

SIAM Council  
July 9, 2009

Agenda Item 8(c)

Board of Trustees  
Regular Session  
July 11, 2009

Agenda Item 9(c)

## 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 seven times thereafter. This SIAG has 1,113 members as of December 31, 2008.

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 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.

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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?

Dynamical systems continues to be a vibrant field, with research that spans a spectrum from pure mathematics to very applied research. The clearest benchmarks for the coverage of the field are the programs of the Snowbird SIAG meetings, the research areas of the officers and advisory board, and the content of the website DSWeb and of the journal SIADS. The number of articles submitted per year to SIADS doubled from 2006 to 2008 (to over 170), as did the number of accepted and rejected articles. Themes that continue to grow include network dynamics (including biological, social, and sensor networks) and stochastic and hybrid systems. Recent areas of growth also include research related to climate change and uncertainty management.

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?

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Membership in the SIAG/DS has been growing healthily for the last 5 years. With 1,113 members (2008) it is one of the three largest activity groups within SIAM. Student members comprise 42% of the activity group, indicating the strong interest of young people in the field. Membership is international (32% is non-US) and highly interdisciplinary (approx. 75% from non-mathematics depts, compared with 42% for SIAM as a whole). There is a large representation from engineering departments (34%), and an effort is being made to ensure representation from the engineering community among the officers and advisory board. A similar effort is being made to ensure representation among the officers from industry, to foster more connections with that community.

Membership of the associated web portal DSWeb is automatic with SIAG/DS membership, but is also free for others. There are currently approx. 2,300 members, from 84 countries. DSWeb therefore performs a valuable outreach service to a broader international audience, including many developing countries, as well as to the broader SIAM community.

The activity group continues its successful tradition of recruiting mid-career individuals for the key position of Program Coordinator, and using the two candidates for that position as co-chairs of the Snowbird conference. This year, Vivien Kirk and John Dawes have agreed to run for the position of Program Coordinator. A similar plan is being implemented for the position of Secretary: the three candidates for that position will share the chief-editorial duties associated with DSWeb and the quarterly Magazine. The duties of the Vice-Chair will be expanded to assist with stimulating and gathering content for the Magazine and DSWeb. The duties of the Chair will also be expanded to include ex-officio membership of the organizing committee for the Snowbird conference.

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

The SIAG sponsors the "Snowbird" SIAM Conferences on Applied Dynamical Systems in May of odd numbered years. These meetings continue to be among the largest SIAG meetings, with attendance increasing each year. There were over 700 attendees in 2007 and 2009, and over 700 presentations (including posters) in 2009.

A network survey was conducted by John Dawes at the 2009 conference, to understand the connectedness of the sessions. The results of that will be made available when they are ready. The results will also be put to good use, as Dawes and Kirk have agreed to co-chair "Snowbird 2011".

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

A track of 5 SIAG/DS minisymposia was organized by Sue-Ann Campbell at the 2008 annual meeting. In 2007 and 2009, the SIAG held its own conference.

The SIAG also has representation on the SIAM-JMM coordinating committee, and members of the SIAG officers and advisory board (Zeeman and Jones) organized a track of 4 minisymposia on Climate Mathematics at the 2008 JMM, and coordinated with SIAG Geosciences to arrange for a 5 minisymposia on climate, energy and natural resources at the 2009 JMM.

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?

The SIAG/DS web portal DSWeb and associated SIAG/DS newsletter DSWeb Magazine continue to be a great success. The magazine features articles, interviews, book reviews, etc, and has been edited by the SIAG/DS Secretary, Evelyn Sander. The SIAG awards two prizes, the Moser Lecture and the JD Crawford Prize, at the

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Snowbird Conferences. There are strong links between the journal SIADS and the activity group. For example, many SIAG/DS members serve on the editorial board. Members of the activity group have secured NSF funding to develop a new Climate Math web portal in collaboration with SIAM staff, aimed at the full SIAM audience, to be housed at the SIAM home page

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

SIAG/DS will continue to maintain DSWeb and the quarterly Magazine, and to award the John David Crawford Prize and Jürgen Moser Lecture.

SIAG/DS will organize the following:

- 11<sup>th</sup> SIAM Conference on Applied Dynamical Systems, Snowbird, Utah, May 2011
- DS track at ICIAM and/or at the SIAM Annual Meeting in 2012
- 12<sup>th</sup> SIAM Conference on Applied Dynamical Systems, Snowbird, Utah, May 2013

SIAG/DS is also jointly organizing the conference DSPDEs '10 (*Emerging Topics in Dynamical Systems and Partial Differential Equations*), Barcelona, Spain, May 31st, – June 4th, 2010. DSPDEs is co-sponsored by SIAG/DS, SIAG/APDES and the three Spanish Math Societies RSME, SCM and SEMA.

New links between the SIADS journal and SIAG/DS are also being forged. For example, DSWeb is now going to include a quarterly *Best Multimedia Materials* feature from SIADS (chosen by a subcommittee of SIADS editors). This will give access to some of the most compelling SIADS materials to people who don't already subscribe to SIADS, thereby serving the dual purpose of outreach for SIAM and advertising for SIADS.

In a similar vein, there is a plan to be more active in sharing DSWeb Magazine articles with the broadest appeal with SIAM news, for the larger SIAM audience.

Development of the SIAM-based Climate Math Web Portal will continue, with the goal of coming on-line by Summer 2010.

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

The timely reminders from SIAM staff to help SIAG officers carry out our duties are much appreciated, thank you. The one area where this could be improved, would be to provide materials required for our administrative duties at Snowbird more in advance of the meeting, so we can prepare in advance, rather than during precious meeting time. For the chair, this particularly includes the prize committee's citations/nominations and any other materials to help prepare for the prize awards ceremony. For all the officers, it includes a fuller description of how the business meeting traditionally runs, what materials will be provided, and by whom. The lunch meeting with SIAM staff before the business meeting is also extremely helpful. We hope that tradition will continue.

The funds currently provided for the two chairs of the Snowbird meeting to attend the meeting are insufficient to cover their basic travel expenses. The meeting is hugely successful and continues to grow, drawing over 700 participants in recent years. We think it's important to recognize the vital role of the chairs in the success of the meeting by properly covering their travel and hotel costs. We are discussing mechanisms for remedying the situation with SIAM.

The SIAM web and publication staff are extremely helpful with our the SIAG's online activities, including DSWeb, the magazine and the Climate Math web portal plans, for which we are very grateful. The one area where we would like to explore possibilities for more support is that of converting accepted articles (e.g. for the

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magazine) to HTML format. This technical task places a regular burden on the magazine editors, and will also arise (transiently) during development of the Climate Math web portal.

Discussions to increase the Moser Lecture Award to \$5,000 continue. The idea is to fund-raise from the membership, starting with substantial donations from senior SIAG/DS members, in the hope that SIAM might provide matching funds.

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

DSWeb and the associated Magazine are an excellent way to promote applied mathematics and computational science, and have a far broader reach than simply the SIAG membership; providing both outreach and advertising for SIAM.

The Climate Math Web Portal will serve as an introduction to climate modeling and climate change research for a broad mathematical audience. The mathematical challenges underlying climate change research are extremely varied in mathematical nature, providing opportunities for important contributions from the full breadth of the SIAM spectrum.

SIAG/DS and the Snowbird meetings have an excellent track-record of attracting non-mathematicians. As mentioned above, over 75% of the SIAG/DS membership is from non-mathematics departments.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2010.

Signed

A handwritten signature in cursive script, reading "Mary Lou Zeeman". The signature is written in dark ink and is positioned above the typed name and title.

Mary Lou Zeeman  
SIAG/DS Chair  
June 23, 2009