



# NSF Program Perspectives on Software Engineering in Science Software Projects

## Software Engineering BOF Supercomputing 2016

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Version: 11/12/16 12:05 PM



## Software Engineering in Science Software Projects

- Industry best practices:
  - Phases determine activities: Requirements, analysis, architecture, design, testing, deployment, maintenance, project management
  - Stages delineate progress: Inception, Elaboration, Construction, Transition
  - Classes of SE practices: Agile (monitor and adjust) vs. structured (plan) (Barry Boehm – Balancing Agility and Discipline)
  - Tools: version management, build management, compilers, profilers, task management, issue and bug tracking
- Processes must be tailored to the circumstance
  - Micro teams
  - What is quality when it comes to research software?
  - What is testing when it comes to simulation at scale?
- NSF: Key to robust and reliable science:
  - Scalability, performance, usability, security,
  - Reusability, reproducibility, sustainability
- NSF: Embed research in the software development
- NSF: Resources available: Software Carpentry, Software Institutes, CTSC