

## CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Dynamical Systems. The SIAG/DS was originally formed under the aegis of SIAM on December 2, 1988 by the SIAM Council and December 3, 1988 by the SIAM Board of Trustees. Its initial operating period began January 1, 1989 and ended December 31, 1991. Its charter has been renewed by the council and board eight times thereafter. This SIAG had 1,268 members as of December 31, 2010; of these, 599 were students.

According to its Rules of Procedure, it is the purpose of the SIAM Activity Group on Dynamical Systems to bring together researchers working on a variety of problems in dynamical systems and to give them contact with people of similar interests but often different backgrounds. By the establishment of this SIAG, cross-disciplinary interactions will be catalyzed among workers with interests in dynamics ranging from fundamental properties of dynamical systems to the development of software for use in the study of dynamics to applications to disciplines such as physics, chemistry and engineering. Also, the SIAG will foster interactions between the academic community working in dynamics and workers in industrial and government settings.

Its purposed functions were to:

- Organize a biennial SIAM Conference on Applications of Dynamical Systems.
- Organize minisymposia at the SIAM Annual Meeting in years when there is no SIAG conference.
- 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.

To which have been added

- To award the John David Crawford Prize and the Moser Lecture
- To develop and foster the dynamical systems web portal DSWeb site for members of the activity group and the public at large.

\* \* \*

For 2012/13 we would like to incorporate the following new activities:

- *To make the “Red Sock” Student poster prize an official SIAM prize. This award currently gives a prize of US\$100 plus a pair of red socks for each of the best five posters presented by students at the biennial SIAM Conference on Applications of Dynamical Systems. Money for the award has in the past come from the pockets of the judges or (in 2011) from the co-chairs' discretionary fund. We would like SIAM to fund this award in the future.*
- To trial the use of social media to promote the activity group.

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 [two/three] years?

*The field is rapidly growing. This is witnessed by the number of participants at the biennial “Snowbird” Applications of Dynamical Systems meetings (see point 3 below). It is also rapidly evolving. Nonlinear science has famously been likened to a zoo of “non-elephant animals”. There is a strong feeling that our community therefore embraces much of modern applied mathematics and is able to rapidly evolve and assimilate new and interesting topics. The overarching community is hard to define other than it involves the mathematics of things that evolve in*

time. It has moved on a long way from “nonlinear dynamics and chaos” and indeed topics like mathematical biology and nonlinear waves and coherent structures which themselves have evolved into SIAGs have in some sense spun out of the dynamical systems activity group. Recently emerging themes of research include complex networks, mathematical medicine, climate change, energy and sustainability. There also remains a rigorous core to the discipline with an emphasis on nonlinear analysis and an activity in applications to engineering and the physical sciences (although interestingly applications to the life sciences now count for about 1/3 of the activity of the group, judging by talks at the 2011 Snowbird meeting).

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 is growing, from 1113 members at the end of 2009 to 1268 at the end of 2010. Slightly less than half of the membership (47%) are students. Of the membership, 18% are female, 29% are from outside the US, 81% are from academic institutions and 60% are from departments of Mathematics or Mathematical Sciences.

It is strongly believed that the DSWeb magazine and portal are highly successful ways of keeping abreast of changes in the field as is the close involvement of the SIAG with the editorial team of the SIAM Journal on Applied Dynamical Systems (SIADS).

We can also point to articles in SIAM News and SIAM Review written by members of the SIAG (or at least, on topics that lie squarely within the SIAG/DS remit that have been judged in those publications to be of interest to the wider SIAM community). Ones that spring to mind include John Hogan and Mike Jeffrey's review of non-smooth dynamics recently, and Mark Newman's 'Dynamics on Networks' article from approx 2005. I think there is an

article by Higham+Grindrod on counting paths in time-evolving networks in a recent or forthcoming SIAM News.

Hinke Osinga has also been very active in obtaining copy for SIAM News. There must be many other examples.

3. Please list conferences/workshops the activity group has sponsored or co-sponsored over the past two years, and give a brief (one sentence or phrase) indication of the success or problems with each.

The main physical activities of the SIAG on Dynamical Systems are centered around the the biennial “snowbird” SIAM Conference on Applications of Dynamical Systems. The list of past conferences may be found at

<http://www.siam.org/meetings/archives.php#DS>

The snowbird meeting in 2009 had 690 attendees. The conference in 2011 had over 830 attendees, which reflects the vibrancy of our community, but has also created a severe headache in terms of venue suitability and format of the meeting (see point 6 below).

We should also mention the meeting held Barcelona, June 2010:

<http://www.siam.org/meetings/dspdes/> This meeting was organised jointly with the PDE SIAG and the Spanish and Catalan Matheamtics Societies. The success of this meeting (perhaps a greater success than a previous attempt 10 years or so ago to organize a “Pacific Rim” meeting) has led to a widespread view that such kind of meetings in Snowbird

"off-years" are a great way to showcase SIAG/DS to a broader and (even more) international audience.

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

*The activity group last had a track at the SIAM Annual Meeting at the 2008 meeting in San Diego.*

*There is also a track organized at ICIAM 2011 by Evelyn Sander, past vice-chair of the SIAG. In addition, we are aware of additional MS organized by members of the SIAG at ICIAM: Hans and Tasso Kaper (MS 340 and 388) and Rachel Kuske (MS35). Maybe there are even more?*

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?

*DSweb continues to be widely read and the portal is an invaluable tool for keeping our community together. However, there was a feeling at the SIAG Business meeting at the 2011 Snowbird meeting that we need to take the lead on a move towards social media.*

*The JD Crawford and the Jeurgen Moser prizes are now well established and are seen by many as the pre-eminent international mark of esteem in dynamical-systems related research.*

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

*Plans are already afoot for the 2013 Snowbird meeting with the co-chairs already identified. One of the issues discussed at the 2011 Snowbird meeting was the extent to which the number of available talk slots were oversubscribed. SIAM are already committed to holding the 2013 and 2015 meetings at Snowbird. All participants were polled on how to manage the size of the meeting. The preliminary results of this survey are in and there seems to be strong agreement with increasing the number of poster presentations (including by Faculty), keeping the plenaries at 45 minutes and of using the whole 5 days. There is majority support for decreasing greatly the number of minisymposia and encouraging most attendees to give either contributed or poster presentations.*

*Other more tentative plans include a prize for the best Faculty poster or contributed talk at the snowbird meeting (in order to encourage a move away from minisymposia). Also a plan for a teaching-materials prize for the DSWeb portal. These will be trialed during the next charter period and if successful we may want to come back to SIAM with more formal proposals to establish these prizes.*

*We would also seek to encourage all members of the SIAG to take the lead in proposing smaller regional (perhaps co-sponsored) meetings in the "off-years" from snowbird following the successful Barcelona meeting.*

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

*SIAM is already very helpful on the multimedia side of things. As we move more to social media, we will need continuing support.*

*We would also like the hugely successful "Red Sock" student prize to be hard wired into our charter for the future and for SIAM to provide the funds for the prize money (about \$500 every two years).*

*We have agreed that SIAM will look seriously at alternative venues for the 2017 meeting, with a view to making a decision about the location of the 2017 meeting before or at the 2013 meeting.*

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

*We believe our SIAG is already evangelistic in supporting new applications of mathematics, for example through the choice of plenary speakers at the Snowbird meetings. There is a strong tradition in having invited speakers (and*

*consequent minisymposium sessions) from outside the discipline. Other innovations we would like to propose to the wider SIAM community that were pioneered at the 2011 Snowbird meeting include; a well received "In Memorium" display for several recent deceased pioneers of the community; a new "TV debate" approach to the Forward Looking Panel session.*

*We would also hope that our experiences with DSWeb and our forthcoming move towards social media can be treated as a test bed by the wider SIAM community.*

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2012.

Signed

Alan Champneys (electronic signature)

7<sup>th</sup> July 2011

---