

Pro Forma CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Analysis of Partial Differential Equations (SIAG/APDE). The SIAG/APDE was originally formed under the aegis of SIAM on December 7, 2002 by the SIAM Board of Trustees and on March 26, 2003 by the SIAM Council. Its initial operation period began April 1, 2003 and ended December 31, 2004. Its charter has been renewed by the council and board two times thereafter, and is chartered to operate through December 31, 2008. This SIAG has 442 members as of December 31, 2007.

According to its Rules of Procedure, the objectives of the SIAM Activity Group on Analysis of PDE are to foster activity in the analysis of partial differential equations (PDE) and to enhance communication between analysts, computational scientists and the broad PDE 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 PDE;
- To increase conference activity in PDE;
- To enhance connections between the applications and analysis communities.

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

Its proposed functions are to undertake a number of activities, including:

1. Organize mini symposia at the SIAM Annual Meeting in years when there is no SIAG conference.
2. At least once every five years either organize a track of at least six mini symposia 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.

Other activities can include:

3. Organize a biennial SIAM Conference on 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, Combustion, Materials Science or the SIAG on Nonlinear Waves and Coherent Structures). 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.
4. 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.

5. Disseminate information. The SIAG will publish a newsletter and maintain a website to facilitate the exchange of information among its members and other interested parties.

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. 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 three years?

The SIAG is growing in developing activities, broadening its scope, and this should continue. Its scope comprises the applied analysis associated to modeling by Partial Differential and Integral equations from several areas from live and social sciences. The wide scope of subjects in the 69 minisymposia sessions in its December 07 meeting is a testimony of their fast growth and breadth.

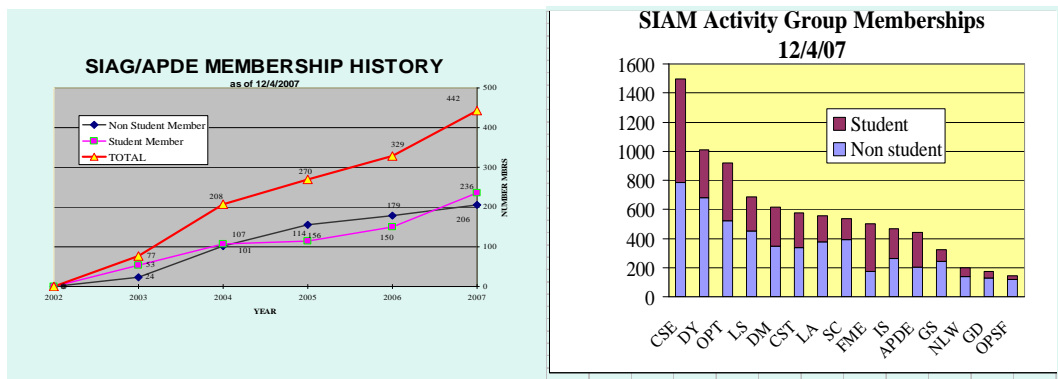
2. How is the activity group doing? Is it remaining vibrant? Is the size of the SIAG stable or increasing? How is the SIAG keeping up with the changes in the field? How are the broader interests of SIAM reflected in the activities of the SIAG?

The SIAG APDE has grown an overall 65% in membership in last 2-year period, with a very significant increase of student membership now reaching 53.5% of the members (see charts below). It represents a very vibrant group with a strong participation in planned activities.

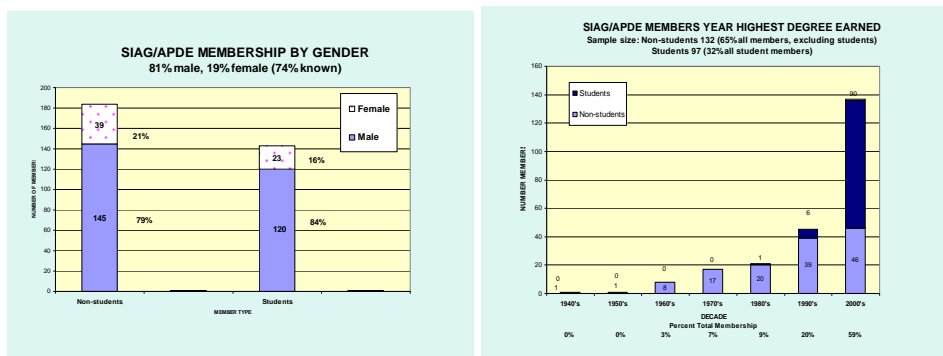
In order to keep up with the changes in the field we strongly encouraged participation and organization of minisymposia sessions in our last meeting, covering the analysis and simulation of non-linear phenomena in areas from quantum, kinetic and classical macro mechanics, as well as integrating innovative developing fields such as optimization of PDEs in network flow modeling with applications to live and social sciences, interacting complex particle systems in quantum and kinetic theories, multi scale phenomena in material and biological sciences, climate and oceanography, advances in calculus of non-linear variations with applications to broad areas in material sciences such liquid crystal or foam modeling, superconductivity, and geometric flows, etc.

The APDE SIAG serves a section of the SIAM membership that has not had a clear role in SIAM in the last decade or so. Bringing this community into the mainstream of SIAM activities will benefit broader SIAM interests in connecting with areas of mathematics that interface with applications. As of December, 2007, the SIAG had 442 members, including 236 (53.5%) student members. The total membership has increased by about 65% in a two-year period. This percentage shows a significant increase in membership numbers, in the previous period the increase was about 45% in corresponding to the initial two year period December 2003-2005.

In four years the APDE group has achieved membership numbers comparable to SIAG groups LA, CS, FME, and IS, with a significant student membership percentage second to FME, which has the largest student membership percentage of any activity group



The following two charts show the current distribution of membership by gender and by the year of highest degree earned. The later one shows a healthy membership support amongst academically junior people.



3. 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.

Since the last charter renewal, the SIAG/APDE has had two conferences. This first one was held in Boston in 2006, in conjunction with the SIAM Annual Meeting and FM06. We know that 245 attendees indicated that they were interested only in attending PD06, and 176 additional attendees indicated that they planned to attend sessions at both AN06 and PD06. There were 36 minisymposium sessions, 11 contributed sessions, and 7 invited presentations, including the SIAG/APDE prize.

The second conference was held in Mesa, Arizona, December 10 to 12, 2007. The conference had more than 280 paid attendees, 9 plenary lectures including the Prize lecture, and 69 concurrent sessions in three days. High overall satisfaction of this last conference was frequently mentioned by conference participants. Scheduling was an intense 8AM to 8PM, which made for a very long three days that might be alleviated by more creative use of poster sessions. It was discussed at the Business Meeting that proceedings might be considered and poster presentations would be included. There was a consensus that the evening reception would be moved to night 1, instead of night 0, and then poster presentations could be held at the reception time.

Overall, the conference was a successful celebration of the SIAG /APDE, with many ideas about how the SIAG could continue its development, and how the APDE community could better organize itself and participate within SIAM.

Although there were no tracks at the ICIAM 2007 Zürich meeting, the members of the SIAG/APDE organized many minisymposia, at least 8 by a very casual count, many involving international collaboration. Some of the topics considered were advances in kinetic theory, soft matter, composite materials and effective media, and emerging issues in mathematical biology.

4. Please indicate the number of mini symposia directly organized by the activity group at the last two SIAM annual meetings. When did the SIAG last organize a track of mini symposia at an annual meeting?

The SIAG has not organized a mini symposia track at an annual meeting yet. One will be planned for the 2010 annual meeting. The current or incoming elected program officers for the period 2009-2011 will nominate a person who will organize a track of APDE minisymposiums, and be nominated to serve on the Organizing Committee for AN10.

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

There have been two newsletters, one in May 2007 and one in April 2008.

The first *SIAG/Analysis of Partial Differential Equations Prize* was made at the 2006 SIAM Conference on Analysis of Partial Differential Equations in Boston in July, 2006. The second *SIAG/Analysis of Partial Differential Equations Prize* was awarded at the 2007 SIAM Conference on Analysis of Partial Differential Equations in Mesa, Arizona, in December 2007, to **Stefano Bianchini, SISSA-ISAS, Italy, and Alberto Bressan, Pennsylvania State University** for their paper "Vanishing Viscosity Solutions of Nonlinear Hyperbolic Systems," *Annals of Mathematics*, Volume 161, Number 1, 2005. (Ann. of Math. Volume 161, Number 1 (2005), 223-342.) The prize was received by Stefano Bianchini who delivered the prize lecture at a plenary session on Tuesday, December 11, 2007. More information can be found at <http://www.siam.org/prizes/sponsored/siagapde.php>

The prize committee included chair Mary Pugh, University of Toronto; Yann Brenier, University of Nice, France; Alice Chang, Princeton University; Bjorn Engquist, University of Texas at Austin; Robert Pego, Carnegie Mellon University.

The current SIAG website is jointly maintained by SIAM administration and the group which currently maintains a linked website at the University of Texas at Austin, under the supervision of the current group Chair.

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

Continued communication with the SIAM membership to emphasize the benefits and low cost of joining the APDE SIAG. Chairs or Program Directors of the SIAG should contact Annual meeting organizers to ask about sponsorship of minisymposia by the APDE SIAG, and should use the newsletter or email to solicit minisymposia from the membership.

Newsletters should be coordinated between the Chair and secretary of the SIAG.

There was a discussion session called "looking forward session", reported by Patricia Bauman (the report was posted on the Group web site). Among the several discussed items for proposed activities, there was particular emphasis on incorporating poster sessions both for academic contributors and graduate students.

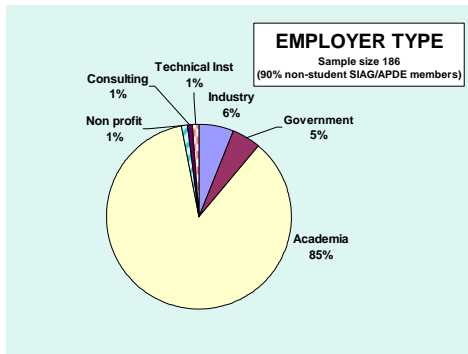
It was proposed that SIAG APDE meetings remain biannual, with the next one planned for December 2009 in a USA territory location. A track of minisymposium will be organized at the 2010 SIAM Annual Meeting.

Promote international joint meetings for one or more SIAG together in order to foster joint international activities. Already the last SIAG APDE conference in December 2007 had significant (about 20%) participants from foreign institutions. Several of these participants are already SIAG APDE members. There have been preliminary discussions among SIAG APDE group officials and members of the international APDE community on the feasibility for a joint meeting in Barcelona, Spain in May 2010, as an additional activity of the group.

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

The APDE SIAG does this by remaining an active organization, showcasing exciting new developments in the field. Awarding prizes is an important activity of our professional organization, and the APDE prize will play its part in promoting SIAM interests.

Given the distribution of membership by employers, the group is in a great majority of academic members (85%). SIAM may help by promoting the APDE membership to its non academic members. That would make the group more diverse in scope and goals, and may help their members to keep focus on innovations from emerging technologies from life and social sciences and statistical modeling.



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

The SIAG APDE brings an analytical vision to SIAM that focus fundamentally in the interactions of applied analysis and scientific computing. It comprises a broad group of active research scientists, 85% in academia, fostering the links between fundamental analytical issues of non-linear modeling in current natural and social sciences. An attainable goal for SIAG APDE is to keep on bridging the interactions between academics in Applied Analysis and Numerical Mathematics and innovative developing technologies at industry and research labs. Such interactions will increase the support of our group community in the form of funding and endorsement of research and SIAM activities as a whole.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2009.

Signed
Irene M. Gamba, SIAG APDE Chair, 2007-2009

On behalf of SIAG APDE officers, elected to two year terms 2007-2008
Vice Chair: Patricia Bauman
Program Director: Carme Calderer
Secretary: David Kinderlehrer

April 25, 2008

Acknowledgment. We would like to thank Susan Whitehouse for her contributions to this application, specifically the data graphics that were available to us for the Business meeting of December 2007, and to Linda Thiel for keeping records of our activities and make them available to us for the purpose of this application.