

## CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Geosciences. The SIAM Activity Group (or SIAG) to which this renewal applies was originally formed under the aegis of SIAM on July 1991 by the SIAM Council and July 1991 by the SIAM Board of Trustees with its initial operating period beginning January 1, 1992 and ending December 31, 1994. Its charter has been renewed by the Council and Board five times thereafter. This SIAG has 400 members as of December 31, 2009.

According to its Rules of Procedure, the objective(s) of the SIAG are to provide an established forum for interdisciplinary interactions among mathematicians, engineers, chemists, physicists, and other scientists having special interests in flow in porous media and geophysics.

Its purposed functions were to organize activities, including conferences and publications, to promote the interaction of practitioners and researchers and to keep the SIAM membership up to date on trends in geosciences.

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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 three years?

Among the many disciplines the members of the Activity Group on Geosciences work in, the most dynamic area is the area of porous media, where members are working with petroleum engineers (enhanced oil recovery), biologists (bio-remediation of groundwater, bio-tissue which are porous in nature), chemists (reactive transport), and mechanical engineers (rock deformation). Mathematically inverse problems and problems involving uncertainty are probably the areas of most activity. Multi-physics applications, e.g., coupling of surface and subsurface flows, have been an area of increased activity. The increasing complexity of physical problems and the need for higher resolution data-driven simulations have lead to even more active development of accurate discretizations and efficient dynamic algorithms for massively parallel computers. Areas in which this SIAG is making a focused effort to improve activity involvement include: seismic modeling, ocean modeling, atmospheric modeling, as well as climate modeling and uncertainty quantification. The latter is, for example, the topic of a minitutorial that we are organizing at the next Geosciences conference, and SIAG GS members have been instrumental in promoting this topic at related IMA meetings also. In particular, many of our members are active in the organization of the IMA workshop "Societally Relevant Computing" which will be held April 11 - April 15, 2011.

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?

This SIAG is growing. The primary interaction and appreciation for participation in this SIAG is the bi-annual meeting. There were 270 registered at the 2005 meeting, and participants numbers grew consistently with more than 400 people attending at the Leipzig conference in 2009.

One consistent comment we received in the last meetings has been complements on the quality of talks. The number of sessions in particular areas has been representative of the level of research activity in that area (e.g. decreasing number of sessions on bio-remediation, increasing number of sessions on inverse problems and oil recovery, as well as ocean and atmospheric modeling). We held the 2005 meeting in France to encourage European participation, which was appreciated by the Europeans; although we had a decrease in participation from the U.S., this was compensated by an increase in participations from Europe. Our 2007 meeting was in the USA, but in 2009 we were back in Europe (Germany), which strengthened again our European membership numbers. Our upcoming 2011 meeting will be in Long Beach, CA. Where we need to improve is attracting members/participants in seismic

modeling (wave propagation/ inversion problems), ocean modeling, atmospheric modeling, and participants from industry. For the last three meetings we have had organizing committee members from those areas, made a concerted effort to invite persons in seismic modeling as plenary speakers and to organize sessions.

Our membership is growing, which is evident of the group being active and vibrant. The total number of members in 2009 was 411, up from 363 in 2008 and 323 in 2007. We are particularly pleased that our student membership is growing with 155 students in 2009, compared to 128 in 2008 and 82 in 2007. This shows that our outreach efforts are paying off.

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.

- SIAM Conference on Mathematical and Computational Issues in the Geosciences (GS07), held in Santa Fe, New Mexico, in collaboration with
- SIAM Conference on Mathematical and Computational Issues in the Geosciences (GS09), held in Leipzig, Germany

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 track

- 2008 (joint mathematics meeting): Organized by members:  
AMS-SIAM Special Session on Environmental Mathematics: Some Mathematical Problems on Climate Change and Geophysical Fluid Dynamics, I, II, and III.
- 2009: Organized by members:  
CP5 (inverse modeling) and CP 26 (Seismic and geophysical modeling). Also two of the plenary addresses were in our area (IP1 and IP0).

Last track of minisymposia organized at an annual meeting: Unknown.

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?

Most interactions occur at our biannual meetings.

We have a newsletter with regular publishing schedule, a wiki website hosted by SIAM, and two Geosciences prizes (junior scientist, career award)

We have also done our best to frequently report about our activities in SIAM News.

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

- 2011 biannual meeting in March of 2011 in Long Beach, CA.
- Submitting articles for SIAM news.
- Further growth of student membership.
- Continuation of Geosciences awards in recognition of outstanding members.
- Close interaction with sister organizations, including Interpore.

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

- SIAM has been extremely helpful with the administration of organizing meetings, keeping this SIAG on track as far as keeping the charter and bylaws updated.

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

- Feedback from new participants at our bi-annual meetings overwhelmingly complement the quality of the talks. Bringing more diverse participants to our bi-annual meetings, especially persons who are in other fields and tend to be more theoretical, become exposed to SIAM, and this should increase the awareness and interest in SIAM.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2011.

Signed  
Margot Gerritsen  
Chair, 2009-2011

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