

SIAG Supercomputing (SC) **Charter Renewal**

This CHARTER RENEWAL applies to the SIAM Activity Group on Supercomputing. The SIAM Activity Group Supercomputing was originally formed under the aegis of SIAM on July 16, 1984 by the SIAM Council and on July 17, 1984 by the SIAM Board of Trustees. Its initial operating period began January 1, 1985 and ended December 31, 1987. Its charter has been renewed by the Council and Board eleven times thereafter. This SIAG had 797 members as of December 31, 2016; of these, 316 were students.

According to its Rules of Procedure, the objectives of the SIAG are to provide an environment for interaction between developers of large-scale applications, programs, applied mathematicians, algorithm designers, and computer architects, to foster the development of analytic methods, efficient algorithms, and applications software in context with advances in computer architecture as applied to high performance computing.

Its proposed functions are to:

- 1) Organize minisymposium at the SIAM Annual meeting in years when there is no Parallel Processing Conference.
- 2) Organize a track of at least six minisymposia at the SIAM Annual Meeting at least once every five years.
- 3) Organize a biennial SIAM Conference on Parallel Processing.

The SIAG complements SIAM's activities and supports its functions. The answers to the questions below indicate how this was accomplished and what the officers propose as the future directions for the SIAG.

- How is the field covered by the activity group doing? Is it growing, is the focus shifting? What have been the significant advances over the last [two/three] years?

Parallel computing is a dynamic and rapidly growing field. New exciting and original ideas keep emerging, as we address several major challenges in our community, the transition to and exascale computing, the Post Moore era, dealing with high dimensional data arising from both scientific computing and machine learning problems, to cite just a few examples. Very often these ideas are produced by interdisciplinary and international collaborations.

- How is the activity group doing? Is it remaining vibrant? Is the size of the SIAG stable or increasing? How is the SIAG keeping up with the changes in the field? How are the broader interests of SIAM reflected in the activities of the SIAG?

Since its creation, the activity group on supercomputing and the SIAM meetings have been essential in strengthening our interdisciplinary community. They provide a forum for presenting the latest cutting-edge results in high performance computing, for enriching interactions, and an opportunity for creating new collaborations.

The co-chairs and the scientific committee of the SIAM Conferences on Parallel Processing have been proactively looking for new emerging research topics with great potential. These topics are discussed during plenary panels and minisymposia of the conference.

- Please list conferences/workshops the activity group has sponsored or co-sponsored over the past three years, and give a brief (one sentence or phrase) indication of the success or problems with each.

The SIAG on Supercomputing has co-sponsored the SIAM PP16 conference, which took place in Paris, France, April 12-15 2016. This is the first time the SIAM Parallel Processing Conference was organized outside USA, in an effort of strengthening the international collaborations in our community. There were a record number of 500 participants. We believe that this conference helped attract more Europeans to our SIAG, and at a longer term develop more collaborations between USA and Europe.

- Please indicate the number of minisymposia directly organized by the activity group at the last two SIAM annual meetings. When did the SIAG last organize a track at an annual meeting or meet jointly with the SIAM Annual Meeting?

Our SIAG on Supercomputing organizes this year a track during the SIAM Annual Meeting 2017. The track is formed by one invited speaker and the following minisymposia which cover some of the most exciting research topics in high performance computing.

- MS076 Communication-Avoiding Algorithms - Part I of II
- MS093 Communication-Avoiding Algorithms - Part II of II
- MS024 High Performance Computing and Data Science in Molecular Engineering - Part I of II
- MS036 High Performance Computing and Data Science in Molecular Engineering - Part II of II
- MS007 New Algorithms for Scientific Computing at Exascale - Part I of II
- MS016 New Algorithms for Scientific Computing at Exascale - Part II of II
- MS040 Resilient Computation in Large Scale Scientific Computing, Part I of II
- MS051 Resilient Computation in Large Scale Scientific Computing, Part II of II
- MS058 High Performance Tensor Computations - Part I of II
- MS069 High Performance Tensor Computations - Part II of II
- MS087 Parallel-in-time Integration of Differential Equations - Part I of II
- MS098 Parallel-in-time Integration of Differential Equations - Part II of II

- Please indicate other activities sponsored by the activity group, to include newsletters, prizes and web sites. Have each of these been active and successful?

Since 2010, SIAG/SC awards the SIAG/Supercomputing Career Prize and the SIAG/Supercomputing Earlier Career Prize. Since 2016, SIAG/SC also awards the SIAG/Supercomputing Best paper prize for the most outstanding paper, as determined by the prize committee, published in a peer-reviewed journal bearing a publication date within the four calendar years prior to the year of the award.

- What activities are planned and proposed for the next period of the charter? Please describe scheduled and suggested future activities in detail.

SIAM PP18: March 7-10, 2017, Waseda University, Tokyo, Japan

SIAM PP20 : Date/Location to be defined

We suggest two future activities. We have submitted a proposal to organize the Gene Golub summer school in 2018. After the first selection phase, our proposal was among the two proposals invited to proceed to a second full proposal phase, but ultimately it was not selected. Based on the very positive feedback we have received, we plan to resubmit a proposal to organize the Gene Golub summer school in 2019 on High Performance Data Analytics, at the confluence of data analytics and high performance computing.

It would be important to have a newsletter which gives the voice to Ph.D. students and junior researchers in our field, in addition to reporting exciting results from our community.

- How can SIAM help the activity group achieve its goals?

To keep our field as exciting as it is today, it is important to attract new students and young researchers to our community as well as to facilitate international exchanges. Organizing a summer school on a topic related to our SIAG could be a particularly efficient way of introducing the cutting-edge parallel computing research to students and so attract to our field next generations of researchers. International exchanges for students and young researchers could be for example fostered through a SIAM Program.

- How can the activity group help SIAM in its general role of promoting applied mathematics and computational science?

There are strong interactions between the activities represented in our SIAG and industrial and academic application domains. As such, our SIAG helps in transferring the latest results obtained in applied mathematics and computational science to a broader audience.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two year operating period beginning January 1, 2018 and ending December 31, 2019.

Laura Grigori , Chair of the SIAG on Supercomputing

June 2, 2017