

Computational Mechanics: The Next Decade

**Drewberry Hall, Johnson Center
George Mason University, Fairfax Campus**

8:30- 9:00 **Welcome:**
President Merten
Rainald Löhner

9:00-10:20 **Session 1: Numerical Methods**

**Advances in the Particle Finite Element Method (PFEM) for
Problems in Sea, Earth and Fire**

Eugenio Oñate, , Sergio R. Idelsohn, Riccardo Rossi
CIMNE, Barcelona, Spain

**Simulation Based Engineering: Challenges in Verification,
Validation and Uncertainty Analysis**

Dominique Pelletier
Ecole Polytechnique de Montreal, Canada

**Development of a Discontinuous Galerkin Method for
Computational Fluid Dynamics**

Hong Luo
North Carolina State University, Raleigh, NC, 27695

**Numerical Modeling of Fluid Instabilities in Laser-Driven
Inertial Confinement Fusion (ICF) Capsules in the Small-
Amplitude Limit**

Steven T. Zalesak
Berkeley Research Associates and NRL, Washington, DC

10:20-10:40: **Coffee Break**

10:40-12:20: **Session 2: Government Perspectives**

Computational Mathematics at AFOSR: Challenges and Future Directions

Fariba Fahroo

Air Force Office of Scientific Research (AFOSR)

Computational Mechanics at DTRA: The Next Decade

Michael Giltrud

DTRA, Fort Belvoir, VA

Understanding and Forecasting the Sun's Impact on the Battlespace Environment

Jill Dahlburg

Space Science Division, NRL, Washington, DC

Missile Aerodynamic Performance Prediction

Alan Nicholson

MSIC, Huntsville, AL

The Next Decade in Supercomputing

R. Aubry, G. Houzeaux, M. Vazquez and J.M. Cela

Barcelona Supercomputing Center, Barcelona, Spain

12:20-13:20: **Lunch**

13:20-14:40: **Session 3: Free Surface Hydrodynamics/Hydraulics**

Do Analytical Methods Have A Future?

Francis Noblesse

NSWC-CD, Potomac, MD

The Future of CFD in Ship Hydrodynamics – Prediction and Optimization

Chi Yang

Center for Computational Fluid Dynamics, GMU, Fairfax, VA

Hydrodynamics vs. Hydraulics: An Old Controversy Yet to be Settled in Flow Simulation?

Gustavo C. Buscaglia

University of São Paulo, Brazil

**Vehicle Biomimetics at the Macro, Micro, and Nano Scale:
Challenges for Computational Mechanics**

William C. Sandberg
SAIC, McLean, VA

14:40-15:00: **Coffee Break**

15:00-16:00: **Session 4: Bio/Medical Engineering**

**Computational Modelling of Human Respiratory System – An
Overview**

Perumal Nithiarasu
School of Engineering, Swansea University, Swansea, Wales, UK

Blood Flow Simulation: The Clinical Perspective

Christopher Putnam
INOVA Fairfax Hospital, Fairfax, VA

Clinical Applications of Computational Hemodynamics

Juan R. Cebal
Center for Computational Fluid Dynamics, GMU, Fairfax, VA

16:00-16:20: **Coffee Break**

16:20-17:40: **Session 5: Fluid/Structure/Thermal Interaction**

Damping the Flames: Fire Modeling for the Next Decade

Kathryn Butler
NIST, Gaithersburg, MD

Challenges in Integrated Structural Impact Analysis

Steve Kan
National Crash Analysis Center, GWU, Ashburn, VA

Modeling of Structural Response to Blast Loading

Joseph D. Baum
SAIC, McLean, VA 22102

**Fifty Years Later: Outstanding Challenges and New
Perspectives for Computational Mechanics**

Charbel Farhat
Stanford University, CA

18:30-21:00: **Reception**