



**Association for
Computing Machinery**

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**ACM KANELLAKIS AWARD HONORS INNOVATOR OF AUTOMATED TOOLS FOR
MATHEMATICS**

**Bruno Buchberger Developed Algorithm Used in Computer Algebra to Solve Problems in Computer
Science, Engineering, and Science**

NEW YORK, May 13, 2008 -- ACM (the Association for Computing Machinery) has recognized Bruno Buchberger, a professor at Johannes Kepler University in Linz, Austria, for his role in developing the theory of Groebner Bases, which has become a crucial building block to computer algebra, and is widely used in science, engineering, and computer science. Buchberger's work has resulted in automated problem-solving tools to address challenges in robotics, computer-aided design, systems design, and modeling biological systems. He will be honored with the ACM Paris Kanellakis Theory and Practice Award, which honors specific theoretical accomplishments that significantly affect the practice of computing.

Buchberger, who named the Groebner Bases after his advisor Wolfgang Groebner, also provided an algorithm, which is a detailed set of instructions in the form of a computer program, for finding these bases. This algorithm is now known as Buchberger's Algorithm. It is included in all major computer algebra software systems including *Mathematica*, *Macsyma*, *Magma*, *Maple* and *Reduce*. These software programs enable computers to manipulate mathematical equations and expressions in symbolic form, and are heavily used in science and mathematics. The American Mathematical Society key word index for mathematics recently created an extra key word for "Groebner Bases."

Currently, Buchberger leads the development of the Theorema project, which aims to extend existing computer algebra systems by creating ways to facilitate mathematical proving. The project's long-term goal is

to create interactive textbooks for mathematicians that contain not only the ordinary passive text, but active text that represents algorithms in executable format, as well as proofs that can be studied, and whose routine parts can be automatically generated. This system will provide a uniform framework in which working mathematicians can access computer support while proceeding through all phases of the mathematical problem solving cycle without leaving the Theorema system.

In 1985, Buchberger founded the *Journal for Symbolic Computation*, and was editor-in-chief through 1995. He founded the Research Institute for Symbolic Computation (RISC) at Johannes Kepler University in 1987, and led it until 1999. In 1991, he founded the Software Park in Hagenberg, Austria, one of Austria's most successful technology parks, combining economics, research, and software.

From 1979-81, Buchberger was Dean of the School of Technical and Natural Sciences at Johannes Kepler University, where he is currently Professor of Computer Mathematics. Buchberger was appointed as a member of the Academia Europea in London in 1991. He has received the Honorary Cross for Science and Culture, First Class, of the Austrian Ministry of Science and numerous other Austrian awards.

A graduate of the University of Innsbruck, he holds a Habilitation and a Ph.D. in mathematics. He was given Honorary Doctorates from the University of Nijmegen, The Netherlands (1993), the University of Timisoara, Rumania (2000), and the University of Bath, UK (2005).

ACM will present the 2007 Kanellakis Award at its annual Awards Banquet June 21, in San Francisco, CA.

The Paris Kanellakis Theory and Practice Award honors specific theoretical accomplishments that have had a significant and demonstrable effect on the practice of computing. This award is endowed by contributions from the Kanellakis family, with additional financial support provided by ACM's Special Interest Groups on Algorithms and Computational Theory (SIGACT), Special Interest Group on Design Automation (SIGDA), Special Interest Group on Management of Data (SIGMOD), Special Interest Group on Programming Languages (SIGPLAN), the ACM SIG Project Fund, and individual contributions.

About ACM

ACM, the Association for Computing Machinery www.acm.org, is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

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