International Workshop on Scientific Computing

On The Occasion of Qun Lin’s 70\textsuperscript{TH} Birthday

\textit{July 15-16, 2006}

\textit{Institute of Computational Mathematics, Beijing}

Program&Abstracts

Sponsors:

Institute of computational Mathematics, CAS
State Key Lab on Scientific and Engineering Computing, CAS
National Basic Research Program "High Performance Scientific Computation Research"
Scientific Committee:

Zhong-ci Shi (Chair, ICMSEC, CAS)
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Thomas Y. Hou (Caltech, USA)
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Xin-hua Wang (Zhejiang Univ.)
Lung-an Ying (Peking Univ.)
De-Hao Yu (ICMSEC, CAS)
Ya-xiang Yuan (ICMSEC, CAS)
Tian-xiao Zhou (ACTRI, Xi’an)
Invited Speakers:

Gang Bao (Michigan State Univ., USA)
Raymond Chan (Chinese Univ. Hong Kong)
Zhangxin Chen (Southern Methodist Univ., USA)
Zhiming Chen (ICMSEC, CAS)
Qiang Du (Penn State Univ., USA & ICMSEC, CAS)
Weinan E (Princeton Univ., USA)
Thomas Y. Hou (Caltech, USA)
Yunqing Huang (Xiangtan Univ.)
Shi Jin (Univ. Wisconsin-Madison, USA)
Kaitai Li (Xi'an Jiaotong Univ.)
Wenbin Liu (Univ. Kent, UK)
Tao Lu (Sichuan Univ.)
Chi-wang Shu (Brown Univ., USA)
Jia-chang Sun (Inst. of Software, CAS)
Xue-cheng Tai (Univ. Bergen, Norway)
Tao Tang (Hong Kong Baptist Univ. & ICMSEC, CAS)
Bin Wang (Inst. of Atmosphere, CAS)
Junping Wang (Colorado School of Mines & NSF, USA)
Jinchao Xu (Penn State Univ., USA)
Ningning Yan (Inst. of Sys. Sci., CAS)
Dehao Yu (ICMSEC, CAS)
Pingwen Zhang (Peking Univ.)
Organizing Committee:

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Chi-wang Shu (Brown Univ., USA)
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Jinchao Xu (Penn State Univ., USA)
Ningning Yan (Inst. of Sys. Sci., CAS)
Linbo Zhang (ICMSEC, CAS)
Pingwen Zhang (Peking University)
Qi-ding Zhu (Hunan Normal Univ.)
Saturday, July 15, 2006

Opening Ceremony 08:30-08:45
Chair: Yaxiang Yuan
Group photo 08:50-09:00

Invited Talks

Chair: Junzhi Cui
Chi-wang Shu 09:00-09:30
High Order Accurate Anti-diffusive WENO Methods and Application to Shallow Water with Transport of Pollutant
Thomas Y. Hou 09:30-10:00
Dynamic Generation and Depletion of Small Scales for 3D Incompressible Flows

Coffee Break 10:00-10:30

Chair: Hou-de Han
Junping Wang 10:30-11:00
Superconvergence for a Stabilized Finite Element Method for the Stokes Equation by Using Coarsening Projections
Yunqing Huang 11:00-11:30
Superconvergence and Adaptivity
Xuecheng Tai 11:30-12:00
A Survey on Domain Decomposition and Multigrid Methods for Nonlinear Problems and Variational Inequalities
**Lunch**  12:00-13:30  
**Venue:** Guest House of Institute of Physics

**Chair:** Tian-xiao Zhou  
Shi Jin  13:30-14:00  
*A Semiclassical Transport Model for Thin Quantum Barrier*  
Wenbin Liu  14:00-14:30  
*Superconvergence in FE Approximation of Optimal Control*  
Bin Wang  14:30-15:00  
*An Economical Approach to Implement the 4-dimensional Variational Data Assimilation*

**Coffee Break**  15:00-15:30

**Chair:** Benyu Guo  
Jiachang Sun  15:30-16:00  
*On Finite Element Methods over 2-D Hexagon and 3-D Dodecahedron Partitions*  
Dehao Yu  16:00-16:30  
*Domain Decomposition with Nonmatching Grids for Exterior Transmission Problems via FEM and DtN Mapping*  
Zhiming Chen  16:30-17:00  
*An Adaptive Perfectly Matched Layer Technique for 3-D Time-Harmonic Electromagnetic Scattering Problems*

**Banquet**  18:00-20:00  
**Chair:** Zhiming Chen  **Venue:** You Yi Hotel
Sunday, July 16, 2006

Invited Talks

Chair: Kaitai Li
Weinan E 08:30-09:00
Some Thoughts about the Curriculum in Computational Mathematics
Raymond Chan 09:00-09:30
Equivalence of Half-Quadratic Minimization and the Relaxed Fixed Point Iteration
Gang Bao 09:30-10:00
Inverse Scattering in Near-field Optics

Coffee Break 10:00-10:30

Chair: Renhong Wang
Kaitai Li 10:30-11:00
A Coupling System of Elliptic Boundary Value Problem and Navier-Stokes Equations for the Geometry Design of Blade’s Surface
Tao Lu 11:00-11:30
Extrapolations for Solving the Weakly Singular Volterra Integral Equations
Ningning Yan 11:30-12:00
Adaptive Finite Element Method for P-Laplacian Equation

Lunch 12:00-13:30
Venue: Guest House of Institute of Physics
Chair: Longjun Shen
Qiang Du 13:30-14:00
Numerical Approximations of a Phase Field Bending Elasticity Model of Vesicle Membranes
Zhangxin Chen 14:00-14:30
Are New Energy Sources Within Reach?
Pingwen Zhang 14:30-15:00
Mathematical Theory of Non-Equilibrium Green Function in MOSFET

Coffee Break 15:00-15:30

Chair: Long-an Ying
Jinchao Xu 15:30-16:00
New Multigrid Methods and Theories for H(curl) and H(div) Systems
Tao Tang 16:00-16:30
Resolving Spike Dynamics for Reaction-Diffusion Systems

Dinner 18:00-20:00
Venue: Guest House of Institute of Physics