

FY 2014

**243**   
Invention Disclosures (campus only)

**194**   
U.S. Patents Issued

**1,766**   
Active U.S. Patents

**53**   
Licenses Granted (including options)

**10**   
Startup Companies

**40**   
Companies Sponsoring Research

**49**   
Companies Giving Gifts

**\$14.4M**  
Corporate Contracts & Gifts

## Focus on a few areas of excellence



At Caltech, birthplace of semiconductor lasers, microprocessor design, and automated DNA sequencing, we believe that the impact of the Information Age has only just begun—and that the greatest transformations lie ahead. The Information Science and Technology (IST) initiative seeks to increase the impact of information on medicine, science, and society. IST focuses on transdisciplinary research widely applicable across natural, social, and engineered systems. Caltech scientists are rapidly uncovering the mathematical, algorithmic, and physical principles that unite information and computation.  
**See: [www.ist.caltech.edu](http://www.ist.caltech.edu)**



Two centers are the focal point of Caltech's pioneering research in energy: the Resnick Sustainability Institute and the Joint Center for Artificial Photosynthesis (JCAP). Resnick scientists address critical challenges in renewable energy and sustainability science with global impact such as photoelectrochemistry and new biochemical processes to reduce the carbon footprint and generation, storage, conversion and distribution of energy. Established as a Department of Energy (DOE) Energy Innovation Hub, JCAP focuses on artificial solar-fuel generation technology and cost-effective methods to produce fuels using only sunlight, water, and carbon dioxide as inputs.  
**See: [www.resnick.caltech.edu](http://www.resnick.caltech.edu) and [www.solarfuelshub.org](http://www.solarfuelshub.org)**



The field of Optogenetics is revolutionizing neuroscience through the use of microbial opsins and light to activate or inactivate specific brain cell types with high specificity. Optogenetics and CLARITY (a new neuroanatomy method for intact circuit mapping) enable scientists to understand brain circuit function and dysfunction, vastly expanding knowledge of the brain and its associated psychiatric and neurological disorders. Through the Beckman Institute Optogenetics Neuroscience Initiative and CLARITY (the BIONIC Center), Caltech is currently developing and expanding upon these molecular and hardware tools and applying them to neural circuitry problems for understanding and improving deep brain stimulation for DBS-targeted disorders.  
**See: [www.glab.caltech.edu](http://www.glab.caltech.edu) and [www.davidandersonlab.caltech.edu](http://www.davidandersonlab.caltech.edu)**



The Department of Medical Engineering (MedE) is truly translational and interdisciplinary by nature. Its focus is on applying medical sciences and multi-disciplinary engineering principles to the design, analysis, and physical demonstration of micro and nanoscale medical devices and systems for translational medicine, including innovative diagnostics, implants, and therapeutic systems. The core group of MedE faculty has been drawn from Aerospace Engineering, Applied Physics, Biological Engineering, Computer Science, Electrical Engineering, Material Science and Mechanical Engineering, and they collaborate very closely in a highly synergistic interdisciplinary environment.  
**See: [www.mede.caltech.edu](http://www.mede.caltech.edu)**

**Caltech** Technology Transfer & Corporate Partnerships

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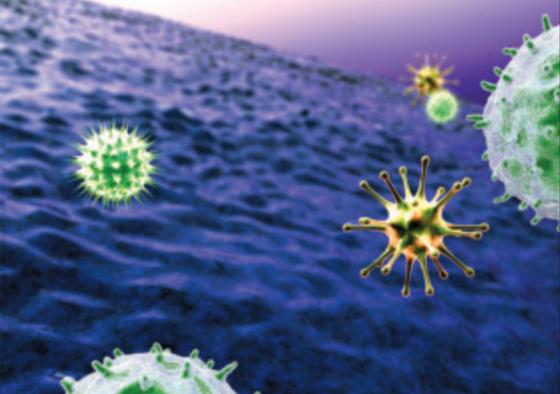


Innovation.  
Entrepreneurship.  
Collaboration.

Innovation.  
Entrepreneurs!  
Collaboration.

OUR VISION

Drive the transfer of scientific and engineering **knowledge** created by our researchers to maximize **societal impact** by developing **partnerships** with industry through the creation of **new ventures**, collaborations with **corporations** and transfer of **intellectual property**, while nurturing an **entrepreneurial** environment.



FY 2014 **A One-Stop Shop**

The Office of Technology Transfer and the Office of Corporate Relations merged to form the new Office of Technology Transfer & Corporate Partnerships (OTTCP), creating a single point of focus for connections between Caltech and Industry.

OTTCP incorporates the functions and services of the former Office of Technology Transfer and the Office of Corporate Relations in a single office under the Provost's Office. The new office is a "one-stop shop" for Caltech-industry negotiations, and handles IP licensing, industry sponsored research agreements, startup creation, and entrepreneurship education, among other activities. Corporate partners no longer have to navigate multiple offices on campus just to get a deal done and OTTCP can quickly put agreements in place without unnecessary delays or redundancies.

**Targeted Immunity**

Technology pioneered in the Caltech laboratory of Prof. David Baltimore, Robert Andrews Millikan Professor of Biology, President Emeritus, and Nobel Laureate, is being used to design novel products to enable the body's own immune system to fight disease.

Prof. Baltimore is the co-founder of Immune Design, a clinical-stage immunotherapy company which uses novel viral vectors and methods to cause the patient's immune system to make cytotoxic T cells that target and kill tumor cells. The company is also developing the technology to treat infectious diseases, allergy, and autoimmune diseases. Immune Design has three products in clinical trials, and announced the close of its initial public offering on July 29 2014.

**Awards for Innovation**

The Los Angeles Business Journal, in partnership with Dr. Patrick Soon-Shiong, a Los Angeles area physician, scientist, entrepreneur, and billionaire philanthropist, honors top innovative California based startup companies. Since the inception of the Patrick Soon-Shiong Innovation Awards in 2010, nine Caltech startups have been honored; the strong showing of Caltech startups highlights our entrepreneurial spirit and major role in the regional innovation ecosystem.

**WINNERS**

**Calhoun Vision Inc**  
Prof. and Nobel Laureate Bob Grubbs; intraocular lens technology

**Coutour Energy Systems**  
Dr. Rachid Yazami; fluorine-based battery technology

**Replenish Inc**  
Prof. Yu-Chong Tai; implantable ocular drug nanopump

**SAFCell**  
Prof. Sossina M. Haile; solid acid fuel cells

**OEwaves**  
JPL Technologist Lutfullah Maleki; microwave-photonic devices for radar and communications

**FINALISTS**

**FastSoft**  
Prof. Steven Low; TCP congestion avoidance algorithm for data transmission

**Materia**  
Prof. Bob Grubbs; Grubbs Catalyst™ for chemical transformation of conventional and bio-based feedstocks

**Protabit**  
Prof. Steve Mayo; in silico engineered protein design

**Neurorecovery Technologies**  
Prof. s Yu-Chong Tai and Joel Burdick; implantable neurostimulator for paralysis treatment

Above image courtesy of Los Angeles Business Journal

**Never Failing Goggles**

Google support allows Caltech Prof. Pietro Perona, Allen E. Puckett Professor of Electrical Engineering, to pursue his innovative research on "Never Failing Goggles" — exploring how to harness the visual ability of web users to classify and search image content. Pictures are the dark matter of the internet. Images and video are the vast majority of the bits that flow through communication networks and populate storage systems. However, it is virtually impossible to search, organize and analyze images automatically; much useful information is thus unreachable and unavailable.

Caltech and Google are working with NYU and Cornell Tech to design and create systems which integrate crowdsourcing with machine learning algorithms to improve the ability to search and identify visual media, to effortlessly analyze large picture datasets, and make such information available to anybody, anywhere. Such systems will help scientists, doctors, and engineers harvest information from medical images, satellite pictures, news streams, and consumer picture databases and organize such information into a form that is readily accessible by us all.

**Flying with Boeing**

The partnership between Boeing and Caltech dates to February 26, 1932, when Boeing began testing at Caltech's GALCIT aeronautics wind tunnel. This decades-long relationship became a formal, strategic partnership in 2004 that focused on "systems integration technologies".

In 2006, Boeing partnered with Caltech's Explosion Dynamics Laboratory to research fuel ignition safety. This led to the development of novel certification methods for the Boeing 787 program, and revised industry standards and design considerations for future aircraft such as the Boeing 777X. Caltech's partnership with Boeing has produced multiple patents and scientific manuscripts. Many Caltech graduates have gone on to work at Boeing and have transitioned some of the Caltech work directly to the company. Boeing continues to increase its collaboration with Caltech, funding multiple projects and increasing interactions campus-wide with students, faculty and post-docs.

**Good Chemistry with Dow**

Since 2009, Caltech and Dow have been strategic partners in advancing R&D and university-industry collaborations in the United States. In October 2011, Caltech and Dow strengthened their relationship in a multi-year commitment. Dow's investment has supported research, students, and infrastructure, enabling critical resources to address key world challenges.

This relationship has continued to blossom since its inception to a number of research areas. These collaborative efforts are strongly aligned to Caltech's scientific expertise and Dow's research interests. In announcing the agreement, Dow's Chairman and CEO, Andrew N. Liveris said "We are pleased to partner with academia to ensure that a vital pipeline of talent and research is available to fuel the discoveries and solutions of tomorrow."

**STARTUP TIMELINE**

Since Caltech's Office of Technology Transfer was established in 1995, its professionals have helped faculty and staff launch over 150 startup companies in industries such as biomedicine, communications, electronics, and energy.

