

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



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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-