

IEEE Cluster 2013 Conference final report

September 23-27, 2013

*Robert J. Ping
Therese Miller
Eric W. Wernert
Craig A. Stewart*

Indiana University

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- Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the funding agencies represented above.



**PERVASIVE TECHNOLOGY
INSTITUTE**

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1. Executive Summary

The Indiana University Pervasive Technology Institute (IU PTI) strives to follow the initiatives of the IU strategic plan for information technology, *Empowering People*. The specific recommendations of the strategic plan which hosting this conference address include:

- Recommendation 7: Indiana University should continue and strengthen its efforts to develop world-class IT professionals and technical staff across the university.
- Recommendation 8: Indiana University should implement a variety of approaches to IT education, skills acquisition, support, and communication that enable any willing learner to efficiently acquire desired IT skills.
- Recommendation 11: Indiana University should work within its missions as a public institution to deepen its technology-supported engagement with institutions and communities beyond IU that advance public health, education, research, economic development, and culture in the State of Indiana.

As a result of hosting the Cluster 13 conference, IU PTI contributed to the economic development of Indiana through professionals from around the world visiting Indianapolis and Bloomington for the conference. The conference enabled a large group of IU faculty, staff, and students to attend the local conference to learn about advances in cluster computing, network and engage with other professionals in their field, and created an atmosphere for skills acquisition in a supportive and communicative environment.

The conference chair explicitly set out to raise awareness and the reputation of the Cluster conference series, to introduce innovative tracks, and to highlight student research. This was accomplished by engaging program chairs from a variety of institutions to participate in the planning and implementation of the conference, by introducing the Visualization Showcase as a new track, and by encouraging students to apply to present their research and participate as volunteers.

Products of the conference include

- [Proceedings available in IEEE Xplore ®](#)
- [Images available in the IU PTI Multimedia Gallery](#)
- Video available on [youtube](#) and in the [IU PTI Multimedia Gallery](#)
- [Cluster 2013 website hosted by IU PTI](#)



Figure 1: The official IU-created logo for Cluster 2013

2. Introduction

The IEEE Cluster 2013 Conference consisted of multiple tracks (research presentations, poster session, visualization showcase), a vigorous student program, keynote and plenary presentations, panel and birds of a feather discussions, and tours of local IT-related facilities in Indianapolis and Bloomington. In addition, tutorials were held on the first day of the conference week and workshops were held on the final day.

Organizers were particularly interested in content related to:

- Current and future directions in cluster technology
- Clusters driving innovation in industrial and academic research
- Clusters in education and outreach
- Clusters and clouds in cyberinfrastructure strategy
- Clusters in distributed visualization
- Systems design and configuration
- Tools, systems software, and middleware
- Algorithms, applications, and performance
- Storage and file systems

This report highlights some of the interactions at the conference as well as outlines the entire program and experience of the participants. It also reveals the geographical break-down of the attendees and the research presented during the conference.



Figure 2: Undergraduate students from Morgan State University with their advisor, Vojislav Stojkovic

3. Highlights of IEEE Cluster 2013 Conference

3.1. Keynote and plenary speakers

A diverse group of gentlemen were employed to give the keynote and plenary presentations. Topics included changing paradigms in clusters, computing in the 21st century, developing a faculty community of practice around cyberinfrastructure, and designing/deploying/enabling science on a particular supercomputer. The presenter's home bases were geographical spread as well. Coming from as far as Kaust, Saudi Arabia and including domestic speakers from Texas, Arkansas, as well as Indiana University. Each of the presentations were recorded and can be found at the following URLs:

- David E. Keyes, King Abdullah University of Science and Technology, Kaust, Saudi Arabia. Opening keynote presentation. *To compute, to breathe, computing in the 21st century*. September 24, 2013. <https://www.youtube.com/watch?v=0vu0XW4kCCE>
- Thomas Sterling, Indiana University Pervasive Technology Institute, Bloomington, Indiana. Closing keynote presentation. *Changing Paradigms for Clusters in the Age of Exascale*. September 26, 2013. <http://pti.iu.edu/gallery/video/all-workshop-videos.php#ieee>
- Jessie J. Walker, University of Arkansas at Pine Bluff. Plenary presentation. *Community organization of cyberinfrastructure adoption and training*. September 24, 2013. <http://pti.iu.edu/gallery/video/all-workshop-videos.php#ieee>
- Jay Boisseau, Texas Advanced Computing Center, Austin, Texas. Plenary presentation. *Designing, Deploying, and Enabling Science on Stampede*. September 25, 2013. <http://pti.iu.edu/gallery/video/all-workshop-videos.php#ieee>

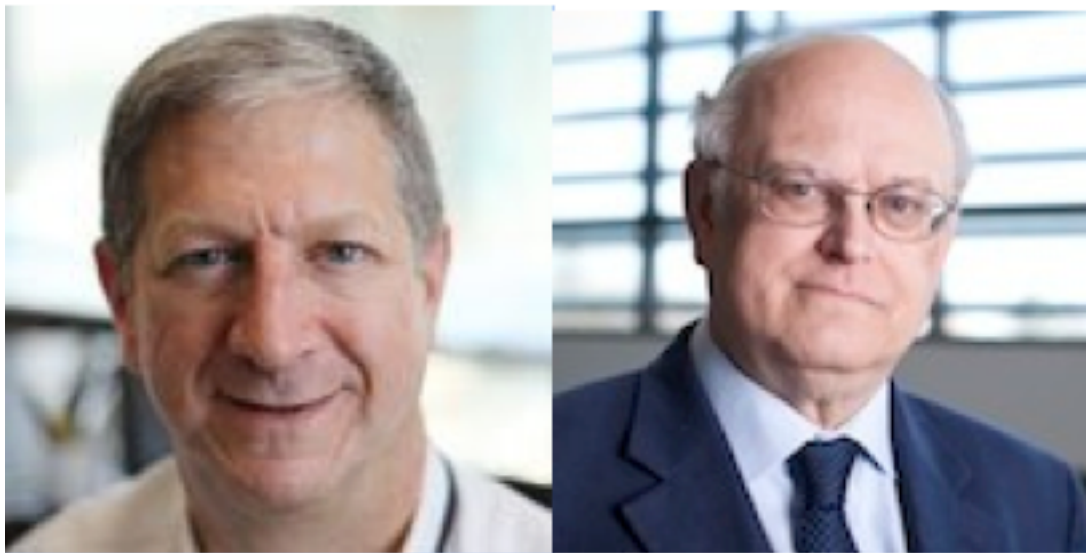


Figure 3: Keynote presenters, David E. Keyes and Thomas Sterling

3.2. Technical and EOT Program

The technical program and education, outreach, and training program received 148 submissions. 46 papers were accepted which created an acceptance rate for the conference of 31.08%. The geographic breakdown by country included submissions from eighteen countries and accepted papers from nine countries including Canada, China, France, Germany, Japan, Singapore, Spain, United Kingdom, and the United States. *A compilation of all statistics related to submissions is included in Section 5.*

After a thorough review, the following papers were selected as award recipients at the conference:

- **Best Technical Paper**

Carlos Reaño, Antonio J. Peña, Federico Silla, Rafael Mayo Gual, Enrique S. Quintana-Ortí, José Duato. *"Influence of InfiniBand FDR on the Performance of Remote GPU Virtualization"*
[10.1109/CLUSTER.2013.6702662](https://doi.org/10.1109/CLUSTER.2013.6702662)



Figure 4: Carlos Reaño and Antonio Peña accept the Best Technical Paper award from awards chair, Nancy Wilkins-Diehr and Conference Chair, Craig A. Stewart

- **Best Education Outreach and Training Paper**

Peter Bui, Travis Boettcher, Nicholas Jaeger, Jeffrey Westphal. *"Using Clusters in Undergraduate Research: Distributed Animation Rendering, Photo Processing, and Image Transcoding"* [10.1109/CLUSTER.2013.6702634](https://doi.org/10.1109/CLUSTER.2013.6702634)

- **Mark Baker Memorial Best Student Paper**

Rong Shi, Sreeram Potluri, Khaled Hamidouche, Xiaoyi Lu, Karen Tomko, Dhabaleswar K. Panda. *"A Scalable and Portable Approach to Accelerate Hybrid HPL on Heterogeneous CPU-GPU Clusters"* [10.1109/CLUSTER.2013.6702619](https://doi.org/10.1109/CLUSTER.2013.6702619)

3.3. Student Program

The student program was initiated by the organizing committee and further enhanced by an award to Indiana University from the National Science Foundation (NSF), *Increasing Student Engagement at Cluster 2013*.

Activities for students included:

- Student dinner and tour of IU PTI Research Technologies Advanced Visualization Lab and GRNOC Facilities
- Mentors who provided answers to questions and advanced their networking capabilities
- Inclusion in student-centric categories in the poster track, technical track, and the visualization showcase
- Eligible for awards in all tracks, whether the track was designated as student or not
- Tutorials
- Workshops, including *LittleFe and the Bootable Cluster CD – An Education and Outreach Appliance*
- Volunteer opportunities throughout the conference week
- An impromptu trip to the IU Data Center in Bloomington, Indiana to learn more about Big Red II and the supercomputing facilities and capabilities at IU

As a result of the funding provided by bronze and silver sponsors, NSF, and additional monies provided by IU PTI, 22 students were awarded complimentary registration (along with one chaperone/advisor) and an additional 10 students were awarded reduced registration. 18 of the 32 student awardees were also given partial or complete travel funding to attend the conference.

Overall there were more than 50 students from a variety of institutions, representing a diverse geographic segment of the United States as well as from overseas. **Students made up over 20% of the total conference attendees** and hailed from:

- Auburn University, Auburn, Alabama, US
- Clemson University, Clemson South Carolina, US
- Earlham College, Richmond, Indiana, US (10)
- Fraunhofer ITWM, Kaiserslautern, Germany
- Georgia Institute of Technology, Sunnyvale, California, US
- Georgia Tech, Atlanta, Georgia, US (2)
- Huazhong University Science and Technology, Wu han, China
- Illinois Institute of Technology, Chicago, Illinois, US (4)
- Indiana University Pervasive Technology Institute, Bloomington, Indiana, US (3)
- Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China (4)
- Indiana University - Purdue University, Indianapolis, Indiana, US
- Miami University, Oxford, Ohio, US (2)
- Morgan State University, Baltimore, Maryland, US (2+advisor)
- Northeastern University, Boston, Massachusetts, US
- National Tsing Hua University, Hsinchu, Taiwan
- Riken Advanced Institute for Computational Science, Kobe, Japan
- Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China
- South Dakota State, Brookings, South Dakota, US
- Technical University of Valencia, Valencia, Spain
- Texas Tech University, Lubbock, Texas, US
- The Ohio State University, Columbus, Ohio, US (3)
- Tokyo Institute of Technology, Tokyo, Japan
- UNC-CH, Carrboro, North Carolina, US
- University of Bordeaux, Talence, France
- University of California, Riverside, US
- University of Colorado, Boulder, Colorado, US
- University of Connecticut, Storrs, Connecticut, US (2)

- University of Illinois - Urbana/Champaign, Champaign, Illinois, US
- University of Notre Dame, South Bend, Indiana, US (2)
- University of the Witwatersrand, Johannesburg, South Africa (2)
- University of Warwick, Coventry, United Kingdom
- Virginia Polytechnic Institute and State University, Blacksburg, Virginia, US
- Virginia Tech, Blacksburg, Virginia, US (2)

Students self-identified during the paper and poster submission process and were eligible for two awards, the Mark Baker Memorial Best Student Paper and Best Student Poster. As the awards unfolded, the organizers quickly realized students had almost swept all the categories winning the overall Best Technical Paper award as well.



Figure 5: Rong Shi receives the Mark Baker Memorial Best Student Paper award from Nancy Wilkins-Diehr

During the student dinner and tour of the IU PTI Research Technologies Advanced Visualization Lab facilities on the Indiana University-Purdue University Indianapolis (IUPUI) campus, students met their mentors. Mentors were assigned 1-3 students each and were available throughout the conference to them. Mentors included:

- Stephanie Burks, Indiana University Pervasive Technology Institute, Bloomington, Indiana
- Vetricia Byrd, Clemson University, Clemson, South Carolina
- Nick Cardo, National Energy Research Scientific Computing Center (NERSC), California
- Yong Chen, Texas Tech University, Lubbock, Texas
- Barb Hallock, Indiana University Pervasive Technology Institute, Bloomington, Indiana
- Thomas Leung, GE Global Research, Niskayuna, New York

- Gerald Lofstead, Sandia National Laboratories, Albuquerque, New Mexico
- Robert J. Ping, Indiana University Pervasive Technology Institute
- Craig Stewart, Indiana University, Bloomington, Indiana
- Vojislav Stojkovic, Morgan State University, Baltimore, Maryland
- Henry Tufo, University of Colorado at Boulder, Boulder, Colorado
- Eric Wernert, Indiana University Pervasive Technology Institute, Bloomington, Indiana

An addition to the overall program was an impromptu visit to the Indiana University Data Center in Bloomington, Indiana. Several students took advantage of the tour.

Stephanie Burks had this to say about the tour and her mentoring experience,

“I thoroughly enjoyed mentoring James Wrenn II. James, along with several other people attended the Data Center tour. Everyone that attended enjoyed the experience. James indicated that seeing the Data Center ‘brought everything together.’

Thank you for setting it up. It really added to the student program.”



Figure 6: Attendees (including many students) made an impromptu trip to the IU Data Center to learn more about the supercomputing facilities and capabilities at IU

3.4. Poster Session and Visualization Showcase

The poster session and visualization showcase was one of the highlights of the conference. Researchers gave informal presentations to attendees as they enjoyed a reception including food, refreshments, and music provided by the Big Robot Ensemble. This Indianapolis-based trio provided live music which was enhanced by video-enriched art, interweaving aesthetic expression with computer interactivity and networked technology. Performers included Scott Deal – Professor of Music and Director of the Donal Louis Tavel Arts and Technology Research Center at IUPUI, Micheal Drews – Assistant Professor of Music at IUPUI, and Jordan Munson – Lecturer in Music at IUPUI.

This track of the conference provided an exceptional avenue for attendees to network. After the event, many of the attendees split-off into small groups and ventured to downtown Indianapolis for dinner and recreation.

There was an array of posters and visualizations to peruse in addition to the visualizations provided by the Big Robot Ensemble. The entire list of research posters is available at:

<http://ieecluster13conference.sched.org/event/c875d85f5daa7484e71fdd3a659b8c32#.U4g0voLCncM>



Figure 7: The Big Robot Ensemble utilizing video, traditional instruments, and computers to create their unique sound and visualizations. Photo credit: Amber Harmon, iSGTW



Figure 8: Attendees visit research posters and have informal discussion with the researchers. Photo credits: Amber Harmon, iSGTW

- **Best Technical Poster**
Patrick Calhoun, David Akin, Joshua Alexander, Brett Zimmerman, Brandon George, Henry Neeman *"The Oklahoma PetaStore: Big Data on a Small Budget"*
- **Best Student Poster**
Charles Peck, Ivan Babic, Jennifer Houchins, Mohammad Mobeen Ludin, Skylar Thompson, Aaron Weeden, Kristin Muterspaw, Elena Sergienko *"LittleFe - The High Performance Computing Education Appliance"*

The first-ever Cluster Visualization Showcase included:

- *Daily Regional Weather Forecasts in Support of Vortex2*. Quan Zhou, Beth Plale, Keith Danielson, Robert Ping, Janae Cummings, and Alan Mauro.
- *Gallery of images created in live leaves by chloroplast movements*. Margaret Dolinsky and Roger Hangarter.



Figure 9: *Gallery of images created in live leaves by chloroplast movements*. Margaret Dolinsky and Roger Hangarter. Photo Credit: Amber Harmon, iSGTW.

- *High Performance Computing for Designing Groundwater Remediation Systems*. Loren Shawn Matott, Camden Reslink, Christine Baxter, Beth Hymiak, Shirmin Aziz, Adrian Levesque, and Martins Innus.
- *Molecular Simulations of the Dynamic Properties of Wild Type and Mutated 14-3-3 α Proteins*. William Albert, Michael Boyles, David Reagan, Jing-Yuan Liu, and Divya Neelagiri.
- *Places & Spaces: Mapping Science*. Katy Borner and Todd Theriault.
- *Visualization of Globular Star Clusters*. David Reagan, William Sherman, Enrico Vesperini, Anna Lisa Varri, and Chris Eller.
- *Visualization of Nuclear Pasta*. David Reagan, Andre S. Schneider, Charles J. Horowitz, Joseph Hughton, Don K. Berry, Eric A. Wernert, and Chris Eller.
- *Visualization of the Buffalo Inner and Outer Harbor*. Martins Innus, Adrian Levesque, Ayla Abyad, Jacob Brubaker, and Hans Baumgartner.

3.5. Workshops

81 participants attended the Cluster 2013 workshops. Workshop topics included:

- 5th Workshop on Interfaces and Architectures for Scientific Data Storage (IASDS). Dries Kimpe and Douglas Thain. This workshop provided a forum for engineers and scientists to present and discuss their most recent work related to the storage, management, and analysis of data for scientific workloads.
- LittleFe and the Bootable Cluster CD – An Education and Outreach Appliance. Charles Peck, Jennifer Houchins, Mohammad Mobeen Ludin, Ivan Babic, Aaron Weeden, and Skylar Thompson. The workshop focuses on use-cases for LittleFe in education, outreach and training, and on developing curriculum modules for the LittleFe/BCCD platform.
- Science Gateways Institute Workshop. Nancy Wilkins-Diehr, Marlon Pierce, and Suresh Marru. This workshop provided a means of exchanging ideas regarding the Gateway Computing Environment series.



Figure 10: A presentation during the Science Gateways Institute Workshop

3.6. Tutorials

Cluster 2013 tutorials included a variety of full day and ½ day sessions. Topics included:

- Programming for the Intel Xeon Phi (MIC). Kent Milfeld, Lucas A. Wilson, Lars Koesterke, John D. McCalpin, John Cazes, and Carolos Rosales.
- A Beginner's Guide to Scientific Visualization Using VisIt 2.6.0. Vetria Byrd and Jill Gemmill.
- Globus Online: Scalable Research Data Management Infrastructure for Campuses and High Performance Computing Facilities. Rachana Anathakrishnana and Vas Vasiliadis.
- GPU Computing with CUDA C/C++. Jonathan Bentz.
- GPU Computing with OpenACC. Jonathan Bentz.
- Parallel I/O – for Reading and Writing Large Files in Parallel. Ritu Arora, Robert McLay, and John Cazes.
- Hadoop on a Cray Cluster Solutions and Introction to MapReduce Programming. Cray, Inc. and Judy Qiu.



**Figure 11: Vetria Byrd introduces the tutorial,
*A Beginner's Guide to Scientific Visualization Using VisIt 2.6.0***

3.7. Panel and Birds of a Feather discussions

Leading experts in areas related to cluster computing contributed to lively discussion on three panels at the IEEE Cluster 2013 conference:

- *Clouds and Clusters – the Walmart effect?* Jay Boisseau, Jim Bottum, Dennis Gannon, Thomas Sterling, Abani Patra (moderator). Abstract: The rapid development and massive investments in cloud methodologies and their market penetration as opposed to the clusters makes it timely to analyze the merits of these related but different modalities of delivering cyber-services. The assembled panel of experts will provide their thoughts on the current and futures of these paradigms in different application domains. Clouds promise to deliver cost savings and flexibility over clusters that continue to deliver high QOS – the question at hand is to identify the value propositions of both in a thoughtful manner so we do not replicate “urban blight” in the ITverse.



Figure 12: Thomas Sterling, Jay Boisseau, and Dennis Gannon. Photo credit: Amber Harmon, iSGTW

- *The many pathways of Campus Bridging – Campus Bridging stories from four different instances.* Ian Foster, Scott Tiede, Marcu Alfred, Tom Bishop, Richard Knepper (moderator). Abstract: Campus Bridging narrows the gap between researcher and national scale cyberinfrastructure by implementing technologies that make these resources appear proximal to the researcher and easy to use. These efforts include making data transfer and management more simple and transparent, creating simpler job submission protocols, and making it easier to join resources together. We hope to discuss the technologies that make it easier for researchers to transition analyses from the lab or office to regional and national infrastructure, success stories from those who have made progress in Campus Bridging, and areas where the gap between local and national resources can

be overcome. Our panel brings together users and creators of XSEDE Campus Bridging technologies: Ian Foster of the Globus Online Project, Tom Bishop who uses Genesis II to manage data and jobs on XSEDE resources, Scott Teige, who has used the Open Science Grid-XSEDE job submission portal, and Marcus Alfred, who has used the XSEDE Campus Bridging Cluster software packages.

- *Research Data Alliance*. Reagan Moore, Giridhar Manepalli, Robert H. McDonald (moderator). Abstract: This panel will presented ongoing development and organizational work being done by the Research Data Alliance (RDA) (<http://rd-alliance.org>). The Research Data Alliance is a new international organization that is being supported by the governments of the European Commission, the Australia Commonwealth Government and the United States Government to implement the technology, practice, and connections that make data work across barriers of government policy and or disciplinary specific standards. The Research Data Alliance aims to accelerate and facilitate research data sharing and exchange. In this panel we will feature current thrusts of the new RDA Working Groups that focus on Big Data Analytics, Data Type Registries, Persistent Identifiers for Data, Data Terminology, and Data Policy. Additionally the panelists and moderator will speak about the current status of the Research Data Alliance in its start-up mode and will update attendees on work that will be on the agenda for the upcoming RDA Second Plenary meeting in Washington, DC that will be held the week prior to the Cluster 2013 Conference.

In addition, Cray, Inc., gold sponsor for the conference, presented two birds of a feather discussions:

- *Yarn – A Tale of Adventures Beyond Hadoop*. Isom Crawford, Cray, Inc. Abstract: The latest release of Apache Hadoop has been adopted by many but information on how to install, configure, deploy, and tune Hadoop 2 - including YARN - is still sparse. We will begin the discussion with an overview of experiences with Apache Hadoop 2 on Cray Cluster Solutions systems, sharing details of how it was installed, configured, and tuned (an ongoing effort). Topics of discussion will include configuration variations, benefits and drawbacks, tuning opportunities, I/O configuration options, etc.
- *HPC Cluster Interconnect Topologies: Is Fat Tree the right Answer*. Steve Lyness, Cray, Inc. Abstract: In this presentation, we will begin the discussion with an overview of cluster configuration variations with FDR Infiniband, Gigabit Ethernet to 40 GigE or with proprietary interconnects like Quadrics and Myrinet and Aries. We will also discuss the cost increase of components that don't give us more compute speed but are part of the infrastructure costs associated with a complete end-to-end system. In the end of our session we will brainstorm when buying a new cluster, do we need to have a full fat tree interconnect topology or if there is something more cost effective?

4. Conference Program (detail)

The searchable schedule of all accepted papers, posters, panels, tutorials, workshops, visualizations, BoFs, plenary and keynote speakers is available here: <http://ieecluster13conference.sched.org/>

Program Key and early-arrival September 22 • Sunday

- [A Administration](#)
- [B BoF](#)
- [E EOT Presentation](#)
- [F Food Service](#)
- [K Keynote Speaker](#)
- [P Panel Presentation](#)
- [L Plenary Speaker](#)
- [R Poster Session](#)
- [S Special](#)
- [D Student Presentation](#)
- [T Technical Presentation](#)
- [U Tutorial](#)
- [V Visualization Showcase](#)
- [W Workshop](#)

7:00pm – 9:00pm A [IEEE Cluster 2013 Office 09th Floor - Room 911](#)

7:00pm – 9:00pm A [Registration Hotel Lobby](#)

September 23 • Monday

6:30am – 9:00pm A [IEEE Cluster 2013 Office 09th Floor - Room 911](#)

6:30am – 9:00pm A [Registration Hotel Lobby](#)

8:00am – 9:00am F [Breakfast Tutorial Rooms \(Hilton\)](#)

8:30am – 12:00pm U [1/2 day Tutorial - A Beginner's Guide to Scientific Visualization Using VisIt 2.6.0 08th Floor - Circle City 08 \(Hilton\)](#)

Speakers: Vetria Byrd

Authors: Vetria Byrd, Jill Gemmill

8:30am – 12:00pm U [1/2 day Tutorial - Globus Online: Scalable Research Data Management Infrastructure for Campuses and High-Performance Computing Facilities 12th Floor - Circle City 12 \(Hilton\)](#)

Speakers: Vas Vasiliadis, Rachana Ananthakrishnan

8:30am – 12:00pm U [1/2 day Tutorial - GPU computing with CUDA C/C++ 15th Floor - Circle City 15 \(Hilton\)](#)

Speakers: Jonathan Bentz

8:30am – 4:30pm U [Full day Tutorial - Programming for the Intel Xeon Phi \(MIC\) 07th Floor - Circle City 07 \(Hilton\)](#)

Speakers: Kent Milfeld, Lucas A. Wilson, Lars Koesterke, John Cazes

Authors: Kent Milfeld, Lucas A. Wilson, Lars Koesterke, John D. McCalpin,

John Cazes, Carlos Rosales

- 10:00am – 10:30am F [Morning Break Tutorial Rooms \(Hilton\)](#)
- 12:00pm – 1:00pm F [Lunch Vincennes Room - 2nd Floor \(Hilton\)](#)
- 1:00pm – 4:30pm U [1/2 day Tutorial - GPU computing with OpenACC 15th Floor - Circle City 15 \(Hilton\)](#)
Speakers: Jonathan Bentz
- 1:00pm – 4:30pm U [1/2 day Tutorial - Hadoop on a Cray Cluster Solutions Systems and Introduction to MapReduce Programming and Generalizing MapReduce as a Unified Cloud and HPC Runtime 12th Floor - Circle City 12 \(Hilton\)](#)
Speakers: Isom Crawford, Judy Qiu
Sponsors: Cray Inc.
- 1:00pm – 4:30pm U [1/2 day Tutorial - Parallel I/O - for Reading and Writing Large Files in Parallel 08th Floor - Circle City 08 \(Hilton\)](#)
Speakers: Ritu Arora, John Cazes, Robert McLay
Authors: Ritu Arora, John Cazes, Robert McLay
- 2:30pm – 3:00pm F [Afternoon Break Tutorial Rooms \(Hilton\)](#)
- 6:00pm – 8:00pm S [Student Dinner and Tour of IU PTI Research Technologies Advanced Visualization Lab facilities IUPUI Informatics & Communications Technology Complex \(ICTC\)](#)
Sponsors: National Science Foundation

September 24 • Tuesday

- 6:30am – 9:00pm A [IEEE Cluster 2013 Office 09th Floor - Room 911](#)
- 6:30am – 9:00pm A [Registration 09th Floor - Victory Ballroom Foyer \(Hilton\)](#)
Exhibitors: Indiana University Pervasive Technology Institute, National Center for Genome Analysis Support, IEEE Computer Society
- 8:00am – 9:00am F [Breakfast 09th Floor - Victory Ballroom \(Hilton\)](#)
Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.
- 9:00am – 10:25am K [Opening Keynote - David E. Keyes, King Abdullah University of Science and Technology \(KAUST\) 09th Floor - Victory Ballroom \(Hilton\)](#)
Speakers: David E. Keyes
Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.
- 10:30am – 10:55am F [Morning Break 09th Floor - Victory Ballroom \(Hilton\)](#)
Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.
- 11:00am – 11:25am D [A-Cache: Resolving Cache Interference for Distributed Storage with Mixed Workloads 15th Floor - Circle City 15 \(Hilton\)](#)
Speakers: Bharath Ravi
Authors: Bharath Ravi, Hrishikesh Amur, Karsten Schwan
- 11:00am – 11:25am T [Co-processing SPMD Computation on CPUs and GPUs cluster 08th Floor - Circle City 08 \(Hilton\)](#)

| | | |
|-------------------|---|--|
| | | <i>Speakers: Hui Li</i> <i>Authors: Hui Li, Geoffrey Fox, Arun Chauhan, Gregor von Laszewski</i> |
| | | Communication and topology-aware load balancing in Charm++ with TreeMatch 12th Floor - Circle City 12 (Hilton) |
| 11:00am – 11:25am | T | <i>Speakers: François Tessier</i> <i>Authors: Emmanuel Jeannot, Esteban Meneses, Guillaume Mercier, Francois Tessier, Gengbin Zheng</i> |
| | | Design of Network Topology Aware Scheduling Services for Large InfiniBand Clusters 12th Floor - Circle City 12 (Hilton) |
| 11:30am – 11:55am | D | <i>Speakers: Hari Subramoni</i> <i>Authors: Dhabaleswar Panda, Hari Subramoni, Devendar Bureddy, Krishna Chaitanya Kandalla, Karl Schulz, Bill Barth, Jonathan Perkins, Mark Arnold</i> |
| | | V2-Code: A New Non-MDS Array Code with Optimal Reconstruction Performance in RAID-6 15th Floor - Circle City 15 (Hilton) |
| 11:30am – 11:55am | D | <i>Speakers: Ping Xie</i> <i>Authors: Ping Xie, Jianzhong Huang, Qiang Cao, Xiao Qin, Changsheng Xie</i> |
| | | PRESENTER UNAVAILABLE: Lit: A High Performance Massive Data Computing Framework Based on CPU/GPU Cluster 08th Floor - Circle City 08 (Hilton) |
| 11:30am – 11:55am | T | <i>Speakers: Yanlong Zhai</i> <i>Authors: Yanlong Zhai, Emmanuel Mbarushimana, Wei Li, Jing Zhang, Kai Yang, Ying Guo</i> |
| | | Lunch 09th Floor - Victory Ballroom (Hilton) |
| 12:00pm – 1:30pm | F | <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> <i>Sponsors: DataDirect Networks</i> |
| | | Plenary Talk - Jessie J. Walker, University of Arkansas at Pine Bluff 09th Floor - Victory Ballroom (Hilton) |
| 1:30pm – 2:25pm | L | <i>Speakers: Jessie J. Walker</i> <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> |
| | | GGAS: Global GPU Address Spaces for Efficient Communication in Heterogeneous Clusters 08th Floor - Circle City 08 (Hilton) |
| 2:30pm – 2:55pm | T | <i>Speakers: Lena Oden</i> <i>Authors: Holger Froning, Lena Oden</i> |
| | | Mercury: Enabling Remote Procedure Call for High-Performance Computing 15th Floor - Circle City 15 (Hilton) |
| 2:30pm – 2:55pm | T | <i>Speakers: Jerome Soumagne</i> <i>Authors: Dries Kimpe, Jerome Soumagne, Judicael Zounmevo, Mohamad Chaarawi, Quincey Koziol, Ahmad Afsahi, Robert Ross</i> |
| | | PRESENTER UNAVAILABLE: I/O Scheduling for Solid State Devices in Virtual Machines (not able to attend) 12th Floor - Circle City 12 (Hilton) |
| 2:30pm – 2:55pm | T | <i>Speakers: Kai Gao</i> <i>Authors: Kai Gao, Wentao Zhao, Yingchun Lei, Yili Gong</i> |
| 3:00pm – 3:25pm | D | Checkpoint-Restart for a Network of Virtual Machines 12th Floor - Circle |

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| | | City 12 (Hilton) <i>Speakers: Rohan Garg</i> <i>Authors: Rohan Garg, Komal Sodha, Zhengping Jin, Gene Cooperman</i> |
| 3:00pm – 3:25pm | D | Oncilla: A GAS Runtime for Efficient Resource Allocation and Data Movement in Accelerated Clusters 15th Floor - Circle City 15 (Hilton) <i>Speakers: Jeffrey Young</i> <i>Authors: Karsten Schwan, Holger Froning, Jeffrey Young, Alex Merritt, Se Hoon Shon, Sudhaka Yalamanchili</i> |
| 3:00pm – 3:25pm | T | Influence of InfiniBand FDR on the Performance of Remote GPU Virtualization 08th Floor - Circle City 08 (Hilton) <i>Speakers: Carlos Reano</i> <i>Authors: Carlos Reano, Antonio J. Pena, Federico Silla, Rafael Mayo Gual, Enrique S. Quintana-Orti, Jose Duato</i> |
| 3:30pm – 4:00pm | F | Afternoon Break 09th Floor - Victory Ballroom (Hilton) <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> |
| 4:00pm – 4:25pm | D | EDR: An Energy-Aware Runtime Load Distribution System for Data-Intensive Applications in the Cloud 12th Floor - Circle City 12 (Hilton) <i>Speakers: Bo Li</i> <i>Authors: Bo Li, Shuaiwen Song, Ivona Bezakova, Kirk Cameron</i> |
| 4:00pm – 4:25pm | D | FlexQuery: An Online Query System for Interactive Remote Visual Data Exploration at Large Scale 15th Floor - Circle City 15 (Hilton) <i>Speakers: Hongbo Zou</i> <i>Authors: Karsten Schwan, Hongbo Zou, Magda Slawinska, Matthew Wolf, Greg Eisenhauer, Fang Zheng, Jai Dayal, Jeremy Logan, Qing Liu, Scott Klasky, Tanja Bode, Michael Clark, Matthew Kinsey</i> |
| 4:00pm – 4:55pm | B | BoF: YARN - A Tale of Adventures Beyond Hadoop 1 08th Floor - Circle City 08 (Hilton) <i>Speakers: Isom Crawford</i> <i>Sponsors: Cray Inc.</i> |
| 4:30pm – 4:55pm | D | Thermal Aware Automated Load Balancing for HPC Applications 12th Floor - Circle City 12 (Hilton) <i>Speakers: Osman Sarood</i> <i>Authors: Harshitha Menon, Bilge Acun, Simon Garcia De Gonzalo, Osman Sarood, Laxmikant Kale</i> |
| 4:30pm – 4:55pm | T | K MapReduce: A Scalable Tool for Data-Processing and Search/Ensemble Applications on Large-Scale Supercomputers 15th Floor - Circle City 15 (Hilton) <i>Speakers: Motohiko Matsuda</i> <i>Authors: Motohiko Matsuda, Naoya Maruyama, Shinichiro Takizawa</i> |
| 6:00pm – 8:30pm | F | Dinner Reception with Poster Sessions and Visualization Showcase with Big Robot Ensemble 09th Floor - Victory Ballroom (Hilton) <i>Artists: Scott Deal, Micheal Drews, Jordan Munson, Big Robot Ensemble</i> <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> <i>Sponsors: Indiana University Pervasive Technology Institute</i> |

- 6:00pm – 8:30pm R [Poster Session with Big Robot Ensemble 09th Floor - Victory Ballroom \(Hilton\)](#)
Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.
Sponsors: Indiana University Pervasive Technology Institute
- 6:00pm – 8:30pm V [Visualization Showcase with Big Robot Ensemble 09th Floor - Victory Ballroom \(Hilton\)](#)
Speakers: Margaret Dolinsky, Quan Zhou, Martins Innus, Loren Shawn Matott, Adrian Levesque
Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.
Sponsors: Indiana University Pervasive Technology Institute
Authors: Quan Zhou, Martins Innus, Loren Shawn Matott, Camden Reslink, Christine Baxter, Beth Hymiak, Shirmin Aziz, Adrian Levesque, Ayla Abyad, Jacob Brubaker, Hans Baumgartner, Beth Plale, Keith Danielson, Robert Ping, Janae Cummings, Alan Mauro, Margaret Dolinsky, Roger Hangarter, Katy Borner, Todd Theriault

September 25 • Wednesday

- 8:00am – 9:00am F [Breakfast 09th Floor - Victory Ballroom \(Hilton\)](#)
Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.
- 8:00am – 6:00pm A [IEEE Cluster 2013 Office 09th Floor - Room 911](#)
- 8:00am – 6:00pm A [Registration 09th Floor - Victory Ballroom Foyer \(Hilton\)](#)
Exhibitors: Indiana University Pervasive Technology Institute, National Center for Genome Analysis Support, IEEE Computer Society
- 9:00am – 9:55am L [Plenary Talk - Designing, Deploying and Enabling Science on Stampede 09th Floor - Victory Ballroom \(Hilton\)](#)
Speakers: Jay Boisseau
Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.
- 10:00am – 10:25am F [Morning Break 09th Floor - Victory Ballroom \(Hilton\)](#)
Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.
- 10:30am – 10:55am E [Using Clusters in Undergraduate Research: Distributed Animation Rendering, Photo Processing, and Image Transcoding 15th Floor - Circle City 15 \(Hilton\)](#)
Speakers: Peter Bui
Authors: Peter Bui, Travis Boettcher, Nicholas Jaeger, Jeffrey Westphal
- 10:30am – 10:55am D [Optimizing Power Allocation to CPU and Memory Subsystems in Overprovisioned HPC Systems 12th Floor - Circle City 12 \(Hilton\)](#)
Speakers: Osman Sarood
Authors: Osman Sarood, Laxmikant Kale, Akhil Langer, Barry Rountree, Bronis de Supinski
- 10:30am – 10:55am T [Highly Optimized Full GPU-Acceleration of Non-hydrostatic Weather Model SCALE-LES 08th Floor - Circle City 08 \(Hilton\)](#)
Speakers: Mohamed Qahib
Authors: Naoya Maruyama, Mohamed Wahib

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| 11:00am – 11:25am | E | Using a Shared, Remote Cluster for Teaching HPC 15th Floor - Circle City 15 (Hilton) <i>Speakers: Henry Neeman</i> <i>Authors: Henry Neeman, Clay Carley, Brett McKinney, Larry Sells, Chao Zhao</i> |
| 11:00am – 11:25am | D | A Case of System-Wide Power Management for Scientific Applications 12th Floor - Circle City 12 (Hilton) <i>Speakers: Zhuo Liu</i> <i>Authors: Zhuo Liu, Jay Lofstead, Teng Wang, Weikuan Yu</i> |
| 11:00am – 11:25am | T | Accelerating Subsurface Transport Simulation on Heterogeneous Clusters 08th Floor - Circle City 08 (Hilton) <i>Speakers: Oreste Villa</i> <i>Authors: Oreste Villa, Nitin Gawande, Antonio Tumeo</i> |
| 11:30am – 11:55am | E | Teaching undergraduates using local virtual clusters 15th Floor - Circle City 15 (Hilton) <i>Speakers: Richard Brown</i> <i>Authors: Richard Brown, Elizabeth Shoop</i> |
| 11:30am – 11:55am | D | A Scalable and Portable Approach to Accelerate Hybrid HPL on Heterogeneous CPU-GPU Clusters 08th Floor - Circle City 08 (Hilton) <i>Speakers: Rong Shi</i> <i>Authors: Rong Shi, Sreeram Potluri, Khaled Hamidouche, Xiaoyi Lu, Karen Tomko, Dhabaleswar K. Panda</i> |
| 11:30am – 11:55am | T | Distributed Resource Exchange: Virtualized Resource Management for SR-IOV InfiniBand Clusters 12th Floor - Circle City 12 (Hilton) <i>Speakers: Adit Ranadive</i> <i>Authors: Karsten Schwan, Adit Ranadive, Ada Gavrilovska</i> |
| 12:00pm – 1:25pm | F | Lunch 09th Floor - Victory Ballroom (Hilton) <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> <i>Sponsors: Cray Inc.</i> |
| 12:30pm – 1:25pm | B | BoF: HPC Cluster Interconnect Topologies: Is Fat Tree the right Answer 09th Floor - Victory Ballroom (Hilton) <i>Speakers: Steve Lyness</i> <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> <i>Sponsors: Cray Inc.</i> |
| 1:30pm – 1:55pm | D | Distributed Data Provenance for Large-Scale Data-Intensive Computing 15th Floor - Circle City 15 (Hilton) <i>Speakers: Dongfang Zhao</i> <i>Authors: Dongfang Zhao, Tanu Malik, Ioan Raicu, Chen Shou</i> |
| 1:30pm – 1:55pm | D | GPU-Accelerated Scalable Solver for Banded Linear Systems 08th Floor - Circle City 08 (Hilton) <i>Speakers: Hang Liu</i> <i>Authors: Hang Liu, Jung-Hee Seo, Rajat Mittal, H. Howie Huang</i> |
| 1:30pm – 1:55pm | T | Developing Communication-aware Service Placement Frameworks in the |

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| | | | <u>Cloud Economy 12th Floor - Circle City 12 (Hilton)</u> <i>Speakers: Chao Chen</i> <i>Authors: Chao Chen, Ligang He, Bo Gao, Hao Chen, Jianhua Sun, Stephen Jarvis</i> |
| 2:00pm – 2:25pm | D | | <u>A Parallel Optimization Method for Stencil Computation on the Domain that is Bigger than Memory Capacity of GPUs 08th Floor - Circle City 08 (Hilton)</u> <i>Speakers: Guanghao Jin</i> <i>Authors: Guanghao Jin, Toshio Endo, Satoshi Matsuoka</i> |
| 2:00pm – 2:25pm | D | | <u>Distance-Aware Virtual Cluster Performance Optimization: A Hadoop Case Study 12th Floor - Circle City 12 (Hilton)</u> <i>Speakers: Xinkui Zhao</i> <i>Authors: Xinkui Zhao, Jianwei Yin, Zuoning Chen, Xiangjian Lu</i> |
| 2:00pm – 2:25pm | D | | <u>Fast Data Analysis with Integrated Statistical Metadata in Scientific Datasets 15th Floor - Circle City 15 (Hilton)</u> <i>Speakers: Jialin Liu</i> <i>Authors: Jialin Lu, Yong Chen</i> |
| 2:30pm – 2:55pm | D | | <u>Force-directed Geographical Load Balancing and Scheduling for Batch Jobs in Distributed Datacenters 12th Floor - Circle City 12 (Hilton)</u> <i>Speakers: Hadi Goudarzi</i> <i>Authors: Hadi Goudarzi, Massoud Pedram</i> |
| 2:30pm – 2:55pm | T | | <u>Active-Learning-based Surrogate Models for Empirical Performance Tuning 08th Floor - Circle City 08 (Hilton)</u> <i>Speakers: Prasanna Balaprakash</i> <i>Authors: Prasanna Balaprakash, Robert Gramacy, Stefan Wild</i> |
| 2:30pm – 2:55pm | T | | <u>Expediting Scientific Data Analysis with Transparent Reorganization of Data 15th Floor - Circle City 15 (Hilton)</u> <i>Speakers: Bin Dong</i> <i>Authors: Bin Dong, Surendra Byna, Kesheng Wu</i> |
| 3:00pm – 3:25pm | F | | <u>Afternoon Break 09th Floor - Victory Ballroom (Hilton)</u> |
| 3:30pm – 3:55pm | D | | <u>Application Power Profiling on IBM Blue Gene/Q 08th Floor - Circle City 08 (Hilton)</u> <i>Speakers: Sean Wallace</i> <i>Authors: Sean Wallace, Venkatram Vishwanath, Susan Coghlan, John Tramm, Zhiling Lan, Michael Papka</i> |
| 3:30pm – 3:55pm | D | | <u>JUMMP: Job Uninterrupted Maneuverable MapReduce Platform 12th Floor - Circle City 12 (Hilton)</u> <i>Speakers: William Clay Moody</i> <i>Authors: Amy Apon, William Clay Moody, Linh Ngo, Edward Duffy</i> |
| 3:30pm – 3:55pm | T | | <u>HPC Runtime Support for Fast and Power Efficient Locking and Synchronization 15th Floor - Circle City 15 (Hilton)</u> <i>Speakers: Hakan Akkan</i> <i>Authors: Hakan Akkan, Latchesar Ionkov, Michael Lang</i> |

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| 4:00pm – 4:25pm | D | <u>Dynamic Slot Allocation Technique for MapReduce Clusters (unable to attend, Video/Skype Presentation) 12th Floor - Circle City 12 (Hilton)</u> <i>Speakers: Shanjiang Tang</i> <i>Authors: Shanjiang Tang, Bu Sung Lee, Bingsheng He</i> |
| 4:00pm – 4:25pm | T | <u>A Cost-Aware Region-Level Data Placement Scheme for Hybrid Parallel I/O Systems 08th Floor - Circle City 08 (Hilton)</u> <i>Speakers: Shuibing He</i> <i>Authors: Shuibing He, Xian-He Sun, Bo Feng, Xin Huang, Kun Feng</i> |
| 4:00pm – 4:25pm | T | <u>A New Design of RDMA-based Small Message Channels for InfiniBand Clusters 15th Floor - Circle City 15 (Hilton)</u> <i>Speakers: Matthew Small</i> <i>Authors: Matthew Small, Xin Yuan</i> |
| 4:30pm – 4:55pm | D | <u>Write Bandwidth Optimization of Online Erasure Code Based Cluster File System 08th Floor - Circle City 08 (Hilton)</u> <i>Speakers: Lin Yan</i> <i>Authors: Lin Yan, Jing Xing, Tian Wang, Zhigang Huo, Jie Ma, Peiheng Zhang</i> |
| 4:30pm – 4:55pm | T | <u>Insight and Reduction of MapReduce Stragglers in Heterogeneous Environment 12th Floor - Circle City 12 (Hilton)</u> <i>Speakers: Xia Zhao</i> <i>Authors: Xia Zhao, Kai Kang, Minhao Xu, Tao Pan, YuZhong Sun, Yin Song</i> |
| 4:30pm – 4:55pm | T | <u>Optimizing Blocking and Nonblocking Reduction Operations for Multicore Systems: Hierarchical Design and Implementation 15th Floor - Circle City 15 (Hilton)</u> <i>Speakers: Manjunath Gorentla Venkata</i> <i>Authors: Manjunath Gorentla Venkata, Pavel Shamis, Richard Graham, Joshua Ladd, Rahul Sampath</i> |
| 5:00pm – 5:25pm | D | <u>Making Work Queue Cluster-Friendly for Data Intensive Scientific Applications 12th Floor - Circle City 12 (Hilton)</u> <i>Speakers: Michael Albrecht</i> <i>Authors: Douglas Thain, Michael Albrecht, Dinesh Rajan</i> |
| 5:00pm – 5:25pm | D | <u>Streamer: A Distributed Framework for Incremental Closeness Centrality Computation 08th Floor - Circle City 08 (Hilton)</u> <i>Speakers: Ahmet Erdem Sariyuce</i> <i>Authors: Ahmet Erdem Sariyuce, Erik Saule, Kamer Kaya, Umit Catalyurek</i> |
| 5:00pm – 5:25pm | T | <u>Scaling of Many-Task Computing Approaches in Python on Cluster Supercomputers 15th Floor - Circle City 15 (Hilton)</u> <i>Speakers: Monte Lunacek</i> <i>Authors: Monte Lunacek, Jazcek Braden, Thomas Hauser</i> |
| 5:30pm – 6:00pm | S | <u>Excursions and Dinner on Own X Locations</u> |
| 5:30pm – 7:00pm | S | <u>Steering Committee Meeting 16th Floor - Circle City 16 (Hilton)</u> |
| 7:00pm – 8:30pm | F | <u>Steering Committee Dinner Restaurant at the Hilton - 120 West Market</u> |

September 26 • Thursday

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|-------------------|---|---|
| 8:00am – 9:00am | F | Breakfast 09th Floor - Victory Ballroom (Hilton) <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> |
| 8:00am – 7:00pm | A | IEEE Cluster 2013 Office 09th Floor - Room 911 |
| 8:00am – 7:00pm | A | Registration 09th Floor - Victory Ballroom Foyer (Hilton) <i>Exhibitors: Indiana University Pervasive Technology Institute, National Center for Genome Analysis Support, IEEE Computer Society</i> |
| 9:00am – 10:30am | P | Panel: Clouds and Clusters – the Walmart effect? 09th Floor - Victory Ballroom (Hilton) <i>Moderators: Abani Patra</i> <i>Speakers: Thomas Sterling, Dennis Gannon, Jay Boisseau, James von Oehsen</i> <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> |
| 10:30am – 11:00am | F | Morning Break 09th Floor - Victory Ballroom (Hilton) <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> |
| 11:00am – 12:00pm | P | Concurrent Panel: Research Data Alliance 08th Floor - Circle City 08 (Hilton) <i>Moderators: Robert H. McDonald</i> <i>Speakers: Reagan Moore, Giridhar Manepalli, Inna Kouper</i> |
| 11:00am – 12:00pm | P | Concurrent Panel: The many pathways of Campus Bridging - Campus Bridging stories from four different instances. 12th Floor - Circle City 12 (Hilton) <i>Moderators: Richard Knepper</i> <i>Speakers: Vas Vasiliadis, Scott Teige, Marcus Alfred, Tom Bishop</i> |
| 12:00pm – 12:45pm | F | Lunch 09th Floor - Victory Ballroom (Hilton) <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> |
| 12:45pm – 1:00pm | S | Awards and IEEE Cluster 2014 Presentation 09th Floor - Victory Ballroom (Hilton) <i>Speakers: Maria Perez</i> <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> <i>Sponsors: National Center for Genome Analysis Support</i> |
| 1:00pm – 2:00pm | K | Closing Keynote - Thomas Sterling, Indiana University Pervasive Technology Institute 09th Floor - Victory Ballroom (Hilton) <i>Speakers: Thomas Sterling</i> <i>Exhibitors: DataDirect Networks, Cray Inc., IBM Inc.</i> |
| 2:00pm – 3:30pm | S | IEEE Cluster 2014 Transition Meeting - Closed Meeting 15th Floor - Circle City 15 (Hilton) |
| 2:00pm – 7:00pm | S | Excursions and Dinner on Own X Locations |

September 27 • Friday

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|-------------------|---|--|
| 7:00am – 6:00pm | A | IEEE Cluster 2013 Office 09th Floor - Room 911 |
| | | Registration 09th Floor - Victory Ballroom Foyer (Hilton) |
| 7:00am – 6:00pm | A | <i>Exhibitors: Indiana University Pervasive Technology Institute, National Center for Genome Analysis Support, IEEE Computer Society</i> |
| 8:00am – 9:00am | F | Breakfast Corydon Room - 2nd Floor (Hilton) |
| 8:15am – 4:15am | W | Workshop: Science Gateway Institute Workshop 15th Floor - Circle City 15 (Hilton) <i>Speakers: Nancy Wilkins-Diehr, Marlon Pierce, Suresh Marru</i> |
| 9:00am – 5:00pm | W | Workshop: 5th Workshop on Interfaces and Architectures for Scientific Data Storage (IASDS) 12th Floor - Circle City 12 (Hilton) <i>Moderators: Dries Kimpe, Douglas Thain</i> |
| 9:00am – 5:00pm | W | Workshop: LittleFe and the Bootable Cluster CD - An Education and Outreach Applliance 07th Floor - Circle City 07 (Hilton) <i>Speakers: Charles Peck, Jennifer Houchins, Mohammad Mobeen Ludin, Ivan Babic, Aaron Weeden, Skylar Thompson</i> <i>Sponsors: National Science Foundation</i> |
| 10:30am – 11:00am | F | Morning Break Workshop Rooms |
| 12:30pm – 1:30pm | F | Lunch Corydon Room - 2nd Floor (Hilton) |
| 3:30pm – 4:00pm | F | Afternoon Break Workshop Rooms |
| 5:00pm – 5:30pm | S | Excursions and Dinner on Own X Locations |

5. Organization and Logistics

5.1. Organizing and Program Committees

| Committee | Name | Institution | Email |
|---|------------------------|--|--|
| <i>General Chair & Overall Leadership</i> | | | |
| General Chair | Stewart, Craig | Indiana University Pervasive Technology Institute | stewart@iu.edu |
| Chair Emeritus | Boisseau, John (Jay) | University of Texas at Austin / Texas Advanced Computing Center | boisseau@tacc.utexas.edu |
| IEEE Cluster steering committee chair | Cortes, Toni | Barcelona | toni@ac.upc.edu |
| Key Leads Meeting Coordinator | Paine, Nina | Indiana University | npaine@indiana.edu |
| <i>Technical Program</i> | | | |
| Chair | Tufo, Henry | Department of Computer Science, University of Colorado at Boulder | tufo@cs.colorado.edu |
| <i>Technical Papers</i> | | | |
| Co-Chair | Cardo, Nicholas "Nick" | National Energy Research Scientific Computing Center (NERSC) | npcardo@lbl.gov |
| Co-Chair | Simms, Stephen | Indiana University | ssimms@iu.edu |
| <i>Education, Outreach, and Training (EOT) Papers</i> | | | |
| Chair | Neeman, Henry | Oklahoma University Supercomputing Center for Education and Research | hneeman@ou.edu |
| <i>Workshops</i> | | | |
| Chair | McMullen, D. F. "Rick" | Arkansas High Performance Computing Center | dfmcmull@uark.edu |

| | | | |
|-------------------------------|--------------------|---|--|
| <i>Panels</i> | | | |
| Co-Chair | Apon, Amy | Clemson University | aapon@clemson.edu |
| Co-Chair | Papadopolous, Phil | San Diego Supercomputing Center, University of California San Diego | phil@sdsc.edu |
| <i>Tutorials</i> | | | |
| Chair | Panda, Dhabaleswar | Ohio State University | panda@cse.ohio-state.edu |
| <i>Visualization Showcase</i> | | | |
| Chair | Dolinsky, Margaret | Indiana University | dolinsky@indiana.edu |
| <i>Poster Session</i> | | | |
| Chair | Newby, Greg | Arctic Region Supercomputing Center, University of Alaska Fairbanks | gnewby@alaska.edu |
| <i>Proceedings</i> | | | |
| Chair | Hart, David | National Center for Atmospheric Research | dhart@ucar.edu |
| <i>Student Volunteers</i> | | | |
| Co-Chair | Hallock, Barb | Indiana University | bahallo@iu.edu |
| Co-Chair | Burks, Stephanie | Indiana University | stlburks@iu.edu |
| <i>Student Programs</i> | | | |
| Co-Chair | Wernert, Eric | Indiana University | ewernert@iu.edu |
| Co-Chair | Peck, Charlie | Earlham College | charliep@cs.earlham.edu |
| Co-Chair | Figuerdo, Renato | University of Florida | renato@acis.ufl.edu |
| Co-Chair | Ping, Robert | Indiana University | robping@iu.edu |

| <i>Communications</i> | | | |
|---|------------------------|--|--|
| North America | Schrock, Ceci | Indiana University | ccjones@iu.edu |
| | Siefert-Herron, Daphne | | dsiefert@indiana.edu |
| South America | Campus Velho, Haroldo | Instituto Nacional de Pesquisas Espaciais | haroldo@lac.inpe.br |
| Mideast | TBD | | |
| Africa | Sibisi, Sibusio | The Council for Scientific and Industrial Research | ssibisi@csir.co.za |
| Europe | Mueller, Matthias | University of Aachen | mueller@rz.rwth-aachen.de |
| Asia | Terence Hung Gih Guang | A*STAR | terence@ihpc.a-star.edu.sg |
| <i>Logistics and Local Arrangements</i> | | | |
| Co-Chair | Miller, Therese | Indiana University | millertm@iu.edu |
| Co-Chair | Ping, Robert | Indiana University | robping@indiana.edu |
| <i>Networking & Security</i> | | | |
| Chair | Beals, Damon | Indiana University | dbeals@iupui.edu |
| <i>Finance and registration</i> | | | |
| Chair | Burns, Stacie | Indiana University | swiegand@indiana.edu |
| 1st deputy | Bohlmann, Nathan | Clemson University | |
| <i>Vendors</i> | | | |
| Hotel liason | Bean, Yvonne | Helms Briscoe, Inc | ybean@helmsbriscoe.com |
| Hilton Hotel representative | Gilliam, Joshua | Indianapolis Hilton | Joshua.Gilliam@hilton.com |
| Registration | Kocias, Ginger | Indiana University Conference Center | iuconfs@indiana.edu |
| IU Purchasing Rep | Richards, | Indiana University | drichard@iu.edu |

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|---------------|---------------|--------------------|--|
| for Contracts | Deborah | | |
| Photography | TBD | | |
| News | Schrock, Ceci | Indiana University | schrock@iu.edu |

Cluster 2013 Program Committee

| Last Name | First Name | Email | Institution |
|---------------|------------|--|--|
| Stewart | Craig | stewart@iu.edu | Indiana University |
| Hart | David | dhart@ucar.edu | National Center for Atmospheric Research |
| Neeman | Henry | hneeman@ou.edu | Oklahoma University Supercomputing Center for Education and Research |
| Ping | Robert | robbing@indiana.edu | Indiana University |
| Simms | Stephen | ssimms@indiana.edu | Indiana University |
| Tufo | Henry | tufo@cs.colorado.edu | University of Colorado |
| Anastasiadis | Stergios | stergios@cs.uoi.gr | |
| Antoniou | Gabriel | Gabriel.Antoniou@inria.fr | INRIA |
| Barth | Bill | bbarth@tacc.utexas.edu | The University of Texas at Austin |
| Bell-Loncella | Elizabeth | etbell@pitt.edu | University of Pittsburgh at Johnstown |
| Bougé | Luc | Luc.Bouge@bretagne.ens-cachan.fr | ENS Cachan/Brittany, IRISA, Rennes, France |
| Brightwell | Ron | rbrigh@sandia.gov | Sandia National Laboratories |
| Buyya | Rajkumar | raj@csse.unimelb.edu.au | The University of Melbourne |
| Calkin | Neil | calkin@clermson.edu | Clemson University |
| Chiola | Giovanni | chiolag@acm.org | University of Genoa |
| Cortes | Toni | toni.cortes@bsc.es | Barcelona Supercomputing Center |
| Cozzini | Stefano | cozzini@democritos.it | CNR/IOM Democritos |
| Cunha | Jose | jcc@fct.unl.pt | Universidade Nova de Lisboa |

| | | | |
|--------------|-------------|--|--|
| De Rose | Cesar | cesar.derose@pucrs.br | PUCRS |
| Ernst | Dan | dje@cray.com | Cray Inc |
| Fox | Geoffrey C. | gcf@indiana.edu | Community Grids Lab, Indiana University, Bloomington, IN 47404, USA |
| Gass | Richard | gassrg@ucmail.uc.edu | University of Cincinnati |
| Gorman | Gerard | g.gorman@imperial.ac.uk | Imperial College London |
| Gray | Paul | gray@cs.uni.edu | |
| Gropp | William | wgropp@illinois.edu | University of Illinois at Urbana-Champaign |
| Ishikawa | Yutaka | ishikawa@is.s.u-tokyo.ac.jp | Graduate School of Information Science and Technology / Information Technology Center, The University of Tokyo |
| Keville | Kurt | debug@mit.edu | MIT |
| Landau | Rubin | rubin@science.oregonstate.edu | Oregon State University |
| Laros | James | jhlaros@sandia.gov | Sandia National Labs |
| Li | Kuan-Ching | kuancli@gm.pu.edu.tw | Providence University |
| Loftis | Bruce | bruce3@tennessee.edu | |
| Luszczek | Piotr | luszczek@eecs.utk.edu | University of Tennessee Knoxville |
| Matsuoka | Satoshi | matsu@is.titech.ac.jp | Tokyo Institute of Technology |
| Montes | Jesús | jmontes@cesvima.upm.es | Universidad Politécnica de Madrid |
| Murphy | Tom | TMurphy@contracosta.edu | |
| Nagel | Wolfgang E. | wolfgang.nagel@tu-dresden.de | ZIH, TU Dresden |
| Navarro | John-Paul | navarro@mcs.anl.gov | Argonne National Laboratory |
| Nikolopoulos | Dimitrios | d.nikolopoulos@qub.ac.uk | Queen's University of Belfast |
| Nou | Ramon | ramon.nou@bsc.es | Barcelona Supercomputing Center (BSC) |
| Panda | Dhabaleswar | panda@cse.ohio-state.edu | The Ohio State University |
| Peck | Charles | charliep@cs.earlham.edu | Earlham College |

| | | | |
|-----------|-----------|--|--|
| Pfister | Greg | greg.pfister@gmail.com | Independent Computer Hardware Professional |
| Pospiech | Christoph | Christoph.Pospiech@de.ibm.com | |
| Rehm | Wolfgang | rehm@informatik.tu-chemnitz.de | University of Technology Chemnitz |
| Sanchez | Alberto | alberto.sanchez@urjc.es | Universidad Rey Juan Carlos |
| Sato | Mitsuhisa | msato@cs.tsukuba.ac.jp | University of Tsukuba |
| Schulz | Karl | karl@tacc.utexas.edu | University of Texas at Austin |
| Shalf | John | JShalf@lbl.gov | Lawrence Berkeley National Laboratory |
| Stanzione | Dan | dstanzi@asu.edu | Texas Advanced Computing Center |
| Talia | Domenico | talia@deis.unical.it | University of Calabria |
| Teller | Patricia | pteller@utep.edu | The University of Texas at El Paso |
| Wang | C.L. | clwang@cs.hku.hk | The University of Hong Kong |
| Wolf | Felix | f.wolf@grs-sim.de | German Research School for Simulation Sciences |

People who served as Sub-reviewers and reviewed at least one technical paper:

| Last Name | First Name | Email | Institution |
|------------|----------------|--|---------------------------------------|
| Bland | Wesley | wbland@mcs.anl.gov | Argonne National Laboratory |
| Chihoub | Houssem-Eddine | houssem-eddine.chihoub@inria.fr | INRIA |
| Ghosh | Siddhartha | sghosh@ucar.edu | UCAR/NCAR |
| Hamidouche | Khaled | hamidouche@cse.ohio-state.edu | The Ohio State University |
| Ibrahim | Shadi | shadi.ibrahim@inria.fr | INRIA |
| Marshall | Paul | marshall.paul.d@gmail.com | |
| Monnet | Sébastien | Sebastien.Monnet@lip6.fr | Laboratoire d'informatique de Paris 6 |
| Nöll | Hendrik | hendrik.noell@informatik.tu-chemnitz.de | University of Technology Chemnitz |

| | | | |
|-------------------|--------------|--|-----------------------------------|
| Pierce | Marlon | marpierc@iu.edu | Indiana University |
| Potluri | Sreeam | potluri@cse.ohio-state.edu | The Ohio State University |
| Rafique | M. Mustafa | mustafa@vt.edu | Virginia Tech |
| Rajachandrasekhar | Raghu | rajachan@cse.ohio-state.edu | The Ohio State University |
| Singh | Raminderjeet | ramifnu@indiana.edu | Indiana University |
| Voran | Theron | theron.voran@colorado.edu | University of Colorado Boulder |

5.2. Registration/Attendees Report

| | |
|--|----------|
| Tutorial (Morning): Globus Online: Scalable Research Data Management Infrastructure for Campuses and High-Performance Computing Facilities | 14 |
| Tutorial (Morning): GPU Computing with CUDA C/C++ | 14 |
| Tutorial (Morning): A Beginner's Guide to Scientific Visualization using VisIt 2.6.0 | 6 |
| Tutorial (Afternoon): Parallel I/O - for Reading and Writing Large Files in Parallel | 15 |
| Tutorial (Afternoon): Hadoop on Cray Cluster Solutions Systems and Introduction to MapReduce Programming | 29 |
| Tutorial (Afternoon): GPU Computing with OpenACC | 5 |
| Tutorial (Full Day): Programming for the Intel Xeon Phi (MIC) | 18 |
| IEEE Member | 40 |
| Student IEEE Member | 31 |
| Non-IEEE Member | 58 |
| Student Non-IEEE Member | 31 |
| IEEE Member Two Days | 1 |
| Non-IEEE Member Two Days | 2 |
| Student IEEE Member Two-Days | 1 |
| IEEE Member Single Day | 4 |
| Non-IEEE Member Single Day | 10 |
| Student Non-IEEE Member Single Day | 1 |
| Workshop: Science Gateway Institute | 35 |
| Workshop: LittleFe and the Bootable Cluster CD - An Education and Outreach Appliance | 22 |
| Workshop: Campus Bridging: Community Workshop | Canceled |
| Workshop: 5th Workshop on Interfaces and Architecture for Scientific Data Storage (IASDS) | 20 |

5.3. Submissions and Acceptance Report

Technical and EOT Papers Track

General Statistics

| | |
|--|--------|
| Submissions | 148 |
| Withdrawn | 4 |
| Moved to Poster Track when not accepted as paper | 31 |
| Accepted | 46 |
| Acceptance rate | 31.08% |
| Reviews | 151 |
| External reviewers | 27 |
| External reviews | 47 |

Statistics by Country (this does NOT include posters that were moved)

| country | authors | submitted | accepted | acceptance rate | PC members |
|--------------|---------|-----------|----------|-----------------|------------|
| Australia | - | - | - | - | 1 |
| Brazil | 6 | 1.45 | 0.00 | 0.00 | 1 |
| Canada | 6 | 1.09 | 0.29 | 0.26 | - |
| China | 52 | 13.20 | 6.20 | 0.47 | - |
| France | 11 | 3.35 | 0.60 | 0.18 | 2 |
| Germany | 2 | 1.17 | 1.17 | 1.00 | 5 |
| Greece | - | - | - | - | 1 |
| Hong Kong | 3 | 1.00 | 0.00 | 0.00 | 1 |
| India | 19 | 7.00 | 0.00 | 0.00 | - |
| Italy | 3 | 0.60 | 0.00 | 0.00 | 3 |
| Japan | 11 | 5.50 | 3.00 | 0.55 | 3 |
| Luxembourg | 4 | 1.00 | 0.00 | 0.00 | - |
| Morocco | 2 | 1.00 | 0.00 | 0.00 | - |
| Portugal | 4 | 1.00 | 0.00 | 0.00 | 1 |
| Saudi Arabia | 2 | 1.00 | 0.00 | 0.00 | - |
| Singapore | 3 | 1.00 | 1.00 | 1.00 | - |

| country | authors | submitted | accepted | acceptance rate | PC members |
|----------------|---------|-----------|----------|-----------------|------------|
| Spain | 10 | 3.03 | 0.83 | 0.27 | 4 |
| Taiwan | 4 | 1.00 | 0.00 | 0.00 | 1 |
| United Kingdom | 7 | 2.10 | 0.60 | 0.29 | 2 |
| United States | 209 | 67.51 | 32.31 | 0.48 | 43 |

Posters Track

General Statistics

| | |
|--------------------|-----|
| Submissions | 44 |
| Accepted | 28 |
| Acceptance rate | 64% |
| Reviews | 65 |
| External reviewers | 0 |
| External reviews | 0 |

Statistics by Country

| country | authors | submitted | accepted | acceptance rate | PC members |
|------------------------|---------|-----------|----------|-----------------|------------|
| Afghanistan | 1 | 0.13 | 0.13 | 1.00 | - |
| Bosnia and Herzegovina | 1 | 0.13 | 0.13 | 1.00 | - |
| Canada | 4 | 2.50 | 1.50 | 0.60 | - |
| China | 26 | 6.50 | 4.50 | 0.69 | - |
| France | 5 | 1.00 | 0.00 | 0.00 | - |
| Germany | 3 | 0.70 | 0.70 | 1.00 | - |
| Italy | 3 | 1.00 | 0.00 | 0.00 | - |
| Russian Federation | 3 | 0.63 | 0.63 | 1.00 | - |
| Spain | 1 | 0.17 | 0.00 | 0.00 | - |
| Taiwan | 9 | 4.67 | 2.67 | 0.57 | - |
| United Kingdom | 10 | 1.67 | 1.00 | 0.60 | - |
| United States | 90 | 24.93 | 16.76 | 0.67 | 3 |

Tutorials Track

General Statistics

| | |
|--------------------|-----|
| Submissions | 11 |
| Accepted | 6 |
| Acceptance rate | 55% |
| Reviews | 0 |
| External reviewers | 0 |
| External reviews | 0 |

Statistics by Country

| country | authors | submitted | accepted | acceptance rate | PC members |
|---------------|---------|-----------|----------|-----------------|------------|
| India | 4 | 1.00 | 0.00 | 0.00 | - |
| Saudi Arabia | 1 | 1.00 | 0.00 | 0.00 | - |
| Switzerland | 1 | 0.50 | 0.00 | 0.00 | - |
| United States | 28 | 8.50 | 6.00 | 0.71 | 3 |

Workshops Track

General Statistics

| | |
|--------------------|------|
| Submissions | 4 |
| Accepted | 4 |
| Acceptance rate | 100% |
| Reviews | 1 |
| External reviewers | 0 |
| External reviews | 0 |

Statistics by Country

| country | authors | submitted | accepted | acceptance rate | PC members |
|---------------|---------|-----------|----------|-----------------|------------|
| United States | 14 | 4.00 | 4.00 | 1.00 | 3 |

Visualization Track

General Statistics

| | |
|--------------------|-----|
| Submissions | 9 |
| Accepted | 8 |
| Acceptance rate | 89% |
| Reviews | 1 |
| External reviewers | 0 |
| External reviews | 0 |

Statistics by Country

| country | authors | submitted | accepted | acceptance rate | PC members |
|---------------|---------|-----------|----------|-----------------|------------|
| United States | 35 | 9.00 | 8.00 | 0.89 | 6 |

6. Sponsors

Sponsorships were very important to the overall success of the conference and the student program would not have been possible without the generous donations of the sponsors as well as the National Science Foundation.

Sincere thanks to the following:



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