

The programme for
the 19th International Conference on
Computer Algebra in Scientific Computing
CASC2017, Beijing, September 18-22, 2017

September 18, Monday

Session Chair: Jin-San Cheng

Tutorial 1: **Jan Verschelde** (University of Illinois at Chicago, USA)

9:30--10:30 **Numerical Algebraic Geometry in the Cloud(1)**

10:30--10:50 tea break

10:50--11:50 **Numerical Algebraic Geometry in the Cloud(2)**

12:00—13:50 **Lunch at Wuke hotel**

Session Chair: Lihong Zhi

Tutorial 2: **Wen-Shin Lee** (University of Antwerp, Belgium)

14:30--15:30 **Sparse interpolation and its connections to Padé approximation, signal processing, and tensor decomposition (1)**

15:30--15:50 tea break

15:50--16:50 **Sparse interpolation and its connections to Padé approximation, signal processing, and tensor decomposition (2)**

18:00---19:30 **Dinner at Wuke hotel**

September 19, Tuesday

9:00-9:10 The beginning session of the conference

Session Chair: Vladimir Gerdt

9:10-10:10 Invited talk 1: **Sergei A. Abramov** (Russian Academy of Science, Russia)

Linear Differential Systems with Infinite Power Series Coefficients

10:10-10:40 photo and tea break

Session Chair: Vladimir Gerdt

10:40—11:10 Xin Pang, David J. Jeffrey and Erik Postma, Computation of Some Integer Sequences in Maple

11:10—11:40 Ruijuan Jing and Marc Moreno Maza, Computing the Integer Points of a Polyhedron, I: Algorithm

11:40—12:10 Ruijuan Jing and Marc Moreno Maza, Computing the Integer Points of a Polyhedron, II: Complexity Estimates

12:10—13:50 **Lunch at Wuke hotel**

Session Chair: Jan Verschelde

14:00—14:30 Yu Wang, Wenyuan Wu and Bican Xia, A Special Homotopy Continuation Method For A Class of Polynomial Systems

14:30—15:00 Wenyuan Wu, Changbo Chen and Greg Reid, Penalty Function Based Critical Point Approach for Computing Real Witness Points of General Polynomial Systems

15:00—15:30 Changbo Chen, Wenyuan Wu and Yong Feng, Full Rank Representation of Real Algebraic sets and Applications

15:30--15:50 tea break

Session Chair: David Jeffrey

15:50—16:20 Alexander Bruno, Victor Edneral and Valery Romanovski, New Integrals of the Algaba-Gamero-Garcia System

16:20—16:50 Sergey Gutnik and Vasily Sarychev, A Symbolic Study of the Satellite Dynamics Subject to Damping Torques

16:50—17:20 Vasily Shapeev and Evgenii Vorozhtsov, The Method of Collocations and Least Residuals Combining the Integral Form of Collocation Equations and the Matching Differential Relations at the Solution of PDEs

17:20—17:50 Alexander Prokopenya, Symbolic-Numerical Analysis of the Relative Equilibria Stability in the Planar Circular Restricted Four-Body Problem

18:00---18:30 Business Meeting

18:30---20:00 **Dinner at Wuke hotel**

September 20 Wednesday

Session Chair: Evgenii Vorozhtsov

9:00-10:00 Invited talk 2: **Lihong Zhi** (Chinese Academy of Sciences, China)

On Simple Multiple Zeros of Polynomial Systems

10:00—10:20 tea break

Session Chair: Evgenii Vorozhtsov

10:20—10:50 Qiaolong Huang and Xiao-Shan Gao, Sparse Polynomial Interpolation with Finitely Many Values for the Coefficients

10:50—11:20 Matteo Briani, Annie Cuyt and Wen-Shin Lee, Sparse interpolation, the FFT algorithm and FIR filters

11:20—11:50 Alexander Gusev, Vladimir Gerdt, Ochbadrakh Chuluunbaatar, Galmandakh Chuluunbaatar, Sergue Vinitzky, Vladimir Derbov and Andrzej Gozdz, Symbolic-Numerical Algorithm for Generating Interpolation Multivariable Hermite Polynomials of High-Accuracy Finite Element Method

11:50—13:20 **Lunch at Wuke hotel**

13:30--17:00 take a bus to go and visit the Summer Palace

17:00--17:30 take a bus to Quanjude Roasted Duck Restaurant (Qinghuayuan)

17:30—20:00 **Banquet**

September 21, Thursday

Session Chair: Greg Reid

9:00—9:30 Zhe Li, Baocheng Wan and Shugong Zhang, The Convergence Conditions of Interval Newton's Method Based on Point Estimates

9:30---10:00 Rina Dong and Chenqi Mou, Decomposing Polynomial Sets Simultaneously into Groebner Bases and Normal Triangular Sets

10:00—10:30 Alexander Gusev, Vladimir Gerdt, Ochbadrakh Chuluunbaatar, Galmandakh Chuluunbaatar, Sergue Vinitzky, Vladimir Derbov and Andrzej Gozdz, Symbolic-Numerical Algorithms for Solving the Parametric Self-Adjoint 2D Elliptic Boundary-Value Problem Using High-Accuracy Finite Element Method

10:30--10:50 tea break

Session Chair: Chenqi Mou

10:50---11:20 Dmitry Lyakhov, Vladimir Gerdt and Dominik Michels, Symbolic-Numeric Integration of the Dynamical Cosserat Equations

11:20---11:50 Matthew England, Hassan Errami, Dima Grigoriev, Ovidiu Radulescu, Thomas Sturm and Andreas Weber, Symbolic Versus Numerical Computation and Visualization of Parameter Regions for Multistationarity of Biological Networks

11:50---12: 20 Jiang Liu, Normalization of indexed differentials based on function distance invariants

12:20—13:50 **Lunch at Wuke hotel**

Session Chair: Wenyuan Wu

14:00—14:30 Vincent Neiger, Hamid Rahkooy and Eric Schost, Algorithms for zero-dimensional ideals using linear recurrent sequences

14:30—15:00 Youren Hu and Xiaoshan Gao, Characteristic Set Method for Laurent Differential Polynomial Systems
15:00—15:30 Jin-San Cheng and Xiaojie Dou, Certifying Simple Zeros of Over-determined Polynomial Systems
15:30--15:50 tea break

Session Chair: Alexander Prokopenya

15:50—16:20 Ryszard Kozera and Lyle Noakes, Non-linearity and non-convexity in optimal knots selection for sparse reduced data
16:20—16:50 Raul Epure, Yue Ren and Hans Schonemann, The polymake interface in Singular and its applications
16:50—17:20 Valentin Irtegov and Tatiana Titorenko, On Stationary Motions of the Generalized Kowalewski Gyrostat and Their Stability
17:20—17:50 Andrei Banshchikov, On the Asymptotic Stability of a Satellite with a Gravitational Stabilizer
18:00-18:10 The closing session of the conference
18:10---19:30 **Dinner at Wuke hotel**

September 22, Friday

Workshop on differential algebra and polynomial system solving

Session Chair: Ruyong Feng

9:00—9:30 Sergei Abramov, On arithmetic and shift complexities of inverting of difference operator matrices
9:30---10:00 Greg Reid, Approximate geometry and symmetry of partial differential equations
10:00—10:30 Zhikun She, Under-approximating backward reachable set of continuous dynamical systems
10:30--10:50 tea break

Session Chair: Zhikun She

10:50---11:20 Chenqi Mu, Analysis of codimension 2 bifurcations for high-dimensional discrete systems using symbolic computation methods
11:20---11:50 Jan Verschelde, The Method of Gauss-Newton to Compute Power Series Solutions of Polynomial Homotopies
11:50---12: 20 Valerij Romanovskij, Invariant surfaces and first integrals of polynomial systems
12:20—13:50 **Lunch at Wuke hotel**

Session Chair: Changbo Chen

14:00—14:30 Victor Edneral, Approximations of Periodic Families of ODEs Solutions by the Normal Form Method.

14:30—15:00 Alexander Gusev, Finite Element Method for Solving Boundary Value Problems for the Self-Adjoint System of Ordinary Second-Order Differential Equations

15:00—15:30 Sergue Vinitzky, Kantorovich Method for Solving Elliptic Boundary-Value Problems Using Parametric Basis Functions

15:30--15:50 tea break

Session Chair: Wei Li

15:50—16:20 Vladimir Gredt, On application of differential and difference algebra to discretization of nonlinear evolution equations

16:20—16:50 Dmitry Lyakhov, Algorithmic Verification of Linearizability for Ordinary Differential Equations

16:50—17:20 Xing Gao, On integro-differential algebras

17:20—17:50 Ziming Li, Additive Decompositions in Elementary Extensions

18:00---19:30 **Dinner at Wuke hotel**