From the Chair

This column marks my first HPC Connect as your Chair. I thank Cherri Pancake for five years of service as the inaugural Chair. She spent countless hours getting things going. I also welcome the new officers: John West (Vice Chair), Rajeev Thakur (Treasurer), Torsten Hoefler (At Large), and Michela Taufer (at Large). It’s a terrific team.

So, how is SIGHPC doing and what are our plans? Arguably, we had the most successful first five years of any SIG in ACM history! Some highlights:

- Taking over from SIGARCH as the sole ACM SIG to co-sponsor the SC Conference (along with the IEEE Computer Society), and setting multiple attendance records during this period.
- Co-sponsoring the PASC Conference, jointly with the Swiss National Supercomputing Centre (CSCS). PASC has a unique model to encourage a multidisciplinary communities.
- Collaborating with existing meetings via in-cooperation status. These include many workshops plus three conferences: EuroMPI, IPDPS, and HPDC.
- Launching the ACM SIGHPC/Intel Computational and Data Science Fellowship program. Intel has committed $1.5 million over five years for the fellowship.
- Creating three ACM SIGHPC Chapters: Education, Big Data, and Resource Constrained Environments (RCE). These include the first virtual (topic-based) chapters in ACM history.

In each case, the SIGHPC executive committee always asked whether a proposed activity serves our members. That question inspired our motto, which you will see throughout the coming year, of “Meeting your needs.” This slogan is partly play on words, since technical meetings are a core activity of SIGHPC, but also reflects the mission of SIGHPC of serving the needs of our members and our field.

Our next goal is to grow SIGHPC membership. In addition to Computer Scientists who are likely already ACM members, we will ask how SIGHPC can meet the needs of computational scientists, who might otherwise consider their professional home to be Physics, Chemistry, Biology, Math, or other fields. Our hope is to attract more SIGHPC-only members (i.e., not already members of ACM) and to bridge the gap between their disciplinary home societies and the HPC community.

I hope to see many of you at SC16. If you see me, let me know how SIGHPC can meet your needs!

Reproducibility at SC16

Teams in the SC16 Student Cluster Competition (SCC) will have a major new task besides benchmarking this year: reproducing the results of a previously published paper! This challenge is part of a broader initiative that aims to promote and support the replication of computational results.

After evaluating submissions from past SC paper authors, the SCC committee selected Michela Taufer to manage this effort.
the SC15 paper, “A parallel connectivity algorithm for de Bruijn graphs in metagenomic applications,” by Patrick Flick, Chirag Jain, Tony Pan, and Srinivas Aluru (all from the Georgia Institute of Technology) for its inaugural reproducibility initiative. The authors transformed their original artifact into an application challenge for the SCC. They will also receive a certificate of appreciation from SIGHPC at the SC16 Award Ceremony, while their paper receives a “Results Replicated” badge in the ACM Digital Library. Co-author Jain will serve as a guest judge.

Authors of accepted papers at SC16 were invited to participate in the next step of the SC Reproducibility Initiative: adding a two-page artifact descriptor as an appendix to their paper documenting its code, data, and workflow. The authors of nine accepted papers elected to do so. These papers will have an Artifacts Available badge attached in the ACM Digital Library. And one of the nine papers—to be announced in December 2016—will serve as the SC17 SCC application.

“SC is looking at extending the artifact descriptor to all the papers, to help support repeatability, replicability and reproducibility of the research presented at the conference,” said John West, Texas Advanced Computing Center and SC16 General Chair.

Gordon Bell Prize Preview

Between the use of Python, domain-specific languages, and the debut of the new number one system on the Top500, this year’s Gordon Bell Prize competition will be one to watch.

“The 2016 Gordon Bell Prize committee had the difficult but extremely fun task of choosing the six finalists,” says chair of ACM’s Gordon Bell prize committee, Subhash Saini, a Senior Computer Scientist at NASA Ames Research Center, USA. "We had an excellent set of nominations representing a broad spectrum of award-relevant criteria such as emerging manycore heterogeneous architectures, advances in algorithms and applications leading to high performance, and extremely high weak and strong scalability up to 10.5 million cores and achieved sustained double-precision performance of up to 50.578 Petaflop/s."

One theme among this year’s finalists was the use of high-level programming techniques. For instance, one finalist demonstrated the use of Python in a high-end HPC context for simulation of real-world flow problems at up to 13.7

SC16: Did You Know?

SC16 will be packed with events, as always. Be sure not to miss these highlights!

SIGHPC Members Annual Meeting

Calling all members: don’t miss the annual SIGHPC Members Meeting at SC16 in November! Plan to bring a friend who is not yet a member to give them a sense for what the SIG is about. Newly elected SIGHPC officers and volunteers will share what’s new in the SIG, provide tips about resources available to members, and listen to your input on priorities for the future. Join us for a lively discussion of how your SIG can best help you grow in your career.

Tuesday, November 15
12:15-1:15pm
Room 355-F

SIGHPC Big Data Virtual Chapter

Joint the first Birds-of-a-Feather (BoF) for the SIGHPC Big Data Virtual Chapter on Tuesday, November 15 from 10:30am to 12:00pm in Room 155-A. The BoF is open to everyone interested in the convergence of HPC and Big Data.

The lineup includes two speakers: Scott Yockel (Harvard Research Computing), on “Big Data: Where doesn’t it come from, and how do I deal with it?” and Harry Mangalam (UC Irvine Research Computing), on “BeeGFS and other distributed file systems in real life.” Following these talks, BoF participants will be able to share their experiences and ideas.

Bring the Kids!

For the first time, SC is offering on-site childcare for a small fee. Children between the ages of 6 months and 12 years of age are eligible. For details, see: http://sc16.supercomputing.org/attendees/on-site-child-care/
Pflop/s and achieved 58% computational efficiency on Titan (Cray XK7) at ORNL, USA / Piz Daint (Cray XC30), Switzerland. Another finalist introduced a domain-specific language that provides easy access to optimized stencil computations, generates C code with MPI calls, and performs automated performance tuning for performance portability. It was applied to magnetohydrodynamics and below-ground biology simulations, scaling up to the full scale of Japan’s K Computer, attaining 1.184 PFlop/s and 11.62% floating-point operation efficiency.

Three of the finalists used the recently introduced heterogeneous manycore system, the Sunway TaihuLight, which is based on processors entirely designed and produced in China. The three applications scale up to 10.5 millions cores and achieve sustained performance of 7.95 PFlop/s, 45.43 PFlop/s, and 50.578 PFlop/s.

The ACM Gordon Bell Prize is awarded each year to recognize outstanding achievement in high-performance computing. Finalists present at SC and the winner is announced at the SC Awards Ceremony. Financial support for the $10,000 prize comes from Gordon Bell, a pioneer in high-performance and parallel computing. For the full list of this year’s finalists, see http://sc16.supercomputing.org/full-program. The presentations will take place on Wednesday and Thursday (10:30 AM to 12:00 PM).

**The New Faces of SIGHPC:**

**ACM SIGHPC/Intel Fellows**

This year, fourteen outstanding individuals have been selected to receive the first ACM SIGHPC/Intel Computational and Data Science Fellowships. The goal of this award is to increase the diversity of students pursuing graduate degrees in data science and computational science, including women as well as students from racial/ethnic backgrounds that have not traditionally participated in the computing field.

> **Courtney Armour**, PhD candidate, Bioinformatics, Oregon State University
> **Michael Barrows**, PhD candidate, Computer Science, University of California San Diego
> **Monica Chelliah**, MS candidate, Scientific Computing, University of Cambridge
> **Dera Dimah**, PhD candidate, Computational Biology and Bioinformatics, Rowan University
> **Cylita Guy**, PhD candidate, Ecology & Evolutionary Biology, University of Toronto
> **Samnigueka Halsey**, PhD candidate, Ecology, University of Illinois at Urbana-Champaign
> **Deborah Hanus**, PhD candidate, Computer Science, Harvard University
> **Jaye Harada**, PhD candidate, Materials Science & Engineering, Northwestern University

Winners of the ACM SIGHPC Intel Fellowship: (left-to-right, from top) Courtney Armour, Michael Barrows, Monica Chelliah, Dera Dimah, Cylita Guy, Samnigueka Halsey, Deborah Hanus, Jaye Harada, Irish Medina, Heather Peacock, Tahiry Rajaonarison, Meena Subramaniam, Victoria Tolls, Anna Wright.
Irish Medina, MS candidate, Computer Science, University of Waterloo
> Heather Peacock, PhD candidate, Geography, Western University
> Tahiry Rajaonarison, PhD candidate, Geodesy and Tectonophysics, Virginia Polytechnic and State University
> Meena Subramaniam, PhD candidate, Bioinformatics, University of California, San Francisco
> Victoria Tolls, MS candidate, Biomedical Informatics, Queen's University
> Anna Wright, PhD candidate, Astrophysics, Rutgers, the State University of New Jersey

Each Fellow receives a $15,000 US stipend, complimentary membership in SIGHPC, and travel to SC. Recipients will receive the stipend annually for up to 5 years. This year’s Fellows will be honored in the SC16 Awards ceremony at 12:45 Thursday, November 14. For additional information on the Fellowship, see http://www.sighpc.org/fellowships.

New HPC Fellows Announced

We wish a hearty congratulations to the 2016 ACM/IEEE-CS George Michael Memorial HPC Fellows, Johann Rudi of The Institute for Computational Engineering and Sciences (The University of Texas at Austin) and Axel Huebl of Helmholtz-Zentrum Dresden-Rossendorf (Technical University of Dresden).

Rudi is recognized for his work on a recent project, “Extreme-Scale Implicit Solver for Nonlinear, Multiscale, and Heterogeneous Stokes Flow in the Earth’s Mantle,” while Huebl is recognized for his work, “Scalable, Many-core Particle-in-cell Algorithms to Simulate Next Generation Particle Accelerators and Corresponding Large-scale Data Analytics.”

The ACM/IEEE-CS George Michael Memorial HPC (GMM) Fellowship is endowed in memory of George Michael, one of the founding fathers of the SC Conference series. The fellowship honors exceptional PhD students throughout the world whose research focus is on high performance computing applications, networking, storage or large-scale data analytics using the most powerful computers that are currently available.

Travel Grant Recipients

SIGHPC awarded six student travel grants to SC16 this year. This year’s recipients include both undergraduate and graduate students from the US and Europe. The grants provide complimentary Technical Program registration and cover costs to a maximum of $600 for students studying in North America and $1200 for students studying elsewhere.

We are pleased to announce this year’s recipients:
> Mathew Bae, an undergraduate at Harvey Mudd College, is applying statistical methods to understand the behaviors and resource usage patterns that influence the energy consumption of jobs in a cluster.
> Sangeetha Banavathi Srinivasa, a Master’s student at Virginia Tech, is currently working on optimizing load balancing in HPC parallel file systems.
> Tiffany Connors, an undergraduate in Informatics at the University of Bergen, plans to pursue a PhD in computer science with an emphasis on machine learning and its applications to HPC.
> Sameera Horawalavithana, a first semester PhD student at the University of South Florida, is scaling up the computational techniques used to anonymize social graphs to hundreds of millions of nodes.
> Chirag Jain, a second year PhD student at the Georgia Institute of Technology, is developing...
scalable serial and parallel algorithms to analyze high throughput sequencing data in genomics.

> Giulio Stramondo, a first year PhD student at the University of Amsterdam, is working on next generation of accelerators for exascale computing.

Are you interested in meeting one of these bright young scholars? The travel grant program matches students with mentors, who help the students navigate the conference, provide advice, and professionally network. To serve as a mentor, please send email to students@sighpc.org.

Papers We Should be Reading

This issue’s recommended reading is an SC15 paper on scientific benchmarking:


Many readers will immediately recognize the subtitle’s sly nod to the classic editorial on fooling the masses by David Bailey, who was a co-recipient of the SC15 Test-of-Time Award for work on the NAS Parallel Benchmarks.

The Hoefler and Belli paper offers twelve best practices of benchmarking, firmly grounded in the basic tenets of statistical analysis that every experimental computational scientist and engineer ought to know by heart. These principles align well with this issue’s lead story on the SC Reproducibility Initiative.

Benchmarking is, of course, a high-stakes activity in our community, driving procurement, determining the winners of high-profile awards like the Gordon Bell Prize, and influencing both the design and use of future hardware and software platforms. As such, it seems fitting that our community continually remind itself of how to “do benchmarking right” and lead the way for field of computing more broadly.

From Hoefler & Belli’s SC15 paper on the principles and practice of statistically sound and reproducible benchmarking.

UPCOMING EVENTS

The following conferences are being held in cooperation with SIGHPC. The proceedings of co-sponsored and in-cooperation events are available without charge to SIGHPC members at the ACM Digital Library.

SIGHPC is a proud co-sponsor of the following events.


Be sure also to check out upcoming conferences and workshops, which are being held in cooperation with SIGHPC.


In addition, there are 24 additional in-cooperation workshops at SC16 alone! For the latest full list of events, visit the SIGHPC website at http://sighpc.org/events/workshops.
### SIGHPC Officers

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td>Jeff Hollingsworth, University of Maryland</td>
<td><a href="mailto:chair@sighpc.org">chair@sighpc.org</a></td>
</tr>
<tr>
<td>Vice-Chair</td>
<td>John West, TACC, University of Texas at Austin</td>
<td><a href="mailto:vicechair@sighpc.org">vicechair@sighpc.org</a></td>
</tr>
<tr>
<td>Treasurer</td>
<td>Rajeev Thakur, Argonne National Laboratory</td>
<td><a href="mailto:treasurer@sighpc.org">treasurer@sighpc.org</a></td>
</tr>
<tr>
<td>Member-at-Large</td>
<td>Torsten Hoefler, ETH Zurich</td>
<td></td>
</tr>
<tr>
<td>Member-at-Large</td>
<td>Michela Taufer, University of Delaware</td>
<td></td>
</tr>
<tr>
<td>Advisory Committee</td>
<td>John West, TACC, University of Texas at Austin</td>
<td></td>
</tr>
<tr>
<td>SC Steering Committee</td>
<td>Trish Damkroger, Lawrence Livermore National Laboratory (Conference Chair, SC14)</td>
<td></td>
</tr>
</tbody>
</table>

### Program Coordinators

<table>
<thead>
<tr>
<th>Category</th>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meetings</td>
<td>Janet McCord, TACC, University of Texas at Austin</td>
<td><a href="mailto:meetings@sighpc.org">meetings@sighpc.org</a></td>
</tr>
<tr>
<td>Communications</td>
<td>John West, TACC, University of Texas at Austin</td>
<td><a href="mailto:communications@sighpc.org">communications@sighpc.org</a></td>
</tr>
<tr>
<td>Newsletter Editor</td>
<td>Rich Vuduc, Georgia Institute of Technology</td>
<td><a href="mailto:newsletter@sighpc.org">newsletter@sighpc.org</a></td>
</tr>
<tr>
<td>Student Programs</td>
<td>Barbara Horner-Miller, BHM Consulting LLC</td>
<td><a href="mailto:students@sighpc.org">students@sighpc.org</a></td>
</tr>
<tr>
<td>Membership</td>
<td>Sue McIntosh, New York University</td>
<td><a href="mailto:membership@sighpc.org">membership@sighpc.org</a></td>
</tr>
<tr>
<td>Websites</td>
<td>Michela Taufer, University of Delaware</td>
<td><a href="mailto:webmaster@sighpc.org">webmaster@sighpc.org</a></td>
</tr>
</tbody>
</table>

### Advisory Board

- John West (Chair), Texas Advanced Computing Center, University of Texas at Austin
- David Abramson, University of Queensland
- Candy Culhane, Department of Defense
- Jeff Nichols, Oak Ridge National Laboratory
- Lucy Nowell, Department of Energy
- Rob Schreiber, Hewlett Packard Laboratories