

# SIAM CSE17 BE: Guided Affinity Groups

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Feb 27, 2017

# Background of the minisymposium

- 1 Session title: MS62 Advanced Modeling and Algorithms in Multiscale Problems  
Time and location: 4:35 PM - 6:15 PM Room: 202.

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- 2** Topics: multiscale problems, applications and common techniques.
- 3** A short introduction to multiscale problems.

# Background of the speakers

- John A. Mitchell, Sandia National Laboratories.  
Center for Computing Research  
Email: [jamitch@sandia.gov](mailto:jamitch@sandia.gov)

# Background of the speakers

- John A. Mitchell, Sandia National Laboratories.  
Center for Computing Research  
Email: jamitch@sandia.gov
- Research interest: My work is at the confluence of engineering mechanics (especially continuum mechanics), materials science, mathematics, algorithms development, and software implementations. I am especially interested in bridging the gap between engineering and applied mathematics, and demonstrating and/or developing novel solutions and implementations for emerging problems.

# Background of the speakers

- Yue Yu (Carol), Lehigh University.  
Department of Mathematics  
Email: [yuy214@lehigh.edu](mailto:yuy214@lehigh.edu)

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- Yue Yu (Carol), Lehigh University.  
Department of Mathematics  
Email: [yuy214@lehigh.edu](mailto:yuy214@lehigh.edu)
- Research interest: My research concerns topics in the areas of numerical analysis, scientific computing and high performance computing, where I work on the development of novel numerical tools for PDEs with background in science, engineering and biomedicine. I am particularly interested in the design and analysis of efficient and stable numerical schemes for multiscale/multiphysics problems with specific focus on interface mathematical conditions.

# Formulate expectations

Find individual challenges to stay focused and motivated throughout session

- Understand the problem and applications.
- Learn extract/evaluate contribution and techniques of the talk: need some preparation.
- Think of one minute brief introduction of yourself and your research interest.
- More...

# Brief introduction to each talk

- 1** Grain Growth Modeling and Novel Data Analytics for Weld Process.

Application: simulate the weld process.

Multiscale problem: evolution of grain growth in microscopic level and distribution of sizes of grain in macroscopic level.

Technique: Kinetic Monte Carlo.

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- 2** Concurrent Multiscale Coupling Methods for the Discretized Peridynamic Theory and the Finite Element Method.

Application: simulate a plate with a hole.

Multiscale problem: neighborhood of hole (defects) needs high resolution, whereas, away from the hole, it needs low resolution.

Technique: domain decomposition and nonlinear mechanics.

# During the session

- Extract main message of a talk most importantly: formulate questions (to self and presenting speakers).
- Interact with presenting speakers (after a talk or after session).
- Possible opportunities?
- More...