The DOE workshop on "Mathematical Research Challenges in Optimization of Complex Systems" will be held at the Marriott Bethesda North Hotel and Conference Center on December 7-8, 2006. The goal of the workshop is to identify opportunities for mathematical research for advancing a range of important DOE applied science applications. There will be presentations by applications experts on: (1) Power Grid Control and Optimization, (2) Optimization of Fossil Fuel Power Generation, (3) Lifecycle Optimization of the Nuclear Fuel Cycle, and (4) Risk Assessment for Cybersecurity. Each of these problems is of great interest to DOE and rich in opportunities for mathematical contributions. About 35 distinguished mathematical scientists representing a broad range of expertise, including relevant areas not traditionally supported by DOE, will participate in intense interactive follow-up discussions and breakouts to identify promising areas for long-term mathematical research contributions. A summary report will be written following the workshop.

Agenda

Thursday, December 7th

8:30 - 8:45 Welcome & Introduction
8:45 - 9:30 Application 1: Fossil Energy Power Generation
9:30 - 10:15 Application 1 questions and discussion
10:30 - 11:15 Application 2: Nuclear Fuel Cycle
11:15 - 12:00 Application 2 questions and discussion
12:00 - 2:00 Buffet lunch and breakout 1a (three breakout rooms)
2:00 - 2:45 Application 3: Electrical Power Systems
2:45 - 3:30 Application 3 questions and discussion
3:45 - 4:30 Application 4: Risk Assessment for Cybersecurity
4:30 - 5:15 Application 4 questions and discussion
5:30 - 7:30 Buffet dinner & Breakout 1b (three breakout rooms)
7:30 - 9:00 Plenary presentation of breakout reports and discussion

Friday, December 8th

8:30 - 10:00 Breakout 2 (two breakout rooms)
10:15 - 12:00 Plenary presentation of breakout reports and discussion
Applications Speakers and Experts

Power Grid Control and Optimization: Robert Thomas, Cornell U.
Optimization of Fossil Fuel Power Generation: Stephen Zitney, NETL
Lifecycle Optimization of the Nuclear Fuel Cycle: Phillip Finck, INL and Dana Knoll, INL
Risk Assessment for Cybersecurity: Dwayne Ramsey, LBL

Mathematical Sciences Participants

Mihai Anitescu, ANL
David Applegate, AT&T Research
John Bell, LBNL
John Birge, U. Chicago
Michael Branicky, Case Western U.
Joe Chow, RPI
Brenda Dietrich, IBM
Paul Frank, Boeing
John Gilbert, UCSB
Martin Groetschel, TU Berlin
Seth Guikema, Texas A&M
Bruce Hendrickson, SNL, co-organizer
Michael Holst, UCSD
Tim Kelley, NCSU
Tammy Kolda, SNL
John Lewis, Cray
Bill Massey, Princeton U.
Juan Meza, LBNL
Jorge More’, ANL
Richard Murray, Caltech
Cindy Phillips, SNL
Vladimir Protopopescu, ORNL
Bill Pulleyblank, IBM
Roman Samulyak, BNL
Radu Serban, LLNL
Ellen Stechel, SNL, DOE ASCAC Representative
Virginia Torczon, C. of William & Mary, DOE ASCAC Representative
Steve Vavasis, U. Waterloo
Bruce West, Army Research Office
Paul Whitney, PNNL
Alyson Wilson, LANL
Margaret Wright, NYU, co-organizer

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