

# Arnold and Shelah Receive 2001 Wolf Prize

The 2001 Wolf Prize in Mathematics has been awarded to VLADIMIR I. ARNOLD of the Steklov Mathematical Institute, Moscow, and the Université de Paris-Dauphine, and to SAHARON SHELAH of the Hebrew University of Jerusalem. Arnold is honored “for his deep and influential work in a multitude of areas of mathematics, including dynamical systems, differential equations, and singularity theory.” Shelah is honored “for his many fundamental contributions to mathematical logic and set theory and their applications within other parts of mathematics.” The two share the \$100,000 prize.



Vladimir I. Arnold



Saharon Shelah

## Vladimir I. Arnold

Vladimir I. Arnold has made significant contributions to a large number of different mathematical disciplines. His many research papers, books, and lectures, plus his enormous erudition and enthusiasm, have had a profound influence on an entire generation of mathematicians. Arnold's Ph.D. thesis contained a solution to Hilbert's 13th problem. His work on Hamiltonian dynamics, which includes cocreation of KAM (Kolmogorov-Arnold-Moser) theory and the discovery of “Arnold diffusion”, made him world famous at an early age. Arnold's contributions to the theory of singularities complement Thom's catastrophe theory and have transformed this field. Arnold has also made innumerable and fundamental contributions to the theory of differential equations, symplectic geometry, real algebraic geometry, the calculus of variations, hydrodynamics, and magneto-hydrodynamics. He has often discovered links between problems in diverse areas.

Arnold was born in 1937 in Odessa, Russia. He received his B.Sc. (1954), his M.Sc. (1959), his Ph.D. (1961), and his D.Sc. (1963) all from Moscow State University. He held positions at that institution until 1986, when he became a professor at the Steklov Mathematical Institute, a position he currently holds. In 1993 he also assumed his other current position as professor at the Université de Paris-Dauphine. His previous honors include the Prize for Young Mathematicians of the Moscow Mathematical Society (1958), the Lenin Prize (1965, shared with A. N. Kolmogorov), the Crafoord Prize of the Royal Swedish Academy of Sciences (1982, shared with Louis Nirenberg), the Lobachevski Prize of the Russian Academy of Sciences (1992), and the Harvey Prize (1994). He is a member of the Russian Academy of Sciences, the Russian Academy of Natural Sciences, the U.S. National Academy of Sciences, the American Academy of Arts and Sciences, the American Philosophical Society, the

Académie des Sciences de Paris, the Royal Society of London, the Accademia dei Lincei, and the Accademia Europaea. He is also an honorary member of the London Mathematical Society.

### **Saharon Shelah**

Saharon Shelah has for many years been the leading mathematician in the foundations of mathematics and mathematical logic. His staggering output of 700 papers and half a dozen monographs includes the creation of several entirely new theories that changed the course of model theory and modern set theory and also provided the tools to settle old problems from many other branches of mathematics, including group theory, topology, measure theory, Banach spaces, and combinatorics. Shelah created a number of subfields of set theory, most notably the theory of proper forcing and the theory of possible cofinalities, which is a remarkable refinement of the notion of cardinality and which led to proofs of definite statements in areas previously considered far beyond the limits of undecidability. His work on set theoretic algebra and its applications showed that many parts of algebra involve phenomena that are not controlled by universally recognized axioms of set theory. In model theory he carried through a monumental program of deep structural analysis known as “stability theory”, which now dominates a large part of the field.

Shelah was born in 1945 in Jerusalem, Israel. He received his B.Sc. (1964) from Tel Aviv University and his M.Sc. (1967) and Ph.D. (1969) from the Hebrew University of Jerusalem. He held positions at Princeton University (1969–70) and the University of California, Los Angeles (1970–71), before returning to the Hebrew University of Jerusalem, where he is currently a professor. Since 1986 he has also been a Distinguished Visiting Professor at Rutgers University. His previous honors include the Erdős Prize (1977), the Rothschild Prize (1982), the C. Karp Prize of the Association for Symbolic Logic (1983), the George Pólya Prize of the Society for Industrial and Applied Mathematics (1992), the Israel Prize for Mathematical Research (1998), the Japanese Association of Mathematical Sciences Prize (1999), and the János Bolyai Prize of the Hungarian Academy of Sciences (2000). He is a member of the Israel Academy of Sciences and Humanities and is an honorary member of the American Academy of Arts and Sciences.

### **About the Wolf Prize**

The Wolf Foundation was established by the late German-born inventor, diplomat, and philanthropist Ricardo Wolf (1887–1981). A resident of Cuba for many years, he became Fidel Castro’s ambassador to Israel and held this position until 1973, when Cuba severed diplomatic ties. Wolf decided then to stay on in Israel, where he lived until his death in 1981.

Five annual Wolf Prizes have been awarded since 1978 to outstanding scientists and artists “for achievements in the interest of mankind and friendly relations among peoples, irrespective of nationality, race, color, religion, sex, or political view.” The prizes of \$100,000 apiece are given every year in four out of five scientific fields in rotation: agriculture, chemistry, mathematics, medicine, and physics. The arts prize rotates among architecture, music, painting, and sculpture. The prize jury in each field is formed by three members: one from the United States, one from Europe, and one from Israel. New juries are appointed each year. The Wolf Foundation does not disclose the names of the jury members in order to allow them to make their decisions exclusively on the basis of the candidates’ achievements.

—*Allyn Jackson*