

Topical Workshop

■ AUGUST 5-9, 2019

Applied Mathematical Modeling with Topological Techniques

Organizing Committee:

Henry Adams, Colorado State University

Maria D'Orsogna, California State University, Northridge

Rachel Neville, University of Arizona

Jose Perea, Michigan State University

Chad Topaz, Williams College



Mathematical modelers face a variety of challenges, including summarizing large data sets to understand and explore a system of interest, inferring the model parameters most accurate for describing a given data set, and assessing the goodness-of-fit

between data sets. Computational topology provides a lens through which these challenges may be addressed. At the same time, just as topological techniques provide opportunities for modelers, the challenges that modelers face give rise to opportunities for applied topologists. For instance, topologists may develop techniques that make model predictions based on the topology of experimental or simulation data, that analyze time-varying data, or that turn model outputs into formats suitable for machine learning.

This workshop brings together the applied mathematical modeling and applied topology communities, aiming to give modelers exposure to topological techniques still not commonly used in their community, and to give topologists exposure to modeling challenges that might stimulate the development of new techniques.

Confirmed Speakers and Research Group Facilitators:

Veronica Ciocanel, Ohio State University

Padraig Corcoran, Cardiff University

Sarah Day, College of William and Mary

Brittany Fasy, Montana State University

Kara Maki, RIT College of Sciences

Melissa McGuirl, UT Austin/Brown University

Francis Motta, Florida Atlantic University

Michael Robinson, American University

Nancy Rodriguez, University of
North Carolina, Chapel Hill

Martin Short, Georgia Tech

Michael Sinhuber, Stanford University

Kathleen Storey, University of Michigan

Mikael Vejdemo Johansson, CUNY

College of Staten Island

Lori Ziegelmeier, Macalester College



Participation

Most ICERM workshops are aimed at scientists who have, or are pursuing, a doctoral degree and are actively involved in the topic of the workshop. For full consideration, the deadline for application is March 18, 2019. To request an invitation to an ICERM workshop, please complete an online application. Support for local expenses may be provided. ICERM encourages women and members of underrepresented minorities to apply. More information and an application form are available on our website.

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, support theoretical advances related to computation, and address problems posed by the existence and use of the computer through mathematical tools, research and innovation.

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