

Achieving Performance on Current and Future Large-Scale Intel Xeon-Based Systems

Richard Gerber (NERSC/LBNL), Glenn Brook (UTK),
David Martin (ANL) and Estela Suarez (FZ Jülich)



SC19

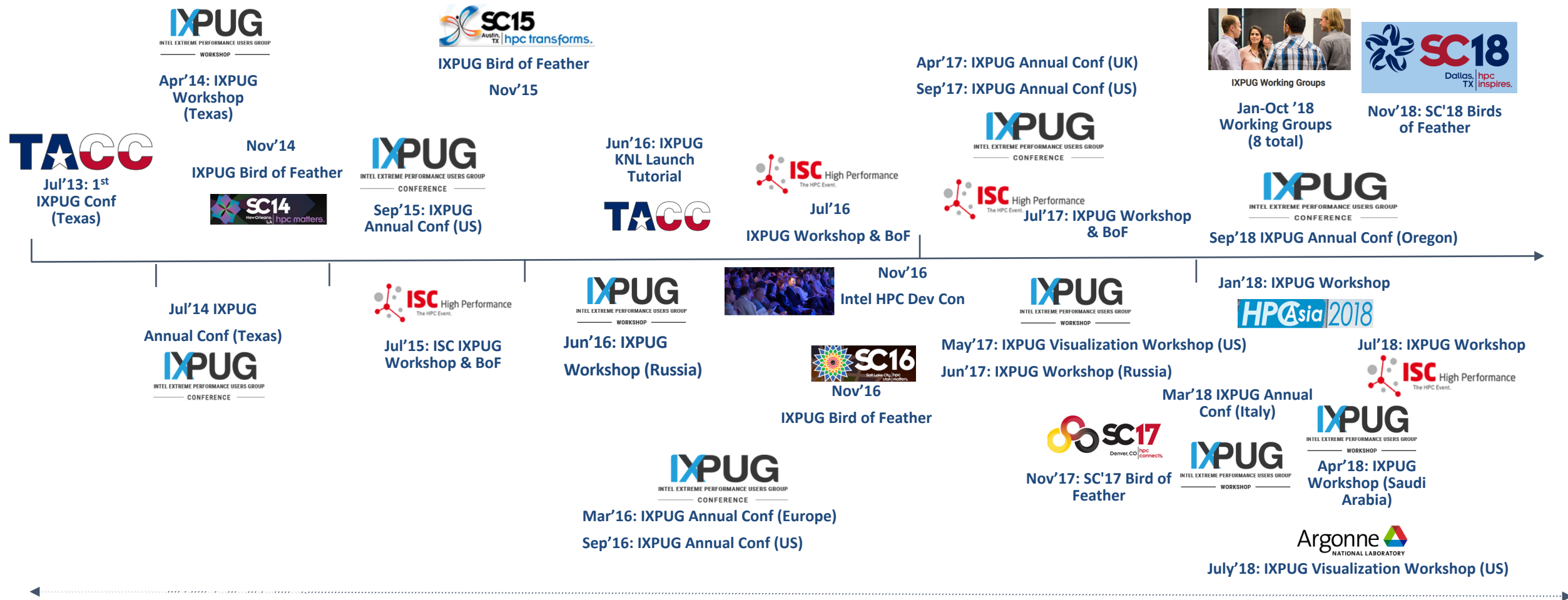
Denver, CO | **hpc**
is now.

About IXPUG

IXPUG = Intel eXtreme Performance Users Group

- Independent users group
- Provide a forum for the free exchange of information
- Enhancing the usability and efficiency of HPC & AI/DL workloads
- Computing systems using Intel® architecture
- Fosters technical collaboration...
 - ❖ System architecture beyond the processor (memory, interconnect)
 - ❖ Software tools and programming models
 - ❖ New workloads (HPC, data analytics, AI, visualization, etc.)
- Freely exchanging best practices, experiences worldwide (open to the public)
- Strong technical support from Intel experts

IXPUG Event Momentum



38+ events; 376+ publications; 600+ members

All technical presentations and recordings are posted on www.ixpug.org

IXPUG Events in 2019

IXPUG Workshop at HPC Asia Conference (January)



IXPUG In Situ Analysis Hackathon at TACC (May)

IXPUG FPGA Workshop at ISC'19 (June)



IXPUG Annual Conference 2019 at CERN (September)

HPC Asia 2020

International Conference on
High Performance Computing in Asia-Pacific Region
Fukuoka, Japan, Jan. 15 – 17, 2020



IXPUG Workshop at HPC Asia 2020

International Conference on HPC in Asia-Pacific Region

IXPUG Workshop at HPC Asia 2020 is an open workshop on high performance computing applications, systems, and architecture with Intel technologies. The workshop aims to bring together software developers and technology experts to share challenges, experiences and best-practice methods for the optimization of HPC, Machine Learning, and Data Analytics workloads on Intel architecture.

Conference Date: January 17, 2020 (Day-3 of HPC Asia 2020)

Location: Fukuoka, Japan

How to Get Involved

Join, Engage and Share:

- Connect with us on Twitter **@IXPUG1**
- Become a member and encourage others to join, by registering at www.ixpug.org
- Contribute by sharing your learnings and experiences in using Intel technology in the regular **IXPUG Webinar** series
- Attend an IXPUG Conferences, Workshops, Birds-of-Feather, etc.
- Post a question, share a technique, best practices, etc. on the “Discussion” board at <https://www.ixpug.org/discussion>

Additional Opportunities:

- **Join the IXPUG Steering Committee**
- Questions: → info@ixpug.org

How to Achieve Performance on Current and Future Large Intel-based Systems?

IXPUG community has...

- in-depth knowledge and experience preparing codes for Intel Xeon Phi and Xeon Scalable family of processors and coprocessors

The future:

- In 2021, exascale system with Intel GPUs will be installed
- IXPUG's optimization targets will be expanding: CPU, GPU, FPGA

Challenges on Heterogeneous Architectures

- Technology development and power demands
→ heterogeneity with a larger technology zoo:
 - ❖ Processing data: CPU, GPU, FPGA, AI
 - ❖ Storing data: ..., HBM, ... , NVRAM (DCPMM), SSDs, ...
- Programmability / Productivity
 - ❖ Programming models, languages, ..., standards
- Performance vs. Portability
 - ❖ Expectations for performance portability, if any?
- Software maintenance