

# **2020 IEEE/ACM 9th Workshop on Python for High-Performance and Scientific Computing (PyHPC 2020)**

**Atlanta, Georgia, USA  
13 November 2020**



**IEEE Catalog Number: CFP20J45-POD  
ISBN: 978-1-6654-2286-4**

**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:	CFP20J45-POD
ISBN (Print-On-Demand):	978-1-6654-2286-4
ISBN (Online):	978-0-7381-1086-8

**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 9th Workshop on Python for High- Performance and Scientific Computing (PyHPC) **PyHPC 2020**

## Table of Contents

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

### Session 1

Experiences in Developing a Distributed Agent-Based Modeling Toolkit with Python .1.....  
*Nicholson T. Collier (Argonne National Laboratory, U.S.A.), Jonathan Ozik (Argonne National Laboratory, U.S.A.), and Eric R. Tatara (Argonne National Laboratory)*

Data Engineering for HPC with Python .13.....  
*Vibhatha Abeykoon (Indiana University Bloomington), Niranda Perera (Indiana University Bloomington), Chathura Widanage (Indiana University Bloomington), Supun Kamburugamuve (Indiana University Bloomington), Thejaka Amila Kanewala (Indiana University Bloomington), Hasara Maithree (University of Moratuwa, Sri Lanka), Pulasthi Wickramasinghe (Indiana University Bloomington), Ahmet Uyar (Indiana University Bloomington), and Geoffrey Charles Fox (Indiana University Bloomington)*

### Session 2

Enabling System Wide Shared Memory for Performance Improvement in PyCOMPSs Applications 22  
*Clément Foyer (HPE, University of Bristol, United Kingdom), Javier Conejero (Barcelona Supercomputing Center, Spain), Jorge Ejarque (Barcelona Supercomputing Center, Spain), Rosa M. Badia (Barcelona Supercomputing Center, Spain), Adrian Tate (Numerical Algorithms Group Ltd. (NAG), United Kingdom), and Simon McIntosh-Smith (University of Bristol, United Kingdom)*

Python Workflows on HPC Systems .32.....  
*Dominik Strassel (Fraunhofer ITWM), Philipp Reusch (Fraunhofer ITWM), and Janis Keuper (Fraunhofer ITWM, Offenburg University)*

### Session 3

Accelerating Microstructural Analytics with Dask for Volumetric X-ray Images .....	41
<i>Daniela Ushizima (Lawrence Berkeley National Laboratory), Matthew McCormick (Kitware Inc. Insight Toolkit Carrboro), and Dilworth Parkinson (Advanced Light Source, LBNL)</i>	
Distributed Asynchronous Array Computing with the JetLag Environment .....	49
<i>Steven Brandt (Louisiana State University, USA), Bita Hasheminezhad (Louisiana State University, USA), Nanmiao Wu (Louisiana State University, USA), Sayef Sakin (University of Arizona, USA), Alex Bigelow (University of Arizona, USA), Katherine Isaacs (University of Arizona, USA), Kevin Huck (University of Oregon, USA), and Hartmut Kaiser (Louisiana State University, USA)</i>	
<b>Author Index</b> .....	<b>59</b>