Physics

Depth and breadth, depth and breadth—do we ever get tired of saying it? Actually, no. It's one of our calling cards. We ask our students to study the field at its base and at its highest reaches. We tend to get results. Our students win an unusual amount of national awards, including the National Science Foundation Graduate Fellowship; the Hertz Foundation Graduate Fellowship; and the American Physical Society's Apker Award for the country's outstanding physics student. Our graduates go on to excellent Ph.D. programs or take leadership positions in a range of fields.

It's surprisingly flexible—students can take a range of electives and special courses—and intensely demanding. Our core courses provide an immersive experience in foundational theory and practice. Specialized seminars and advanced reading courses feature rigorous, high-level work typically offered only in graduate programs.

Every course—including discussion sections and labs—is taught by our full-time faculty. And professors expect students to join them on major research projects. Students become deeply knowledgeable and broadly experienced in classical and modern physics, in theory and experiment, in foundations and applications. And our astronomy program is a joint venture with Pomona College; it includes foundational courses, half-courses and research.

The Physics department even has its own astronaut, HMC physics major and NASA astronaut Stanley G. Love who returned to HMC to address the question "Where should we go?" as part of Convocation on September 4, 2008. Dr. Love, who flew on a Shuttle mission in earlier 2008 which included two 7-hour space walks while docked to the International Space Station, spoke insightfully about two approaches to space missions: the Apollo and the Hubble. The Apollo effort was aimed at landing men on the Moon and returning them safely; it was audacious, expensive, and enormously successful. The Hubble has been another spectacular success, although for neither of the two primary investigations for which it was designed. Rather it has allowed scientists to observe that the expansion of the Universe is accelerating, an unanticipated but extraordinarily fundamental and (and baffling) discovery that poses exciting challenges for particle physics and cosmology. Love argued that Hubble-style projects are more likely to succeed in future. But what the department doesn't have but could certainly use includes:

- Superluminescent diode operating at a center wavelength of 850 nm to 1300 nm, with a spectral width of 80 nm to 200 nm. Output power >= 1 mW
- Super continuum (fiber?) laser operating at a center wavelength of 800nm to 1300 nm, with a spectral width of 100 nm to 300 nm. Output power >= 10 mW
- Oscilloscopes – 2–4 GHz bandwidth– Agilent, LeCroy or Tektronix
- Geodetic-grade GPS receiver systems