

WE HEAR THAT

MacArthur Fellows Announced

In October, the John D. and Catherine T. MacArthur Foundation presented fellowships with “no strings attached” financial support to 23 individuals. According to the foundation, it selects “talented individuals who have shown extraordinary originality and dedication in their creative pursuits, and a marked capacity for self-direction.” Of the fellows, five work in physics-related fields. They are **Christopher Chyba**, **Michael Dickinson**, **Lene Hau**, **Brooks Pate**, and **David Spergel**. Each MacArthur fellow will receive \$100 000 a year for the next five years.

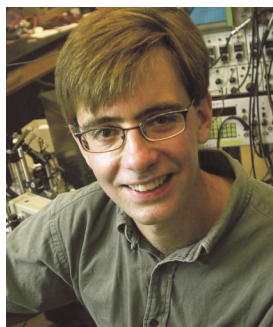
Chyba is a planetary scientist and science policy specialist and the Carl Sagan Chair for the Study of Life in the Universe at the SETI Institute in Mountain View, California. He is also codirector of the Stanford University Center for International Security and Cooperation and an associate professor of geological and environmental sciences at Stanford. His research focuses on reconstructing the conditions that spawned terrestrial life and exploring the similarities and differences among other objects in the Solar System. The foundation described Chyba as being “dedicated to the idea that scientists share a dual responsibility for enhancing our understanding of the natural world and for participating in the public discourse that affects our collective futures.”

Dickinson is an insect physiologist and professor of integrative biology at the University of California, Berkeley. His research is helping to solve the mysteries of insect flight (see *PHYSICS TODAY*, December 2000, page 22). He has created a robotic fly model with which one can carefully control each of the parameters of wing movement and assess their effects on aerodynamics. His research has also provided insight into how the fly’s brain controls aerodynamic properties. According to the foundation, Dickinson “has continually demonstrated the capacity to master any relevant scientific discipline necessary, and his ‘magic hands’ in the laboratory enable him to generate the key empirical data from which to build a comprehensive description of insect flight.”

The foundation recognized Hau’s research, which “extends the limits of



CHYBA



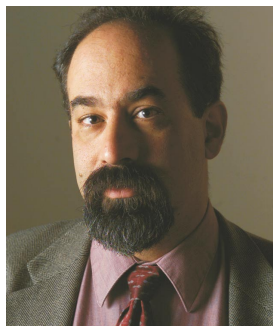
DICKINSON



HAU



PATE



SPERGEL

our capacity to control light and opens uncharted territory for novel research and future engineering applications.” A Gordon McKay Professor of Applied Physics and a professor of physics at Harvard University, Hau has shown how it is possible, under precise experimental control, to dramatically extend the time it takes for photons to pass through laser-manipulated ultracold gases and Bose–Einstein condensates (see *PHYSICS TODAY*, April 1999, page 9; July 1999, page 17; March 2001, page 17). The foundation said Hau’s “experiments provide a proof-of-concept for the development of optical switches that preserve the quantum state of photons passing through them. Such switches may be an invaluable component of future computers that use quantum physics to perform calculations.”

A physical chemist at the University of Virginia in Charlottesville, Pate has revealed new insights into chemical reactions of excited molecules. Much of his research has focused on a special class of reactions, known as unimolecular isomerization, in which a single molecule changes the configuration, but not the number, of its constituent atoms. Using spectroscopic techniques that he has developed, such as microwave-infrared double reso-

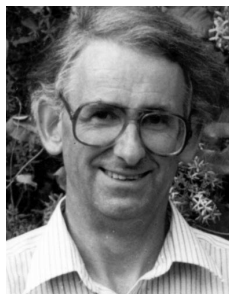
nance, he has examined the effect of vibrational and rotational nuclear motion on overall chemical reactivity. “By revitalizing this branch of physical chemistry, Pate’s research brings us closer to realizing the long-anticipated promise of laser technology for unprecedented control of chemical reactions,” said the foundation.

Spergel “takes risks with his ideas and, even at an early stage in his career, has left a marked impression in several areas of astrophysics,” acknowledged the foundation. A professor of astrophysical sciences at Princeton University and the editor of the *Princeton Series in Astrophysics*, Spergel has been exploring such astrophysical issues as the interpretation of the solar neutrino flux, the role of dark matter in the formation of the Galaxy, the early history of galactic formations and gravitational deformations, and the shape of the universe. His work on NASA’s Microwave Anisotropy Probe “has the potential to transform our understanding of the history and topology of the early universe,” said the foundation. Recently, he proposed a method for masking direct light from a star so that much dimmer light reflected off orbiting planets might be detected.

Achievements in Geophysics Honored

The American Geophysical Union recognized the contribution of several members of the geophysics community at its annual fall meeting held last month in San Francisco.

The 2001 William Bowie Medal, AGU’s highest award, was presented



MCKENZIE

to **Dan McKenzie**, Royal Society Professor of Earth Sciences at Cambridge University. The society honored McKenzie for his “fundamental contributions to understanding plate tectonics and willingness to share his

expertise with his colleagues to further this research.”

Richard G. Fairbanks was recognized with the 2001 Maurice Ewing Medal for his “distinguished contributions in the fields of paleoceanography, paleoclimatology, and marine geochemistry,” according to the medal citation. He is a professor of Earth and environmental science at Columbia University and a senior scientist at the Lamont-Doherty Earth Observatory.

The 2001 Harry H. Hess Medal went to **Albrecht Hofmann**, director of the geochemistry division at the Max Planck Institute for Chemistry in Mainz, Germany. Hofmann was praised by AGU for his “outstanding contributions to the geochemistry and dynamics of the Earth’s mantle.”

John H. Woodhouse received the Inge Lehmann Medal for 2001. He was chosen for his “outstanding contributions to theoretical seismology and their impact on our understanding of three-dimensional structure of the mantle and inner core anisotropy,” according to the society. Woodhouse is a professor of geophysics and the head of the department of Earth sciences at the University of Oxford.

The 2001 Roger Revelle Medal was presented to **James Hansen**, who was cited for his “outstanding contributions to understanding and communicating the nature of terrestrial atmospheres, the Earth’s climate system, and potential anthropogenic impacts.” Hansen is head of the NASA Goddard Institute for Space Studies in New York City.

Byron Tapley was honored with the Charles A. Whitten Medal for 2001 for his “original and innovative applications of statistical orbit determination theory and leadership in understanding the Earth’s geodesy.” Tapley is the Clare Cockrell Williams Chair in Engineering at the University of Texas at Austin and also director of the university’s Center for Space Research.

The Edward A. Flinn III Award for 2001 went to **Vinod K. Gaur**, Distinguished Professor at the Indian Insti-

tute of Astrophysics in Bangalore. The award citation credits Gaur for his “contributions facilitating research and development through the introduction of international collaboration in various aspects of Earth sciences in India.”

Three individuals garnered James B. Macelwane Medals for 2001. AGU gives this award to scientists younger than age 36 in recognition of their significant contributions to the geophysical sciences. The recipients were **Vasilis Angelopoulos**, an associate research physicist at the space sciences laboratory at the University of California, Berkeley; **Daniel P. Schrag**, a professor of Earth and planetary sciences at Harvard University; and **Azadeh Tabazadeh**, a research scientist in the Earth sciences division at NASA Ames Research Center at Moffett Field, California.

OSA Awards Given at Fall Meeting

A highlight of the Optical Society of America’s annual fall meeting in Long Beach, California, last October, was the presentation of several awards in recognition of notable contributions to the field.

The 2001 Frederic Ives Medal/Jarus W. Quinn Endowment, OSA’s most prestigious honor, was presented to **Nick Holonyak Jr.**, John Bardeen Chair Professor of Electrical and Computer Engineering and Physics at the University of Illinois, Urbana-Champaign. Holonyak was recognized by the society for his “outstanding, celebrated, and precedent-setting work in semiconductor science and technology.”

The Esther Hoffman Beller Medal for 2001 went to **Douglas S. Goodman**, a Distinguished Engineer at the Polaroid Corp in Waltham, Massachusetts. Goodman was cited by OSA for his “dedication to teach and inspire others about optics.”

Duncan T. Moore, the Rudolf and Hilda Kingslake Professor of Optical Engineering at the University of Rochester’s Institute of Optics in New York, received the 2001 OSA Leadership Award/New Focus Prize in recognition of his “technical, educational, and service contributions to the optics community and for contributions in public policy.”

Barbara A. Paldus, accepted the 2001 Adolph Lomb Award for her work on the “development of the

ultrasensitive absolute method for trace analysis of gas-phase species.” Paldus, founder and chief technology officer of BlueLeaf Networks in Long Beach, California, is the first woman to receive the Lomb Award since its inception in 1940.

The winner of the C. E. K. Mees Medal for 2001 was **Humio Inaba**, who was honored by OSA for his “contributions in quantum and optical electronics.” Inaba is a professor emeritus at the Tohoku Institute of Technology and Tohoku University in Sendai, Japan.

The 2001 David Richardson Medal was awarded to **Huib Visser**, a senior research fellow at the TNO Institute of Applied Physics (Delft University) in the Netherlands. The prize citation acknowledged Visser’s “innovative designs of complex optical space instrumentation.”

Federico Capasso, vice president of physical research at Bell Laboratories, Lucent Technologies, in Murray Hill, New Jersey, accepted the R. W. Wood Prize for 2001. The prize citation praised his “seminal contributions to the invention, demonstration, and development of the quantum cascade laser.”

The 2001 Allen Prize went to **David N. Whiteman**, a physical scientist in the atmospheres laboratory at NASA’s Goddard Space Flight Center in Greenbelt, Maryland. OSA acknowledged Whiteman for his “significant advances in the detection of water vapor, liquid water, and aerosols in the atmosphere using Raman lidar.”

Bernard Yurke received the Max Born

Award for 2001 for his “contributions in bosonic and fermionic squeezed states and the theory of local reality violations,” according to the citation. Yurke is a distinguished member of the technical staff at Bell Laboratories, Lucent Technologies.

The 2001 Joseph Fraunhofer Award/Robert M. Burley Prize went to **Warren J. Smith**, chief scientist at Kaiser Electro-Optics in Vista, California. Smith was honored for “providing a lifetime effort in optical engineering and applied optics.”

Shuji Nakamura, a professor of materials science at the University of California, Santa Barbara, received the 2001 Nick Holonyak Jr Award for his “original demonstration and commercialization of GaN-based semiconductor lasers and LEDs.”

The Ellis R. Lippincott Award for



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