**Program-at-a-Glance**

**Saturday Evening, July 12**

5:00 PM-8:00 PM Registration

**Sunday Morning, July 13**

7:30 AM-8:00 PM Registration
8:30 AM-5:00 PM

Short Course on Linear Algebra Algorithms and Software for Large Scientific Problems
Jack Dongarra
8:45 AM-5:30 PM

Short Course on Level Set Methods
James Sethian
10:00 AM-10:30 AM Coffee

**Sunday Afternoon, July 13**

12:00 PM-1:30 PM Lunch (for Short Courses participants only)
4:00 PM-8:00 PM
Annual Meeting poster set-up begins
6:00 PM-8:00 PM Welcoming Reception

**Monday Morning, July 14**

7:30 AM-8:00 AM Coffee
7:30 AM-5:00 PM Registration
8:15 AM-8:30 AM Welcoming Remarks and Announcements
Gene H. Golub, Stanford University; and William M. Coughran, Jr., Bell Laboratories, Lucent Technologies
8:30 AM-9:15 AM

IP1 Structured Total Least Squares, the Riemannian SVD and Applications in Signal Processing and System Identification
Bart De Moor, Katholieke Universiteit Leuven, Belgium
Chair: Gene H. Golub, Stanford University
8:30 AM-4:00 PM Exhibits open
8:30 AM-5:30 PM

AWM Workshop (see separate program)
9:15 AM-10:00 AM

IP2 Algorithms for Computing Matrix Logarithms and Exponentials
Alan J. Laub, University of California, Davis
Chair: Gene H. Golub, Stanford University
10:00 AM-10:30 AM Coffee and Poster Session
10:30 AM-12:30 PM Concurrent Sessions

**Monday Afternoon, July 14**

12:30 PM-2:00 PM Lunch (attendees are on their own)
2:00 PM-2:45 PM

IP3 Recent Advances and Open Problems in Iterative Methods for Solving Linear Systems
Anne Greenbaum, Courant Institute of Mathematical Sciences, New York University
Chair: Kathryn E. Brenan, Aerospace Corporation
2:45 PM-3:15 PM Coffee and Poster Session
3:15 PM-5:45 PM Concurrent Sessions

**Monday Evening, July 14**

6:00 PM-7:00 PM
Special Session: Funding Opportunities in Applied Mathematics and Computation
Organizer: James M. Crowley, Executive Director, SIAM

**Tuesday Morning, July 15**

7:30 AM-8:00 AM Coffee
7:30 AM-5:00 PM Registration
7:30 AM-8:30 PM
Graduate Student Focus on Diversity Workshop (see separate program)
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<tr>
<td>8:00 AM-10:30 AM</td>
<td>AWM Workshop (see separate program)</td>
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<td>8:30 AM-4:00 PM</td>
<td>Exhibits open</td>
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<td>8:30 AM-9:10 AM</td>
<td>IP4 Mathematical Problems in Electrical Impedance Imaging</td>
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<td></td>
<td>Margaret Cheney, Rensselaer Polytechnic Institute</td>
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<td>Chair: Raymond Chan, Chinese University of Hong Kong, Hong Kong</td>
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<td>9:10 AM-9:20 AM</td>
<td>Awarding of The SIAM Prize for Distinguished Service to the Profession</td>
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<td>Chair: John Guckenheimer, President, SIAM, and Cornell University</td>
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<td>9:20 AM-10:00 AM</td>
<td>IP5 Computer-Aided Design of Bioactive Molecules</td>
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<td>J. Andrew McCammon, University of California, San Diego</td>
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<td>Chair: Raymond Chan, Chinese University of Hong Kong, Hong Kong</td>
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<td>10:00 AM-10:30 AM</td>
<td>Coffee and Poster Session</td>
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<td>10:30 AM-12:30 PM</td>
<td>Concurrent Sessions</td>
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<tr>
<td>MS19 Solving Large-Scale Nonsymmetric Eigenvalue Problems</td>
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<td>Organizer: Nicholas J. Higham, University of Manchester, United Kingdom</td>
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<td>MS20 Modeling of Natural Science Phenomena: Comparison of Theory with Experiment</td>
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<td>Organizer: David J. Wollkind, Washington State University</td>
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<tr>
<td>MS21 Effective Numerical Methods for Free Boundary Problems (Part I of II)</td>
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<td>Organizers: Thomas Y. Hou, California Institute of Technology; Hongkai Zhao, Stanford University; and Xiaolin Li, Indiana University-Purdue University, Indianapolis</td>
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<td>MS22 Structured Total Least Norm Approximation Methods and Applications</td>
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<td>Organizers: Haesun Park, University of Minnesota, Minneapolis; and J. Ben Rosen, University of California, San Diego</td>
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<td>MS23 A Proposed Curriculum for the Professional MS Degree</td>
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<td>Organizer: Ben A. Fusaro, Florida State University</td>
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<td>MS24 Nonlinear Models in Electrical Engineering, Review and Open Problems</td>
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<td>Organizer: Michal Odyniec, Hewlett Packard Co.</td>
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<td>MS25 A Tribute to the Memory of George Forsythe</td>
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<td>Organizer: Cleve Moler, TheMathWorks, Inc.</td>
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<td>MS26 High Order Methods for Compressible Flow Calculations (Part I of III)</td>
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<td>Organizers: George Karniadakis and Chi-Wang Shu, Brown University</td>
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<td>MS27 Architectures for Scientific Computing</td>
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<td>Organizer: Jack Dongarra, University of Tennessee, Knoxville and Oak Ridge National Laboratory</td>
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<td>CP7 Special Functions, Approximations, and Applications</td>
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<td>Chair: Charles Tier, University of Illinois, Chicago</td>
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<td>CP8 Solitons, Waves, Flow</td>
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<td>Chair: Suncica Canic, Iowa State University</td>
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<td>CP9 Control and Applications I</td>
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<td>Chair: I. Norman Katz, Washington University</td>
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<td>CP12 Control and Applications II</td>
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<td>Chair: E. G. Rosen, University of Southern California</td>
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<td><strong>TUESDAY AFTERNOON, JULY 15</strong></td>
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<tr>
<td>12:30 PM-2:00 PM Lunch</td>
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<td>2:00 PM-2:45 PM</td>
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<td>The John von Neumann Lecture</td>
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<td>William Kahan, University of California, Berkeley</td>
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<td>Chair: John Guckenheimer, President, SIAM and Cornell University</td>
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<td>Coffee and Poster Session</td>
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<td>3:15 PM-5:45 PM</td>
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<td>Concurrent Sessions</td>
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<td>MS28 Preconditioning and Iterative Methods for Problems Arising in Fluid Flow</td>
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<td>Organizer: Andy Wathen, Oxford University, United Kingdom</td>
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<td>MS29 The Development of O(N), First Principles, LDA Based Electronic</td>
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<td>Organizer: William A. Shelton, Oak Ridge National Laboratory</td>
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<td>MS30 Effective Numerical Methods for Free Boundary Problems (Part II of II)</td>
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<td>Organizers: Thomas Y. Hou, California Institute of Technology; Hong-Kai Zhao, Stanford University; and Xiaolin Li, Indiana University-Purdue University, Indianapolis</td>
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<td>MS31 Challenging Optimization Problems in Computational Biology (Part I of II)</td>
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<td>Organizer: Zhijun Wu, Argonne National Laboratory</td>
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<td>MS32 New Methods for Least Squares Problems with Uncertainty and Structure</td>
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<td>Organizers: Laurent El Ghaoui and Herve Lebret, Ecole Nationale Superieure de Techniques Avances, France</td>
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<tr>
<td>MS33 DD/MG Algorithms in Unstructured Grid Applications: Basic Algorithms (Part I of II)</td>
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<td>Organizers: Tony F. Chan, University of California, Los Angeles; Timothy J. Barth and Wei-Pai Tang, RIACS, NASA Ames Research Center</td>
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<td>MS34 High Order Methods for Compressible Flow Calculations (Part II of III)</td>
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<td>Organizers: George Karniadakis and Chi-Wang Shu, Brown University</td>
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<td>MS35 Experiences in Teaching Mathematical Modeling</td>
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<td>Organizer: Fadil Santosa, University of Minnesota, Minneapolis</td>
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<td>MS36 Object-Oriented Software Design and Development of Partial Differential Equations</td>
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<td>Organizers: David L. Brown and William D. Henshaw, Los Alamos National Laboratory</td>
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<td>CP10 Matrix Decomposition</td>
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<td>Chair: Haesun Park, University of Minnesota, Minneapolis</td>
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<td>CP11 Numerical PDE II</td>
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<td>Chair: Daniel L. Marcus, Lawrence Berkeley National Laboratory</td>
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<td><strong>WEDNESDAY MORNING, JULY 16</strong></td>
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<td>7:30 AM-8:00 AM</td>
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<td>Coffee</td>
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<td>Exhibits open</td>
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<td>8:30 AM-9:15 AM</td>
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<td>IP6 Multiresolution Algorithms in Computer Graphics</td>
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<td>Peter Schröder, California Institute of Technology</td>
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<td>Chair: Rosemary E. Chang, Silicon Graphics Computer Systems</td>
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<td>9:15 AM-10:00 AM</td>
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<td>IP7 High Performance Computer Architecture</td>
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<td>John L. Hennessy, Stanford University</td>
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<td>Chair: Rosemary E. Chang, Silicon Graphics Computer Systems</td>
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<td>10:00 AM-10:30 AM</td>
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<td>Coffee and Poster Session</td>
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<td>10:30 AM-12:30 PM</td>
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<td>MS37 Recent Development and Applications of Least-Squares Finite Element Methods</td>
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<td>Organizers: Daniel C. Chan, Boeing North American, Rockeydine Division; and Zhiquang Cai, Purdue University, West Lafayette</td>
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<tr>
<td>MS38 DD/MG Algorithms in Unstructured Grid Applications: CFD and Structures Algorithms (Part II of II)</td>
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<td>Organizers: Tony F. Chan, University of California, Los Angeles; Timothy J. Barth and Wei-Pai Tang, RIACS, NASA Ames Research Center</td>
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<td>MS39 Applications of Compiler Technology in Computational Science</td>
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<td>Organizers: Vladimir Kotlyar, Cornell University; and Lucas Roh, Argonne National Laboratory</td>
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<td>MS40 High Order Methods for Compressible Flow Calculations (Part III of III)</td>
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<td>Organizers: George Karniadakis and Chi-Wang Shu, Brown University</td>
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<td>MS41 New Time Integration Algorithms for Solving PDEs</td>
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<td>Organizer: Jianping Zhu, Mississippi State University</td>
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MS42 Preconditioned Methods for Large Eigenproblems
Organizer: Andrew V. Knyazev, University of Colorado, Denver

MS43 The Mathematical Contest in Modeling (MCM)
Organizer: Ben A. Fasano, Florida State University

MS44 Reduced-Order Modeling and Applications in Circuit Simulation (Part I of II)
Organizer: Roland W. Freund, Bell Laboratories, Lucent Technologies

MS45 Modeling in Optical Science (Part I of II)
Organizers: Gang Bao, University of Florida, Gainesville; and Lawrence C. Cowan, Bell Laboratories, Lucent Technologies

CP13 Economics and Finance
Chair: Agapi Somwaru, ERS, Washington, DC

CP14 Numerical PDE III
Chair: Donna Calhoun, University of Washington

CP15 Least Squares and Singular Value Decomposition
Chair: Gilbert Strang, Massachusetts Institute of Technology

THURSDAY MORNING, JULY 17
7:30 AM-8:00 AM Coffee
7:30 AM-5:00 PM Registration
8:30 AM-9:15 AM
IP9 Clusters and Massively Parallel Computers: Are the Architectures Converging?
Paul C. Messina, California Institute of Technology
Chair: Robert G. Voigt, National Science Foundation
9:15 AM-10:00 AM
IP10 Impact of the Internet on Scientific Computing
Eric Grosser, Bell Laboratories, Lucent Technologies
Chair: Robert G. Voigt, National Science Foundation
10:00 AM-10:30 AM Coffee
10:30 AM-12:30 PM Concurrent Sessions
MS55 Fast Toeplitz Solvers (Part I of II)
Organizer: Xiao-Qing Jin, University of Macau, People’s Republic of China

MS56 The Mathematical Sciences and their Applications Throughout the Undergraduate Curriculum: An NSF Initiative Whose Time is Now
Organizers: Lee L. Zhu, University of New Hampshire; and I. Edward Block, SIAM

MS57 Advances in Optimal Flow Control (Part II of III)
Organizers: S. S. Sritharan, Naval Command Control and Ocean Surveillance Center, and University of Colorado, Boulder; and S. S. Ravindran, North Carolina State University

MS58 Moving-Grid Methods for Partial Differential Equations (Part II of III)
Organizers: Guoqiang Liao, University of Texas, Arlington; and Paul A. Zegeling, Utrecht University, The Netherlands

MS59 Nasty Nonsmooth Nonlinear Optimization
Organizers: C. T. Kelley, North Carolina State University; and Margaret H. Wright, Bell Laboratories

MS60 Mimetic Finite-Difference Methods for Partial Differential Equations
Organizers: James M. Hyman and Mikhail J. Shashkov, Los Alamos National Laboratory

MS61 Theory and Applications of Orthogonal Decompositions
Organizers: Ricardo D. Fierro, California State University, San Marcos; and Sabine Van Huffel, Katholieke Universiteit Leuven, Belgium

MS62 Nonlinear PDE Methods in Image Processing (Part I of II)
Organizer: Tony F. Chan, University of California, Los Angeles

MS63 Challenging Optimization Problems in Computational Biology (Part II of II)
Organizer: Zhijun Wu, Argonne National Laboratory

CP19 Electromagnetics
Chair: Jane Callum, IBM T. J. Watson Research Center

CP20 Geophysics
Chairs: Nancy K. Nichols, University of Reading, United Kingdom; and Jennifer Mueller, University of Nebraska, Lincoln

CP21 Combustion
Chair: Christopher H. Raymond, Northwestern University

THURSDAY AFTERNOON, JULY 17
12:30 PM-2:00 PM SIAM Networking Picnic Lunch
2:00 PM-2:45 PM Past-President’s Address
The Pursuit of Optimality: From the Big Picture to the Gory Details
Margaret H. Wright, Bell Laboratories
Chair: John Guckenheimer, President, SIAM and Cornell University
2:45 PM-3:15 PM Coffee
3:15 PM-5:45 PM Concurrent Sessions
MS64 Fast Toeplitz Solvers (Part II of II)
Organizers: Xiao-Qing Jin, University of Macau, People’s Republic of China

MS65 Adaptive Method of Lines (Part I of III)
Organizers: A. Vande Wouwer and P. Saucez, Faculte Polytechnique de Mons, Belgium; and William E. Schiesser, Lehigh University

MS66 Advances in Optimal Flow Control (Part III of III)
Organizers: S. S. Sritharan, Naval Command Control and Ocean Surveillance Center, and University of Colorado, Boulder; and S. S. Ravindran, North Carolina State University

MS67 Large-Scale Optimization and Automatic Differentiation
Organizers: Thomas F. Coleman, Cornell University; and Andreas Griewank, Technical University of Dresden, Germany

MS68 Nonlinear PDE Methods in Image Processing (Part II of II)
Organizer: Tony F. Chan, University of California, Los Angeles
### Thursday Evening, July 17

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<tr>
<td>5:45 PM-6:45 PM</td>
<td>Panel on Mathematics Education in the 21st Century</td>
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<tr>
<td>6:45 PM-7:45 PM</td>
<td>MAW Session (Mathematics Awareness Week)</td>
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### Friday Morning, July 18

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<td>7:30 AM-8:00 AM</td>
<td>Coffee</td>
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<tr>
<td>7:30 AM-12:00 PM</td>
<td>Registration</td>
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<tr>
<td>8:30 AM-9:15 AM</td>
<td>IP11 Modeling Error, Error Estimations, and Adaptivity in the Analysis of Heterogeneous Materials</td>
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<tr>
<td>9:15 AM-10:00 AM</td>
<td>Award and Presentation: The James H. Wilkinson Prize in Numerical Analysis and Scientific Computing</td>
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<tr>
<td>10:00 AM-10:30 AM</td>
<td>Coffee</td>
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<td>10:30 AM-12:30 PM</td>
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### Friday Afternoon, July 18

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<th>Time</th>
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<tr>
<td>12:30 PM-2:00 PM</td>
<td>Lunch</td>
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<tr>
<td>2:00 PM-2:45 PM</td>
<td>IP12 New Perspectives in Turbulence: Scaling, Asymptotics, and the Role of Intermittency</td>
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<tr>
<td>2:45 PM-3:15 PM</td>
<td>Coffee</td>
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