THIS IS CALTECH

2018

Caltech

www.caltech.edu

CALTECH SCIENTISTS AND ENGINEERS HAVE:

Lifted the fog on smog	Detected **gravitational waves**
Engineered the **transistor**	

Pioneered **silicon chip** design

Determined **we are all stars**	Discovered how **viruses replicate**

Demoted **Pluto**	Invented the **pH meter**	Discovered the **positron**


pun intended!

THESE ARE OUR STUDENTS

Caltech's students excel in one of the world's most rigorous academic environments. They come to Caltech from all over the United States and across the globe, bringing diverse experiences, perspectives, and passions. They share an unbridled sense of curiosity and an extraordinary aptitude for science, engineering, technology, and math.

CALTECH STUDENT BUCKET LIST

- Visit **Zuma Beach**
- Eat at **Tommy's**
- See the **L.A. Basin** from Mount Wilson
- Have dinner at the **Athenaeum**

85%
of undergraduate students live in Caltech housing, where they study, socialize, and dine together. Students remain part of the same close-knit community all four years.

When it opens in the fall of 2018, the Bechtel Residence will add
212
beds to campus.

Stephanie Threatt

GRADUATE STUDENT SPOTLIGHT

HOMETOWN: Charlotte, North Carolina

RESEARCH FOCUS: Designing, synthesizing, and assessing the biological activity of rhodium complexes that bind specifically to DNA mismatches.

WHY CALTECH? "After spending most of my life on the East Coast, I was interested in attending graduate school on the West Coast. I found the program here had the rigor, diversity, and flexibility I was seeking."

CONNECTING: "I've been fortunate to establish meaningful relationships with several staff members at the Caltech Center for Diversity."

POST-CALTECH PLANS: "I'm open to pursuing jobs in academia and industry. I believe working in the field of science policy could also prove to be very rewarding."

LIVING IN PASADENA: "Pasadena is a great place to live because everything I need and want, ranging from my dentist to my favorite taco truck, is within two miles of my apartment. Also, the city is in such close proximity to Los Angeles that going to the beach, hiking, and attending concerts are all activities I can enjoy on a regular basis."

HOMETOWN: Pico Rivera, California

MAJOR: Geochemistry

ON BELONGING: “My first term I was still under the impression that everyone was a lot smarter than me. But then, my sophomore year, I was taking organic chemistry, a really hard series, and I actually did well, and that felt like a breakthrough. I thought, ‘OK. I am more than capable of handling the work here. I made the right choice.’”

DE-STRESSING: “Running has been a really big stress reliever. It’s kind of how I stay sane.”

OUTSIDE OF CLASS: “I joined the Caltech Latino association. When they wanted to partner with low-income local high schools, my old high school immediately popped into my head. I started going once a month and taking fellow students with me to talk about their majors, what research they’ve done, just to expose the students to all the different fields in science.”

FIRST-GENERATION THOUGHTS: “My parents didn’t get to go to college, but they’ve always been so supportive. My dad is a pool serviceman and on the back of his car he has this sticker that says Caltech Dad. I think that’s what pushes me to really do well.”

961 undergraduate students

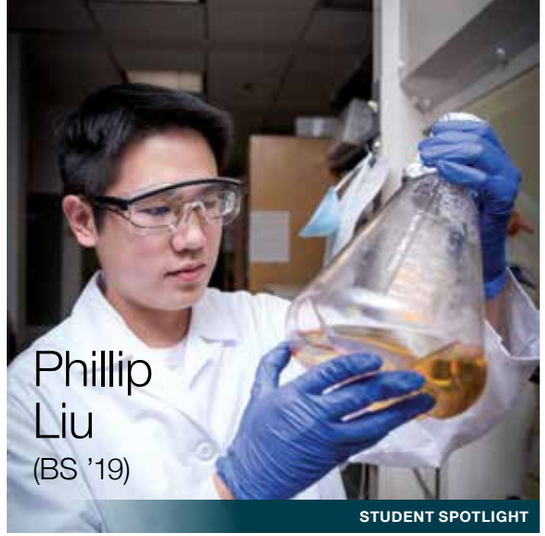
1,277 graduate students

8% undergraduate admission rate

Caltech’s mascot is the beaver—an homage to nature’s engineer.

“The truth shall make you free.”

CALTECH’S MOTTO



HOMETOWN: Scarsdale, NY

MAJOR: Biology

WHY CALTECH? “Because of its small size and the real sense of community I felt when I visited the campus. The people in my house and my lab these past three years have been a part of my family, and Caltech has really truly been a home away from home.”

PROFESSORS: “Pamela Bjorkman has been an absolutely amazing research adviser since my freshman year, and I’m really glad to be doing a senior thesis in her lab.”

EXTRACURRICULAR ACTIVITIES: “I’m on the Science Olympiad planning team, organizing the L.A. regional competition and the Southern California Science Olympiad Tournament here at Caltech. I’m also the academic co-chair of the Biology Undergraduate Student Advisory Committee, and serve on the Caltech Y Student Executive Committee.”

JUST FOR FUN: “I enjoy playing cards and board games with my friends, and exploring the various hidden gems that L.A. has to offer throughout the city.”

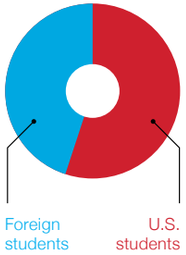
ONLY AT CALTECH

Every morning during finals week, at 7 a.m., Richard Wagner’s “Ride of the Valkyries” is played at an ear-splitting volume.

The cannon outside Fleming House is fired a few times throughout the year.

Every Halloween night, students dunk pumpkins in liquid nitrogen and drop them from Caltech’s tallest building—Millikan Library—to see if they emit a brief bioluminescent glow as they hit the ground and shatter.

45% of the 2017–2018 graduate population are foreign students. The top five countries from which these students hail are China, Canada, India, South Korea, and Taiwan.



THIS IS STUDENT LIFE

A Caltech education is notable for its challenging curriculum, close collaborations with faculty, and small class size. Caltech students work toward undergraduate and graduate degrees alongside their intellectual equals in an atmosphere of close collaboration and mutual support.

ACADEMICS

Students choose from **27** options (majors) in **6** academic divisions:

- Biology and Biological Engineering
- Chemistry and Chemical Engineering
- Engineering and Applied Science
- Geological and Planetary Sciences
- Humanities and Social Sciences
- Physics, Mathematics and Astronomy

Through collaboration with area medical centers, Caltech offers a **premed program** that provides students with the clinical research experience they will need to apply to medical schools.

3:1 student/ faculty ratio

95% of undergraduates participate in research

Caltech students can hone their writing skills at the **Hixon Writing Center** through collaborative, interactive one-on-one tutoring.

A WELL-ROUNDED EDUCATION

Athletics facilities

- Two gymnasiums
- 3,500-square-foot weight room
- Two 25-yard pools
- Four racquetball courts
- Eight tennis courts

Popular physical education courses include:

- Hiking
- Half-marathon training
- Rock climbing

10
all-SCIAC honors

43
athletic program records broken in 2017

With **18 DIVISION III VARSITY TEAMS**, Caltech primarily competes in the Southern California Intercollegiate Athletic Conference **(SCIAC)**.

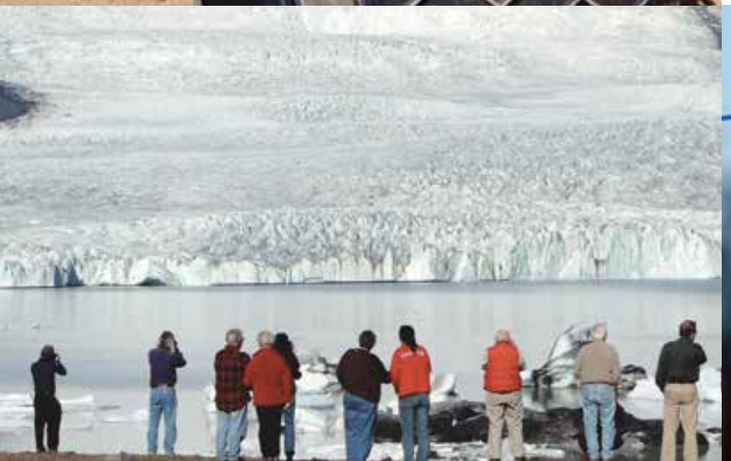
80% of students participate in **intercollegiate**, **club**, **intramural**, and informal **recreational** activities.

2 OUT OF 3 Caltech undergrads play at least one musical instrument or sing in **the Caltech Glee Club** and **Chamber Singers**. The **Caltech Orchestra** performs **3 to 4 major concerts** a year. Caltech musicians also play with the **Wind Orchestra**, the **Caltech Jazz Band**, or **chamber music groups**.

Theater Arts at Caltech produces and performs **2 or more plays** each academic year.

There are more than **150 student clubs** and sports organizations on campus, ranging from **juggling** and **alpine climbing** to **entrepreneurship** and **robotics**.

The **Caltech Y** offers hundreds of opportunities to get involved in **educational** programs, **outdoor** adventures, **community** service, **social** activities, and **cultural** events.

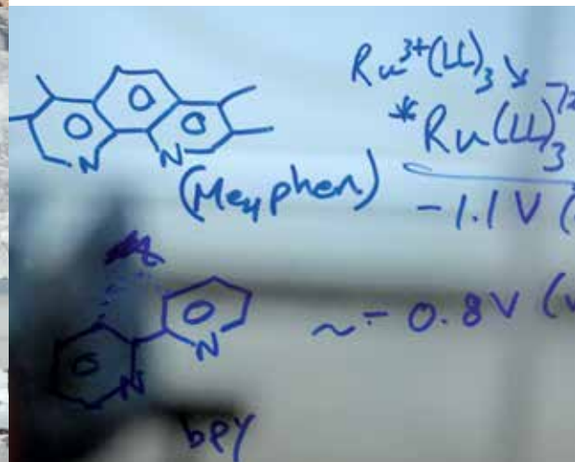


STUDENT RESEARCH

Students at Caltech can participate in research through a wide variety of programs, many of them over the summer break. The Institute also makes research and internship opportunities available to visiting students.

STUDY ABROAD

Caltech students can spend time in such cities as Cambridge, London, Copenhagen, Edinburgh, Paris, and Melbourne.



SURF (Summer Undergraduate Research Fellowships)
Every summer, students in the SURF (Summer Undergraduate Research Fellowships) program do research with experienced mentors working at the frontier of their fields. From writing proposals to presenting results, SURF students experience the process of research as a creative intellectual activity.

80% of all Caltech undergrads participate in the SURF program

10 weeks of research

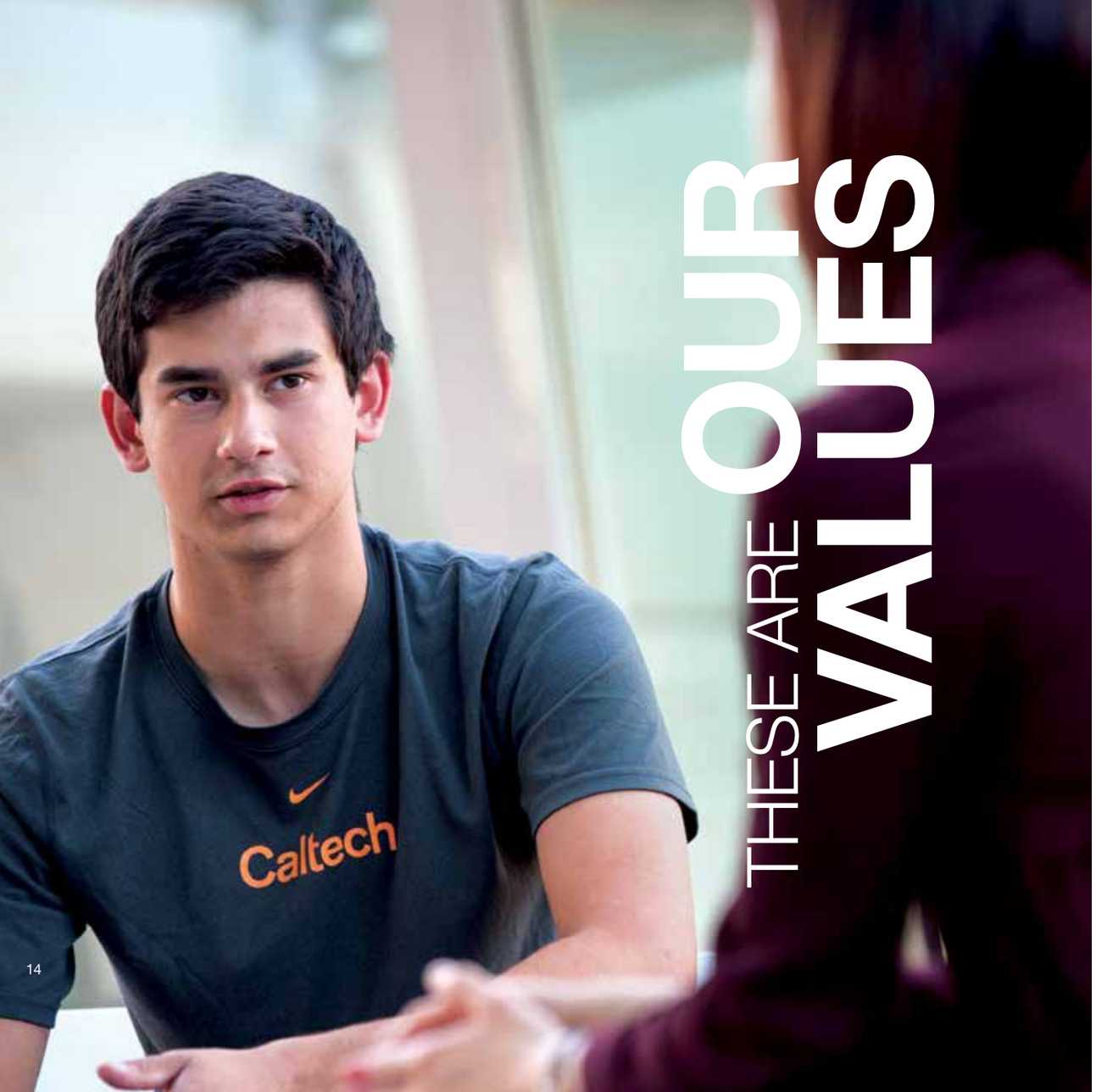
$6,275 stipend

The Amgen Scholars Program brings students from other universities and colleges to Caltech to conduct research in biology, chemistry, or biotech-related fields with a Caltech faculty mentor.

Exchange Programs give Caltech students opportunities to travel to the University of Iceland or the Gwangju Institute of Science and Technology in South Korea to conduct research and experience other cultures.

Students taking part in **NASA/JPL Summer Programs** live on the Caltech campus and join a large community of undergraduate researchers.

Through the Caltech-led **GROWTH** (Global Relay of Observatories Watching Transients Happen) collaboration, students can study at partner institutions in Germany, Taiwan, India, Israel, Japan, or Sweden.



THESE ARE OUR VALUES

"To accomplish our mission, we need to welcome into our midst the most creative and original scholars from every background and every perspective, from every part of our society, and from every country in the world."

—Caltech president Thomas F. Rosenbaum

THE CALTECH HONOR CODE:

No member of the Caltech community shall take unfair advantage of any other member of the Caltech community.

Three values that define and drive Caltech

Excellence:
The Institute's faculty and student body are committed to an uncompromising standard of excellence.

Ambition:
Scholars at Caltech take ambitious intellectual risks to revolutionize understanding of the world around us.

Perspective:
Viewing a problem from new perspectives is vital to ensuring that Caltech's scientific and technological discoveries achieve the most profound impact.


Caltech

THESE ARE OUR FACULTY

Maura Dykstra

FACULTY SPOTLIGHT

ASSISTANT PROFESSOR OF HISTORY

RESEARCH FOCUS: "I'm interested in how people are governed and how policy decisions—made to help society flourish and to keep people from doing bad things—produce opportunities for cheating, opportunities for beauty, and unexpected consequences."

CURRENT PROJECT: "I'm writing a book on the evolution of legal and bureaucratic governing institutions in China from 1644 to 1800."

WHY HISTORY: "History gives us a perspective on the questions of the present day that requires us to expand our point of view beyond the most obvious parameters. A careful attention to how things came to be imbues us with an appreciation for the possibilities of what might have been and opens us up to questions that people caught up in the current moment might forget to ask."

WHY CALTECH: "What is uniquely wonderful about working at Caltech is that I get to be in the same place as people who are working on the problems of today and in a community where a conversation across disciplines is encouraged."

Caltech faculty, alumni, and trustee honors:

Nobel Laureates (faculty and alumni)	**37**
National Medal of Science recipients (faculty and alumni)	**58**
National Medal of Technology and Innovation recipients (faculty, trustees, and alumni)	**13**
Elections to the National Academies (faculty and trustees)	**125**

The CaltechAUTHORS repository contains more than

70,000

publications by Caltech researchers.

It currently grows at the rate of more than

3,000

new papers per year.

Caltech faculty and graduate student teaching assistants find the support they need to be **excellent educators** through seminars, practical training, and teaching resources offered by the Center for Teaching, Learning, and Outreach.

Brian Stoltz

FACULTY SPOTLIGHT

PROFESSOR OF CHEMISTRY

RECIPIENT OF THE 2017 RICHARD P. FEYNMAN PRIZE FOR EXCELLENCE IN TEACHING

RESEARCH FOCUS: Chemical synthesis with an emphasis on the development of new strategies for the preparation of complex molecules possessing interesting structural, biological, and physical properties.

ON WINNING THE FEYNMAN PRIZE: "I am so excited to have been nominated by my former students and colleagues, and to receive this amazing recognition from Caltech. To be associated in this way with the most outstanding educators at the Institute and with Feynman himself is truly humbling."

ON TEACHING AT CALTECH: "I love to teach, and especially at Caltech, because our students are so thirsty for new knowledge. As a result, it drives me to explain the material in a way that students will not only understand the concepts and examples, but also appreciate and love the beauty in the science itself. From teaching, I always learn something new myself, and often that new inspiration comes from our students and their questions."

Domniki Asimaki

FACULTY SPOTLIGHT

PROFESSOR OF MECHANICAL AND CIVIL ENGINEERING

RESEARCH FOCUS: "I am interested in the fundamental understanding and modeling of soils and embedded structures under extreme conditions, such as earthquakes."

WHY CALTECH: "Earthquake engineering as a discipline was born at Caltech, at the interface of seismology and engineering. This close connection between the two disciplines still characterizes earthquake-related research at Caltech. The lack of boundaries between Earth sciences and engineering and the small scale of the Institute make collaborations natural, and maximize the creative potential of students and faculty. If there is such a thing as an academic paradise for people in my field, that is Caltech."

WHY SOUTHERN CALIFORNIA: "Los Angeles is the first city in the U.S. that's making resilience a design goal. This, combined with the strategic decision of the Division of Engineering and Applied Science to focus on this area of research, has made this the perfect time and place to explore our city's capacity to endure and recover from stress: to bend and not break."

ADMINISTRATION SPOTLIGHT

David Tirrell

CARL AND SHIRLEY LARSON PROVOSTIAL CHAIR AND ROSS MCCOLLUM-WILLIAM H. CORCORAN PROFESSOR OF CHEMISTRY AND CHEMICAL ENGINEERING

Became provost: October 1, 2017

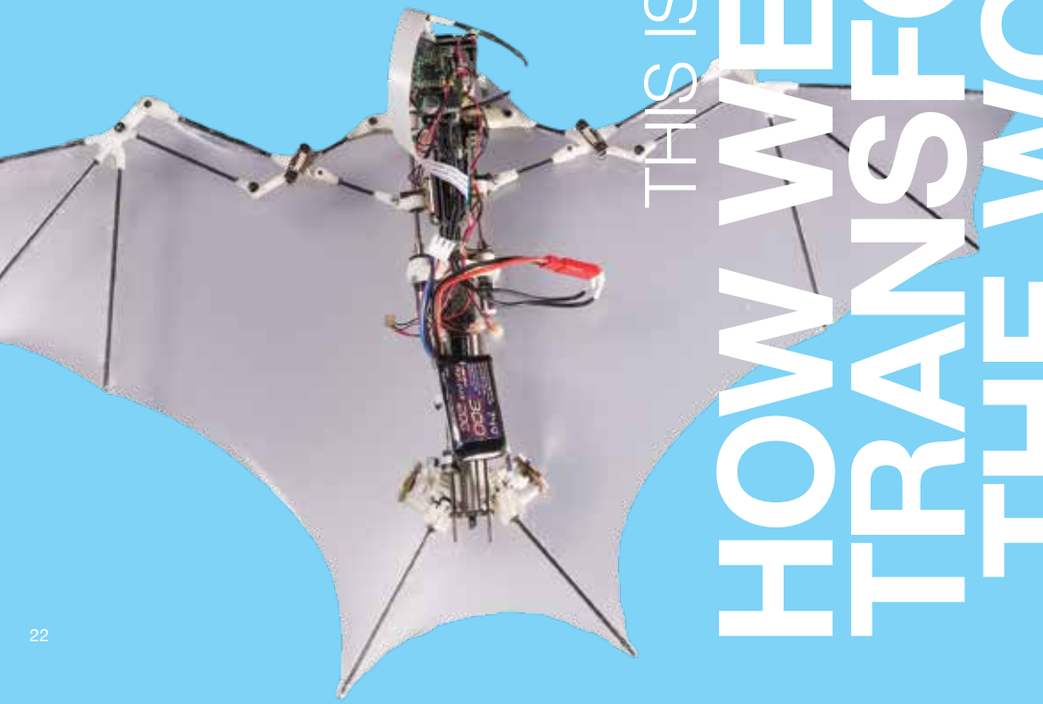
THE ROLE: The provost advances the academic agenda of the Institute through faculty recruitment, retention, and promotions, and via budget prioritization. The provost also works closely with the division chairs on programmatic initiatives.

TIRRELL SAYS: "My goals are to ensure that Caltech continues to attract people of extraordinary talent and commitment, and to help create an environment that enables them to do their best work."

CALTECH CAREER: A Caltech faculty member since 1998, Tirrell is one of only 19 people elected to all three National Academies: Sciences, Engineering, and Medicine.

The work that takes place at Caltech helps cure disease, augment environmental resources, and lessen the impact of natural disasters.

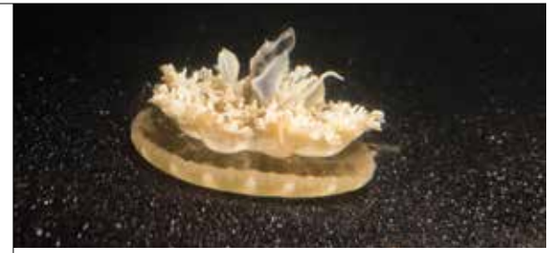
THIS IS HOW WE TRANSFORM THE WORLD



IN THE PAST YEAR, CALTECH FACULTY HAVE:

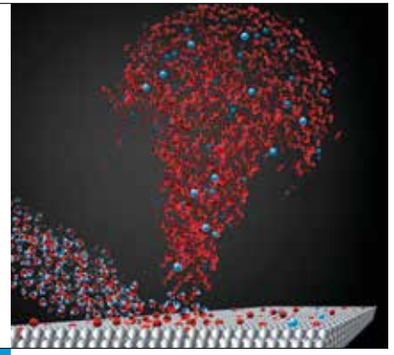
Cracked the code of facial recognition to determine that the brain uses a simple and elegant mechanism to perceive facial identity.

Built a robot drone that can closely mimic the flight characteristics of bats.



Discovered that jellyfish sleep, implying that sleep is an ancient behavior, largely untouched by millennia of evolution.

Demonstrated in the lab how **MOLECULAR OXYGEN**, the same gas humans breathe, may be produced in real time on the surface of comets.



Discovered that the ability to **generate oxygen** through photosynthesis evolved just once, roughly **2.3 billion years ago**, in certain types of cyanobacteria.

THE YEAR OF LIGO

2017 was an extraordinary year for LIGO (the Laser Interferometer Gravitational-wave Observatory).

For the first time LIGO detected the ripples in space and time known as gravitational waves **from the collision of two neutron stars**. This detection was also the first to be confirmed by telescopes working in the electromagnetic spectrum.

For their work on LIGO's development and ultimate success, Caltech's Barry C. Barish, the Ronald and Maxine Linde Professor of Physics, Emeritus, and Kip S. Thorne (BS '62), the Richard P. Feynman Professor of Theoretical Physics, Emeritus, as well as MIT's Rainer Weiss, were awarded the **2017 Nobel Prize in Physics**.

AUTHOR SERVICES LIBRARIAN, THESIS COORDINATOR, AND REPOSITORY COORDINATOR

ALL IN A DAY'S WORK: "I help authors with copyright questions, work with faculty and staff to get their publications into the right repository, help graduate students get their theses deposited into CaltechTHESIS, and teach various library classes."

BEST PART OF THE JOB: "Every day is different, and I'm always learning new things: from fun facts about Einstein found in an oral history to research in macular degeneration from a student's thesis."

WHY CALTECH IS UNIQUE: "The scientific discoveries made here and at JPL are incredible, and I get to be part of it in some small way. I can't imagine working anywhere else."

FEELS LIKE HOME: "I grew up in Algeria, and moved to the U.S. to go to college. The climate, vegetation, and topography here remind me very much of Algeria and the Mediterranean. I love the diversity of people, cultures, and languages. There is always something interesting happening, and the variety is endless."

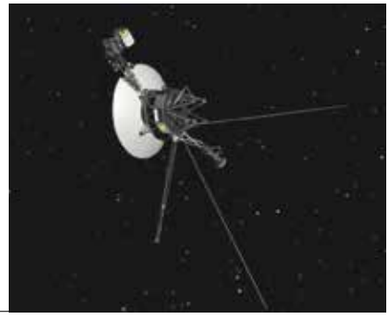
THIS IS JPL

Managed by Caltech for NASA, the Jet Propulsion Laboratory is the leading U.S. center for the robotic exploration of the solar system. Scientists based on campus and at JPL work together on missions that focus on planetary exploration, Earth science, and space-based astronomy.

2017 MILESTONES

Voyager celebrated 40 years in space

For four decades, the Voyager spacecraft have been exploring the outer planets. Voyager 1 discovered the first known active volcanoes outside Earth and became the first-ever spacecraft to enter interstellar space. Voyager 2 is the only spacecraft to have flown by all four outer planets: Jupiter, Saturn, Uranus, and Neptune.



Cassini made its Grand Finale

After almost 20 years in space, the Cassini spacecraft plunged into Saturn's atmosphere on September 15. In the months before its Grand Finale, Cassini executed 22 dives between Saturn and its rings, bringing the spacecraft closer to Saturn than ever before, and yielding stunning images and new insights into the planet's structure.

NuSTAR celebrated its fifth anniversary

Since its launch on June 13, 2012, NuSTAR has taken some of the most detailed high-energy X-ray images of the sky, allowing us to watch black holes spinning, to map the radioactivity from the remnant of an exploded star, to detect an extremely bright pulsar, and more.

Curiosity marked five years on Mars

On August 5, NASA celebrated the Curiosity rover's fifth anniversary on the surface of the Red Planet. Over the course of its mission Curiosity has captured more than 200,000 images and drilled more than a dozen rock samples.

THIS IS WHERE DISCOVERY HAPPENS

The Center for Autonomous Systems and Technologies (CAST) opened in 2017 in a 10,000-square-foot facility located in the Guggenheim Aeronautical Laboratory. CAST seeks to unite experts from the fields of machine learning, aerospace, controls, and robotics. The center includes:

- A three-story aerodrome, the tallest indoor drone arena of its kind, with a custom-built wall of 1,296 fans that create the myriad wind conditions to which the drones must learn to react.
- A space robotics lab with a clean room and a spacecraft motion-simulation facility.
- An advanced mobility lab with multiple tracks on which to test walking robots.

Centers and institutes across campus bring together scientists and engineers to collaborate and add innovative and diverse perspectives to tackle society's most pressing challenges.

The **Beckman Institute** develops methods, instrumentation, and materials for fundamental research in chemistry and biology.

The **Resnick Sustainability Institute** fosters advances in energy science and technology.

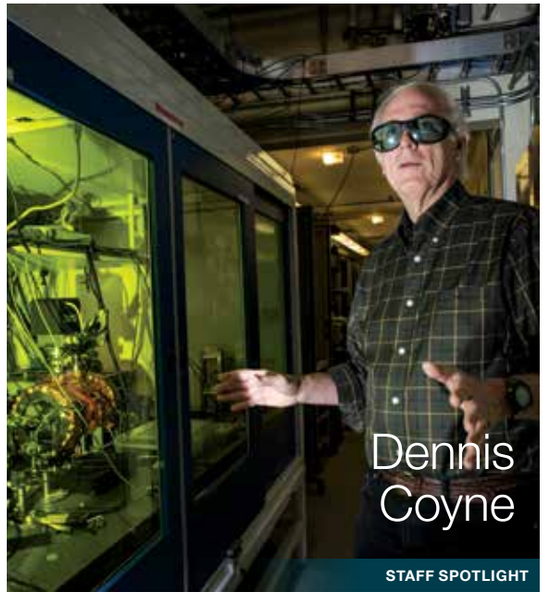
The **Tianqiao and Chrissy Chen Institute for Neuroscience at Caltech** seeks to deepen our understanding of the brain and how it works.

The **Kavli Nanoscience Institute** advances cross-disciplinary research in the areas of nanoscience and nanotechnology.

The **Donna and Benjamin M. Rosen Bioengineering Center** supports research at the intersection of biology and engineering.

INSTRUMENTATION

The Institute attracts and supports scientists and engineers committed to inventing instruments that will propel advances in basic research and create new technologies for society.



CHIEF ENGINEER FOR THE LIGO LABORATORY

RECIPIENT OF THE 2018 LANCELOT M. BERKELEY - NEW YORK COMMUNITY TRUST PRIZE FOR MERITORIOUS WORK IN ASTRONOMY BY THE AMERICAN ASTRONOMICAL SOCIETY (AAS)

WHAT HE DOES: Oversees all engineering aspects of the LIGO project.

BEST PART OF THE JOB: "I enjoy continually learning and being challenged by the science and engineering on a world-class, ground breaking project."

WHAT MAKES CALTECH DIFFERENT: "The people and their commitment to science, to discovery, to excellence is unsurpassed."

JUST FOR FUN: "I like to 'make sawdust,' watch trout ignore my flies, and occasionally brew tasty beer."

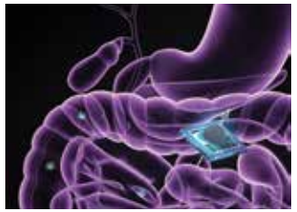
NOT FROM AROUND HERE: "I grew up on the East Coast. However, I've been spoiled by the SoCal weather and never want to shovel snow again."

Advanced telescopes and cutting-edge instrumentation at the **Keck** and **Palomar** observatories have advanced astronomical discovery by Caltech scientists, who are also designing the **Thirty Meter Telescope**, which should become the most powerful tool of its kind.

Caltech's **Seismological Laboratory** is renowned for geophysical exploration and is the epicenter of earthquake research.

A state-of-the-science **atmospheric chamber** in the Linde + Robinson Laboratory for Global Environmental Science is used to study the photochemical reactions of gaseous and particulate pollutants.

Caltech scientists have designed a prototype **mass spectrometer** that can determine the temperatures at which mineral samples from the distant past formed. Another group has created a **nanodevice** that can weigh a single molecule, a development that may eventually help diagnose disease or measure air pollution.



In 2017, Panda Express co-founders Andrew and Peggy Cherng made a gift to name and endow the **Andrew and Peggy Cherng Department of Medical Engineering at Caltech**. Researchers in the department design and fabricate devices and systems for translational medicine including diagnostics, therapeutics, implants, and noninvasive imaging that will lead to less expensive, more effective, and more accessible health care.

Recent Caltech medical engineering advances include:

- Microchips that track smart pills
- A smartphone camera app to measure heart health
- Imaging technology to cut down on cancer surgeries
- Laser-induced sound waves that provide panoramic views of tissue functions

OVER THE YEARS, CALTECH SCIENTISTS AND ENGINEERS HAVE:

Discovered the positron, paving the way for positron emission tomography (PET) scanners

Invented a method for the automated sequencing of DNA

Developed the Robot Assisted Microsurgery system

Designed next-generation neuroprosthetics for patients with paralysis

Developed a better intraocular retinal implant

BREN PROFESSOR OF MEDICAL ENGINEERING AND ELECTRICAL ENGINEERING

CALTECH'S FIRST FULL-TIME CHERNG MEDICAL ENGINEERING FACULTY MEMBER

TECHNOLOGICAL INNOVATION: Wang's lab has developed an imaging technology, called photoacoustic tomography, that can noninvasively peer deeper inside biological tissues than previously possible. This technique may help surgeons confirm they have removed the entirety of a tumor in one surgery.

ON MEDICAL ENGINEERING AT CALTECH: "When we combine the strength of our world-class lab members with the number of nearby first-rate medical institutions, we have no shortage of research ideas or clinical collaboration. This combination presents a tremendous opportunity for biological and medical engineering at Caltech."

Tech transfer

Caltech's Office of Technology Transfer and Corporate Partnerships helps scientists and engineers on campus and at JPL transfer the fruits of their research to the commercial sector.

RECENT STARTUPS

Caltech researchers launched **16 startups** in 2017.

Virtualitics merges artificial intelligence, big data, virtual reality, and augmented reality to gain insights from complex data sets.

Axial Biotherapeutics focuses on treating diseases and disorders of the central nervous system through the gut's microbiome.

PACT Pharma is developing personalized T-cell therapies for cancer treatments.

THIS IS LIFE AFTER CALTECH

Caltech's more than 24,000 living alumni include Academy Award-winning artists, trailblazing corporate executives, successful entrepreneurs, academic leaders, medical pioneers, and technological innovators.

Travis Bayer (PhD '07)

ALUMNI SPOTLIGHT

CHIEF TECHNOLOGY OFFICER OF ASILOMAR BIO

WHAT THEY DO: Asilomar Bio is a seven-person startup that has used synthetic biology to develop what co-founder Bayer hopes will transform the lives of sub-Saharan farmers and industrial agriculture alike. The startup's first product, slated for market approval in 2018, was initially developed to make plants more resilient during drought. Field tests showed it could do much more, changing the way the plant was accessing and using water.

WHY BAYER IS EXCITED: "Think about the nitrogen, the water, and the energy that goes into growing crops. If you can improve the efficiency of the agricultural system by even a little bit, you've really effected mass change."

Telle Whitney (PhD '85)

ALUMNI SPOTLIGHT

FORMER CEO OF THE ANITA BORG INSTITUTE

WHAT SHE DID: At the Anita Borg Institute, Whitney worked with companies to recruit, retain, and advance women in technology. She also founded the Grace Hopper Celebration of Women in Computing with Anita Borg in 1994, an annual event that drew over 18,000 participants in 2017.

ON THE GRACE HOPPER CELEBRATION: "You cannot imagine what it's like to be at a technical conference just surrounded completely by women. It's life changing."

ADVICE FOR WOMEN LEADERS: "Stay focused on key outcomes, but also remember that women who are in senior positions are important role models for all women in an organization. You need to take that responsibility seriously, be available, and speak broadly."

CJ Beegle-Krause (BS ’82)

ALUMNI SPOTLIGHT

SENIOR RESEARCH SCIENTIST, FOUNDATION FOR SCIENTIFIC AND INDUSTRIAL RESEARCH (SINTEF) IN NORWAY

WHAT SHE DOES: Beegle-Krause spent eight years at the National Oceanic and Atmospheric Administration, responding to more than 200 oil spills—including massive events like 2010’s Deepwater Horizon oil spill in the Gulf of Mexico—and developing spill-forecasting methods that have become industry standards. For the past five years, Beegle-Krause, now at SINTEF, has been researching the behavior and movement of spills in Arctic conditions.

HOW TO RESPOND TO AN OIL SPILL: “Decision making in oil spills always has to answer five questions. *What was spilled?* That’s the chemistry. *Where will it go?* That’s the trajectory. *Who will it hit?* That’s the natural resources. *How will it hurt?* That’s the toxicology. *And how do we best respond?* The key is putting those pieces together.”

Dan Lieberman (PhD ’05)

ALUMNI SPOTLIGHT

PRINCIPAL INVESTIGATOR, INTELLECTUAL VENTURES LAB

WHAT HE DOES: Lieberman leads the IV Lab’s fluid and respiratory system group, and works on an innovative solution to the often-overlooked problem of children dying of pneumonia, the world’s number one cause of death in children under 5, due to the lack of available oxygen. His team has developed a mask-type device that offers a massive efficiency boost to oxygen delivered through traditional nasal cannula.

HOW IT HELPS: “We can produce the same concentration of oxygen in your lungs as a nasal cannula using one-half to one-third the flow. That would make an oxygen bottle last two to three times as long.”

WHAT’S NEXT: “The idea is to have something that we can deploy to smaller health facilities, so that patients can get the treatment when they need it, and not have to wait to get higher up in the hospital system, which usually means having to go to a bigger city.”

Recent Alumni Nobelists

Over the past five years, five Caltech alumni have been recognized by the Nobel committee for their innovative scientific accomplishments. They include:

2013

Martin Karplus (PhD ’54) won the Nobel Prize in Chemistry along with Michael Levitt and Arieh Warshel. They were awarded the prize “for the development of multiscale models for complex chemical systems.”

2014

Eric Betzig (BS ’83) won the Nobel Prize in Chemistry along with Stefan Hell and William Moerner. They were awarded the prize “for the development of super-resolved fluorescence microscopy.”

2015

Arthur B. McDonald (PhD ’70) won the Nobel Prize in Physics along with Takaaki Kajita. They were awarded the prize “for the discovery of neutrino oscillations, which shows that neutrinos have mass.”

2017

Michael Rosbash (BS ’65) won the Nobel Prize in Physiology or Medicine along with former Caltech postdoctoral fellow Jeffrey C. Hall and Michael W. Young. They were awarded the prize “for their discoveries of molecular mechanisms controlling the circadian rhythm.”

2017

Kip S. Thorne (BS ’62) won the Nobel Prize in Physics along with Caltech’s Barry C. Barish and MIT's Rainer Weiss. They were awarded the prize “for decisive contributions to the LIGO detector and the observation of gravitational waves.”

THIS IS OUR CAMPUS

Founded in 1891 as Throop University, Caltech has been on its present site since 1910 and became the California Institute of Technology in 1920.

BUILDING MILESTONES

Caltech continues to grow, with several projects currently under construction.

Bechtel Residence

Named for Caltech life trustee Stephen D. Bechtel Jr., the Bechtel Residence will provide undergraduate housing to 212 students, allowing undergrads to live on campus for all four years and fully participate in residential life. Students and other stakeholders provided input on the design and use of the residence. The finished residence, at the north edge of campus, will feature a large interior courtyard and six structures, interconnected to encourage interaction. The residence will open to students in fall 2018.

Hameetman Center

A new campus center is currently under construction on the site of the former Winnett Student Center. The Hameetman Center will replace Winnett as Caltech's central community gathering place.

Scheduled to open in late 2018, the two-story center is named in honor of Caltech trustee Fred Hameetman (BS '62) and his wife, Joyce, who provided the initial funding to initiate the design of the reimagined campus hub. The Hameetman Center will feature a large public lounge, an expanded Red Door Marketplace, the Caltech Store, music rehearsal facilities, student club rooms, a multipurpose room, and a conference room.

Tianqiao and Chrissy Chen Neuroscience Research Building

In 2017, Caltech broke ground on the Tianqiao and Chrissy Chen Neuroscience Research Building. The three-story, 150,000-square-foot facility, which is scheduled to open in fall 2020, will be located on the northwest corner of campus and will serve as the Institute's hub for neuroscience research. Once completed, the building will house labs and offices for more than a dozen principal investigators and will be the administrative home of the Tianqiao and Chrissy Chen Institute for Neuroscience at Caltech. The building will also house research support space, as well as a teaching lab and a 150-seat lecture hall.

Reaching 100

The **Parsons-Gates Hall of Administration** is the first building on campus to cross the 100-year threshold. Constructed in 1917, this was the first home of what would become Caltech's Division of Chemistry and Chemical Engineering.

THIS IS HOW WE ENGAGE

Caltech is an integral part of and partner with the city of Pasadena. As the city's largest employer, the Institute offers opportunities for interaction both on and off campus.

On stage

Performers visiting campus in 2017 included **Turtle Island Quartet**, **Lily Cai Dance Company**, and **Juilliard String Quartet**.

On the town

Caltech scientists engage with the community through events like **Astronomy on Tap** (part of a larger astronomy outreach program), in which Caltech astronomers give informal talks at a local Pasadena pub, complete with fun quizzes and lively discussion.

At the podium

Researchers based on campus and at JPL present their work to the public nine times a year through the **Earnest C. Watson Lecture Series**, delving into topics such as **how fish sleep**, **the cleanliness of the Cloud**, and our path to **creating the robots of science fiction**.

The **Junior Watson Program** brings top high school scientists to campus to hear a lecture and visit a lab.

The twice-monthly **von Karman Lecture Series**, named after JPL's founder, tackles topics around space missions, instruments, and other technologies, and will be presented on campus, for the first time, in 2018.

The **Caltech Associates**, a philanthropic organization of around 2,000 community members, business leaders, entrepreneurs, and academics, supports Caltech and takes part in a lively roster of scholarly and social events on and off campus.

In campus labs

Caltech's on-campus educational outreach programs bring the excitement of scientific discovery to thousands of future scientists and engineers every year. Popular summer programs for schoolchildren include **Project Scientist Academy**, in which 4- to 12-year-olds tackle themes ranging from the science of crime to STEM in sports; **Summer Research Connection**, in which high school students and teachers are embedded in Institute labs for summer-long research projects; and **Community Science Academy**, a six-week program that offers local high school students hands-on experience in biology, chemistry, and engineering.

In the classroom

Caltech brings STEM to life for schoolchildren throughout the Pasadena area. On **Science Wednesdays**, Caltech grad students and postdocs visit area elementary school classrooms; during **Science Night**, Caltech volunteers conduct science demonstrations at schools across Pasadena and the San Gabriel Valley.

In conversation

Panel discussions provide a forum for experts from Caltech and beyond to connect around important issues and cultural experiences. In 2017, groups gathered to talk about Syfy's ***The Expanse*** television series as well as the **Golden Records** that had been launched into space with the Voyager spacecraft 40 years earlier.

Institute scholars benefit from the rich resources of The Huntington Library, Art Collections, and Botanical Gardens. Collaborations between the two institutions have given rise to new courses, conferences, and research partnerships such as the Caltech-Huntington Humanities Collaborations.

Cassini End of Mission

Crowds at JPL and on campus gathered on September 15, 2017, to celebrate as the Cassini spacecraft ended its 20-year mission with a dive into Saturn's atmosphere.

Eclipse Viewing Party

When the Great American Solar Eclipse passed over North America on August 21, 2017, community members and local residents flocked to campus for a viewing party that packed the Beckman Institute lawn. Solar telescopes, eclipse glasses, and on-hand astrophysicists helped everyone learn from this rare experience. Caltech also hosted two trips to Oregon, which was at the center of the path of totality, for the Caltech Alumni Association and the Caltech Associates.

"Space exploration is for all of humanity, not just for one agency or one university. When our spacecraft venture to Mars or Saturn on journeys of discovery, they carry a handful of instruments but the imaginations of millions of people. It is deeply important to us at JPL and on campus that the public share the spirit of discovery and excitement with us, and we take that responsibility as seriously as our engineering and scientific quests."

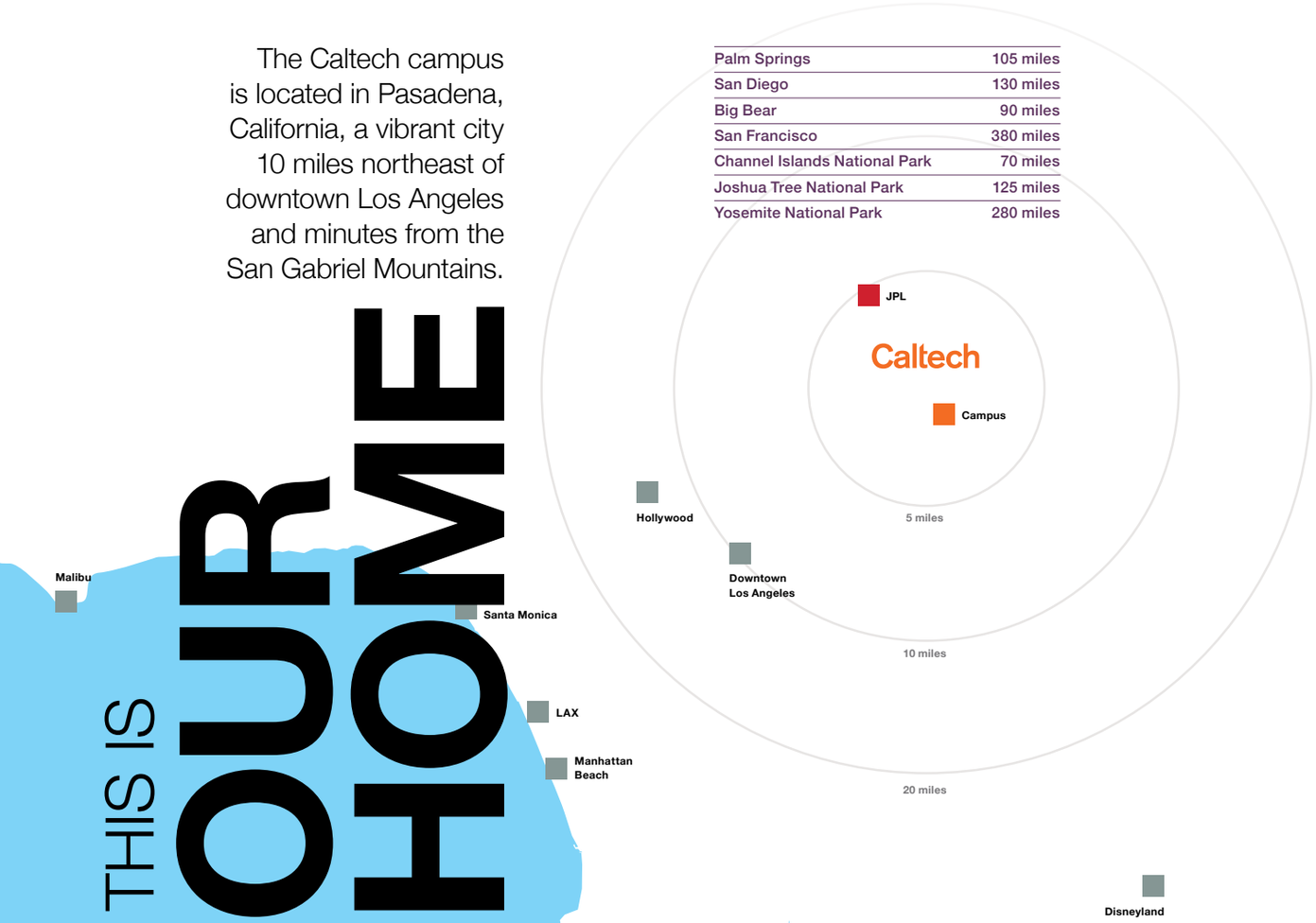
—Michael Watkins, Director of JPL

More than **20,000 people** attended the annual Explore JPL open house, an event during which visitors can enjoy an up-close look at the Lab and take part in interactive demonstrations.

The Caltech campus is located in Pasadena, California, a vibrant city 10 miles northeast of downtown Los Angeles and minutes from the San Gabriel Mountains.

THIS IS OUR HOME

Palm Springs	105 miles
San Diego	130 miles
Big Bear	90 miles
San Francisco	380 miles
Channel Islands National Park	70 miles
Joshua Tree National Park	125 miles
Yosemite National Park	280 miles



Note: Distances are approximate

Downtown Los Angeles is a few stops away on the Metro Gold Line

Hollywood is 25 minutes from Pasadena

The Rose Bowl Stadium is 10 minutes from Caltech's campus

PASADENA IS HOME TO:

- Tournament of Roses Parade
- Norton Simon Museum
- Huntington Library, Art Collections, and Botanical Gardens
- Old Pasadena
- Pasadena Playhouse

Average high temperature

77°

On location

The Caltech campus routinely appears in well-known TV programs and movies.

Modern Family
The X-Files
The Big Bang Theory
Silicon Valley
Transparent
GLOW
Legally Blonde
West Wing
NCIS

Campus Tours
Prospective students are encouraged to visit campus and see life at Caltech firsthand. To find out more, visit admissions.caltech.edu.

Architectural tours offer visitors and residents a unique perspective on Caltech. For reservations and information, call (626) 395-4656.

We connect with students, alumni, and the wider world through Facebook (California Institute of Technology), Twitter (@Caltech), Caltech YouTube channel, Instagram (@Caltechedu), and Snapchat (@Caltechedu).

Caltech
1200 East California Blvd.,
Pasadena, CA 91125

Produced by the Office of Strategic Communications, Caltech

On the front cover: Members of Caltech's new women's soccer team, which was added to the athletic program's roster of sports in fall 2017.

Above: CAST's main assembly room, which features a modular design and an 85-foot-long overhead track for walking robots.

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