 (T)
- Martin Luther King Day (Institute Holiday): January 18 (M)
- Add Day: January 22 (F)
- Midterms: February 3 (W) - 9(T)
- Presidents' Day (Institute Holiday): February 15 (M)
- Midterm Deficiency Notices Due: February 16 (T)
- Drop Day: February 24 (W)
- Registration for Spring Term: February 25 (Th)-March 9 (W)
- Last Day of Classes: March 9 (W)
- Study Period: March 10 (Th)-13 (Su)
- Final Exams: March 14 (M)-16 (W)
- End of Second Term: March 16 (W)
- Spring Recess: March 17 (Th)-March 27 (Su)
- Instructors' Final Grade Reports Due: March 21 (M)
ACADEMIC ELIGIBILITY AND YOU

For those who are unaware, the academic eligibility policy details the criteria which every student must follow in order to continue being a student at Caltech. Collectively, these rules are officially stated in the catalog in the “Scholastic Requirements” section. There are two parts to this policy, the criteria for eligibility to register and the rules for how ineligibilities are handled. The Undergraduate Academic Standards and Honors Committee (UASH) is the final decider on academic eligibility, so they can grant waivers of any parts of this policy if needed.

The current academic eligibility policy is based on a simple rule: Every term, all students must pass 33 units of coursework with a minimum term GPA of 1.9. If you are a freshman on pass-fail, the only requirement is that you pass 33 units of coursework, with no GPA requirement. There are a few exceptions to this rule, but you can never become ineligible as long as you stay above this line. However, if you pass fewer than 36 units in a term or if you fail a core course, you will continue to be a student in good standing, but you will have to talk to the Dean before registering to make sure that everything is still going well.

If you need to take a light term for any reason, the Dean’s office can approve an underload petition, which can allow you to fall below the 33 unit line without any trouble in two cases: if the underload is approved before add day or if the Dean waives this requirement. However, if you
get an approved underload to drop a course after add day and the Dean does not grant the waiver, you will become ineligible even though you passed all of your classes. If you find yourself in this circumstance, feel free to talk to your advisor or anyone at the Dean’s office. Reach out to someone if you need help!

Finally, if you do become ineligible, there is a well-defined process for handing the ineligibility. If it is your first time being ineligible, the Dean’s office can summarily restate you, or they can have UASH handle the restatement process. The majority of the time, the Dean’s office will handle the reinstatement. After the second ineligibility, you will have to take two terms (not including summer) off and then petition UASH for reinstatement. UASH will base their reinstatement decision off of what you did during your time off, so internships, jobs, and courses at other schools will help with the reinstatement decision. After the third ineligibility, you will be asked to leave.

Ineligibility is not a fun process, so if you do come close to ineligibility, you should reach out to your advisor, the Deans, or one of the six student representatives and alternates on UASH: Cat Jamshidi, Erin Isaza and Sean McKenna are the student representatives, and Anne Dorsey, Bianca Ray Avalani, and Stephanie Huard are the alternates.
Glossary to Life at Tech

ACM (n). (1) The Applied and Computational Math option. (2) Short for ACM 95, a differential equations class required by many majors, often taken sophomore year.

Alley (n). The hallway you live in. Feel free to unite and challenge other alleys to any sort of competition you can think of.

Averite (n). A member of Avery.

Big-I (n). Short for Big Interhouse, occurs once every other year. The 8 houses team up in pairs to build 4 themed parties which all happen on the same night. Not to be confused with Interhouse.

Bonfire (n). The Pasadena Fire Department Co. 34 is supposed to be very nice. Feel free to have one. See MOSH.

Booty House (n). That one house.

B.S. (n). What you get from Caltech. Literally.

CDS (n). Short for Caltech Dining Services.

C-Store (n). The mecca of gourmet cuisine, it’s located next to Chandler and you can spend your DBal there. To check if the C-Store is open, visit http://isthecstoreopen.caltech.edu/. See DBal.

Darb (n). A member of Dabney.

DBal (n). Short for “Declining Balance.” As a part of the board plan, you get $320 or $475 (depending on the term) of DBal. It can be spent at a number of food-serving places on campus and at JPL.

DDR (n). Caltech physical education. No, really.

DEI (phr). Dabney Eats It. See FEIF.

Deity (n). What you should consider praying to early and often if you hope to graduate.

Ditch Day (n). It’s tomorrow, frosh.
Go to bed frosh, Ditch Day is tomorrow!

EOM (phr). End of Message. Put it at the end of the subject line of an email that doesn’t have any body text.

Extension (n). Not as hard to obtain as you think. See Flame.

FEIF (phr). Fleming Eats It Faster. See DEI.

Flame (v). The result of overloading an undergraduate’s heat shields
through academic friction.

**Flem (n).** A member of Fleming.

**Flick (v).** The process of taking the longest possible amount of time to do the smallest possible amount of work.

**Frosh (n).** Someone in their first year at Caltech but no longer in their first week at Caltech.

**γδβγ (phr).** God Damn Blacker Gang.

**House (n).** Those residences of the North.

**Hovse (n).** Those residences of the South.

**Interhovse (n).** An official party put on by one of the houses. There are 8 Inverhovse parties per year. Not to be confused with *Big-I*. *Wasn’t Booty Interhovse the awesomest thing ever!*?

**Lloydie (n).** A member of Lloyd.

**LN2 (n).** Has many useful applications. *So we got a bunch of LN2 the other day...*

**Los Angeles (n).** Even more mythical (and yet rumored to be even more exciting than) Pasadena. See *Pasadena*.

**Mole (n).** A member of Blacker.

**MOSH (n).** Try calling him from an LA County Jail. Try not to end up in an LA County Jail.

**Millikan Library (n).** Kind of like a library, but without books. Known for the cryogenic pumpkin garden on the roof.

**Mountains (n).** A really useful landmark to the North. If you can’t see them, turn around. If you’re sure you’re facing North, just think about all the smog you must be breathing.

**Off-Campus (n).** Housing that is owned by Caltech (so is technically on campus) but is not Avery, Blacker, Dabney, Fleming, Lloyd, Page, Ricketts, or Ruddock.

**Off-Off (n).** Short for “Off-off-campus.” Housing that is not owned by Caltech (so is technically off campus).

**Pageboy (n).** A member of Page.

**Pasadena (n).** Rumoured to be a young exciting city, with lots to do, and excellent night life. If you look hard enough, you may find some senior Techer who has been off campus long enough to see it.
PF (v). To PF a class is to take it on Pass/Fail; pronounced “piff.”
I PFed Bi 1 so hard, dude, made it by 5 points!

Pond (v). It’s like taking a shower. Only dirtier. And usually on your birthday.
I really hope they’re nice, and pond me in Millikan this year...

RF (n). Nowadays it means a prank, once referring to the practice of tossing a rat frozen in LN2 into another’s room.

Ride, The (n). Wagner’s The Ride of the Valkyries. Try playing it in Blacker sometime.

Rotation (n). Spinning oneself in a counterclockwise direction.

Rudd (n). A member of Ruddock.

SFL (n). A nice place to sleep when kicked out of your room by your roommate.

Shaft (n). What you get when you step into the Millikan elevator at the 8th floor when it is on the 9th.

Skurve (n). A member of Ricketts.

Shower (n). A forcible reminder of the importance of personal hygiene.

Slave (n). See Averite

Stack (n). “Hmm... something is different with my room.”

TQFR (n). Stands for “Teaching Quality Feedback Report,” and you should actually fill them out at the end of each term.

UASH (n). You flick. You flame. UASH.
Caltech

Exclusive Off-Campus Housing Service

👉 admin@places4students.com
🌐 www.places4students.com
📞 1-866-766-0767

Helping Students Find A Home Away From Home!
T-HOW

This section contains questions and answers that vary from crucial to trivial. If you have any questions not answered here we suggest asking upperclassmen or your advisor.

CONTENTS

How do I get a key that I need? .............................................................. 16
How do I get an emergency loan? ........................................................... 16
How do I keep up with my classes if I get sick? ................................. 16
How do I replace my Caltech ID if I lose it? ........................................ 16
How do I borrow a dolly? ................................................................. 16
How do I get furniture for my room? ................................................... 16
How do I request repairs for my room? ............................................... 16
How do I get LN2? ........................................................................... 16
How do I obtain GN2? ...................................................................... 17
How do I obtain R2D2? ..................................................................... 17
How do I help improve courses that I am dissatisfied with? ............. 17
How do I become a Health Advocate (Health Ad)? ......................... 17
How do I get off board? ................................................................... 17
How do I declare my major? ............................................................... 17
How do I paint a mural? ................................................................... 17
How do I find somewhere to park on campus? ................................... 18
How do I finish an ACM 95 set, lab report, and hum paper in one night? 18
How do I get a girlfriend? ................................................................. 18
How do I get a boyfriend? .................................................................. 18
How do I obtain free condoms? ......................................................... 18
How do I deal with a broken condom? ................................................ 18
How do I learn LaTeX? ..................................................................... 18
How do I become a tour guide? .......................................................... 19
How do I get a referral to a doctor or dentist? ..................................... 19
How do I register to vote? ................................................................. 19
How do I get a SURF? ..................................................................... 19
How do I file taxes? .......................................................................... 19
How do I get software that I need? ..................................................... 20
How do I join a music group? ............................................................ 20
How do I find somewhere to practice music? ...................................... 20
How do I change my room combination? ......................................... 20
How do I know if I can prank something? ......................................... 20
How do I find free tutoring? ............................................................... 21
How do I get a UGCS account? .......................................................... 21
How do I get emergency medical/fire/police attention? ................... 21
How do I survive in the line of gunfire? .............................................. 21
How do I build a desktop computer? ................................................. 22
How do I add/drop classes? ............................................................... 25
How do I change advisers? ............................................................... 25
How do I declare a minor or double major? ...................................... 25
How do I find a work study job? ........................................................ 25
How do I petition UASH? ................................................................. 25
How do I get a key that I need?
Find out from the Campus Key Shop (towards the southern end of Physical Plant) who has key control over the key you want. Go to them and tell this person why you need the key. They will give you a signed key control form which you then take back to the Key Shop or the Card Office to get your key. For the key that opens Sloan, Bridge, and several other buildings, you can go to the math or physics office to get this signed form.

How do I get an emergency loan?
Caltech Y offers a 30-day interest-free loans of up to $50. The Deans' Office may be able to loan you up to $500 through the Hoover Loan program. If you need a bank loan, check out the Caltech Credit Union.

How do I keep up with my classes if I get sick?
You might want to check with the individual professors, but most of them will accept a note from the Health Center for extensions on routine assignments (some of them won’t ask for even that much). To get extensions for midterms or finals, you almost always need a note from the Deans, and they will grant them far less liberally.

How do I replace my Caltech ID if I lose it?
Go to the Card Office, located on the first floor of CSS next to the housing office. It is open from 9am to 1pm, and there is a $15 charge for the replacement. They will replace damaged cards for free.

How do I borrow a dolly?
You can borrow a dolly for free from the Housing office (they will want you to leave a student ID as a deposit). Depending on the size, the time of day, and what you need it for you can also try physical plant or various campus loading docks.

How do I get furniture for my room?
If you need additional Caltech furniture, try contacting the housing office through fixit (email fixit@caltech.edu) or email the house to see if someone has an extra/doesn’t want theirs. You can also wait until the end of the year when seniors leave, at which point there will be a lot of furniture and other random items for sale or even free. Other options include Ikea and craigslist (kind of sketchy sometimes).

How do I request repairs for my room?
For painting or repairs, email the housing office at fixit@caltech.edu. This will usually produces a response within a few days. You can also go to the Housing office in the Center for Student Services in person. For after-hour emergency repairs, call (626) 395-6571.

How do I obtain LN2?
The Dean can give you permission to get LN2. They will want to know what you are using it for and will ask you a lot of relevant safety questions. In order to do this you need to have gone through LN2 safety training. There will be an opportunity to do so at some point.
during the year; ask your house president if you’re interested.

**How do I obtain GN2?**

Breathe in. Or open and then close a sandwich bag, if you want to be able to use it for something. Caltech provides complementary GN2 pumped into every room.

**How do I obtain R2D2?**

Go to Rordis City on Nubia and contact Industrial Automaton. The entire R-series is very well reviewed.

**How do I help improve courses that I am dissatisfied with?**

You should first see if your course has an ombudsperson and then talk to this person. If it doesn’t, then you should contact the ARC (Academics and Research Committee). There are several ways to do this. The first is to talk in person to an ARC rep; every house has one. The second way is to use the ARC’s anonymous contact box, which you can find at www.ugcs.caltech.edu/~arc/comments.php. You can also attend an ARC meeting—find out where/when these are by asking an ARC rep. Also, you should fill out all of your TQFRs at the end of each term, especially for TAs.

**How do I become a Health Advocate (Health Ad)?**

At the end of the year (around May), there will be an application open to freshman and sophomores that you can fill out (needs to include a letter of recommendation from an RA and another individual) and email to Mark Stapf, the program coordinator. The following year, the selected individuals will take a three-term course sequence that trains you to be a Red-Cross-certified emergency medical responder (EMR) and a health advocate. The course is three units and meets Wednesday nights.

**How do I get off board?**

The only real way to get off board is to move off-campus. You can petition for a special meal for medical or religious reasons with a detailed letter from a doctor or religious leader. Contact Jon Webster at jwebster@caltech.edu for more information.

**How do I declare my major?**

You’ll receive a form during third term of your freshman year and then you’ll fill it out. If you would like to change majors after declaring, visit http://regis.caltech.edu/forms.htm and click on "Petition to Change Options."

**How do I paint a mural?**

If you want to put up a mural you need to get approval from the Housing office. The mural policy available on the Housing website has a pretty clear description of the process, but here is what you have to do in a boiled-down form. According to the mural policy you can’t paint on the ceiling, and the North House doors need a 6-inch white border. Once you get your House President’s approval, talk to the AVPSL (Tom Mannion) and the MOSH (Erik Snowberg) to show them the mural you
plan to put up. You’ll need to give them a picture of what you plan to paint and tell them where you plan to paint it (either in paper or via email). After Tom and Snowberg approve the mural you have to talk to Peter Daily.

**How do I find somewhere to park on campus?**

There are many lots commonly used by undergrads: the South Lot (which is really an underground parking structure), which is on California behind Cahill, the Marks/Braun lot, which is behind Marks/Braun, the Holliston parking structure, the garage below Avery, parking all along the north side of campus, and parking north of Broad, Beckman, Moore, and Annenberg.

You will need a parking permit to park for an extended period of time on campus. Temporary permits are available from a machine on the top level of the South Lot or on the third floor in the Holliston structure, but if you want to park on campus for more than a week or so, you want to get an actual permit, available from the parking office (located at 515 Wilson). You have to fill out a registration form first, available online at [http://parking.caltech.edu/parking](http://parking.caltech.edu/parking).

**How do I finish an ACM 95 set, a lab report, and a hum paper in one night?**

You don’t.

**How do I get a girlfriend?**

You don’t.

**How do I get a boyfriend?**

The odds are good, but the goods are odd.

**How do I obtain free condoms?**

Some undergraduate houses keep these in public locations—ask an upperclassman if you’re not too shy. You can also get some in the Health Center restrooms or from Health Advocates.

**How do I deal with a broken condom?**

Don’t use it. The Health Center can provide you with treatments for sexually transmitted diseases. If pregnancy is a concern, the morning-after pill is available at the Health Center, but it is only effective if used within 72 hours of intercourse. AIDS testing is available for a nominal fee, but is not anonymous.

All concerns can also be addressed by Planned Parenthood (1-800-234-PLAN).

**How do I learn LaTeX?**

The best way to learn is to start writing your solution sets in LaTeX, either following that guide or another guide or asking someone you know for help. [detexify.kirelabs.org/classify.html](http://detexify.kirelabs.org/classify.html) is also pretty useful. Many math TAs would be willing to answer your questions because then they don’t have to read as many handwritten solution sets. Sometimes, TAs will even give you advice on LaTeX’d sets on how to write them better.
How do I become a tour guide?
Admissions will likely send out an email announcing that they are hiring sometime during third term. The hiring process involves an application, an interview with one of the tour guide captains, and finally an interview with the Admissions Counselor in charge of tour guiding (currently Jessica Silva). Assuming you survive this process and are hired, you will be able to start leading tours as early as the middle of third term.

How do I get a referral to a doctor or dentist?
Go to the health center and tell them the type of doctor you need a referral to. They will make sure that the doctor is approved by Caltech’s health insurance (or your own if it’s different). You can have them make the appointment for you if they’re not busy, or they will just give you a phone number to call and you can make the appointment yourself.

How do I register to vote?
If you want to register to vote, you have to be at least eighteen years old and a US citizen. To register to vote in California, you have to prove that you live here with some permanency (a letter addressed to you should suffice). You also have to not be a felon and not be “mentally incompetent,” but that’s probably not an issue for you. To register, fill out the form at www.sos.ca.gov/hvrc/fedform/. More information is available at www.sos.ca.gov/elections/elections_vr.htm. You can also just go to the local DMV and they’ll walk you through what to do, but you’ll probably want to make an appointment as lines are very long (but with an appointment it shouldn’t be too bad). If you are from out of state, you can likely register to vote through the mail. Find the “National Mail Voter Registration Form” online and follow your state guidelines.

How do I get a SURF?
For information on doing research at Caltech, see the Guide to Research for Undergraduates (GRU) section in the Little t, available in its entirety on the little t’s website (http://donut.caltech.edu/ascit/Little_t).

How do I file taxes?
This can get very, very complicated if you’re in a special situation, or it can be very, very simple. Your parents will probably know more about this than we can tell you since what you have to do in your home state varies from state to state. There’s a lot of information on the Internet that can help you. We suggest looking at www.ftb.ca.gov/individuals/index.shtml and http://www.ftb.ca.gov/forms/2014_California_Tax_Rates_and_Exemptions.shtml and the official IRS website, www.irs.gov. There are many online services that will help you file electronically, but be careful—most of them will let you file federal taxes for free but then charge you money to fill out your state taxes. They will not be clear about whether they’ll require you to pay until after you’ve filled out a lot of information, so make sure you’re not very sleepy when filing or you’ll probably just give in and pay the
money. You can get paper copies of forms from the post office in Kieth Spalding.

How do I get software that I need?

For the most part, you’ll be able to get all the software that you need for free from Caltech. There are two places that you can download software from: software.caltech.edu, which is for most of the software that’s available, and msdnaa.caltech.edu, which only has Microsoft software but has a lot more than software.caltech.edu does. Note also that you can download any piece of software there once, but if you need to install a second time you need to get approval (which they’ll give, but again it takes a business day). Do not buy any software until you’re sure that you can’t get it for free from Caltech.

Also, there’s some Adobe software (Photoshop and some version of the Creative Suite 5) that you can’t install on a personally-owned computer but you *can* go to SFL to use on a computer there.

How do I join a music group?

Most music groups have a booth at the club fair at the beginning of first term, where you can sign up for auditions at these booths. Auditions will probably be held in the music house, which is across the street from Avery and then down a path (if you’re worried about getting lost, just walk down Hill past admissions). For more information, visit http://www.music-theater-art.caltech.edu/.

How do I find somewhere to practice music?

If you want a good piano, you can go all the way to the music house, which is far away if you live on the Olive Walk but very close to Avery. There are several noise-proofed practice rooms there. If you just want a quiet place with a music stand, you can go to the basement of the South Houses (the SAC), and there are a few music practice rooms there; two of those also have pianos. Or you could just practice in your room as long as no one near you is trying to sleep.

How do I change my room combination?

There is a small bolt, or lack thereof (if someone took it off already) on the top or bottom of your lock. Remove it with a hex wrench if it’s still there. Press the button inside with a long pointy object. Now type in the old combination, press the button again, clear the combination (turn the lever in the opposite direction than would open the door), enter your new combination, and turn the lever to open the lock. Make sure it works before closing the door. If you have problems, find a friend who is more technically apt.

How do I know if I can prank something?

There are some items that no one is allowed to prank (the IHC has agreed that they will not be pranked). An up-to-date list can be found on the IHC website (ihc.caltech.edu) under the Resolutions section. A list current as of this publication is the Blacker dining hall tapestry, the Fleming bell, the Fleming cannon, the wall-sized Fleming flag, the Lloyd portrait, the Page portrait, and the Page Nixon poster. If you intend to prank something you should go to the aforementioned
website and read the IHC resolution about RFs (pranks). If your prank is more elaborate than a post-it note on your friend’s door that says, “the little t told me to put this post-it note here, hahaha!” just to confuse them (props if you actually do this!) then you should let a member of the IHC or Tom Mannion know of your intent a reasonable amount of time in advance and wait for approval to proceed. If you tell someone other than Tom Mannion, they will pass word on to Tom, and then Tom can make sure that you have all the equipment you need, that you are safe, and that security doesn’t interfere with your efforts. Obviously he’ll also make sure that the prank is reasonable.

How do I find free tutoring?
Go to the Deans’ office. They pay upperclassmen to tutor you in all core classes, and a few other ones as well, so it is free for you, and the tutor still gets paid. Or just knock on someone’s door — a lot of people will be glad to help.

How do I get a UGCS account?
Getting a UGCS account is easy! Go to www.ugcs.caltech.edu/New_Account.xhtml and follow the instructions. You will need SSH, so Windows users can pick up PuTTY for free from the internet. If you have any questions, email the sysadmins (they’re really nice sometimes) at sysadmins@ugcs.caltech.edu.

How do I get emergency medical/fire/police attention?
Call Security at (626) 395-5000 (you only need to dial the last four digits if you are on campus. This is true for all campus phone numbers). They will contact 911 right away if you tell them to, and direct them to the obscure campus location you are at. Dialing 911 from campus just reroutes you to security. Dialing 911 from your cell phone does not directly reroute you to security, but 911 will transfer you to security as soon as you say you’re at Caltech. It is therefore much better to just call security directly, so go put Campus Security’s number in your cell phone right now and try to memorize it. Again, their number is (626) 395-5000.

How do I survive in the line of gunfire?
If you are the primary target, run. Run fast and in irregular zigzags. Don’t bother to count shots. Turn a corner as quickly as possible. If you are not the primary target, hide. If the intended target is near you or the shooter is firing at random, get as low as possible. Lay flat. If you are outside and can get to a car, run behind it and lie behind the tire on the opposite side of the car from the shooter (note that a car will not stop higher caliber shots). If there are no cars, try to find a gutter. If you are inside a building, get into another room and lie flat, or stay behind a heavy, thick object. If you happen to be face-to-face with the shooter, do anything to make yourself less of a target. Turn sideways and stay low. If the shooter is outside, stay inside and away from doors and windows. Stay down until the shooting stops or authorities give the all-clear.
How do I build a desktop computer?

You need the following components: Motherboard, CPU, RAM, GPU, HDD/SSD, Case, Power Supply, Optical Drive, Mouse, Keyboard, Monitor.

Also keep in mind that this should not be your only resource! There are forums at www.newegg.com that often see topics like, “I’m building my first computer! I want it to play Starcraft II but it doesn’t need to be able to do anything else. Please help me!” and there are lots and lots of people who will comment with advice. Also, once you get to Tech you can ask people for suggestions (and help actually assembling); there are many people who would find it very fun to help you.

The first thing to decide is whether or not you plan on gaming heavily on your computer or not. If not, then consider looking for a motherboard with an on-board video card, as this will be cheaper than buying a dedicated video card, which you won’t need.

In deciding which motherboard to get, it’s important to consider which CPU you want. Recommended review sites for finding out about such things are www.anandtech.com and www.tomshardware.com. The motherboard must have a compatible CPU socket type with the CPU that you want.

Another consideration is the number of RAM slots on the motherboard, as well as its maximum supported RAM. If you are just using this computer for web-surfing, writing documents, and gaming, then 8gb of RAM is more than sufficient.

However, if you plan on running computations on data sets that are multiple gigabytes in size, then 12 or 16gb would make your job smoother. Make sure you get the correct type of RAM (DDR3 or DDR2, usually). The speed does not matter terribly much. Better RAM will have a lower CAS latency, but the benefit is very small outside of benchmarks.

If you want to do heavy gaming on your computer, make sure your motherboard has at least 1 “PCIe x16” slot for your GPU. For the true gaming enthusiasts who absolutely must play at 60 fps, or maybe at ultra-high resolutions (2560x1600 or greater), look for a motherboard with 2 PCIe x16 slots, and make sure that they are designed to run in at least x8/x8 mode when both are in use. Running one of your cards in x4 mode (like 16x/4x) can degrade performance at high resolutions.

Often-times, it’s most cost effective to get 2 mid-range cards and run them in SLI (Nvidia) or Crossfire (AMD). They will frequently outperform the top-of-the-line card at the time for the same cost. The most important thing to do is to look up benchmarks and decide which level of performance is within your budget. A very good resource for benchmarks of nearly all types of computer hardware can be found at www.anandtech.com/Bench/.

Picking the hard drive for your computer is usually very simple. There is not a significant real-life difference between various hard drives, and it usually comes down to the ratio of good/bad reviews a particular drive has gotten. A good way to bench the reliability of a hard drive is to look at the reviews it has gotten on www.newegg.com from buyers.

Getting a capacity of at least 1TB is recommended for storage,
although more or less may be needed based on what you plan on storing. DVDs are 1-4GB each, and you may require more space if you plan on storing your entire collection on your hard drive. Don’t spend too much time on this step, though, because it’s very easy to add additional hard drives in the future.

Solid state drives (SSDs) are a relatively new technology that uses flash memory instead of spinning platters to store your data. They are faster, more energy efficient, and more durable than HDDs, but they are also more expensive per unit of storage space. However, the price is dropping and the maximum storage space is increasing.

A common configuration used today is to buy a medium (64-250gb, depending on your budget and what you need) SSD to install your operating system and programs on and use a higher capacity HDD for storage of media and documents. This combines the best of both worlds, as your OS and programs are what benefit from the speed of a SSD, while your media would take up too much space to effectively store on SSDs.

For most people, any computer case will be sufficient, and it’s recommended to just get one you can afford, and wouldn’t mind having in your living space. However, if you do heavy computation and/or gaming, it’s a good idea to get a case with superior cooling characteristics. This usually comes in the form of larger and more fans in the case, as well as having a larger and less cramped case. This is definitely a good area to do some research online in if you want a good case that will help keep your components from overheating. Both tomshardware and anandtech both have reviews for cases, and www.silentpcreview.com has very in-depth reviews of many cases. Important factors are whether or not it supports the form factor of your motherboard, and how loud the included fans are, as well as any specialized cooling hardware the manufacturer may have designed. For ease of installation, some cases are tool-less. This may be extremely helpful if you find using small screwdrivers difficult or plan on opening your case frequently for some reason.

Your choice of power supply will depend upon how powerful your components are. Certain cases also come with power supplies. The largest power draw would come from the GPU. If you aren’t building a gaming PC and don’t have a high-end GPU, then a 400-500W power supply of nearly any brand will do. If you do have a high-end GPU or multiple graphics cards, go for at least 700W, and read reviews on various makes and models to determine the reliability of each power supply.

Any optical drive will do, as long as it reads DVDs so that you can install your OS from one. You may want DVD writing capabilities, or Blu-ray compatibility, but all drives that have the same media compatibility are essentially the same. Don’t expect to spend more than $20 on a DVD burner (but Blu-ray burners are much more expensive).

Most common mice and keyboards will do, unless you believe that you are so accurate with your control that a good mouse benefits your gaming. Cheap mice and keyboards won’t last very long, but they’re cheap. More expensive mice may not last much longer, but look for mechanical keyboards, rather than the common rubber-
dome keyboards. These things actually last forever and are highly recommended if you don’t want to get a new keyboard every other year.

Most mice today use an optical or laser sensor to track your surface. An important thing to note is that these mice will have trouble on highly reflective surfaces. Go for a more diffuse surface and they’ll work fine.

Choosing a good mouse usually involves trying the fit with your hand first, as most mice are more accurate than the human body is capable of controlling anyways.

Be careful of wireless mice and keyboards, as the dorms at Tech have tons of RF interference due to our wireless network, and sometimes there is too much noise and wireless mice and keyboards will experience input delays.

You’ll generally want some sort of LCD monitor for your computer (although you can probably find a CRT somewhere on campus for free). It’s recommended to have a resolution at least 1680x1050, and at least 21” in size. Smaller than 21” monitors will require the user to sit very close to the screen (like laptop screens).

There are many types of LCD monitor panels out there, with 2 main types of backlighting. There is the more common, and cheaper, CCFL backlighting, which essentially uses fluorescent bulbs to light your screen. Then, there is the more expensive LED lighting option, which comes in back and edge-lit variations. Back-lit is considered to be better for uniformity, while edge-lit is cheaper.

LED backlights are generally brighter than CCFL backlights, and have better uniformity over the screen. They are also more power efficient, and take up less space, so LED lit monitors tend to be lighter and thinner than CCFL monitors.

There are two commonly affordable LCD panel types: TN and IPS. TN is cheaper, has extremely fast response time (less streaking when motion is on-screen), but poor viewing angles and color representation. IPS panels are fancier, have great viewing angles, and better colors than TN panels, but also usually have slightly slower response time (>6 ms) and are much more expensive.

There exist IPS panels that are made for gaming with fast response times, as well as TN panels with great color representation, but those are out of the norm.

Once you have chosen your parts, you should review them, and make sure your motherboard has enough ports to support all of the components. Just match up each connector type of the component to one such slot on the motherboard.

If everything has a home on the motherboard, and it’s all within your budget, then it’s time to order.

It’s recommended that you buy retail versions of your components rather than OEM versions, since retail packages come with required cables and accessories, while OEM may be slightly cheaper, but won’t come with anything except the barebones hardware.

Assembling the computer is done slightly differently depending on the case and motherboard you have. It’s best to follow the assembly instructions that come with your case and motherboard.

Make sure that you are minimizing the amount of static electricity on
your body when you touch the components. Try not to assemble the computer on carpet, and don’t rub the carpet while moving around and holding computer parts.

It’s possible to buy anti-static wristbands, but they aren’t really necessary if you’re careful. If you have a metal, or otherwise conductive, case, it can help if you install your power supply and plug it in first, as power supplies frequently have grounded outer shells, which will also ground your case when you install the power supply. This provides an easy way for you to rid yourself of accumulated static (touch the case or power supply), and may prevent your electronics from burning out.

Most computers can be assembled with only a phillips head screwdriver. Occasionally, a flathead may be required, but no specialized tools are necessary.

Don’t be afraid of using a bit of force when plugging parts together. The circuit boards are capable of flexing a few degrees without damage, and some slots require quite a bit of effort. However, please remember to make sure you are plugging things into the correct slots. It’s usually pretty easy to identify what goes where, and each slot and plug combination are exclusive, so you can’t plug anything into the wrong type of slot.

How do I add/drop classes?
You fill out the yellow Add/Drop card before Add Day (3rd week of term) for adding classes and before Drop Day (7th week of classes) to drop a class. To add a course, you need the professor’s signature as well as your adviser’s. If you adviser is not in town, talk to one of the Deans. To drop a course, you just need your advisor’s (or Dean’s) signature. To add a course with a time conflict, you will need to fill out the orange Time Conflict card.

How do I change advisers?
Submit the Change of Adviser form, available at http://regis.caltech.edu/forms.htm under the heading “Request a Change of Adviser.”

How do I declare a minor or double major?
Submit the relevant forms, available at http://regis.caltech.edu/forms.htm under the heading “Double Options and Minor petitions.”

How do I find a work study job?
See the next little section or contact the Career and Development Center.

How do I petition UASH?
Visit http://regis.caltech.edu/forms.htm and click on the relevant UASH form(s). For more information about UASH, visit http://www.registrar.caltech.edu/uash/.
ON - CAMPUS
CAMPUS EMPLOYMENT

Frosh can’t work on campus first term and need the Dean’s permission second term. Other students are free to work if they wish.

ISOLATED SOURCES OF MONEY

- SSEL Experiments: www.ssel.caltech.edu
- Brainscience Experiments: www.brainscience.caltech.edu
- Random experiments in flyers on campus
- Write for the Tech. Submit articles/comics to tech@caltech.edu

STEADY WORK OPPORTUNITIES

During the summer, there are a lot more research jobs available (talk to the CDC for other types of jobs and/or internships), including SURFs (which are more plentiful, but they make you do more paperwork and write progress reports—it’s supposed to simulate the “real-world” research conditions...). If you’re just looking for employment and not research, you can work for Campus Housing or one of the libraries or the Career Development Centers or other on-campus offices if you have a work-study grant. These jobs will pay you reasonably and sometimes provide free housing, but they’re usually pretty boring and you’ll spend a lot of time doing nothing.

- Admissions. Give tours of Caltech to interested prefrosh and their parents. Contact Jessica Silva, jsilva@caltech.edu.
- Library Sitting. $10/hr but possibly the easiest job on earth. Open to work-study only. Contact Viet Nguyen, viet@library.caltech.edu.
- Caltech FUND Phonathon. Talk to alums about how great your experience here is. Pay range from $12-20/hr; application available at http://fund.caltech.edu.
- TAing a class. Talk to the professor of the class you’re interested in TAing.
- Tutoring Pasadena Area High Schoolers. Pays ~$30/hr. For more info, visit www.career.caltech.edu/joblistings/tutoring.shtml.
- Ushering. $15/hr and lets you see performances for free. You get 2 hours automatically, 3-5 hours depending on the show, and 4 hours automatically if you take tickets. Talk to Adam Jacobo ajacobo@caltech.edu.
- Waiting Dinner. Pays about $8 an hour and not incredibly time consuming. Talk to your House’s head waiter.
- Working in a Lab. Payment varies here, anywhere from $9 an hour for a bottle washer to $20+ an hour for a research assistant. You’ll need to find a prof who agrees to hire you.
- Caltech Y. Varies from tutoring high-school kids on campus, to gardening at the Huntington, to working in a soup kitchen downtown. Work-study only. Walk into the office and say you want to talk to someone about work study. Athena is very helpful.
Build Your Network and Begin Your Career

CALTECH CAREER DEVELOPMENT CENTER

On Campus

Services offered include:

- Career counseling services for current undergraduate and graduate students, current Caltech postdocs and recent alumni
- General walk-in counseling hours from 9-11 am and 1-4 pm on Tuesdays, Wednesdays and Thursdays (pre-health advisor available on T/TH)
- Internship walk-in counseling hours on Mondays, Wednesdays and Fridays from 9-11 am and 1-4 pm
- Professional skills workshops
- Career Fairs in October and February
- On-campus information sessions and recruiting with major companies
- Online job and internship listings through TecherLink
- Pre-health and other pre-professional counseling and advice

For more information on the above please visit our website.

VISIT US AT:
414 S. Holliston Ave
Center for Student Services Suite 310

Phone: 626-395-6361
E-mail: career@caltech.edu
http://www.career.caltech.edu

Please call, email or go to our website to schedule an appointment.
On Campus

CAMPUS SERVICES

The following is an attempt to list and summarize Caltech’s offices and services. Only those likely to be relevant to students are listed. CSS stands for Center for Student Services and is located at the corner of Holliston and San Pasqual, on the way from the north houses to Avery, across the street from the Caltech Y.

CONTENTS

Athletic Facilities ............................................................... 30
Audio/Visual ...................................................................... 30
Bookstore .......................................................................... 30
Bursar’s Office ................................................................. 30
Career Development Center .......................................... 30
Center for Diversity .......................................................... 31
Confidential Resources ...................................................... 32
Counseling Center ............................................................. 32
CS Cluster ......................................................................... 32
Deans’ Office ..................................................................... 33
Dining Services .................................................................. 33
Chandler Cafe .................................................................... 33
Broad Cafe ......................................................................... 33
Red Door Cafe .................................................................. 33
Coffeehouse ....................................................................... 33
Convenience Store ............................................................ 33
Fellowships and Study Abroad ......................................... 33
Financial Aid ....................................................................... 33
Graphic Resources ............................................................ 34
Health Advocates .............................................................. 34
Health Center ..................................................................... 36
Health Educator ................................................................ 37
Housing Office .................................................................. 37
IMSS .................................................................................... 37
International Student Program ......................................... 39
Libraries ............................................................................... 39
Mail Services .................................................................... 40
MOSH .................................................................................. 40
Parking Office ..................................................................... 40
Public Events ...................................................................... 40
Registrar ............................................................................ 40
Resident Associates ............................................................ 42
Resident Life Coordinators ............................................... 42
Security ............................................................................... 43
Student Activities and Programs ........................................ 43
UASH .................................................................................... 43
UGCS ................................................................................... 43
Caltech Wired .................................................................... 44
Caltech Y ............................................................................ 44
Athletic Facilities

South of California, between Hill and Wilson
x6146, www.gocaltech.com

There are two gyms here: Brown Gym and Braun Gym. The only entrance is through Braun Gym (ID card necessary), but Brown can be reached by going through Braun to the track outside and back into Brown. They are both located on the southern side of campus. Brown Gym has a basketball court and is also used for volleyball, badminton, gymnastics, and martial arts. The climbing wall is at the east end of Brown; you can get a key from the front desk of Braun.

Braun Gym also offers volleyball, basketball, and badminton. It has squash and racquetball courts, a dance/aerobics room (they offer classes with or without PE credit in these, as well as in yoga and martial arts), a weight room, and a cardiovascular fitness area. Hours are 6 am - 10:30 pm M-F and 8 am-8 pm on the weekends.

Between the two gyms there are two heated outdoor pools (open 6 am - 8:30 pm (closed 9 am - 11 am though) weekdays and 10 am - 7:30 pm weekends). One of them is deep enough for water polo and three-meter diving. There is a track and a soccer/football field on the south side of the gym. On the north side of the gym, a softball field and another soccer field are located on top of the parking structure. Further to the east there are tennis courts.

Audio/Visual

320 S. Michigan
x4657, http://amt.caltech.edu

They rent out audio and visual equipment, cheaper than off-campus locations.

Bookstore

Winnett Student Center
x6161, http://caltechstore.caltech.edu

The bookstore sells office supplies, lab notebooks, magazines, posters, assorted candies, greeting cards and gifts, calendars, New York Times bestsellers, college paraphernalia, etc. You can charge purchases to your student account (but not to declining balance). They’ll also cash checks. Open weekdays 8:30am-5:30pm.

As of the recent bout of budget cuts in 2009, the bookstore no longer sells textbooks. Instead, Caltech partnered with an online bookstore (bookstore.mbsdirect.net/caltech.htm) and have set up an email address (textbooks@caltech.edu) should you have trouble with the online system. You can return textbooks for two weeks to the online store, but you will have to pay for the return shipping costs.

As always, it is advisable to get your books early from bargain online retailers: half.com and Amazon marketplace are both good resources. One of the best sources, however, is that upperclassman who never, ever, wants to see that particular book again. Ever.

Bursar’s Office

CSS first floor
x2988, www.bursar.caltech.edu

They bill your tuition and maintain your billing address. You can make payments on your tuition directly in their office, even paying in cash if you want to.
Career Development Center  
**CSS third floor**  
x6361, [www.career.caltech.edu](http://www.career.caltech.edu)

The CDC helps students find summer and permanent employment. They also post internships, tutoring jobs (this is very lucrative if you have the time), work-study jobs, and volunteer opportunities. They are also great resources for resume writing, interviewing techniques and salary negotiations. They maintain a library of information on employers and graduate schools. Recruiters from industry usually come to Tech first and second terms to interview students. The CDC will help you set up an interview. Watch for notices in the Tech and around campus.

Center for Diversity  
**CSS second floor**  
x6207, [http://diversitycenter.caltech.edu/](http://diversitycenter.caltech.edu/)

The new Caltech Center for Diversity (CCD) is a recent merger of the Minority Affairs office and the Women’s Center. As part of the merger they included LGBT support explicitly in their mission statement, so there has since been more active LGBT support. The director for the center is Eva Graham (formerly the director for Minority Affairs).

The CCD supports minority students, helping them graduate as well as informing the rest of campus about underrepresented cultures. They organize Freshman Summer Institute for incoming frosh, the Math and Science Achievement Program, and academic and career information for underrepresented minorities. They cosponsor Semana Latina and activities for Black History Month. They also administer the Mellon Fellowship Program and support student organizations for underrepresented minorities.

They also coordinate outreach programs that expose precollege minority students to math and science: Saturday Tutorial program for children of Caltech staff (student run) and the Saturday Academy for local high school students. They would appreciate student support (speaking, teaching, or tutoring) for either of these programs.

In addition to this, the combined CCD works for the advancement of women in science and engineering, as well as at Caltech. They have a lending library about women in science and engineering and invite women speakers—contact them if you want to be notified. In the past, they have organized self-defense classes (open to both males and females), screened movies, and hosted women’s nights. Additionally, as funding allows, they organize weekly lunches, to which all frosh women are invited. These lunches are great if you just need a little time with your fellow females.

LGBTQ events, typically organized by a combination of the CCD, PRISM, and Pride, include a weekly Friday lunch (BYOL on alternating Fridays), an LGBTQ support group twice per month at 7:30pm in the Health Center, movie screenings, and invited speakers. To learn more or join the email lists visit rainbow.caltech.edu.

One of the nice things about the CCD is that they tend to offer free lunches to various groups of people. Here’s a list of their lunches:

- **All-CCD luncheon** (for all populations served): 1st Wednesday of the month
- **Graduate women’s discussion group**: 1st & 3rd Mondays of the month
• Frosh women lunch meetings: 1st & 3rd Thursdays of the month
• LGBTQ undergrad lunches: 2nd & 4th Mondays of the month
• LGBTQ graduate lunches: 2nd & 4th Fridays of the month
• Grad Chat (for underrepresented minority grad students): 1st & 3rd Thursdays of the month
• Underrepresented minority student (URM) undergrad lunches: 2nd Fridays of the month

Confidential Resources

Confidential resources are available to the Caltech community as confidential sources (to a point). They are available for support with both academic and mental issues and are trained to try and help you with your problems. At the very least, they will listen to you and provide support in whatever capacity they can. They cannot keep information confidential that may cause harm to anyone but other than that, they are good resources for confiding in.

List of confidential resources:
• Taso Dimitriadis (CCD Program Manager) - (626) 395-8108
• Jenny Mahlum (Health Educator) - (626) 395-2961
• Counseling Center - (626) 395-8331
• Health Center - (626) 395-6393

Counseling Center

Arden St, just south of California x8331, http://counseling.caltech.edu

Open weekdays 8am-5pm (off from noon - 1 pm).
You can get psychological counseling, evaluation and medication. The counselors here help with a wide range of problems: coping with stress, difficulties with advisers, homesickness, relationship problems, loneliness, depression, trouble with parents, and more. The service is confidential, and can be used for short-term or long-term help. Sometimes for specialized or intensive care they can and will refer you to outside professionals who can help diagnose and/or treat you.

The counselors stress that most of the people they see face the same problems as the rest of Caltech students and are not sick or disturbed, at least any more than the rest of us are. If you’re feeling down, please, please talk to the Counseling Center, a Health-Ad, a UCC, or a friend. Depression is treatable and Caltech’s Safety Net is there for you.

If you have an emergency after hours, you can call security (x4701) and have them page the psychologist on call.

CS Cluster

Annenberg 104
http://cs.caltech.edu

The CS cluster is a collection of computers for CS majors that are located in Annenberg Lab (ANB 104). You can SSH into login. cs.caltech.edu using your CS cluster username and password (which you receive from the sysadmins upon taking a class which requires it, or if you’re a CS major), and from there access any of the machines. All of the machines are on a networked filesystem, so you can access your files from any of them. They are mostly running openSUSE, but the lab has a few Windows boxes as well.
On Campus

Deans’ Office

Open 8am-noon, 1pm-5pm.

The Dean’s Office offers many services, and you should go to the website to see them all, but here are important ones. If you have any questions or concerns about your academic course load, go to the Deans office. If you want to take courses at Art Center, Occidental, or Scripps, the Dean’s office can give you permission to do so. They run an excellent student tutoring program.

Dining Services

If you live on campus, you are probably on the board plan. This includes five dinners per week in your house dining hall, and a declining balance that you can use at a number of Caltech dining facilities to buy lunch or whatever else you want.

The board program for the North and South Houses also includes an open kitchen 7:30am-11:30am and between 3pm and dinner—you can go and get whatever food you want from the wide selection of cereal, fruit, and drinks.

If you live off-campus, you still have the option to go on board. The net money you pay per dinner is lower if you buy the board plan, but not by that much. Dinner is about $13/meal if you are off board and about $12/meal if you are on board. Given that very few people are diligent enough to attend every dinner and use up the entirety of the declining balance, it is very rare that someone off-campus chooses to buy board unless they are incredibly lazy.

- **Chandler Café**, open from 7am to 10:30am for breakfast and 11am-3pm for lunch. They serve a pretty generic American breakfast and all sorts of food for lunch. It’s reasonably cheap, especially for a declining balance vendor—lots of grad students and professors eat here for real money since it is subsidized by the rest of the board program.
- **Broad Café** is open from 7:45am to 2:30pm. It is located east of Broad in the northwest corner of campus. They have sandwiches, snacks, and various drinks.
- **Red Door Café** (7:45am-5:30pm) is pretty similar to Broad, only with croissants and prepackaged sandwiches.
- **The Coffeehouse (Chouse)**, formerly in the South Houses, is currently located in the Red Door Café from 10pm-2am on days when there’s class in the following morning (Sunday through Thursday).
- **The Convenience Store** (also called the C-Store) bears an unusual resemblance to a 7-11. Their hours change rather often, and, they also close down for a half-hour break somewhere between one and three times per day. Your best bet is checking isthecstoreopen.caltech.edu.

If you have questions or concerns about the dining program, talk to your house food committee representative—there is one for each house.
Fellowships and Study Abroad

Caltech has exchange programs with Cambridge, University College of London, University of Copenhagen, Danish Technical Institute, and University of Edinburgh. There are a number of other programs available. Most people go for one term of their junior year, although the fall term of senior year is also doable.

Financial Aid

About two-thirds of Caltech’s students receive financial aid. You need to reapply every year. You can go to the Financial Aid office if your family’s circumstance has changed; they will take a look at your case individually and are very accommodating in the case of parental job loss or death. The finaid office certainly benefits from the small size of Caltech and takes into account far more factors than a larger organization would allow.

Graphic Resources

Graphic Arts offers various printing and copying services. They have excellent copiers. They also produce letterheads, envelopes, and business cards with the Tech emblem and provide binding and finishing services, slide and overhead production, and mounting and scanning services. You’ll have real trouble stumping them with your graphics needs (if you’re willing to pay the prices). They can also make color copies and passport photos while you wait. All Graphic Arts services can be charged to your student account.

Health Advocates

Health advocates are students who took a year-long course training them to be first responders. They all have kits that include band-aids, Ace wraps, some over-the-counter medications, condoms, ear plugs, and many things that are useful in emergencies but not for day-to-day use. They also have a little bit of training in counseling, so if you want to talk to an undergrad about anything but aren’t sure who to go to, you can find a health ad. We’re listing them here with their house affiliations, but you are not at all required to go to a health ad in your house and are encouraged to find a health ad in another house if you can’t find one in your own house and need one.

Avery: May Hui, Jenny He, Sheila Lo, Kevin Yu, Lauren Li, Gauri Shastri
Blacker: Andre Comella, Melissa Cronin, Catherine Pavlov, Kate Evans, Emily Meany, Jeffy Rosenberg
Dabney: Alex Mun, Alex Geffner-Mihlsten, Sylvia Hurlimann, Chengyi Lee
Fleming: Kristin Anderson, Courtney Chen, Rushikesh Joshi, Grace Leishman, Aashrita Mangu, Tomas Tussie, Kevin Yei
Lloyd: Edward Garza, Snigdha Kumar, Stephanie Wong, Stephanie Hong, Judy Shon, Evan Sloan
Page: Megan Keehan, Valerie Pietrasz, Roshan Agrawal, Christine Chou, Nishant Desai
Ricketts: Stella Wang, Erin Isaza, Andrew Montequin, Laura Watson
Ruddock: Meeghana Pagadala, Heather Gold, David Inglis, Auggie Nanz
FASA offers fellowship advising on applying for:
Science/Engineering Graduate Fellowships (NSF, Hertz, NDSEG, etc.)
Graduate Fellowships Abroad (Fulbright, Rhodes, Churchill, etc.)
Summer Study Abroad Fellowships (SanPietro and Bishop)
and more!

FASA also manages all official study abroad programs:
- Cambridge Scholars Program
- Copenhagen Schoolers Program
- École Polytechnique Scholars Program
- Edinburgh Scholars Program
- Melbourne Scholars Program
- University College London Scholars Program

The FASA Library has a large selection of travel books geared to the student budget, as well as information on fellowships, opportunities to study or work abroad, and general travel information.
Hours during term are M-Th 8:15am-4:45pm, F 8:15am-4pm (open 12pm-1pm); hours during break are M-Th 8:15am-4:45pm, F 8:15am-4pm (closed 12pm-1pm)

In an emergency, call security at (626)395-5000 if you’re on Caltech-owned property or 911 if you’re off-campus.

You don’t need an appointment (unless you wish to see a specific doctor or nurse)—just drop in. Their services include medical consultations and treatments, lab tests and x-rays at off-site facilities, specialty clinics, prescription medications, Pap smears, birth control prescriptions, health education and preventative care, allergy injections and other immunizations. (Note that you are not required to get a referral from the health center to visit another doctor, despite that the insurance forms make it seem otherwise.) If you are having trouble with your insurance forms, the receptionist Jeanne Holloway is extremely helpful with sorting things out and pointing you in the right direction.

The medical and counseling staff are on call for acute medical problems when the Health Center is closed. Call (626) 584-2421 and ask for Dr. Stuart Miller; say that you are a Caltech student. Often, a physician can help you by giving advice or phoning in a prescription. But if your problem is serious, the doctor will direct you to the nearest emergency room or urgent care center. The nearest emergency room is Huntington Memorial, 100 W. California Blvd. The nearest urgent care center is at 401 South Fair Oaks.

Services at the Health Center are free to registered Caltech students. Lab tests are covered by insurance when they’re medically necessary (once your deductible is paid). Optional lab tests (HIV, cholesterol, immunity) are not covered. Prescribed medicines that the health center has are either cheap or free.

Condoms are available without charge in the restrooms. Prescribed contraception is available at a reduced price. The morning-after pill is available but is only effective if used within 72 hours of intercourse.

Dermatologic services and allergy injections are available by appointment only. The orthopaedic clinic is open every other Thursday 5pm-6pm. Travel immunizations can be done both by appointment and just with a walk-in.

The women’s health clinic offers Pap exams, birth control, and pregnancy testing. They can refer you to obstetricians, hospitals, family planning clinics, and family planning counseling. This requires an appointment, however.
When you need health services beyond these, the Health Center can refer you to outside specialists. Students are enrolled in Aetna’s Chickering plan, unless they opt out because they are already covered under a similar plan. You can find a preferred provider (PPO) at www.aetna.com/docfind/custom/chickering. Most expenses are paid at 100%, but some are paid at 80%; the latter includes, but is not limited to, prescription drugs and medicines, anesthesiologists, ambulance, and services during travel outside the U.S.

If you choose to use a different provider, you will usually be covered for 70% of expenses. You will also get up to 50% off eye exams and prescriptions when done by a VisionOne optometrist. In all of these cases, be sure to show your card before treatment.

All students are also required to enroll in the CIGNA Dental Insurance Plan unless exempted because of existing coverage.

Health Educator

CSS, second floor
x2961, www.healtheducation.caltech.edu

The idea behind the health educator is to provide health promotion programs to enhance your Caltech experience. The current health educator is Jenny Mahlum (jmahlum@caltech.edu). Some program topics include stress and time management, nutrition, sexual health, alcohol and other drug use and abuse, balancing academic and social activities, and general health and wellness.

She is also there to answer minor and/or embarrassing questions that you don’t feel like going to the Health Center about. Services are free and confidential, and there are free snacks. Drop-in hours are 4-5:30pm on Mondays and 2-3:30pm on Thursdays.

Housing

CSS, first floor
x6176, http://housing.caltech.edu

The Housing Office furthers the goals of Caltech by providing convenient, attractive housing. To this end, the Housing Office guarantees housing for all first year undergraduate students and all first year graduate students.

Specific people who can be extremely helpful to students are Marie Lara, an administrative assistant, and Juan Balcazar, the head of maintenance; they will go out of their way to work things out. If you talk to them you can get things fixed (leaky faucets and the like that clearly are not your fault) and get furniture moved around (extra desks taken away, extra beds moved in, whatever you want they will try to accommodate).

If you need repairs, you can call x6175 during the business day and x6571 ((626) 255-1770 if you are off-campus) during the night. The online fixit@caltech.edu can be helpful sometimes.

IMSS

CSS third floor
x3500, http://imss.caltech.edu

Information Management Systems and Services (IMSS) runs the campus network and some computer labs. You should have received an account at the beginning of freshman year. This account can be used for @caltech.edu email, web hosting on www.its.caltech.edu, Solaris login to its.caltech.edu, and Windows machines. Caltech-owned
MAIN OFFICE

WEB: HTTP://WWW.HOUSING.CALTECH.EDU/UNDERGRAD/

EMAIL: HOUSING@CALTECH.EDU

PHONE: (626) 395-6176

MAINTENANCE OFFICE

WEB: HTTP://WWW.ITS.CALTECH.EDU/~FIXIT/index.htm

EMAIL: FIXIT@CALTECH.EDU

PHONE: (626) 395-6175
housing provides one network port per pillow. On-campus housing is directly connected to the Caltech network with gigabit in some areas. Apartments generally have cable modem service with a VPN to allow access to library resources. DHCP works in most places, although you may have to wait up to 30 seconds after connecting the cable. IMSS employs student representatives in each house to maintain house labs and to help with computer problems.

Site-licensed software such as Mathematica, Matlab, and Maple are available from software.caltech.edu. The lab also has a quality color printer available for students.

**International Student Programs**

CSS second floor
x6811, www.international.caltech.edu

The ISP supports international students at Caltech. They can give you immigration advice and help you with any number of other things associated with living in the US. The ISP office supports various cultural programs and runs the “International Student Orientation” -- a supplement to the standard orientation for those less familiar with the US. The office is open from 9am to 5pm, and they have walk-in hours (no appointment needed) from 1pm to 4pm.

**Libraries**

http://library.caltech.edu

The Caltech Library System contains over 550,000 books and 3,000 journal subscriptions that are vital to the Institute’s mission of research and teaching. A Caltech ID is required to enter or remain in the libraries after 5pm and on weekends.

- **Millikan Library**: Undergoing renovations.
- **Sherman Fairchild Library**: Engineering and Applied Sciences. They also have group study rooms, a Public Affairs Reading Room, a nice multimedia room for techno-fancy conferences, copiers/printers, many tables to get work done outside of your room, and a small leisure reading section with open journals and newspapers on the third floor. It used to be open 24/7 all year round with a current undergrad ID card, but it is now closed from 3am to 9am Friday night and 2am to 9am Saturday night.
- **Dabney Library** has a few open use computers, one of the few open access working scanners on campus and comfy chairs for studying. It is also almost always very quiet and has a nice not-too-busy feeling. This library has a large number of novels and is a great resource for leisure reading. Open M-F 8am-1am, Sa-Su 9am-1am and 8am-12am, Sa-Su 9am-12am during breaks (same as Millikan).
- The **Geology and Planetary Science Library** is on the second floor of North Mudd. It’s beautiful.
- A separate **Math Library** is in the basement of Sloan.
- The **Astrophysics Library** is in the south end of Cahill.

The online catalog for all of these is at http://clas.caltech.edu. The library also maintains a research paper search engine at http://library.caltech.edu/scisearch/index.html. Caltech has online access to most research journals and databases.
Mail Services

There’s a US Post Office contracted out to Caltech employees in the lobby of Keith Spalding (across California next to Cahill). They can also do FedEx shipping from there.

Mail to undergrads is delivered to the mailboxes between Lloyd and Page. If you get mail for the previous mailbox user, just make a note on the envelope to reroute it and put it in the outgoing mail box, conveniently located twenty feet to the east at the Tech Express. If you want to mail something, you can stamp it (available at Bookstore or at the Tech Express), or write down your student ID and they will charge it to your account. Mailing things to campus addresses (intra-campus) is free and convenient.

You can pick up your package at the Tech Express, located on the Olive Walk, or at either Keith Spalding or the Physical Plant, depending on its method of arrival.

To get something mailed to you, use this address:

Your Name
1200 E. California Blvd.
MSC xxx
Pasadena, CA 91126

MOSH 500 S Hill Ave
(626) 395-2541, http://mosh.caltech.edu/

Erik Snowberg, the Master of Student Houses (MOSH), acts as a liaison between Caltech undergraduates and faculty to promote the well-being of students, both socially and academically. To this end, the MOSH hosts events for faculty and undergraduates throughout the year, and works closely with students on the Academics and Research Committee. He organizes trips to the opera, theater, and symphony, has students over for meals and movies, co-hosts etiquette dinners, and arranges other activities.

Parking Office 515 S Wilson Ave
x8877, http://parking.caltech.edu

The parking office is in charge of allowing you to park on campus. Go to their office to get a permit (although you need to fill out a form first), dispute a ticket, or ask questions. During the week 9am-5pm parking requires a permit that runs about $40 per month, which allows you to park in any unmarked space.

Public Events Winnett Student Center, first floor by ATM
x4652, www.events.caltech.edu

Caltech Public Events invites performers and speakers to Caltech. It’s $5 for Caltech students, and events are often open to the general public. The website has a full list of performers for the coming year.

Registrar CSS first floor
x6355, http://regis.caltech.edu

There are three terms in a year and ten weeks of classes in each term. You can add new classes until Add Day. You can drop classes until Drop Day. You will need to pick up a yellow card from the Registrar, fill it out, and have the professor and your advisor sign it. The Dean can
REDUCED SHAKESPEARE COMPANY
THE COMPLETE HISTORY OF COMEDY (ABRIDGED)
10/17/2015

GOOD LOVELIES
11/14/2015

MARK O’CONNOR
AN APPALACHIAN CHRISTMAS
12/12/2015

GARRY KRINSKY
TOYING WITH SCIENCE
1/15/2016

YAMATO
THE DRUMMERS OF JAPAN
1/30/2016

THE HOT SARDINES
SPEAKEASY NIGHTS
2/20/2016

BRADLEY FIELDS
MATHEMAGIC!
3/4/2016

CALADH NUA
3/12/2016

THE INTERGALACTIC NEMESIS:
TARGET EARTH
4/9/2016

CAPITOL STEPS
5/7 & 8/2016

For tickets call 626 395-4652
www.events.caltech.edu
sign for your advisor if your advisor is away. They will also sign it if your advisor is very busy, but they really would like to encourage you to hunt down your advisor. If you drop a class before Add Day, the professor teaching the class does not need to sign it.

If you and the professor agree, you can take an extension (an “E”) to finish a class. You will need to work out all the arrangements with the professor, and the professor needs to submit the grade by the Add Day of the following term. You can do this for up to six classes during your time at Caltech. “I”s are a separate matter entirely and are only given out with proper medical reasons approved by the Dean’s office.

There is a set of academic requirements you must fulfill to be eligible to register for a given term. These are long and complicated; if you’re in danger of being close to them, check out the Catalog, or www.deans.caltech.edu/details/eligibility.html.

Registration is online at http://regis.caltech.edu/regis.htm during the final weeks of the prior term. Conflicting classes are registered for on paper during the term.

Other things you might want to talk to the Registrar about: getting transcripts ($5 for official, $0 for unofficial since you can now print them yourself on Regis), getting out of core classes, changing your major, and talking to them during your senior year to explain how you’re going to fulfill the forty-two graduation requirements still ahead of you. Try to talk to them pretty early in the senior year because it will give more time for confusion to settle out.

Resident Associates

At least one in every house

More commonly known as RAs, every house has one or two of them. They are there if you need help resolving personal conflicts or are feeling stressed about academics and don’t want to go to the counseling center. They can to help you plan house events and will occasionally sponsor smaller ones. They are not a confidential resource, but most RAs will not tell anyone any concerns that you bring to them unless they see your concerns as suggesting a danger to yourself or to others. All RAs are interviewed by the house that they will be assigned to, and the house has to approve the RAs before they will be assigned, so your RAs are almost certainly very good fits for your house’s culture. Overall, they’re pretty awesome people and you should get to know them.

Resident Life Coordinators

SAC, Page, Avery, Catalina

Resident Life Coordinators (RLCs) act as a liaison between the RAs and the Deans office. In addition, they provide support to the student population in an academic and mental capacity, and work closely with House ExComms to plan both educational and entertaining events for undergraduates.

RLC Contact information:

• Larissa Charnsangavej (Catalina) - (626) 395-2152
• Erica Crawford (North Houses) - (626) 395-6963
• Jenny Galvez (South Houses) - (626) 395 3402
• Joe Bennethum (Avery, Off-Campus) - (626) 395-8025
On Campus

Security

Holliston Parking Structure, first floor
http://security.caltech.edu
x5000 (emergencies), x4701 (non-emergencies)

Security provides escorts at night, both around campus and to off-campus housing. They can also get you into buildings if you have a good reason to go there, as well as handle lockouts. They usually want to see ID for this. In theory, they can issue you a temporary card if you lost yours and need access before the Card Office is open. They are very accommodating about opening up labs and classrooms when you realize you forgot your notebook and the building has been locked for the night.

Security is also in charge of parking and enforcement. Their tickets actually matter, so make sure you pay them prior to graduation.

Student Activities and Programs

CSS first floor
x6194, http://studentlife.caltech.edu/

The student life office can be a good resource for club funding and scheduling various events on campus. You can always email Tom Mannion, Senior Director of Student Activities and Programs, and nothing beats a person-to-person meeting. Tom is the type of guy who, if you called him and said you needed a crane, would probably meet you later that afternoon with two birds and an industrial-size crane trailing behind him.

UASH

CSS first floor
http://www.registrar.caltech.edu/uash/

The Undergraduate Academic Standards and Honors committee (UASH), composed of around 8 professors elected by the Caltech faculty, 6 students (3 voting, 3 alternate) selected by the IHC, the Registrar, and the Undergraduate Deans. The committee is responsible for awarding a variety of academic honors (e.g. graduation with Honors) and is responsible for ensuring that a consistent set of standards and rules is applied in academic matters involving undergraduates. UASH meets on the second day of every term to consider reinstating students who have lost their eligibility. The Deans can reinstate you from your first ineligibility and sometimes for minor infractions. You need to file a petition for UASH to the Registrar by 3pm on the first day of term.

Students who need to be reinstated by UASH are advised to meet with one of the Deans before petitioning the committee. A Dean can read a draft of your petition and advise you about your appearance before the committee. It is important to get your adviser’s statement of support and signature on the petition.

UGCS

Winnett 2C
www.ugcs.caltech.edu

The Undergraduate Computer Science lab (UGCS) has been operating at Caltech since 1989. Originally run by Caltech’s CS department (and prioritized for CS majors), UGCS is now an independent, student-run organization that provides cluster services for the entire Caltech community and its alumni. There are approximately 1500 active accounts from students, staff, and faculty. UGCS provides numerous services to its users, including (but not limited to):
shell access
email (SMTP, IMAP, POP3)
mailing lists
file storage (AFS, NFS)
distributed computing (distcc, Mathematica)
web hosting (personal websites, vhosts, cgi)

Various sysadmin-created scripts and programs, available on the UGCS website, allow easy access to cluster services, and online documentation is designed to be easy to follow and instructive. Email accounts remain active after graduation and provide a unique opportunity to stay in contact with other Caltech students and alumni.

For more information, visit www.ugcs.caltech.edu. For questions or comments, please email the sysadmins at sysadmins@ugcs.caltech.edu.

Caltech Wired
Winnett Student Center
x8006, www.caltechwired.caltech.edu

Attached to the bookstore, this is a computer store. They are not a ripoff on a number of items (for ethernet cables order from www.monoprice.com, though). You can buy actual computers there, too, and they are fairly knowledgeable if you need advice for what to buy. They're affiliated with Apple, so you get a $200 discount if you buy a Mac computer from them. They can also directly order from a number of other manufacturers with educational discounts.

Caltech Y
505 S Wilson Ave (next to the Credit Union)
x6163, www.caltechy.org

A well-run and ambitious organization for community service and outdoors trips. The Y was founded in 1916 and is celebrating 100 years of great service this year! They have a long and fascinating history. In fact, the secretary of the Y in the 1920s, Charles Schwieso, Jr., founded this very freshman handbook that you are reading right now.

The Y coordinates a backpacking trip (the Y hike) to the Sierras every September before school starts and other hiking and biking trips, help with Black History Month, International Week, Alternative Spring Break, and Make a Difference Day, invite speakers of global influence, coordinate Noon Concerts, and then some. They have a volunteering and an outdoors mailing list to inform you of most of these activities; you can sign up on their website.

They also rent out camping gear, event equipment (tables, chairs, etc.), as well as sell balloons and discount tickets to movies, concerts, and amusement parks. Contact caltechy@caltech.edu to get involved.

The Y was founded in 1916 and is celebrating 100 years of great service this year!
Programs


Opportunities

ExComm Student Leadership (the movers and shakers), Rise Tutoring, Community Service Event Planning, Social Activism Speaker Series (SASS) Committee, Y Outdoor Leadership, Front Desk Workers and Community Service Work Study.

Services

Discount Movie Tickets, Camping and Backpacking Equipment, Sound System Equipment, Video Projectors, Meeting Space, and all sorts of other stuff to rent and use at your event.

Oh, yeah...we usually have free food at our events and activities!
ASCIT sponsors many clubs each year, and there are even more that are unfunded but still exist. This is a list of those clubs and their contacts. Clubs with asterisk have their advisor listed as the primary contact. If you wish that there were a club for something and don’t see it listed here, ask around, and if you don’t hear anything about such a club existing you should start it yourself! Visit http://donut.caltech.edu/clubs/clublist.php for more information.

300 Heros Club
Vy-Luan Huynh, vhuynh@caltech.edu

Biology and Bioengineering (BBE)
Rushikesh S. Joshi, rsjoshi@caltech.edu

Black Ladies Association of Caltech
Amarise N. Little, alittle@caltech.edu
blacscience.org

Black Students of the California Institute of Technology (BSCIT)
Amarise N. Little, alittle@caltech.edu

Bridges at Caltech
Aaron Towne, atowne@caltech.edu

CHMMC Management Club
Alex Stark, jstark@caltech.edu

Caltech Alpine Club
Lauren Montemayor, lmont@caltech.edu

Caltech American Institute of Chemical Engineers (AICHE)
Shi En Kim, shi_en_kim@caltech.edu
www.its.caltech.edu/~aiche/

Caltech Anime Society
Vy-Luan Huynh, vhuynh@caltech.edu

Caltech Badminton Club
Phong Nguyen, ptnguyen@caltech.edu
http://badminton.caltech.edu

Caltech Ballet Club
Aileen Hui, aileenh@caltech.edu
caltechballet.blogspot.com

Caltech Ballroom Dance Club
Victoria Chernow, vcharnow@caltech.edu
ballroom.caltechdance.org/
Caltech Biotechnology Club
Seth Lieblich, slieblic@caltech.edu

Caltech Bouldering
Jean Turban, jturban@caltech.edu

Caltech Bridge Club
Nima Badizadegan, nbadizad@caltech.edu

Caltech C (Chinese Association)
Xander Zheng, tzheng@caltech.edu

Caltech Chemistry Club
Kurtis Carsch, cartech@caltech.edu

Caltech Chess Club
Victor Venturi, vventuri@caltech.edu

Caltech Chinese Student Association (CCSA)
Amy Hu, thhu@caltech.edu
https://www.facebook.com/groups/caltechchinese/

Caltech Christian Fellowship (CCF)
Jessica Lam, jlam@caltech.edu
ccf.caltech.edu

Caltech Co-Ed Volleyball Club
Dingyi Sun, dsun@caltech.edu

Caltech Consulting Club
Lennon Luo, shaoxiongluo@caltech.edu
http://consulting.caltech.edu/

Caltech Cricket Club
David Hall, dhall@caltech.edu

Caltech Dance Show Club
Gregory Donaldson, gdonalds@caltech.edu
http://www.its.caltech.edu/~dance/

Caltech Dance Team
Aileen Hui, aileenh@caltech.edu

Caltech Dance Troupe
Cynthia Jiang, cbjiang@caltech.edu
http://www.its.caltech.edu/~troupe/

Caltech Dhamaka
Ellora Sarkar, esarkar@caltech.edu
Caltech Entrepreneurship Club
Andrew Lim, allim@caltech.edu
http://caltecheclub.tumblr.com/

Caltech Golf Club
Dylan Schultz, dschultz@caltech.edu

Caltech InnoWorks
Jihoon Lee, jlee5@caltech.edu

Caltech Karate Club
Scarlett Dong, sdong@caltech.edu

Caltech Korean Student Association
Minsoo Kim, mkim@caltech.edu

Caltech Latino Association of Students in Engineering and Sciences
William Schmidt, Jr., wschmidt@caltech.edu
http://clases.caltech.edu/About_Us.html

Caltech League of Legends Club
Betsy Fu, cfu@caltech.edu
https://www.facebook.com/groups/223746637640476/

Caltech Needle Arts Club
Tanis Darnton, tdarnton@caltech.edu

Caltech Newman Center
Thomas Catanach, tcatanac@caltech.edu
http://www.its.caltech.edu/~nmcenter/

Caltech OSA Student Chapter
Jeremy Brouillet, jbrouill@caltech.edu

Caltech Ophthalmology Club
Alexander Hsu, adhsdu@caltech.edu

Caltech Premedical Association (CPMA)
Kevin Yu, syyu@caltech.edu

Caltech Robotics Team*
Joel Burdick, jwb@robotics.caltech.edu
crt.caltech.edu

Caltech Smash Club
Jerry Feng, jfeng@caltech.edu

Caltech Soccer Club
Kevin Gao, kgao@caltech.edu
Caltech Sustainable Vehicles Club  
Rob Anderson, rmanders@caltech.edu

Caltech Table Tennis Club  
Alexander Hsu, adhsu@caltech.edu

Caltech Tai Chi Club  
Lindsey Whitesides, lwhitesides@caltech.edu  
http://www.its.caltech.edu/~dotaichi/

Caltech Ultimate Frisbee Club*  
Jason Trevor, trevor@hep.caltech.edu  
http://ultimate.caltech.edu

Christians on Campus at Caltech  
Max Murialdo, mmuriald@caltech.edu

Club Latino  
Nadia Herrera, nherrera@caltech.edu  
http://www.its.caltech.edu/~clatino/

Dance Dance Revolution Club  
Panavia Shou, lshou@caltech.edu

EXPLICIT  
Kelvin Bates, kelvin@caltech.edu

Encounter Jesus Fellowship  
Lisa Beckmann, lbeckman@caltech.edu

Engineers for a Sustainable World  
Michael Grappone, jgrappon@caltech.edu  
www.esw.caltech.edu

Engineers Without Borders Caltech Chapter  
Jihoon Lee, jlee5@caltech.edu

Fluid Dynamics  
Juliet Su, ysu@caltech.edu  
http://www.fdacappella.com/

French Club  
Bryan Hunter, bhunter@caltech.edu  
http://www.its.caltech.edu/~franco/

Harmonic Motion  
Bianca Avalani, brayaval@caltech.edu

Hillel  
Aaron Feldman, agfeldma@caltech.edu  
http://hillel.caltech.edu/
IEEE
Katherine Lai, kqlai@caltech.edu
http://ieee.caltech.edu/

InterAxon
Nancy Wen, nwen@caltech.edu
http://caltechinteraxon.wordpress.com

Keytones
Sirus Han, sirushan@caltech.edu

Magic: the Gathering Club
Yury Aglyamov, yaglyamo@caltech.edu

Nerf Club
Kyle Seipp, kseipp@caltech.edu

OASIS
Prachi Parihar, pparihar@caltech.edu
http://oasis.caltech.edu/

Orienteering Club
Victoria Stevens, vstevens@caltech.edu
http://www.its.caltech.edu/~o-club/

Out of Context
Anjali Premkumar, apremkum@caltech.edu
ooc.caltech.edu

PRISM
Kelvin Bates, kelvin@caltech.edu
http://www.ugcs.caltech.edu/~prism/

Paddling Club
Matt Coggon, mcoggon@caltech.edu
http://www.its.caltech.edu/~paddle/

Physics Club*
Gil Refael@caltech.edu

Quiz Bowl
William Hoza, whoza@caltech.edu
quizbowl.caltech.edu

Robogals
Megan Keehan, mkeehan@caltech.edu
pasadena.usa.robogals.edu

S.P.E.C.T.R.E.*
Warren Brown, wcb@hss.caltech.edu
www.caltech.edu/spectre/
Sargam*
Kaushik Bhattacharya, bhatta@caltech.edu

Science & Engineering Policy At Caltech (SEPAC)
Katherine Saad, katsaad@caltech.edu
http://www.its.caltech.edu/~sepac/

Science Olympiad Club
Patrick Yu, payu@caltech.edu

Singapore Students Society (S^3)
Lidan Yu, lyu@caltec.edu
http://s-cubed.caltech.edu/

Snow Sports Club
Hunter Davis, hdavis@caltech.edu

Society of Women Engineers*
Portia Harris, pbharris@caltech.edu
http://www.cco.caltech.edu/~swe/index.html

Strong Ales Club
Joel Schmidt, jschmidt@caltech.edu
http://technique.caltech.edu/index.php?q=node/879

Student Investment Fund
Grace Leishman, gleishma@caltech.edu
sif.caltech.edu

Student-Athlete Advisory Committee
Kristin Anderson, knanders@caltech.edu
http://gocaltech.com/SAAC/index

Techers for a Sustainable Future (TSF)
Magnus Haw, mhaw@caltech.edu

The Feminist Club
Valerie Pietrasz, vpietras@caltech.edu
feminist.caltech.edu

The Pipettes
Preethi Periyakoil, pperiyak@caltech.edu

UAV Engineering
Connor Lee, clee@caltech.edu

Women’s Soccer Club
Aileen Cheng, accheng@caltech.edu

Workgroup on Educational Science and Technology
Bassam Helou, bhelou@caltech.edu
1. Martin Karplus (PhD ’54), recipient, 2013 Nobel Prize in Chemistry
2. Arati Prabhakar (PhD ’85), director of DARPA
3. Iram Parveen Bilal (BS ’04), film director
4. Cyrus Behroozi (BS ’97), engineer with Google[x]’s Project Loon
5. Paul Steinhardt (BS ’74), 2014 Distinguished Alumnus
With more than 23,000 graduates, Caltech’s alumni have an outsized impact on science, business, and culture around the world. Access the full potential of this unparalleled network through the Caltech Alumni Association. We’ll help you to find, friend, work for, and learn from the best.
Caltech administrators and professors accept a lot more student input than their counterparts at other universities. You should make use of the student government that’s available, but remember that they also have as many time constraints as you do, so don’t abuse their helpfulness.

**TABLE OF CONTENTS**

<table>
<thead>
<tr>
<th>Committee</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Directors</td>
<td>54</td>
</tr>
<tr>
<td>Review Committee</td>
<td>54</td>
</tr>
<tr>
<td>Interhouse Committee</td>
<td>55</td>
</tr>
<tr>
<td>Academics and Research Committee</td>
<td>56</td>
</tr>
<tr>
<td>Board of Control</td>
<td>56</td>
</tr>
<tr>
<td>Conduct Review Committee</td>
<td>57</td>
</tr>
<tr>
<td>ASCIT Publications</td>
<td>58</td>
</tr>
</tbody>
</table>

**BOARD OF DIRECTORS**

The power-wielders of ASCIT are people you elect to the Board of Directors (BoD) — three corporate officers (President, Treasurer, Operations Director), chairmen of three student committees (Interhouse Committee, Social Committee, Academics and Research Committee), and one appointed Secretary, adding up to seven officers. The BoD meets once per week to tell stories, pass landmark legislation, and discuss student concerns. Any ASCIT member is welcome to attend. The minutes of the meetings are posted weekly in the Tech. The BoD can be contacted directly at bod@donut.uqcs.caltech.edu.

- **President** .............................................. Nima Badizadegan
- **VP for Academic Affairs** .............................. Jay Palekar
- **VP for Non-Academic Affairs** ........................ Catherine Jamshidi
- **Director of Operations** ............................... Sean McKenna
- **Treasurer** ................................................ Kalyn Chang
- **Director for Social Activities** ...................... Annie Chen
- **Secretary** ................................................ Phillip An

**REVIEW COMMITTEE**

The website of the Review Committee (RevComm) cannot be found on Donut. The RevComm is charged with interpreting the bylaws when need arises, running elections, deciding election protests, and investigating special problems before the Corporation. The RevComm is made up of one member appointed from each House and an IHC-appointed chairman.

- **Chairman** .................................................. Anne Dorsey
- **Avery** ...................................................... Olivia Hindera
- **Blacker** ................................................... Harrison Krowas
INTERHOUSE COMMITTEE

The Interhouse Committee (IHC) of the California Institute of Technology exists for the purpose of allowing communication between the eight Student Houses towards the solution of common problems. Specific charges of the IHC include organizing Rotation, overseeing Interhouse sports and Discobolus, and selecting the student members of the Faculty-Student Committees. The IHC acts as a representative and liaison for all members of the house system to Caltech administration and faculty. The IHC can be contacted directly at ihc@caltech.edu.

Chairman..................................................Catherine Jamshidi
Secretary..................................................Margaret Lee
Avery..........................................................Tony Zhang
Blacker.....................................................Catherine Pavlov
Dabney....................................................Nicholas Schiefer
Fleming.....................................................Patric Eck
Lloyd........................................................Bobby Sanchez
Page.......................................................Nishant Desai
Ricketts....................................................Andrew Montequin
Ruddock..................................................Patrick Nikong

IHC APPOINTED OFFICES

IHC Athletic Manager .....................................Elliot Simon
The IHC Athletic Manager is a liaison between the Athletic Department, the IHC, and the Houses. She takes care of athletic awards and keeps track of Interhouse and Disco challenges.

IHC Food Chair ...........................................Sierra Lincoln
The food chair serves as a liaison between CDS and the students on board. She oversees food-rep meetings and works with CDS on the student handbook, menus, and survey analysis. To contact the entire committee (including Peter Daily) email cdsfood@caltech.edu.

IHC Stewardship Chair..............................Andre Comella
The Stewardship Committee is responsible for stewardship of the Houses, which means fixing and paying for damages and making necessary repairs to ensure the Houses don’t fall apart.

The IHC also appoints undergraduate representatives for Faculty-Student committees. A complete list of these committees and their
On Campus

ACADEMICS AND RESEARCH COMMITTEE

Chaired by the Director for Academic Affairs, the ARC takes suggestions and solves problems concerning academics and research. Each year the ARC awards ASCIT Teaching Awards to exceptional professors and TAs nominated by students. Every other year, the ARC organizes the Student-Faculty Conference (including this year). House reps are chosen by each House, and the Reps at Large are appointed by the partial committee of House reps. If you want a class started, ended, or changed, or have any other academic- or research-related concerns, talk to your representative or email arc@donut.caltech.edu.

Chair ......................................................... Jay Palekar
Secretary ...................................................... Erin Isaza
Avery ........................................................... Namita Ravi
Blacker ...................................................... Anusha Nathan
Dabney ........................................................ Marcus Bintz
Fleming ..................................................... Lani Kim
Lloyd ......................................................... Rachael Morton
Page ............................................................ Emily Mazo
Ricketts ...................................................... Avery Marshall
Ruddock ..................................................... Tim Liu
Reps at Large ............................................. Junedh Amrute, Gabby Tender, Nikita Sirohi

BOARD OF CONTROL

The Board of Control is composed of the chair, a secretary, representatives from each of the Houses (elected by each House), and representatives at large (elected by the entire student body). The Board of Control is charged with the administration of the Honor System, one of the greatest strengths of Caltech. The Honor Code works because intelligent people act in a reasonable manner in order to make Caltech a pleasant environment.

The Board of Control takes action only when it seems that the bounds of reasonable action have been taken too far. The decisions of the Board are reviewed by the Deans. The Deans will either uphold the decision or, occasionally, send the case back to the Board for further review. Very rarely, the Deans may decide that the case lacks merit and will dismiss it. All the proceedings of the BoC are kept under lock and key and are available only to the BoC. The administration has no access to these records, only to summaries of convictions, and usually they will keep even these confidential.

If you witness or hear of something that you think may be a violation of the Honor System, or if you are unsure whether some action that you intend to take is within the bounds of the Honor System, consult a member of the Board, either in detail or in abstract form. Messages for the Chairman and Secretary can be left in strict confidence at x6200 or you can email boc@ugcs.caltech.edu. Lack
of forethought and understanding are major factors in many Honor System violations, so always consider how your actions will affect others. The Honor System can only continue to work with the support and cooperation of the community.

See also the Honor Code Handbook, published in its entirety in the little t, at the beginning of the Reference section.

Chairman................................................................. Paul Dieterle
Secretary.............................................................. Ian Kuehne, Junedh Amrute
Avery ................................................................. Caroline Howard, Alexander Meiburg
Blacker .............................................................. Gillian Kopp, William Ballinger
Dabney ............................................................... Ashwin Hari, Ayaana Sikora
Fleming ............................................................. David Wang, Anshul Ramachandran
Lloyd................................................................. Daniel Molina, Samuel Yee
Page................................................................. Serena Delgadillo, Frederick Berl
Ricketts ............................................................. William Schmidt, Chloe Hsu
Reps at Large .................................................... Olivia Hindera,
                                          Gabby Tender, Joseph Schneider
Off-Campus.......................................................... Kevin Shu

CONDUCT REVIEW COMMITTEE

The Conduct Review Committee deals with nonacademic Honor Code violations. Such problems include those that involve personal disputes between individuals, policy violations, or issues that affect a large number of students. The CRC is co-chaired by the student chairman and Associate Dean Lesley Nye and contains one representative from each House and one representative elected by off-campus students.

Student Co-Chairman ................................. Megan Keehan
Avery .............................................................. Ethan Lo
Blacker ........................................................... Carly Robison
Dabney ............................................................ Tristan Brown
Fleming .......................................................... Parul Pubbi
Lloyd.............................................................. Amanda Gao
Page.............................................................. Roshan Agrawal
Ricketts ........................................................ Alison Dugas
Ruddock........................................................ Ryan Dempsey
Rep at Large .................................................... Nikita Sirohi
Off-Campus...................................................... Jake Ketchum
ASCIT PUBLICATIONS

These publications are under the domain of ASCIT. Editors of these publications are either elected by the students or appointed by the BoD, and these publications are subsidized almost solely by ASCIT.

THE CALIFORNIA TECH

The campus newspaper, published weekly except during vacation and examination periods. It is the finest publication that ASCIT has. Movie reviews, book reviews, cool research articles, comics, funny articles, serious articles, political articles, and basically any type of socially acceptable newspaper submissions are welcome. Email submissions to tech@caltech.edu as plain-text attachments, including the author’s name, by Friday of the week before publication.

Editors-in-Chief ......................... Katherine Guo, Chloe Hsu,
                              Neera Shah, Nehaly Shah
Business Manager .........................Grace Leishman

THE BIG T

A yearly publication which acts as the student yearbook.
Editors-in-Chief .....................Meghana Pagadala,
                              Harinee Maiyuran, Soumya Kannan

THE LITTLE T

Hailed by the New York Times as “Riveting” and by the the Economist as “the most influential Caltech undergraduate student handbook of 2015,” the little t is among the most important handbooks of the 21st century. A masterpiece of editing and organization, this family-friendly guidebook has been known to bring tears to the eyes of many Techers.

Editor-in-Chief ..................Ciara Ordner

TOTEM

Our literary arts magazine.
Editors-in-Chief ............. Bianca Ray Avalani, Janice Jeon

DONUT

ASCIT’s handy web interface at donut.caltech.edu.

Donut Team ...............Rahul Bachal, Robert Eng, Chloe Hsu,
                          Alex Meiburg, David Qu, Kevin Shu

SAC RESOURCES

The SAC (Student Activities Center) is a maze of rooms below the South Houses that looks like a bunch of empty hospital hallways.
ASCIT maintains some of the rooms in the SAC for student use. First, there’s the ASCIT Screening Room with a large projector which lets you play your favorite DVD’s or binge watch Orange Is The New Black en masse with its new Netflix account! In order to access the screening room, simply press “Enter” on the keypad lock—there is no combination. Second, there are a couple of group study rooms where you can work on your plans for world domination and/or your Ma 1a sets at 3am. Finally, there are music practice rooms available for you to tirelessly perfect your favorite Mozart and Metallica pieces. All these rooms can be reserved through donut at http://donut.caltech.edu/rooms/bookroom.php.

Another room in the SAC is SPECTRE, our student-run science fiction library. Students are free to borrow from its collection of over 12,000 sci-fi works. The combination is 42.

RULINGS OF THE REVIEW COMMITTEE

2014.1 The Chair of the Review Committee does not get a vote on 2014.9 Teams of 1 person may run for Tech Editor 2014.10 RevComm meetings in which a vote is not taking place may be held over email.

2015.1 If a tie occurs in an election, a protest is automatically put on file with the review committee 2015.3 The words “In such circumstance that the ASCIT Vice President of Academic Affairs should be incapacitated or otherwise unable to perform the duties of the ASCIT Vice President of Academic Affairs, the ARC Secretary shall serve as the acting ASCIT Vice President of Academic Affairs until such time as the ASCIT Vice President of Academic Affairs returns to duty or an election to fill the vacancy in the office of the ASCIT Vice President of Academic Affairs occurs.” in Article III Section 2 of the ARC Bylaws are in conflict with the ASCIT Bylaws and, as such, are null and void.

TITLE IX

Title IX is a federal law that prohibits discrimination on the basis of gender, gender identity, and sexual orientation. At Caltech we take compliance with Title IX very seriously. We are committed to providing an environment free from discrimination. For the health, safety, and happiness of our campus, members of the community are trained in Title IX support and education. Faculty members, administrators, and students alike work together to improve Caltech’s policies and procedures in responding to all Title IX concerns. Most importantly, our community strives to make Caltech safe and enjoyable for students in the lab, on the field, and in the dorm regardless of gender, gender identity, or sexual orientation. To contact someone with questions or concerns, or to find out how you can get involved, visit titleix.caltech.edu and see the offices and resources page. View the Title IX Advisory Board link to see who your house reps are.
...TO PASADENA AND BEYOND!
**ANIMAL HOSPITALS**

Animal Emergency Clinic 2121 E Foothill Blvd.  
(626) 564-0704

People give this place mixed reviews, so it is your best choice only when it is your only choice. If you go here, you need to be very attentive and ask questions about short-term and long-term care.

Foothill Veterinary Hospital 2204 E Foothill Blvd.  
www.foothillvet.com, (626) 792-1187

A standard veterinary clinic (i.e. treating mainly cats and dogs). The place gets a lot of bad reviews for screwy-to-nonexistent appointment systems, but it’s a perfectly good place for walk-in care.

Rose City Veterinary Hospital 2695 E Foothill Blvd.  
www.rosecityvets.com, (626) 796-8387

Another standard veterinary clinic, perhaps slightly farther away. The people there are helpful and friendly and the care is good, though the place is a bit pricier.

**ART SUPPLIES**

Blick Art Materials 44 S Raymond Ave.  
www.dickblick.com, (626) 795-4985

Has a good selection, reasonable prices, and a helpful staff. It is about 30 minutes walking, so you should find a friend with a car. Your best bet nearby (though Michael’s is within walking distance). They have a 10% discount program for students that is free to join, so you might want to do that.

Fabric District Around E 9th St. and Maple Ave. (Los Angeles)  
Store Hours and Details Vary

The Fabric District is a collection of many stores mostly along E 9th St. within a span of a couple blocks. The stores have a large variety of fabrics and some very reasonable prices. Hours vary, but it is better to go on a weekday when it is less crowded and you can expect to pay less for parking. If you want to save money, haggling actually works, especially if you’re buying large quantities (e.g. for Interhouse).

Jo-Ann Crafts 2115 W Commonwealth Ave (Alhambra)  
www.joann.com, (626) 284-3236

Used to be near campus, but that one closed down, and now the closest location is in Alhambra. Sells fabric for clothes, but the selection is poor and it is overpriced. Unless you need fabric in a pinch (or advice on how to sew), the Fabric District is a much better choice. The editors recommend going to the Fabric District instead of Jo-Ann Crafts; the selection is better and the prices are much, much more reasonable.

Michael’s 1155 E Colorado Blvd.  
www.michaels.com, (626) 431-2850

This is a prototypical art supply store with fake plants and overpriced wrapping paper. It is close and convenient for many Techers, but (like any art supply store) kind of expensive. If you talk to a sales representative and they tell you a price for an item, make sure that you actually get that price as the cashier rings you up.
To Pasadena and Beyond!

There are an amazing number of bad car mechanics in the area. As a result, while I’ve listed confirmed ripoffs, I would strongly suggest only using a place that someone recommends to you. Remember: for a smog test use a test-only place.

Not Recommended: Del Mar Radiators, Vince’s Auto, Ford/Mercury dealer on Colorado/Hill, Honda of Pasadena, Steve’s Auto Service, Purrrfect Auto, and Master Automotive.

A&A Tire 2307 E Colorado Blvd.
(626) 449-5213

A good, inexpensive place for all sorts of basic repairs, not just tires. One of the mechanics there, Sarkis, has some good reviews (his assistant Lester has less good reviews). This place is your best bet for basic repairs.

Accurate Autoworks 26 N Hill Ave.
www.accurateautoworks.net, (626) 584-6632

They get a lot of people from Tech, as it is the closest and most convenient good place to go. Mention that you’re from Caltech.

Advanced Muffler 1234 E Walnut St.
(626) 795-3104

Good for exhaust and brakes, the place is generally regarded as an honest and safe place to go for auto repairs. Has great reviews on Yelp.

America’s Tire 1917 E Colorado Blvd.
www.discounttire.com, (626) 584-6770

This is a great place for tires. If you think that your tire has a slow leak, you can take it here and they can patch it for free. The tire selection is good and the prices moderate.

Hill Smog Test Only 248 N Hill Ave.
(626) 796-7609

Test only places are the way to go for smog checks. This smog check place is quick and close should you need one.

BANKS

The Caltech Employees Federal Credit Union gives a good interest rate (at the time of writing this it is above 1.0%), and the most hassle-free banking ever. The membership fee is $0.25, and the minimum balance is $5. They are also on campus with an ATM in Winnett where you can deposit checks and take out cash (in increments of $20). They also let you get a student credit card without a yearly fee, but you have to be 21 years old to get it or have your parents cosign. For other banks, you can use any of four or five banks within a block of Lake and Colorado.

Bank of America 880 E Colorado Blvd.
www.bankofamerica.com (626) 304-3120

Bank of the West 587 E Colorado Blvd.
www.bankofthewest.com (626) 564-4000
The elements you need for top financial services are right in the palm of your hand.

Your smart phone...and a Caltech Employees Federal Credit Union mobile banking app...can prove to be the smarter solution to unparalleled account access.

Our state-of-the-art Credit Union e-Branch lets you access your money any time, anywhere, with FREE mobile banking: Transfer funds or deposit a check in seconds with your smart phone or tablet.

Or get cash at our two fee-free on-campus ATMs. We also offer a low-cost MasterCard...affordable private student loans...and a full on-campus office.

It’s just smart to belong to CEFCU. You can join online at www.cefcu.org or call 800/592-3328. We’ve literally put access to all our financial services in the palm of your hand.

www.cefcu.org • 800/592-3328
Campus Office: 515 S.Wilson
ATMs: Winnett Center
Keith Spalding Building

Must qualify for CEFCU membership to join. Minimum $5 deposit and one-time $5 membership fee due upon opening any CEFCU account. All loans subject to credit approval. CEFCU is an Equal Opportunity Lender. Federally insured by NCUA.
Chase
www.chase.com
860 E Colorado Blvd.
(626) 795-5177

Citibank
www.citibank.com
(800) 627-3999
285 S Lake Ave.

Wells Fargo
www.wellsfargo.com
(626) 449-8611
82 S Lake Ave.

BICYCLE SHOPS/REPAIR

Bikes are pretty useful to have in Pasadena, as many things are in the 1.5-3.5 mile range. You can get one at Target (Colorado and Hudson), or at a fancy bike shop. When choosing a bike, keep in mind that the half-life of a good bicycle on campus, even if it is locked by U-locks, is about a year and a half. Taking your bike inside may be a good idea. Target sells house brands for $100-150. These tend to break relatively easily. At the next level up they sell Schwinn’s and other brands for $150-250, which are pricier but sturdier. Your best value, though, is a used bike. The best source of these is Craigslist or an upperclassmen.

If you need a bike shop, be it for repairs or buying a nicer bike, try: (Note: one or possibly both of these places gives a 10% discount to Caltech students so call before you go, and check their websites for coupons.)

Incycle
175 S Fair Oaks Ave
www.incycle.com, (626) 577-0440
Expensive, but most people seem happy with the service. They have a very good selection and can repair your bike quickly.

Pasadena Cyclery
1670 E Walnut St.
www.pasadenacyclery.com, (626) 584-6391
Another good place, cheaper, but spottier repair work.

BOOKSTORES

If you cannot wait three to five days for Amazon, some brick-and-mortar stores are listed below for instant gratification.

Book Alley
1252 E Colorado Blvd.
(626) 683-8083
A really nice used book store with lots of interesting and rare books, open until 9pm except on Sundays when they close at 7pm. This is a good place for bargain books.

Cliff’s Books
630 E Colorado Blvd.
(626) 449-9541
A cheap but badly organized used book store, open until midnight. A little bit cramped and muggy, but not a bad bookstore overall.

Vroman’s
695 E Colorado Blvd.
(626) 449-5320
Reasonable prices, nice atmosphere, and they often attract major authors for book signings. Open until 9pm Monday through Thursday, until 10pm on Friday and Saturday, until 8pm on Sunday.
CLOTHING

This category gets a lot bigger if you have a car, and obviously listing every clothing store in Pasadena is just silly so this is just a quick overview of your options. The nearest mall is rather expensive and is called the Paseo (Colorado and Los Robles). For lots of higher end clothing options try walking around old town or on Lake from California to Colorado.

Aaardvark’s

2650 E Colorado Blvd.
(626) 304-9067

They have a huge selection of vintage and costume clothing, and they’re open from 11am to 7pm. The service is terrible but sometimes you can find some wonderful stuff here. Apache is one of their largest boons from Techers, though Halloween is obviously much larger.

Macy’s

401 S Lake Ave.
www.macys.com, (626) 792-0211

Fancy clothing and housewares. Probably one of the most expensive Macy’s you’ve ever encountered.

Out of the Closet

1726 E Colorado Blvd.
www.outofthecloset.org, (626) 440-1719

Thrift store, more expensive than others, but the profits go to an AIDS charity. They sometimes have some really interesting stuff -- it’s hit-or-miss. Need something for Drag Show?

Ross

460 S Lake Ave.
www.rossstores.com, (626) 844-0592

Mostly clothing, but actually sells some housewares upstairs. It’s a reasonably priced place and very close to campus.

TJ Maxx

455 S Lake Ave.
www.tjmaxx.tjx.com, (626) 683-8715

Like Ross, mostly clothing, but also good for housewares and some personal care products. Advertised as: “Designer Brands and T.J. prices”

DRY CLEANERS

French Hand Laundry & Dry Cleaners

606 S Lake Ave.
(626) 792-3881

Pretty expensive and takes a while, but very high quality.

Green Street Cleaners

726 E Green St.
(626) 449-5057

It’s a good deal, but further away.

Tip Top Cleaners

565 S Lake Ave.
(626) 796-6777

Pretty fast and decently priced, but the quality isn’t very good.
Depending on what you need, try the EE stockroom or calling up an electronics company and asking for a free sample of some crazy part.

**Duvac**
1759 E Colorado Blvd.
(626) 796-3291

Has industrial-type things, i.e. cables and the like. It’s better than Radioshack but not as cheap as the Internet. Your best bet is to find a friend who can help you order the right part online or going to a stockroom, but if you need cables in a pinch go here.

**GNP Audio**
1254 E Colorado Blvd.
www.gnpaudiovideo.com, (626) 577-7767

Run by Tech alums, has very good and very expensive audio equipment.

**Monoprice**
www.monoprice.com

Very cheap cables, and their warehouse is within driving distance of Caltech, so you can pick up your orders if you need them instantly; otherwise their overnight shipping is the cheapest option and costs about $5 up to a large weight of cables.

**Newegg**
www.newegg.com

Also cheap electronics, although not as discounted as Monoprice compared to other places.

**Radioshack**
825 N Lake Ave.
www.radioshack.com, (626) 798-1432

Has basic parts; It’s Radioshack.

### Groceries

**99 Ranch**
1300 S Golden West Ave. (Arcadia)
www.99ranch.com, (626) 445-7899

A wonderful Asian foods market, and a great place to get fresh fish, produce, and spices at a reasonable price.

**Farmer’s Market**
Sierra Madre and Paloma
www.pasadenafarmersmarket.org, (626) 449-0179

Times and locations vary based on season, so we suggest you look at the website for the most up-to-date information. Or you could call them, but who does that anymore.

**Hawaii Supermarket**
120 E Valley Blvd. (San Gabriel)
www.hawaii-supermarket.com, (626) 307-0062

Has a lot of unusual Asian foods and cheap produce.

**Pavilions**
845 E California (corner of California and Lake)
www.pavilions.com, (626) 449-3968

Open until midnight every day, this is probably the grocery store you’ll use the most. We suggest getting a free Vons card (Vons and Pavs are the same company). You can enter your phone number instead of remembering the card, and it saves you a lot of money.
To Pasadena and Beyond!

Ralph’s 160 N Lake Ave.
www.ralphs.com, (626) 793-7480
Open until 2am every day and closer than the 24/7 Vons.
Trader Joe’s 345 S Lake Ave.
www.traderjoes.com, (626) 395-9553
Really great selection of frozen food items and meat. Vegetables are alright. Some people love it because it has unique things, and some people hate it because they can’t find what they’re looking for.

Whole Foods Market 3751 E Foothill Blvd. (on Arroyo)
www.wholefoodsmarket.com, (626) 351-5994
Whole Foods is a national-enough chain that you probably know what it’s like (pricy but good and has a wide selection of fancy cheese). This one, however, has a cart escalator, making it quite excellent. Not really in walking distance, but very easy driving distance.

**HAIRCUTS**

18|8 Men’s Haircare and Grooming Center 374 East Colorado Blvd.
www.eighteeneight.com, (626) 844-7188
A very good and highly recommended barber shop. Despite being pricey, it is frequented by male Techers. Seriously.

Academy Barber Shop 27 N Catalina Ave.
(626) 449-1681
Near Mentor Barber Shop; it is a decent barber shop but slightly more expensive than Mentor’s. One review on Yelp complained that the guy there recommended that they go to Mentor’s for a very easy haircut since Mentor’s could do it well enough and is cheaper. The poster found this negative. In the opinion of the editors, that’s awesome. Note that they do not accept credit cards though.

Hair on Lake 256 S Lake Ave.
(626) 793-6222
A good salon, but kind of pricey.

Look Apart Salon 809 E Green St.
(626) 793-2492
Average priced salon, i.e. $25 for a girl’s haircut, less for guys.

Mentor Barber Shop & Style 31 N Catalina Ave.
(626) 795-6781
Acceptable and very reasonably priced, i.e. $10-15 range. This is your best bet in Pasadena for a cheap, decent haircut.

Nippers (...it’s a salon!) 915 E. California Blvd.
(626) 304-9768
A very sketchy salon. Definitely worth going at least once. Reasonably priced.

**HARDWARE AND HOUSEWARES**

Orchard Supply Hardware 452 S Fair Oaks Ave. (South Pasadena)
www.osh.com, (626) 403-8115
A good hardware store in the Home Depot style—this is the closer one in South Pasadena. There is another on Colorado in Pasadena, but
it’s actually farther away. Both are open until 9pm, except Sundays when they close at 8pm.

Target
777 E Colorado Blvd.
www.target.com, (626) 584-1606
They have things like laundry detergent, clothes, and other similar “necessities”, open from 8am until 12pm, except on Sundays until 11pm.

Home Depot
500 S Marengo Ave. (Alhambra)
1625 S Mountain Ave. (Monrovia)
www.homedepot.com, (626) 458-9800 (Alhambra)
(626) 256-0580 (Monrovia)
Both Home Depots are fairly well stocked with tools, hardware, and wood. They will even cut wood for you (within reason) when you buy it from them. There are more in the area, but these are the main ones.

Walgreens
670 N Lake Ave
www.walgreens.com, (626) 585-8926
Has some basic houseware things and is very close and directly on the way to Target, so you might as well try it on your way there.

HOTELS

Probably for your parents to stay at when they visit, not for you. If you’re around and don’t have housing, there are plenty of couches around campus to crash on. Most of the hotels listed have Caltech rates and all are reasonably close by.

If you’re a prefrosh, Admissions should send you a list of nearby hotels at some point; that list will be more comprehensive than this one.

Athenaeum
551 S Hill Ave.
http://athenaeum.caltech.edu, (626) 395-8200
You need a member to sponsor the guest(s), but it’s close by (on-campus) and reasonably priced for nice rooms (ballpark $150/night for room, $230/night for suite without taxes).

Best Western Motel
3570 E Colorado Blvd.
www.bestwestern.com, (626) 796-9100 / (800) 937-8376
You get a discount for using the Caltech corporate ID number, which is 01388930. It only works if you call the 800 number (when they ask for payment information, you can give them this number). Rooms from $75.

Hilton Pasadena
168 S Los Robles Ave.
www.hilton.com, (626) 577-1000
Good place if you want to spend the extra cash.

Vagabond Inn
1203 E Colorado Blvd.
www.vagabondinn-pasadena-hotel.com, (626) 449-3170
Best bet for a cheap, close hotel.

LIBRARIES

There’s a small public library branch on Hill, just south of Colorado. The central Pasadena branch is at 285 E Walnut St., and they’ve got a large assortment of fiction and normal-people journals. With a form of ID and
a proof of address (any letter addressed to you at your Caltech address) they will give you a library card. The central library is pretty quiet and really nice inside if you like the classic library look. If you’re looking for a place off-campus to get work done that has free wifi, the Pasadena library does. But you should probably just go to SFL or Millikan and sit in a corner where no one will find you instead.

Further into LA, the Los Angeles Central Library is located at 630 W 5th St. Whatever non-technical reading material your heart desires could probably be found here. The Huntington Library is also pretty close by and is worth going to at least once.

**MEDICAL CARE - ADVANCED**

If you’re not sure what type of medical care you need, call Campus Security at (626) 395-5000 (put that number in your cell phone) or x5000 from a campus (land-line) phone.

You can also call Dr. Miller, the on-call doctor at any time at (626) 584-2421 (you should also put that number into your phone). If it’s an emergency, call Security instead. If it’s not an emergency and easy to deal with, find a Health Advocate.

For basic medical care (a regular doctor’s appointment, OB/GYN, etc.), ask the Health Center for a referral.

**EMERGENCY ROOMS**

If you are on Caltech campus and need emergency medical attention call x5000 (626) 395-5000. Put this number in your phone right now! If you are off campus call 911.

Here is a list of the local emergency rooms. Go to emergency rooms if you need any serious medical attention; urgent care facilities are for late night not-life-threatening problems and are not equipped for surgery or advanced medical care. Huntington is your best bet for a good, nearby Emergency Room. This is where an ambulance will probably take you, though they may go to another Emergency Room if Huntington is too crowded.

- **Glendale Adventist Medical Center** 1509 Wilson Ter. (Glendale) www.glendaleadventist.com, (818) 409-8000
  A 24 hour emergency room, about 15 minutes west of Caltech.

- **Huntington Memorial Hospital** 100 W California Blvd. www.huntingtonhospital.com, (626) 397-5000
  A 24 hour emergency room, the closest to Caltech.

- **Methodist Hospital** 300 W Huntington Dr. (Arcadia) www.methodisthospital.org, (626) 898-8000
  A 24 hour emergency room, about 15 minutes east of Caltech.

**HOSPITALS**

If you are on Caltech campus and need emergency medical attention call x5000 (626) 395-5000. If you are off-campus call 911.
You should put Security’s number into your phone right now (again, their number is (626) 395-5000. We keep telling you to do this because it’s important.)

Glendale Adventist Medical Center 1509 Wilson Ter. (Glendale)
www.glendaleadventist.com, (818) 409-8000
A hospital with a 24 hour emergency room, about 15 minutes west of Caltech.

Huntington Memorial Hospital 100 W California Blvd.
www.huntingtonhospital.com, (626) 397-5000
They have 24 hour emergency room, the closest to Caltech. The hospital itself is also quite nice. They’re pretty nice about letting you come visit people.

Las Encinas Hospital 2900 E Del Mar Blvd.
www.lasencinashospital.com, (626) 795-9901
This is the mental hospital of choice for emergencies and hospitalization near Caltech. The facilities are rather nice actually.

Methodist Hospital 300 W Huntington Dr. (Arcadia)
www.methodisthospital.org, (626) 898-8000
A hospital with a 24 hour emergency room, about 15 minutes east of Caltech.

UGENT CARE

If you are on Caltech campus and need emergency medical attention call x5000 (626) 395-5000. Put this in your phone! If you are off campus call 911.

Here is a list of the local urgent care facilities. Urgent Care facilities are (ideally) good for faster, cheaper help on late night not-life-threatening problems. They are not equipped for surgery or advanced medical care; for this you will need an Emergency Room. During daytime on weekdays the Caltech Health Center (just South of California on Arden) is the place to go—it’s free for Caltech students whether or not you have Caltech’s Health Insurance plan.

Healthcare Partners Medical Group 401 S Fair Oaks Ave.
www.healthcarepartners.com, (626) 795-2244
This is a 24 hour urgent care that is pretty close to Caltech. I’ve generally had good experiences here, but it gets mixed reviews. The service is slow and the bedside manner is lacking, but it gets the job done. It’s the place of choice for nearby urgent care.

Pasadena Community Urgent Care 3160 E Del Mar Blvd
www.pasadenaurgentcare.com, (626) 270-2400
Open every day from 7am to 10pm. This place is a newer urgent care facility and is a bit far from Caltech, but its hours are better than some of the nearer-by places.

Medical Urgent Care Clinics 600 S Lake Ave.
www.medicalurgentcareclinics.com, (626) 844-8848
Open from 9am-6pm during the week, 9am-3pm on Saturday, and closed on Sunday. This facility is very close to Caltech (on the corner of Lake and California).
OFFICE SUPPLIES

FedEx Office (Kinko's) 855 E Colorado Blvd. www.fedex.com, (626) 793-6336
This place is open 24 hours.

Office Depot 1130 E Colorado Blvd. www.officedepot.com, (626) 666-6900
Open until 8pm during the week, 7pm on weekends. It’s basically the same as Office Max.

Office Max 721 E Colorado Blvd. www.officemax.com, (626) 449-5676
Open until 9pm during the week (except 6pm on Wednesday), 8pm on Saturday, and 6pm on Sunday. It’s basically the same as Office Depot.

Pasadena Image Printing 817 E Colorado Blvd. www.pasadenaimageprinters.com, (626) 796-9174
Supposed to be higher quality than Kinko’s, but has shorter hours and the “website” sucks.

PHARMACIES

The Health Center is usually cheaper, but they might not have what you want. If you must go off-campus, the best place is Walgreens (9pm during the week, 6pm on weekends). They are also in the preferential list on the health plan, so show your health card when you first get one filled there. Always check the preferred pharmacy list on the health plan so you don’t have to fill out tons of paperwork to get your prescription filled cheaply.

If you have a prescription from home that you need refilled, you need the phone number of your home pharmacy and then you can probably get the prescription transferred to a pharmacy here. The same works if you need a refill while out of town, etc.

CVS Pharmacy 1401 S Baldwin Ave. (Arcadia) www.cvs.com, (626) 445-1284
This is the closest 24 hour pharmacy. The CVS at 777 Arroyo is 24 hours but the pharmacy isn’t.

Rite-Aid 1038 E Colorado Blvd. www.riteaid.com, (626) 796-5539
Open until 10pm during the week. The pharmacy closes at 6pm on weekends.

Walgreens 310 S Lake Ave. www.walgreens.com, (626) 583-8066
Close and cheap -- The store is open until 10pm, but the pharmacy closes at 9pm during the week and 6pm on weekends.
There are a lot of churches, temples, and the like in the area. In fact, Pasadena seems to be the place to put a church in the nearby area, so you have many, many options. For a more educational, if somewhat evangelical experience there is the Fuller Theological Seminary on Union around Los Robles. The list below is in alphabetical order by key word (i.e. Pasadena does not count), and all phone numbers are 626 area code.

**Abundant Life Community**
1530 E Elizabeth St. 398-2418

**All Saints Episcopal Church**
132 N Euclid Ave. 796-1172

**Baha’i Community, Pasadena**
www.pasadenabahai.org

**Baptist Church, First**
75 N Marengo Ave. 793-7164

**Buddhist Temple, Pasadena**
1993 Glenrose Ave. 798-4781

**Calvary Chapel of Pasadena**
2200 E Colorado Blvd. 584-9992

**Chabad of Pasadena**
1090 E Walnut St. 564-8820

**Church of Christ**
1727 Kinneloa Canyon Rd. 791-2499

**Christian Church, Pasadena**
789 N Altadena Dr. 798-0591

**Congregational Church, First**
464 E Walnut St. 795-0696

**Foursquare Church, First**
174 Harkness Ave. 792-1803

**Grace Pasadena**
85 E Holly St. 224-4568

**Grace Church, Sovereign**
1530 E Elizabeth St. 398-2418

**Grace Lutheran Church**
73 N Hill Ave. 792-4169

**Jesus Christ of LDS, Church of**
1503 E Colorado Blvd. 792-5114

**Jewish Temple, Pasadena**
1434 N Altadena Dr. 798-1161

**Knox Presbyterian Church**
225 S Hill Ave. 449-2144

**Lake Ave. Church**
393 N Lake Ave. 844-4700

**Ma Durga Temple**
2007 E Foothill Blvd 578-9009

**Masjid Al-Taqwa**
2181 N Lake Ave. 398-8392

**Mennonite Church, Pasadena**
041 N Altadena Dr. 398-8224

**Mother Mountain Aerie, Coven of the**
www.mothermountain.org

**Presbyterian Church, Pasadena**
585 E Colorado Blvd. 793-2191

**Quaker Orange Grove Friends**
520 E Orange Grove Blvd. 792-6223

**Scientology, Cult of**
35 S Raymond Ave. 792-7532

**Self-Realization Fellowship (Hindu)**
50 N El Molino Ave. 683-3983

**St. Philip’s Roman Catholic**
151 S Hill Ave. 793-0693

**St. Mark’s Episcopal Church**
1014 E Altadena Dr. 798-6747

**Unitarian Church, Neighborhood**
301 N Orange Grove 449-3470

**Unitarian, Throop Memorial**
300 S Los Robles Ave. 795-8625

**Unitarian Universalist Pagans, Covenant of**
www.cuups.org

**United Methodist, Holliston**
1305 E Colorado Blvd. 793-0685

**Vision Christian Fellowship**
1555 E Colorado Blvd. 304-2688

---

**SPORTS AND RECREATION**

**Big 5**
3719 E Colorado Blvd.
www.big5sportinggoods.com, (626) 795-3111

Standard sports store. As if Techers actually play sports.

**REI**
214 N Santa Anita Ave. (Arcadia)
www.rei.com, (626) 447-1062

Very good, very expensive camping, hiking, and backpacking gear. I recommend the lightweight sleeping bag and a good backpacking shirt from REI before any backpacking expedition. It’s worth the price.
The Department of Athletics, Physical Education and Recreation passionately supports the philosophy that a sound mind and healthy spirit reside within a sound body.

We invite you to work out in our 3,500-square-foot weight room, two gymnasiuums, pair of 25-yard pools, dual multi-use fields, 400-meter track and racquetball, squash and tennis courts.

And come cheer on your classmates in one of our 19 intercollegiate sports!

For more information, visit: GoCaltech.com

To join in the conversation and get updates, follow us on twitter: @CaltechBeavers

DEVELOP.
COLLABORATE.
COMPETE.
EXCEL.
TRANSFORM.
**VIDEO GAMES**

**Game Empire**
1795 E Colorado Blvd.
www.gameempirepasadena.com, (626) 304-9333
Has board games, trading card games, and role playing games. They occasionally hold tournaments.

**GameStop**
1253 N Lake Ave.
www.gamestop.com, (626) 794-2106
You can trade in old video games and consoles here.

**Interact! Used DVDs and Video Games**
350 S Lake Ave.
www.interactcd.com, (626) 578-7282
Buys and sells used DVDs and video games. Prices are reasonable, selection is average. Not as good as GameStop but closer.

**The Internet**

**Play N Trade**
247 E Colorado Blvd.
(626) 683-9118
A game buying and trading store where you can try games before you buy them.

---

**FUN**

With a car, a friend with a car, or sufficient naïveté to hope to get somewhere on public transport, the joys of LA open up to you. Well, at least if/when you have free time. For that matter, it might be worth it to stay here for some vacation so you can check some of these things out.

**AMUSEMENT/THEME PARKS**

Seeing as you can either buy tickets to these at the Bookstore or the Caltech Y, the editors strongly recommend doing just that to save a lot of money. Another option is to find someone with coupons or season passes who is willing to get you in for cheap or free (a surprising number of Techers, especially third-term seniors, like to take a day off and go to some of these).

**Disneyland/California Adventures**
Anaheim, 110 to the 5
Disneyland rules. Has mostly themed rides. California Adventures has more roller coasters and the like.

**Knott’s Berry Farm**
Buena Park, south on the 5 through Orange County
A park with a Peanuts theme, they do a good Halloween thing if you are into that, call well in advance for tickets (think September).

**Raging Waters**
San Dimas, 210 to the 57 south
Huge water park.

**Six Flags Magic Mountain/Hurricane Harbor**
Valencia, 210 to the 5
Often has a few rides closed, but some of the best thrill rides in the...
area. Also has a water park.

Universal Studios Hollywood, 110 to the 101
Movie sets, props, a few actual rides. There is also a big fancy shopping area called CityWalk next to the park.

BEACHES

Now that you’re living near the beautiful Southern California coastline, you too have the opportunity to become one of the muscled, tanned, totally hot-looking beach babes (or beach hunks) that you could see all the time on TV (if you watched any). The beaches that follow are listed north to south. All of these are within an hour and a half’s drive; most are about an hour away. A useful website for a list of amenities for very specific beaches is www.usc.edu/org/seagrant/beach/beach.html. Keep in mind that LA County beaches close at 10pm; this is usually, but not always, enforced.

Point Mugu State Park is towards the further end of Santa Monica Mountains. The only reason to go here, other than variety, is camping; there’s a campground right on the beach. Beware of strong riptides. Make reservations.

Leo Carillo Beach allows swimming, surfing, scuba diving, and snorkeling. There’s a nature trail around several tidal pools if you are interested in marine ecology. There is also intermediate to advanced surfing as well as advanced windsurfing. It’s fun to visit here at night (though in theory it’s prohibited).

Broad Beach is technically private, but no matter how rich you are, you can only own down to within a certain distance of the high tide line. It’s just a little west of Zuma, but not as crowded. Watch out for guys on ATV’s, probably hired by the rich people, who patrol. There are tide pools.

Zuma Beach has clean sand, decent bathrooms, and lots of Valley Girls. The waves are usually better than average. Crowded, but not as much so as Malibu, Venice, or Santa Monica. Park on the roadside opposite to the beach to save yourself some money on parking.

Point Dume is pretty unknown and thus is the best place to go on a summer weekend to find more sand than towels. The sand and water are clean, and you hike up for a nice view. Waves are nice. Also good at night.

Malibu Surfrider is really crowded. There are tide pools, but you can’t swim in them (they kicked some Techers out). It can also be fun to see the houses of the rich and famous lining the hills, which will probably disappear after the mudslides next rainy season.

Las Tunas Beach is for scuba diving (there’s an offshore reef) and fishing.

Santa Monica Beach is a bit unpleasant. The water is dirty, the pier almost as much so, and it’s incredibly crowded, probably because it’s closest to San Fernando Valley. The sand extends out fairly far and
when it gets windy the sandstorms are terrible. Third St. Promenade is a decent walk.

**Venice Beach** is a very crowded beach, but there are cool street vendors and performers. You can rent rollerblades or bicycles, and try not to get run over by the flock of other rollerbladers. You could also stop by Muscle Beach to look at unattractive muscle-bound men with good tans. Be sure to look for the guitar guy on skates; he might be wearing his turban.

**Dockweiler Beach** is next to the airport, and this can be irritating (but it also means that it is less crowded). You can build small fires there, but you can do so also at Bolsa Chica, which is entirely more pleasant.

**Manhattan Beach** has a nice promenade, and the beach isn’t quite as crowded as Santa Monica. The water’s reasonable. There are volleyball nets. There are good restaurants up Manhattan Beach Boulevard; The Kettle is open 24 hours.

Going down the coastline, there is:

- **Hermosa Beach**, which is unremarkable;
- **Redondo Beach**, which is unremarkable but with a nightlife;
- **Torrance Beach**, which has scuba;
- **Abalone Cove Beach**, which has an ecological preserve and no lifeguards;
- **Cabrillo Beach**, which is also unremarkable;
- **Long Beach City Beach**, which features a catamaran launch ramp;
- **Seal Beach**, which has fine sand; and
- **Sunset Beach**, which is only worthwhile for the kayaking nearby.

If you go just a bit further south, there’s Huntington State Beach, which is well-kept up and allows bonfires (this is probably the best place to go for these). Unfortunately they close right on the dot at 10pm, and they’ll kick you out.

**BOWLING**

- **300 Pasadena**, 3545 E Foothill Blvd., (626) 351-8858
  Kind of expensive, open until midnight Mon-Thu, 11pm Sun, and 2am Fri-Sat.

- **Pasadena Lawn Bowling Club**, 275 S Raymond Ave.
  They meet Saturday mornings in the park to dress in white, wear straw hats, and play bocce.

**CONCERT VENUES**

**CLASSICAL**

In addition to the two below venues, the Caltech Office of Public Events hosts numerous classical concerts in Beckman, Ramo, and Dabney Hall. You can also go to [www.musiccenter.org](http://www.musiccenter.org) for specific concert dates.

- **Hollywood Bowl**, Hollywood
  Outdoor half-sphere on a side of a hill, with surprisingly good acoustics up to about the third cheapest level. Both popular and
classical performances. Tickets can be very cheap if you are willing to give up some sound quality.

Walt Disney Concert Hall           Downtown Los Angeles
Brand new home of the LA Philharmonic and already considered to be one of the best acoustic setups in the world. They also give tours of the unique architecture.

NON - CLASSICAL

This lists small, non-classical venues. For large events (such as at the Staples Center, Rose Bowl, Long Beach Arena, or Universal Amphitheatre), just go to www.ticketmaster.com. Various local coffee shops and bars often have live music if you poke around, but it is hard to predict when. As a result they are not worth listing here.

El Rey Theater           Wilshire Los Angeles
Has the feeling of an old, classy theatre since it is one. They have indie-rock bands. No age limit.

The Palladium           Hollywood
Distinctive for merchandising, a huge floor where good seats are outside your price range, a long line, and invasive security. It is also often 21+.

The Key Club           West Hollywood
Small-midsized bands, often all ages.

The Troubadour           Hollywood
Had a lot of famous bands early in their careers, tickets are cheap, and you can get close to the band. The bands come hang out and chat after the show. Full bar, no age limit. Tickets are cheap.

Whisky A Go-Go           West Hollywood
Smaller rock bands, no age limit.

The Wiltern Theater           Los Angeles
Pretty upscale: opera, pop, and rock, no age limit.

FLEA MARKETS

PCC           Hill and Colorado
In the mornings on the first Sunday of every month, free admission. This market takes up three floors of a parking garage and another parking lot. Like most flea markets, prices range from very cheap to very expensive.
To Pasadena and Beyond!

Rose Bowl
http://rgcshows.com/RoseBowl.asp

Second Sunday of every month, $8 admission fee. Early admission available for higher rates, but stalls may not all be set up until 9 AM, and begin dismantling at 3 PM. Shoppers may remain until 4:30 PM.

---

HIKING AND CAMPING

There are a lot of trails, both nearby and further away. Perhaps the best collection of them is by the National Forest Service at www.fs.fed.us/r5/angeles. Keep in mind that to park in any national forest in Southern California you will need to buy an Adventure Pass, $5/day or $30/year (a National Parks Golden Passport is also accepted). Here are the major hiking areas:

**Bailey Canyon**: Take the 210 and exit on Baldwin Avenue. Go north and turn left on Grandview, then right on Grove. Continue to the end of the road (and a parking area). The hike up here is steep but gives you a good view of the area.

**Channel Islands National Park**: Free to visit, but in order to camp there, there is a $15/night fee. You will also need to book a ferry in advance to take you to the island. (Island Packers is a good one, about ~$50 per person). The campgrounds can be Spartan, but it offers great kayaking, snorkeling, and good views.

**Chantry Flats**: Take the 210 to Santa Anita and continue north on Santa Anita, eventually branching left on Santa Anita Canyon Road. There are many trails from here. Not too challenging, though finding a parking spot can be difficult. -- Surtevant Falls is a good easy hike.

**Eaton Canyon**: Go east on Colorado and turn left at Altadena Drive. Turn Right onto Canyon Close Road. Continue and turn into the Eaton Canyon parking area just after New York Drive. Depending on how much it has rained you may get your feet wet at a river crossing (usually you do not), and you will eventually reach a waterfall.

**Echo Mountain**: Drive up to the end of Lake, and there is a gate into the trailhead on the corner at the end. The hike is best completed in morning shade; it is short and steep, ending in a remarkable abandoned hotel site.

**Henninger Flats**: Leaving from the Eaton Canyon Trailhead, the trail to Henninger Flats takes you up the abandoned southern end of the Mount Wilson toll road to a secluded but comfortable campground.

**Millard Canyon**: Take Lake all the way north and make a left on Loma Alta, turn on Chaney Trail. The hike starts out on Sunset Ridge. This is a beautiful hike with great views of Millard Canyon, a 50-foot waterfall, many lovely spots with gentle pools and cascades, and even an abandoned gold mine.

**Mt. Wilson**: Take the 210 to Baldwin and Baldwin north to Mira Monte, go right on Mira Monte and look for the signs.
San Gabriel River - East Fork: Take the 210 to Azusa and go north to East Fork Road. Go down the service road at the hairpin turn (about 8 miles in) and you can hike to the ‘mysterious’ Bridge to Nowhere. The trail is tricky to follow -- try to stick to the east mountainside. Your feet will get wet. People also bungee jump off this bridge (see www.bungeeamerica.com/nowhr.htm).

**ICE SKATING**

Pasadena Ice Skating Center  
310 E Green St.  
(626) 578-0800

$8 during general admission, $3 for skate rentals, usually open from 12-4pm during the week, though Caltech sometimes sponsors free nights for students. Check www.skatepasadena.com for their calendar.

**MOVIE RENTALS**

ASCIT DVD Library  
3rd Floor of Sherman Fairchild Library
Not a very big selection. Check online on Donut.

Netflix  
Internet
Isn’t expensive if you only want to stream movies online ($8 a month), and with Caltech’s internet connection you don’t really need to worry about streaming not working. Netflix is also available in the ASCIT Screening Room.

Pasadena Public Library  
285 E Walnut St.  
For those who plan ahead. They have a nice DVD collection.

**MOVIE THEATERS**

**PASADENA AREA**

ArcLight Cinemas Pasadena  
Colorado and Los Robles  
Moderately expensive theater. You must choose your seat when buying a ticket. They have 21-and-over late night showings with alcohol.

Academy 6  
Catalina and Colorado  
Second run and really cheap, which is awesome. Evenings are $3, matinees are $2. They generally feature films a couple months after the release date.

iPic Theaters  
42 Miller Alley  
Quite swank. Reclining seats in pairs, good for a nice date. $20-30 per ticket.

Laemmle’s Playhouse 7  
673 E Colorado Blvd.  
Art and independent films. Students with ID $7 on Sundays after 6pm; general $11.

**LOS ANGELES AREA**

Hollywood is probably the most appropriate place to view a movie. There are a few classic theatres listed below, along with a drive-in, which is its
own neat experience. Far away.

The ArcLight Hollywood
They play everything, and while it is $11 a ticket, the seats, sound system, and screens are all super modern and worth it for a movie you really want to see.

Grauman’s Chinese Theater Hollywood
One of the oldest and biggest theaters, they have stars’ handprints and footprints in the front, and it’s all very elaborate.

Landmark’s Nuart West Los Angeles
They do special shows, like an avant-garde orchestra performing music for a classic silent film.

Pacific El Capitan Hollywood
A fancy theater that shows Buena Vista movies, including Disney ones.

Vineland Drive-In City of Industry
$9 a person to sit in your car with whatever food you want and see current movies. They have four screens.

If you are looking for places to screen movies, you can go to the ASCIT Screening Room. Moore 070 usually works quite well if you do not mind the awkward chairs; you might even be able to get security to let you in. Jorgensen 74 is good as well. The housing office also has a nice TV if you are polite and not too messy they might let you use to view movies or just watch TV. It is also possible to use the multimedia room in SFL; just ask the staff.

MUSEUMS
PASADENA AREA

The Huntington Library Allen and Orlando
10:30am-4:30pm
$12 with student ID, $15-$20 without
Giant botanical gardens and several American and British art galleries. It also has the cheapest tea room in the area at $25 a person. Free on first Thursday of month with advance tickets.
www.huntington.org/

The Pacific Asia Museum Colorado and Los Robles
W-Su: 10am-6pm
$7 with student ID
Free the fourth Friday of every month. Contains a large collection of Asian and Pacific Islander art and artifacts. Exhibits include Buddhist items, as well as those of various regions of South, Southeast, and East Asia. However, the lack of cultural context and explanation can be daunting.
www.pacificasiamuseum.org/

The Norton Simon 411 W Colorado Blvd.
M,W,R,Sa,Su: noon-6pm, F: noon-9pm
Closed Tuesdays
Free with student ID. It contains a small collection of Western and
Asian art. The Asian art has a primarily religious focus and offers more explanation than the Asia Pacific museum, while the Western includes pieces by well-known artists.

www.nortonsimon.org/

The Bunny Museum
1933 Jefferson Dr.
(626) 798-8848

By appointment only with some open house days, a house stuffed with bunny themed items whose owners still live there.

www.thebunnymuseum.com/

LOS ANGELES AREA

California African American Museum
Exposition Park (LA)
Features African American art, history, and culture along with a research library. Free and open T-Sa 10am-5pm; Su 11am-5pm.

California Science Center
Exposition Park (LA)
This is not really for Techers, but if you’ve got a younger sibling visiting, it’s pretty good as far as science museums go and has an IMAX. Open 10am to 5pm every day, and parking is $10; admission is free.

Gene Autry Western Heritage Museum
Griffith Park (LA)
Settlers in the western United States. Really good collection. It contains the Southwest Museum of the American Indian, but this museum is closed to the public for a conservation project scheduled to be completed in 2013. Open T-Sa: 10am-4pm, Su: 11am-5pm, it costs $6 for students (with ID).

Getty Center
Los Angeles
Free admission but $15 for parking (parking is $10 after 5pm F-Sa)
T-Th, Su: 10am-5:30pm, F-Sa: 10am-9pm, M: closed
Best art museum in LA. Well-known collection of western art in an architecturally famous building.

Getty Villa
Pacific Palisades (Malibu)
Free Admission but must be reserved in advance
W-M: 10am-5pm
Ancient Greek, Roman, and Etruscan artifacts in a ridiculous setting.

Heritage Square Museum
Los Angeles
$10 for all adults
F-Su, holiday Mondays: 12pm-5pm
This is that clump of Victorian houses you drive past on the 110. Easy to get to on the Gold Line.

La Brea Tar Pits Museum
Downtown Los Angeles
$8 for students, $11 for adults
Daily: 9:30am-5pm
Has mammal and bird fossils along with an Olympic pool sized active tar pit. Awesome. Free first Tuesday of month.

LA County Museum of Art
Downtown Los Angeles
$10 with student ID, $15 for adults; free the 2nd Tuesday of every month
Typical large-city art museum, with a lot of modern and European art and a Japanese collection. Free after 3pm on weekdays and on second Tuesday of month.
Los Angeles Zoo
Griffith Park Los Angeles
$16 for admission, free parking
Daily: 10am-5pm

Isn’t nearly as cool as the San Diego one, but it’s much closer.

Museum of Contemporary Art
Downtown Los Angeles
$7 for students with ID, $12 for adults.

Sizeable and well-known museum. It has three locations with varying hours: the MOCA Pacific Design Center is open Tuesday-Friday 11am-5pm and 11am-6pm on weekends, MOCA Grand Avenue and the Geffen Contemporary at MOCA are open 11am-5pm on Mondays and Fridays, 11am-8pm on Thursdays, and 11am-6pm on weekends.

Museum of Death
6031 Hollywood Blvd. (Hollywood)
www.museumofdeath.net, (323) 466-8011

A good display of various serial killers and embalming facts and gruesome things. They’ve a collection of two-headed animals in jars. The staff is really friendly. It’s worth going to at least once if you think you’d be at all interested. $15 with free parking.

Museum of Jurassic Technology
Culver City
Takes suggested donations, not entrance fees

Tracks in scientific thinking that are no more; it is very hard to describe it more precisely than that. R: 2pm-8pm, F-Su: 12pm-6pm

PARKS

There are quite a number of parks in Los Angeles County, and the best resource to find one to your tastes would be www.laparks.org/dos/parks/parks.htm. Griffith Park has barbecue pits if you are so inclined, though all of them forbid open fires.

Descanso Gardens
La Canada Flintridge
Head towards the intersection of the 210 with the 2. A nice large garden to walk around in. Sometimes they host free programs; otherwise it’s $6 to get in and only open until 5pm.

El Miradero Mansion and Brand Park
Glendale
A public arts and music library with 700 acres of parkland, including a Japanese Tea House and Garden. Open normal library hours and perhaps after dark. Their website is www.ci.glendale.ca.us/library/brand_index.asp.

Griffith Park
Los Angeles
Off of the 134, a giant park of both landscaped and wild areas open to the public until 10pm daily.

The LA County Arboretum
Arcadia
http://arboretum.org

125 acres of parkland and conservatory, open until 5pm daily with a small admission fee. This place is seriously awesome. Definitely go if you like plants.
Radio and TV

This is purely a list of what you are supposed to hear. Actual reception of these stations can vary widely from radio to radio and place to place on campus. Not that anyone even listens to the radio anymore. For a complete list, go to http://www.ontheradio.net/metro/los_angeles_ca.aspx,

**FM Stations**

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Contemporary</td>
<td>92.7, 103.5, 106.7</td>
</tr>
<tr>
<td>Alternative</td>
<td>88.7, 98.7, 103.1</td>
</tr>
<tr>
<td>Christian Contemporary</td>
<td>95.9, 101.5</td>
</tr>
<tr>
<td>Classical</td>
<td>88.5, 91.5</td>
</tr>
<tr>
<td>Classic Rock</td>
<td>93.1, 95.5</td>
</tr>
<tr>
<td>College</td>
<td>88.9, 90.1</td>
</tr>
<tr>
<td>Country</td>
<td>105.1</td>
</tr>
<tr>
<td>DEI</td>
<td>45.9</td>
</tr>
<tr>
<td>Hip Hop</td>
<td>93.5, 100.3, 105.9</td>
</tr>
<tr>
<td>Jazz</td>
<td>88.1, 94.7</td>
</tr>
<tr>
<td>Oldies</td>
<td>101.1</td>
</tr>
<tr>
<td>Public</td>
<td>89.3, 89.9, 90.7</td>
</tr>
<tr>
<td>Religious</td>
<td>99.5</td>
</tr>
<tr>
<td>Spanish</td>
<td>93.9, 94.3, 96.3, 96.7, 97.9, 98.3, 101.9, 103.9, 105.5, 107.1, 107.5</td>
</tr>
<tr>
<td>Urban Contemporary</td>
<td>92.3, 102.3</td>
</tr>
<tr>
<td>Talk</td>
<td>Try some AM stations</td>
</tr>
<tr>
<td>Top-40</td>
<td>97.1, 102.7, 104.3</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>106.3</td>
</tr>
</tbody>
</table>

**AM Stations**

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Contemporary</td>
<td>1220</td>
</tr>
<tr>
<td>Disney</td>
<td>1110</td>
</tr>
<tr>
<td>Chinese (Mandarin)</td>
<td>1300, 1370, 1600</td>
</tr>
<tr>
<td>Chinese (Cantonese)</td>
<td>1430</td>
</tr>
<tr>
<td>Iranian</td>
<td>670</td>
</tr>
<tr>
<td>Korean</td>
<td>1230, 1650</td>
</tr>
<tr>
<td>Multiethnic (Multiple non-English languages)</td>
<td>1190</td>
</tr>
<tr>
<td>News</td>
<td>790, 870, 980, 1070, 1380</td>
</tr>
<tr>
<td>Oldies</td>
<td>1260, 1510</td>
</tr>
<tr>
<td>Religious</td>
<td>1280, 1460</td>
</tr>
<tr>
<td>Spanish</td>
<td>830, 900, 930, 1020, 1220, 1330, 1390, 1470, 1580</td>
</tr>
<tr>
<td>Sports</td>
<td>570, 610, 710, 1150, 1540</td>
</tr>
<tr>
<td>Talk</td>
<td>640</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>1480</td>
</tr>
</tbody>
</table>

**Television**

As far as TV goes, you probably won’t have time for it. But if you just can’t do without, the North Houses still have TVs in their lounges. Many other Houses have TVs in their lounges as well. The following are broadcast television stations. Remember, you now need a digital antenna to pick these up. Also, if you get cable, just ask your service provider.
If you are looking for places to screen movies, you can go to the ASCIT Screening Room. Moore 070 usually works quite well if you do not mind the awkward chairs; you might even be able to get security to let you in. Jorgensen 74 is good as well. The housing office also has a nice TV that if you are polite and not too messy they might let you use to view movies or just watch TV. It is also possible to use the multimedia room in SFL; just ask the staff.

RESTAURANTS

This is not a comprehensive list of all restaurants. Instead, we’ve listed ones that are open 24/7 and that we go to a lot. If you’re planning on ordering, we recommend doing it through eat24.com. Many of these places are familiar with Caltech so you can just tell them Caltech instead of trying to give directions. There are also a lot of nice (expensive) restaurants in Old Pas. Ask an upperclassman for more suggestions.

Bahooka (Seafood, $15) 4501 Rosemead Blvd. (Rosemead) (626) 285-1241, www.bahooka.com

It's a bit of a drive and quite pricey, but there are tons of aquariums and the ambiance is nice and really unique. Also you can order drinks in large bowls for two people and it'll come with something on fire (literally) in the center of the bowl. Opens at 11:30 on weekdays and at noon on weekends; closes at 9pm the night before a weekday and at 10:30pm the night before a weekend.

BCD Tofu House (Korean, $8-15) 3575 Wilshire Blvd. (LA) (213) 382-6677, www.bcdtofu.com/location

A 24-hour Korean restaurant specializing in spicy tofu soup. Limited vegetarian options. Higher quality food preparation than most other 24-hour restaurants. They also give you infinite free appetizers.

Buca di Beppo (Italian, $7-20) 80 W Green St. (626) 792-7272, www.bucadibeppo.com

You can’t really go by yourself, as all of the dishes are designed to fill between 2 and 6 people (depending on the dish and the size you get). If
you’re really hungry, you probably want a dish and a half for two people, so an appetizer and an entree makes sense, and then it can get pretty expensive, but it’s good. Hours are M-R: 11am-10pm, F: 11pm-11pm, Sa: 11am-11pm, Su: 11am-10pm.

Canter’s (Deli/Sandwich, $10) 419 N Fairfax (W Hollywood ) (323) 651-2030, www.cantersdeli.com
Open 24/7, it’s a very well-known Jewish deli. They have decently good food for the price. The cherry phosphates are very good, as are their latkes; however, if you want food in the middle of the night, IHOP is probably a better bet because it’s closer and cheaper.

Celestino’s (Italian, $15-25) 141 S Lake Ave. (626) 795-4006, www.calogerodrago.com
Not quite as fancy or uptight as it looks from the outside (but it is a fairly fancy restaurant). It’s reasonably priced for a decent meal. Open M-R: 11:30am-2:30pm, 5:30pm-10pm, F: 11:30am-2:30pm, 5:30pm-11pm, Sa: 5:30pm-11pm, Su: 5pm-9pm.

The same as every other one, except perhaps a longer wait. It can be 2 hours on the weekend, and they do not take reservations. The salads are decent, but if you know what type of food you want, you can probably find better and cheaper elsewhere. Cheesecake is about $6-8 more than what’s listed above. Open M-Sa: 11am-close, Su: 10am-close (typically 11pm-1am).

Cherry on Top (Frozen Yogurt, $3-7) 1299 E Green St. (626) 440-1299, www.cherryontop.net
Self-serve yogurt that’s really tasty. It’s open pretty late and it’s really close to campus, but it’s on the expensive side. Open Su-R: 11am-11pm, F-Sa: 11am-11:30pm.

Self-serve yogurt that’s really tasty. It’s open pretty late and it’s really close to campus, but it’s on the expensive side. Open Su-R: 11am-11pm, F-Sa: 11am-11:30pm.

Chipotle (Mexican, $6-9) 246 S Lake Ave. (626) 229-9173, www.chipotle.com
Close, relatively cheap, and decent with large portions. Everyone eats here all the time. Open 11am to 10pm daily.

Corner Bakery (Bakery/Café, $5-8) 345 S Lake Ave. (626) 578-1281, www.cornerbakerycafe.com
Decent sandwiches and pretty close to Tech. They also sell baked goods in entire pans if you want a lot of something. Surprisingly poor bread. Open Su-R: 7am-9pm, F-Sa 7am-10pm.

Counter (Burger, $9-20) 140 Shoppers Lane (626) 440-1008, www.thecounterburger.com
Their menu is a checklist, and you list the ingredients you want on your burger. They have everything from Brie to American cheese, from dried cranberries to cucumbers to tomatoes for toppings, and many more sauces than I even knew existed. They also have veggie burgers.
It’s very expensive for a burger, but it’s delicious and definitely worth it.

Dog Haus (Hot Dogs/Burgers, $4-8) 105 N Hill Ave
(626) 335-9111, www.doghausdogs.com

So delicious - with a 10% Caltech discount! You can either order a premade creation, or make your own level 1, 2, or 3 dog/burger with fried eggs, chile, bacon, mushrooms, avocado, and more! Everything is served on Hawaiian sweet rolls, and vegetarian options are available. It’s within walking distance of campus. Open 11am-10pm daily.

Domino’s (Pizza, $5-10) 2363 E Colorado Blvd.
(626) 584-0866, www.dominos.com

Free delivery. Ask if they have any specials. In all honesty, it’s not very good pizza. Open Su-R: 11am-12am, F-Sa: 11am-1am, and you can order online right up until closing time.

Donut Man (Donuts, $4-8) 915 E Route 66 (Glendora)
(626) 335-9111

Delicious donuts. Especially the strawberry donuts, when they’re in season. This is where ASCIT gets donuts from for midnight donuts.

Du-par’s Restaurant and Bakery ($11-30) 214 S Lake Ave. (Pasadena)
(626) 405-8820, www.cherryontop.net

Open 24 hours! Serves breakfast, brunch, and sandwiches. Meals can be on the pricier end.

Einstein Bros Bakery ($2-5) 605 S Lake Ave.
(626) 449-6415, www.einsteinbros.com

A chain of bagel stores. It’s OK if you aren’t from the New York area. If you are, well, it is a bagel... just pretend that you don’t know how much better they can be. Open M-F: 5am-5pm, Sa-Su 6am-4pm.

El Super Burrito (Mexican, $5-6) 3631 E Colorado Blvd.
(626) 792-4482

The price is reasonable considering their food quality and portion sizes. It’s better than most Mexican fast food and open late but pretty far away. Open 6am to midnight daily.

Ernie’s Taco Truck (Mexican, $4) On campus
Try physical plant or CSS between 11-2 PM and Keith Spalding around 4. It’s significantly cheaper than Chandler, and they have Mexican Coke with real sugar in it. Try it at least once while you are at Tech. And Ernie’s the nicest guy.

Float (Sandwiches, $10-15) 380 S Lake Ave.
(626) 844-3488

Cute little sandwich shop that sells luxury sodas and coffee as well.

Fredo’s (Pizza, $5-10) 950 E Colorado Blvd.
(626) 568-0505

Free delivery. Pizza is always 2 for 1. 15% off for Caltech students. Their pasta isn’t as good as their pizza, and if you eat in the actual restaurant, food is much better but the restaurant itself is sub-par.

Ginger Corner Market 217 S Michigan Ave
(626) 795-2447

Offers great coffee, baked goods, and sandwiches. Also, it’s a close
To Pasadena and Beyond!

**IHOP (Diner, $5-15)**
880 S Arroyo Pkwy.
(626) 449-5226, www.IHOP.com

It’s IHOP; they’re pretty decent and don’t vary much. Open 24/7; for this reason alone you will almost certainly go here at least once.

**In-N-Out (Fast Food: American, $5)**
2114 E Foothill Blvd.
(800) 786-1000, www.in-n-out.com

This is the quintessential Southern California fast food place. They only make three things—burgers, fries, and shakes—but they do them well and in many possible ways. I have to actively try to avoid eating here all the time. If you’re vegetarian, you can order a grilled cheese sandwich, which is a burger except without the meat and is surprisingly delicious. Open Su-R: 8am-1am, F-Sa: 8am-1:30am.

**Islands (Burgers, $10-15)**
330 E Colorado Blvd.
(626) 304-9050, www.islandsrestaurants.com

Pretty good burgers in a silly setting (they constantly play videos of surfers and/or snowboarders on giant televisions). Sometimes they have good deals on their mixed drinks. A good place to go with a large group of friends, but we don’t recommend going here for an nth date (where you know the number n) or taking your family here because it’s so hard to pay attention to anything other than the TV screens.

**Jamba Juice (Smoothies, $3-5)**
204 S Lake Ave.
(626) 744-5200, www.jambajuice.com

If you have been to one, you have been to them all. Even the smell is the same. The drinks are tasty, even if they are overpriced. This one is open daily 7am to 9pm, but if you’re craving a smoothie at 10pm there’s one in Eagle Rock (near Occidental college, maybe a 15-minute drive down the 210) that’s open until 10:30 most nights. Or you could just go to Tea Spots instead.

**Mediterranean Cafe ($5-10)**
273 Shoppers Lane (Pasadena)
(626) 793-8844

A Caltech favorite! A family owned restaurant within walking distance from campus. Service is extremely quick and the owners are super nice. The kabob plates and chickenshawerma are popular dishes.

**Panda Express (Chinese, $5-10)**
218 S Lake Ave.
(626) 796-7710, www.pandaexpress.com

If you order the food to go, they give you more. Ask them for half fried rice, half chow mein instead of white rice. It’s worth it. Open daily 10am-10:30pm.

**Pantry, The Original (American, $10)**
877 S Figueroa St. (LA)
(213) 972-9279, www.pantrycafe.com

They switch to the breakfast menu at 4am, making it cheaper to eat there. It’s the time Techers traditionally go. You won’t understand the bill, and the food you get might not be what you order; however, I once saw someone get a plate of pancakes to soak up an entire bottle of syrup. It was pretty awesome. Open 24/7.

**Papa John’s (Pizza, $5-15)**
800 S Fair Oaks Ave.
(626) 441-8484, www.papajohns.com

Do not call them, online ordering is much more efficient. You can

---

place to campus to get coffee when Red Door is closed on weekends.
order online by putting 1200 E California Blvd as the address but then entering instructions to the driver of “Corner of Holliston and San Pasqual.” Also make sure you click on “Special Offers” instead of “Menu.” Open for delivery 10:45am to 10pm.

Peet’s Coffee and Tea (Coffee & Tea, $2-5) 605 S Lake Ave. (626) 795-7413, www.peets.com

Starbucks, take two. It’s very close to Tech. Open M-R: 5am-10pm, F: 5am-11pm, Sa: 6am-11pm, Su: 6am-10pm.

Pie N’ Burger (Burgers, Pies, $10) 913 E California Blvd. (626) 795-1123, www.pienuburger.com

They make decent burgers, though it’s more expensive than you’d normally pay. The pies, which you can get to go, are really, really good. Try the pecan one. Open M-F: 6am-10pm, Sa: 7am-10pm, Su: 7am-9pm.

Pizza Hut (Pizza, $5-15) 777 S Arroyo Pkwy. (626) 792-2800, www.pizzahut.com

This one has a ‘Wing Street’. Order online and give the address for CSS or the Ath as the delivery address.

Root Beer Joe’s (Deli/Sandwich Shop, $5-9) 380 S. Lake St. #106 (626) 844-3488, www.rootbeerjoes.com

They have a delicious garlic sauce that makes their sandwiches especially yummy. Open 8am-6pm M-F, Sa 9am-6pm, Su 10am-5 pm.

Rubio’s (Mexican, $2-7) 216 S Lake Ave. (626) 449-3013, www.rubios.com

They can make lots of stuff vegetarian if you ask for it. It might be slightly better than Baja Fresh, but it’s a close call. On Tuesdays, they offer fish tacos for $1.25. They’re worth a try.

Souplantation (American, $10) 201 S Lake Ave. (626) 577-4798, www.souplantation.com

Show your Caltech ID for 10% off. It’s a good selection of decent food. Salads, pizza, soup, brownies. Open M-R: 11am-9pm, F-Sa: 11am-10pm, Su 9am-9pm.

Subway (Deli/Sandwich Shop, $3-10) 2377 E Colorado Blvd. 526 S Lake Ave. (626) 405-4900, www.subway.com

It’s Subway! If you’re living on the Olive Walk, the Lake location is closer; if you live in Avery or off-campus the Colorado location is closer.

Tarantino’s (Pizza, $10) 784 E Green St. (626) 796-7836

Cash only! They sometimes close early if they aren’t busy, but it’s some of the best pizza around. On M-R they also do an all-you-can-eat xyz, where xyz varies by the day of the week. Really good garlic knots. Open M-R: 11am-10pm, F-Sa: 11am-11pm, Su: 5pm-10pm.

Tea Spots (Tea/Boba/Smoothies, $2-4) 1443 E Colorado Ave. (626) 396-0886

Get drinks (delicious BOBA) and maybe the snack food if you are hungry. The meals are less delicious. They open at 10am on
weekdays, 11am on weekends and close at midnight the nights before
weekdays and at 1am Friday and Saturday night.

Which Wich (Superior Sandwiches, $8-13) 230 S Lake Ave.
(626) 795-2000

Open from 9am-10pm daily. Order your sandwich by checking off
the ingredients you want on a sandwich bag. A more expensive/tastier
version of Subway/Jersey Mike’s/Jimmy Johns. It is next to a place
called Fish Dish which also serves food.

(626) 577-9273, www.yardhouse.com

Go during happy hour and the appetizers (and beer) are half off.
Price listed is for food only. They have very good veggie burgers.
Happy hour is M-R: 5pm-7:30pm, and hours are Su-R: 11am-12am,
F-Sa: 11am-1:30am.

Yogurtland (Frozen Yogurt, $3-8) 415 S Lake Ave.
(626) 440-7060, www.coldstonecreamery.com

It’s really expensive, but the pre-made ideas are cheaper if you want
a lot of mix-ins. Since they give you a large amount of rich ice cream,
you don’t feel ripped off after paying $5. Open Su-R 11am-10pm, F-Sa
11am-11pm.

THEATERS

With aspiring performers on every corner, Los Angeles is full of theatres,
some of which are better than others. If there is something on tour
nationally it is likely to come to at least one of the Los Angeles theaters
eventually. A few of these theaters are listed below.

PASADENA AREA

Boston Court 70 N Mentor Ave.
www.bostoncourt.com, (626) 683-6883

Previews are $17 a ticket, regular performances are $27 with student
ID, $32 normally. Look at their calendar beforehand, as times and shows
vary.
The Civic Auditorium 300 E Green St.
www.thepasadenacivic.com, (626) 449-7360

You have to watch their calendar. Symphonies and musicals and
many guest speakers.
The Pasadena Playhouse 39 S El Molino Ave.
www.pasadenaplayhouse.org, (626) 356-7529

Highly regarded, but very expensive.

LOS ANGELES AREA

Ahmanson Theater & Mark Taper Forum Downtown Los Angeles
www.centertheatregroup.org, (213) 628-2772

Show musicals and plays that Broadway has gotten bored of, along
with very modern productions (which are a lot more expensive to get
tickets for). There are a limited number of $20 tickets available (“Hot Tix”)
in advance if you call them. If you can afford to buy tickets not in the
balcony, we recommend that, because the theater isn’t that deep.
Crossley Theater
1760 N Gower St. (Hollywood)
www.actorsco-op.org, (323) 462-8460
A small and intimate theater that plays some classic and some newer plays with an in house cast, tickets from $20-30 for students.

Glendale Centre Theater
324 N Orange St. (Glendale)
www.glendalecentrepac.org, (818) 244-8481
Shows musicals and comedies, mostly classics and children’s productions. Tickets from $15-25.

Kodak Theater
6801 Hollywood Blvd. (Hollywood)
www.kodaktheatre.com, (323) 308-6300
Hosts the academy awards, mostly children’s productions and concerts. Ticket prices vary based on performance, but are typically quite pricey.

LA Theater Center
514 S Spring St. (Los Angeles)
www.losangelestheatercenter.com, (213) 489-0994
Contemporary plays. Tickets from $15-100 with discounts online if you look for them.

Pantages Theater
6233 Hollywood Blvd. (Hollywood)
www.broadwayla.org, (323) 468-1770
Mostly former Broadway musicals; tickets are pricey and they have Ticketmaster charges. Prices depend on what show you’re seeing, prices are upwards of $25, typically higher.

Will Geer Theatricum Botanicum
1419 N Topanga Canyon Blvd. (Topanga), www.theatricum.com, (310) 455-3723
Stages classic works and is a repertory theatre group; it is outdoors, though, on benches. Student prices are $15-20. Wear a hat/sweater as appropriate.

YOGA

Caltech offers several classes, but they’re all pretty much the same. If you want to practice it more seriously, these three places (especially the first two) are good places to start with.

Bikram Yoga College
2089 E Colorado Blvd.
(626) 304-9642
Has very physically intense yoga, practiced in a room that is kept at about 105 degrees. $18 per class, but they claim to have student rates if you call or talk to them in person.

Yoga House
11 W State St.
(626) 403-3961
Offers multiple types of yoga, including less intense ones, $14 with student ID for single classes, packages are 10% off with student ID.

Yoga Kingdom Sanctuary
553 S Lake Ave.
(626) 792-7871
Offers multiple types of yoga. The first class free is you sign up for their newsletter, $12 per class after that (for students) with various monthly packages.
To Pasadena and Beyond!

LOCATED IN THE WINNETT STUDENT CENTER

BUSINESS HOURS MONDAY - FRIDAY 8:30am - 5:30pm

INSIGNIA CLOTHING & GIFTS
SCHOOL AND OFFICE SUPPLIES
COMPUTERS & ACCESSORIES
ATM ON THE PREMISES

WE CAN SPECIAL ORDER ANY BOOK IN PRINT!
TRANSPORTATION

AIR TRAVEL

The closest airports to Pasadena are Burbank (BUR) and Los Angeles (LAX). While in theory you could also fly to Ontario (ONT), Long Beach (LGB), and Orange County (SNA), this is usually far less convenient, as a shuttle from Orange County would run you $60 ($80 without a reservation).

A few good websites for tickets are listed below; however, many airlines guarantee the lowest fare will be on their site, so always double check with them. The discount airlines are also not listed by consolidators, so their websites are also shown below.

- [www.mobissimo.com](http://www.mobissimo.com) — just sends you to the airline’s own home page, but is often the cheapest way to book flights.
- [www.kayak.com](http://www.kayak.com) — also sends you to the airline’s home page, but gives more options as to multi-city trips and other airports.
- [www.southwest.com](http://www.southwest.com) — this is really nice if you book early and they fly to where you want to go. Southwest also allows two free bags!
- [www.studentuniverse.com](http://www.studentuniverse.com) — you have to book a number of days in advance (it might be 45), but they sometimes have rates the airlines don’t publish even on their websites.

Other somewhat less useful websites include Orbitz, Travelocity, Priceline, and Expedia.

There are several options for getting to and from the airport. You can often send out a house email to see if there are others leaving around the same time as you or if someone is willing to drive you. We recommend buying them food or paying for their gas as compensation.

Drive to LAX by taking the 110 south. Follow it to the 105, and go west on the 105. Get off at Sepulveda. If you’re driving to Burbank, take the 210 west to the 134 to the 5 north and the follow signs.

Supershuttle is probably your best bet as far as shuttles are concerned. It’s $30 each way to/from LAX and slightly less to Burbank. They expect tips, so it’s more like $35. If you want a shuttle to the airport, make a reservation at least 6 hours in advance at [www.supershuttle.com](http://www.supershuttle.com). There is also PrimeTime Shuttle which achieves the same goals as super shuttle for about the same (maybe less) price.

Public transit in LA is a lot better than people think, and getting to the airport only takes ~2 hours. What you want to do is end up at Union Station in downtown LA. There are two ways to do this. If you don’t have much luggage the 485 bus picks up along Lake Ave and then runs express to downtown ($1.75). If you have more luggage, then the Metro Gold Line ($1.75) is often a bit easier (and depending on the time of day also faster); the closest station to campus is probably the one at Del Mar and Raymond. If you have so much luggage that getting off campus seems impossible (and you cannot even get a ride as far as the train station), try taking the Arts bus number 10 ($0.50) on the north side of campus to the Allen St. Gold Line station. From
To Pasadena and Beyond!

Union Station you walk out the non-Amtrak entrance (there are signs to buses, follow those). Go all the way up the stairs and head outside to your right. Go to the little booth at the end of the traffic oval and purchase a FlyAway ticket ($4.00). This ticket lets you get on the bus that goes directly to the terminals at LAX from Union Station. They leave every half hour during the day and every hour late at night. Be wary about coming back, however; while the FlyAway buses run all night, Gold Line currently stops at 11pm and the 485 stops running at about 1am.

LONG-DISTANCE BUSES AND TRAINS

Greyhound is very cheap, but also very uncomfortable; an overnight trip is not recommended. Their website is www.greyhound.com. It’s $15/way to Santa Barbara, and pretty reasonable to the Bay Area if you book in advance.

Megabus is probably the best/cheapest way to travel from SoCal to NorCal. If you book early enough, tickets are as cheap as $1 (but are usually more like $30)!! From Union Station in LA to San Francisco it takes around 7 hours. Their website is www.megabus.com.

Amtrak is grossly incompetent as far as being on time is concerned, and takes about double the time it would take you to drive anywhere, but they have much nicer seats. It’s sort of an experience thing, not an efficient travel thing. It’s ridiculously expensive over long distances. However, if you look for the weekly specials on their website (www.amtrak.com), you can often get tickets at exorbitantly cheap prices; a previous editor got from Seattle to LA for $50 a few years ago.

Metrolink will get you from Union Station (you can take the Gold Line here) to other destinations in Los Angeles, Ventura, San Bernardino, Riverside, Orange County, or Palmdale. It’s cheaper than Amtrak and way more efficient.

Zipcar is a nationwide car-sharing service which arrived on campus fairly recently. Currently, two Zipcars live near San Pasqual and Holliston, and three more live near San Pasqual and Wilson. The idea is simple: for a $35 annual membership fee (student rate), you can reserve any of these cars on zipcar.com for an hourly rate of approximately $8-10/ hour. Gas and insurance are included in the price, but you need to have had your license for at least one year. If the on-campus cars are booked, as of August 2015 there are at least 10 other zipcars living elsewhere in Pasadena.

PUBLIC TRANSPORTATION GUIDE

Despite the sprawl of the city, public transit in this area is surprisingly good (though if you are used to anything like New York, Boston, or DC it’s going to be pretty bad).

www.mta.net is a useful resource to plan trips. The Gold Line and the ARTS system (particularly Route 10) are the systems most self-respecting Techers should become familiar with.

The following guide (and much more) can be found at http://transitguide.caltech.edu. It was compiled by Ameera Chodhury
To Pasadena and Beyond!

(Caltech 2004) for the benefit of the Caltech community.

The Metro Rail System is comprised of the Metro Gold, Red, Blue, and Green Lines:

- The **Metro Gold Line** connects Pasadena to Union Station, a major transit hub in downtown Los Angeles, where you can catch Amtrak, Metrolink, Greyhound, and the Metro Red Line. The easiest way to get to the Gold Line is to go west on California, then south on Marengo. The station will be on your left at the end of a small cul-de-sac (Fillmore).

- The **Metro Red/Purple Line** subway provides service between Union Station, the Mid-Wilshire area, Hollywood and the San Fernando Valley, and intersects the Metro Blue Line.

- The **Metro Blue Line** runs north and south between Long Beach and Los Angeles, and connects to the Metro Green Line.

- The **Metro Green Line** crosses the Blue Line, running east and west between Norwalk and Redondo Beach, curving south near LAX, the Los Angeles International Airport.

- The **Metro Orange Line** is a dedicated busway that functions very much like an urban light rail system. The Metro Orange Line runs east and west through the San Fernando Valley and intersects the Metro Red Line.

The Metro Bus System operates over 200 bus lines, which offer a variety of services, such as Local, Rapid, and Freeway Express. To help riders identify which type of service a bus provides, Metro uses both color-coding and numbering systems.

- **Metro Local buses** are painted in California poppy orange and have bus numbers between 1-300. 1-99: Local buses to and from downtown Los Angeles. 100-199: East and West Local buses. 200-299: North and South Local buses.

- **Metro Limited Stop** and **Metro Express** buses have bus numbers between 300-599. 300-399: Limited Stop Buses. 400-499: Express buses to and from downtown LA. 500-599: Crosstown freeway express buses.

- **Metro Rapid** buses are the fastest and most frequent and come every 3-10 minutes during peak hours. Unlike regular buses, Rapid buses have special sensors to change traffic signals. You'll recognize Metro Rapid buses and stops by their distinctive red color, and Rapid bus numbers are always in the 700s. Metro Rapid 780 links Pasadena to Hollywood. Complete information about Metro Rail and Bus service can be found online at [www.metro.net](http://www.metro.net).

Some popular destinations easily accessible by transit are:

- **Union Station** - Gold Line to Union Station
- **Koreatown** - Gold Line to the Purple Line
- **Chinatown** - Gold Line to the Chinatown Station
- **Little Tokyo** - Gold Line to Little Tokyo/Arts District Station
- **Hollywood** - Gold Line to Red Line
- **Santa Monica** - Gold Line to Union Station, transfer to Big Blue Bus Rapid 10
- **UCLA** - Gold Line to Purple Line to Metro Rapid 720
- **USC** - Gold Line to Purple Line to Expo

**Pasadena Area Rapid Transit System (ARTS)** has seven routes that connect Pasadena. The 10 ARTS bus services Caltech at three stops: Del Mar @ Hill, Del Mar @ Chester, and Del Mar @ Wilson, and links Caltech to Old Town and the Allen Gold Line station for only $0.75. For Gold Line commuters, the 10 ARTS bus can get you to
Caltech in six minutes, and has the most reliable and frequent service. Complete information about the ARTS buses can be found online at www.ci.pasadena.ca.us/trans/transit/.

**Foothill Transit** serves the San Gabriel and Pomona Valleys. Bus lines 187 and 690 link Pasadena to Pomona and Claremont via Arcadia, Asuza, Duarte, and Glendora. Complete information about the Foothill Transit system can be found online at www.foothilltransit.org.

**Metrolink** is a commuter rail service that is cheaper and has more frequent service than Amtrak. Metrolink provides service to Los Angeles, Orange, Riverside, San Bernadino, San Diego, and Ventura counties. You can catch Metrolink at Union Station. Complete information about the Metrolink system can be found online at www.metrolinktrains.com.

**PAYMENT OVERVIEW**

- ARTS System fare. $0.75
- Metro Rail or Bus fare, two hours of unlimited transfers. $1.75.
- Day Pass, unlimited travel all day. $6
- Bag of Tokens (10). Available at the Caltech Bookstore. Good for base fare on Metro. $12.50
- Student Monthly Pass. Available at the Caltech Bookstore. Price includes Caltech subsidy. $11
- Monthly Pass. Available at the Caltech Bookstore. Price includes Caltech subsidy. $37
- EZ Transit Pass Available at the Caltech Bookstore. Good on Metro and 17 other transit providers. Price includes Caltech subsidy. $45

Be warned **they do not make change**. If $5 is all you have, $5 is what you pay.

**Monthly Pass Subsidies:** To encourage Caltech students, faculty, and staff to commute via public transit, Caltech’s Rideshare office offers a $25 monthly subsidy on a monthly pass from any transit provider. To buy a subsidized Metro monthly pass, simply show your Caltech ID to the cashier at the Caltech Bookstore. If you did not buy your pass at the Caltech bookstore or have a student monthly pass, contact Irma Cruz at x4702 to receive your subsidy. You may only collect the subsidy on one pass per month. Metro weekly and semi-monthly passes are not eligible for the subsidy.

With Caltech’s $25 monthly subsidy, the Metro Student Monthly Pass costs only $11 per month! Obtaining this pass, however, requires some effort. Complete an application for a student monthly pass and submit it with the required documentation and a $1 application fee to the Metro Customer Center at Union Station. [www.metro.net/images/CollegeID_app.pdf](http://www.metro.net/images/CollegeID_app.pdf)

**Caltech Train Subsidy:** Caltech’s Rideshare Office also offers a $10 monthly subsidy on 10-trip Metrolink tickets, and a $50 monthly subsidy for a Metrolink monthly pass, which is also good on Amtrak under the Rail 2 Rail Program. A valid Metrolink ticket or pass also acts as a transfer on connecting transit away from the station. Contact Irma Cruz at x4702 to receive your subsidy.

Missing something? Let us know so that we can include it next year. Email littlet@donut.caltech.edu.
REFERENCE
The following is an abridged copy of the Honor Code Handbook. For the full Honor Code Handbook, including case review and examples, visit the Dean’s Office website at www.deans.caltech.edu (click on the New Students link) or contact:

The Board of Control
c/o Dean of Students
210-87
California Institute of Technology
Pasadena, California 91125
(626) 395-6200
routing@caltech.edu
Every community, either through accident or conscious design, adopts certain levels of accepted conduct. With unfortunate frequency, the standards adopted officially and unofficially by academic communities are founded on a "lowest common denominator" of human behavior. It is considered a fact of life at many colleges that intensive proctoring, special examination booklets, and energetic suspicion on the part of the faculty are required to achieve some semblance of honesty in the majority of students.

The Caltech community has the privilege of disregarding these pessimistic traditions. The name given to our community’s official — and practiced — ethical code is the "Honor System." The Honor System embodies our mutual trust and respect.

The Honor System makes Caltech a better and more enjoyable place to work and live because it affords to each person within the Caltech community the trust and freedom that honesty merits. As such, only one guideline is necessary to protect our community: "No member of the Caltech community shall take unfair advantage of any other member of the Caltech community." Because of its nature, this principle must apply to all of the community, everywhere within the community. It is not restricted to transactions of a purely academic nature between students and faculty, but also binds students in their non-academic relations with any other member of the community.

On the other hand, the Honor System is not an administrative creation intended to ease the enforcement of university regulations or marginally decrease the chance of student cheating. A fundamental aspect of the Honor System is that the responsibility students display in their conduct must be met by trust from others. An example of this is Caltech’s official position on proctoring, which is not only held unnecessary, but is strongly discouraged under current faculty regulations. The bodies which deal with violations of the Honor System are also committed to promoting an atmosphere of trust and confidence. As it should be, honesty is a two-way street at Caltech.

It must be stressed that the responsibility for the maintenance of the Honor System lies with each student. In particular, this responsibility includes determining any possible consequences of our actions. We have accepted such responsibility in the belief that only by regulating our own conduct can we successfully promote a high standard of individual integrity.

The Honor system is enforced by two bodies: The Board of Control, comprised solely of students, and the Conduct Review Committee, comprised of students, faculty, and administrators. The Routing Group decides to which of these bodies cases will be referred.

The Honor System was not imposed upon the students and it will not be removed by any hand other than our own. Consequently, any necessary interpretation and enforcement is our duty and is performed by students. Members of the community must always bear in mind that their actions and attitudes directly influence a proud and valuable trust which many generations of students have kept. The rewards of life under the Honor System are considerable; the responsibilities at times may be heavy and serious. The obligations have been met successfully in the past, and only we can insure that they will continue to be met.

**LIVING UNDER THE HONOR CODE**

The Honor System is an agreement between members of the Caltech community, embodied in a single sentence: **No member of the Caltech community shall take unfair advantage of any other member of the Caltech community.**

This principle, while extremely short, is the sole basis of the Honor System. The key words are "unfair advantage." To not take unfair advantage, it is often
sufficient to simply employ common sense and show respect for others and their privacy. But there are times when distinguishing fair and unfair courses of action will require a considerable amount of analytic thought. It is when one loses the habit of such thought that one’s actions may come into conflict with the Honor System. Failure to realize the consequences of a course of action does not justify it. Remember that purity of motive, when unaided by awareness, will not necessarily guarantee purity of action.

No distinction is made between academic and non-academic areas. Stealing from another student is a violation, just as cheating on a physics test is, as will be explained further in the following sections. However, the Honor System is not limited to examples such as these; any action which places a member of the Caltech community at an unfair disadvantage may result in an investigation. Honor System violations do not necessarily entail material disadvantage; invasion of privacy and actions that cause others emotional distress are examples.

It is important to realize that the Honor System covers every aspect of our interactions with members of the Caltech community. This is a larger body of people than appears at first glance. In addition to undergraduates, graduate students, and faculty, the Caltech community also includes administrative and scientific support staff, campus maintenance and custodial staff, and in some instances other companies or institutions which have relations with Caltech. Actions against people who are not direct members of the Caltech community may eventually become Honor System offenses if they result in action being taken against the Caltech community. Consequently, it is impossible to give a set of comprehensive examples that displays every possible situation in which the Honor System must be carefully applied. Therefore, the purpose of the following discussion is to outline a few areas of life at Caltech and demonstrate how the principles of the Honor System should be considered.

I. Tests

Academic life at Caltech is very different from life at a high school or another college. The vast majority of quizzes and midterm or final examinations are take-home. Stapled-shut tests are picked up in class or at a professor’s office. Printed instructions on the cover of the test specify the conditions under which it must be taken, including the time limit, reference materials allowed, and the due date. The test may be taken at any time and at any place the student wishes, as long as the instructions are followed. If there is any confusion concerning allowed references or time limits, it is your responsibility as a student to seek clarification from the professor or a teaching assistant.

Violating an exam policy takes unfair advantage of other students in the class and compromises the trust of the instructor. In particular, a student working on a take-home exam should not consult students or sources other than those permitted by the instructor. This includes adding photocopies of other references to one’s course notes when the instructor allows only course notes during the exams.

Any work done after the time limit of an exam should be clearly designated as such by drawing a line beneath the work completed during the allowed time, labeling this line, and then continuing with the test, indicating the amount of extra time spent. Many professors will give some credit for this work.

II. Homework and Laboratory Assignments

The misinterpretation of homework collaboration policies has been a source of problems in the past. Most instructors state their policies at the beginning of each academic term. It is your responsibility as a student to get this information. If the policy is ambiguous, seek clarification from the instructor. Note that although collaboration on some assignments may be unrestricted, there is a fine line between an exchange of ideas and some forms of plagiarism. Violating a collaboration policy takes unfair advantage of those who abide by the restrictions placed on them and compromises the trust of the instructor. In general, both student and instructor share the responsibility for clarifying any rules governing a
particular course. When in doubt, a student should consult the instructor before proceeding.

These principles also apply to laboratory course work and research. Falsification or theft of results (“drylabbing”) are serious acts of intellectual dishonesty, as is claiming undue credit for another’s work or ideas.

III. Papers and Reports

Students are required to produce a large number of reports and research papers during their careers at Caltech. In collecting data and information, students need to actively avoid plagiarizing the work of others. Proper footnoting of source material and documentation of borrowed ideas are absolutely essential. Many professors are willing to show students how to correctly document their papers. Plagiarism, whether inadvertent paraphrasing or direct substitution, takes unfair advantage of any original authors, the instructor who incorrectly believes that the ideas are the plagiarist’s, and other students who correctly footnote all sources. If you are unsure about what constitutes plagiarism, there is an excellent course available at the Hixon Writing Center which can help elucidate when and how to document references properly.

IV. Library Usage

The operation of all Institute libraries is governed by the Honor System. At Caltech, students are not subjected to having their backpacks and briefcases checked before leaving the library. This valuable freedom has been maintained because the students respect the library rules and feel bound by the Honor System to do so. It is the student’s responsibility to see to it that he or she is aware of all the rules applying to any library material used. Further information regarding the library’s policies can be found at http://library.caltech.edu/about/default.htm.

A person who keeps a three-hour reserve book for longer than the specified time takes advantage of others who need the book, particularly at critical times such as before a test. Anyone who removes a book without intending to return it, or who mutilates or defaces a book, is stealing from every library user in the community. There are also some people who do intend to return books but do not bother with checking them out. Such people ignore the possibility that the library might decide the book is lost and replace it; or that a student might badly need a book and want to contact the person who took it, and the library would be unable to locate the borrower.

V. Master Keys

In the spirit of the Honor System, master keys allow members of the community access to a number of facilities including libraries, mailboxes, and classrooms. A student who uses a master key assumes responsibility for the legitimacy of his actions. Possession of a master key does not necessarily provide authorization for its use. Authorization to enter a non-public area consists of permission from the proper person to enter that particular room at that time.

Be aware that thefts, vandalism, and unfortunate accidents have occurred when Caltech master keys have come into the possession of people who were not members of the community. In addition, the security of many Caltech laboratories and rooms depends on the accountability of key possession, and is diminished by not reporting keys that are given to other students or lost. In light of this, students with master keys should be careful to consider Caltech’s security and liability when using or circulating keys.

VI. Institute Property

Equipment, vehicles, and other property owned by the Institute are not necessarily available for unrestricted student use. Students need to be cautious to ensure that their actions do not lead to a restriction of student privileges. In recent years, there has been an increasing number of problems with the use of electrical and gas carts. These carts are intended for use by the staff, in carrying out their daily duties for Caltech. Using these carts without explicit permission
can seriously interfere with the responsibilities of the departments to which the carts belong. Unauthorized use of these vehicles can render them useless by depleting their power supplies or, even worse, by permanently damaging them. A cart should be used only after specific permission has been obtained from its owner and should always be used in such a way that will not endanger the safety of others. Operation of these carts on campus should abide by general traffic laws. Take note that only a small number of these carts are licensed for street use.

VII. Practical Jokes and Pranks

Pranks (“RF’s”) and practical jokes have always been a part of undergraduate life at Caltech. Pranks, when planned with consideration for the rest of the community, can be very enjoyable. However, badly thought-out pranks can result in a reduction of student privileges, or may otherwise take unfair advantage of someone in the community.

When executing a prank, always keep in mind a number of issues. Will the receiver(s) of the joke think of it as humorous, or will they be upset? Will the joke possibly cause the destruction of property or the invasion of privacy? Could the prank cause a curtailment of student rights and privileges? Could it injure someone? Could it damage the position of the Institute, or cost the Institute money for reparations?

When pulling a prank as a house against another house, one must be particularly conscious of how the victim house members will react. One way to help make sure a prank against another house does not turn out badly is to notify the president of the house you are pranking before pulling the prank.

Whenever a prank is pulled, a note should be left informing the “victim” that he or she has been the object of a prank. The note should include the clear identity of the prankster(s) in case something goes wrong and the prankster needs to be contacted and in order to prevent misdirected retaliation. If no note is left, the person may misinterpret that situation and attribute the prank to theft or vandalism.

Finally, computer pranks should be treated extremely carefully. Computers and computer networks make it easy to affect many people — it is important to consider the results of your actions carefully. Considering the importance of unrestricted computer and network access to a large portion of the community, the creation or spreading of damaging viruses, false email or newsposts, or other destructive programs, for example, may be a serious violation of the Honor System.

VIII. Traditions

House traditions, Ditch Day stacks, and other revered Caltech traditions are irreplaceable parts of student life. Unfortunately, these may occasionally get out of hand.

When acting as a part of a group, always think as an individual. Ask yourself many of the same questions that are relevant to a prank: Will this be fun for the participants, or upsetting? Will this destroy someone else’s property, or invade someone’s privacy? Could this cause harm to other members of the community, even those who are not directly involved?

When planning a stack or tradition-related event, always keep others in mind. Check your plans against Caltech’s hazing policy or other relevant policies, and remember that those involved may react in unforeseen ways. (See the section on Laws and Institute Rules.)

IX. Computer Usage

Computing resources are scattered around campus and connected by a campus-wide network. Most resources are available 24 hours a day. Keys and lock combos are readily available. The use of computer resources is governed by the Honor System. Theft, damage (even minor damage, such as spilling water into a keyboard), or misuse of the equipment takes advantage of all the other users who will lose the use of the resources. Allowing unauthorized non-Caltech
people access to the equipment reduces the amount of equipment available for Caltech users and may lead to thefts.

Use of computer accounts on the various computer clusters is also governed by the Honor System. Damaging system files or gaining unauthorized access to another user’s files places other users at a disadvantage. Files located in user areas on disk should be respected as their personal property. Having the ability to gain access to another user’s files does not imply having their permission to do so.

Many computers on campus have policies designed to allocate system resources (such as system disk space, memory, printers, modem lines) fairly and prevent unintentional damage to the system. Circumventing these policies may place other users at a disadvantage.

Because of the advances of networking it is very easy to communicate with other users on the computer system in a variety of ways. As with any interpersonal communications, it is important to think about how you are interacting with the person and whether you are using the computer to harass or victimize them.

Breaking into computers at remote sites could have serious repercussions for Caltech as an institute and could result in a serious reduction of some of the network computer resources available to us.

X. Companies Unaffiliated with Caltech

At a first glance, one might think that it is impossible for a Caltech student to transgress the Honor System while interacting with someone outside the community. However, this is not true if that person or organization offers a service to the community that might be jeopardized by the student’s actions.

These dangers are best illustrated by example. For instance, if a student chooses to abuse campus pay telephones and make free telephone calls he does not appear to have taken unfair advantage of the community at first glance. However, although the company operating those telephones will probably be unable to trace the person who actually made the calls, they might bill the Institute or refuse to operate pay telephones on campus. Therefore, the entire Caltech community would be put at a disadvantage by the student’s actions.

XI. Laws and Institute Rules

The laws of federal, state, and local governments are frequently more restrictive than the Honor System alone. Some activities against other members of the Caltech community, such as theft or assault, are clearly violations of both the Honor System and criminal laws, and as such may fall in both jurisdictions. Other actions which violate laws but have no immediate effect on the Caltech community may not be Honor System violations. Students are still responsible, however, for any consequences and penalties that result from their actions. The same is true for rules established by branches of the Institute.

This distinction does not mean that illegal actions are condoned by the Honor System. It is possible for some activities to have far-reaching consequences for Caltech that are not easily foreseen. For example, damage to the Institute’s reputation, cutbacks of Institute funding or fines and further restrictions are indirect ways that the entire community may ultimately pay for the actions of a few people. Students are urged to consider seriously the long-term ramifications of their actions beforehand.

XII. Interpersonal Relations

Violations of the Honor System do not always involve material or tangible advantages. Clear examples of this are unfair discrimination and invasion of another’s privacy. An action that places a demonstrably unreasonable emotional burden on another person invariably results in taking unfair advantage of that person. Actions which harmfully degrade an individual or group, promulgate damaging rumors, or place someone in a situation where he or she feels threatened, harassed, or victimized may unfairly disadvantage members of
the community. In order to create a healthy living and studying environment for everyone, it is important to be aware of the effects one's actions will have on others.

XIII. Sexual Harassment

As described in the previous section, if a student's actions place someone else in a situation where they feel threatened, harassed, or victimized, the student may be placing them at a disadvantage. For legal reasons, the Board of Control is not permitted to handle cases involving sexual harassment. The Dean of Students Office has information detailing the Institute's policies and procedures concerning sexual harassment.

THE BOC AND THE CRC

Ideally, the Honor System should operate smoothly without any intervention. However, in practice, there are circumstances which prevent this. First, some people choose not to follow the Honor System; adequate measures must be taken to protect our community from them. Secondly, the intuitive sense of right and wrong upon which the Honor System so heavily relies does not always operate uniformly in complex situations.

The Board of Control (BoC) and the Conduct Review Committee (CRC) have been formed to help alleviate these problems. The BoC, a committee of undergraduates, is part of the Associated Students of the California Institute of Technology, Inc., and is chaired by a student elected by the student body. The duties and procedures of the Board are outlined in the ASCIT bylaws. (See the Bylaws section.) It is comprised of 23 students: the Chairman and two Secretaries, who do not vote; two representatives elected from each of the eight undergraduate houses; one representative elected by students who live off-campus; and three representatives at large, appointed by the Board from the entire student body.

The CRC, a committee of undergraduates, faculty, and staff, is co-chaired by the Associate Dean of Students and a student elected by the student body. Furthermore, student representatives are selected by each of the eight houses along with 2 representatives at large to serve on a rotating basis on the CRC. For a given case, the co-chairs will choose four other members from a designated pool of candidates to hear the case. One of the four members selected must be a student, and one must be a staff or faculty member. Members will be selected on a rotating basis, except in special circumstances.

The decision as to which of the two bodies, the BoC or the CRC, will review a particular case is made by the "Routing Group" (RG), comprised of the Dean of Students, the Senior Director of Campus Life or his designee, the chairman of the Board of Control, and the student co-chair of the CRC.

No one remembers just how or when the Honor System and the Board of Control started, although they were fully operating in the early 1920's. The Board originally considered, in addition to its present duties, matters concerning tradition, such as disrespectful freshmen and smoking in front of Throop Hall. In an effort to reignite class spirit, the Board once suggested that an annual freshman-sophomore competition be held; and the Board of Control Secretary added as an afterthought that a mud pit would be a good place for it. Eventually the Board of Control concerned itself only with violations of the Honor System, and a separate body, the Court of Traditions, was established to handle the rest. The latter is no longer even a memory.

The Conduct Review Committee was formed in part from a desire to give other groups of the Caltech community, in particular undergraduates and faculty, a voice in dealing with problems erstwhile considered only by the Dean or other members of the administration. Such problems include those that involve personal disputes between individuals, policy violations, or issues that affect a large number of students.

The Board currently deals with violations of the Honor System committed
by undergraduates, that is, situations in which an undergraduate has, either consciously or unconsciously, gained an unfair advantage over other members of the community. Each decision is made independently, as the Board does not act on precedent. Considering every case on its own merits, the Board tries to treat each person fairly, as well as protect the Caltech community as a whole.

The CRC handles a wide range of issues, and because it may deal with widely known incidents or situations involving groups of people, it may at times be forced to operate more publicly than the Board of Control. If the outcome of a case could potentially affect many students, it would be difficult to come to an appropriate decision in total secrecy. The Conduct Review Committee will seek to make decisions in the best interest of the entire Caltech community. This emphasizes that the Conduct Review Committee is a body for joint decisionmaking. Representation of several constituencies on the committee is expected to bring about decisions that address the concerns of professors, students, and administrators. The CRC’s role is purposefully not expressed too specifically so as not to limit its scope and unnecessarily complicate its workings.

REPORTING SUSPECTED VIOLATIONS

No body is charged with surveillance under the Honor System; the Board of Control and the Conduct Review Committee are judiciary bodies, not police agencies. This means that every member must share the responsibility of protecting the Caltech community and upholding the Honor System.

This is indeed a heavy obligation. It implies not only refraining from actions that may violate the Honor System, but also protecting our community from any who engage in such activities.

Unfortunately, this duty can cause a conflict of responsibility or divided loyalty, especially if you have seen a violation or strongly suspect that one has been committed. You are placed in the difficult situation of weighing your obligation to the community against your concern for the violator. You might be tempted to warn the suspected violator of the seriousness of his or her acts, thinking this to be a satisfactory solution to the dilemma. However, the suspected violator may be able to convince you that no violation has occurred when one may have. If you suggest that the person turn himself or herself in, you really have no way of verifying, nor are you likely to know, if the questionable action is repeated. You are also not aware of the past record the person might have, a factor which plays a significant role in the Board’s or CRC’s decision concerning protection of the community.

Perhaps even more serious than these considerations is the possibility of contamination of evidence. If the person is warned about an investigation, evidence and testimony could be destroyed or altered, hindering the ability to discover the truth essential in making a fair decision.

The decisions of the Board and CRC are not intended to punish the violator in any way. If you are concerned that a possible Honor System violation may have occurred, but find it difficult to report the situation, please keep in mind that the BoC’s goal when dealing with students who have committed Honor System violations is always to bring the violator to a place where they can live under the Honor System effectively. The decisions of the BoC and CRC are motivated by concern for the defendant as well as for the community as a whole. This is one of the most difficult areas of the Honor System for most students, however it is also one of the most important aspects of the Honor System.

In light of this, the Board and CRC have taken the position that it is the responsibility of every student to protect the community and the Honor System. A conscious failure to report suspected violations may itself be considered an Honor System violation.

If you do suspect that a violation has been committed, but are unsure what to do, talk with your house Board representative, or to any other member of the BoC, or speak to a member of the Routing group. You may also report to the confidential answering machine at the number: (626) 395-6200 (campus
extension x6200). The Chairman of the Board of Control can always be contacted by e-mail at boc-chair@ugcs.caltech.edu. The Secretary can be reached at bocsec@ugcs.caltech.edu. The Routing Group can be reached through the Dean of Students at campus extension x6351 or by email at routing@caltech.edu.

In all cases, consider your personal responsibility to the Caltech community of which you are a vital part. It is far better to report a strong suspicion than to allow it to grow and compound. A case that is closed without a conviction vanishes from the records of all concerned.

Q&A ABOUT THE BOARD OF CONTROL

Q: Who can be investigated by the Board of Control?
A: The Board is in charge of dealing with suspected Honor System violations by undergraduates. The Graduate Review Board is responsible for cases involving graduate students. The Graduate Review Board may be reached through the Dean of Graduate Students or through referral from the Board of Control. For situations involving both graduate and undergraduate defendants, the GRB and BoC will investigate the case together. Problems involving faculty members, staff, or administration should be brought to the attention of the Student Grievance Committee.

Q: What can a person be investigated for?
A: Academic cases in which the Honor System may have been violated by an undergraduate student are investigated by the Board of Control. Obvious examples include cheating on exams, breaking homework collaboration policies, and plagiarism. Examples of nonacademic violations that would be investigated by the Conduct Review Committee are theft and vandalism.

Q: Why is the Board so secretive?
A: The Board of Control investigations and hearings are conducted in secret to protect the individuals being investigated. In order to prevent the formation of an unfair bias or prejudice against those appearing before the Board, extreme measures are taken to ensure that details about particular cases do not become known to the community. The results of Board votes are kept confidential to prevent any conflicts between defendants and individual Board members.

Q: What can the Board do to a person?
A: If a person is convicted of committing an Honor System violation by the Board of Control, the responsibility of the Board is to nullify whatever advantages were taken by the individual. This would include actions such as giving no credit for homework, or exam problems completed in violation of the Honor System or requiring the person to provide compensation if property had been damaged. After nullification, the Board considers whether the person is capable of living under the Honor System in the future. Among actions that may result from this are placing the student on probation, having the student take a leave of absence, or recommending the student for expulsion. See Protection of the Community section for more information.

Q: Are the Board’s decisions always carried out by the Dean?
A: The Board of Control acts as an advisory committee for the Dean, providing recommendations after investigating the case and coming to a decision. If the Dean feels that the Board’s decision is not justified then he or she may choose to not follow it. However, it is only in very rare circumstances that the Dean will overrule a Board decision. Slightly more often he or she may ask the Board to reconsider its decision, though this too is rare. (See Statistics.)

Q: Is it an Honor System offense to not report a suspected violation?
A: Strictly speaking, yes. The Honor System is only effective as long as the members of the community uphold it. However, cases where violations are not
reported will have to be investigated for special circumstances. The section on Reporting of Suspected Violations has more information.

**Q:** What records are kept of cases?

**A:** In the case of a conviction, the records will contain the names of the defendants and the decisions of the Board, minutes of all proceedings connected with the case, and any physical evidence with bearing on the case. The minutes will also contain a summary of the ideas and concerns that were brought up during the investigation by Board members as well as testimonies of those interviewed. The records will only be consulted in the event of a future conviction of one of the defendants, or for purposes of preparing abstracts or computing statistics. If no conviction results, the evidence that accumulated during the investigation will be kept by the Board Secretary in case the investigation is re-opened. However, when a new Secretary is elected, all the evidence of the investigations that did not result in a conviction will be destroyed by the outgoing Secretary.

**Q:** Is it an Honor System violation to disobey Federal, State, or Local laws and Institute Rules?

**A:** Disobeying laws or Institute rules is not a priori a violation, but if the action results in placing other members of the community at an unfair disadvantage, it may become one. However, even though breaking a law or Institute rule might not fall within the Board’s jurisdiction, it is expected that students be cognizant of such rules and comport themselves accordingly. There are other bodies on campus that deal with various disciplinary problems that may not be Honor System violations, or that the Board of Control is not allowed to deal with. For example, a main purpose of the CRC is to work with cases concerning Institute policies, which are also possibly violations. Be reminded that the intent of legislation is often to protect people from unfair or dangerous actions in the first place, and Institute rules frequently uphold legal or insurancerelated obligations. Students are still responsible to the appropriate bodies for the consequences of disobeying these laws or rules.
GUIDE TO RESEARCH
FOR UNDERGRADUATES

This is a fairly new section for the print edition of the little t. The Guide to Research for Undergraduates (GRU) began on the little t’s website and through the contributions of many dedicated Techers managed to make itself look halfway decent. (Note that this has not been reviewed by any profs and is just the opinions of people who have contributed to it.) You too can contribute to this guide (and to many other things as well!) on the little t’s online wiki, hosted on Donut at http://donut.caltech.edu/ascit/Little_t. If you’re just wondering about what classes to take frosh year, you can find a fantastic guide on the ARC’s website: http://arc.caltech.edu/files/ARC_FroshGuide_2011.pdf.

CONTENTS

Why Do Research? ................................................................. 111
What to Expect ........................................................................ 111
Timetables .............................................................................. 111
Summer Research ................................................................. 111
Thesis .................................................................................. 111
Other .................................................................................. 113
How to Find Research ........................................................ 113
Meeting Professors .............................................................. 113
Supported Events .................................................................. 114
Getting a Prof’s Attention .................................................... 114
Contacting Professors .......................................................... 114
Scheduling a Meeting ............................................................ 115
Meeting with the Professor ................................................ 115
Follow-up Contact ................................................................ 115
Applying for Multiple Projects .......................................... 115
Announcements of Opportunity ........................................... 116
Outside Caltech ................................................................... 116
JPL ..................................................................................... 116
Medical ................................................................................ 116
How to Get Supported ......................................................... 117
SURF .................................................................................. 117
Other Grants ......................................................................... 118
Pay ..................................................................................... 119
Units .................................................................................... 119
Doing Research ..................................................................... 119
Starting in the Lab ............................................................... 119
During Summer .................................................................... 119
Resources ............................................................................ 121
General Advice ..................................................................... 121
Notes from Students .......................................................... 121
Notes from Faculty .............................................................. 122
How to Find Time for Research ......................................... 122
Additional Resources .......................................................... 122
Option Survival Guides ...................................................... 123
SUMMER UNDERGRADUATE RESEARCH FELLOWSHIPS

Don’t miss out on Caltech’s favorite sport...

Early January - SURF Information Session

Late February - SURF Applications Due

Mid-June to Late August - SURF

Late October - SURF Seminar Day

To find out more, visit surf.caltech.edu
Why Do Research?

Research is the general term for how we advance scientific knowledge. Theoretically it’s something you inherently want to be doing. Adding to sum of human knowledge can be quite enjoyable and rewarding.

Doing research at Caltech as an undergrad is a valuable experience for applying to graduate school. It will give you a taste of what going into a doctoral program will entail, and the whole research professor thing. It also looks good as a credential when applying to graduate school. Caltech’s challenging coursework and research experiences puts you closer to what graduate school is like than probably any other UG school.

Doing research also enables you to meet faculty, postdocs, grad students, etc. who are interested in the same topics you are.

What to Expect

For first-time researchers at Caltech, even if you have research experience from high school, the process for finding a lab to work in may seem daunting. But, this is Caltech where there are many labs, a small student body, and lots of funding.

Caltech is advertised as a school with a lot of research opportunities. This is quite true; there’s a ton of research going on here. But you cannot expect a project to be handed to you in your lap. Caltech is the real world, faculty is very busy with their research, and you have to actively pursue a project to obtain one.

A SURF is an excellent way to be exposed to research, starting with the grant-seeking process to get funding and finishing with the presentation of your findings to your peers. You probably won’t be able to finish a major project in 10 weeks, but you’ll get some valuable experience along the way.

Your relationship with your faculty mentor will be dependent on the quality/independence of your work and the amount of time they have available.

Timetables

Summer Research

SURF Proposals are due to the SFP office late February. So you need to have your project fully settled and the 2-3 page proposal written by then. You also need a recommendation letter from a professor (not your mentor) and an additional professor/grad/postdoc.

Unfortunately, you will be competing with all of the other UGs seeking research opportunities, as well as non-Caltech students, so the earlier you can start searching the better. It’s hard to find time amongst all the homework, but most students find their research project in January. Some students are starting to look in December and November.
THESIS

Each option has different systems for doing a thesis (See Units below). Typically you register for a ‘thesis course’ which will last the whole year and you have to submit a paper and give a presentation in the third term.

Obviously registration is third term the year before you do your thesis, but it’s fine if you’re not sure if you have a thesis project by then. Like any other class you can register it before add day of first term, but obviously the more weeks you have to work on it the better. Note: Theses are not necessarily required to be Senior year and you may be able to do it Junior year.

OTHER

School-year research or other non-time-structured research just needs to be coordinated with you and the professor. If you want research units you need to have made your decision by add day. Some classes that allow you to do research for units are ch10c (if you already took Ch10a and/or Ch10b), Ph11 (which is only available to freshmen, and you have to be accepted into it by doing “hurdles” during first term), and ESE90, but there are others too, and some options (such as math) have an “independent study” class that can be taken to pursue research.

HOW TO FIND RESEARCH

There’s plenty of research going on at Caltech (and those other research institutions). The first search is the most difficult, since upperclassmen will already have faculty relationships (if they made an effort to previously).

Various ways of meeting professors and learning about Caltech research are detailed below. The following websites list research being done at Caltech:

- Applied Physics: www.aph.caltech.edu/seminars.html
- Astronomy: www.astro.caltech.edu/research
- Biology: www.biology.caltech.edu/research
- Chemistry and Chemical Engineering: www.cce.caltech.edu/faculty/index.html
- Geological and Planetary Sciences: www.gps.caltech.edu/research
- Computation and Neural Systems: www.cns.caltech.edu/research/index.html
- Computer Science: http://www.cms.caltech.edu/research
- Electrical Engineering: http://ee2.caltech.edu/research/index.html
- Mechanical Engineering: http://www.mce.caltech.edu/research
- Physics: www.pma.caltech.edu/GSR/physresearch.html
MEETING PROFESSORS

Faculty consists of those older people standing in front of the blackboards during lecture. They’re doing some amazing research and most of them are quite interesting individuals (but not all of them are interesting or want to talk to you).

Seminars are a good way to learn about research going on. Most divisions have a weekly seminar, and most options have a seminar (pizza) class. You can also stop by professors’ offices (especially when you know they have scheduled office hours) or talk to them after class. If they’re not busy they’ll probably be happy to talk to you (remember, you’re both people who like science!).

Many houses allow you to invite professors to dress dinners; that’s a great time to be able to talk to a prof about their research.

SUPPORTED EVENTS

MOSH option teas. Each year the MOSH hosts several Option Teas at his house. These are intended to help freshmen meet faculty and upper-class students in their option, and are all typically held sometime during Winter or Spring Term. You can use this as a jumping-off point to meet faculty in your major and to ask upperclassmen about their research experiences. Keep an eye out for a directory email in early January. (The information here was adapted from http://mosh.caltech.edu/events.)

MOSH/ARC Faculty lunches. The MOSH and the ARC set up student-faculty lunches as a means to facilitate interaction between undergraduates and interested faculty. The lunches are all held in one of the Houses (it varies) and take place in the fourth, seventh, and ninth weeks of each term. Keep an eye out for the periodic emails announcing these lunches. It’s also free lunch!

Take-a-Prof-to-Lunch. You can get money from ASCIT to eat lunch with a professor at the Ath. It is a pretty sweet deal, but is hard to do unless you already know the professor through a class. Going out to lunch is a good way to get a bit of often difficult-to-obtain time to talk with your favorite professor about doing a research project in their lab. If you’re interested in taking advantage of this program, contact ASCIT for more details.

Option-coordinated events. Many Options will have Option-specific socials or events which are another good venue to meet faculty and learn more about their research. Each division’s website has a calendar of events, and in some cases upperclassmen will help organize or direct you to such event (e.g. BUSAC socials).

GETTING A PROF’S ATTENTION

CONTACTING PROFESSORS

Find or e-mail professors whose labs appeal to you, letting them know that you are interested in doing a SURF or other project in their lab and would like more information. Contact many professors;
if multiple professors respond back to you then you will have more options. A lot of them just do not respond to e-mails and want you to meet with them in person. Those you decide not to work with will not be offended; just make sure you let them know as soon as you find out that you’ll have a different project.

In your initial e-mail to the professors you may want to send them a CV to demonstrate that you are qualified for working with them. If you have researched in the past, highlight your experience and skills. However, you do not need to have prior research experience; many professors are willing to accept people who have never researched before.

If there is a particular professor who does not respond to you, but you would really like to work with them, then go to their office and schedule an appointment.

**SCHEDULING A MEETING**

Once a professor responds to your e-mail, schedule a meeting with them, giving at least three times when you are available to meet with them. Also, ask if there is any background reading you need to do. If they send you reading, you should read as much of it as you can, and try to come up with intelligent questions that you could ask related to the reading. Make sure though that your questions aren’t answered somewhere else in the material that the prof gave you! If they don’t give you any reading, try some google searches of your own to get at least a pretty good idea of what the current state of their area of research is.

**MEETING WITH THE PROFESSOR**

Ask questions! Try to find out what people in his/her lab do—specific projects they are working on. You will most likely be working with a postdoc or graduate student so make sure the postdocs and graduate students are doing work that interests you. Ask what kinds of expectations the professor has of students working in his/her lab and gauge what the working environment is like. Find out about the project that you could work on over summer, either from the professor or from a graduate student/postdoc the professor directs you to.

**FOLLOW-UP CONTACT**

When you have identified the lab that you want to be in (and you know they want you), e-mail the professor who runs that lab. Verify who you will be working with, and contact them right away. Schedule a meeting to gather information for your proposal, if you will be doing a SURF. Starting the proposal early will allow you and your mentor/co-mentor to proof it a couple of times. Also, contact the other professors you met with to thank them for their time and inform them (politely of course) that you are working in a different lab and so won’t be able to work with them.

**APPLYING FOR MULTIPLE PROJECTS SURF**

The SURF application process does allow you to apply for multiple projects at the same time, and they also try not to let the same
committee read multiple proposals from the same person (this way they don’t weigh your proposals against each other; however, if you’re concerned about the same committee reading your two proposals, you should ask the SURF office for clarification on this). However, before you apply for multiple SURFs, you need to make sure that any lab that you might turn down after grants are awarded isn’t counting on having you.

**ANNOUNCEMENTS OF OPPORTUNITIES**

Faculty can post available research opportunities on these websites. UROH is intended for school-year research, while SURF is for summer research.

**SURF Announcements of Opportunity:** http://announcements.surf.caltech.edu/index.cfm?formType=SURF

**UROH Announcements of Opportunity:** http://announcements.surf.caltech.edu/index.cfm?formType=UROH

**OUTSIDE CALTECH**

When applying for research or internships outside of Caltech, be clear about your interests and ensure that your position is guaranteed. Sometimes funding falls through or there is a miscommunication and both your and the lab’s time is wasted. There are opportunities through the division clubs on campus (such as the biotech club) for you to distribute your resume throughout the year. Be sure to keep your ears open for any companies or labs that will be visiting to discuss their research. There is a lot of joint research done between universities.

Also make sure to stop by the career fair every term, as many companies recruit there for summer internships in which you would be doing company-sponsored research.

**JPL**

Mechanical Engineers more than any other option pursue research at JPL, as there are many opportunities for them there. Just because you’re not a MechE, doesn’t mean you shouldn’t consider JPL as an option. SFP holds an info-session in January about opportunities at JPL, and the SURF announcements of opportunity are a good way to learn about opportunities there. There are also many other NASA programs (Space Grant is a fairly common one.)

**MEDICAL**

**HMRI.** Huntington Medical Research Institute consists of various labs that are local to the Pasadena area. Several of the researchers who work in these labs have close ties to Caltech. If the lab you are interested in cannot fund you, and you cannot arrange for a SURF, they might have other ideas of where you can apply to get money. A list of research programs that are available through HMRI is available at http://www.hmri.org/research/programs and information relevant to students who wish to apply to the 10-week research program is available at http://www.hmri.org/education/summer-student-program.
City of Hope. The City of Hope hospital offers additional research opportunities, unrelated to the preceptorship they offer, relevant to its medical fields. Students who are accepted will receive $4000 for 10 weeks of work on a project in a field of their choosing. There are opportunities to participate in various workshops related to medicine (e.g. biomedical ethics), research presentations, and other science-related issues. The website for general research and more information for high-school and college students can be found here: http://www.cityofhope.org/education/summer-student-academy/Pages/default.aspx.

Other. There are other interesting research opportunities through national programs, such as the American Heart Association (http://www.heart.org) that you can use to sponsor your work in a local lab or somewhere else. You just need to search for these large groups early on in the year, as the deadlines for their applications vary.

HOW TO GET SUPPORTED

Once you have an adviser, now the decision needs to be made with your advisor as to how your research will be supported. The most common method is a summer SURF grant, although there are many other nationally available undergraduate research grants. These grants will cover your salary but often not all the lab expenses you will incur. The easiest option is to compensate you with units, which may help you towards your degree. And the last option, if your professor is willing, is direct salary pay though the professor’s budget. Note that you can do research for work-study one term, units the next, and then continue as a SURF over the summer, or any other combination of compensations. It all depends on your project.

SURF

This is by far the most popular method of getting research support at Caltech. As long as you’ve found a project and an adviser has agreed to take you on (and has funding for you), then your proposal will almost certainly be approved. You’ll receive a stipend of $6000 for the summer, which comes in part from SFP’s budget and donations and in part from your professor’s lab’s funding (or entirely from SFP’s budget if your mentor doesn’t have funding for you). Caltech Housing will cost you about $1500 for the summer (although you can probably find off-campus housing for less, and then there’s food and other living expenses).

Information for what you need to do as an applicant is available at www.surf.caltech.edu/applicants/index.html. The application is online at www.surf.caltech.edu/applicants/application/caltech.html and important application dates are listed on www.surf.caltech.edu/dates/index.html.

Writing the Proposal: First, be sure to read any background papers necessary for the comprehension of your experiment. Take some time to look over the SURF proposal guidelines before starting. Also, don’t be afraid to ask for help. The Hixon Writing Center, now integrated
into the Deans office tutoring, is a wonderful resource. The people there are always more than happy to lend their assistance. They can work on getting the paper started or review it. Finally, be sure to write your proposal well in advance. You should be able to give your mentor plenty of time to look over it and recommend any changes they feel are necessary.

**Recommendations:** You do not need to get your recommendations from professors and TAs who teach option classes, especially if you’re a freshman. Core classes are totally acceptable. Do not be afraid to ask people to write you a letter; just make sure that you provide them with your CV if they want it and talk to them about why you are qualified for doing a SURF. If they do not feel they can write you an adequate letter, they will tell you.

**OTHER GRANTS**

The SFP website lists the various available grants and links to information about each on their main website (www.sfp.caltech.edu/).

**Amgen Scholars**—Do a Biology and Chemistry research project, it is a 10-week research program with a mentor, proposal, and final report process that is very similar to the SURF process. You get $5500 instead of $6000.

**Exchange Programs**—Do a 10-week research project in Kanpur, Singapore, Hong Kong, or Iceland. This can be a lot of fun to do, but you have to start the application early. Applications and recommendations are due in early February.

**LIGO**—A 10-week program with the LIGO project. More information is available at www.ligo.caltech.edu/LIGO_web/students/undergrads.html.

**MURF**—Same as a SURF, but aimed at providing underrepresented students with more opportunities for research and exposure to Caltech.

**NASA USRP**—Work at a NASA center (could be JPL, could be somewhere else) on a 10-week research project. Start and end times are flexible within a 15-week period, but the project has to be 10 consecutive weeks.

**NASA Space Grant**—Yet another 10-week program for a fellowship with NASA.

**NASA PGGURP**—This is a program specifically for Planetary Geology and Geophysics. It’s an 8-week program, with applications due in mid-February.

The George W. Housner Student Discovery Fund can also be used to fund research or travel to conferences. You can continue a SURF project or to do other research projects. It is less precisely defined than most other programs. This is a good resource for seniors who are not eligible for SURFs. Be sure not to tie this directly to a SURF in your proposal, though, as it is not intended to supplement the SURF program directly.

NSF lists available grants on their website at [www.nsf.gov/funding/education.jsp?fund_type=1](http://www.nsf.gov/funding/education.jsp?fund_type=1). The Research Experiences for Undergraduates (REU) is the most popular program that people use
(especially if you’re trying to do math research). These are usually offered at many universities, and each one has a slightly different application process. It’s a good idea to look early (think December) so as not to miss any deadlines.

Always, when applying for summer research outside of Caltech, make sure that you check the start dates of the program so that you don’t apply for something that starts three weeks before finals are over; many programs are designed around semester-system school years since they take place at semester-system universities.

**PAY**

If your professor has sufficient funds to cover you, they might be able to pay your salary directly. Essentially you’re being paid for by a research grant the professor already obtained instead of one of the grants specifically designed for undergraduates to apply to.

Work Study is a program in which the federal government pays 3/4 of your salary and your employer pays only 1/4. Talk with the Financial Aid office to see you if you qualify. Professors are understandably much more willing (and able) to offer pay if you can qualify for work study.

**UNITS**

The other way to be reimbursed for your time is units. Some courses require approval of an option officer or committee; otherwise you can just register the course on REGIS as part of your regular course registration. Ideally units go towards your graduation, either as part of your degree requirement or substituting a degree requirement, thus enabling you to take fewer classes and actually have time for research.

**DOING RESEARCH**

**STARTING IN THE LAB**

You may want to start working in your lab third term so that by the time your SURF officially starts, you will know your way around and have learned basic techniques. Also, if this is really something you are enthusiastic about, why not start as soon as you can? Talk it over with your mentor/co-mentor before registering for third term, since you can likely get course credit for starting during the school year.

**DURING SUMMER**

Touch base with your mentor and co-mentor, letting them know of your progress and asking them for help when you encounter difficulty. Check whether you are accomplishing the goals you set out to accomplish, and make new goals as you get more familiar with your project. Attend lab meetings and try to get experience talking about your research by presenting your findings at a lab meeting; it will prepare you for the final SURF talk. Other fun things to do over summer include joining SURFSAC and planning activities, going to SURFSAC planned activities (dinners with professors, ice cream socials, movies), attending lunch seminars to learn more about
research in other fields, and going to career workshops.

We also highly encourage you to take E11 over the summer if your project allows you to; it satisfies the Institute Writing Requirement and ensures that you aren’t scrambling to write your SURF paper during first term because you put it off all summer long.

**RESOURCES**

**Caltech Library Services** subscribes to and owns thousands of resources. It can be daunting figuring out which ones are right for your research. Caltech librarians can provide invaluable help pinpointing the right databases, articles, journals, and books. Schedule an appointment with a librarian who will show you how to find what you need; Ask a Librarian has a complete listing of librarians with their email contacts.

The library also offers workshops throughout the school year on many of its databases. For instance, in the Web of Knowledge class, you can learn how to search scholarly literature, improve your article-retrieval skills, and how to export records into EndNote. The library advertises its classes on its website. [http://library.caltech.edu](http://library.caltech.edu) is the general library email address, and (626) 395-3404 is the number for the reference desk at the Sherman Fairchild Library, staffed M-F, 9am-5pm.

An undergraduate guide to Caltech library resources is available online at [http://libguides.caltech.edu/undergraduates](http://libguides.caltech.edu/undergraduates).

**GENERAL ADVICE**

**NOTES FROM STUDENTS**

• The most important thing is that if you want to get a SURF or other research, you have to work for it. If a professor doesn’t respond by e-mail, call them. If that doesn’t work, try to meet them in person by scheduling a meeting through their secretary, going to a class they teach, or going to any office hours they hold. Sometimes, your ability to find and talk to a professor despite their inability to answer emails promptly is the requirement for researching with that professor.

• It’s best to be able to find a research group early enough such that you can stay with them for 2-3 years, which is roughly the amount of time needed to be competent enough in the lab and field to pursue and answer your own research questions. Typically, you spend your first few months just figuring out how things work before being given your own problem. Don’t be afraid to switch groups early on if you don’t like what you’re doing.

• Don’t be surprised if you have to send a lot of emails. If a professor turns you down, ask them if they can send you a list of other professors who are looking for SURF students. This can be incredibly helpful, especially if the professor wants to talk with you about what your experience and interests are before suggesting other pros to talk to; this way you will only be sent to pros who are likely good fits for your skills and interest set.

• Don’t worry if you don’t feel you can come up with your own
Most SURF’s start by you finding a prof whose research you like and they propose some projects you can choose from. You should have a general idea of what you want to do though.

- The science is important, but the lab environment is important too. If you have the luxury of choosing between two or more lab groups that all do research you like, try attending a few group meetings. Are the grad students happy? Serious? A little crazy? The personality of the grad students, the atmosphere at group meetings, and other hard-to-define cues all indicate what kind of personality thrives in that lab.
- After your project you can submit your final paper to the Caltech Undergraduate Research Journal (CURJ), see http://curj.caltech.edu/ for more information.

**NOTES FROM FACULTY**

- You should be looking for research because you’re interested in a topic and want to answer questions and commit time to problems, not because you just want to add to your CV.
- Don’t be afraid of topics. Clearly no one doing research right now knew everything there is to know about their field when they started or even everything there was to know about their field at the time that they started researching.
- Rather than performing all of your correspondence online, it can be valuable experience for students to have to walk up to professors’ doors.
- One reason faculty may not post their open reserach positions online is that non-Caltech students flood these postings, and generally professors would like to take on Caltech students over non-Caltech students.

**HOW TO FIND TIME FOR RESEARCH**

- Do it in the summer (or during other breaks).
- Take fewer classes. You don’t need 54 (or even 45) units a term to graduate on time.
- Find out if you can substitute research units for a lab or other graduation requirement.

**ADDITIONAL RESOURCES**

There are several online resources for more information about getting and doing research. Some of these places are listed here.

- BUSAC has a page with a lot of useful advice, much of which has been transferred into this guide: www.its.caltech.edu/~busac/SURFinformation.htm.
- An undergraduate guide to Caltech library resources is available online at http://libguides.caltech.edu/undergraduates.
- The SFP (SURF) website www.sfp.caltech.edu/.
- The UROH website http://uroh.caltech.edu/index.html.
The little t’s website offers yet another resource for the wayward Techer, started by collaboration between the little t, the ARC, and many other people and resources. The Survival Guides: Option Based Guides for Undergraduates are available online at http://donut.caltech.edu/ascit/Little_t. You can access (and contribute to!) these guides and many other things on the little t’s online wiki. Guides are in development for all options not listed here. Some of the guides are available only online in the form of reports from the 2013 Student Faculty Conference (SFC). SFC’s happen every other year, and help the faculty and the students evaluate and change majors.

APPLIED COMPUTATIONAL MATHEMATICS

Please see: http://arc.caltech.edu/SFC2013/ACM2013.pdf

APPLIED PHYSICS, ASTROPHYSICS, PHYSICS

APPLIED PHYSICS

The applied physics option is great for people who want to study physics as it applies to useful problems. “Useful” is (at least at this school) taken to mean anything that could conceivably be encountered in a technological application over the next few decades. This is a fairly broad definition; Caltech’s applied physics division has its strongest programs in quantum optics, hydrodynamics, plasma physics, nanofabrication, and a variety of fields in condensed matter physics. Although the applied physics option falls under the administrative umbrella of Engineering and Applied Science, its course requirements and research opportunities are much closer to those of physics than to those of mechanical or electrical engineering, so bear this in mind when considering it as an option. The first applied physics requirement you will encounter in your Caltech career is the lab requirement. The applied physics option requires three introductory lab courses, chosen from APh/EE 9b (introduction to microfabrication), APh 24 (basic and advanced optics), Ph 3 (introductory physics lab), Ph 5 (electronics for physicists), Ph 6 (electromagnetic phenomena), and Ph 7 (nuclear phenomena). There is some (small) chance that you could convince the option representative to let you use a few terms of APh 109 (microfabrication, but more advanced than APh 9) or even Ch 6 (physical chemistry) on this requirement. The institute core requirements mandate that you take an extra introductory lab on top of Ch 3a/Ch 3x, so APh 9 and Ph 3 are both good choices for this, because you can knock off an option requirement at the same time. Taking these courses freshman year is popular. If you’re undecided between physics and applied physics, taking Ph 3 is an efficient choice because it counts for both. If you’re undecided between electrical engineering and applied physics, taking APh 9 also counts for both. Note that in order to take APh 9b you must take APh 9a, and in order to take APh 24 you must take APh 23, so plan ahead.

In terms of actual content, APh 9 has been going through some changes lately, but it is usually a good introduction to nanofabrication and it teaches skills that are quite marketable when the time comes for SURF hunting. The labs introduce modern electronics fabrication techniques, and you’ll get to make your own LEDs and transistors from scratch (silicon wafers, that is, they don’t make you grow and cut the crystals, that would be challenging). The devices often work at least reasonably well, and that’s always really exciting. Ph 3 is a pretty
straightforward mechanics lab- the real aim of the class is to introduce you to \LaTeX and to teach you error analysis. It is a prerequisite for Ph 6 and Ph 7. Ph 6 and Ph 7 are excellent, well-run courses headed by the indomitable Frank Rice and his talented TAs, chosen from the best of the previous year’s Ph 6 and Ph 7 classes. These are great courses to take for any experimental scientist, and I highly recommend that you try to take at least one of them. Both classes are challenging, so budget time accordingly. APh 23 and 24 have been going through some changes recently, but historically they have been extremely fast-paced overviews of modern optics. The class goes much, much deeper than just lenses and mirrors, so don’t think that a mastery of geometric optics will make this class boring.

An opportunity that is available to incoming freshman is the Ph 11 program. Although it is listed as a physics course, Ph 11 accepts people from just about all options, and in fact many of the faculty with whom Ph 11 students work are applied physics professors. You will probably get a handout explaining the Ph 11 application process elsewhere, so I will not describe it in detail here, but it is a great thing to think about applying for if you plan on doing research.

Like most other options, applied physics requires that you complete a science writing course. E 10 (technical seminars) is required. A technical writing course is also required; there’s a long list of technical writing courses that count. E 11 (the general engineering one) and Ph 70 (the physics one) are popular, but there are other courses that work. Your primary responsibility in most of these courses is to turn some piece of research that you’ve carried out into a technical paper conforming to the style and formatting of a scientific journal or engineering publication. You should probably do this after you’ve done a SURF or technical internship, but earlier is generally better. If you get good results from a SURF, you can kill two birds with one stone and write up a paper intended for publication while completing this class. There’s also an option for you to add a few units to a senior thesis and deal with this requirement then.

The list of required courses is pretty similar to that of physics, although it is a bit longer. You must take Ph 12abc (sophomore physics for physics majors), Ph 17ab (thermodynamics) or APh 105ab (states of matter, which is a materials science-themed course), Ph 106abc (classical physics and electromagnetism), Ph 125ab or Ch 125ab (quantum mechanics; note that Ph 125c is not required, but is a prerequisite of many advanced APh courses and is quite useful). Most applied physics majors take Ph 125 over Ch 125; it is much more relevant to the other courses you will be taking, and is sort of the unofficially recommended choice. Ma 2 (differential equations), Ma 3 (statistics), and ACM 95abc (complex analysis and more differential equations) are also required.

The most unique aspect of the applied physics option at Caltech is its depth requirement. The physics and chemistry options, for example, require the completion of a pooled set of elective units that can be cobbled together from any of a variety of courses. Applied physics offers up a list of sequences that can be chosen from and requires that one be completed in its entirety. For example, someone with an interest in semiconductor physics might choose to complete the solid state sequence (APh 114abc), a three-term sequence of courses designed to give students some depth of understanding in hard condensed matter phenomena. Sequences exist in solid state physics (APh 114), fluid mechanics (APh 101), materials science (APh/MS 105), hydrodynamics and heat/solute transport (APh 115 and 116), photonics and optoelectronics (APh 130, 131, and 132), plasma physics (APh 156), and biophysics (APh/BE 161 and 162). Sequences are typically a year long, and are most often completed in a student’s junior or senior year. Note that many of these courses have substantial prerequisites, so plan ahead when scheduling them- Ph 125 must be taken before APh 114, for example, and ACM 95 must be completed before APh 115 and 116. Not all of these courses are offered every year, so keep that in mind as well. Several of these courses function as unofficial training/feeder courses for on-campus applied physics labs, so signing up for the one associated with a group you want to work with is a great way to secure a SURF (for example, APh 156 feeds Prof. Bellan’s plasma physics lab, APh 115 and 116 feed Dr.
Troian’s transport lab, and APh 114 feeds into Prof. Schwab’s and Prof. Atwater’s groups). This is unofficial, of course, and you can certainly get into these labs without taking these courses, but taking the course will help an enormous amount. It’s probably not too difficult to convince the option representative that a few other courses have enough applied physics content to satisfy the sequence requirement; APh 190 (quantum electronics) and perhaps Bi/Ch 170 (biophysics of macromolecules) spring readily to mind.

The last requirement is the advanced lab requirement. This is satisfied by APh 78abc (this is the experimental senior thesis- note that the theoretical senior thesis, APh 79abc, does not count!) or one term of APh 77 and one term chosen from of a list of labs in a variety of other options. APh 77 is two terms long, so staying in the advanced applied physics lab for two terms satisfies this requirement, but you can also branch out and try other things (physical chemistry, electrical engineering, and aerospace engineering are a few of the possibilities) for the second term.

This is not a requirement, but a piece of advice: you should probably try to complete either Ph 125 or ACM 95 your sophomore year, if possible. This is because a). piling Ph 125, Ph 106, and ACM 95 all into the same year is a reliable recipe for misery and b). ACM 95 and Ph 125 are prerequisites for many applied physics sequences, and it’s usually a good idea to try to do your sequence your junior year so that you can get a SURF in your area of specialty after your junior year and turn it into a senior thesis after the SURF. This is a good way to ensure that your senior thesis is productive and successful.

An idiosyncrasy of the applied physics option is the fact that the lack of a free-for-all elective requirement means that there are many courses listed as applied physics courses that do not formally satisfy any applied physics requirements at all. Some of these are still great courses, and you should take them if you’re interested- you’ll probably have some free time to follow your interests.

The applied physics option is a great place to be if you want to do undergraduate research. The three-term sequence requirement will automatically expose you to a deep pool of professors that specialize in your area of interest, but if you want to meet more you can simply go to Watson and knock on some doors (Watson contains most of the applied physics labs at Caltech). Plasma physics, hydrodynamics, and some quantum optics live on the first floor; the second is dominated by quantum optics and nanofabrication. Some applied physics faculty work in Steele as well. The two buildings are actually connected, and their occupants work pretty closely with each other. Keep in mind that not all groups have regularly-updated websites, so you can often find hidden opportunities by simply wandering around the building and harassing graduate students and professors. They will almost always talk to you.

We’re glad you’re considering applied physics; the program is diverse enough that you are likely to find something you like. As far as opportunities after college go, applied physics is one of the more versatile majors. Graduates of Caltech’s applied physics option can attend graduate school in physics, applied physics, chemical physics, applied mathematics, and some engineering programs. Those who leave academia often end up working on interesting technical problems in the electronics, oil, space, and even finance industries (the last is quite a bit more common than you might otherwise think). Applied physics graduates that go on to law school often become quite successful in patent law. If you have questions about these opportunities, Caltech’s applied physics faculty are a great resource, because many spent time in industry before coming to academia. Dr. Schwab led an NSA quantum computing lab, Dr. Troian worked on the hydrodynamics of oil prospecting for Exxon, and Dr. Scherer has worked closely with (and even helped found) companies in the microelectronics and micro-optics industries. Other examples exist, of course- the best way to find them is to talk to people in Watson and Steele.
The astrophysics option at Caltech requires the following courses: Ay 20 (basic astronomy and the galaxy), Ay 21 (galaxies and cosmology), Ay 101 (physics of stars), Ay 102 (the interstellar medium), Ay 30 (Introduction to Modern Research) or Ay 141 (research conference in astronomy), Ay 31 (writing in astronomy), Ma 2 (differential equations), Ma 3 (probability and statistics), Ph 2 or Ph 12 abc (physics for non-majors and physics for physicists, respectively-Ph 12 is highly recommended), Ph 125 ab (note that Ph 125c is not required), and Ph 106 abc (classical physics and electromagnetism). Ph 106 and Ph 125 are both quite a bit of work, so budget time accordingly.

You must also complete any three labs from the following list: Ph 3 (mechanics lab), Ph 5 (electronics for physicists), Ph 6 (electromagnetic phenomena), Ph 7 (nuclear phenomena), and Ay 105 (optical astronomy instrumentation). APh 23 and 24 (modern optics) can also be taken together to count as one lab. APh 23 is all classwork, and APh 24 is all labs; the first serves as a prerequisite for the second, which is why they’re put together as a package deal. More detailed descriptions of these labs are available in the applied physics section.

You need to take 63 additional units of Ay or Ph courses; you are encouraged to use these units to pursue your specific interests within astrophysics. On top of this, 27 additional units of science and engineering courses must be taken, of which 18 must be outside of the physics, mathematics, and astronomy department. Several courses in applied math and applied physics work well here, as do many courses in geology and planetary science. A few chemistry courses are also good candidates. ACM 95abc (complex analysis and more differential equations) is an excellent choice; Ch 126 (spectroscopy) is another good one.

Option Requirements: The option requirements for physics are:
1. One of Ph3, Ph5, Ph8bc or APh9a
2. Ma2 and Ma3
3. Ph12abc
4. Ph6
5. Ph7
6. Experimental Thesis/Senior Lab: 27 units of Ph78 or 18 units of Ph77 or 9 units of Ph77 and 9 units from APh77 or Ay105
7. Ph70
8. Ph106abc
9. Ph125abc
10. 90 units of Advanced Physics Electives in addition to the above. These include any Ph, APh, or Ay course numbered 100 or above, or any of Ph5, Ph20, Ph21, Ph22, Ph78, Ph79, ACM95, ACM101, Ma5, Ma108, or up to ten units of Ay20/Ay21. Only 9 units of Ph77 may count toward this requirement, and then only if those units are not satisfying the senior lab/thesis requirement. Other than ACM95, no courses fulfilling this requirement may be taken on P/F unless they are only offered on P/F. No more than 9 units of Ph171/Ph172/Ph173 may count toward this requirement without permission from the Physics Undergraduate Committee. This committee may also be petitioned if students wish to use courses not included in the above to fulfill this requirement.
11. 9 units of science or engineering electives outside of Ph/APh/Ma/ACM. These units must not overlap with Core. Note that passing grades must be earned in at least 486 units in total, including the courses listed above.

1Both terms are necessary
2Other communication courses, including E10, Ay30, and Ma10, may be substituted for this. The oral communication courses are the ones that substitute for Ph70: the Institute Core Scientific Writing requirement will then require an additional scientific writing course such as E11, Ay31, Ma11, etc.
Research Opportunities: It is highly recommended that undergraduates in physics pursue research during their time at Caltech. This is in part because the most important parts of a graduate application are research experience and letters of recommendation (research is a great way to get to know professors). More importantly, however, research is your opportunity to discover new things about the world around you. You worked hard to get to Caltech, much harder than you needed to if all you wanted was solid coursework. Take advantage of what the Institute has to offer research-wise: it's where the academic experience really shines.

A by-no-means exhaustive list of the opportunities available is shown below.

1. Ph11. This three-term course (beginning in the second term of freshman year) is open to freshmen by doing two entrance hurdles. The hurdles are mini research projects, and are due around weeks four and eight of the first term. They should be available in every house, as well as in Sloan Annex, and online. The course is structured as a research tutorial, with toy problems gradually giving way to serious research projects, and includes guaranteed funding for a summer research project.

2. Ph171/172/173. These courses, all on P/F, give you credit for in-year research. The different numbers correspond to reading, experiment, and theory respectively.

3. Ph78/79. These courses correspond to theoretical and experimental senior theses respectively. Note that only an experimental senior thesis excuses you from senior lab.

4. SURF. The Summer Undergraduate Research Fellowship program funds your research during the summer. Applications are due in February, so you should be looking for a professor to mentor you starting near the end of first term. The SURF program only lasts for ten weeks (which is not long at all when you're doing things which have never been done before!), so it is strongly recommended that you either start your research before the official start of the program (using one of the Ph171/172/173 courses if you want credit) or plan on continuing your work into the fall. While the majority of SURF students do their work at Caltech, you can also do them at other universities or research institutions (CERN is a big one).

Recommended Course Ordering: While it is common at Caltech to ignore prerequisites, there are several which are quite important. In particular, Ph12ab build strongly on linear algebra, so Ma1b should be seen as a hard prerequisite. Likewise, Ph106 and Ph125 should generally only be taken after Ph1 and Ph12b respectively. It is often recommended, though by no means required, that students take Ph127abc prior to taking Ph205abc. The reason for this is that the former, though focused primarily in statistical mechanics, provides a strong and concrete background in field theories and the renormalization group. This makes the more mathematical and abstract (and somewhat less physical) introduction to these topics in Ph205 more understandable.

Likewise it is recommended that students take Ph1 prior to Ph6/Ph7 and that they have taken or be enrolled in Ph12 while taking these lab courses. Cases of students being successful in Ph6/Ph7 otherwise are rare.

Recommended Coursework: If you ask any physics major from the past several decades to name their favorite courses, chances are that Ph101 topped the list. In fact, so many Techers take it that you need not restrict yourself to physics majors. The course, an introduction to order of magnitude physics, covers everything from animal physiology to weather systems to material properties to astrophysics, and it is really well done. Ph127 is another course likely to be near the top of that list, though far fewer people take it. It is an advanced course in statistical mechanics, quantum statistical mechanics, the renormalization group, and critical phenomena. If you plan on going into condensed matter physics, this is an extremely important one
to take.

If you plan on going into high energy physics, take Ph205. It’ll get you up to speed on quantum field theory in quite a bit of depth, though it won’t cover the full breadth of the standard model. There are other courses in the 200’s which will fill in the relevant particles and phenomena.

If you plan on going into astrophysics, take Ph236. General relativity comes in handy out there...

If you plan on going into quantum computing, take Ph219. If you want to work on the interface between quantum computing and condensed matter, this goes well with Ph127, though both are sufficiently under united that they shouldn’t be taken concurrently.

There have been cases of students successfully taking Ph125 without Ph12b, but these generally involved students with very strong backgrounds both in physics and the relevant applied math. In cases where this does arise, students may petition to have Ph125a replace Ph12b. The current standard is that an A- or above in Ph125a is sufficient to excuse a student from Ph12b.

Students have tried this, and failed.

Scheduling: There are several things worth considering when putting together a schedule. First and foremost, not all units are created equal. Take into account the effective units that a course takes up when scheduling, not just the listed units. For example, when I took Ph127abc, the first term took 12 hours/week, the second took 15-18 hours/week, and the third took 30 hours/week. All three terms were listed as 9 units. As of this writing, you may reasonably expect Ph6, Ph7, Ph106, and Ph125 to be slightly under united. Ph101 and Ph127 are the only courses in the option at the moment which are significantly under united. When taking Ph205, Ph219, and Ph236, plan on them being significantly under united if you want to solve every problem and get the most out of the course, but being correctly united if you just want to hit the pass mark.

The next thing worth considering in planning a schedule is that you have four years!. Furthermore, if you plan on going to graduate school, you have more years after that to take courses. There’s no need to cram everything into your first few years, especially not if it comes at the cost of your learning the material properly. The one case where it may make sense to make terms more difficult than necessary is when attempting to get through the prerequisite tree to take a course which is relevant to your interests. If you want to be a field theorist, for example, it may be worth taking Ph125 and Ph127 concurrently junior year to get the most out of Ph205 senior year.

Finally, certain courses are only offered in alternating years. In particular, Ph101 and Ph219 alternate, such that only one is offered any year. The former is generally third term, and the latter is usually the first two terms. If the content of Ph219 is interesting to you but not something you’re considering research in, Ph135 often has a term devoted to quantum computing. This may ease the scheduling burden.

BIOENGINEERING

Student Writers: Malvika Verma (Co-chair), Michelle Tang (Committee member), Aleena Patel, and Karsyn Bailey
Faculty Writer: Professor Niles Pierce (Co-Chair, Option Rep)

The Bioengineering undergraduate option at Caltech launched in the 2009-10 academic year. Four years later, there are 60 BE majors in the option. After major updates to the option requirements following the first year, the requirements have stabilized in subsequent years. The unit load is roughly comparable to other engineering degrees (but less than ChE). It is possible to study abroad and to double major. Students are strongly encouraged to seek out research opportunities during the summer or the academic year. Bioengineering research at Caltech focuses on the application of engineering principles to the
design, analysis, construction, and manipulation of biological systems, and on the
discovery and application of new engineering principles inspired by the properties
of biological systems. BE graduates tend to go to medical school, graduate
school, or industry.

On the chart (on the previous page) are the updated Core units (the new
Core). Note that Math 2a is now Math 2, and Math 2b is now Math 3. Details of
the course descriptions are in the Caltech Catalog: http://catalog.caltech.edu.
For more BE specific information, visit http://www.be.caltech.edu/undergraduate/
index.html

Upperclassmen Advice:
• Take CS 1, Bi 8, and Bi 9 as a frosh.
• Take ACM 95abc when most of your friends are taking it (probably s’more
year)
• Bi/CNS 150 is a popular choice for the Bio requirement since it is very well-
taught
• Be comfortable with programming in Matlab or Python and have taken Bi/
Ch 110, so ChE/BE 163 won’t be as difficult for you
• If you’re pre-med or planning to study abroad, take Ch 41abc s’more year

Research Advice:
• Summer: Many BE students do SURFs over summer in either BE labs or
Bio labs. Taking BE 1 and Bi 2 are a good way to get some exposure to the
research done here. Some students even work in labs outside of Caltech.
Make sure you contact the prof you are interested in working with early on
(like November or December). If they don’t respond to their email, call their
office phone or just go and visit their lab. During your s’more or junior year,
apply for the Amgen Scholars program since it’s essentially the same thing
as SURF with some extra money and the opportunity to go to a research
conference at UCLA.
• Year-round: BE gives get elective credits (BE 98) for doing research during
the year. If you’re thinking of grad school, it’s good to show that you’re
interested in research at other times than the summer.
• iGEM (International Genetically Engineered Machines competition); This is
a team project of Caltech undergrads who plan the project during the year
and work in the lab over the summer under guidance of several graduate
students and professors. If the team does well, they travel to compete!
• Network: Attend the BE seminar series and the BE holiday parties.

Advising:
• Upperclassmen: Ask them questions. If there isn’t a BE in your house, you
can email an Option Mentor (found at arc.caltech.edu) or any of the writers
of this guide.
• Option Advisor: You’ll be assigned one once you declare BE, so develop
a good relationship with your prof. He or she will sign your yellow card, so
know when he or she is around.
• Option Rep: Currently, this is Prof. Niles Pierce. He has office hours once a
week to answer questions and give advice on your BE schedule.

Are you a pre-med?
If you’re interested in medicine, being both a bioengineer and a pre-med is
a great option. A strong engineering and research background from a prestigious
and world-renowned school like Caltech can help you stand out over your
competitors when applying to medical school. If you find that medicine isn’t the
right path for you, you have a great engineering basis to fall back on. As you
can see, being a bioengineer and a pre-med opens up a lot of doors for you
in the future. It is also relatively easy to accomplish both given that many of
the pre-med requirements are already BE requirements. To fulfill the pre-med
requirements in their entirety, you have to take the entire year of Ch 41abc, a
physics lab (both terms of Ph 8 or Ph 3), an organic chemistry lab (Ch 4a or Ch
8) and three English classes.
For more details on pre-med requirements, you can talk to James Berk at the
Career Development Center or see this:
Study Abroad:

Many of the universities abroad offer Biology classes that can count for the “Advanced Biology” class required of the BioE option. If you are studying abroad first term junior year, you will want to find a way to take Bi/Ch 110 abroad to avoid falling behind. Sometimes specific classes or electives will be approved for equivalent credit. It is a good idea to check with the professor of the class you wish to take abroad to ensure you can get equivalent credit. Note that students’ past experiences at a university don’t always apply to the current year, so check beforehand.

- University of Edinburgh: These classes have been approved in the past for equivalent credit with no extra work: Molecular Genetics 3 → Bi 122 (Adv Bio elective). Structures and Functions of Proteins 3 → Bi/Ch 110 (Option requirement)
- The University of Cambridge is structured such that you can only take courses in one field. Being a BioE comes in handy because you can take courses in either the Engineering Tripos or the Natural Sciences Tripos. We recommend enrolling in the Engineering Tripos because it allows you to meet more option requirements and also provides the opportunity to take an HSS course. Due to the option requirements during first term, it is easier to meet requirements during Lent (second) term at Cambridge. The following classes in the Engineering Tripos have been approved for equivalent credit with little or no extra work: 3G2 Mathematical Physiology → BE/APh 161 (Option requirement); 3G3 Introduction to Neuroscience → Bi/CNS 150 (Adv Bio elective); 4G2 Biosensors → Bioengineering Elective; 3E6 Organisational Behaviour → Advanced Social Science

Double Major

Double majors or minors are certainly possible with the Bioengineering option; they just require some pre-planning and forethought. Humanities and Social Science second majors are the easiest to arrange due to the 12 HSS requirements for Caltech students. The humanities minor requires 72 units in that subject, and one can be a frosh hum. The humanities major requires 99 units in that subject, including the two or three-term thesis course, typically taken during the senior year. If you choose to major in the humanities, the thesis restricts you from studying abroad during your senior year. The best way to plan a major in the humanities is to start early: take both frosh hums during first and second term frosh year, then take your first advanced hum third term. From there on, all of your humanities courses should be in the humanities subject you would like to major in. If you keep up with your humanities by taking one each term, you will finish on time.

BUSINESS ECONOMICS AND MANAGEMENT

Author: Misha Raffiee

The Business, Economics, and Management option is often used as a double major with a science or engineering major, preparing undergrads for managerial roles in technically-oriented firms. In recent years, however, BEM has also become increasingly popular as a stand-alone major for those interested in careers on Wall Street or in consulting.

The BEM curriculum is designed to give students a solid foundation and background in economics (Ec 11, Ec 122, and PS/Ec 172), finance (BEM 103), accounting (BEM 102), investments (BEM 104), and options (BEM 105). Students are able to continue their focus into these fields or specialize in fields such as law, political science, and psychology through diverse elective course offerings. Students are strongly encouraged to seek out research and internship opportunities during the summer, and many Wall Street and consulting firms hold information sessions during the year or have tables at the career fairs (held once
in October and once in February) for students interested in summer internships and eventual full-time jobs. BEM graduates have gone on to incredibly successful careers at firms such as Bain, Bank of America, Deutsche Bank, Goldman Sachs, Lehman Brothers, McKinsey, Morgan Stanley, JP Morgan Chase, and dozens of other premier financial companies.

Option Requirements:

- Ec 11 (Introduction to Economics)
- PS/EC 172 (Non-cooperative Games in the Social Sciences)
- BEM/EC/SS 20 ((Scientific Writing and/or Oral Presentation in the Social Sciences), or similar writing/oral presentation course(s)).
- BEM 102 (Introduction to Accounting)
- BEM 103 (Introduction to Finance)
- BEM 104 (Investments)
- BEM 105 (Options)
- Law 33 (Introduction to the Law)
- ACM 118 (Methods in Applied Statistics and Data Analysis) or EC 122 (Econometrics)
- Five courses from BEM Elective Option List (listed below) These may be taken Pass/Fail.
- 45 additional units of science, mathematics, and engineering courses; this requirement cannot be satisfied by courses listed as satisfying the introductory laboratory requirement or by any course with a number less than 10. These may be taken Pass/Fail.

Elective List:
BEM courses (excluding the ones listed under (1) and (2) above), Ec 105, 106, 116, 121 ab, 122, 123, 129, 130, 132, 135, 145, Ec/PS 160 abc, PS 12, Psy 15, Psy 20, ACM 116, Ma 112 a, and Law 134.

Details of the course descriptions are in the Caltech Catalog (http://catalog.caltech.edu/) and for more BEM-specific information and a 4-year plan graduation plan on the Caltech BEM website, visit http://bem.caltech.edu/academics/index.html.

Advice on Option Requirements

- Take CS 1 (even though it’s not an option requirement, you won’t believe how many finance companies prefer, if not require a knowledge of CS) and Ec 11 as a frosh. If you’re really ambitious, you may also want to take BEM 102 (Introduction to Accounting) to get ahead in option requirements.
- Communicate often with the BEM Option Rep to make sure you’re on track to graduate since some elective courses aren’t offered every year. BEM is really flexible in approving alternate elective course requirements in cases when listed elective courses are not offered.
- Try to take BEM 103, BEM 104, and BEM 105 in the same year (or at the very least concurrent years) since the courses build on each other and you’ll be much more successful in those classes if the material is still fresh in your mind.

Research and Internship Advice:
During the summer, many BEM students do SURFs in other fields (science or engineering) over the summer, but some also elect to do SURFs in economics or finance fields. As with any SURF, make sure you start early (November/December) to contact professors about working in their lab – a lot of labs fill up extremely quickly, and students who start after the new year often struggle to find labs to work in (and some don’t find a lab at all).

Other BEM students do internships during the summer. Start researching internship opportunities early (as early as August the year before you’re planning on doing the internship). Once you’ve decided to apply for industry internships, make sure you have a working resume (the career center is a good resource for
resume writing tips) and professional attire. Depending on which firm you want to work for, you may also need additional preparation for the application and interview processes (for example, many consulting companies ask interviewees to analyze case studies, while others ask quantitative and logic questions). As far as making the initial connections, go to the career fair and information sessions held throughout the year (sign-up for the information session mailing list on TECHerlink), and don’t be shy about introducing yourself and handing out your resume to company recruiters.

If you want to do research for credit during the school year, you can enroll in BEM 190 (Undergraduate Research Project in BEM). While research in BEM is not as common during the school year, it’s definitely an important experience to have if you are looking at Masters’ and PhD programs in a BEM or BEM-related field.

Also, check the Linde Institute’s website at http://linde.iems.caltech.edu/ for internship and job postings, research opportunities, and scholarship information. This is a valuable resource that has been historically underused.

Advising:

Ask upperclassmen questions! If there isn’t a BEM major in your house, don’t hesitate to ask upperclassmen in BEM in other houses or talk to/email an Option Mentor (found on the ARC website at arc.caltech.edu).

You’ll be assigned and option advisor once you declare BEM (or, in the case of declaring BEM as a double major, you’ll be able to select an advisor). Make sure you meet with your advisor regularly, and make an effort to form a good relationship with him or her. Your advisor will sign your add/drop card (the yellow one), time conflict card (the orange one), and any other forms/cards you’ll come across. And hey, you never know – maybe he/she will even end up writing you letters of recommendation for graduate school. So, long story short, get to know your advisor!

Currently, the option rep is Prof. John Ledyard. He’s a great resource to talk to about any issues that arise with graduation requirements (and any other questions you may have about BEM).

Double Majoring:

Doing a double major in BEM extremely doable! In fact, BEM is the most common double major choice. One reason for this is the overlap between BEM and general institute core graduation requirements; as it is, all undergrads are required to take 12 terms of Humanities and Social Sciences (HSS) courses to graduate – basically every single course you take as part of the BEM curriculum satisfies the core HSS requirements (so you’re able to double count courses that go towards your general diploma as part of core towards a BEM degree as well).

If you do want to do BEM as a second major, make sure you plan early (preferably freshman or sophomore year) so you’ll be able to graduate on time without taking insane numbers of units during your later terms. One thing that’s really useful if you’re thinking about declaring BEM is to take introductory social science courses (which are required as part of the core curriculum anyway) that satisfy BEM graduate requirements during your freshman year. That way, even if you end up deciding not to declare BEM, you’ll still be ahead on general institute graduation requirements since you’ve already gotten your intro social science classes out of the way.

On another note, you are able to declare a double major until the beginning of your first term senior year - to get approval for a second major, you’ll need a signature from your advisor and option rep in the first major, and advisor (who more often than not you’ll choose yourself) and option rep from the second major. Since BEM is often the second major chosen, it’s important to get to know faculty in the option so that you’ll be familiar with at least one BEM faculty when the time comes to choose an advisor.

Really important! Don’t hesitate to talk to your advisor in your first major (whether it’s BEM or something else), the option rep, or any upperclassman who is doing a double major in BEM (there are plenty of us!) to get a better sense of
how to plan out a double major.

## Biology

### Required Courses:

For Grades: Bi 8, Bi 9, Bi 117, Bi 122, Bi/CNS 150, Ch 41 abc, Advanced Biology Lab (or at least 12 units of independent research Bi 22- p/f), Biochemistry (2 of Bi/Ch 110, 111, 113, or 132), Scientific Writing (Bi 24, CNS/Bi/Ph 107, or other scientific writing equivalent: E11, Ge13, etc… with oral presentation/option representative approval), Distribution Requirement

(As of Feb 2013)***Keeping the total number of required units neutral: it is proposed that the Biology Option will require Ma 2, Ma 3 and any 2 of Ph 2, 3, and 4, although these need not be taken consecutively or in a fixed order. This Physics and Math requirement can also be satisfied in part by successfully taking a “reasonable” replacement for any of these required courses.

A “Reasonable” replacement will be defined by:

1. Equally or more advanced quantitative coursework; and
2. Essentially similar scope of subject matter as the course replaced. The Biology Option representative will be empowered to make this determination with aid of an advisory list which can be updated as relevant new courses are developed inside and outside of Biology.

A total of 146 units of Biology classes are required to be taken and passed. More information about required courses can be found on the BUSAC webpage on the biology.caltech.edu website as well as in the 2013 SFC Biology report on the ARC website.

### Upperclassmen Advice:

If you are considering the Biology option, take Bi 8 and/or Bi 9 as a frosh, even if the catalog says otherwise. It’s a good way to see if biology interests you without a grade consequence. For those who do eventually declare Bio, it’s nice to have the requirement out of the way early.

Start thinking about research early. Research is a huge part of biology, even if you’re pre-med. Bi 2 and working a lab are two great places to start. Plus, being on pass-fail takes some of the pressure off so that you can learn to manage your time effectively if you decide you want to do lab work during the school year. Finally, it gives you some background if you want to do summer research.

Planning out a 4 year schedule to include all the required classes will help keep you on track for graduating. Though you don’t have to strictly follow your plan, it gives a better idea of when you need to take certain classes. Similarly though some classes may have prerequisites, if you feel that you are prepared enough and ask the professor, you can probably get into the class without having taken the prerequisites.

Ask upperclassmen about which Biology electives to take. The catalog usually does not give enough info. Asking students who have taken these classes will always give a much better perspective of the class material and whether or not you would want to take a class. Also, don’t be afraid to “sample” classes before deciding to add or drop them before add and/or drop day.

### Advice on Research:

Start your search early. During second term, or even before winter break, is a good time to gather information about labs on campus. If you wait too long, professors may not have room for you in their labs even if you are highly qualified.

Some people work for professors whose classes they have taken or for professors who lecture in seminar classes like Bi 2, but that is not the only way to find a lab. Search the biology faculty website, read professors’ published papers, talk to upperclassmen biology majors in your house and around campus to get a feel for what labs appeal to you.

Also, the SURF website has a section for Announcements of Opportunity but
If you’re considering the chemistry option, awesome choice! Hopefully in the next few paragraphs we’ll give you an idea of why we enjoy being chemistry majors and how you should go about choosing classes and finding research opportunities.

One of the best parts of the chemistry major (besides being interesting!) is that it is very flexible. This means you get to take classes you want to take, rather than spending four years satisfying requirements. The requirements are: Ch 41abc (organic chemistry), Ch 21abc (physical chemistry, alternatives exist, see below), Ch 14 (analytical chemistry), Ch 90 (technical presentations), Ma 2 (differential equations), Ph 2a (basic quantum mechanics), five lab courses, and five advanced elective courses in any area you desire (inorganic, organic, physical, biochemistry, computational). Ma 3 (statistics) is “recommended” but not technically required. For the electives, some people choose to stay only within their area(s) of interest, while others try to get exposure to more topics. Generally, most people begin taking advanced courses in the third term of their sophomore year, although it’s fine to wait until you are a junior too. Most of these advanced classes are pretty work-intensive, so it’s wise to leave enough time in your schedule.

Below we’ve compiled a list of information/suggestions about the lab classes and electives in specific areas of chemistry.

Labs: You should try to take Ch 3a in the first or second term of your freshman year. You should also take Ch 10 as a freshman. Ch 10 is the best class ever: it fulfills a lab requirement, you take it pass/fail, you get free pizza once a week, and you get the opportunity to do research that can lead to a SURF! Best. Class. Ever. Ch 10ab (first two terms) is a 1 hour seminar once a week during lunch that is given by a professor from the chemistry department. If you enroll in Ch 10c, you’ll have to find a professor to work with and you get lab credit for doing research in their lab during the term. Generally all of the professors who present for Ch10ab are interested in finding students, so it’s a really great opportunity to get started on research. Ch 10 is inconsistent with a few summer programs, however (Ph 11, some external research programs, and internships, for example), and you certainly aren’t required to take it. If you choose not to take it, you will have to take 5 lab courses instead of 4.

After Ch 3a, many (but not all) people take Ch 4 ab, which will introduce you to the wonders of synthetic organic chemistry. Ch 4 follows along with Ch 41 quite nicely, so it’s a good idea to take them at the same time, but it isn’t critical. After that, you need to take two more lab classes (or three if you didn’t take Ch10c), and you can pick whatever you want out of Bi 10, Ch 5ab, Ch 6ab, Ch 7, and Ch 15. Note that you don’t actually have to choose Ch 4ab as two of your lab courses; you can take only one term of Ch 4, or you can circumvent it entirely. Avoiding it entirely is not recommended (it teaches important skills), but people who are more interested in physical chemistry can take one term of Ch 4 (either a or b), Ch 10, and three other labs. Many of the chemistry labs list Ch 4 as a prerequisite, though, so be sure to plan ahead. If you’re interested in biology too, take Bi 10 or Ch 7 (Bi 10 is popular and enrollment is through the lottery). Ch 5ab is a good choice if you’re interested in more advanced aspects of organic or inorganic synthesis, and Ch 6ab is great if you’re interested in physical chemistry. Ch 7 follows the curriculum of Ch 145 (protein chemistry) pretty closely, so take both at the same time if you can—you’ll actually get to do what you learn about in the Ch 145 lectures. Note that although Ch 14 is a prerequisite to Ch 15 (in addition to being a requirement), it is typically scheduled third term, while Ch 15 is scheduled first term. This will force you to plan far ahead if you want to take Ch 15. Ch 14 in its current incarnation is a cross between rate constant problems.
from AP Chemistry and an introduction to mass spectrometry, separation techniques, and chromatography. Each of these is critical to modern chemistry research, so the second half of this course is very useful. Ch 15 is the analytical chemistry lab; the first half of the course develops analytical chemistry skills, and the second half allows you to complete a project of your design in analytical chemistry. This part of the course is as cool as you make it; if you can think of an interesting project, it will be a spectacular experience. You are given access to the full resources of Caltech’s most advanced analytical chemistry lab, and this allows you to do some truly CSI-level stuff.

Inorganic Chemistry: Ch 102 is the introductory inorganic class. It provides a good basis in group theory and a general survey of topics in inorganic and bioinorganic chemistry (including catalysis) and makes Ch 112, inorganic chemistry, much easier. If you will be SURFing in an inorganic lab during your freshman summer or are an inorganic whiz, you may wish to consider taking Ch 102 in the spring of your freshman year (but most people take this during their sophomore year). Ch 153 (advanced inorganic) and Ch 154 (organometallic) are also recommended, usually in your junior or senior years. Keep an eye out for Ch 155 (catalysis), which is a seminar-style class that is offered in alternate years. If you are super hardcore about ligand field theory, accept the challenge and take Ch 213, said to be one of the most difficult classes at Caltech! As far as lab classes go, Ch 5b is a good choice if you’re interested in inorganic—it focuses on glovebox, Schlenk line, and high-vac line techniques and is interesting and helpful whether you’ve had previous exposure to these techniques or not.

Organic Chemistry: After taking Ch 41abc you can take Ch 144 (advanced organic chemistry) and/or Ch 242 (chemical synthesis). Ch 144 is not offered every year, so plan ahead. Ch 242 has an emphasis on the synthesis of natural projects, and sometimes involves a project where you must propose a synthetic route to a newly discovered natural product. Also of potential interest is Ch 250 (advanced topics in chemistry), a pass-fail seminar class with presentations by pharmaceutical companies.

Physical: If you are looking into physical chemistry, you may want to consider taking Ch 21abc sophomore year. The class should give you an idea if physical chemistry is for you. Be aware that you will need to devote time to learning quantum mechanics in this and sophomore physics. Given the physics flavor of physical chemistry, analytical track physics and Ph 12 will be helpful. After this, Ph 125abc is good for improving your understanding of Quantum Mechanics. Ch 6ab is the most relevant lab course; it is scheduled with a lab partner and TA separately each week, which makes it flexible to schedule. It also lacks lab reports, allowing you to focus on lab work. Ch 15 helps build familiarity with different physical laboratory instrumentation and techniques, although the techniques used in Ch 15 certainly aren’t limited in applicability to physical chemistry. All three classes are 10 units at the moment which may be problematic in scheduling them. For more advanced work, you can take Ch 227 (advanced topics in chemical physics) and a variety of other 200-level physical chemistry courses. If you’re interested in biophysics as well, Bi/Ch 170abc (biochemistry and biophysics of macromolecules) is also a good class to take. If you’re interested in thermodynamics and statistical mechanics, Ch 165, Ch 164, and Ch 166, are excellent choices. Ch 122, X-ray crystallography, is popular and useful in building understanding of 3-D molecular structure techniques. Ch 120, the nature of the chemical bond, gives a better understanding of bonding and goes well beyond Ch 1. Ch 144 covers physical organic chemistry if that is your interest. In general, as a physical chemist, you have flexibility in choosing later classes. Ch 147 and Ch 148 teach polymer chemistry and polymer physics, respectively, and are quite useful for people doing research with polymers (common in fluid mechanics and materials science).

Biochemistry: First, biochemistry students can take advantage of the option to
take Ch 24 and Ch 25 in place of Ch 21bc. These courses count for the physical chemistry requirement but will be more useful for students interested in biological applications. Next, there are five official biochemistry courses. The first, Bi/Ch 110, is an introduction to biochemistry. If you’re interested in biochemistry you should definitely take this course. It’s a prerequisite for a lot of other biology and biochemistry related courses. Bi/Ch 111 is a course about gene expression. However, this course requires Bi 122 (genetics) and Bi/Ch 110. If you plan on taking Bi/Ch 111 you should take Bi/Ch 110 and Bi 122 the first term of your junior year (or before). Bi/Ch 113 is about the biochemistry of cellular processes such as cell fusion and signaling. Bi/Ch 132 is a more biophysics focused course, with an emphasis on structural biology. Ch/Bi 231 is a seminar style course in which students research more advanced biochemistry topics and present to the rest of the class. However, it isn’t offered every year and is usually quite a small class, so be sure to contact the professor if you’re interested in taking this class.

Outside of these biochemistry courses there is also Ch 145, a bioorganic chemistry course that goes over peptide synthesis and other interesting aspects of chemical biology. The Ch 7 lab follows the Ch 145 curriculum pretty closely. The BMB/Bi/Ch 170 series is also very useful to an aspiring biochemist, focusing mainly on structural biology. Similarly, BMB/Ch 178 is a must for people interested in enzymes. ESE/Bi 166 is a great course for people interested in glycolysis pathways (this will not automatically qualify as an advanced chemistry elective, so if you’re hoping for that you will need to petition the curriculum committee). Ch 212 is useful for people interested in both inorganic and biochemistry. Ch 146, while seemingly relevant, hasn’t been offered for at least four years so don’t count on being able to take it.

Computational: Computational chemistry is a new and happenin’ field. If you are interested in computational problems and lab work is not essential to your love of chemistry, it might be for you. There are a number of courses to take in this awesome new field. Ch 21, physical chemistry, is helpful in understanding the physical concepts that underlie computational models. Ch 120 and 121, the nature of the chemical bond and atomic-level simulations of materials and molecules, are useful. The latter in particular is one of the few fully computational chemistry classes. Ph 125 is ideal for gaining a better understanding of the quantum physics used in these models. Ph 127abc and Ch 165, 164, and 166 cover statistical mechanics and thermodynamics from different perspectives, which can be useful. Taking additional classes in organic, inorganic, and biochemistry relevant to the computational problems you are interested in is also useful.

Miscellaneous Information: It is often possible to avoid taking Ch 91 to fulfill your scientific writing requirement, although in this year’s catalog this is not explicitly allowed. Many scientific writing courses can be used to replace it, including Ay 31, Ge 13, En 84 (offered by announcement), or E11 (the most generic option). This is important if you have difficulty fitting Ch91 into your schedule or if you’d just rather take a writing class with a slightly different emphasis. Most people take Ch 91/E 11 and Ch 90 (oral presentation) in their junior or senior years, but it is more useful if you take it earlier. It’s best to have a piece of original work to write up during the class, however, so you might want to complete a SURF before taking it.

It is nominally possible to take ESE 142 instead of Ch 14 to fulfill the analytical chemistry requirement. If you can’t fit Ch 14 into your schedule, or if you’re just not crazy about the class, it is in principle an option, and the chemistry department will accept it as a replacement. The current revision of the catalog has removed ESE 142 from the list of courses offered by the ESE department, however, so the future of this option is uncertain. If you are interested in doing research during the school year, you should think about enrolling in Ch 80, a pass-fail class with flexible uniting. If you are a junior or senior, you may be interested in enrolling in Ch 82, the senior thesis course. Both of these options
provide good opportunities to get units for the work you do in a lab, although they do not count towards your laboratory requirements.

CHEMICAL ENGINEERING

Student Writers: Connor Coley, Ashley Guo

The Chemical Engineering undergraduate option branches into four tracks: biomolecular, environmental, materials, and process systems. The course requirements are significantly more extensive than any other major offered (the number of units is about 30% higher than the second-highest major). A consequence of this is that there is very little flexibility in selecting courses; however, it is possible to study abroad, double major, and even both at the same time. Students are encouraged to seek out research opportunities and internships during the summer. While a few students conduct research during the academic year, it is not nearly as common as the Chemistry option. The curriculum is incredibly analytical, but has an increased emphasis on solving physical problems as students approach their senior year design lab. ChE undergraduates have the option of completing a two-term senior thesis (ChE90ab) in place of their second senior lab requirement. ChE post-graduates usually split 50-50 between graduate school and industry.

Option Requirements

With the modification of the Core curriculum, the ChE department has decided to keep most of the requirements from “old Core” with a couple exceptions. Ph2a will be kept as a prerequisite for Ch21a, the physical chemistry course taught by Professor Okumura from the chemistry department, and Ch21a will in turn replace Ph2b. Ch21c, a statistical mechanics and thermodynamics course taught by Professor Miller from the chemistry department, will also be required in place of Ph2c. Likewise, Ma2 will be kept as a prerequisite for the ACM95 series. Ma3 will however be replaced by a statistical analysis course listed under ChE. This class will have a programming focus and will be tailored specifically to ChE undergraduates.

• Ch/ChE9 [Chemical Synthesis Lab]
• Ch21a (in place of Ph2b) [Physical Chemistry]
• Ch21b or Ch24 [Spectroscopy]
• Ch21c (in place of Ph2c) [Statistical Mechanics and Thermodynamics]
• ChE?? (in place of Ma3) [Numerical Methods]
• Ch41abc [Organic Chemistry]
• ChE62 [Separation Processes]
• ChE63ab [Chemical Engineering Thermodynamics]
• Ch/ChE91 or En84 [Scientific Writing]
• ACM95abc [Introductory Methods to Applied Math]
• ChE101 [Chemical Reaction Kinetics]
• ChE103abc [Transport Phenomena]
• ChE105 [Dynamics and Control]
• 3 Science/Engineering Electives/Thesis
• Ec11, BEM102, or BEM103
• Track Electives (Refer to track requirements)

Our Advice on Option Requirements:

• Take CS 1 as a frosh (you’ll need to be comfortable with Mathematica/MATLAB for many of your classes, and this is a nice intro to programming).
• Consider doubling up on humanities at some point your frosh year. This gives you one less class to worry about fitting in during the following three years.
• Take ACM 95abc sophomore year otherwise junior year will be rough.
• The number of requirements can be daunting; ask an upperclassman to help you with your four-year plan! (AIChE also has copies of sample four-year plans from upperclassmen available for review, at least one from
every ChE track)

- The four tracks only matter for about 5 electives junior/senior year. The materials track curriculum looks particularly daunting, but there is actually a lot of flexibility in your choices).
- If you want to study abroad, the best time is senior year fall – you’ll have to do both a design lab and a senior thesis when you get back in winter though!

Research Advice:

It’s pretty typical to get a SURF for the summer after your freshman year. For the following summers, people split into research and industry; most companies don’t like hiring sophomores, so it can be good to stick to research (especially if you’re thinking about grad school). You can look up ChE profs online, or take the ChE 10 pizza class, to get familiar with the type of research available here. Make sure you ask about SURFs early! Remember that space per lab may be limited, and some particularly popular groups are full by the beginning of winter break.

During the year, you can ask the option rep about getting credit for research, or do it “pro-bono.” If you’re thinking of grad school, it’s good to show that you’re interested in research at other times than the summer.

If you want an industry internship, the number of ChE companies at the career fair is pathetic – don’t rely on them to find you! If you’re serious about working in industry (either post-graduation or as an internship), talk to Professor Vicic about your research interests. Ask upperclassmen or professors to connect you to recruiters. You can also get in touch with certain companies by asking the Career Development Center if they have any alumni contacts there. Be proactive!

Advising:

The Caltech chapter of AIChE (American Institute of Chemical Engineers) has a few mentoring programs that can help you figure out what to do with your life and how to do it. Sign up for AIChE at the first career fair and they’ll make sure you have both an upperclassman and an industry mentor. Don’t hesitate to contact members of the AIChE executive committee if you have any questions, whether it’s about a specific concern or ChE in general. They are there to help.

Ask Upperclassmen questions. If you don’t know one personally, you can search the directory or ask AIChE to hook you up.

You’ll be assigned an option advisor once you declare ChE, so develop a good relationship with your prof. If you’re thinking about grad school, they might be writing a recommendation letter in a few years. When you declare ChE, you’ll be given the option to list topics or professors of interest, which helps determine your advisor. Even if you’re super interested in a specific topic, don’t dismiss profs that concentrate in other areas of interest! You might not want to work in their lab, but they might be great advisors.

Double Majoring:

Double majors or minors are certainly possible with the Chemical Engineering option; they just require some pre-planning and forethought. Humanities and Social Science second majors are the easiest to arrange due to the 12 HSS requirements for Caltech students. The most common second-major is BEM: if you focus your 4 “additional HSS” classes on BEM courses, you can get away with only taking 4-5 extra classes. The same is true of humanities majors, although these will require a senior thesis.

Computer Science

So, you’re interested in learning how to survive the Caltech Computer Science major? Here’s a few things you might want to know.

Curriculum:

Two years ago, the introductory CS curriculum was revamped. CS1 is now an introduction to programming (in Python) to people who have never seen...
programming before. CS2 is a survey course, providing breadth and exposure to many different fields of CS. It has changed quite drastically in a few years, but is now converging to a more or less stable state. If you know for sure that you want to major in computer science, you should absolutely take these two classes your freshman year (in fact, if you have not seen programming before, you may want to consider taking CS1 even if you might not major). CS4 is an introduction to advanced programming concepts and is taught in Scheme (a variant of LISP). Note that it is possible to test out of CS1 (common) and CS2 (less common), but not CS4.

Often times your CS upperclassmen know a great deal about the current course offerings, so do use this resource. However, be careful of their advice; some classes produce very divisive opinions, and other classes may change from year to year (such as CS1 changing to its current form with the old version becoming CS4 a few years ago), or depending on what instructor teaches it (such as CS 138 and CS 153).

Another thing to note is that prerequisites very seldom matter. Many of the upper level electives list CS21 and CS38 as prerequisites, but often only assume knowledge from one or neither of these classes. It might be a good idea to know algorithms and some quantum mechanics before taking a quantum computing course, but it might be unnecessary to know the theory behind a Turing Machine before taking a course on graphics. If you’re unsure, ask the prof! I promise they’ll be honest with you. Also, drop day is week 7 and dropping a class won’t kill you, we promise.

The main components of the curriculum look a little bit like this:

**CS1, CS2, CS4:** Introductory courses, as above.

**Ma/CS 6a:** Introduction to discrete math. Some students have found it to overlap a little with CS38. In either case, if you can swing taking it before CS38, it might make the latter. If you take CS38, you might find this class very easy (though that’s not a promise).

**CS 21:** Decidability and computability. This will probably be your first theoretical CS class. It is often highly praised.

**CS 24:** What is going on in that magic black box of a computer? From assembly and hardware up. Introduces a lot of interesting low-level concepts. Currently, there is no advanced version, but that may change soon.

**CS 38:** Introduction to algorithms.

CS 21, 24, and 38 are intended to be done sophomore year, but some freshmen feel like they have the room for them during their first year and think they can handle these classes then. If you think that is the case with you, by all means feel free to try these classes then (more room for electives, right?)

Beyond that are electives, the project sequence, and units in other departments. Electives tend to fall into a few categories: “we have nobody to teach this,” “this is taught whenever someone feels like it,” “we intend this course to be taught about every other year,” “this course is regularly taught about every year.” The department is working very hard to fix courses of the first category, and courses of the second category tend to be survey and seminar-type courses. As far as course content, check out TQFRs, the advice of the upperclassmen, and even "gasp" ask the prof! Sometimes strange circumstances (such as sabbaticals, profs leaving, etc.) can cause certain electives to be sporadically offered. All the CS majors have felt this frustration, but the best advice is probably to not become too wed to a very strict four year plan, but to try to create a flexible schedule so that you can take interesting classes when they pop up.

But what are project sequences? This requirement can be satisfied in three ways. The first way is to find a prof who would be willing to supervise a CS81 project over at least two quarters and have it pre-approved as satisfying these requirements. The second way is to do the same, but do a three quarter thesis (CS80). The third way is to take a set of classes as laid out in the catalog. The CS department has promised to try to teach every project sequence except information and complexity every year (lack of project sequence classes has been an issue in the past). While many students take the third option, there is much to be said for considering the first two. Many students often lament the lack
of a project sequence class that satisfies their particular interests. This is what CS80 and CS81 are for! Profs are very open to supervising these.

You’ll notice that Caltech CS is very theory-oriented. If you yourself are very theoretically oriented, you probably don’t need this paragraph -- it will be very easy to find classes relevant to your interests. If not, you will find that the opportunities to do practical CS are not as evident as at other schools, but it is a lie that you cannot learn anything practical at Caltech. Students taking CS141 have implemented distributed systems. Students in other courses have done kernel programming, machine learning of attacks on Wikipedia, and learned about compilers. If you can’t find a class in the thing you want to learn, find a prof who will be willing to do a one or two term CS81 or a CS90 (reading) with you and perhaps a few other students. Often times at Caltech you will have to take some of your own initiative to learn things, but profs are more than willing to help you where they can.

Research:

A big giant gigantic warning: Most surfs labeled “CS” that look appealing to people without a lot of CS experience turn out to be mostly only coding. This is often the case with “Computer Science” SURFs that are cross-listed with other disciplines.

CS internships pay about three times as well as surfs, and it’s good to get some exposure to industry and see if that’s more your style. You’ll probably have a similar experience in an internship frosh year as junior year, so it’s to your advantage to do an internship early, and SURF later. While good CS frosh SURFs do exist (legend has it there’s some good stuff in the Vision Lab), far too many people are lost to lonely thankless codemonkey jobs in the basements of Caltech and JPL labs. Some advice: taking CS24 and CS38 before doing job interviews may be very beneficial.

If you do have a good project, and a prof to work on it with, credit is available for time spent researching during the year (CS 81).

Advising:

Believe it or not, pretty much all profs and lecturers in CS are approachable. If you’re not sure about something, talk to the professors involved. You will find the vast majority of them remarkably receptive to your problems and comments, and more willing than you’d think to provide frank advice.

ELECTRICAL ENGINEERING

Reasons you might want to be an EE:

- You like building or want to learn how to build electronics – learn what parts to choose for your MP3 player, oscilloscope, or whatever you are building based on specifications and where to buy them.
- You want to build your own chips – transistors, LEDs, microfluidics.
- You want to know how radios and cellphones work – modulate/demodulate a signal while suppressing noise to get your message across.
- You want to write error correcting codes, encode/decode messages, process signals, and more.
- You want to design your own CPU.
- You want to effectively compress, store, and communicate data.
- You want to learn the black magic behind RF.
- You actually want to make biodevices work – not just use them.
- You want to make things go faster, faster, faster and smaller, smaller.

So You Want to be an Electrical Engineer. Now what.

Requirements

- EE 1, APh/EE 9 ab, E 10, E 11, EE 40, 44, 45, EE/CS 51, 52, EE 90, 111, 151, and 160.
• ACM 95 ab, ACM/EE 116.
• EE 113 or CDS 110 a.
• One term of EE 91.
• EE 80 abc, or a sequence consisting of CS/EE 143, 144, 145, or a sequence consisting of BE/EE 189 ab, or one course selected from an additional term of EE 91, EE/CS 53, EE 119 c, and CS/EE/ME 75 c (note that CS/EE/ME 75 ab does not satisfy this requirement).
• In addition to the above courses, 27 units selected from any EE course numbered over 100, or any cross-listed courses numbered over 100 that include EE in the listing.
• Passing grades must be earned in a total of 486 units, including courses listed above.

Advice from Upperclassmen:
• The catalog has suggested schedules, but you’re free to put the classes in whatever order you want to. It’s ok to move requirements to senior year - especially so that you can take a more interesting course sophomore/junior year. Be wary of pushing too many requirements back though.
• Don’t let the classes dishearten you. It looks really daunting, you may be scared you won’t finish, but don’t worry. Just take it one step at a time, one thing at a time, don’t get bogged down in the big picture, focus on each part, and the project suddenly becomes a lot smaller.
• Don’t be discouraged by any single class. People sometimes say “I hated ____ , so I must hate EE.” However, no single class can determine EE. The field has many faces: analog design, digital design, communications, microprocessor systems, optics, systems, VLSI... the applications are endless. Focus on what you’re interested in.
• Just because you’re an EE doesn’t mean you can’t do CS if you want to, many of the best coders I’ve met are EE’s. Knowing how the underlying system works is not to be undervalued, plus it’s much harder for CS majors to learn EE.
• Do personal projects, you learn a ton (way more than you suspect), companies love it, and when you’re done you’ll feel great about it.
• Although you’re going to procrastinate anyway, you have been warned to not do it - especially for EE5x.
• Extensions are traps. Period.

Advice from faculty:
• Go to your adviser to figure out what classes you might want to take – we know what we would like to see if you were applying to grad school at Tech.
• If you have interest in what I am working on, come talk to me.
• GO TO CLASS.

Advice on finding research:
• Talk to upperclassmen, professors, and alumni to get suggestions of who to talk to and how – network, network, network.
• Ask professors what they would expect out of you in order to research with them.
• Don’t be narrow-minded in what you might want to do.
• Think about whether you might eventually want to go to industry or grad school. For industry, try to get an internship from a place you might be interested in working at. You basically get a free trial of the company and chances are it’ll be easier to go back to that company if you like it - they might even offer you a job for when you graduate. For grad school, get a SURF or other research position. If you do well, you will have great recommendations!
• Learn a new language or two.
• Go to the career fairs.
Requirements:
All five of the GPS options require the Ge11 series as well as Ge13 and Ge109, which are the scientific communication courses. Most GPS majors take a writing class besides Ge13 (which hasn’t been offered for awhile), but Ge109 is considered by most to be a pretty excellent course for the verbal communication requirement. The GPS options require two terms each of second-year math and physics courses, but there is flexibility as to which courses may be taken. For more information about the option-specific major requirements, check out the GPS website (gps.caltech.edu/education/undergraduate).

Advice:
Take a variety of classes to figure out what you’re interested in; the majors have a lot of room for flexibility! That said, also take your time to work through required courses, because you have the time and you’ll get a lot more out of the classes if you’re not constantly rushing to complete the work. Find a way to meet and talk to professors and graduate students. Social Hour (5 pm on Fridays on the South Mudd 3rd floor patio) is a great, informal place to do this! Also, go to seminars. There are seminars at 4 pm almost every day, and they are excellent places to start if you’re curious about what earth and planetary scientists actually do. In general, the GPS undergrads are quite satisfied with the division, and if you have any specific questions about any of the majors or which faculty to consider working with, come talk to one of us!

Research:
There are a lot of possibilities for finding research in the GPS department. If you’re looking for an overview of the research that’s being done, then Ge10, our pizza course, may be a good place to start. If you’re interested in learning more about research from a specific field, then seminars could be useful. Every week, there are five seminars (geology, tectonics, planetary science, environmental science, and the general division seminar), so ask an upperclassmen or professor about the day/time/location if you’re interested. If neither of these resources are useful, then talk to people! The division is fairly close-knit; undergrads, grad students, and professors are more than happy to help you find direction.

Math

Required courses. Math majors are required to take ma5, 108, and 109. The course catalog suggests that math majors take ma5 sophomore year, ma108 junior year, and ma109 senior year. Realistically, you’ll want to take ma5 freshman or sophomore year, ma108 sophomore year, and ma109 sophomore or junior year. This will give you at least a year in which you can take any class that requires any one of the “core” math classes. It will also free up your schedule when you know more math and are more aware of what topics in particular interest you.

You are also required to take either ma116a or ma117a or ma6c and either ma121a or ma6a. These are entirely up to you, although we recommend that if you like ma6c you take 116a or 117a and that if you like 6a you take 121a. Ma10 is an oral presentation class and can be taken junior or senior year; it’s recommended that you take it after having completed one or two summer research projects.

Elective courses. Many math majors take ma120, which is a second course in algebra. It’s also common to take ma121abc (in addition to ma6a) or 116abc in addition to 6c. If you enjoy 108, then you should take 110, and if you enjoy 109 then you should take 151. Other than that, you’ll know pretty early on in a course if you have enough background to do well in it, so we encourage you to try things
Collaboration. Almost everyone collaborates in math classes, whether part of general core, major-specific core, or electives. Make sure that you always understand what you're doing, and if the people you work with always seem ahead of you should maybe start the sets earlier, but collaboration is incredibly valuable and highly encouraged (obviously some classes have different collaboration rules from others, but most classes expect you to collaborate on every set, even if not on every problem on every set).

Research. Math is one of the hardest subjects to get SURFs in, especially if you're a freshman. If you want research after your frosh year, you almost definitely need to take ma5 (there are people who get research without having taken ma5, but that rarely happens). It would also be a good idea to start skimming math books at the beginning of the year so that you can get a feel for a topic you might want to pursue. Once you have a topic in mind, you should find a professor or postdoc and ask them if they would be willing to take you as a SURF student. Your sophomore and junior years it should be easier to get research, but you might be expected to come up with your own problem. That said, SURF isn't the only option open to math majors. There are also many, many REU programs that you can apply to around the country. A list of them appears here: www.nsf.gov/crssprgm/reu/list_result.cfm?unitid=5044. You should start looking in November or December since some of the applications are due in early February and you need to get letters of recommendation. Note that since Caltech is on a quarter system, there will be some programs that you cannot apply to because they start before we get out of school for the summer, so pay attention to start date and make sure it's after finals are over. Good luck!

MATERIAL SCIENCE

Engineering and Applied Science: Material Science is a flexible major for those interested in Material Science. It provides a strong background in math, and thermodynamics, and allows for specialization in fields of interest. There are essentially four subsets of classes in material science: chem/cheme which includes polymers, quantum, and computational chem, and ChemE thermodynamics, the more applied physics/physics/electrical engineering approach, which covers nanotech, quantum and semi-conductors, or a more mechanical approach, which covers statics, dynamics, and fracture. The EAS:MS major also allows for a good deal of breadth in general material science fields, instead of requiring you to focus too much on any particular topic. EAS:MS is good if you have a particular interest in material science, and want some flexibility in picking your schedule. It is also good if you prefer a more theoretical approach than that provided by ChE, MechE, or EE. It is not particularly suited for those interested in biomaterials or inorganic materials currently.

Interesting classes:
- Ch120b/121ab: Goddard’s computational chemistry series
- MS90: A really fun lab class, essentially breaking things and looking at how they break
- ChE/Ch147 and 148: Excellent polymers classes
- Ge114ab: A hands on mineralogy class

For research opportunities, there’s a number of labs on Caltech in the MS, Ch, ChE, APh, Ae, GPS and ME departments that do interesting research with material science. Profs are approachable, and there tend to be more grad students in MS than under grad, so it's not too hard to find a spot in a lab. Also, depending on the kind of research you are interested in doing, JPL is another good place to look. They have groups that research composites for space flight.
among other things. Several Caltech professors have groups jointly between Caltech and JPL.

MECHANICAL ENGINEERING

Please see: http://arc.caltech.edu/SFC2013/ME2013.pdf

This is a collection of suggestions from both professors and students. Obviously, people’s experiences vary, and so some advice may seem contradictory.

Advice from Profs:

• Do not take more than 4 scientific/technical courses in one quarter.
• Distribute the HSS and PE requirements out over the four years.
• Pay attention to the development of your writing and communication skills – these skills are critical to your future careers.
• Find a summer internship in engineering.
• Develop your computational skills through CS 1, CS 11, ACM 11, or other computational courses.
• Make connections with at least three faculty members inside and outside of the classroom. You will need references whether you find a job or go to graduate school. The most obvious way to connect with faculty is by attending class and engaging in the lectures (asking questions in or after class, going to office hours).
• Less is more. Don’t try and be involved in everything. However, find at least one project (design project, SURF, senior thesis, solar decathlon…) that highlights your talents and abilities. You can use this project in your job interviews, graduate school applications.
• Strongly consider doing a senior thesis (ME90), especially if you are planning on going to graduate school. It’s also a compact way to simultaneously satisfy much of requirements #5, #6, and #7.
• Be open minded about doing research and taking advanced classes in ME and related options that are "outside your comfort zone". You may discover a new passion!
• Remember, the ME Faculty is small: take advantage of interesting classes and research projects in Ae, Env, BioE, EE, MS, APh, CDS, ACM, etc.

Advice from Students:

• You don’t necessarily have to go to class. If prof writes things on the board that isn’t proofs and the sets are straight from that material, go to class. If the notes are posted online or you can get by with reading the textbook, don’t. However, it is good to go to class to make sure you don’t fall behind.
• Take ACM 95 sophomore year. This will make sophomore year tough but your remaining time here nice and give you lots of time for ME 72 junior year.
• Learn how to program / learn Mathematica and Matlab early. We recommend taking CS1,2,11, and the INTRO TO MATHEMATICA/MATLAB COURSE ACM 11
• Save hums for senior year. You’ll want to enjoy it and you’ll have more time to build ditch day, do fun things, get ready for the world beyond Caltech.
• Be aware that ME115 is the linear algebra behind robotics, not building an actual robot
• Take ME72, which satisfies a lot of requirements. It’s also really fun.
• Don’t wait until senior year to take ME72. The class takes a lot of time and senior year you’ll be busy figuring out what to do after Caltech, whether it is filling grad school applications, going to job interviews, etc.
• Don’t overload; it’s actually physically possible to finish ME in 3 years, so if you’re taking 4 years, enjoy them.
• Take ME 13 as soon as possible if you’re uncertain you want to be a ME.
• Also if grad school doesn’t sound like your thing, don’t feel pressured to have to go. You are a MechE. You can get a job.
KNOW ALL MEN BY THESE PRESENTS:
That we, the undersigned, have this day voluntarily associated ourselves together for the purpose of forming a non-profit corporation under the laws of the State of California, and we do hereby certify:

FIRST: That the name of this corporation is:
ASSOCIATED STUDENTS OF THE CALIFORNIA INSTITUTE OF TECHNOLOGY, INC.

SECOND: That the objects and purposes for which said corporation is formed and the nature of the business to be transacted and carried on by said corporation are as follows, to wit:
(a) To own such property, real or personal, which is necessary to carry out the purpose of the corporation.
(b) To publish an annual for the student body, and to do all things necessary to carry on its publication.
(c) To publish a newspaper for the student body, and to do all things necessary to carry on its publication.
(d) To manage, control and conduct sports, games, contests and other student body events and activities between students, classes, and other schools.
(e) To apply the Honor System between the members of this corporation, and to all scholastic activities, and to the relations between the members of this corporation and the Faculty.
(f) To grant awards for proficiency in scholastics, games, sports, contests, and other student activities.
(g) To conduct this corporation as a non-profit corporation under the laws of the State of California.
(h) To generally conduct, manage and control the business and affairs of this corporation and the students of the California Institute of Technology, and to that end to do all things necessary to carry out the purposes of this corporation.

That this is a corporation which does not contemplate pecuniary gain or profit to the members thereof.

THIRD: The principal office for the transaction of the business of the corporation is to be located in the County of Los Angeles, State of California.

FOURTH: The name and addresses of the persons who are to act in the capacity of directors until the selection of their successors, and the offices they now hold in the unincorporated association, are:

Names: Wallace J. S. Johnson, President
Fred King Vice-President
Euclid Watts Secretary
Robert Kramer Treasurer
Robert Parker Athletic Manager
Neil Snow Publicity Manager
Don Webster Representative at Large
Wendell Miller Representative at Large

The address of each of the aforesaid persons is c/o California Institute of Technology, Pasadena, California.

Authority is hereby granted to the members of this corporation entitled to vote to change from time to time the authorized number of directors of this corporation by a By-Law duly adopted by such members.

FIFTH: All undergraduate students of the California Institute of Technology shall, upon registration and payment of the dues to be provided for by the By-Laws of this corporation, become members of this corporation. There shall be but one class of membership.

The property, voting and other rights and privileges of the members, and their liability for dues and assessments and the method of collection thereof, shall be set forth in the By-Laws of this corporation.

SIXTH: The name of the existing unincorporated association which is being incorporated is “Associated Students of the California Institute of Technology.”

IN WITNESS WHEREOF, and for the purpose of forming this corporation under the laws of the State of California, we, the undersigned, being the President and Secretary of the Associated Students of the California Institute of Technology, an unincorporated association, duly authorized by said unincorporated association so to do, have executed these Articles of Incorporation this 21st day of January, 1935.

Wallace J. S. Johnson
President
Euclid Watts
Secretary
of the Associated Students of the California Institute of Technology, an unincorporated association.

ARTICLE I--PURPOSE

SECTION 1. The Associated Students of the California Institute of Technology (ASCIT) shall exist for the benefit of undergraduates as given in the Articles of Incorporation. ASCIT shall provide representation for students to the Institute, seek to improve academic and nonacademic aspects of student life, provide universal student resources, support publications, and uphold the Honor System.

ARTICLE III--OFFICERS

SECTION 1. CORPORATION OFFICES. The following are the elected general offices of the Corporation. Only registered undergraduates who are Corporation members shall be appointed or elected to an office of the Corporation. Undergraduates must be either a junior or a senior in the fall term immediately following their election to be elected to the offices of President or Vice President.

Office of the President: The President shall be the official representative of the Corporation, and he shall preside at its meetings. He shall be chairman of the Board of Directors and have ultimate responsibility for proper observance of all responsibilities delegated to officers of the Corporation.

Office of the Treasurer: The Treasurer shall receive all money belonging to the Corporation and shall deposit it to the credit of the

ASCIT BYLAWS

Reference
Corporation. He shall keep a full account of money expended and received and make a report of such account once a term at a regular meeting of the Board of Directors, except as the Board of Directors may desire. The Treasurer shall at such time as he may determine, make public the details of the organization funding and reimbursement processes at the beginning of each academic year.

Office of the Director for Social Activities: The Director for Social Activities shall be chairman of the Executive Social Committee. He shall be responsible for the organization of the Corporation’s social activities and shall coordinate them with the social activities of the undergraduate Houses.

SECTION 2. APPOINTED OFFICES. The following are the appointed offices of the Corporation.

Office of the Secretary: The Secretary shall keep a record of the proceedings of the meetings of the Corporation and the Board of Directors and publicly post the proceedings. He is responsible for publicly posting notices of all meetings of the Corporation. He shall oversee communications and act as custodian to the records, the Corporation seal, and the archive. He shall act as liaison to the Board of Directors for all non-academic committee student representatives. The Secretary shall maintain the official copy of the Bylaws, Resolutions, and Board of Directors Policies and Procedures.

SECTION 3. The following elected offices are open to all registered undergraduates: Board of Control Chair, Board of Control Secretary, Conduct Review Committee Student Chair, and Tech Editor(s).

SECTION 4. In the event of the absence of the President, the order of succession for assuming the duties of his office shall follow the order listed in these Bylaws until the Review Committee has appointed an Acting President.

SECTION 5. If an officer ceases to be a registered undergraduate, he shall retire from that office or may petition the Review Committee for permission to continue with the exception of the offices of Board of Control Chair and Board of Control Secretary who may not petition.

ARTICLE IV--THE BOARD OF DIRECTORS

SECTION 1. MEMBERSHIP: The Board of Directors shall consist of the general elected officers of the Corporation. No person shall be elected to more than one office that would entitle him to a seat on the Board of Directors.

SECTION 2. The Board of Directors shall require all officers of the Corporation to comply with its provisions. It shall exercise all other powers in connection with the affairs of the Corporation not delegated to other persons or agencies or reserved for the Corporation itself. The Board of Directors shall have the responsibility to recognize, investigate, and discuss the long-range and immediate problems of the Corporation and to make use of qualified people on and outside the Board of Directors.

(a) It shall have the ultimate power to authorize budget assignments and expenditures and shall adopt a general budget at the beginning of each fiscal year. (b) It shall have the power to make awards and appointments as provided in these Bylaws. (c) The Board of Directors may form temporary committees responsible to itself, for the investigation and discussion of Corporation problems. (d) It shall have the power to pass Resolutions concerning policy and operations of the Board of Directors.

SECTION 3. MEETINGS. Meetings of the Board of Directors shall be held at least once a week—except during Rotation, final examinations, and vacations—at the call of the President, or of any two members of the Board of Directors. Four members shall constitute a quorum. Issues concerning the full Board of Directors will take precedence over business concerning only a portion of the Board.

SECTION 4. STAFF. The Board of Directors may choose to create staff positions to assist with the responsibilities of officers of the Corporation, with the approval of the Review Committee. Staff positions must be voted upon in a Board Resolution. The officer receiving the position retains responsibility for the staff. All staff positions and resolutions expire upon retirement of the associated officer and cannot be reappointed without reapproval of the position and resolution by the Review Committee.

SECTION 5. RESOLUTIONS. The Board of Directors may pass Resolutions upon approval of four members. The Secretary shall record and make public all Board Resolutions. Resolutions concerning the formation of a committee or office shall require the approval of the Review Committee. Approved staff positions and their duties will be recorded in a Resolution.

SECTION 6. POLICIES AND PROCEDURES. The Board of Directors may direct the staff to carry out its duties in accordance with these Bylaws. These policies and procedures may be amended upon approval of four members. Any significant change must be announced to the Corporation at least one week prior to its enactment.

ARTICLE V--COMMITTEES

SECTION 1. The Academics and Research Committee shall consist of the Chairman, a Secretary appointed by the committee, one member elected from each of the houses, and at least two additional at-large members appointed by the committee. The House-elected members shall be elected during second term each year using procedures determined by each House. The Committee shall be responsible to the Board of Directors for actively enhancing the academic and research experience available to undergraduates at the Institute. The Committee shall act as the nominating committee for all academic committees. The Committee Secretary shall serve as liaison to all academic committees.

SECTION 2. The Interhouse Committee is a body entirely separate from the Corporation, existing to fulfill the purpose outlined in its Definition and is derived from the Institute undergraduate residential House System. The Committee represents the members of the Houses to the Board of Directors via the Interhouse Committee Chairman. The Board of Directors defers some of its responsibilities regarding committee appointments, Institute representation, and intramural sports to the Committee. The Interhouse Committee is the final authority on all non-academic Faculty Board committees. All recommendations made by the Committee by three weeks before the end of the academic year will be approved by the Board of Directors.

For positions the Interhouse Committee has not made recommendations by that time, the Board of Directors and previous committee representatives may act as the nominating committee at the discretion of the President.

SECTION 3. The Executive Social Committee consists of a Chairman, one member elected from each of the Houses, and at least three additional at-large members appointed by the committee. The Committee shall be responsible for planning and organizing all social functions of the Corporation and shall meet at least once each month of the academic year.

ARTICLE VI--REVIEW COMMITTEE

SECTION 1. MEMBERSHIP: The Review Committee shall have a Chairman and voting members consisting of one ASCiT member from each undergraduate House selected by the Interhouse Committee before the beginning of the third term. Members of the Board of Directors may not serve on the Review Committee.

SECTION 2. DUTIES: The Review Committee shall have the power to interpret the Bylaws. The Committee will oversee all Corporation elections and appointments. It shall have the sole power to consider the validity of protests, to rescind invalidated elections, and to appoint persons to fill vacancies in the Board of Directors. The Committee will verify that the Resolutions and policies of the Board of Directors are in accordance with the Bylaws, Resolutions, and policies and procedures. The Committee may initiate the recall election of any officer without petition.

SECTION 3. MEETINGS. The Review Committee shall be held at least once each month of the academic year at the call of the Chairman of the Committee, any two members of the Committee, or a petition of 10% of Corporation members. Rulings shall be made by a two-thirds vote. A record of rulings shall be maintained by the Corporation Secretary.

ARTICLE VII--ELECTIONS, APPOINTMENTS, AND PROCEDURES

SECTION 1. Election Periods. Nominations for CRC CoChair, IHC Chair, BoC Chair, BoC Secretaries, and Tech Editors shall open at 8 A.M. on the 9th Monday of term and shall close at 5 P.M. the following Friday. Nominations for all other elected offices shall open at 8 A.M. on the 3rd Monday of term and shall close at 5 P.M. the following Friday. All nominated candidates shall be listed on an ballot and voted upon at elections to occur the Monday immediately following the closing of nominations for that office. (See SECTION 2. Announcements, The Review Committee Chairman shall publish an announcement in the issue of The California Tech immediately preceding the opening of these nominations. Only nominations for current ASCiT members shall be considered valid. The Review Committee Chairman shall compile a list of candidates and confirm that those candidates accept the nomination. The California Tech and Donut shall publish that complete list of nominated candidates and any statements they wish to make. The Review Committee Chairman shall post nomination sheets, announce nominations, and announce when the election is to be held.

SECTION 3. Voting Procedures. Voting shall be conducted online. Voting will take place from 10:00 A.M. to 11:59 P.M. on the day of the election. Absentee ballots shall be allowed in the case of a voter who expects to be absent on the day of an election.
Absentee ballots must be filed with the Review Committee Chairman no later than the midnight prior to the election. Voting by proxy is prohibited. All ballots shall be cast secretly.

SECTION 4. Voting Privileges. All registered undergraduates may vote for the Board of Control Chairman, the Board of Control Secretary, the Interhouse Committee Chairman, and the Conduct Review Committee Student Chairman. Only members of the Corporation may vote for other elected officers.

A voter may cast no more than one ballot in each election.

SECTION 5. Ballot Procedures. Each voter shall rank the candidates for each office in order of descending preference, with 1 (first Rank) representing the most preferred. For the first Rank, the voter may choose one of the following:

(a) a nominated candidate,
(b) any other legally qualified person,
(c) the word "NO,"
(d) abstaining.

For Second Rank (2) and subsequent Ranks, "NO" is not permitted. No candidate may be ranked twice, and no candidates may be ranked equally. A voter may abstain at any point in the ranking by leaving the remaining Ranks blank. A ballot conforming to these guidelines shall be considered correctly-cast.

SECTION 6. Counting Procedures. In order to win the election, a candidate must receive an absolute majority of votes. Absolute majority shall be defined as more than half the number of correctly cast non-abstaining votes. The Review Committee shall conduct the Count Process as follows:

(a) For each office, all correctly cast ballots shall be organized and counted according to first Rank votes. If no candidate receives more than the number of "NO" votes, then there shall be a vacancy in that office. If not, the "NO" votes shall be distributed among the candidates according to Second Rank, (b) If no candidate has an absolute majority of votes, the candidate with the least number of votes shall be eliminated, and each of that candidate’s ballots shall be redistributed among the remaining candidates by next available choice ranked. If all remaining candidates on a ballot have been eliminated, then that ballot shall be considered an abstention. (c) If a candidate now has an absolute majority of votes, that candidate wins. If not, steps (b) and (c) shall be repeated until a winner has been determined.

SECTION 7. Reporting. The Review Committee Chairman must release and post the report of the Review Committee no earlier than 11:59 P.M. on the first day following the election and no later than 10:00 A.M. the second day following the election. This report shall be posted on Donut. Numerical results will not be made public until all officers have been elected. All protests must be given in writing either to the President or the Chairman of the Review Committee. If no protests are received prior to 11:59 P.M. on the first day following the election, the report of the Review Committee will be considered valid and final. Upon receipt of a valid protest, all scheduled elections must be postponed for one week, pending resolution of the difficulty. All contested election results shall be withheld until all protests for the respective elections have been resolved.

SECTION 8. Installation of CRC CoChair, IHC Chair, BoC Chair, BoC Secretaries, and Tech Editors will take place at the start of 3rd term.

Installation of all remaining Officers will take place 7th Monday of 3rd term.

An oath of office shall be administered by the retiring President to the incoming President which may take the following form: "I do solemnly swear that I will support the Articles of Incorporation of the Associated Students of the California Institute of Technology, Incorporated, and that I will discharge the duties of the office to which I was elected to the best of my ability."

The President shall administer the oath of his choice to the incoming Board of Directors.

SECTION 9. Retirement. All general officers of the Corporation shall retire immediately upon the installation of their respective successors.

SECTION 10. Vacancies. In the event of a vacancy of any elected office due to "NO" winning the election, the current officer holder will not be forced to retire their position. Upon retirement, the Review Committee may appoint an acting officer to fill the office and perform all of its duties.

In the event of a vacancy of any elected office not due to an election decision, the Review Committee may appoint an acting officer to fill the office and perform all of its duties.

The Review Committee shall convene within two weeks of notification of the vacancy to either appoint an acting officer or defer appointment of an acting officer to a special election. A special election to replace an acting officer may be initiated by a petition of 10% of students allowed to vote for that office. If the vacancy resulted from recall of an elected officer, special election to replace the recalled officer occurs automatically. The Review Committee may choose to defer any acting officer appointment to a new special election. During these special elections, standard election procedures shall be followed with the exception that the nominations will be opened on the Wednesday immediately following the deferral decision of the Review Committee or the presentation of the petition to the Review Committee. An individual may have no more than one vote despite performing the duties of more than one Board of Directors office.

In the event of a vacancy of any appointed position, the body with original appointment power may restart their standard appointment decision process.

If an officer for any reason finds he will be unable to perform his duties for five consecutive weeks, he must retire or petition the Review Committee for permission to continue his office.

SECTION 11. Appointments. The Corporation Secretary shall announce the availability of any open Board of Director appointed offices and publicly post a nomination sheet. Application periods for the appointed offices shall be opened as soon as possible after the first meeting of each new Board of Directors. Application periods shall remain open at least one week.

The Board of Directors shall interview these applicants for appointed offices. The interviews and appointments shall be closed, but the Board of Directors may invite certain individuals to assist with the interview and the selection.

Appointments to these offices shall be made by the Board of Directors no later than two weeks after the application period for those offices are closed.

SECTION 12. Non-election votes. For non-election votes, the winning proposal must receive an absolute majority of votes.

Absolute majority is defined as follows:

(a) In votes requiring a simple majority, absolute majority shall be defined as half the number of correctly-cast non-abstaining votes.
(b) In votes requiring a two-thirds (2/3) majority, absolute majority shall be defined as two-thirds (2/3) of the number of correctly-cast non-abstaining votes.

ARTICLE VIII.--RECALL

SECTION 1. Any elected officer may be recalled in a special election. A special election shall be held upon presentation of a petition bearing the signatures of twenty percent (20%) of those eligible to vote for the office or by request of the Review Committee. Signatures will be valid only if the petition was signed not more than seven days before it was submitted to the Board. On the question of whether or not the officer shall be recalled, an affirmative vote from two-thirds (2/3) of the voters shall suffice to remove him from that office, otherwise he shall continue.

SECTION 2. Any appointed Board of Director appointed officer may be recalled by a two-thirds vote of the Board of Directors.

SECTION 3. In the event of a successful recall of an elected officer, nominations will open the Wednesday immediately following the removal of the ejected officer and a special election following standard elections procedures will be held within two weeks. The successor will take office immediately upon election.

In the event of a successful recall of an appointed officer, applications for the office will open immediately and the standard appointment decision process will be concluded within two weeks.

SECTION 4. Any appointed committee member may be recalled by a two-thirds vote of the body with the corresponding appointment power.

ARTICLE IX.--FISCAL

SECTION 1. DUES. The Corporation dues shall be payable on registration day of each term at the rate given in the schedule.
Dues for each term shall be non-refundable after add day of said term. Of the dues, 10% each term shall be for a subscription to The California Tech.

SECTION 2. BUDGET. Upon entering office, the new Board of Directors shall adopt a budget to govern all Corporation expendi-
tures for the following fiscal year.

SECTION 3. AUDIT. All the books of account of the Corporation including those of the Big T and The California Tech shall be submitted by the Treasurer to a certified public accountant at the end of each fiscal year for auditing. The fiscal year shall begin on October 1st and end on September 30th. The audit shall cover the entire fiscal year concerned, including all checks and bank statements, purchase orders, bills, and receipts.

SECTION 4. CHECKS. The President and Treasurer shall have the power to sign the checks of the Corporation.

SECTION 5. BIG T ASSESSMENT. Each Corporation member will be assessed thirty-six dollars ($36) for the Big T, payable on the days of registration at the rate of twelve dollars ($12) per term. A member withdrawing before the end of third term may either receive a refund for installments paid, or complete the payments and receive an annual. Before the end of third term, a member who does not wish to receive a copy may, upon written request to the Business Manager of the Big T, receive a refund of any installments paid toward that year's book.

ARTICLE X--PUBLICATIONS

SECTION 1. The official publications of this Corporation are:
(a) California Tech, a newspaper published at least once a week, except during finals and vacations,
(b) Big T, an annual published once a year,
(c) little t, a student handbook published once a year,
(d) Totem, a literary art anthology published once a year,
(e) Donut, a website.

SECTION 2. The officers of these publications are:
(a) for The California Tech: Editor(s), elected by the Corporation; and Business Manager, appointed by the Board of Directors.
(b) for the Big T: Editor(s) and Business Manager, both appointed by the Board of Directors.
(c) for the little t: Editor(s) and Business Manager, both appointed by the Board of Directors.
(d) for Totem: Editor(s), appointed by the Board of Directors.
(e) for Donut: A Development Team, approved by the Board of Directors.

SECTION 3. The officers of each publication are solely responsible to the Board of Directors for that publication’s success. The Board of Directors may make recommendations to the publication's officers in regard to policy or finances. The Board of Directors is ultimately responsible for the circulation and finances of the publications. The Director of Operations shall be responsible for maintaining communication with publication officers on the progress of publications.

SECTION 4. The Editor(s) of each publication is responsible for the selection and preparation of all content of that publication exclusive of advertising material. He is responsible for meeting deadlines agreed upon with printers or other contractors. His responsibilities terminate after the publication is printed.

SECTION 5. The Business Manager of each publication is responsible for all funds belonging to that publication. The Business Manager is the only one empowered to transact business in the name of a publication. His responsibilities terminate after distribution of the publication, invoicing of all advertising and receivables, payment of outstanding bills, preparation of adequate financial records, and, in the case of the Big T and the little t, the collection of revenues from advertising and other sources. If no Business Manager is appointed for the publication, these responsibilities are also those of the Editor(s).

SECTION 6. Receiving ASCIT funding is contingent upon the following conditions. All publications must be completed and distributed to students in a timely manner. The Tech shall publish ASCIT minutes, the Interhouse Committee Rotation schedule, and the candidates list and statements for ASCIT elections. The Articles of Incorporation, these Bylaws, Board of Director Resolutions, and rulings of the Review Committee shall be kept current on the Donut website and published each year in the little t in completely amended form. Donut must also make posting announcements, minutes, and general information convenient for Board members. The Review Committee shall mediate disputes between the publication officers and the Board.

ARTICLE XI--PRIVILEGES OF MEMBERSHIP

SECTION 1. All members of the Corporation shall be entitled to:
(a) The right to hold a Corporation office, in accordance with the provisions of these bylaws.
(b) One vote in each corporate election.
(c) One subscription to all Corporation publications.

ARTICLE XII--CORPORATION MEETINGS

SECTION 1. Corporation meetings may be called at any time by the President or the Board. Twenty-five percent of the membership shall constitute a quorum.

SECTION 2. The Corporation may exercise all powers consistent with the Articles of Incorporation and these Bylaws. In all questions of procedure for which provisions are not made in the Bylaws, the current edition of Robert’s Rules of Order shall determine the rule.

ARTICLE XIII--BOARD OF CONTROL

SECTION 1. Purpose and Duties. The Board of Control (BoC) shall review all cases of alleged violations of the Honor System and shall make recommendations to the Dean of Students for action in those cases in which a violation is found to have been committed.

SECTION 2. Membership. The activities of the BoC will be led and reviewed by the BoC Chair. The two BoC Secretaries shall assist the Chairman in investigation and case organization. The voting members of the Board shall consist of: two members elected from each of the undergraduate houses, three at-large members appointed by the BoC, and one member elected by students outside of the Houses.

(a) All BoC members shall serve a term of one year. The BoC representatives shall be selected as follows:
(i) House representatives shall be elected each year by vote of the members of that House. Voting shall be open to all registered
undergraduates who are members of the House and who have not yet voted in another election for BoC representative. A candidate may run in any House, but students may only vote in one House. All representatives must be elected before the eighth week of second term.

(ii) At-large representatives shall be appointed each year by the newly elected Board members before the end of second term.

(iii) The election for the off-campus representative shall be run by the Review Committee before the eighth week of second term. Elections will be announced and conducted as specified in Article VII. Registered undergraduates who did not vote in an election for House representative may vote for the off-campus representative.

(b) If a BoC member fails to register or takes a leave of absence at any time during his term of office, said member shall retire from that office immediately. Only registered undergraduates may serve on a case.

(c) If a BoC member retires before his term of office expires, he shall be replaced in the manner of his selection. The new representative shall serve for the remainder of the term.

(d) All BoC representatives must attend a formal training before they may serve on a case. Training shall be conducted by the Chairman and Secretaries with assistance from the Dean of Students and former Board representatives. Training must be completed before the beginning of third term. The training shall be open to any member of the Caltech community at the discretion of the Chairman and the Dean.


(a) Reporting. Violations of the Honor System may be brought to the attention of the Board by any member of the Caltech community.

(b) Preliminary Investigation. When a suspected violation of the Honor System is reported, two members of the Board will conduct a preliminary investigation. The Chairman and one of the Secretaries will conduct this investigation unless one or both of them must excuse themselves, in which case the Chairman shall appoint suitable replacements. The preliminary investigation will be conducted as follows:

(i) The investigators will require any persons involved to discuss their knowledge of information concerning the case and will receive copies of all relevant evidence.

(ii) The investigators will determine whether the case will be brought to a full hearing of the Board or should be dismissed.

(iii) All potential defendants will be informed of all potential violations cited in the initial report. In addition, they will be informed of any current or former Board members or House presidents who may hear the case.

(iv) The defendant may select an assistant representative who may be present at the preliminary meeting and any future meetings. The defendant may consult this representative for explanations of Board proceedings and for information regarding the resources available to him. The assistant representative must be selected from a list of current or former representatives or House presidents and approved by the Chairman.

(c) Hearing.

(i) If a defendant feels that particular Board members are unable to render an unbiased judgment, a request may be made to the Chairman or the Dean of Students before the start of the full Board hearing that those members not sit on the case.

(ii) If a Board member feels unable to render an unbiased judgment in a particular case, that member should disqualify himself. Furthermore, no member of the Board shall sit in judgment of his own case. The preliminary investigators shall not have a vote on the Board.

(iii) No Board representative shall conduct any investigation outside a hearing except at the instruction of the Chairman.

(iv) Any person appearing before the Board at a hearing will be informed of the reasons for their presence.

(v) At any point before or during the hearing the defendant may select a silent witness with whom he may speak about his case. The silent witness may accompany him to any future meetings with the BoC. This silent witness must be a member of the Caltech community and approved by the Chairman. Additional silent witnesses may be granted only at the discretion of the Chair and the Dean of Students.

(vi) A defendant may be accompanied by an assistant representative and a silent witness. During the hearing, the defendant may request an aide with the assistant representative and may speak with him at any time for clarification or explanation. All those accompanying him to a BoC hearing must not disrupt or interfere with the proceedings of the Board in any way, and shall be immediately removed at the Chair’s discretion if such disruption occurs.

(vii) Seven (7) voting members of the Board shall constitute a quorum. If needed to maintain a full quorum of the Board, the Board shall reserve the right to ask a past BoC representative or a current House president to serve on a case, contingent on a three-fourths (3/4) vote of the remaining voting Board members. All those serving on a case are bound to secrecy.

(viii) In case of absence or disability of the Chairman, the Board shall select a temporary chairman from among their number who, while acting as Chairman, shall not have a vote. In the case of absence of the Secretary, the Chairman shall appoint a temporary Secretary, who shall not have a vote.

(ix) A defendant attending a hearing of the full Board may ask the Chairman at any time for permission to hold a short, private recess with a Board member of the defendant’s choice. Any new information pertaining to the case revealed in this conference will be shared with the full Board. The member shall remain able to vote on the case.

(x) OATH. The oath taken by all persons appearing before the Board of Control shall be: “I do solemnly swear (or affirm) to tell the truth, the whole truth, and nothing but the truth.”

(d) Decisions.

(i) When a case is brought to a hearing of the full Board, the Board will make three decisions:

  1. Conviction: Whether or not an Honor System violation has been committed.
  2. Nullification: How to nullify the advantage that has been taken.
  3. Protection: How to protect the Caltech Community from future violations.

(ii) Before the Board votes to convict, the defendant will be shown all physical evidence pertaining to his case and given a reasonable opportunity to respond.

(iii) Before a vote for conviction or dismissal, all aspects of the case must be thoroughly considered. A three-fourths (3/4) vote of the voting members of the Board present shall be necessary for any decision of the Board except case dismissal or the tabling of a case, which shall both require a simple majority.

(iv) No decision of a previous Board shall be revoked by any Board, unless the Board is convinced that new evidence or changed conditions change the status of the original case.

(v) In cases resulting in conviction, the Chairman and Secretary must make clear to the defendant the Board’s basis for its decisions, including but not limited to the main line of reasoning that led to conviction.

(e) Confidentiality.

(i) All those appearing before the Board, and the Board itself, are expected to maintain absolute secrecy regarding case meetings of the BoC. Divulgance of any of the proceedings shall be considered a violation of the Honor System.

(ii) Should the defendant wish to discuss the issues involved in his case with others, after his case has been completed, he may do so in any time, provided others to independent of the case of the case that any knowledge of others defendants is made public without the permission of those persons. However, once the defendant initiates discussion, others in the case are no longer bound to secrecy.

(iii) If, in a particular case, the Board shall deem it wise to make known the proceedings of the Board, the Chairman shall be empowered to, upon resolution of the Board, to convey such information without disclosing the names or identities of any persons involved.

(iv) When a case is reported to the Board by some member of the Community, the Board will inform this member that the case is being considered. If any grade changes or status changes are necessary, the appropriate faculty member or administrator will be notified of the need for such changes at the close of the case.

(f) Records. Records of the proceedings of the Board are to be kept by the Secretaries.

(i) The Chairman and the Secretaries shall have the sole power to access the BoC records and shall do so only on official business of the Board.

(ii) The official minutes of proceedings resulting in convictions shall include the names of all persons concerned, the decisions reached by the Board with corresponding vote tallies, a description of any previous convictions, as well as the names of the
members of the Board present.

(i) The BoC may collaborate with the Graduate Review Board (GRB), the Dean of Students, the Director of Residence Life, and the Conduct Review Committee.

(ii) If a case involves both a undergraduate and graduate defendant, the Chairman and Secretary may conduct the preliminary investigation with the Chairman and Secretary of the GRB. The Chairman and Secretary of the GRB may sit in on the Board hearing for the case and shall not have a vote. The GRB shall have access to the records for this case.

(h) Review and Appeals.

(i) The Dean of Students will review all cases resulting in conviction conducted by the Board of Control. The Dean reserves the right to call for a reinvestigation of any case resulting in conviction upon suspicion of bias, incomplete information, or if additional relevant evidence becomes available.

(ii) Persons convicted of an honor code violation by the Board may raise objections to any aspect of the Board’s conviction, nullification and protection decisions for consideration by the Dean, who could make an independent assessment if warranted. The defendant should submit such objections in writing along with any supplementary material to the Dean within 10 days.

(iii) Final decisions for persons convicted of an honor code violation by the Board are made by the Dean, except as possibly modified through point (v) below.

(iv) The Dean shall be consulted in all cases the Board wants to dismiss, whether as a result of the preliminary investigation or a full hearing, without the names or identifying details of any involved persons being revealed. As a result of this consultation, further action by the Board may be agreed upon by the Board and Dean. If this further action leaves the Board’s decision to dismiss unchanged, or if no further action is taken, then the dismissal decision becomes final. Final decisions for persons dismissed of an honor code violation are made by the Board. All finalized dismissals shall be reported to the Dean for the purpose of keeping anonymized statistics.

(v) Cases resulting in leave shall receive a procedural review through the Vice President for Student Affairs. ARTICLE XIV—CONDUCT REVIEW COMMITTEE

SECTION 1. The position of Conduct Review Committee Chairman is not a Corporation office and shall be open to any undergraduate. Procedures for electing the Conduct Review Committee Chairman will follow those as outlined in Article VII.

SECTION 2. MEMBERSHIP. The student representatives on the Conduct Review Committee shall consist of the Conduct Review Committee Chair, one representative from each of the undergraduate houses, elected by the members of that House, and one member elected by students living outside of the Houses.

(a) The representatives from the Houses shall be elected each year in accordance with the election procedures determined by the House. A candidate may declare his candidacy in any House, but all students shall vote in the House with which they are affiliated at the time of the election. Students not affiliated with any House may register to vote in the House of their choice. Students not registered nor affiliated with a House at the time of the election may not vote.

(b) Students affiliated with more than one House may only vote in one House.

(c) Students living outside the houses and associated off-campus alleys shall be eligible to elect one representative in an annual election organized according to procedures determined by the electors. Eligible students who choose to vote in the election for off-campus Conduct Review Committee Representative may not vote for Conduct Review Committee Representatives in one of the Houses.

(d) In the event that a Conduct Review Committee representative from the Houses retires before his term of office expires, the House shall elect a replacement for the remainder of the term of office in accordance with the election procedures determined by the House.

ARTICLE XV—AMENDMENTS

SECTION 1. These bylaws may be amended in the following manner. The amendments may be proposed by official action of the Board of Directors, or by submission to the Board of Directors of the proposed amendment signed by twenty percent (20%) of the members of the Corporation. The President shall then call an election of the Corporation within fifteen (15) days after the proposal of the amendment.

SECTION 2. No Bylaw amendment concerning the Board of Control or the Conduct Review Committee shall be made by any vote restricted to Corporation members. Such amendments may be proposed by official action of the Board of Directors, or by submission to the Board of Directors of the proposed amendment signed by twenty percent (20%) of the registered undergraduate students. The President shall then put the amendment to a vote open to all registered undergraduates within fifteen (15) days after the submission of the amendment.

SECTION 3. Notice of the election and a complete statement of the amendment shall be posted and published at least seven (7) days previous to the election. For passage, an amendment must receive a two-thirds (2/3) majority vote.

ARTICLE XVI—ADOPTION

SECTION 1. These bylaws shall become operative immediately upon passage.
to the BoD at any point during the academic year. (d) ASCIT funding will be given by reimbursement only. Clubs that have been allocated funding must contact the ASCIT Treasurer for reimbursement. (e) Only clubs officially recognized by ASCIT may receive funds from the ASCIT Treasurer.

RESOLUTION V – THE ASCIT TEACHING AWARDS
SECTION 1. ASCIT acknowledges the need for Teaching Awards as a means of recognizing individuals who excel in inspiration and motivation of students, approachability and concern for students, and effective and efficient communication of course material – qualities which otherwise go largely unwarranted.
SECTION 2. The Academics and Research Committee shall be responsible for gathering information from any available sources and rating instructors and teaching assistants by any means previously approved by the Board of Directors.
SECTION 3. The Academics and Research Committee shall determine the recipients of the Teaching Awards by the 6th Monday of third term, and present the awards prior to the end of the academic year. The Board of Directors and the Academics and Research Committee shall determine the form of the awards each year.
SECTION 4. Four awards shall be presented to course instructors and four to teaching assistants without regard to title. No individual may receive an award if they have received an award in the past two academic years.
SECTION 5. The awards shall recognize excellence in teaching for the academic year in which they are presented, as well as the third term of the previous year. Previous experience shall not be relevant.
SECTION 6. The Director of Academic Affairs shall maintain a permanent record of the Teaching Award recipients, which will be available to all members of ASCIT.

RESOLUTION VI – MULTIHUSE FUNDING
SECTION 1. ASCIT shall provide $200 per house per term for activities facilitating multi-house interaction.
SECTION 2. ASCIT shall provide $500 per house per fiscal year for large Interhouse parties.
SECTION 3. The Board of Directors shall determine whether a specific event satisfies the requirement for multi-house interaction or an Interhouse party.
SECTION 4. The BoD must be informed of a multihouse funding request either in person or through the Social Director or Treasurer before the event to be funded.

RESOLUTION VII - DUES AND ASSESSMENT ADJUSTMENTS
SECTION 1. Notice of modifications to ASCIT dues and assessments shall be given, in writing, to the following offices upon approval of such changes by the student body: Student and Employee Accounts, Collections; Vice President for Student Affairs; and Financial Aid Office. The Board of Directors shall be responsible for notifying those offices in writing as soon as the Board is aware of the possibility that such action might be taken.
SECTION 2. The Board of Directors shall not pass adjustments in dues or assessments during third term in consideration of Caltech offices that require time to update their records to reflect the changes.

RESOLUTION VIII - JAMROOM
SECTION 1. The Jamroom exists to provide reasonable, student-managed practice space for Caltech community musicians and bands. The equipment in the Jamroom is the property of ASCIT. ASCIT shall fund the Jamroom at a sufficient level to keep it operational, but the Jamroom manager may solicit additional funds from other sources.
SECTION 3. All those affiliated with Caltech (JPL, Staff, Faculty, Grad, or Undergrad student) are eligible for Jamroom membership. Membership fees shall be $30 per year for anyone with a Caltech ID or $40 for anyone with a JPL ID and lasts for one year.
SECTION 4. The Board of Directors shall appoint (a) Jamroom Manager(s) under recommendation from past Managers. The Manager(s) shall ensure that equipment and facilities are properly maintained, keep an inventory of the equipment, organize and manage the membership, and spend the money allocated to the Jamroom in accordance with its budget. The Jamroom Manager(s) shall be (a) Jamroom member(s), but not necessarily (an) ASCIT member(s).
SECTION 5. The Jamroom Manager(s) shall serve ex officio on the ASCIT Executive Social Committee.

RESOLUTION IX - DONUTS AND BAGELS
SECTION 1. There will be free donuts provided on Friday mornings and free bagels provided on Monday mornings to all ASCIT members, except during final examinations, Rotation, and vacations. This shall be the foremost duty of the ASCIT President, though he may seek assistance.
SECTION 2. Free donuts for ASCIT members shall also be provided at midnight once each term.
SECTION 3. The Donut Man (a.k.a. Far Foster’s) of Glendora shall be the Official Donut Provider of the Corporation for the termly Midnight Donuts event.

RESOLUTION X - DELEGATION OF NOMINATION AUTHORITY
In light of the fact that the Faculty Board believes that ASCIT should be the body that appoints students to Faculty/Student Committees.
SECTION 1. ASCIT shall appoint student members to the Faculty/Student Committees in accordance with the rules set forth by the Bylaws of the Faculty Board.
SECTION 2. ASCIT shall delegate nomination authority of the following Faculty/Student Committees to the Academics and Research Committee (ARC): Academic Policies, Core Curriculum Steering, Council for Undergraduate Education, Curriculum Committee, Exchange Programs and Study Abroad, Housner Fund, and the Library Committee.
SECTION 3. ASCIT shall delegate nomination authority of the following Student/Faculty Committees to the Interhouse Committee (IH): Athletics & Physical Education, Computer Advisory, Convocations, Foreign Students and Scholars, Freshman Admissions, Health, Institute Art, Institute Programs, Moore-Hufstedler Fund, Parking, Scholarships & Financial Aid, Sustainability Council, Student Life & Housing, Undergraduate Academic Standards and Honors, and Upperclassman Admissions.
SECTION 4. Nomination authority for any remaining Faculty/Student Committees, including any ad-hoc committees, shall be delegated to the ASCIT Board of Directors and its associated bodies.
SECTION 5. ASCIT requires that student appointees to the Faculty/Student Committees give regular feedback to the ASCIT Secretary.

RESOLUTION XI – ASCIT SCREENING ROOM
SECTION 1. The ASCIT Screening Room was created in order to provide a high-quality, on-campus, sponsored facility for ASCIT members to view digital content.
SECTION 2. The online reservation system on the ASCIT Donut website shall determine who has reserved the room. The individual who has reserved the timeslot and specified the movie shall have priority. Any ASCIT member may reserve the Screening Room online at the ASCIT Donut website. Guests may attend Screening Room activities, but only current ASCIT members may make reservations. If a member who has reserved a timeslot decides not to use that timeslot as he has originally specified, he has an obligation to change or not present in the Screening Room at any time after 30 minutes after the start of the reservation, the remainder of the reservation may be considered cancelled.
SECTION 3. The Screening Room shall only be reserved for projector use. “Movie marathons”, etc. are not allowed if others are waiting to use the room.
SECTION 4. Screening Room patrons should use appropriate judgement in determining that usage of the Screening Room is in accordance with the Institute Policy on Acceptable Use of Electronic Information Resources. ASCIT is not responsible for the actions of Screening Room patrons.

RESOLUTION XII – STUDENT-FACULTY CONFERENCE
SECTION 1. A Student-Faculty Conference (SFC) shall be held between February and April of every odd year to maintain open lines of communication between students and faculty and to improve academics and campus life.
SECTION 2. A limited number of topics of discussion shall be decided upon prior to the SFC by the ASCIT Vice President for Academic Affairs.
SECTION 3. Committees formed prior to the SFC shall study and investigate the topics. The ARC shall appoint students to these
IHC DEFINITION

Article I - Prologue
The Interhouse Committee of the California Institute of Technology shall exist for the purpose of providing a liaison and common meeting ground between the Student Houses of said Institute, providing a forum for resolving disputes between the Student Houses, providing a communication for solution of common problems concerning said Student Houses. In accordance with ASCIT Resolution V, the IHC recognizes its existence as a body entirely separate from the corporation.

Section 1.
The voting members of the Interhouse Committee shall be the presidents of the seven Student Houses and the chancellor of Avery or their duly constituted alternates. The president, chancellor, or alternate representative from each house and Avery must be an undergraduate student.

Section 2.
The Chairman of the Interhouse Committee shall be the duly elected IHC Chairman, a general officer of the Associated Students of the California Institute of Technology, Inc. For purposes of definition, duty, election, and eligibility of this officer, the Interhouse Committee shall refer to the By-laws and Resolutions of said Corporation, as approved by the Board of Directors of said Corporation on May 23, 1966, and as affixed to the official copy of this definition. (See the ASCIT Bylaws, Article IV, Section 6.)

Section 3.
The Secretary of the Interhouse Committee shall serve the committee after all seven Houses have elected new presidents and those presidents have taken office. The procedure of candidature for this nomination shall be at the discretion of the appointing Interhouse Committee.

Section 4.
Meetings of the Interhouse Committee shall be upon call of the Chairman or upon joint petition of any two voting members.

Section 5.
A quorum of the Interhouse Committee shall be four voting members. No meeting of the committee with less than a quorum in attendance shall be considered official, nor shall any minutes be published for such a meeting. No meeting shall begin without a quorum present. No action of the Interhouse Committee shall be considered official or binding on the members unless approved by at least four voting members.

Section 7.
The House president or representative to the Interhouse Committee must be chosen by means of a house-wide election, which is the responsibility of the House. The Interhouse Committee can in no other way direct, influence, or restrict the choosing of said president or representative.

Article II - Structure
Section 1.
The Interhouse Committee shall have jurisdiction only over all matters that concern the Student Houses collectively, but in no case shall it exercise any jurisdiction over any matter which is exclusively the concern of a single House. In matters which concern Interhouse athletics and the Discobolus competition, the Interhouse Committee shall exercise joint authority with the Athletic Department, as provided in the rules governing these competitions.

Section 2.
The Interhouse Committee shall specifically perform the following duties:
- It shall oversee and direct the freshman visitation (rotation) program. It shall try and punish any reported violations of the visitation (rotation) rules as established by the Committee.
- It shall work with the Athletic Department to ensure smooth operation of the Interhouse and Discobolus sports programs. It shall approve the awarding of freshman and varsity rating points.
- It shall represent the Student House governments to the Administration on matters concerning the Houses collectively.

It shall serve as a means of discussion and solution of problems common to the houses.

Article IV - Legislation
Section 1.
Amendments to this Definition shall be presented at a meeting of the Interhouse Committee. If the Executive Committee of seven Houses approves said amendment subsequent to this meeting, it shall be passed. If not, the amendment may be presented again one month later, after which the approval of the Executive Committee of six Houses shall be sufficient for passage.

Section 2.
Resolutions concerning matters of policy may be added to this Definition upon approval of five voting members of the Interhouse Committee and shall be binding upon future committees unless revoked by a vote of five voting members.

Section 3.
This definition shall be considered legal when ratified by all eight houses.

Article V - Official Copies
The Chairman of the Interhouse Committee shall be responsible for keeping an official copy of this definition with all amendments, resolutions, and changes noted therein. The Chairman shall keep attached to this official Definition a copy of the By-laws and Resolutions of the Associated Students of the California Institute of Technology, Inc. (ASCIIT), recognized by the Committee as official with regard to the IHC Chairman, and a copy of the Interhouse and Discobolus sports rules as currently accepted by the Interhouse Committee and the Athletics Department.
AUTOGRAPH PAGE
FOR ALL YOUR SUPER COOL SOON TO BE FAMOUS AND RICH FRIENDS TO SIGN SO YOU CAN SELL IT
Below is an alphabetical list of all subsections of sections contained in the Inside Tech, Outside Tech, and Student Government sections. For an index of restaurants, see the restaurants section. We also have a Table of Contents at the beginning of the Inside Tech section.

Academics and Research Committee .............................................. 56
Academic Calendar ........................................................................ 8
Air Travel ..................................................................................... 92
Amusement/Theme Parks ................................................................. 74
Animal Hospitals ........................................................................... 61
Art Supplies ................................................................................... 61
ASCIT Publications ......................................................................... 58
Athletic Facilities ........................................................................... 30
Auto Repair .................................................................................... 62
Banks ............................................................................................. 62
Beaches ......................................................................................... 75
Bicycle Shops/Repair ..................................................................... 64
Board of Control ............................................................................ 56
Board of Directors ......................................................................... 54
Bookstores ..................................................................................... 64
Bowling ......................................................................................... 76
Bursar ............................................................................................ 30
Campus Bookstore ......................................................................... 30
Center for Diversity ........................................................................ 31
Clothing ........................................................................................ 65
Concert Venues (classical) .............................................................. 76
Concert Venues (non-classical) ....................................................... 77
Conduct Review Committee ........................................................... 57
Counseling Center .......................................................................... 32
Dry Cleaners .................................................................................. 65
Electronics ...................................................................................... 66
Financial Aid ................................................................................... 33
Flea Markets ................................................................................... 77
Groceries ....................................................................................... 66
Haircuts .......................................................................................... 67
Hardware and Houseware .............................................................. 67
Health Advocates .......................................................................... 34
Health Center ................................................................................. 36
Health Educator ............................................................................. 37
Hiking and Camping ...................................................................... 78
Hospitals ....................................................................................... 69
Hotels ............................................................................................. 68
Ice Skating ...................................................................................... 79
Interhouse Committee .................................................................... 55
Libraries ........................................................................................ 68
Medical Care (advanced) ................................................................. 69
Movie Rentals ................................................................................. 79
Movie Theaters .............................................................................. 80
Museum .......................................................................................... 80
Office Supplies ............................................................................... 71
Parks ............................................................................................... 82
Pharmacies ..................................................................................... 71
Religion and Worship .................................................................... 72
Resident Life Coordinators ............................................................ 42
Restaurants .................................................................................... 84
Review Committee ........................................................................ 54
Sports and Recreation .................................................................... 72
Theaters .......................................................................................... 89
Urgent Care .................................................................................... 70
Video Games .................................................................................. 74
Yoga ............................................................................................... 90
Safety at Caltech

Orientation week includes a scheduled time slot for a fire/earthquake/other important safety info presentation. It can’t hurt to actually pay attention instead of sleeping through it, right? Anyways, here’s a digest of the information presented (also, see safety.caltech.edu/students), but you’d do well to listen to the orientation presentation anyways:

Event Planning and Construction

This is probably where you’ll interact with the safety office the most during your time at Tech. For Interhouse and other institute-sponsored parties, part of the deal is that the Deans/Safety Office needs to approve event plans and inspect your construction to make sure it won’t disintegrate when people twerk on it. There is a pdf with several components available at https://deans.caltech.edu/documents/122-event_registration_update042314.pdf. Ask upperclassmen who have planned events before for help with jumping through all the hoops.

Emergencies

The MOST IMPORTANT THING TO REMEMBER ABOUT EMERGENCIES is the phone number for Caltech Security in emergencies: 626-395-5000. If, for some strange reason, a campus landline is more conveniently located than your iPhone, simply dial 5000 into the landline. Note that security has a separate number for non-emergencies: 626-395-4701

Fire

We know you’ve all done fire drills before, but remember that there are no teachers checking you in once you exit the building. That means you should know the evacuation assembly areas for buildings you spend a lot of time in, like lab and your house. In Avery, for example, this is posted on the back of the door to every room.

Earthquake

Earthquakes happen. It’s no one’s fault (blame San Andreas). Don’t get all shook up. Just release some tension. Remember that the biggest danger from earthquakes is falling things above your head. So the most important response is to get under something sturdy, like a table, which will protect you from falling chemical containers, light fixtures, and your roommate who’s still asleep in her lofted bed.

Intruders

Our campus is open, so you’ll find very quickly that you can identify most people who are walking past you. You’ll also pretty easily be able to discern who looks like a Caltech community member and who doesn’t. This is important because we don’t have desk monitors at the entrances to the student houses; thus, the security of the house, and your belongings inside it, is dependent on students being vigilant about who they let into the house. If someone “tailgates” when you swipe your ID, don’t be afraid to ask who they are and who in the house they are going to see. This also applies to other campus buildings.
### Reference

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>He</td>
<td>10</td>
<td>Ne</td>
<td>16</td>
<td>Ar</td>
<td>18</td>
<td>Kr</td>
<td>36</td>
<td>54</td>
<td>86</td>
<td>Rn</td>
<td>118</td>
<td>Uuo</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>9</td>
<td>F</td>
<td>17</td>
<td>Cl</td>
<td>35</td>
<td>Br</td>
<td>34</td>
<td>52</td>
<td>84</td>
<td>At</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>8</td>
<td>O</td>
<td>15</td>
<td>P</td>
<td>33</td>
<td>Se</td>
<td>32</td>
<td>50</td>
<td>82</td>
<td>Pb</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>7</td>
<td>N</td>
<td>14</td>
<td>Si</td>
<td>31</td>
<td>Ge</td>
<td>30</td>
<td>49</td>
<td>80</td>
<td>Bi</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>6</td>
<td>C</td>
<td>13</td>
<td>Al</td>
<td>29</td>
<td>Zn</td>
<td>28</td>
<td>48</td>
<td>78</td>
<td>Po</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>5</td>
<td>B</td>
<td>12</td>
<td>Mg</td>
<td>27</td>
<td>Co</td>
<td>26</td>
<td>47</td>
<td>76</td>
<td>Pb</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>4</td>
<td>Be</td>
<td>11</td>
<td>Ca</td>
<td>25</td>
<td>Ni</td>
<td>24</td>
<td>46</td>
<td>75</td>
<td>At</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>3</td>
<td>Li</td>
<td>10</td>
<td>K</td>
<td>23</td>
<td>Cu</td>
<td>22</td>
<td>45</td>
<td>74</td>
<td>Tl</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>2</td>
<td>Na</td>
<td>9</td>
<td>Ca</td>
<td>21</td>
<td>Zn</td>
<td>20</td>
<td>44</td>
<td>73</td>
<td>Tl</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>1</td>
<td>H</td>
<td>8</td>
<td>K</td>
<td>19</td>
<td>Co</td>
<td>18</td>
<td>43</td>
<td>72</td>
<td>Hf</td>
<td>Uuo</td>
<td>Uuo</td>
<td>Uuo</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Lanthanides

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>La</td>
<td>Ce</td>
<td>Pr</td>
<td>Nd</td>
<td>Sm</td>
<td>Eu</td>
<td>Gd</td>
<td>Tb</td>
<td>Dy</td>
<td>Ho</td>
<td>Er</td>
<td>Tm</td>
<td>Yb</td>
<td>Lu</td>
<td>Hf</td>
<td>Ta</td>
<td>W</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
</tbody>
</table>

### Actinides

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ac</td>
<td>Th</td>
<td>Pa</td>
<td>U</td>
<td>Pa</td>
<td>U</td>
<td>Pa</td>
<td>U</td>
<td>Pa</td>
<td>U</td>
<td>Pa</td>
<td>U</td>
<td>Pa</td>
<td>U</td>
<td>Pa</td>
<td>U</td>
<td>Pa</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
</tbody>
</table>
### For Math Majors

#### Frequently used constants

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
<th>Relative std. uncert. $u_x$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed of light in vacuum</td>
<td>$c_0$</td>
<td>299 792 458</td>
<td>m/s</td>
<td>exact</td>
</tr>
<tr>
<td>Magnetic constant</td>
<td>$\mu_0$</td>
<td>$4\pi \times 10^{-7}$</td>
<td>N A$^{-2}$</td>
<td>exact</td>
</tr>
<tr>
<td>Electric constant $1/\mu_0$ e$^2$</td>
<td>$e_0$</td>
<td>$8.854 187 817 \ldots \times 10^{-12}$</td>
<td>F m$^{-1}$</td>
<td>exact</td>
</tr>
<tr>
<td>Newtonian constant of gravitation</td>
<td>$G$</td>
<td>$6.674 08(31) \times 10^{-11}$</td>
<td>m$^3$ kg$^{-1}$ s$^{-2}$</td>
<td>$4.7 \times 10^{-6}$</td>
</tr>
<tr>
<td>Planck constant</td>
<td>$\hbar$</td>
<td>$1.054 571 780(13) \times 10^{-34}$</td>
<td>J s</td>
<td>$1.2 \times 10^{-8}$</td>
</tr>
<tr>
<td>Elementary charge</td>
<td>$e$</td>
<td>$1.602 176 620(68) \times 10^{-19}$</td>
<td>C</td>
<td>$6.1 \times 10^{-9}$</td>
</tr>
<tr>
<td>Magnetic flux quantum $h/2e$</td>
<td>$\phi_0$</td>
<td>$2.067 833 831(13) \times 10^{-14}$</td>
<td>Wb</td>
<td>$6.1 \times 10^{-9}$</td>
</tr>
<tr>
<td>Conductance quantum $2e^2/h$</td>
<td>$G_0$</td>
<td>$7.748 091 730(15) \times 10^{-2}$</td>
<td>S</td>
<td>$2.3 \times 10^{-10}$</td>
</tr>
<tr>
<td>Electron mass</td>
<td>$m_e$</td>
<td>$9.109 389 56(11) \times 10^{-31}$</td>
<td>kg</td>
<td>$1.2 \times 10^{-8}$</td>
</tr>
<tr>
<td>Proton mass</td>
<td>$m_p$</td>
<td>$1.672 621 989(21) \times 10^{-27}$</td>
<td>kg</td>
<td>$1.2 \times 10^{-8}$</td>
</tr>
<tr>
<td>Proton-electron mass ratio</td>
<td>$m_p/m_e$</td>
<td>$1836.152 673 55(17)$</td>
<td>kg</td>
<td>$9.5 \times 10^{-11}$</td>
</tr>
<tr>
<td>Fine-structure constant $e^2/4\pi \varepsilon_0 h c$</td>
<td>$\alpha$</td>
<td>$7.297 352 566(17) \times 10^{-2}$</td>
<td>m$^{-1}$</td>
<td>$2.2 \times 10^{-10}$</td>
</tr>
<tr>
<td>Inverse fine-structure constant</td>
<td>$\alpha^{-1}$</td>
<td>$137.035 999 159(51)$</td>
<td>m$^{-1}$</td>
<td>$2.3 \times 10^{-10}$</td>
</tr>
<tr>
<td>Rydberg constant</td>
<td>$R_{\infty}$</td>
<td>$10973 731 558 58(65)$</td>
<td>m$^{-1}$</td>
<td>$5.9 \times 10^{-12}$</td>
</tr>
<tr>
<td>Avogadro constant</td>
<td>$N_A,L$</td>
<td>$6.022 140 857(74) \times 10^{23}$</td>
<td>mol$^{-1}$</td>
<td>$1.2 \times 10^{-6}$</td>
</tr>
<tr>
<td>Faraday constant</td>
<td>$F$</td>
<td>$96 485 329 06(59)$</td>
<td>C mol$^{-1}$</td>
<td>$6.2 \times 10^{-5}$</td>
</tr>
<tr>
<td>Molar gas constant</td>
<td>$R$</td>
<td>$8.314 498(48)$</td>
<td>J mol$^{-1}$K$^{-1}$</td>
<td>$5.7 \times 10^{-7}$</td>
</tr>
<tr>
<td>Boltzmann constant</td>
<td>$k_B$</td>
<td>$1.380 648 52(79) \times 10^{-23}$</td>
<td>J K$^{-1}$</td>
<td>$5.7 \times 10^{-7}$</td>
</tr>
<tr>
<td>Stefan-Boltzmann constant</td>
<td>$\sigma$</td>
<td>$5.670 367(15) \times 10^{-8}$</td>
<td>W m$^{-2}$K$^{-4}$</td>
<td>$2.3 \times 10^{-6}$</td>
</tr>
</tbody>
</table>

### Electromagnetic Spectrum

- **Radio**: $10^5$ to $10^{12}$ m
- **Microwave**: $1$ m
- **Infrared**: $10^2$ m
- **Visible**: $10^3$ m
- **Ultraviolet**: $10^4$ m
- **X-ray**: $10^5$ m
- **Gamma Ray**: $10^6$ m

About the size of...

- Buildings
- Humans
- Honey Bee
- Pinhead
- Protozoan
- Molecule
- Atoms
- Atomic Nucleus

---

**For Physics Majors**

**Electromagnetic Spectrum**

<table>
<thead>
<tr>
<th>Radio</th>
<th>Microwave</th>
<th>Infrared</th>
<th>Visible</th>
<th>Ultraviolet</th>
<th>X-ray</th>
<th>Gamma Ray</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength in centimeters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Reference**

155
“TO THE SAC!”
PASADENA ARTS MAP
IMPORTANT ON-CAMPUS NUMBERS

Emergencies (24-hour) .................................................. (626) 395-5000
Doctor on call (24-hour) ................................................ 584-2421
Physical Plant (24-hour) ................................................ 4717
Security, Non-Emergency (24-hour) .................. 4701
Suicide Prevention ......................................................... (877) 727-4747
Bursar’s Office .............................................................. 6753
Dean’s Office ................................................................. 6351
Housing Office (after hours) ........................................ 6176 (6571)
Registrar’s Office .......................................................... 6354
Bookstore ................................................................. 6161
C-Store ................................................................. 2935
Earthquake Hotline ....................................................... 3003
Operator ................................................................. 0 or 6811
Safety ................................................................. 3405
Wired ................................................................. 8006

(For other student-services phone numbers, look up the particular service’s entry in the Campus Services section.)

CONFIDENTIAL RESOURCES

Jenny Mahlum, Health Educator .............................. (626) 395-2961
Taso Dimitriadis, CCD Program Director ............... (626) 395-8108
Counseling Center .................................................. (626) 395-8331
Health Center .......................................................... (626) 395-6393

RESIDENT LIFE COORDINATORS

Larissa Charnsangavej, Catalina ............................... (626) 395-2152
Jennifer Galvez, South Houses ....................... (626) 395-3402
Erica Crawford, North Houses ....................... (626) 395-6963
Joe Bennethum, Avery, Marks, Braun, Off-Campus .... (626) 395-8331

OFF-CAMPUS NUMBERS

Better Business Bureau ....................................... (714) 527-0680
California Highway Conditions ..................... (800) 427-7623
FBI ................................................................. (626) 919-3434
Federal Information Center .............................. (800) 727-4995
Huntington Memorial Hospital ....................... (626) 397-5000
NSA .......................................................... (###) ###-####
Las Encinas Hospital ........................................ (626) 759-9901
Pasadena General Information ...................... (626) 405-4000
Secret Service .................................................. (213) 894-4830