

WE HEAR THAT

1999 MacArthur Fellows Announced

In June, the John D. and Catherine T. MacArthur Foundation awarded fellowships to 32 individuals, who will receive five years of “no strings attached” financial support to use as they see fit. Among those honored are six with backgrounds in physics-related fields: **Jillian F. Banfield**, an associate professor of geology and geophysics at the University of Wisconsin—Madison; **Shawn Carlson**, founder and executive director of the Society for Amateur Scientists and an adjunct professor of physics at San Diego State University; **Juan Martin Maldacena**, an associate professor of physics at Harvard University; **Peter Shor**, a senior member of the research staff at AT&T Labs in Florham Park, New Jersey; **Eva Silverstein**, an assistant professor of physics at the Stanford Linear Accelerator Center; and **Jeffrey R. Weeks**, an independent mathematician in Canton, New York. They will receive grants ranging from \$245 000 to \$305 000.

According to the foundation, Banfield “has contributed fundamental insights into the physical and chemical forces that shape the earth’s surface.” Her studies have revealed the mechanisms of rock weathering and help to explain how elements such as toxic heavy metals can accumulate in soil. Her observations “may lead to an enhanced understanding of soil and sediment formation, factors affecting water quality and environmental processes as well as provide clues to the origins of life on earth.”

Carlson, a physicist and educator, works to make the scientific process less mystifying and more comprehensible to nonscientists. The foundation observed that, “through his dissemination of inexpensive experiments, many designed by Carlson himself, he demonstrates that scientific research is a quest to understand natural phenomena in which everyone can participate.”

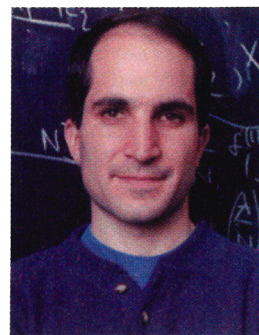
A string theorist, Maldacena “is redefining the boundaries of mathematical physics,” according to the foundation. “He has made key conceptual breakthroughs that have clarified thorny problems in theoretical physics, including the ultimate structure of matter.” Maldacena recently captured the attention of the theoretical physics community by postulating a critical theoretical link between the four-dimensional structure of quantum



BANFIELD



CARLSON



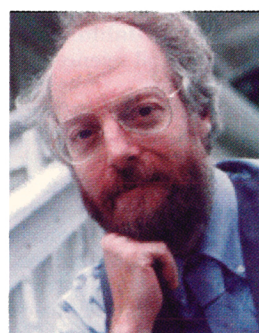
MALDACENA



SHOR



SILVERSTEIN



WEEKS

chromodynamics and a ten-dimensional string theory.

Shor is a computer scientist who is helping shape the field of quantum computing. “Using tools from physics, computation, and information theory, his discoveries offer the possibility of an exponential increase in the speed of an important class of calculations, breaking limits in computing currently thought to be insurmountable.” In 1998, Shor received the Nevanlinna Prize from the International Congress of Mathematicians.

Silverstein and her collaborators have made noteworthy contributions to the development of matrix theory (or M-theory), the umbrella theory for string theories. Her exploration of the relationship between the cosmological constant and more recent explanations of particle physics based on string theory provides “key insights into the age, structure, dynamics, and eventual fate of the universe.” She was also recently named a Sloan fellow.

Weeks is a researcher, writer, software developer, and mathematics educator. The foundation announcement stated, “He has made fundamental contributions to the analysis of knots, and collaborates with cosmologists to interpret the shape of the universe.” He also writes texts and articles, targeted to

young adults and nonspecialists, that are designed to stimulate interest and skill in thinking about geometry and space.

Guggenheim Foundation Names Fellows for 1999

The John Simon Guggenheim Foundation has awarded 179 US and Canadian fellowships this year, with an average value of \$33 836 each. The foundation has also awarded 34 Latin American and Caribbean fellowships this year, averaging \$32 000 each. The recipients were chosen for their “unusually distinguished achievement in the past and exceptional promise for future accomplishment,” according to the foundation. The American and Canadian recipients pursuing physics-related research include

David N. Beratan, an associate professor of chemistry at the University of Pittsburgh

Roger Bilham, a professor of geological sciences at the University of Colorado, Boulder and associate director of the Cooperative Institute for Research in the Environmental Sciences

Stephen G. Brush, a Distinguished University Professor of the