

WE HEAR THAT

MacArthur Fellows Announced for 2002

In September, the John D. and Catherine T. MacArthur Foundation named as its fellows 24 individuals, ranging from a trombonist to a paleoethnobotanist to a cosmologist. Among those honored are four with backgrounds related to physics: **Paul Ginsparg**, **Charles Steidel**, **Brian Tucker**, and **Paul Wennberg**. The nearly two-decade-old fellowship program is giving each winner a \$500 000 unrestricted grant for the next five years.

Ginsparg, who holds a joint appointment at Cornell University as a professor in both the physics department and the faculty of computing and information science, is widely known for creating, while a research staff member at Los Alamos National Laboratory, the e-print archive currently hosted by the Cornell University Library at <http://arXiv.org>. His document server, says the foundation, “represents a conscious effort to reorganize scientific communications, establishing a marketplace of ideas of new submissions with minimal editorial oversight and abundant opportunity for commentary, supporting and opposing, from other investigators.”

This interactive mechanism for scientific communications complements and, in some cases, replaces more traditional paper publications. The foundation says Ginsparg has “deliberately transformed the way physics gets done—challenging conventional standards for review and communication of research and thereby changing the speed and mode of dissemination of scientific advances.”

After Steidel completed his graduate studies in 1990 at Caltech, he developed a highly sensitive

method for identifying red-shifted objects; that method is based on the effects of interstellar hydrogen on the objects’ spectra. Steidel, now a professor of astronomy at Caltech, has “substantially expanded our capacity to detect galaxies at the end of the universe,” says the foundation, adding that his efforts have provided astronomers “the means to explore with much greater sensitivity the early processes in the cosmos that led to the distribution of galaxies in the contemporary universe.”

Steidel is working to test, through observation, competing theories of how star formation has evolved over time. According to the award citation, “By developing innovative methodology and making careful measurements, Steidel continues to enhance our understanding of the early history of the universe.”

Tucker is a seismologist who uses affordable civil engineering practices to help avoid disasters in the poorest countries. More than 10 years ago, he founded GeoHazards International, a not-for-profit, nongovernmental agency dedicated to preventing earthquake-induced structural failures in developing countries. He currently is president of GHI, a consulting professor in Stanford University’s civil engineering department, and a member of the editorial board of the *Journal of Earthquake Engineering*.

According to the foundation, Tucker is “an expert at adapting techniques used by developed countries in risk-mitigation projects so that [those techniques] fit within the social, political, and economic constraints of at-risk communities.” GHI principally focuses on schools because, in many regions, their poor construction makes them a common source for earthquake casualties. Tucker and his associates are working to develop and

apply a global earthquake-risk index to estimate risk and motivate risk-reduction measures. The foundation says that his “efforts have dramatically reduced the potential for death and injury to children and others from earthquakes in vulnerable cities around the world.”

Wennberg has “significantly refined our understanding of natural and anthropogenic influences on the chemistry of the atmosphere,” says the foundation. Free radicals are a major contributor to the formation of ozone and the regulation of greenhouse gases, but their low concentration and instability present obstacles for experimenters looking to study them.

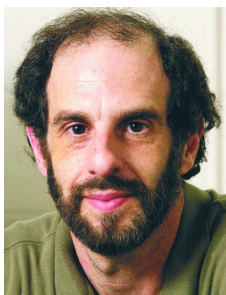
To overcome such difficulties, Wennberg and colleagues developed airborne sensors to detect these substances. He refuted the belief that lower stratospheric ozone is destroyed mainly by nitrogen oxides and showed that odd-hydrogen catalysis can be a quantitatively more important process. Ozone in the stratosphere shields Earth from UV radiation, but tropospheric ozone, which largely results from nitric oxide delivered to the atmosphere by aircraft and surface hydrocarbon burning, significantly reduces air quality. Says the foundation, “By developing methods for measuring radical gases in situ and interpreting these results within a theoretical framework, Wennberg has advanced our understanding of atmospheric chemistry.”

Balzan Foundation Gives Prize in Geology

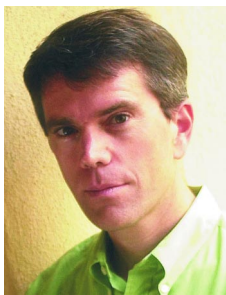
At a ceremony in Rome this month, the International Balzan Foundation is presenting four Balzan Prizes for 2002. Each year, the foundation gives awards in two different categories within the sciences and two within the humanities. One of this year’s disciplines is geology.

Xavier Le Pichon, chair of geodynamics at the Collège de France, is being honored as “one of the pioneers of the plate tectonics theory and of the high-resolution exploration of plate boundaries by submersibles.” He will receive a cash prize of 1 million Swiss francs (approximately \$662 000).

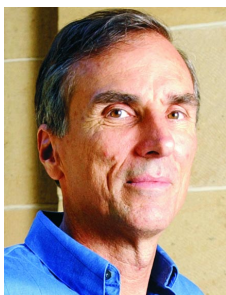
According to the citation, Le Pichon was the first to propose within plate tectonic theory a global quantitative



GINSPIRG



STEIDEL



TUCKER



WENNBERG

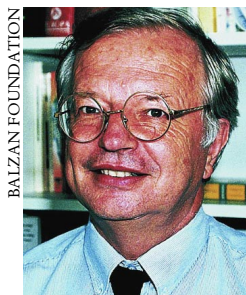
model of the motions of plates at Earth's surface. In 1968, he computed a global map of the relative movement of the six major plates. This map became the foundation for improved understanding of how earthquakes are distributed and for large-scale reconstruction of how continents and ocean basins were configured in the past.

Le Pichon also took the lead in using submersibles to explore the deep ocean. From the 1970s to the 1980s, he and his colleagues began high-resolution studies of midoceanic ridges, studies that led to the discovery of hydrothermal sources. He extended those studies to deep-sea trenches in the eastern Mediterranean Sea and to the Pacific Ocean trenches of Japan. Since the late 1990s, he has used ge-

octic methods to help him clarify interseismic deformation.

The foundation says that Le Pichon's "leading role in the development of marine geology in France and in many international programs, together with his gift of

combining mathematics, geophysics, and geology, [has] been the basis for his excellent teamwork and guidance of young talent in the earth sciences."



LE PICHON

Rubin Wins Cosmology Prize

The Peter Gruber Foundation will present its Cosmology Prize for 2002 to **Vera Rubin** this month in a ceremony at the Carnegie Observatory's Centennial Symposia II in Pasadena, California. She will receive a gold medal and \$150 000. The foundation, which is based in St. Thomas, US Virgin Islands, annually awards the prize to recognize individuals who have contributed to fundamental advances in cosmology. Jury members appointed by the International Astronomical Union in Paris select the recipients.

An astronomer at the Carnegie Institution of Washington's Department of Terrestrial Magnetism, Rubin is "preeminent in studying the motions of galaxies," reports the foundation. Her "pioneering studies of deviations of galaxy motions from classic Hubble theory demonstrated that large-scale structure existed in the universe." Through her explo-

rations of the rotation of spiral galaxies, she has found that most of the universe is unseen dark matter.

The foundation notes that Rubin is a role model for women in the sciences, particularly in astronomy. In 1965, she became the first woman sanctioned to observe at Palomar Observatory and, in 1996, was the first woman since 1828 to receive the Gold Medal from the Royal Astronomical Society in London. "By example and gentle voice," says the citation, "she has championed equal rights and revealed the incredible beauty of the universe."



RUBIN

IOP Announces Award Winners for 2002

At a ceremony to be held in London in January, the Institute of Physics will give awards to 14 individuals who have contributed to the development, management, understanding, and communication of physics worldwide.

The IOP will present its Paul Dirac Medal and Prize to **Christopher Hull** for his "pioneering work in superstring theory." He is a professor of theoretical physics at Queen Mary, University of London.

Terry Quinn, director of the Bureau International des Poids et Mesures in Sevres, France, will receive the Glazebrook Medal and Prize. He is being honored for his "leadership [in] international metrology."

In recognition of his "contributions to the study of electronic properties of condensed matter," the IOP will award its Guthrie Medal and Prize to **Michael Springford**, an emeritus professor of physics at the University of Bristol.

The Bragg Medal and Prize will go to **Ian Lawrence** for his "innovative contributions to physics education." He is a lecturer in physics education at the UK's University of Birmingham.

Michael Lockwood will receive the Charles Chree Medal and Prize for his "contributions to sun-climate relationships." He holds joint appointments as a professor in the solar-terrestrial physics group in the University of Southampton's department of

physics and astronomy and as chief scientist of the space science and technology department at the Rutherford Appleton Laboratory in Didcot, Oxfordshire, UK.

The IOP will present its Duddell Medal and Prize to **Stephen Myers**, director of the Super Proton Synchrotron-Large Hadron Collider division at CERN. He is being honored for his "contributions to the development of the major charged particle accelerator projects at CERN."

Peter Barham will receive the Kelvin Medal and Prize for his "innovative public activities promoting physics." He is a reader in physics at the University of Bristol.

The IOP's Mott Medal and Prize will be given to **Phil Woodruff** for his "contributions to the field of surface and interface science." He is a professor of physics and an Engineering and Physical Sciences Research Council (EPSRC) senior fellow at the University of Warwick.

The Thomas Young Medal and Prize will be presented to **J. Roy Sambles**, professor of experimental physics at the University of Exeter. The IOP is recognizing his "contributions to the study of optical properties of thin films."

Sean Langridge will receive the Charles Vernon Boys Medal and Prize for his "contributions to the field of modern magnetism." He is an instrument scientist at the Rutherford Appleton Laboratory.

The IOP will hand out its Maxwell Medal and Prize to **Tchavdar Todorov** for "theoretical contributions to electronic conduction in atomic-scale conductors." He is a reader in applied mathematics and theoretical physics with the atomistic simulation group in the school of mathematics and physics at the Queen's University Belfast.

Three winners will share the Paterson Medal and Prize. **Colin Cameron**, **Maurice Stanley**, and **Christopher Slinger** will be acknowledged for "the development of a computer-generated holography system" whose first applications, according to the IOP, will include industrial aerospace. The winners work for QinetiQ in the UK. Cameron is a team leader for holographic computational systems, Stanley is a team leader for spatial light modulator technology, and Slinger is the holography technical leader and chief technology officer for Holographic Imaging, a joint venture formed by QinetiQ and the Ford Motor Co.