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Franz Winkler is professor and chairman of the Research Institute for Symbolic Computation (RISC) at Johannes Kepler University (JKU) in Linz, Austria. He focuses on problems of computer algebra, computational geometry, and logical reasoning.

After his diploma studies in mathematics, he spent a year of graduate studies at Rensselaer Polytechnic Institute (RPI) in Troy, New York, in the frame of a Fulbright scholarship. He finished his PhD studies in Austria, and then accepted a visiting assistant professorship at the University of Delaware, where he spent two years. He returned to Austria and completed his habilitation in mathematics at JKU. His academic career led him to a full professorship at JKU. For several years, he has been the chairman of the RISC institute.

His research and teaching span various areas of symbolic computation. In the late 1970s, he created one of the first implementations of the Gröbner bases algorithm, and he has worked on constructive methods in polynomial elimination theory ever since. He has published papers on efficient versions of completion algorithms for term rewriting systems. Gröbner bases and canonical term rewriting systems are complete versions of polynomial ideal bases and axiom systems for equational logical theories. Winkler contributed strongly to the creation of a general theory of completion. More recently, he investigated the application of computer algebra methods to problems in computational algebraic geometry, such as the rational parametrization of algebraic curves. His research group has developed the program system CASA, based on the computer algebra system Maple, for analyzing, designing and manipulating algebraic curves and varieties. Currently, he is working on symbolic computation in differential algebraic theories.

Winkler has published numerous scientific papers and several books, including a monograph on computer algebra. He has received the highest Austrian award for PhD studies, the *promotio sub auspiciis praesidentis rei publicae*. Besides his position at JKU, he has held several visiting professorships and visiting researcher positions in Europe, the US, China, Japan, and Australia. He cites international cooperation and stimulating work with young scientists as the most rewarding aspects of his academic career.

Reviews by Franz Winkler

Incompleteness: the proof and paradox of Kurt Gödel (Great Discoveries)
Goldstein R., W. W. Norton & Co., Inc., 2005. 296 pp. Type: Book
Kurt Gödel is certainly one of the best known and least understood mathematicians of the twentieth century, both within and outside of mathematics. Goldstein does a remarkable job of explaining the societal background, the philosophical and...

Theory revision with queries: Horn, read-once, and parity formulas
Goldsmith J., Sloan R., Szörényi B., Turán G. Artificial Intelligence 156(2): 139-176, 2004. Type: Article
The problem addressed in this paper is the following: we are given a Horn clause representing a theory about some real-world phenomenon, for example, saying that a cup is an object that is upright, liftable, open, graspable, and white. Now, we...

Root comparison techniques applied to computing the additively weighted Voronoi diagram
Karavelas M., Emiris I. Discrete algorithms (Proceedings of the fourteenth annual ACM-SIAM symposium, Baltimore, Maryland, Jan 12-14, 2003) 320-329, 2003. Type: Proceedings
Karavelas and Emiris consider additively weighted Voronoi diagrams (Voronoi diagrams in which the sites carry weights), and the distance of a point from a site is the Euclidean distance minus the weight of the site. Geometrically, this...

On interactive proofs with a laconic prover
Goldreich O., Vadhan S., Wigderson A. Computational Complexity 11(1/2): 1-53, 2003. Type: Article
As the authors state, "Interactive proof systems are two-party randomized protocols through which a computationally unbounded prover can convince a probabilistic polynomial-time verifier of the membership of a common input in a...

Decomposition plans for geometric constraint systems, part I: performance measures for CAD
Hoffman C., Lomonosov A., Sitharam M. Journal of Symbolic Computation 31(4): 367-408, 2001. Type: Article
Geometric constraint systems appear widely in engineering applications in CAD/CAM/CAE. Roughly

speaking, a set of objects from a limited set of object types (for example, point, lines, circles, and arcs) is equipped with a set of constraints,...

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