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## **A Guided Tour of Agile Software Development for Computational Scientists and Engineers**

Part 1: November 4th, 2020

Part 2: December 2nd, 2020

2:30-5:30 PM PST

Workshop Facilitators:

Damian Rouson, Ph.D.

Mary Ann Leung, Ph.D.

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# What To Expect

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When computational science and engineering (CSE) rely on software written in-house, many code developers have application-relevant formal education but little or no software engineering training. Moreover, most formal software engineering courses focus on applications other than CSE. This workshop provides a gentle introduction to widely used, agile development practices and tools for a broad CSE audience. Agile is especially important for working in team development and open-source projects. The workshop alleviates one problem that sometimes limits the potential audience for such material: the seemingly obvious requirement of being familiar with the programming language(s) employed. We focus on an activity with no programming-language prerequisite: document creation in Markdown and LaTeX. An additional unique aspect will be the incorporation of a professional development activity: students will apply the practices and tools learned to develop a draft of an application for a graduate or postdoctoral fellowship.

## What's on the agenda?

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- \* Day 1: Introduction to agile development
  - An overview of CSE graduate and postdoctoral fellowship opportunities and their benefits.
  - Collaborative source control using git, GitHub, and git workflows.
  - An interactive, pair-programming exercise in test-driven development of a fellowship application in Markdown.
- \* Day 2: Agile development topics
  - Building a report in LaTeX with CMake.
  - An interactive, continuous-integration testing exercise.
  - Development sprints in research software settings and best practices in object-oriented design.

## Workshop Facilitators

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### Damian Rouson, Ph.D.

Damian Rouson has taught over 33 courses and tutorials on CSE software engineering at conferences, government laboratories, universities, and corporations throughout the U.S. and Europe. Most of the courses covered object-oriented, parallel, modern Fortran and mixed Fortran/C/C++. He has also developed video tutorials for the U.S. Nuclear Regulatory Commission and for the JOLTS online collection at Stanford University. He holds a bachelors degree from Howard University and M.S. and Ph.D. degrees from Stanford University, all in mechanical engineering.

### Mary Ann Leung, Ph.D.

Mary Ann Leung was a fellow and later served as Program Manager for the prestigious Department of Energy Computational Science Graduate Fellowship and served as an invited speaker for the National Academies Fellowship Roundtable on multiple occasions. She regularly mentors CSE students in career and professional development and makes use of her extensive background in designing and facilitating engaging interactive virtual training. She holds a bachelors degree from Mills College and MS. and Ph.D. degrees from the University of Washington, all in computational chemistry.