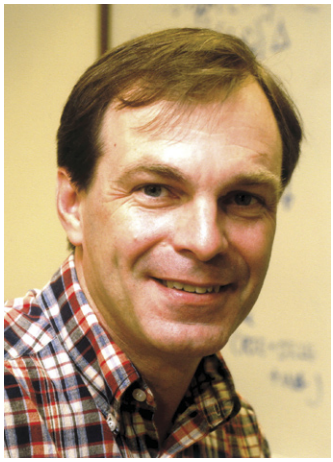
Lange Named California Scientist of the Year



Andrew Lange, the Goldberger Professor of Physics, has been named California Scientist of the Year for 2003 by the California Science Center, the 14th Caltech faculty member to win that honor. He shares the award with Saul Perlmutter, senior scientist and group leader at the Lawrence Berkeley National Laboratory in Berkeley.

Using two very different techniques, Lange and Perlmutter's experimental efforts have confirmed a remarkable theory of how the universe expanded and evolved after the Big Bang. The selection panel of the California Science Center concluded that Lange and Perlmutter's discoveries complement each other so well in revealing the nature of the universe that both scientists should be recognized this year.

Lange studies fluctuations in the cosmic microwave background (CMB) radiation, a relic of the primeval "fireball" that filled the early universe (see *E&S,* No. 3, 2000). These signals, which are visible today at microwave frequencies, provide a clear "snapshot" of the embryonic universe at an epoch long before the first stars or galaxies had formed. In general, this radiation reaches the earth uniformly from all directions in the sky. However, at the level of 0.003 percent there is an intricate pattern of fluctuations in the CMB. Using novel detectors developed at the Jet Propulsion Laboratory and flown on a balloon-borne telescope high above Antarctica, Lange's group was able to make the first resolved images of these very faint patterns. The images demonstrate that the radiation fluctuates on an angular scale of one degree, which is exactly what scientists expected from a mathematically flat universe, which, according to Einstein's general theory of relativity, places constraints on the amount of mass and energy in the universe.

Perlmutter's work indicates that the source of astronomical energy giving rise to a flat universe comes from a type of negative gravitational pressure or dark energy permeating the universe. □

Three elected to AAAS

The American Academy of Arts and Sciences has elected three Caltech faculty members as academy fellows. They are Fred C. Anson, the Gilloon Professor of Chemistry, Emeritus; Joseph L. Kirschvink, professor of geobiology; and Colin F. Camerer, the Axline Professor of Business Economics.

Anson has carried out pioneering work on the electrochemistry of polymers, on the catalysis of electrode reactions, and on electrochemical reactions that involve ultrathin coating of molecules on electrode surfaces.

Kirschvink, who has been honored by students for his excellence in teaching, studies how biological evolution has influenced, and has been influenced by, major events on the surface of the earth. His most significant contributions include the "snowball" earth theory—the theory that the entire planet may have actually frozen over several times in its history, possibly stimulating evolution. Another original concept concerns the Cambrian evolutionary explosion that he believes may have been precipitated in part by the earth's rotational axis having moved to the equator in a geologically short interval of time.

Camerer's research in experimental and behavioral economics integrates psychol-

ogy with economics to explore the impact on decision sciences and game theory. His research uses economics experiments and field studies to understand how people behave when making decisions. Such research is helpful in predicting economic trends and in understanding social policy. Poverty, war, cross-cultural interactions—most social issues are affected by decision psychology.

The total number of Caltech faculty named to the academy is now 82. □

New Faculty Officers

David Goodwin, professor of mechanical engineering and applied physics, has been elected new chair of the faculty; Henry Lester, the Bren Professor of Biology, will serve as vice chair; and David Wales, professor of mathematics, will continue as secretary of the faculty. They will serve two-year terms, beginning July 1.

The faculty files—

into Commencement 2003.

Other Honors and Awards

Six Caltech professors received Alfred P. Sloan Research Fellowships for 2003, which provide grants of $40,000 over a two-year period to young researchers to allow them the freedom to establish their own independent research projects at a pivotal stage in their careers. They are Paul David Asimow, assistant professor of geology and geochemistry; Linda C. Hsieh-Wilson, Jonas C. Peters, and Brian M. Stoltz, assistant professors of chemistry; Danny Calegari, associate professor of mathematics; and Athanassios G. Siapas, assistant professor of computation and neural systems. Stolz also received a $180,000 grant over three years from Johnson & Johnson's Focused Giving Program to continue his research on developing antileukemic drugs derived from the yew tree.

The 2003 ASCIT Teaching Awards went to Warren Brown, associate professor of history; Ada Chan, Bateman Research Instructor in Mathematics; John Eiler, assistant professor of geochemistry; James Eisenstein, professor of physics; and Ritsuko Hirai Toner, lecturer in Japanese.

Donald Helmberger, Smits Family Professor of Geophysics and Planetary Sciences and director of the Seismological Laboratory, has been awarded the 2002 Medal of the Seismological Society of America. The award is "given to persons for outstanding contributions in seismology and earthquake engineering who are distinguished for their attainments in seismology or related sciences, or for their service to the profession or the Society."

Michael Hoffmann, the Irvine Professor of Environmental Science and dean of graduate studies, gave the third annual Harold S. Johnston Lecture at UC Berkeley on March 18; the title of his lecture was "Photochemistry in Ice: Nitric Acid Photolysis and the Production of NO_2 and NO."

Alexander Kechris, professor of mathematics, is a corecipient of the 2003 Carol Karp Prize, which he shares with Greg Hjorth, a mathematics professor at UCLA. Awarded by the Association for Symbolic Logic, the prize is given every five years for a "connected body of research, most of which has been completed in the time since the previous prize was awarded," and this year recognizes the recipients' work on Borel equivalence relations. The prize consists of a cash award.

Joseph Kirschvink, professor of geobiology, has had an asteroid named after him. The asteroid (27711) Kirschvink was discovered at Palomar Observatory in 1988 by the late Gene Shoemaker and his wife Carolyn, who named it for Kirschvink.

Anneila Sargent, professor of astronomy and director of both the Owens Valley Radio Observatory and the Interferometry Science Center, has been named to the United Kingdom's Particle Physics and Astronomy Research Council (PPARC). Sargent, who has been president of the American Astronomical Society and chair of NASA's Space Science Advisory Committee, is expected to provide an international perspective to PPARC. Her appointment is for four years. She has also been selected for the 2003 George Darwin Lectureship of the Royal Astronomical Society.

The Caltech Graduate Student Council gave its Mentoring Award to Re'em Sari, associate professor of astrophysics and planetary science, and its Teaching Award to Mark Wise, the McCone Professor of High Energy Physics. The GSC Teaching Assistant Awards went to grad students Justin Bois in chemical engineering and Kumar Manoj Bobba in aeronautics. □