

Gromov Receives Nemmers Prize

MIKHAEL L. GROMOV, professor of mathematics at the Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France, and Jay Gould Professor of Mathematics at the Courant Institute of Mathematical Sciences at New York University, has been named the recipient of the Frederic Esser Nemmers Prize in Mathematics.

The prize recognizes outstanding achievement in mathematics as demonstrated by major contributions to new knowledge or the development of significant new modes of analysis. The prize carries a stipend of \$150,000. In connection with the prize, Gromov is expected to deliver public lectures and participate in other scholarly activities at Northwestern University during the 2004-05 academic year.

The Selection Committee for the prize recognized Gromov “for his work in Riemannian geometry, which revolutionized the subject; his theory of pseudoholomorphic curves in symplectic manifolds; his solution of the problem of groups of polynomial growth; and his construction of the theory of hyperbolic groups.” His work has been revolutionary in a number of basic areas of modern geometry.

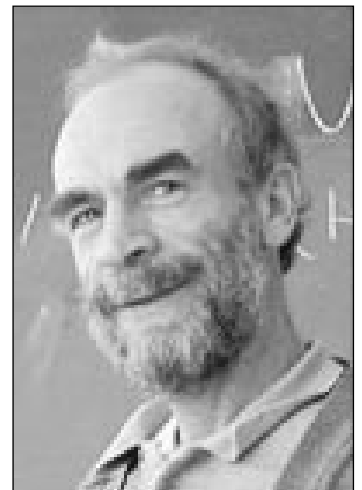
Gromov’s work is “both tremendously elegant and immediately relevant to problems in applied mathematics and mathematical physics in a way that reflects his tremendous creativity and excellent taste,” said Ezra Getzler, professor of mathematics at Northwestern University. Getzler commented that “Gromov’s work on symplectic manifolds has already played a central role in the development of one of the most promising unified field theories of theoretical physics, string theory. He is a true successor to great geometers of the past, such as Felix Klein, who lectured at Northwestern in 1893.”

The Work of Mikhael Gromov

Gromov’s work covers all areas of geometry and its relations with neighboring fields such as topology and analysis. He brings a profoundly original and expansive viewpoint to any subject he works on. This viewpoint illuminates the subject and opens spectacular vistas which cannot be seen with the nose closer to the ground, and sometimes it creates a whole new subject which is then explored by many other researchers for years, long after Gromov has moved on.

A hallmark of much of Gromov’s work is the softening of geometry, whereby equations are replaced by inequalities or approximate or asymptotic equations. Examples include the “coarse” viewpoint on Riemannian geometry, which considers all Riemannian structures at once; the “homotopic” viewpoint on partial differential equations, which solves generic underdetermined and some determined and overdetermined systems via topology; and the “asymptotic” viewpoint on geometric group theory. Gromov has revolutionized symplectic geometry by the introduction of methods from complex analysis and has given important impulses to index theory and to sub-Riemannian (or Carnot-Carathéodory) geometry. He has introduced many important new concepts into geometry, most of which are outgrowths of his “coarse” or “soft” viewpoint: almost flatness of metrics and connections, simplicial volume, K -area, hyperbolicity of groups, etc.

A few of the many concrete results proved by Gromov are: the existence of foliations on open



Mikhael L. Gromov

manifolds, the volume comparison estimate generalizing a result of Bishop, the finiteness of positively curved manifolds, the nonexistence of metrics of positive scalar curvature on flat or hyperbolic and other enlargeable manifolds (joint with H. B. Lawson Jr.), the construction of manifolds of variable negative curvature (with W. P. Thurston), the construction of nonarithmetic lattices in hyperbolic spaces (with I. Piatetski-Shapiro), and the uniqueness of the symplectic structure on the complex projective plane (completed by C. H. Taubes).

Gromov has had and will continue to have a widespread influence on contemporary mathematics.

Biographical Sketch

Mikhael L. Gromov was born on December 23, 1943, in Boksitogorsk, USSR, and has been a French citizen since 1992. He studied at the University of Leningrad, where he received his doctorate in 1969. In 1974 he left the USSR and became a professor at the State University of New York at Stony Brook. In 1981 he moved to the Université de Paris and the following year assumed his present position as a permanent professor at the Institut des Hautes Études Scientifiques. He is currently also a professor at the Courant Institute of Mathematical Sciences, New York University.

Gromov has received many prizes and honors, including the Prize of the Mathematical Society of Moscow (1971), the Oswald Veblen Prize of the AMS (1981), the Prix Élie Cartan de l'Académie des Sciences de Paris (1984), the Prix de l'Union des Assurances de Paris (1989), the Wolf Prize (1993), the AMS Leroy P. Steele Prize for Seminal Contribution to Research (1997), the Lobachevski Medal (1997), the Balzan Prize (1999), and the Kyoto Prize (2002). He was an invited speaker at the International Congress of Mathematicians in Nice (1970), Helsinki (1978), Warsaw (1982), and Berkeley (1986). He is a foreign member of the U.S. National Academy of Sciences and of the American Academy of Arts and Sciences, and a *membre de l'institut* of l'Académie des Sciences de Paris. He received an honorary doctorate from the Université de Genève in 1992.

About the Nemmers Prize

Every other year Northwestern University presents the Frederic Esser Nemmers Prize in Mathematics and the Erwin Plein Nemmers Prize in Economics. The 2004 prize in economics went to Ariel Rubinstein, professor of economics at Tel Aviv University and New York University.

The Nemmers Prizes are made possible through bequests from the late Erwin E. Nemmers, a former member of the Northwestern faculty, and his brother, the late Frederic E. Nemmers, both of Mil-

waukee. Erwin Nemmers, who persuaded his brother to join him in making a substantial contribution to Northwestern, served as a member of the faculty of the Kellogg School of Management from 1957 until his retirement in 1986. Along with his brother, Frederic, he was a principal in a Milwaukee-based, family-owned church music publishing house.

Their gifts, totaling \$14 million, were designated by Erwin and Frederic Nemmers for two purposes: the establishment of four endowed professorships in the Kellogg School of Management and the establishment of the Nemmers Prizes.

A third award, the Michael Ludwig Nemmers Prize in Musical Composition, was announced in fall 2003 and will be awarded in 2004–05. Like the economics and mathematics prizes, the music prize will be awarded every other year; it will have a value of \$100,000.

—Allyn Jackson