

## **SIAG Analysis of Partial Differential Equations (APDE) Charter Renewal Application**

This CHARTER RENEWAL applies to the SIAM Activity Group on Analysis of Partial Differential Equations. The SIAM Activity Group APDE was originally formed under the aegis of SIAM on March 26, 2003 by the SIAM Council and on December 7, 2002 by the SIAM Board of Trustees. Its initial operating period began April 2003 and ended December 31, 2004. Its charter has been renewed by the Council and Board seven times thereafter.

Statistical information on SIAG as of 12/31/17:

- This SIAG had 922 members as of December 31, 2017; of these, 595 (64.5%) were students and 327 were not students.:
- Gender of non-students: 60 female and 250 male
- Location of non-students: 213 domestic, 114 international members

According to its Rules of Procedure, the objective(s) of the SIAG are:

It is the purpose of the SIAM Activity Group on Analysis of APDE to foster activity in the analysis of partial differential equations (APDE) and to enhance communication between analysts, computational scientists and the broad APDE community.

Its goals are:

- To provide a forum where researchers in the area, theoretical and applied, can meet;
- To be an intellectual home for researchers in the analysis of APDE;
- To increase conference activity in APDE;
- To enhance connections between the applications and analysis communities. In particular, to foster interdisciplinary research that stems from analysis of PDE.

Within the framework of SIAM, the SIAG will conduct activities that implement its purposes.

The SIAG on APDE will undertake a number of activities, including:

1. **Organize a biennial SIAM Conference on Analysis of PDE.** Because of connections between PDE and the topics of many of the other SIAGs, the SIAG/APDE will also solicit opportunities to run joint meetings with other SIAGs and with other periodic SIAM meetings (for example, Materials Science, Nonlinear Waves and Coherent Structures, and Computational Science and Engineering). The chair of the conference organizing committee shall be either the program director or the chairperson of the SIAG or their designee. The organizing committee must be approved by the VP for Programs at least 16 months before the conference.

2. **Disseminate information.** The SIAG will maintain a website to facilitate the exchange of information (conferences, summer schools, job announcements) among its members and other interested parties.

3. **Award the SIAG Analysis of PDE Prize**, established in 2005, to the author(s) of the most outstanding paper, as determined by the Prize Selection Committee, on a topic in Partial Differential Equations published in English in a peer-reviewed journal bearing a publication date within the four calendar years preceding the year of the award.

4. **Organize minisymposia at the SIAM Annual Meeting** in years where there is no SIAG conference.

5. At least once every five years either **organize** a track of at least six **minisymposia at the SIAM Annual Meeting or have an activity group meeting held jointly** with the annual meeting. The VP for Programs and the VP at Large will coordinate the scheduling with the SIAG chair.

6. With the approval of the SIAM Program Committee, the SIAG may **organize special sessions at SIAM meetings**, and conduct special one- or two-day meetings immediately before or after a regular SIAM meeting. Other SIAG meetings may be organized only with the approval of the SIAM president and vice president for programs.

SIAG meetings, workshops, and conferences may be organized only with the approval of the SIAM president and the SIAM vice president for programs.

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

*1. List all current officers of the activity group (including advisory board, if relevant).*

Chair: Eitan Tadmor

Vice Chair: Milton da Costa Lopes Filho

Program Director: Alexis Vasseur

Secretary: Alina Chertock

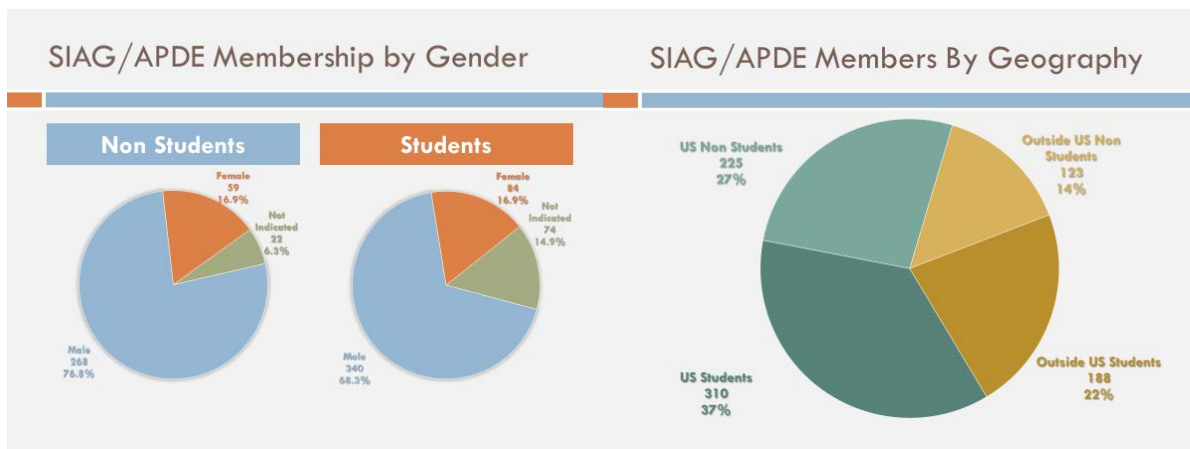
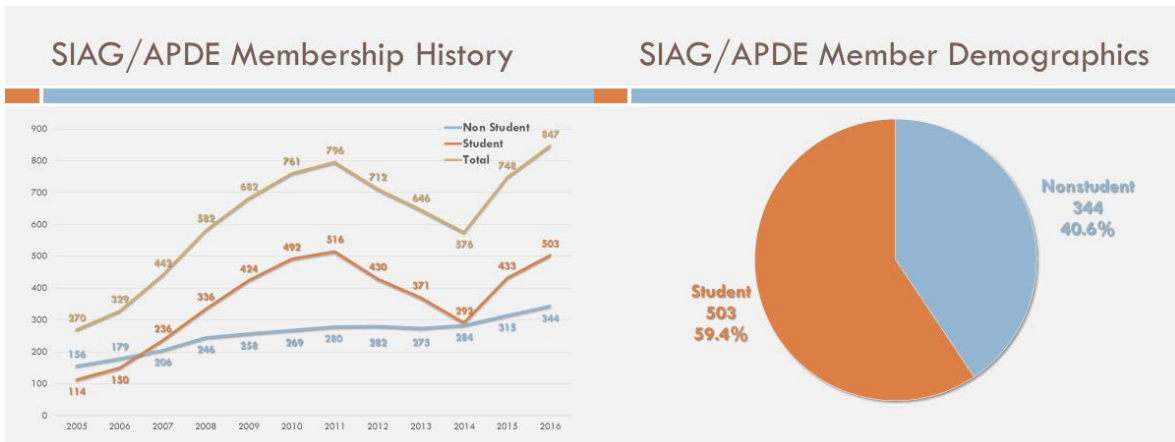
*2. How is the field covered by the activity group doing? Is it growing, is the focus shifting? What have been the significant advances over the last two years?*

The activity group APDE represents a diverse community with a large variety of fields related to the Partial Differential Equations. It fosters interactions between theory, applications, and continues its efforts to interdisciplinary activities.

The field of PDE has a huge scientific impact and visibility in the mathematical community. For instance, The high quality of the work of Armstrong and Smart recognized by the SIAG/APDE prize in 2017 testifies to the health of the area of research, and the involvement of the activity group in the endeavor of the field. Several areas are experiencing significant growths, including the interaction between PDE and probability, nonlocal or partial PDE, kinetic theory, new trends in fluid mechanics, (as the application of convex integration).

**3. 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?**

The bi-annual meeting organized by the actuality group of APDE is one of the main platforms for junior and senior researchers to exchange ideas and present state-of-the art results. The central role it plays is reflected in both – the size of membership and its healthy gender and geographical distributions (see below), and very high quality of presentations in its bi-annual meetings. Because of overlap in interests, there are many from other SIAGs who take part in the APDEs meetings.



**4. 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 APDE organizes the biennial conference on Analysis of Partial Differential Equations.**

The SIAG APDE organizes the biennial conference on Analysis of Partial Differential Equations. The last meeting took place at the Baltimore Convention Center, December 8th to 12th, 2017. It consisted of eight plenary talks, the SIAG prize lecture, sixty-eight minisymposia and eleven contributed talk sessions. The minisymposia and contributed talk sessions took place on up to twelve parallel sessions. In addition, the meeting hosted the SIAG-APDE business meeting and

a meeting of the Editorial Board of SIAM Journal on Mathematical Analysis. Scientific activity retained the usual high standards for this conference. A last-minute change of venue complicated the logistics, but the alternate site proved to be easily accessible and adequate for the needs of the conference. The previous conference took place at the DoubleTree resort, Scottsdale, AZ, December 7th to 10th, 2015. It was slightly better attended, perhaps due to the regional weather, but substantially the same in all other aspects.

***5. 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?***

The only time the Analysis of PDE was held jointly with the SIAM Annual Meeting was in 2006, in Boston, July 10th to 12th. A track was organized in the 2016 Annual Meeting, with five minisymposia.

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

The activity group maintains a website at <http://siags.siam.org/siagapde/index.html>. There is a mailing list to which members regularly post and receive information about conferences, summer schools, jobs and post-docs.

The SIAG/APDE awards the SIAM Activity Group on Analysis of Partial Differential Equations Prize. The prize was established in 2005 and it is awarded to the author(s) of the most outstanding paper, as determined by the prize committee, on a topic in partial differential equations. The SIAG/APDE Prize is awarded at the biennial Conference on Analysis of PDE.

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

The main activity sponsored by the Activity Group will be the 2019 Analysis of PDE meeting. The venue has not yet been chosen. It is important to maintain the high scientific standards of this meeting, while broadening participation.

***8. How can SIAM help the activity group achieve its goals?***

Most of the SIAG/APDE community consists of academic members (85%). Thus, SIAM can help to promote this activity group in non-academic institutions, such as industry and research labs. SIAM could also help establishing liaisons with international organizations with whom SIAM maintains reciprocal agreements. Many of these organizations have members with interests in line with those of the SIAG/APDE and, perhaps, a SIAG/APDE membership could be added as a free perk of Reciprocal Membership.

***9. How can the activity group help SIAM in its general role of promoting mathematics and computational science?***

The SIAG/APDE contributes an analytical vision to SIAM that focuses on the interactions of rigorous analysis with modeling and scientific computing. It comprises a broad group of active

research scientists, 85% of which in academia, working towards understanding fundamental analytical issues for nonlinear models in the natural and social sciences. Applied mathematics relies on the synergy between rigorous analysis, computations and modeling and analysis of PDE is one of the classical areas where such synergy unfolds. Thus the SIAG/APDE community naturally plays a pivotal role in the development of interdisciplinary research and fruitful collaborations among applied mathematicians.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2019 and ending December 31, 2020

Signed and dated by current SIAG Chair

Eitan Tadmor, Chair

On behalf of SIAG/APDE officers

Milton Lopes Filho (Vice Chair) Alexis Vasseur (Program Director) and Alina Chertock (Secretary)

June 2018

**Acknowledgments.** We thank Timothy Fest, Nancy Snell and Linda Thiel and for their expertise in organizing APDE 2017 meeting and for the contributions to this application.