

FIVE RECEIVE MACARTHUR FELLOWSHIPS IN 1987

The John D. and Catherine T. MacArthur Foundation last year named five people working in physics or related fields to receive its five-year fellowships. Daniel H. Friedan and Stephen Shenker (both of the University of Chicago), David Gross (Princeton University), Michael C. Malin (Arizona State University, Tempe) and John H. Schwarz (Caltech) were among the 32 recipients of the 1987 awards. The foundation imposes no restrictions on how fellows may use their funds, in the hope that this "freedom from financial constraints will lead to discoveries or other significant contributions to society that might otherwise not be made." The 1987 awards ranged in value from \$150 000 to \$375 000, reflecting a 25% increase over previous years to compensate for inflation and for the fact that these fellowships are taxable under the new tax laws.

Friedan and Shenker have made contributions to string theory and to the statistical mechanics of two-dimensional systems. In his PhD thesis Friedan studied certain general properties of the statistical mechanics of two-dimensional systems that have applications in string theory. He

Daniel H. Friedan



derived Einstein's equation for gravity, $R_{\mu\nu} = 0$, from the two-dimensional invariance. Shenker has worked in both fields. In 1983 Friedan and Shenker collaborated in applying concepts from string theory to a classification of phase transitions in two-dimensional systems; that classification made possible the prediction of exact values for critical exponents in two-dimensional systems. Since then they have continued to use the fundamental analogy between two-dimensional critical phenomena and string world sheets to study the fundamental structures of both.

Friedan received his AB in literature in 1969 from Princeton University. His initial graduate studies were in philosophy; he completed his PhD in physics at the University of California at Berkeley in 1980 and held a postdoctoral position at Saclay (France) in 1980-81. Friedan went to Chicago in 1981 as an assistant professor, and in 1987 he was named a full professor of physics.

Shenker holds a BA (1975) from Harvard and a PhD (1980) from Cornell. He held postdoctoral positions at the University of Chicago and at the Institute for Theoretical Physics,

Stephen Shenker



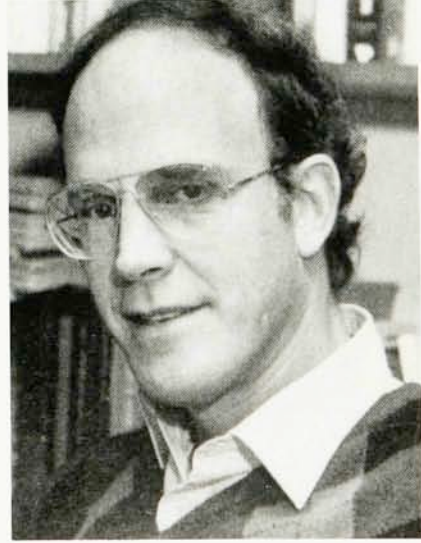
Santa Barbara, from 1979 to 1981. Shenker became an assistant professor of physics at Chicago in 1981; he was named a full professor in 1987.

Gross and his collaborators developed the heterotic string theory in 1984. He is currently studying the behavior of string theory at distances much shorter than the Planck length, 10^{-33} cm. In 1973 Gross and Frank Wilczek (Institute for Theoretical Physics, Santa Barbara) and H. David Politzer (Caltech) simultaneously discovered the phenomenon of asymptotic freedom, which is fundamental to quantum chromodynamics. (See the article by Gross, *PHYSICS TODAY*, January 1987, page 39.)

Gross received his BSc in 1962 from Hebrew University (Jerusalem, Israel) and his PhD from Berkeley in 1966. He was a junior fellow at Harvard from 1966 to 1969, when he went to Princeton. He became a full professor at Princeton in 1971, and in 1986 he was named Higgins Professor.

Malin is the principal investigator of a project to build a camera for the next planned NASA mission to Mars—the Mars Observer, scheduled for 1992. The camera, built in collaboration with G. Edward Danielson of

David Gross

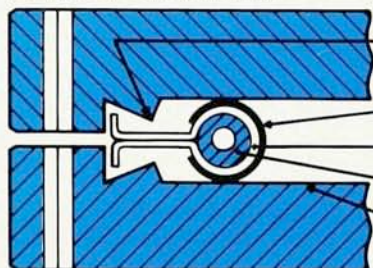


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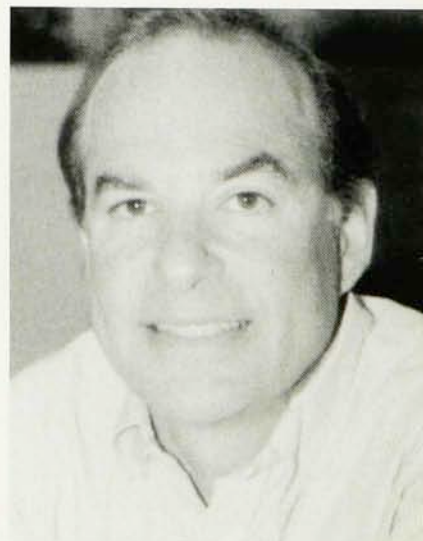


Michael C. Malin

Caltech, will be capable of resolving features as small as 2-3 meters across. As one of the principal investigators with the US Antarctic research program, Malin is studying chemical and physical processes in that continent's few ice-free regions. At Arizona State he has been developing numerical computer models of volcanic flows and eruptions. He and Roger Phillips (Southern Methodist University) have proposed localized conduction and volcanic mechanisms (the "hot spot" model) to explain heat loss from the interior of Venus. In addition, Malin has studied remote sensing capabilities of radar, visible, near-infrared and thermal sensing systems.

Malin received his AB in physics from Berkeley in 1971 and his PhD in planetary sciences and geology from Caltech in 1976. He was a senior scientist at Caltech's Jet Propulsion Lab from 1975 to 1979 before joining

John H. Schwarz



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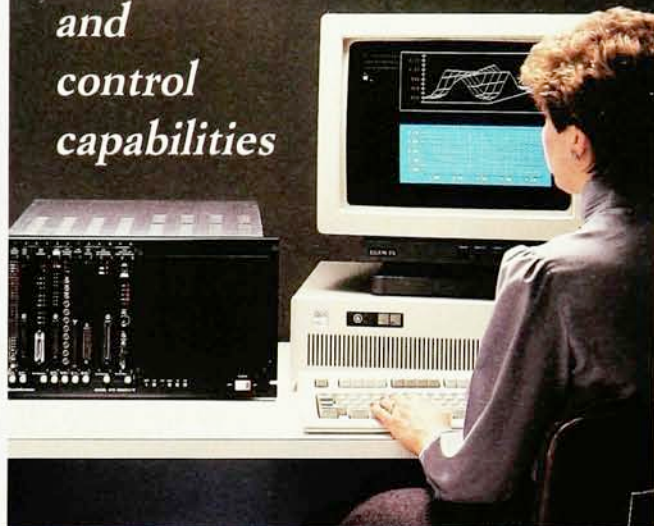
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the faculty of Arizona State in 1979 as an assistant professor. He became a full professor there in 1987.

Schwarz has worked on string theory since the late 1960s. In 1974 he and the late Joël Scherk proposed applying string theory to unify all fundamental interactions, including gravity. In 1984 he and Michael Green (Queen Mary College, London) discovered that the anomalies in ten-dimensional unified superstring theories cancel if the gauge group is either of the Lie groups $SO(32)$ or $E_8 \times E_8$. Schwarz and Green subsequently applied $SO(32)$ to develop a finite ten-dimensional superstring theory. (See the article by Schwarz, PHYSICS TODAY, November, page 33.)

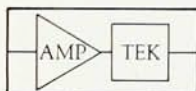
Schwarz received his BA in 1962 from Harvard and his PhD in 1966 from the University of California, Berkeley. He was an instructor (1966-68), lecturer (1968-69) and assistant professor (1969-72) of physics at Princeton. In 1972 he went to Caltech as a research associate; he became a professor of theoretical physics there in 1985.

IN BRIEF

Usha Mallik, formerly a physicist at SLAC, and **Yasar Onel**, formerly a *chargé de recherche et d'enseignement* at the University of Geneva, have become associate professors of experimental elementary-particle physics in the University of Iowa physics and astronomy department.

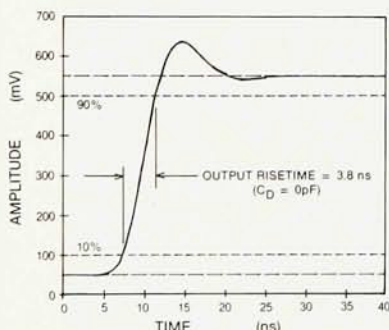
Chia-wei Woo, president and professor of physics at San Francisco State University, will become the founding president of the Hong Kong University of Science and Technology, a new university devoted to research and development and entrepreneurship, in September 1988.

Hendrik C. Van de Hulst, a professor at the University of Leiden, The Netherlands, delivered the 1987 Jansky Lecture, "Far from the Stars, in the Midst of Astronomy," at the University of Virginia last fall. Van de Hulst predicted in 1944 that the newly developed radiotelescopes would be able to detect radiation arising from the hyperfine structure of neutral hydrogen atoms in the Galaxy's interstellar medium. Harold I. Ewen and Edward M. Purcell (Harvard University) subsequently discovered the 21-cm line radiation in 1951.



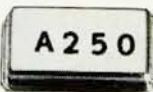
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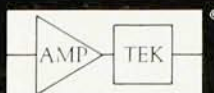
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