Workshop on Advancing X-cutting Ideas for Computational Climate Science (AXICCS)

September 12-14, 2016

Hilton Rockville, 1750 Rockville Pike, Rockville, MD 20852

Agenda

Monday, September 12, 2016

Start Time	End Time	Topic
9:00AM	9:30AM	Welcome
9:30AM	10:30AM	Plenary: **Bill Collins**, Lawrence Berkeley National Laboratory *Climate Simulation at Impactful Scales: Charge for a New Physics Paradigm*
10:30AM	11:00AM	Coffee Break
11:00AM	12:30PM	Breakout #1

Breakout Topic 1A: Climate Science Problems in Coupling
*Moderators: **Peter Caldwell and Forrest Hoffman***
Speakers: 40 minutes total
Discussion: 50 minutes
L. Li, Y. Shi, C. Duffy. *Building Computational Bridges Across the Water, Ecosystem, and Soil Biogeochemistry Disciplines*
R. Mills and F. Hoffman. *Machine-learning guided, multi-resolution approaches to high-fidelity representation of global hydrology in ESMs*
H. Waisman, J. Bassis, S. Price, R. Tuminaro and I. Tezaur. *A physics based iceberg calving model coupled with a global ice-sheet flow model for accurate assessment of sea level rise*
M. Hoffman, L. Bertagna, M. Gunzburger, M. Perego and Stephen Price. *Realistic Subglacial Hydrology For Improved Ice Sheet-Climate Coupling and Sea Level Prediction*

Breakout Topic 1B: Climate Model Complexity and Scaling
*Moderators: **Ruby Leung and Paul Ullrich***
Speakers: 45 minutes total
Discussion: 45 minutes
M. Allen, M. Branstetter, O. Omitaomu. *Embedded Urban Framework for ACME Regions of Refined Resolution*
P. Bochev, K. Evans, M. Gunzburger and K. Peterson. *Optimization-Based Heterogeneous Numerical Methods: an Abstraction for Mathematically Rigorous Coupling of Earth System Models*
C. Jablonowski, J. Ferguson, H. Johansen and P. Colella. *Transforming Climate Modeling via Scale-Adaptive Computational Techniques*
W. Maslowski, A. Roberts, E. Hunke, F. Giraldo and M. Kopera. *Sea Ice Modeling Across Scales at Exascale and Beyond*

Breakout Topic 1C:
*Moderators: **Charles Jackson and Michael Prather***
Speakers: 40 minutes total
Discussion: 50 minutes

A. Salinger, E. Phipps and J. Fyke. *Embedded Ensembles*

S. Mahajan, K. Evans and M. Norman. *Expanding the Utility of High-Resolution Global Climate Models via Short Ensembles*

S. Price, M. Perego and G. Stadler. *Optimization and Uncertainty Quantification of Ice Sheet Models*

S. Wang, N. Urban, M. Maltrud and Alexandra Jonko. *Automation of parameterization and structure selection of ocean biogeochemical models*

12:30PM	2:00PM	Lunch
2:00PM	2:30PM	Outbriefs from Breakout #1 (all)
2:30PM	3:30PM	Plenary: **Christopher S. Bretherton**, University of Washington *Frontiers in Multiscale and Global Simulation of Boundary Layer Clouds and Their Interactions with Climate*
3:30PM	4:00PM	Coffee Break
4:00PM	5:30PM	Breakout #2: Math and Computer Science Advances

Breakout Topic 2A: Coupling, PDEs, and linear algebra
*Moderators: **Ray Tuminaro and Dan Martin***
Speakers: 45 minutes total
Discussion: 45 minutes
M. Perego, S. Price and A. Salinger. *Next generation implicit solvers and analysis algorithms for ice sheet modeling*
J. Brown. *Higher Standards on the Control of Numerical Accuracy*
M. Norman. *New Temporal and Spatial Algorithms for Atmospheric Climate Models*

Breakout Topic 2B: Optimization and Statistics
*Moderators: **Stefan Wild and George Ostrouchov***
Speakers: 40 minutes total
Discussion: 50 minutes
O. Ghattas and **G. Stadler**. *From Data through Inference to Optimization under Uncertainty: Towards End-to-End Climate Model-Based Decision-Making*
J. Ray, L. Swiler, G. Pau, G. Bisht, F. Hoffman, M. Huang, Z. Hou and X. Chen. *Improving predictive capability of land surface models through robust statistical calibration techniques*
N. Urban. *Climate Model Uncertainty Quantification*

Breakout Topic 2C: Computational Performance and Data Management
*Moderators: **Sam Williams and Kerstin Kleese Van Damm***
Speakers: 40 minutes total
Discussion: 50 minutes
P. Ullrich, G. Jost, B. Lelbach and H. Johansen. *Exascale-Ready Programming Models for Climate*
D. Wang, O. Hernandez, G. Lopez and F. Winkler. *Compiler-based software analysis toolkit for climate model development*

5:30PM	7:00PM	Poster Session

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Tuesday, September 13, 2016

Start Time	*End Time*	*Topic*
9:00AM	9:30AM	Outbriefs from Breakout #2 (all)
9:30AM	10:30AM	Plenary: **Petros Koumoutsakos**, ETH Zurich, Switzerland *The Art of Computational Science: Closing Gaps, Forming Alloys*
10:30AM	11:00AM	Coffee Break
11:00AM	12:30PM	Breakout #3: Climate Response to Math and CS Ideas
		Breakout Topic 3A: Same as 1A
		Breakout Topic 3B: Same as 1B
		Breakout Topic 3C: Same as 1C
12:30PM	2:00PM	Lunch
2:00PM	2:30PM	Outbriefs from Breakout #3 (all)
2:30PM	3:30PM	Plenary: **George Mozdzynski**, European Centre for Medium-Range Weather Forecasts, UK *Addressing Future Scalability and Power Challenges at the European Centre for Medium-Range Weather Forecasts (ECMWF)*
3:30PM	4:00PM	Coffee Break
4:00PM	4:30PM	Wrap-up

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Wednesday, September 14, 2016

Start Time	*End Time*	*Topic*
8:30AM	1:00PM	PC Only Report Writing