Bass Receives National Medal of Science

On July 18, 2007, President George W. Bush announced the recipients of the 2006 National Medal of Science. Among the eight medalists is HYMAN BASS, Roger Lyndon Collegiate Professor of Mathematics and of Mathematics Education at the University of Michigan. Bass was cited for "his fundamental contributions to pure mathematics, especially in the creation of algebraic K-theory, his profound influence on mathematics education, and his service to the mathematics research and education communities. With his unique combination of gifts he has had enormous impact over the course of a half century."

President Bush presented the awards to the 2006 and 2005 National Medal of Science recipients in a White House ceremony on July 27, 2007. (Among the 2005 recipients is Stanford University statistician Bradley Efron; an announcement about that award appeared in the September 2007 issue of the *Notices*.)

Hyman Bass

The accompanying sidebar provides a brief account of Bass's research in mathematics. He has also worked extensively in mathematics education, primarily in collaboration with Deborah Ball of the University of Michigan. This work has centered on subject-matter knowledge entailed in teaching, practice-based research on teaching and learning, teacher education, reasoning and proof in school mathematics, and analysis of curriculum materials. Bass was a member of the Mathematical Sciences Education Board of the National Research Council from 1991 until

The Mathematical Work of Hyman Bass

Hyman Bass's wide-ranging research in algebra has featured a conceptual clarity and generality that not only powerfully addressed deep questions but provided the tools and framework for others who followed in his pioneering footsteps. His early work considered commutative rings of finite injective dimension, and his recognition of their "ubiquity" resulted in one of the most often-cited papers in commutative algebra. Bass's interest in projective modules led to his project to systematically translate topological K-theory into algebra, and in particular to the definition of K_1 of a ring and the analysis of the latter, including a complete description in the important case of rings of algebraic integers. The answer, as well as the analysis, is connected to the Congruence Subgroup Problem, another area where Bass made fundamental contributions.

One of the techniques used in the Congruence Subgroup Problem led to the consideration of groups acting on trees and generalizations and in turn to considerations of locally compact automorphism groups of trees and the lattices in them. As with algebraic K-Theory, Bass's work not only solved basic problems in the theory of tree lattices but formulated the foundations for the subject. Along with his genius for setting the stage and systematizing subjects, Bass has many technically demanding achievements, including subtle and significant examples delineating the boundaries of the representation theory of finitely generated groups.

No brief summary can do more than suggest the range of topics on which Hyman Bass's work has made an impact. For a fuller account covering Bass's work up to 1997, we refer the reader to [1].

—T. Y. Lam, University of California, Berkeley
and
—A. R. Magid, University of Oklahoma

Reference

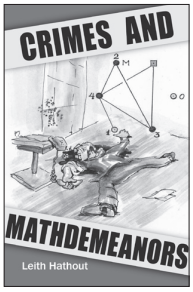
[1] *Algebra, K-Theory, Groups, and Education*, Contemp. Math. **243** (1999), Amer. Math. Soc., Providence, RI.

NEW from A K PETERS

Mysteries and Puzzles

Crimes and Mathdemeanors

Leith Hathout $14.95; Paperback; 150 pp.



"Leith Hathout, drawing on a great love of mathematics, has with incredible ingenuity embedded fourteen lovely problems within fourteen mystery yarns."

—MARTIN GARDNER

"This is a truly delightful book that should inspire many a high school student, bored with classroom 'word problems,' to take a second look at the subject with fresh eyes. The more so if they realize that the author is, like them, a high school student!

—KEITH DEVLIN

"I am hoping that in the setting of solving a mystery, [kids my age] might come to see math as interesting and useful and beautiful."

—LEITH HATHOUT

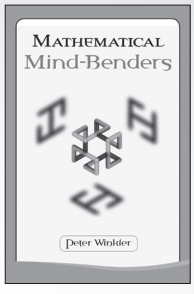
Save 20% on these titles
discount code AMS

Mathematical Mind-Benders

Peter Winkler $18.95; Paperback; 160 pp.

This wonderful book presents, from diverse sources and with wit and humor, many interesting and challenging problems, both mathematical and otherwise. Like its predecessor, it is a must for the shelves of a problem connoisseur."

—ANDY LIU



This book is for lovers of mathematics, lovers of puzzles, lovers of a challenge. Most of all, it is for those who think that the world of mathematics is orderly, logical, and intuitive—and are ready to learn otherwise!

Celebrating 15 years of
Independent Publishing

www.akpeters.com

2000 (chair, 1993–2000). From 1998 until 2006 he was president of the International Commission on Mathematics Instruction, which operates under the auspices of the International Mathematical Union.

Born on October 5, 1932, in Houston, Texas, Hyman Bass received his Ph.D. from the University of Chicago in 1959 under the direction of Irving Kaplansky. Bass was on the faculty of Columbia University before moving to the University of Michigan in 1999. He has held numerous visiting positions, including at the Institute for Advanced Study in Princeton, the Tata Institute for Fundamental Research in Mumbai, and at the Institut des Hautes Études Scientifiques in Paris. He has served on the AMS Council and on many AMS committees, including the *Notices* Editorial Board. He was president of the Society during 2001 and 2002. His honors include the AMS Cole Prize in Algebra (1975) and the Gung and Hu Award for Distinguished Service to Mathematics of the Mathematical Association of America (2006). Bass was elected as a member of the American Academy of Arts and Sciences (1980), as a fellow of the American Association for the Advancement of Science (1980), and as a member of the U.S. National Academy of Sciences (1982). He was an invited speaker at the International Congress of Mathematicians in Moscow (1966) and in Vancouver (1974), and he delivered a plenary address at the International Congress on Mathematical Education in Copenhagen (2004). He was a member of Bourbaki from 1970 until 1982.

The National Medal of Science is the country's highest distinction for contributions to scientific research. According to a news release from the Office of Science and Technology Policy, "The National Medal of Science honors individuals for pioneering scientific research in a range of fields, including physical, biological, mathematical, social, behavioral, and engineering sciences, that enhances our understanding of the world and leads to innovations and technologies that give the United States its global economic edge." The National Science Foundation administers the award, which was established by the Congress in 1959.

—Allyn Jackson