

**THE THIRD
INTERNATIONAL
CONFERENCE
ON NUMERICAL ALGEBRA
AND
SCIENTIFIC COMPUTING
(NASC10)**

(<http://lsec.cc.ac.cn/~NASCNAG/>)

**Institute of Computational Mathematics
Academy of Mathematics and Systems Science**

October 23–27, 2010

NASC is an international conference organized by the Chinese numerical algebra group starting from 2006. The conference highlights recent advances in theoretical, computational and practical aspects of linear and nonlinear numerical algebra. The aim of the conference is to gather numerical algebra and scientific computing experts to exchange ideas and discuss future developments and trends of these closely related fields.

The topics of NASC10 include, but are not limited to: solutions of linear and nonlinear equations; least-squares problems; computations of eigenvalue problems; tensor decompositions and computations; parallel computations; constructions and analyses of preconditioners; methods and theories of structured matrices; and applications of numerical algebraic techniques and algorithms.

An important event during the conference is the award of the *Applied Numerical Algebra* (ANA) Prize which is awarded to the two best papers by young Chinese scientists working on numerical algebra and scientific computing.

CONFERENCE CHAIRS:

Martin H. Gutknecht (ETH Zurich, SWITZERLAND)
Zhong-Ci Shi (Chinese Academy of Sciences, CHINA)

SPONSORSHIP:

Academy of Mathematics and Systems Science, CAS
State Key Laboratory of Scientific/Engineering Computing
National Natural Science Foundation of China
National Key Laboratory of Computational Physics
The Computer Network Information Center, CAS
Department of Mathematical Sciences, Tsinghua University

PROGRAM

OCTOBER 22 (FRIDAY) REGISTRATION and RECEPTION

15:00-17:30 REGISTRATION

Place: The Reception Hall of Motel 168

(Zhong-Guan-Cun Branch)

No. 106, The East Zhong-Guan-Cun Road

Hai-Dian District, Beijing

Tel.: +86-10-82121666

18:00- RECEPTION DINNER

Place: Jade Palace Hotel

(In Coffeeshop on the 2nd Floor)

No. 76, Zhi-Chun Road, Hai-Dian District, Beijing

Tel.: +86-10-62628888

LECTURE VENUE: **The Conference Hall**
Si-Yuan Building
Academy of Mathematics and Systems Science

OCTOBER 23 (SATURDAY)
OPENING CEREMONY AND LECTURES

- 8:30-9:00 OPENING CEREMONY
- 9:00-9:30 GROUP PHOTO
- 9:30-10:50 INVITED TALKS Chairperson: **Zhong-Ci Shi**
- 9:30-10:10 **M.H. Gutknecht:** Spectral Deflation in Krylov Solvers
- 10:10-10:50 **C. Brezinski:** Moments of a Linear Operator on a Hilbert Space
with Applications
- 10:50-11:10 TEA BREAK
- 11:10-12:00 ANA Prize Session Chairperson: **Lev A. Krukier**
- 11:10-11:35 **Candidate A:** B. Dong
- 11:35-12:00 **Candidate B:** J.-F. Yin
- 12:00-14:00 LUNCH (The 4th Floor of Wu-Ke Restaurant)
- 14:00-15:20 INVITED TALKS Chairperson: **James G. Nagy**
- 14:00-14:40 **K. Hayami:** Inner-Iteration Preconditioners for Least Squares
Problems
- 14:40-15:20 **G.V. Muratova:** Fourier Analysis of Multi-Grid Method for
Convection-Diffusion Equation
- 15:20-15:40 TEA BREAK
- 15:40-17:45 CONTRIBUTED TALKS Chairperson: **Ken Hayami**
- 15:40-16:05 **J.V. Lambers:** Spectral Methods for Time-Dependent Variable-
Coefficient PDE Based on Block Gaussian Quadra-
ture
- 16:05-16:30 **Z.-R. Ren:** On Sinc Discretization and Banded Precondition-
ing for Linear Third-Order Ordinary Differential
Equations
- 16:30-16:55 **H. Sadok:** New Implementation of the Block GMRES Method
- 16:55-17:20 **F.-S. Bai:** Preconditioning for the Multi-Homogeneous Homo-
topy Method
- 17:20-17:45 **M. Mitrouli:** On the Sign Changes Property of Sylvester
Hadamard Matrices
- 18:30 DINNER
Place: Guo-Lin Restaurant, The 2nd Floor
Add: No. A2, The South Road of Zhong-Guan-Cun
Tel: 010-62622557
- 20:30- **SELECTION of APPL. NUMER. ALGEBRA PRIZE**
Place: Room 305, Sci./Tech. Complex Building
Panel Chairs: I.S. Duff, M.H. Gutknecht, Z.-C. Shi

OCTOBER 24 (SUNDAY)

LECTURES

- 8:30-9:50 INVITED TALKS Chairperson: **Martin H. Gutknecht**
- 8:30-9:10 **R.H. Chan**: Multilevel Algorithm for a Poisson Noise Removal Model with Total-Variation Regularization
- 9:10-9:50 **L.A. Krukier**: Field of Values and Convergence of Skew-Symmetric Iterative Methods
- 9:50-10:10 TEA BREAK
- 10:10-11:30 INVITED TALKS Chairperson: **Claude Brezinski**
- 10:10-10:50 **A. Spence**: Perturbation Theory for Eigenvalues of Symmetric Matrices with Random Perturbations
- 10:50-11:30 **D.B. Szyld**: Algebraic Optimizable Schwarz Methods for the Solution of Banded Linear Systems and PDEs on Irregular Domains
- 11:40-14:00 LUNCH (The 4th Floor of Wu-Ke Restaurant)
- 14:00-15:40 CONTRIBUTED TALKS Chairperson: **Alastair Spence**
- 14:00-14:25 **T. Kaijser**: A Simple and Robust Method to Find Solutions to Fredholm Integral Equation, First Kind, From Experimental Data
- 14:25-14:50 **Z.-Y. Liu**: Structured Schur Methods for Square Roots of Centro-Hermitian Matrices
- 14:50-15:15 **F.-R. Lin**: The Combination of Modica-Mortola Functional and Total Variation Functional for Fredholm Integral Equations of the First Kind
- 15:15-15:40 **M.-S. Wei**: On the Perturbation Bounds of G-Inverses and Oblique Projections
- 15:40-16:00 TEA BREAK
- 16:00-17:40 CONTRIBUTED TALKS Chairperson: **Apostolos Hadjidimos**
- 16:00-16:25 **T.D. Pham**: An Overlapping Additive Schwarz Preconditioner for the Laplace-Beltrami and Hypersingular Integral Equations Using Spherical Splines
- 16:25-16:50 **Y.-H. Liu**: Hermitian-Type Singular Value Decomposition with Statistical and Financial Applications
- 16:50-17:15 **B.-Y. Li**: A Contribution to the Condition Number of the Scaled Total Least Squares Problem
- 17:15-17:40 **G. Wu**: Arnoldi Versus GMRES for Computing PageRank: A Theoretical Contribution to Google's PageRank Problem
- 18:30 BANQUET (INCLUDING ISSUE OF THE PRIZE)
Place: Xin-Kai-Yuan Restaurant, The 1st Floor
Address: No. 67, The West of the North Forth Ring Road
Hai-Dian District, Beijing. Tel: +86-10-82886001
Remark: Buses start from the front of the Conference Hall at 18:00

OCTOBER 25 (MONDAY)

LECTURES

- 8:30-9:50 INVITED TALKS Chairperson: **Raymond H. Chan**
- 8:30-9:10 **X.-J. Chen**: Minimizing the Condition Number of a Gram Matrix on the Sphere
- 9:10-9:50 **J.G. Nagy**: Structured Linear Algebra Problems in Adaptive Optics Imaging
- 9:50-10:10 TEA BREAK
- 10:10-11:30 INVITED TALKS Chairperson: **Daniel B. Szyld**
- 10:10-10:50 **M.K. Ng**: Total Variation Based Image Restoration and Reconstruction Problems
- 10:50-11:30 **A. Hadjidimos**: Scaled Extrapolated Modulus Algorithms for the Solution of the Linear Complementarity Problem with an H_+ -Matrix Coefficient
- 11:40-14:00 LUNCH (The 4th Floor of Wu-Ke Restaurant)
- 14:00-15:40 INVITED MINISYMPOSIUM–A
Chairpersons: **Michael K. Ng and Xing-Ping Liu**
- 14:00-14:25 **H.-B. An**: Multigrid Preconditioned Newton-Krylov Method for Solving the 2-D 3-T Energy Equations
- 14:25-14:50 **C. Mouilleron**: Computing Specified Generators of Structured Matrix Inverses
- 14:50-15:15 **H. Xin**: Computational Enhancements When Preconditioning Oseen's Type Problems
- 15:15-15:40 **J.-H. Yun**: Parallel Performance of Multisplitting Methods with Preweighting
- 15:40-16:00 TEA BREAK
- 16:00-17:40 INVITED MINISYMPOSIUM–B
Chairpersons: **Hassane Sadok and Xin-Guo Liu**
- 16:00-16:25 **J.-L. Xia**: Efficient Structured Preconditioning for Large-Scale Sparse Matrices
- 16:25-16:50 **M. Sedlacek**: Smoothing and Regularization with Modified Sparse Approximate Inverse
- 16:50-17:15 **X.-Y. Zuo**: An Improved Bi-CGSTAB2 Algorithm Suitable for Distributed Parallel Computing
- 17:15-17:40 **C.-P. Jeannerod**: Preconditioned Algorithms for the Exact Solution of Structured Linear Systems
- 18:00 DINNER
Place: The 4th Floor of Wu-Ke Restaurant

OCTOBER 26 (TUESDAY)

LECTURES

- 8:30-10:30 INVITED TALKS Chairperson: **Xiao-Jun Chen**
- 8:30-9:10 **E.G. Ng**: Sparse Matrix Computation in Large-Scale Scientific Applications
- 9:10-9:50 **H. Dai**: Model Updating with Symmetric Positive Semi-Definiteness and Connectivity
- 9:50-10:30 **L.-Z. Lu**: Restartable Generalized Second Order Krylov Subspace Method
- 10:30-10:50 TEA BREAK
- 10:50-11:40 CONTRIBUTED TALKS Chairperson: **Esmond G. Ng**
- 10:50-11:15 **X. Yang**: On Waveform Relaxation Methods for Time-Dependent Stokes Equations
- 11:15-11:40 **W.-G. Gao**: Orbital Minimization with Localization
- 11:40-14:00 LUNCH (The 4th Floor of Wu-Ke Restaurant)
- 14:00-15:40 CONTRIBUTED TALKS Chairperson: **Er-Xiong Jiang**
- 14:00-14:25 **K. Jbilou**: Block Arnoldi-Based Methods for Large Scale Discrete-Time Algebraic Riccati Equations
- 14:25-14:50 **A. Bouhamidi**: Global Krylov Subspace Methods for Computing the Meshless Elastic Polyharmonic Splines
- 14:50-15:15 **Y.-F. Su**: Solving Rational Eigenvalue Problems via Linearization
- 15:15-15:40 **T.-X. Li**: The Palindromic Generalized Eigenvalue Problem $A^*x = \lambda Ax$: Numerical Solution and Applications
- 15:40-16:00 TEA BREAK
- 16:00-17:40 CONTRIBUTED TALKS Chairperson: **Galina V. Muratova**
- 16:00-16:25 **G.-D. Gu**: HSS Method with a Complex Parameter for the Solution of Complex Linear System
- 16:25-16:50 **T.-X. Gu**: Parallel Krylov Subspace Methods on Distributed Architectures: A Survey
- 16:50-17:15 **Y.-M. Wei**: Ill-Conditioning of the Truncated Singular Value Decomposition and Tikhonov Regularization for Numerical Partial Differential Equations
- 17:15-17:40 **X.-H. Shao**: Modified Iterative Method for the Augmented System
- 18:00 DINNER
Place: The 4th Floor of Wu-Ke Restaurant

OCTOBER 27 (WEDNESDAY)

EXCURSION

7:30-16:30 EXCURSION (To Ba-Da-Ling Great Wall and Ming Tombs)

7:30 (**EXACT**) Buses Start from the gates of both
Jade Palace Hotel and Motel 168 (Zhong-Guan-Cun Branch)

18:00 DINNER

Place: The 4th Floor of Wu-Ke Restaurant