

CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Nonlinear Waves and Coherent Structures (NLWCS). 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 once thereafter. This SIAG had 133 members as of December 31, 2005.

According to its Rules of Procedure, the objective(s) of the SIAG 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.; and
to promote and facilitate Nonlinear Waves and Coherent Structures as an academic discipline with a strong interdisciplinary component.

Its purposed functions were to promote and facilitate research in the area through a variety of activities, including:

Organize a biennial SIAM Conference on NWCS.

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.

* * *

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?

We believe the field is doing extremely well. We have seen developments in the stability analysis of coherent structures, with increased interest in discrete and periodic systems. The latter are often related to applications to nonlinear optics, where the contributions from our discipline have moved from the more mature and well established studies of soliton and solitary wave propagation in optical fibers as it is applied to optics communications to the current and exciting research trend of light propagation in systems with periodic structures, such as photonic crystals and gratings. The study of water waves is another topic of importance, with the development of strong interdisciplinary groups which involve both theorists and experimentalists. Bose-Einstein condensation continues to be a field of intense research with strong presence from SIAG members.

Further, the increasing number of workshops and small meetings both in the US and in Europe indicates the field is alive and evolving in a significant way.

We need to see more activity on the mathematical biology side. This is a new area which is developing slowly. Most applications of nonlinear waves are in the field of neuroscience, but there is a lot of potential to apply nonlinear modeling and method of analysis of nonlinear pde's to a variety of areas in biology. The SIAG needs to be more proactive in this domain.

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 large number of submissions (46 MS; 50 CP and 11 posters) we received for the 2006 conference is an indication of growing interest and activity in the field of nonlinear waves and coherent structures, as well as in the SIAG. We will take advantage of this success to try to increase membership in the SIAG, by advertising for the SIAG at the 2006 meeting in Seattle. The list of plenary speakers and the topics they will talk about, when compared to the last SIAG meeting reflect how the discipline remains vibrant. That some keynote talks will be delivered by researchers outside the Applied Mathematics discipline who were willing to participate indicates this SIAG promotes a healthy cross fertilization of ideas.

A quick look at the topics of the last and the next SIAG conference as well as the SIAG member shows this SIAG has significant presence of areas such as Dynamical Systems, pde's and Computational Mathematics.

We are relatively young and there is always room for improvement, we think the slope points in the right direction.

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.

The SIAM Conference on Nonlinear Waves, Central Florida University, October 2-5, 2004.
-- This conference had 188 paid attendees.

The 2006 SIAM Conference on Nonlinear Waves and Coherent Structures will be held at the University of Seattle, Washington, September 9-12, 2006. We have received submissions from more than 200 participants, so the number of attendees should be as large, but probably bigger than it was in 2004. Nathan Kutz and Bernard Deconinck are organizing a workshop entitled "Stability and instability of nonlinear waves" (supported by NSF and PIMS) which precedes the SIAG conference. Although not sponsored by SIAM the time and location of this event is not only important in terms of the theme, but has served as a pipeline for young graduate students and postocs that will have the opportunity to attend both conferences.

4. 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 tract of minisymposia at an annual meeting?

None directly organized by the SIAG group, but there have been some organized by members of this activity group. For SIAM 2006 in July, there is a MS in Bose-Einstein condensates, there is a MS on Multiscale interactions in coherent structures and there is a MS on Progress in nonlinear optics.

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

None at this time.

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

Participation in the 2007 ICIAM conference. Organization of the 2008 conference, maybe in Europe. We need to reach out to the math biology community. Design of a SIAG webpage to advertise other events, jobs etc.

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

We are relatively young and could benefit from more established SIAGs and in particular if SIAM can help us facilitate co-participation in events with the SIAG on dynamical systems, which has grown too big, we think can benefit both parties; for example, this would give SIAM members who work in the area of dynamical systems, partial differential equations and modeling venues to meet and exchange ideas every year.

Again being on the learning curve, facilitate a smooth transition between charters. If we end up setting the next conference, it will make it easier for the new charter to have time to develop things beyond the conference. (Since we started from scratch: location, times, etc), this consumed a lot of our time.

If SIAM supports the idea of a SIAG 2008 conference in Europe and current costs. While we are enthusiastic about this, at current costs there is a possibility to have a decrease in participation. We were successful in building momentum as the numbers indicate. It could be a tough enterprise to recover if we lose this momentum. SIAM has to be aware of this and find ways to make this a successful event.

SIAM could also provide funds for the officers to meet once a year.

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

Facilitate involvement of student chapters (the sum of the workshop and the conference will do a lot on this matter). Develop a website.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2007.

Signed [Alejandro Aceves](#)
SIAG Chair
Date: [April 20, 2006](#)

Nonlinear Waves and Coherent Structures

The Activity Group on Nonlinear Waves & Coherent Structures (NLW) fosters collaborations among applied mathematicians, physicists, fluid dynamicists, engineers, and biologists in those areas of research related to the theory, development, and use of nonlinear waves and coherent structures. It promotes and facilitates nonlinear waves and coherent structures as an academic discipline; brokers partnerships between academia, industry, and government laboratories; and works with other professional societies to promote NLW.

The activity group organizes the biennial [SIAM Conference on Nonlinear Waves & Coherent Structures](#).

Chair: [Alejandro Aceves](#) 1/1/05 - 12/31/06

Vice Chair: [Gerard looss](#) 1/1/05 - 12/31/06

Program Director: [Roger Grimshaw](#) 1/1/05 - 12/31/06

Secretary: [Joceline Lega](#) 1/1/05 - 12/31/06