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Algorithms, and Complexity (Abstract) (Invited Talk) -- Supporting Global Numerical Optimization of Rational Functions by Generic Symbolic Convexity Tests -- Term Cancellations in Computing Floating-Point Gröbner Bases -- One Class of Third-Order Linear ODE's -- GPGCD, an Iterative Method for Calculating Approximate GCD, for Multiple Univariate Polynomials -- Derivation of Explicit Difference Schemes for Ordinary Differential Equations with the Aid of Lagrange-Burmans Expansions -- Parametric Qualitative Analysis of Ordinary Differential Equations: Computer Algebra Methods for Excluding Oscillations (Extended Abstract) (Invited Talk) -- An Analytical Model for the Probability Characteristics of a Crack Hitting an Encapsulated Self-healing Agent in Concrete -- Extending Clause Learning of SAT Solvers with Boolean Gröbner Bases.

Sommario/riassunto

The CASC Workshops are traditionally held in turn in the Commonwealth of Independent States (CIS) and outside CIS (Germany in particular, but, at times, also other countries with lively CA communities). The previous CASC Workshop was held in Japan, and the 12th workshop was held for the first time in Armenia, which is one of the CIS republics. It should be noted that more than 35 institutes and scientific centers function within the National Academy of Sciences of Armenia (further details concerning the structure of the academy can be found <http://www.sci.am>). These institutions are concerned, in particular, with problems in such branches of natural science as mathematics, informatics, physics, astronomy, biochemistry, etc. It follows from the talks presented at the previous CASC workshops that the methods and systems of computer algebra may be applied successfully in all the above-listed branches of natural sciences. Therefore, the organizers of the 12th CASC Workshop hope that the present workshop will help the Armenian scientists to become even more familiar with the capabilities of advanced computer algebra methods and systems and to get in touch with specialists in computer algebra from other countries. The 11 earlier CASC conferences, CASC 1998, CASC 1999, CASC 2000, CASC 2001, CASC 2002, CASC 2003, CASC 2004, CASC 2005, CASC 2006, CASC 2007, and CASC 2009 were held, respectively, in St. Petersburg (Russia), Munich (Germany), Samarkand (Uzbekistan), Konstanz (Germany), Yalta (Ukraine), Passau (Germany), St.
