



ICERM



Institute for Computational and Experimental Research in Mathematics

IdeaLab for Early Career Researchers

Inverse Problems and Uncertainty Quantification

JULY 6 – 10, 2015

■ Organizing Committee

Omar Ghattas, University of Texas at Austin

Youssef Marzouk, Massachusetts Institute of Technology

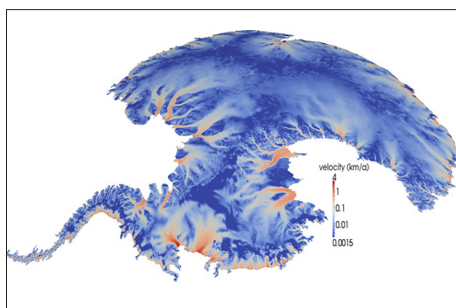
Noemi Petra, University of California, Merced

■ Description

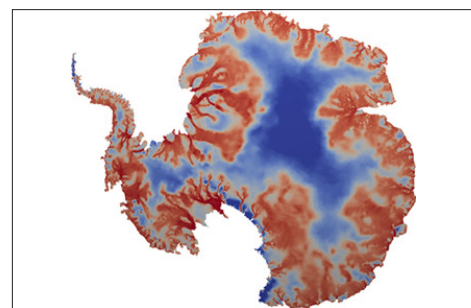
IdeaLab is a one-week program at ICERM aimed at early career researchers that focuses on a topic at the frontier of research. Participants are exposed to a problem whose solution may require broad perspectives and multiple areas of expertise. Senior researchers introduce the topic in tutorials and lead discussions. The participants break into teams to brainstorm ideas, comprehend the obstacles, and explore possible avenues towards a solution. The teams are encouraged to develop a research program proposal. On the last day, they present their ideas to one another and to a small panel of representatives from funding agencies for feedback and advice.

■ 2015 Topic

Inverse problems arise in an enormous variety of science and engineering applications. Examples range from understanding the dynamics of Antarctic ice sheets to developing predictive models of combustion emissions. The goal of this IdeaLab is to lay out the fundamentals of uncertainty quantification for inverse problems in a relatively rapid but hands-on manner, so that participants can understand and fluently discuss the current state of the art. We will also present connections to classical (regularization-based) inverse problems and brainstorm projects focusing on new methodological approaches and new applications.



Satellite observations of surface ice flow velocity used to solve Antarctic ice sheet inverse problem, along with a model of ice flow as a non-Newtonian fluid



Inferred basal friction parameter field (warm colors imply low resistance to sliding at base of ice sheet)

■ Funding

- Travel support
- Six nights accommodations
- Meal allowance

■ To Apply

- Applicants should be at an early stage of their post-Ph.D. career (within 5 years of Ph.D.)
- All applications must be submitted via MathPrograms.org (see "Brown University")
- Rolling application review begins April 2015. Applications remain open until positions filled.

About ICERM The Institute for Computational and Experimental Research in Mathematics (ICERM) is a National Science Foundation Mathematics Institute at Brown University in Providence, RI. Its mission is to broaden the relationship between mathematics and computation: specifically, to expand the use of computational and experimental methods in mathematics, to support theoretical advances related to computation, and address problems posed by the existence and use of the computer through mathematical tools, research and innovation. For more information about our programs and opportunities to participate, please visit our website: icerm.brown.edu.



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