

WE HEAR THAT

1998 Wolf Prizes Given in Physics and Chemistry

In January, the Wolf Foundation, based in Herzlia, Israel, announced the recipients of its 1998 Wolf Prize in physics and in chemistry. In a ceremony to be held in Jerusalem in May, the physics prize will be conferred on theorists **Yakir Aharonov** and **Michael Berry** and the chemistry honors will be shared by **Gerhard Ertl** and **Gabor A. Somorjai**.

Aharonov and Berry are being honored for "the discovery of the quantum topological and geometrical phases and their incorporation into many fields of physics." Aharonov is a professor of physics at the University of South Carolina and at Tel Aviv University in Israel, while Berry is the Royal Society Research Professor at University of Bristol in England. The two will split the monetary award of \$100,000.

The quantum topological phase mentioned in the citation is a reference to work that Aharonov began with the late David Bohm. The two discovered the now-well-known Aharonov-Bohm effect: When a charged particle moves around a magnetic flux line but in a field-free region of space, its wave function acquires a net phase. The prediction, which has been confirmed, is based on the nonlocality of quantum mechanics.

The topological phase noted in the citation refers to work done by Berry in discerning a second type of phase acquired by a quantum particle just by virtue of its adiabatic motion around certain geometries in parameter space. Also named for its discoverer, the Berry phase, according to the Wolf Foundation, is "a generalization of the Aharonov-Bohm effect . . . [and] an integral part of modern quantum physics."

In announcing its chemistry prize, the Wolf Foundation cites chemists Ertl and Somorjai "for their elucidation of fundamental mechanisms of heterogeneous catalytic reactions at single crystal surfaces." Ertl is a professor at the Fritz Haber Institute of the Max Planck Society in Berlin and Somorjai is a professor at the University of California, Berkeley, and at the Lawrence Berkeley Laboratory.

Ertl has determined the detailed mechanisms at the molecular level of the catalytic synthesis of ammonia over iron and the catalytic oxidation of carbon monoxide over palladium. In the process, he discovered the phe-



YAKIR AHARONOV



MICHAEL BERRY



GERHARD ERTL



GABOR A. SOMORJAI

nomenon of oscillatory reactions on platinum surfaces. According to the Wolf Foundation, Ertl's work is "distinguished by his ability to design experiments which identify and isolate the key parameters which control chemical reactivity at catalytic surfaces."

According to the prize announcement, Somorjai has pioneered the application of low-energy electron diffraction in surface crystallography and recognized the crucial importance of steps, kinks and terraces in heterogeneously catalyzed reactions. He has applied scanning tunneling microscopy and sum frequency generation to molecular surface characterization under "prac-

tical" conditions, such as high pressures rather than ultrahigh vacuum. Finally, the announcement notes, Somorjai has had "the personality to promote the field of surface science among the wider community."

National Academy Prizes to Be Given in April

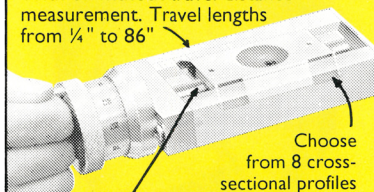
At its annual meeting in April, the National Academy of Sciences will present nine awards to individuals in different fields of science, in-

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cluding five in the mathematical and physical sciences.

NAS will give its Alexander Agassiz Medal to **Walter C. Pitman III**, a senior research scientist at Columbia University's Lamont-Doherty Earth Observatory in Palisades, New York. Pitman is being cited for "his fundamental contribution to the plate tectonic revolution through insightful analysis of marine magnetic anomalies and for his studies of the causes and effects of sea level changes." The Agassiz Medal is given every three years.

The NAS Award in Applied Mathematics, also presented every three years, will go to **Paul R. Garabedian** for "his spectacular contributions to computational fluid dynamics, especially the mathematical design of the first shock-free transonic airfoil." The citation also mentions his work for future controlled thermonuclear fusion, specifically, "the first stellarator with an almost smooth magnetic field." Garabedian is a professor of mathematics at New York University.

Allen J. Bard, who holds the Hackerman/Welch Regents' Chair in Chemistry in the department of chemistry and biochemistry at the University of Texas at Austin, will receive the NAS Award in Chemical Sciences. Bard is being recognized for "his fundamental

developments in mechanistic electrochemistry, electrochemiluminescence, semiconductor photoelectrochemistry, and scanning electrochemical microscopy."

Wayne A. Hendrickson will be the first recipient of the NAS Alexander Hollaender Award in Biophysics, an award that will be given every three years. He was chosen for "his contributions to macromolecular crystallography, in the development of robust methods of phasing and refinement, and in determination of complex and biologically important structures." Hendrickson is an investigator at the Howard Hughes Medical Institute and a professor in the department of biochemistry and molecular biophysics at the Columbia University College of Physicians and Surgeons.

The NAS Award for Scientific Reviewing is given for reviewing in various fields, and the 1998 field is geology and geophysics. **James R. Holton**, a professor in the University of Washington's department of atmospheric sciences, has been selected to receive this award. The citation praises Holton for "his landmark reviews that have become the primary cornerstones of the current understanding of dynamical meteorology of the Earth's stratosphere for both researchers and students."

OBITUARIES

Vladimir Naumovich Gribov

Vladimir Naumovich Gribov, a leading theorist in particle physics, died in Budapest on 13 August 1997 in the aftermath of a stroke. His outstanding results, original ideas and powerful techniques formed the basis of the current theoretical description of high-energy particle collisions and are applied by theorists and experimentalists worldwide.

Born on 25 March 1930 in Leningrad, Gribov graduated from Leningrad University in 1952. But only in 1954, when the antisemitism of the regime became looser after Stalin's death, could he, with the help of Ilya Shmushkevich and Karen Ter-Martirosyan, start research at the Leningrad Physico-Technical Institute. Rather soon, he became a recognized leader of theorists—informally at first, then later as the head of the institute's theory division.

Gribov's close personal contact with Lev Landau and Isaak Pomeranchuk during his trips to Moscow in the late 1950s was turning point in his scientific life. Landau considered him as his fu-



VLADIMIR NAUMOVICH GRIBOV

ture successor. Pomeranchuk inspired Gribov's interest in the collisions of hadrons at asymptotically high energies.

In 1961, Gribov applied the technique of complex angular momenta, which was first used by Tullio Regge in nonrelativistic quantum mechanics, to the asymptotic behavior of scattering amplitudes. Exploiting the analyticity



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