THE FOURTH

INTERNATIONAL

CONFERENCE

ON NUMERICAL ALGEBRA

AND

SCIENTIFIC COMPUTING

(NASC 2012)

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

School of Mathematical Sciences
Dalian University of Technology
Dalian, P.R. China

October 20–24, 2012

NASC is an international conference organized by the *Chinese numerical algebra group* (**CNAG**), and run by *Academy of Mathematics and Systems Science* (**AMSS**), *Chinese Academy of Sciences* (**CAS**), 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 NASC 2012 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:

Lev A. Krukier	**(Southern Federal University, RUSSIA)**
Zhong-Ci Shi	**(Chinese Academy of Sciences, CHINA)**

SPONSORSHIP:

Academy of Mathematics and Systems Science, CAS

Dalian University of Technology

National Natural Science Foundation of China

PROGRAM

REGISTRATION and RECEPTION

15:00-17:30   REGISTRATION

Place: In the Hall of the Participant's Living Hotel

- **Howard Johnson Parkland Hotel**

    No. 95, Huizhan Road, Shahekou District, Dalian

    Tel.: +86-411-84990000

- **Xinghai Golf Hotel**

    No. 29, Xinghe Road, Shahekou District, Dalian

    Tel: +86-411-82193333

18:00-   RECEPTION DINNER

Place: Xinghai Golf Hotel

    No. 29, Xinghe Road, Shahekou District, Dalian

    Tel: +86-13591137353

LECTURE VENUE: **The Conference Hall**

    Yan-Jiao Building

    Dalian University of Technology

OCTOBER 20 (SATURDAY)
OPENING CEREMONY AND LECTURES

9:30-9:55   OPENING CEREMONY   Chairperson: **Bo Yu**

9:55-10:20   GROUP PHOTO

10:20-11:50   INVITED TALKS   Chairperson: **Zhong-Ci Shi**

10:20-11:05   **L. Reichel**: Network Analysis via Gauss Quadrature
11:05-11:50   **I.S. Duff**: The Augmented Block Cimmino Distributed Solver

11:50-14:00   LUNCH (DUT International Convention Center)

14:00-14:50   ANA Prize Session   Chairperson: **Zhong-Zhi Bai**

14:00-14:25   **Candidate A: B. Dong**
14:25-14:50   **Candidate B: L.-H. Zhang**

14:50-15:40   CONTRIBUTED TALKS   Chairperson: **Lothar Reichel**

14:50-15:15   **L.A. Krukier**: Symmetric and Skew-Symmetric Splitting and Iterative Methods
15:15-15:40   **M. Tuma**: Algebraic Preconditioning of Linear Algebraic Systems and Linear Least-Squares Problems
15:40-16:00   TEA BREAK

16:00-17:40   INVITED MINISYMPOSIUM
                Chairpersons: **Ken Hayami/Galina V. Muratova**

16:00-16:25   **Z.-Q. Wang**: Restrictively Preconditioned Chebyshev Method for Solving Systems of Linear Equations
16:25-16:50   **K. Morikuni**: GMRES Methods with Inner Iterations for Least Squares Problems
16:50-17:15   **Q. Chu**: Large Scale Least Squares Problems in Wavefront Reconstruction
17:15-17:40   **L.-L. Zhang**: Two-Stage Multisplitting Iteration Methods Using Modulus-Based Matrix Splitting as Inner Iteration for Linear Complementarity Problems
18:00-20:00   BANQUET
            (Hosted by School of Mathematical Sciences, DUT)
            Place: DUT International Convention Center
            Add: South Gate of Dalian University of Technology
            Tel: +86-411-84708888

20:30-   **SELECTION of APPL. NUMER. ALGEBRA PRIZE**
            Place: Room B1212, Chuangxinyuan Building, DUT
            Panel Chairs: I.S. Duff, L.A. Krukier, Z.-C. Shi

OCTOBER 21 (SUNDAY)
LECTURES

9:30-11:45   INVITED TALKS   Chairperson: **Iain S. Duff**

9:30-10:15   **M.G. Neytcheva**: Multiphase Flow Simulations: Models and Efficient Preconditioning Techniques for the Arising Algebraic Equations

10:15-11:00   **Z.-Z. Bai**: Block-Factorization Preconditioning Methods for Block Two-by-Two Linear Systems

11:00-11:45   **M. Rozloznik**: Numerical Behavior of Inexact Linear Solvers

11:45-14:00   LUNCH (DUT International Convention Center)

14:00-15:40   INVITED MINISYMPOSIUM
                 Chairpersons: **Hua Dai/Wen-Wei Lin**

14:00-14:25   **W.-W. Lin**: Eigendecomposition of the Discrete Double-Curl Operator with Application to Fast Eigensolver for 3D Photonic Crystals

14:25-14:50   **D.-D. Tian**: Alternating Projection Method for Quadratic Model Updating Problems

14:50-15:15   **Z.-R. Ren**: On Preconditioned Iterative Methods for Sinc Systems of Linear Third-Order ODEs

15:15-15:40   **C.-S. Wang**: Conditioning of State Feedback Pole Assignment Problems

15:40-16:00   TEA BREAK

16:00-17:15   CONTRIBUTED TALKS   Chairperson: **Maya G. Neytcheva**

16:00-16:25   **Y.-M. Huang**: On Decomposition-Based Block Preconditioned Iterative Methods for Half-Quadratic Image Restoration

16:25-16:50   **W. Xu**: Using Directed Edge Separators to Increase Efficiency in the Determination of Jacobian Matrices via Automatic Differentiation

16:50-17:15   **G. Wu**: A Thick-Restarted Bilinear Lanczos Algorithm for High Dimensionality Reduction and Feature Extraction

18:00-20:00   BANQUET of NASC 2012 (Including Issue of the Prize)
             Place: Lanbao Restaurant
             Add: No. 39, Xiaopingdao Road, Ganjingzi District, Dalian
             Tel: +86-411-84779999

OCTOBER 22 (MONDAY)
LECTURES

9:30-11:45   INVITED TALKS   Chairperson: **Lev A. Krukier**

9:30-10:15   **B. Yu**: Solving Polynomial Systems Derived from Eigenfunction Expansion Discretization of Elliptic Equation

10:15-11:00   **M. Redivo-Zaglia**: Convergence Acceleration of Kaczmarz's Method

11:00-11:45   **L. Cvetkovic**: Nekrasov Matrices-Generalizations and Applications

11:45-14:00   LUNCH (DUT International Convention Center)

14:00-15:40   CONTRIBUTED TALKS   Chairperson: **Michela Redivo-Zaglia**

14:00-14:25   **H.-B. An**: Iteration Process of JFNK Method and Physical Constraint

14:25-14:50   **T.-X. Gu**: Parallel BiCG Iterative Method Based on FLAME Framework

14:50-15:15   **Y.-M. Wei**: A Sharp Version of Bauer-Fikes Theorem

15:15-15:40   **L. Wang**: A Simplified Low-Rank Revealing QR Algorithm

15:40-16:00   TEA BREAK

16:00-17:40   CONTRIBUTED TALKS   Chairperson: **Ljiljana Cvetkovic**

16:00-16:25   **Z.-J. Bai**: A Regularized Directional Derivative-Based Newton Method for Inverse Eigenvalue Problems

16:25-16:50   **V. Kostic**: Application of M-matrices in Neural Network Models of Brain Activity

16:50-17:15   **K. Doroslovacki**: Modified Iterative Method for the Augmented System

17:15-17:40   **L. Du**: Conjugate Gradient Type Methods for the Approximation of Block Bilinear Form $C^H A^{-1} B$

18:00-20:00   DINNER
    Place: DUT International Convention Center
    Add: South Gate of Dalian University of Technology
    Tel: +86-411-84708888

OCTOBER 23 (TUESDAY)
LECTURES

9:30-11:00   INVITED TALKS   Chairperson: **Bo Yu**

9:30-10:15   **C. Brezinski**: Extrapolation Methods and Linear Algebra Problems

10:15-11:00   **H. Sadok**: Review of Algebraic and Convergence Properties of Krylov Subspace Methods

11:00-11:20   TEA BREAK

11:20-12:15   CONTRIBUTED TALKS   Chairperson: **Miroslav Rozloznik**

11:20-11:50   **T.-X. Li**: A Structure-Preserving Doubling Algorithm for Quadratic Eigenvalue Problems Arising from Time-Delay Systems

11:50-12:15   **J.-F. Yin**: Accelerated Modulus-based Successive Overrelaxation Method for Pricing American Options

12:15-12:30   CLOSING CEREMONY   Chairperson: **Zhong-Zhi Bai**

12:30-14:00   LUNCH (DUT International Convention Center)

14:00-16:00   POSTER SESSION

Z.-G. Jia: A Real-Valued Spectral Decomposition of the Undamped Gyroscopic System with Applications

S. Jian: A Modified Jacobi-Conjugate Preconditioned Gradient Method for Symmetric Eigenvalue Problems

J.-X. Li: An Efficient Group Update Method for Sparse Min-Max Problems

W. Liu: Aggregate Function-Based Filled Function Method for Constrained Global Optimization

O.A. Pichugina: Using Skew-Symmetric Preconditioners for Solving Transport-Dominated Convection-Diffusion Problems

D.-L. Ren: A Modified Tikhonov Regularization Method

H.-X. Wang: On Least Squares Solutions Subject to a Rank Restriction

K.-F. Wang: The Competitive Decision Algorithm for the Vehicle Routing Problem with Simultaneous Delivery and Pickup

18:00-20:00   DINNER
Place: Xinghai Golf Hotel
Add: No. 29, Xinghe Road, Shahekou District, Dalian
Tel: +86-411-82193333

OCTOBER 24 (WEDNESDAY)
EXCURSION

7:30-16:30   EXCURSION   (To Jinshitan National Holiday Resort)

7:30   **(EXACT)**   Buses start from the gates of both

Xinghai Golf Hotel and Howard Johnson Parkland Hotel

18:00-20:00   DINNER
Place: Xinghai Golf Hotel
Add: No. 29, Xinghe Road, Shahekou District, Dalian
Tel: +86-411-82193333

PREVIOUS NASCS:

NASC 2006: AMSS, Beijing, October 22–25
Co-Chairs: Raymond H. Chan and Zhong-Ci Shi
Special Issue: Journal of Computational and Applied Mathematics, 226:1(2009)
Special Issue Editors: Zhong-Zhi Bai, Lothar Reichel and Zhong-Ci Shi

NASC 2008: Nanjing Normal University, Nanjing, November 2-5
Co-Chairs: Iain S. Duff and Zhong-Ci Shi
Special Issue: Linear Algebra and Its Applications, 434:11(2011)
Special Issue Editors: Zhong-Zhi Bai, Michele Benzi, Iain S. Duff, Andreas Frommer and Zhong-Ci Shi

NASC 2010: AMSS, Beijing, October 23–27
Co-Chairs: Martin H. Gutknecht and Zhong-Ci Shi
Special Issue: Numerical Linear Algebra with Applications, 19:6(2012)
Special Issue Editors: Zhong-Zhi Bai, Iain S. Duff, Lothar Reichel and Zhong-Ci Shi

PREVIOUS ANA PRIZE WINNERS:

NASC 2006: Heng-Bin An

NASC 2008: Zheng-Jian Bai

NASC 2010: Jun-Feng Yin

ANA PRIZE COMMITTEES:

NASC 2006

Advisory Board: Iain S. Duff   Gene H. Golub   Zhong-Ci Shi

Members:

Feng-Shan Bai	Zhao-Jun Bai	Hua Dai	Iain S. Duff
Gene H. Golub	Martin H. Gutknecht	Ken Hayami	Lev A. Krukier
Tian-Gang Lei	Xing-Ping Liu	Wen Li	Lin-Zhang Lu
Shu-Fang Xu	Zhong-Ci Shi	Yang-Feng Su	

NASC 2008

Advisory Board: Iain S. Duff   Zhong-Ci Shi   Andrew J. Wathen

Members:

Zhong-Zhi Bai	Iain S. Duff	Ken Hayami	Volker Mehrmann
Zhong-Ci Shi	Yong-Zhong Song	Andrew J. Wathen	

NASC 2010

Advisory Board: Iain S. Duff   Martin H. Gutknecht   Zhong-Ci Shi

Members:

Raymond H. Chan	Iain S. Duff	Martin H. Gutknecht	Er-Xiong Jiang
Lev A. Krukier	Lothar Reichel	Zhong-Ci Shi	Yong-Zhong Song
Andrew J. Wathen			

NASC 2012

Advisory Board: Iain S. Duff   Lev A. Krukier   Zhong-Ci Shi

Members:

Hua Dai	Iain S. Duff	Ken Hayami	Lev A. Krukier
Maya G. Neytcheva	Lothar Reichel	Zhong-Ci Shi	