Analysis of Partial Differential Equations
Charter Renewal

This CHARTER RENEWAL applies to the SIAM Activity Group on Analysis of Partial Differential Equations. The SIAM Activity Group (or SIAG) to which this renewal applies was originally formed under the aegis of SIAM on March 26, 2003 by the SIAM Council and December 7, 2002 by the SIAM Board of Trustees with its initial operating period beginning April 1, 2003 and ending December 31, 2004. Its charter has been renewed by the Council and Board 5 times thereafter. This SIAG has 646 members, including 378 student members, as of December 31, 2013.

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 PDE to foster activity in the analysis of partial differential equations (PDE) and to enhance communication and exchange of ideas between analysts, the broad PDE community, computational scientists and applied mathematicians. 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. In particular, to foster interdisciplinary research that stems from the analysis of PDEs.

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 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.

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. SIAG/Analysis of Partial Differential Equations Prize:
   The SIAM Activity Group on Analysis of Partial Differential Equations (SIAG/APDE) Prize, established in 2005, is awarded to the author(s) of the most outstanding paper, as determined by the prize 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 prior to the year of the award.

Other activities can include:

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 : Edriss Titi ; Vice-Chair : Catherine Sulem ;
    Program Director: Suncica Canic ; Secretary: Anna Mazzucato.

2. 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.

One of the central activity of the SIAG APDE is the organization of the biennial conference on Analysis of Partial Differential Equations. It is one of the most highly regarded PDE conference in the sense that while it is focused on problems involving PDEs, it has a broad spectrum and includes topics from abstract mathematical analysis to applications to an increasing variety of fields.

This list of conferences may be found at http://www.siam.org/meetings/archives.php#pde.

The SIAM Conference on Analysis of Partial Differential Equations in 2013 had 351 attendees.

3. 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?

One of the specific missions of the SIAG is to extend its inter-disciplinary efforts (not just among analysts and numerical analysts, but also to a broader community of applied scientists) and to increase the overall visibility of the PDE community.
The wide variety of topics for the 88 minisymposia sessions and 14 contributed presentations sessions in its December 2013 meeting testifies to its breadth. They covered highly active areas of applied analysis including Fluid mechanics and geophysical dynamics; Conservation laws; Kinetic theory; Nonlinear waves; Optimal control; Elasticity; Dispersive equations; Geometric PDEs; Stochastic PDE; Financial Mathematics; Image

processing; Game theory; Numerical analysis and computations; Variational methods and applications in material sciences. The conference had also 9 plenary lectures including the Prize lecture given by László Székelyhidi, 2 mini-tutorials on game theoretical methods in PDEs and kinetic descriptions of multiscale phenomena in collective dynamics given respectively by Marta Lewicka and Eitan Tadmor. The conference was a success. A poll sent to all participants a short time after the end of the conference shows a high level of satisfaction of the participants.

4. 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 http://siags.siam.org/siagapde/index.html.   It has also a mailing list and its members regularly receive information about summer schools, conferences, and jobs announcements. We have received information that it is very useful for the PDE community.
The SIAM Activity Group on Analysis of Partial Differential Equations (SIAG/APDE) Prize, established in 2005, 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 contributions must be contained in a paper or papers published in English in a peer-reviewed journal. The prize is awarded every two years at the **SIAM conference on Analysis of Partial Differential Equations**.
It was awarded in December 2013 at the conference in Orlando (Florida) to **Camillo De Lellis** (Universität Zurich) and **László Székelyhidi Jr.** (Universität Leipzig) for their paper "The Euler Equation as a Differential Inclusion ", Annals of Mathematics, Volume 170, Number 3, 2009, 1417 - 1436.
The Prize Selection Commitee was chaired by Konstantina Trivisa, University of Maryland with members Luis Caffarelli, University of Texas at Austin, Nader Masmoudi, Courant Institute New York University, Helena Nussenzveig-Lopes, Universidade Federal do Rio de Janeiro, Sylvia Serfaty, UPMC Université Paris 6.

5. 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?
SIAG/APDE has achieved membership numbers in the middle range of SIAM activity groups, comparable to SIAG groups LA, CST, DM and IS, with a significant student membership percentage. The size of the SIAG has slightly decreased recently but the number of students has remained constant.

6. 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?

There will be about 6 mini-symposia organized by members of the SIAG APDE at the joint SIAM - ICIAM meeting August 2015 in Beijing.

We expect to receive an invitation to have a sponsored track (sessions and a representative of the SIAG/APDE on the organizing committee) for the 2016 Annual Meeting.

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

The next SIAM conference on Analysis of Partial Differential equations will be held in November 2015. The location is under discussion.

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

Since most of the SIAG/APDE group consists of academic members (85%) form mathematics departments, SIAM may help promoting the SIAG/APDE membership among non-mathematical departments as well as industry and research lab communities.

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

The SIAG/APDE contributes to the analytical vision to SIAM and enhances collaboration and interaction between scientists covering a large spectrum of applied mathematics. It comprises a large group of active research scientists, fostering the understanding of fundamental analytical problems for nonlinear models in the natural and social sciences. It has a pivotal role in the development of interdisciplinary research, fruitful collaborations among scientists working in various fields.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two year operating period beginning January 1, 2015.

Signed   Edriss Titi, SIAG/APDE Chair

On behalf of SIAG/APDE officers :
Catherine Sulem (Vice-Chair), Suncica Canic (Program Officer), Anna Mazzucato (Secretary).
June 2014

Ackowledgments: We would like to thank Nancy Snell, Linda Thiel and Susan Whitehouse for the contributions to this application, specifically the data graphics that were available to us and the records of our activities available to us for the purpose of this application.