

2022 IEEE/ACM Workshop on Latest Advances in Scalable Algorithms for Large-Scale Heterogeneous Systems (ScalAH 2022)

**Dallas, Texas, USA
13 – 18 November 2022**



**IEEE Catalog Number: CFP22A63-POD
ISBN: 978-1-6654-7571-6**

**Copyright © 2022 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP22A63-POD
ISBN (Print-On-Demand):	978-1-6654-7571-6
ISBN (Online):	978-1-6654-7570-9

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2022 IEEE/ACM Workshop on Latest Advances in Scalable Algorithms for Large-Scale Heterogeneous Systems (ScalAH) **ScalAH 2022**

Table of Contents

Message from the Workshop Chairs	v
Workshop Organization	vi

Session 1

Implementing Asynchronous Jacobi Iteration on GPUs	1
<i>Yu-Hsiang Tsai (Karlsruhe Institute of Technology), Pratik Nayak (Karlsruhe Institute of Technology), Edmond Chow (Georgia Institute of Technology), and Hartwig Anzt (University of Tennessee; Karlsruhe Institute of Technology)</i>	
GPU Optimization of Lattice Boltzmann Method with Local Ensemble Transform Kalman Filter	10
<i>Yuta Hasegawa (Japan Atomic Energy Agency, Japan), Toshiyuki Imamura (RIKEN, Japan), Takuya Ina (Japan Atomic Energy Agency, Japan), Naoyuki Onodera (Japan Atomic Energy Agency, Japan), Yuuichi Asahi (Japan Atomic Energy Agency, Japan), and Yasuhiro Idomura (Japan Atomic Energy Agency, Japan)</i>	

Session 2

Scalable Finite-Element Viscoelastic Crustal Deformation Analysis Accelerated with Data-Driven Method	18
<i>Kohei Fujita (The University of Tokyo), Sota Murakami (The University of Tokyo, Japan), Tsuyoshi Ichimura (The University of Tokyo), Takane Hori (Japan Agency for Marine-Earth Science and Technology, Japan), Muneo Hori (Japan Agency for Marine-Earth Science and Technology, Japan), Lalith Maddegadara (The University of Tokyo, Japan), and Naonori Ueda (Center for Advanced Intelligence Project, RIKEN)</i>	
MARs: Memory Access Rearrangements in Open MPI	26
<i>Yicheng Li (University of Tennessee), Joseph Schuchart (University of Tennessee), and George Bosilca (University of Tennessee)</i>	

Session 3

Threshold Pivoting for Dense LU Factorization	34
<i>Neil Lindquist (University of Tennessee, USA), Mark Gates (University of Tennessee, USA), Piotr Luszczek (University of Tennessee, USA), and Jack Dongarra (University of Tennessee, USA)</i>	
Mixed-Precision Algorithm for Finding Selected Eigenvalues and Eigenvectors of Symmetric and Hermitian Matrices	43
<i>Yaohung Tsai (University of Tennessee, USA), Piotr Luszczek (University of Tennessee, USA), and Jack Dongarra (University of Tennessee, USA)</i>	
Author Index	51