

# INTEL® PARALLEL COMPUTING CENTERS

## February 2018 Newsletter

### Highlights



The formally known “Intel Xeon Phi User Group” changed the definition of their name to “[Intel eXtreme Performance User Group](#)” (IXPUG). This change also for expanding focus to include system HW beyond the processor (memory, interconnect), SW tools, programming models, and new workloads (visualization, data analytics, machine learning). IXPUG continues to be an independently-led global committee freely exchanging information that enhances usability and efficiency of scientific and technical applications using Intel architecture.



[Testing your code on Intel® Xeon Phi \(Skylake\)](#). Register now to test your optimized application for multi-node using the TACC, Stampede II system. Upon requesting access, create a new account (do not click on PI-eligible) and follow the email instructions. Then email the [ipcc.program.office@intel.com](mailto:ipcc.program.office@intel.com) account and include your username in the communication.



#### Optimization Techniques

[Vectorization of Inclusive/Exclusive Scans in Compiler 19.0](#). New OpenMP syntax to support inclusive and exclusive scan patterns, known as prefix or cumulative sum. Three new OMP SIMD experimental features: vectorization of loops with breaks, syntax for compress/expand patterns and syntax for histogram pattern.

[Accelerated Reverse Time Migration with Optimized I/O](#). Reverse time migration is used for generating a seismic image of the underground layers of the earth. Here, we review two implementations (one using the standard approach, the second one doing an extra propagation) using random velocity boundaries and reducing I/O communications.

[Leverage System Diagnostics in an Application with Intel® Cluster Checker](#). Intel® Cluster Checker is a system diagnostics tool capable of identifying issues such as those that lead to application errors or underperformance. In this presentation, we discuss how application developers may leverage the API within Intel Cluster Checker to proactively identify and treat those issues.



### Code Case Study

[Scale out for large minibatch SGD: Residual network training on ImageNet-1K with improved accuracy and reduced time to train.](#) Using a combination of techniques, we have achieved a scalable solution based on Intel's distribution of Caffe that provides state-of-the-art neural network training both in terms of time to trained model and in achieving accuracy.

[Python in the NERSC Exascale Science Applications Program for Data.](#) Python-centered work is part of a larger effort called the NERSC Exascale Science Applications Program (NESAP) for Data. The highlight areas for future work and emerging best practices on Python in HPC.

[Accelerate Eigen Math Library for Automated Driving Workloads.](#) Primary compute kernel in several automated driving workloads showing improvement in Eigen's performance on small DGEMMs on the Intel® Xeon® processor through LIBXSMM and Intel® Math Kernel Library (Intel® MKL) with MKL\_DIRECT\_CALL.



### Science Breakthrough

[Using AI to Discover the Moon's Hidden Treasures.](#) With the help of artificial intelligence, NASA's Frontier Development Lab and Intel are mapping the moon's craters to find hidden lunar resources. Scientists believe the moon is rife with natural resources that could help space explorers settle the lunar landscape – much like early settlers did on earth.

[Exploring the Convergence of AI, Data and HPC.](#) HPC and the artificial intelligence communities are converging as they are both running similar types of data and compute intensive workloads on HPC hardware, including supercomputers, institutional clusters or the cloud.

## 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
February 13, 2018	Frankfurt, Germany	ISC18 <a href="#"><u>Tutorials</u></a>
February 16, 2018	Thuwal, Saudi Arabia	<a href="#"><u>IXPUG Workshop at KAUST</u></a>
February 21, 2018	Frankfurt, Germany	ISC18 <a href="#"><u>PhD Forum</u></a>
February 28, 2018	Frankfurt, Germany	ISC18 <a href="#"><u>BoF</u></a>
March 9, 2018	Frankfurt, Germany	ISC18 <a href="#"><u>Research Posters</u></a>
March 16, 2018	Frankfurt, Germany	ISC18 <a href="#"><u>Project Posters</u></a>
April 15, 2018	Frankfurt, Germany	ISC18 Call for Papers
April 15, 2018	Dallas, Texas	<a href="#"><u>ACM Gordon Bell</u></a>
April 16, 2018	Dallas, Texas	SC18 <a href="#"><u>Tutorials</u></a>
March 19, 2018	Dallas, Texas	SC18 <a href="#"><u>Papers</u></a>
July 31, 2018	Dallas, Texas	SC18 <a href="#"><u>Poster</u></a>
July 31, 2018	Dallas, Texas	SC18 <a href="#"><u>BoF</u></a>

## Global Training Opportunities

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
Feb 12-14, 2018	Espoo, Finland	<a href="#">Advanced Parallel Programming @ CSC</a>
Feb 12-16, 2018	Bologna, Italy	<a href="#">14<sup>th</sup> advanced school on Parallel Computing @ CINECA</a>
Feb 21-22, 2018	Hamburg, Germany	<a href="#">Technical Computing &amp; Artificial Intelligence Workshops</a>
Feb 22, 2018	Webinar	<a href="#">Intel® Fabric Builders Overview</a>
Feb 21-24, 2018	Baltimore, Maryland, US	<a href="#">SIGCSE 2018</a>
Feb 26 –March 2, 2018	New York, US	<a href="#">Intel Knights Landing (KNL) Hackathon 2018</a>
Feb 27-March 1, 2018	ALCF, US	<a href="#">ALCF Simulation, Data, and Learning Workshop</a>
March 1-2, 2018	Ostrava-Poruba, Czech Republic	<a href="#">Intel Xeon Phi programming (PTC course)</a>
March 5-7, 2018	Bologna, Italy	<a href="#">IXPUG Annual Spring Conference</a>
March 8, 2018	Virtual Meeting	<a href="#">Compiler Prefetching for Knights Landing</a>
March 12-16, 2018	IRZ, Germany	<a href="#">Parallel Programming of High Performance Systems @ RRZE</a>
March 15, 2018	San Francisco, US	<a href="#">Intel® AI DevCon</a>
March 18-22, 2018	New Orleans, LA, US	<a href="#">American Chemical Society National Meeting</a>
April 22-25, 2018	Thuwal, Saudi Arabia	<a href="#">IXPUG KAUST Spring Conference 2018</a>
May 10, 2018	Virtual Meeting	High Productivity Languages (Register link coming soon)
May 28-June 1, 2018	Ljubljana, Slovenia	<a href="#">European HPC Summit Week 2018</a>

## More News...

Check out these latest HPC news stories:

- [HPC Optimizes Energy Exploration for Oil and Gas Startups](#)
- [Parallel University Magazine: Programming with the OpenCL™ Platform](#)
- [PSSC Labs Announces Hadoop Big Data Servers with Intel Xeon Scalable Processors](#)
- [The Hard Limits for Deep Learning in HPC](#)

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