

# **2020 IEEE/ACM 3rd Annual Parallel Applications Workshop: Alternatives To MPI+X (PAW-ATM 2020)**

**Atlanta, Georgia, USA  
12 November 2020**



**IEEE Catalog Number: CFP20S73-POD  
ISBN: 978-1-7281-5451-0**

**Copyright © 2020 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:	CFP20S73-POD
ISBN (Print-On-Demand):	978-1-7281-5451-0
ISBN (Online):	978-1-7281-5450-3

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2020 IEEE/ACM 3rd Annual Parallel Applications Workshop: Alternatives To MPI+X (PAW-ATM) **PAW-ATM 2020**

## Table of Contents

Message from the Workshop Chairs .v.....  
Workshop Organization .vi.....

### Session 1

Hedgehog: Understandable Scheduler-Free Heterogeneous Asynchronous Multithreaded Data-Flow Graphs .1.....  
*Alexandre Bardakoff (National Institute of Standards & Technology, USA), Bruno Bachelet (Université Clermont Auvergne, CNRS, LIMOS, France), Timothy Blattner (National Institute of Standards & Technology, USA), Walid Keyrouz (National Institute of Standards & Technology, USA), Gerson C. Kroiz (University of Maryland Baltimore County, USA), and Loïc Yon (Université Clermont Auvergne, CNRS, LIMOS, France)*

TaskTorrent: a Lightweight Distributed Task-Based Runtime System in C++ .16.....  
*Léopold Cambier (Stanford University, USA), Yizhou Qian (Stanford University, USA), and Eric Darve (Stanford University, USA)*

### Session 2

Evaluation of Multiple HPC Parallelization Frameworks in a Shallow Water Proxy Application with Multi-Rate Local Time Stepping .27.....  
*Martin Bogusz (Department of Informatics, Technical University of Munich), Philipp Samfass (Department of Informatics, Technical University of Munich), Alexander Pöpl (Department of Informatics, Technical University of Munich), Jannis Klinkenberg (IT Center, RWTH Aachen University), and Michael Bader (Department of Informatics, Technical University of Munich)*

An Implicitly Parallel Meshfree Solver in Regent .40.....  
*Rupanshu Soi (BITS Pilani - Hyderabad Campus, India), Nischay Ram Mamidi (BITS Pilani - Hyderabad Campus, India), Elliott Slaughter (SLAC National Accelerator Laboratory, USA), Kumar Prasun (BITS Pilani - Hyderabad Campus, India), Anil Nemili (BITS Pilani - Hyderabad Campus, India), and Suresh M. Deshpande (Jawaharlal Nehru Centre for Advanced Scientific Research, India)*

### Session 3

HOOVER: Leveraging OpenSHMEM for High Performance, Flexible Streaming Graph Applications ...  
55

*Max Grossman (Georgia Institute of Technology), Howard Pritchard (Los Alamos National Laboratory), Steve Poole (Los Alamos National Laboratory), and Vivek Sarkar (Georgia Institute of Technology)*

Exploring Hybrid MPI+Kokkos Tasks Programming Model .66.....

*Samuel Khwis (Ohio Supercomputer Center), Karen Tomko (Ohio Supercomputer Center), Jahanzeb Hashmi (The Ohio State University), and Dhabaleswar Panda (The Ohio State University)*

**Author Index 75** .....