

# Workshop on Experimental and Computational Fracture Mechanics: Validating peridynamics and phase field models for fracture prediction and experimental design

February 19th to 21st 2025

As our compute capacity grows, science simulations are not only becoming bigger, but more complex. Simulations are carried out at multiple scales and using multiple kinds of physics at once. Boundaries are irregular, grids are irregular, computational domains can be dynamic and complex. In such scenarios, the ideal way to parallelize often cannot be statically determined. At the same time, hardware is becoming more heterogeneous and difficult to program. Increasingly, scientists are turning to asynchronous, dynamic parallelism in order to make the best use of increasingly challenging hardware. As a result, numerous frameworks, platforms, and specialized languages have sprung up to answer this need.

The objectives of this workshop are to bring together experts in asynchronous many-task frameworks, developers of science codes, performance experts, and hardware vendors to discuss the state-of-the-art techniques needed to program, analyze, benchmark, and profile these codes to achieve maximum performance possible from modern machines. This workshop will promote a dialogue between these communities, and help identify challenges and opportunities for advancement in all the disciplines they represent.

## Organizing committee

- Patrick Diehl, Los Alamos National Laboratory (USA)
- Martin Schulz, Technical University of Munich (Germany)
- Erwin Laure, Max Planck Computing and Data Facility (Germany)
- Markus Rampp, Max Planck Computing and Data Facility (Germany)

## Scientific committee

- Alex Aiken, Stanford (USA)
- Erwin Laure, Max Planck Computing & Data Facility (Germany)
- Christoph Junghans, Los Alamos National Laboratory (USA)
- Bryce Adelstein Lelbach, NVIDIA (USA)
- Laxmikant V. Kale, University of Illinois at Urbana-Champaign (USA)
- Brad Chamberlain, HPE and University of Washington (USA)
- John D. Leidel, Tactical Computing Laboratories (USA)

## Technical program chair

- Patrick Diehl, Los Alamos National Laboratory (USA)
- Martin Schulz, Technical University of Munich (Germany)
- Erwin Laure, Max Planck Computing and Data Facility (Germany)
- Markus Rampp, Max Planck Computing and Data Facility (Germany)

## Technical program

- Kevin Huck, University of Oregon (USA)
- Dirk Pflüger, University of Stuttgart (Germany)
- Huda Ibeid, Intel
- Dirk Pleiter, KTH Royal Institute of Technology (Sweden)
- Keita Teranishi, Sandia National Laboratories (USA)
- Gregor Daiß, University of Stuttgart (Germany)
- Najoude Nader, Louisiana State University (USA)
- Hartmut Kaiser, Louisiana State University (USA)
- Steven R. Brandt, Louisiana State University (USA)
- Narasinga Rao Miniskar, Oak Ridge National Laboratory (USA)
- Markus Rampp, Max Planck Computing and Data Facility (Germany)
- Sumathi Lakshmiranganatha, Los Alamos National Laboratory (USA)
- Nikunj Gupta, Amazon (USA)
- Jonas Posner, University of Kassel (Germany)
- Chris Taylor, Tactical Computing Laboratories (USA)
- Aurelien Bouteiller, University of Tennessee, Knoxville (USA)
- Joseph Schuchart, University of Tennessee, Knoxville (USA)
- Rabab Alomairy, Massachusetts Institute of Technology (USA)
- Julian Samaroo, Massachusetts Institute of Technology (USA)

## Logistics

- Friederike Neu, Max Planck Computing and Data Facility (Germany)