

INTEL® PARALLEL COMPUTING CENTERS



January 2018 Newsletter

Highlights



Optimization Techniques

[Single Instruction Multiple Data \(SIMD\) Vectorization with High-Level Vectors](#) (by Florian Wende, Zuse Institute Berlin): We demonstrate a high-level vector coding scheme using OpenMP* 4 to approach SIMD vectorization of complex code sections in a portable way.

[Practical Affinity for Threaded MPI Applications](#) (by Larry Meadows, Intel): We show how to pin threaded MPI ranks to processor cores for the best performance on Intel Architecture clusters when using common MPI implementations and job control systems.

[Julia*: Petascale Made Simple](#) (by Keno Fischer, Viral Shah, and Ranjan Anantharaman, Julia Computing Inc.): A hands-on tutorial showing how Julia and its tools and libraries for making parallel, high-performance computing easy on a massive scale.



Code Case Study

[Psychlone*: Portability & Scalability for a Large Intel® Xeon Phi™ Processor](#) (by Sergi Siso, STFC, Hartree Centre): It is essential to design programming models with a good separation of domain science and parallel system. LFRic (an atmospheric model) leverages Psychlone* (a code generator tool) used for operational weather forecasting and climate modeling by 2020.

[Accelerate Cryo-Electron Microscopy Reconstruction in RELION with x86 SIMD Instructions](#) (by Erik Lindahl, Stockholm Univ & Charles Congdon, Intel): Structural biology is evolving to where cryo-electron microscopy (cryo-EM) now determines 3D structures from thousands of noisy images and relies on very large computations. Accelerating the RELION program with x86 SIMD, Intel® Threading Building Blocks, and Intel® Math Kernel Library to provide outstanding performance.



Science Breakthrough

[Deep Learning for Science](#) (by Mr. Prabhat and Michael F. Wehner, LBNL): Exploring how Deep Learning (DL) can solve scientific problems, through a variety of Lawrence Berkeley National Laboratory's (LBNL) applications. Reviewing classification and regression problems from astronomy to high-energy physics with results from detecting extreme weather patterns in climate simulations.

[Gravitational Waves: The Role of Computing in Opening a New Field of Astronomy](#) (by Joshua L. Willis, LIGO & Dan Stanzione, TACC): The LIGO & Virgo observatories detected gravitational waves from the merging of two neutron stars. These discoveries point out many of the ways in which high-throughput and high-performance computing have been essential to its progress.

Speaker & Publication Opportunities

There are several opportunities for you to share your learnings, best practices and techniques around the benefits You've received in leveraging Intel® architecture. We would like bring to your attention some key abstract submission deadlines for 2018 conferences and workshops. Feel free to submit abstracts to all that interest you.

Submission Deadline	Location	Event
January 12, 2018	New York, USA	Intel Knights Landing (KNL) Hackathon 2018
January 31, 2018	Bologna, Italy	IXPUG Annual Spring Conference
February 13, 2018	Frankfurt, Germany	ISC18 Tutorials
February 21, 2018	Frankfurt, Germany	ISC18 PhD Forum
February 28, 2018	Frankfurt, Germany	ISC18 BoF
March 9, 2018	Frankfurt, Germany	ISC18 Research Posters
March 16, 2018	Frankfurt, Germany	ISC18 Project Posters
January 28 -31, 2018	Tokyo Japan	IXPUG HPC Asia 2018
April 22,-25, 2018	Thuwal, Saudi Arabia	IXPUG Workshop at KAUST

Free Training Opportunities: Join, Learn and Excel

Join us at any of these upcoming educational workshops and conferences and learn about new Parallel Programming concepts, Intel® Libraries, Software Development tools and Artificial Intelligence frameworks. They are open to the public and free to attend.

Date	Location	Event
Jan 24-25, 2018	LRZ, Germany	Programming the new KNL Cluster at LRZ
Jan 28-31, 2018	Tokyo, Japan	IXPUG Workshop at HPC Asia
Jan 16-18, 2018	Virtual	Leverage multi-core performance using Intel® Threading Building Blocks (Intel® TBB) by NAG
Jan 30-Feb 1, 2018	Warrington, UK	Intel Xeon Phi KNL Advanced Programming
Feb 12-14, 2018	Espoo, Finland	Advanced Parallel Programming @ CSC
Feb 12-16, 2018	Bologna, Italy	14th advanced school on Parallel Computing @ CINECA
Feb 21-24, 2018	Baltimore, Maryland, USA	SIGCSE 2018
March 5-7, 2018	Bologna, Italy	IXPUG Annual Spring Conference

March 12-16, 2018	IRZ, Germany	Parallel Programming of High Performance Systems @ RRZE
March 15, 2018	San Francisco, USA	Nervana Con by Intel Nervana
April 22-25, 2018	Thuwal, Saudi Arabia	IXPUG KAUST Spring Conference 2018
May 28-June 1, 2018	Ljubljana, Slovenia	European HPC Summit Week 2018
Webinar	Virtual	Bring Intelligence to the Edge with Intel's Neural Compute Stick Webinar by Intel
Webinar	Virtual	Colfax MC² Series by LRZ
Webinar	Virtual	A Gentle Introduction to MPI by CSC
Webinar	Virtual	Statistics and Machine Learning for HEP 1/3 by CERN
Webinar	Virtual	Statistics and Machine Learning for HEP 2/3 by CERN
Webinar	Virtual	Statistics and Machine Learning for HEP 3/3 by CERN
Webinar	Virtual	Monte Carlo simulation code modernization by CERN

Access to Intel® Xeon Phi™ Processor

We encourage all Intel PCC members to leverage the TACC cluster to testing your optimized application for multi-node. To request access, please click [HERE](#) and create a new account (do not click on PI-eligible) and follow the email instructions. Please email the ipcc.program.office@intel.com account and include your username in the communication.

More News...

Check out these latest HPC news stories:

- [Intel Xeon Processors and Intel Omni-Path Architecture Offer Breakthroughs for Top500 Systems](#)
- [Democratizing Genomics So Life Scientists Can Focus on Science and Not HPC](#)
- [AI and HPC: Inferencing, Platforms & Infrastructure](#)
- [AI Technology: The Answer to Diffusion Compartment Imaging Challenges](#)
- [Intel® Omni-Path Architecture and Intel® Xeon® Scalable Processor Family Enable Breakthrough Science on 13.7 petaFLOPS MareNostrum 4](#)
- [GENCI: Advancing HPC in France and Across Europe](#)
- [Julia Language Delivers Petascale HPC Performance](#)

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