1010-14-4   **Rekha R. Thomas*** (`thomas@math.washington.edu`), Department of Mathematics, Box 354350, University of Washington, Seattle, WA 98195. *Goebner Bases: From theory to applications and back.*

Groebner bases of polynomial ideals are special generating sets of the ideal that play a central role in solving polynomial systems. Since the invention of Buchberger's algorithm for their computation in the 1960s, these bases have revolutionized computational methods in commutative algebra and algebraic geometry and form the heart of modern computer algebra packages such as Macaulay 2, CoCoA and Singular. They have also become an important theoretical tool in algebra and algebraic geometry. My aim in this talk is to present a biased survey of the highlights of Groebner bases in both theory and applications begining with Paul Gordan's proof of Hilbert's basis theorem in 1900. (Received November 29, 2004)