Preface

Foreword ................................................................. iii

Full Papers

The Software Development Process of FLASH, a Multiphysics Simulation Code
Anshu Dubey, Katie Antypas, Alan Calder, Bruce Fryxell, Don Lamb, Paul Ricker, Lynn Reid, Katherine Riley, Robert Rosner, Andrew Siegel, Francis Timmes, Natalia Vladimirova, and Klaus Weide — University of Chicago, USA; Lawrence Berkeley National Laboratory, USA; Stony Brook University, USA; University of Michigan, USA; University of Illinois at Urbana-Champaign, USA; University of Western Australia, Australia; Argonne National Laboratory, USA; Arizona State University, USA; University of New Mexico, USA .................................................. 1

A Case Study: Agile Development in the Community Laser-Induced Incandescence Modeling Environment (CLiiME)
Aziz Nanthamornphong, Karla Morris, Damian W. I. Rouson, and Hope A. Michelsen — University of Alabama, USA; Sandia National Laboratories, USA ....................................................... 9

Binary Instrumentation Support for Measuring Performance in OpenMP Programs
Mustafa Elfituri, Jeanine Cook, and Jonathan Cook — New Mexico State University, USA .................................................. 19

Software Design for Decoupled Parallel Meshing of CAD Models
Serban Georgescu and Peter Chow — Fujitsu Labs, UK .................................................. 24

Erika S. Mesh and J. Scott Hawker — Rochester Institute of Technology, USA .................................................. 32

Water Science Software Institute: An Open Source Engagement Process
Stan Ahalt, Larry Band, Barbara Minsker, Margaret Palmer, Michael Tiemann, Ray Idaszak, Chris Lenhardt, and Mary Whitton — RENCI, USA; University of North Carolina at Chapel Hill, USA; NCAR, USA; SESYNC, USA; Red Hat, USA .................. 40

Techniques for Testing Scientific Programs Without an Oracle
Upulee Kanewala and James M. Bieman — Colorado State University, USA .................................................. 48

Design and Rationale of a Quality Assurance Process for a Scientific Framework
Hanna Remmel, Barbara Paech, Christian Engwer, and Peter Bastian — University of Heidelberg, Germany; University of Münster, Germany .................................................. 58

Implementing Continuous Integration Software in an Established Computational Chemistry Software Package
Robin M. Betz and Ross C. Walker — San Diego Supercomputer Center, USA; UC San Diego, USA .................................................. 68

Practical Formal Correctness Checking of Million-Core Problem Solving Environments for HPC
Diego Caminha B. de Oliveira, Zvonimir Rakamarić, Ganesh Gopalakrishnan, Alan Humphrey, Qingyu Meng, and Martin Berzins — University of Utah, USA .................................................. 75

Position Papers

DSLs, DLA, Dxt, and MDE in CSE
Bryan Marker, Robert Van de Geijn, and Don Batory — University of Texas at Austin, USA .................................................. 84

Towards Flexible Automated Support to Improve the Quality of Computational Science and Engineering Software
Davide Falessi and Forrest Shull — Fraunhofer CESE, USA .................................................. 88

Implicit Provenance Gathering through Configuration Management
Vitor C. Neves, Vanessa Braganholo, and Leonardo Murta — UFF, Brazil .................................................. 92