

Third Joint Conference on Computational Mathematics (JCCM3)

January 23-27, 1995

Hilltop House Hotel

Los Alamos, NM

Sunday, January 22, 1995

6:00 - 8:00 p.m. Registration Reception
Hilltop House Hotel/Trinity Sights Restaurant

Monday, January 23, 1995

8:00 - 8:30 a.m. Registration (Hilltop House Hotel/Acoma Room)

8:30 - 8:45 **Welcome** (Hilltop House Hotel/Taos - Tyuoni)
H. A. Dayem, LANL
Director, Computing, Information and Communications Division

Session 1 - High Performance Computing

Session Chair: M. P. Sohn, LANL

Program Manager for Computational Physics

- 8:45 - 9:30 **Parallelization of Evolutionary Problems in Computational Physics**
I. D. Sofronov and O. I. Sofronova, VNIIEF
- 9:30 - 10:15 **High Performance Computing at the Advanced Computing Laboratory**
D. W. Forslund, LANL
- 10:15 - 10:45 Break and Group Photo
- 10:45 - 11:30 **Massively Parallel Computing at Sandia National Laboratories**
E. Barsis and S. S. Dosanjh, SNL
- 11:30 - 12:15 p.m. **3D Evolution of Rayleigh-Taylor and Richtmeyer-Meshkov Instabilities in Converging Geometries Using Adaptive Mesh Refinement (AMR)**
R. I. Klein, LLNL
- 12:15 - 1:15 Lunch, Loft

Session 2 - Continuum Mechanics/Hydrodynamics**Session Chair:**

- 1:15 - 2:00 **Problem of Conservatism in Numerical Methods of Continuum Mechanics**
V. F. Kuropatenko, VNIITF
- 2:00 - 2:45 **Parallel Solid Dynamics Codes**
J. M. McGlaun, SNL
- 2:45 - 3:00 Break
- 3:00 - 3:45 **Technique and Set of Program GRAD for Solution of Nonstationary Problems of Continuum Mechanics**
V. A. Suchkov and A. S. Shnitko, VNIITF
- 3:45 - 4:30 **Scalable, Compatible, Energy and Entropy Conserving Hydrodynamics**
E. J. Caramana and P. P. Whalen, LANL
- 5:30 - 6:45 Reception, Bradbury Science Museum

Tuesday, January 24, 1995**Session 3 - Transport Methods****Session Chair:**

- 8:30 - 9:15 a.m. **VNIIEF Techniques and Programs for Solving 2D and 3D Nonstationary Problems of Radiant Energy Transfer in Complex-Shaped Regions Using View Factors--Conversion Application Problems**
Yu. N. Babayev, S. V. Bazhenov, A. A. Bazin, E. G. Vasina, V. V. Gorev, Yu. A. Dementyev, V. G. Zagrafov, E. A. Karpovtsev, A. I. Kirillov, V. F. Mironova, P. I. Pevnaya, P. A. Perepelkin, G. I. Skidan, I. D. Sofronov, B. P. Tikhomirov, E. N. Tikhomirova, and N. I. Yurina, VNIIEF
- 9:15 - 10:00 **Unconditionally Stable Explicit Algorithms for Diffusion**
F. Graziani, LLNL
- 10:00 - 10:15 Break

- 10:15 - 11:00 **Nonlinear Numerical Methods in Transport Theory**
R. E. Alcouffe, W. F. Walters and T. A. Wareing, LANL
- 11:00 - 11:45 **The Monotone Methods for Obtaining Solutions of Nonlinear Radiative Transfer Equations**
M. Yu Kozmanov, VNIITF
- 11:45 - 12:30 p.m. **Cost Effective Scheme of Monte-Carlo Method for Nonlinear Radiant Heat Exchange Problems**
A. V. Adeyev, VNIITF
- 12:30 - 1:30 Lunch
- 1:30 - 2:45 Tours of LANL Computing Facilities
(VNIITF and VNIIEF Participants Only)
- 1:30-1:45 Travel to TA-3, SM-2011 and SM-200
- 1:45-2:15 **Group A - Tour Advanced Computing Laboratory**
C. Hansen, LANL
Group B - TeleMed Demonstration
D. Forslund, LANL
- 2:15-2:45 **Group A - TeleMed Demonstration**
D. Forslund, LANL
Group B - Tour Advanced Computing Laboratory
C. Hansen, LANL
- 2:45 - 3:00 Return to Hilltop House Hotel

Session 4 - Parallel Methods/Medical Applications**Session Chair:**

- 3:00 - 3:45 **Message Passing Strategies**
R. F. Barrett, LANL; M. Berry, University of Tennessee; J. Dongarra, University of Tennessee and ORNL; V. Eijkhout, UCLA; and C. Romine, ORNL
- 3:45 - 4:30 **An Application of Sn Transport to Medical Studies**
P. Nowak, LLNL
- 4:30 - 5:00 **Internet Connections to Russian Laboratories**
R. K. Wallace, LANL

Wednesday, January 25, 1995**Session 5 - Unstructured/Lagrangian Grid Methods****Session Chair:**

- 8:30 - 9:15 a.m. **Solution of Multi-Dimensional Gas Dynamics Problems on Irregular Lagrangian Grids**
V. V. Rasskazova, V. N. Motlokhov, A. N. Shaporenko, and A. I. Panov, VNIIEF
- 9:15 - 10:00 **3D Unstructured Grid Generation and Computational Physics Algorithms**
M. S. Sahota and H. E. Trease, LANL
- 10:00 - 10:15 Break
- 10:15 - 11:00 **Sn Transport on Unstructured Meshes**
P. Nowak, LLNL
- 11:00 - 11:45 **Massively Parallel Self-Adjoint Sn and Pn Transport Methods on Unstructured 3-D Grids**
J. E. Morel, J. M. McGhee, and W. F. Walters, LANL
- 11:45 - 12:30 p.m. **Applications of Monte Carlo to Medicine**
J. Rathkopf, LLNL
- 12:30 - 1:30 Lunch

Session 6 - Particle and Energy Transport**Session Chair:**

- 1:30 - 2:15 **Linear Monte Carlo Computations of Combined Gamma, Electron and Positron Transport (ELIZA Code)**
E. N. Donskoi, VNIIEF
- 2:15 - 3:00 **Parallel Processing in Monte-Carlo Application**
A. V. Adeyev, A. A. Makeyev, and A. I. Orlov, VNIITF
- 3:00 - 3:15 Break
- 3:15 - 4:00 **Parallel Monte Carlo Simulation and Performance**
J. Rathkopf, LLNL

4:00 - 4:45 **Maximum Principle for Radiative Transfer Equations
Considering Electron and Ionic Heat Conduction**
M. Yu. Kozmanov, VNIITF

Wednesday Evening: Dinner for Russian visitors hosted by Los Alamos participants

Thursday, January 26, 1995

Session 7 - Industrial Applications
Session Chair: J. W. Shaner, LANL

8:30 - 9:15 a.m. **Challenges and Opportunities in Industry**
J. W. Shaner, LANL

9:15 - 10:00 **Intel Projects**
K. Pocek, Intel Corp.

10:00 - 10:15 Break

10:15 - 11:00 **Perspectives on Working with Industry**
P. Donohue, Malabar Associates

11:00 - 11:45 **Challenges in the Oil and Gas Industry**
K. G. Eggert, LANL

11:45 - 12:30 p.m. **NAS Parallel Benchmark Suite**
J. T. West, IBM

12:30 - 1:30 Lunch

1:30 - 1:45 Travel to TA-53, MPF-622
(VNIITF and VNIIEF Participants Only)

1:45 - 2:30 **Los Alamos Neutron Scattering Center Tour**
T. Brun, LANL

2:30 - 2:45 Travel to TA-35

2:45 - 3:15 **Ion Implantation Facility Tour**
D. Rej, LANL

3:15 - 3:30 Return to Hilltop House Hotel

Session 8 - Neutron Transport**Session Chair:**

- 3:30 - 4:15 **Numerical Method TREL' for Critical Parameters Computation of Three-Dimensional Neutron-Nuclear Systems**
S. B. Serov, VNIITF
- 4:15 - 5:00 **Numerical Solution of Neutron Transport and Diffusion in Nuclear Power Reactor Safety Problems**
V. V. Yevdakimov, A. V. Nikiforova, G. G. Farafontov, L. P. Fedotova, R. M. Shagaliyev, and V. A. Shumilin, VNIIEF

Friday, January 27, 1995**Session 9 - Hydrodynamic/Material Properties****Session Chair:**

- 8:30 - 9:15 a.m. **Numerical Simulation of Shock-Free Unlimited Gas Compression in Lagrangian Variables Using the 'D' Technique**
A. Yu. Artemyev, V. I. Delov, L. V. Dmitriyeva, I. D. Sofronov, and Yu D. Chernyshev, VNIIEF
- 9:15 - 10:00 **Equation of State and Phase Diagram of Carbon**
A. B. Averin, V. V. Driemov, S. I. Samarin, and A. T. Sapozhnikov, VNIITF
- 10:00 - 10:15 Break
- 10:15 - 11:00 **Modeling Composite Materials**
F. L. Addessio and J. Aidun, LANL
- 11:00 - 11:45 **Molecular Dynamics and Atomic-Scale Simulation of Material Properties**
J. Belak, LLNL
- 11:45 - 12:30 p.m. **Nonequilibrium Multiphase Mixture Modeling Implemented into Shock Physics Analysis**
M. Baer, E. Hertel, and R. Bell, SNL
- 12:30 - 1:30 Lunch

Session 10 - Jupiter Impact/Numerical Methods

Session Chair:

- | | |
|-------------|---|
| 1:30 - 2:15 | Jupiter Impact and Antipodal Shock Focussing
<i>M. Boslough, SNL</i> |
| 2:15 - 3:00 | Improved Advection Methods
<i>L. G. Margolin, LANL</i> |
| 3:00 - 3:45 | Method of Support-Operators and High-Order Finite-Difference Schemes on Non-Uniform Grids
<i>M. J. Shashkov, LANL</i> |
| 3:45 | Adjourn |
| 6:00 | Banquet/Bishops Lodge |