



Caltech

# The Caltech Advantage

*Caltech seeks answers to “impossible” questions, discovers new knowledge, and leads the way into the future.*

## STIMULATING EXPLORATION

Caltech is one of the world’s leading science and engineering research institutions due to a proven strategy of attracting top-caliber scientists and scholars and providing an environment in which they can thrive.

### FOCUSED RESEARCH

Emphasize fundamental science; promote high-risk, high-reward research; and solve complex scientific and societal problems.

### EXTRAORDINARY FACULTY

Recruit and attract promising and accomplished scientists who are explorers, pioneers, and inventors.

### INTELLECTUAL & CREATIVE FREEDOM

Cultivate an entrepreneurial environment and cross-disciplinary collaborations sustained by technical, human, and financial resources.

### UNIQUE EDUCATIONAL EXPERIENCE

Provide a rigorous curriculum integrated with extensive opportunities for research and faculty interaction.

### PARTNERSHIP WITH JET PROPULSION LABORATORY (JPL)

Propel space exploration and advanced instrumentation development with joint research and faculty appointments and the Keck Institute for Space Studies (KISS).

## THE CALTECH ADVANTAGE

# ACCELERATING DISCOVERY

## SEEKING SOLUTIONS TO GLOBAL CHALLENGES

### Developing alternative energy sources

- Expanding tools for efficiently generating, storing, and distributing clean power
- Inventing energy technologies inspired by biological systems

### Advancing health & medicine

- Nanoengineering molecular medicines and drug-delivery devices
- Boosting the potency of HIV-fighting proteins

### Improving information systems

- Enhancing global communication networks
- Developing quantum computing and information technologies

### Engineering advanced materials

- Creating novel polymers, elastics, adhesives, and metallic glasses
- Studying aerospace engineering, thermodynamics, and turbulence

### Enhancing our society

- Gaining greater insight into human motivation
- Improving financial decision making

### Understanding the environment

- Developing systems to manage and respond to natural hazards such as earthquakes, tsunamis, and fires
- Studying tectonics, earthquake processes, and climate

### Exploring the universe

- Investigating galaxies, stars, and solar systems
- Designing spacecraft, telescopes, optics, and microelectronics

# LEADING INNOVATION

## INVIGORATING THE ECONOMY

- Caltech consistently ranks among the top research institutions with its robust knowledge and technology transfer activities.
- In FY 2011, JPL subcontracted \$593 million in projects to companies and organizations in 48 states and Washington, D.C.

## LAUNCHING NEW MARKETS

- Caltech-led innovations have shaped several industries:
  - Aerospace
  - Electronics
  - Telecommunications
  - Information technology
  - Biotechnology
- Caltech researchers have created some of the key technologies behind such commercial products as satellites, integrated circuits, the DNA sequencer, hydrogen fuel cells, and infrared thermometers.

# MAGNIFYING IMPACT

## SHAPING TOMORROW'S SCIENTIFIC AGENDA

- Caltech alumni hold faculty or administrative leadership positions at more than 500 universities around the world.
- Caltech faculty are spearheading new fields such as bioinspired engineering, neuroeconomics, nanoscience, and quantum information and matter.
- Caltech leads large-scale science and engineering projects worldwide, including observatories, space missions, fundamental physics collaborations, and global seismological studies.

## CONNECTING SCIENCE TO SOCIETY

- Increasing diversity by expanding access to science, technology, engineering, and mathematics for historically underrepresented students.
- Encouraging global citizenship by training renaissance scientists to drive social change across industrial sectors and geographic boundaries.
- Promoting sustainability by integrating environmental stewardship with classroom instruction, research initiatives, and campus management.