

Charter Renewal Application for the SIAM Activity Group on Nonlinear Waves and Coherent Structures

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Nonlinear Waves and Coherent Structures. The SIAG/NWCS 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 with its initial operating period beginning January 1, 2003 and ending December 31, 2005. Its charter has been renewed by the Council and Board 3 (three) times thereafter. This SIAG had 312 members, including 162 student members, as of 12/31/2011.

According to its Rules of Procedure, the purpose of the SIAG is to foster activity in the area of Nonlinear Waves and Coherent Structures. Its goals are:

- To foster collaborations among applied mathematicians, physicists, fluid dynamicists, engineers, biologists, and economists in those areas of research related to the theory, development, and use of nonlinear waves and coherent structures.
- To promote and facilitate Nonlinear Waves and Coherent Structures as an academic discipline.

Its purposed functions were:

The SIAG on NWCS will organize activities in Nonlinear Waves and Coherent Structures. The SIAG is expected to:

1. The SIAG on Nonlinear Waves and Coherent Structures (NWCS) will promote and facilitate research in the area through a variety of activities, including:
2. Organize a biennial SIAM Conference on NWCS. The SIAG also will consider dovetailing specialized workshops and conferences with the SIAM Annual meeting. In particular, it is planned to have the biennial meeting alternate loosely between university-style meetings, ones dovetailed with SIAM Annual Meetings, and joint meetings with other SIAGs.
3. Broker partnerships between academia, industry, and government laboratories. The SIAG will seek to facilitate the establishment of academic programs in NWCS to foster its development as an academic discipline. The SIAG also will facilitate the placement of undergraduate and graduate students in internships in industry and government laboratories.
4. The SIAG will work with other professional societies to promote NWCS. For example, SIAM and another society might organize a workshop on a topic of mutual interest. The SIAG also would attempt to increase government support for NWCS through various outreach activities.

Other activities may include:

5. Organize minisymposia at the SIAM Annual Meeting in years where there is no SIAG conference.
6. 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.
7. 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.
8. Award of the biennial Martin Kruskal Lecture Prize, established in 2012.

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).

J. Nathan Kutz (Washington) – Chair

Thomas Bridges (Surrey) – Vice-Chair

Bernard Deconinck (Washington) – Program Director

Panayotis Kevrekidis (UMass) - Secretary

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 has made great efforts to build upon its core strengths as well as expand to new fields. Much of its core strengths lie in classic application fields like fluid dynamics and generic pattern forming systems in PDEs. Key members of these traditional communities are clearly present and active in the SIAG. Moreover, they are strongly represented via their attendance at the bi-annual SIAG meeting. As for expand to new fields, there have been efforts to increasingly bring in members with scientific interests in the biological sciences and climate modeling, both areas of continued growth and importance for application of the 21st century mathematical workforce. We do not see that the SIAG has grown significantly. Rather, it seems to have stabilized to a critical mass of leading scholars in the field. This allows for the application of leading mathematical methods to a broader set of problems and the possibility of transformative impact and significant advances.

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 SIAG group has reached a very comfortable size where all the key intellectual figures in the community are active in this group without feeling that the group is too big. At this point, there seem to be no plans to continue growing the SIAG. Rather, there is the idea of consolidating the SIAG gains so as to establish the leading organization devoted to the study of nonlinear waves. By engaging the leading members of the community, the SIAG is keeping up with changes in the field and applications in new and exciting avenues. These new developments often have strong overlap with other existing SIAG groups such as the dynamical systems activity group, computational science and engineering activity group and the analysis of partial differential equations group. Indeed, many SIAG members in the NWCS group are also involved with another SIAG group of SIAM. Moreover, the bi-annual conference held by the SIAG seems to be of broader appeal than just the SIAG members.

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 NWCS organizes the biennial conference on Nonlinear Waves and Coherent Structures. This list of conferences may be found at: <http://www.siam.org/meetings/archives.php#nonlinearwaves>. The SIAM Conference on Nonlinear Waves and Coherent Structures was held in Philadelphia, PA on August 16-19, 2010 and had 263 attendees including 198 paid non students and 41 paid students attending. Additionally, there will be both a workshop and 5th bi-annual conference in Seattle, from June 10-12, 2012 and June 13-16, 2012 respectively. It is anticipated that 60 graduate students will participate in the workshop preceding the conference. Final numbers on the conference are currently not available, but it is anticipated that 250-300 participants will be in Seattle for this event, many of them (anticipated 80-100) being graduate students.

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 of minisymposia at an annual meeting or meet jointly with the SIAM Annual Meeting?

NWCS: Track at AN09; also scheduled for AN13.

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 SIAG now sponsors the Martin Kruskal prize for outstanding contributions to the development of nonlinear wave theory. At the upcoming bi-annual Seattle meeting in June 2012, we will present the first recipient of the prize: Prof. Alan Newell of the University of Arizona.

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

A critical part of our planning is to determine the next conference venue for the NWCS'14. We aim to proceed quickly with determining the location and its viability so as to avoid the problems experienced in the last few venue selections. In addition to pre-planning for NWCS'14, we are committed to running a mini-symposium track at the SIAM annual meeting in July 2013.

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

SIAM is already doing a nice job of bringing together the leading community of scholars in the arena of applied mathematics. It is this membership that ultimately provides a vibrant intellectual backdrop for the SIAG. Thus keeping a healthy overall SIAM organization is the most critical aspect of running a strong SIAG.

9. How can the activity group help SIAM in its general role of promoting nonlinear waves and coherent structures?

It is incumbent upon the SIAG to run an exciting, intellectual appealing, and scientifically broad bi-annual meeting. In so doing, this becomes the strongest promoter of research in the field as well as keeping a loyal base of the strongest intellectual talent in the world.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two year operating period beginning January 1, 2013.

Nathan Kutz
SIAG/NWCS Chair
7/1/2012