CISL Seminar Series

High-performance Geometric Multigrid (HPGMG) and quantification of performance versatility

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Many applications require flexibility in the problem complexity, target accuracy, and time and cost to solution. This is exacerbated by new physical models, model coupling, and more sophisticated analysis techniques such as optimization, data assimilation, and uncertainty quantification. Moreover, as models become increasingly relevant, their execution is subjected to more external requirements (e.g., policy, weather, manufacturing, field studies, disaster response). We need abstractions that render large regions near the (problem complexity, accuracy, time, cost)-Pareto front accessible with practical hardware resources and maintainable source code. The HPGMG benchmarking effort attempts to quantify versatility (and variability) of machines so that practitioners can make informed decisions about the suitability of a given machine for their purposes. This talk will discuss design choices and open problems for benchmarking to be representative of a broad range of applications run in diverse scientifically-relevant configurations.

Bio:

Jed grew up in Alaska, earning BS degrees in Mathematics and Physics and an MS in Mathematics at the University of Alaska Fairbanks, during which he was the principal author of the Parallel Ice Sheet Model (PISM). In 2011, he completed a Dr.Sc. at ETH Zürich, where he investigated computational methods for ice sheet and glacier dynamics. He became an active PETSc developer during this time, leading to a postdoc and later Asst. Computational Mathematician appointment at Argonne National Lab. He is now Asst. Professor of Computer Science at the University of Colorado Boulder. His work has been recognized by the 2014 SIAG/SC Junior Scientist Prize and a 2014 IEEE TCSC Young Achiever Award, and as co-recipient of the 2015 SIAM/ACM Prize in Computational Science and Engineering.

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10:00 -11:00 am
Mesa Lab, Main Seminar Room

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