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Nota di contenuto	Tropical Geometry of Biological Systems (Invited Talk) -- Algebraic and Geometric Analysis of Singularities of Implicit Differential Equations (Invited Talk) -- On the Complexity of Computing Integral Bases of Function Fields -- Truncated and Infinite Power Series in the Role of Coefficients of Linear Ordinary Differential Equations -- On Periodic Approximate Solutions of the Three-Body Problem Found by Conservative Difference Schemes -- Univariate Polynomials With Long Unbalanced Coefficients as Bivariate Balanced Ones: a Toom–Cook Multiplication Approach -- Power Series Arithmetic with the BPAS Library -- Enhancements to Lazard's Method for Cylindrical Algebraic Decomposition -- The Complexity and Parallel Implementation of two Sparse Multivariate Hensel Lifting Algorithms for Polynomial Factorization -- The GPGCD Algorithm with the Bézout Matrix -- On

Parametric Linear System Solving -- Symbolic-Numeric Algorithm for Computing Orthonormal Basis of  $O(5)$   $SU(1,1)$  Group -- Symbolic-Numeric Study of Geometric Properties of Adiabatic Waveguide Modes -- Intrinsic Complexity for Constructing Zero-Dimensional Gröbner Bases -- On the Study of the Motion of a System of Two Connected Rigid Bodies by Computer Algebra Methods -- Complexity Estimates for Fourier-Motzkin Elimination -- Progress Report on the Scala Algebra System -- Routh – Hurwitz Stability of a Polynomial Matrix Family. Real Perturbations -- Hermite Rational Function Interpolation with Error Correction -- Good Pivots for Small Sparse Matrices -- Nullstellensatz-Proofs for Multiplier Verification -- "Mathemachines" via LEGO, GeoGebra and CindyJS -- Balanced NUCOMP -- Contact Linearizability of Scalar Ordinary Differential Equations of Arbitrary Order -- Faster Numerical Univariate Polynomial Root-Finding by Means of Subdivision Iterations -- Computing Parametric Standard bases for Semi-weighted Homogeneous Isolated Hypersurface Singularities -- Acceleration of Subdivision Root-Finding for Sparse Polynomials -- Analytical Computations in Studying Translational-Rotational Motion of a Non-Stationary Triaxial Body in the Central Gravitational Field -- A Linear Algebra Approach for Detecting Binomiality of Steady State Ideals of Reversible Chemical Reaction Networks -- First-Order Tests for Toricity -- Looking for Compatible Routes in the Railway Interlocking System of an Overtaking Station Using a Computer Algebra System -- Computing Logarithmic Vector Fields along an ICIS Germ via Matlis Duality -- Robust Numerical Tracking of One Path of a Polynomial Homotopy on Parallel Shared Memory Computers -- Symbolic-Numeric Computation of the Bernstein Coefficients of a Polynomial from Those of One of Its Partial Derivatives and of the Product of Two Polynomials -- Comparative Study of the Accuracy of Higher-order Difference Schemes for Molecular Dynamics Problems Using the Computer Algebra Means -- Characterizing Triviality of the Exponent Lattice of a Polynomial through Galois and Galois-Like Groups.

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### Sommario/riassunto

This book constitutes the refereed proceedings of the 22nd International Workshop on Computer Algebra in Scientific Computing, CASC 2020, held in Linz, Austria, in September 2020. The conference was held virtually due to the COVID-19 pandemic. The 34 full papers presented together with 2 invited talks were carefully reviewed and selected from 41 submissions. They deal with cutting-edge research in all major disciplines of computer algebra. The papers cover topics such as polynomial algebra, symbolic and symbolic-numerical computation, applications of symbolic computation for investigating and solving ordinary differential equations, applications of CAS in the investigation and solution of celestial mechanics problems, and in mechanics, physics, and robotics.

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