

SIAM Activity Group Geosciences Charter Renewal Application

This CHARTER RENEWAL applies to the SIAM Activity Group on Geosciences (SIAG/GS). The SIAG/GS was originally formed under the aegis of SIAM in July 1991 by the SIAM Council and 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 nine times thereafter.

Statistics:

- *This SIAG has 463 members, including 154 student members and 309 non-student members, as of December 31, 2017*
- *There are 56 female and 240 male members of this SIAG who are non-students*
- *There are 187 domestic members and 122 international members who are non-students*

According to its Rules of Procedure, the objective of the SIAM Activity Group on Geosciences is 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:

1. *The SIAG will 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.*
2. *The SIAG shall not present awards or otherwise recognize scientific achievement, professional service, or the like without prior approval by both the SIAM Major Awards Committee and the SIAM Council of the award criteria, the method of selection of recipient(s), the nature of the award, and all other aspects, if any, of each such award must have the prior approval of the SIAM Board of Trustees.*

Other activities may include:

3. *Organize minisymposia at the SIAM Annual Meeting in years where there is no SIAG conferences.*
4. *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.*
5. *Organize a biennial SIAM Conference on Geosciences. The SIAG will consider dovetailing specialized workshops and conferences with the SIAM Annual meeting or other SIAG conferences. The chair of the conference organizing committee shall be either the program director or the chairperson of the SIAG or their designee. The organizing committee must be approved by the VP for Programs at least 16 months before the conference.*
6. *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.

7. Award the biennial SIAG/GS Career Prize and the SIAG/GS Junior Scientist Prize.

8. Maintain a wiki site for the activity group

http://wiki.siam.org/siaggs/index.php/Main_Page

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).

- Chair: Susan Minkoff
- Vice-Chair: Jodi Mead
- Program Director: Sorin Pop
- Secretary: Yuguang Chen

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 field of computational geosciences is flourishing. There are new areas that are important today which were not envisaged when the activity group was organized in 1991. (I recall attending that very meeting in Houston as a graduate student.) Specifically, climate modeling is very important today (including topics such as sea ice modeling, tsunami/hurricane modeling, etc). Also unconventional resource recovery and renewable energy are two very important relatively new areas of active research in the mathematical community today. Topics such as recovering oil and gas from shale rock, microseismic event modeling, and methane hydrates fall under the category of unconventional resource recovery. For renewable energy areas of research including wind energy, geothermal energy, and solar power are of great interest. In terms of an application area, mathematical and computational geosciences is as vibrant and relevant today as in the early 1990's.

Mathematically solving these problems requires the use of sophisticated mathematical and computational tools including (but not limited to) multiphysics and multiscale modeling, high performance computing, and most recently data analytics and machine learning.

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 group has remained relatively stable throughout the last 27 years with the size of the group neither growing rapidly nor decreasing substantially. The SIAG has done a good job of including new topics as the energy and environmental fields evolve (especially including more on climate change, renewable energy and unconventional resource recovery). To tackle the challenges of these new areas sophisticated mathematics and computing are essential. As can be seen with some of the recent disasters such as the BP oil spill, much still needs to be learned, and modeling and simulation of these complex processes is crucial for increasing our understanding of these new processes as they are being pushed forward due to increasing energy demands and our changing climate.

4. 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.

In 2017 the SIAM Geosciences Conference was held in Erlangen, Germany. There were approximately 450 attendees at the meeting and 81 minisymposia. In March 2019 the next SIAM Geosciences meeting will be held in Houston, Texas with a special interest in attracting more industry participation.

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

I am not aware of the number of SIAM GS minisymposia organized by the activity group at the last two SIAM Annual meetings. However, in Portland this summer SIAM Geosciences will have a track with 10 minisymposia and one invited speaker.

Because of the number of Activity Groups, the current guidelines are that an Activity Group should organize a track about every seven (7) Annual Meetings or meet jointly with the Annual Meeting within a seven (7) meeting period.

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 activity group does maintain a website for the group. There has intermittently been a newsletter/wiki although it is not currently active. However information is sent via the listserv about jobs and events of interest to the group several times per week. There are two prizes given at each of the SIAM Geosciences meetings (a junior scientist prize and a career award). Also, we do have a new SIAM News liaison (Talea Mayo). A recent issue of SIAM News focused on Topics in the Geosciences (January/February 2018).

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

The next SIAM Geosciences meeting will be held in Houston, Texas, in March 2019. We are holding it in Houston in part to attract more industry participation. Most of the major oil companies and many service companies are now located in Houston. We have one invited speaker (of 6) from ExxonMobil (confirmation pending) and plan to have a panel with folks from industry (and perhaps academia and labs). We also hope to organize sessions on "problems of interest to industry" at the SIAM GS 19 meeting.

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

Finding ways for us to attract more industry members to SIAM overall which is especially relevant for this activity group.

9. *How can the activity group help SIAM in its general role of promoting geosciences?*

Our conferences tend (more than many activity groups) to be of interest to industrial participants at oil and gas companies, etc. We have the ability with appropriate promotion and advertising to build interest in SIAM in the industrial community.

This SIAG/GS requests that the SIAM Council and Board of Trustees renew its charter for a two year operating period beginning January 1, 2019.

Susan E. Minkoff

6/13/18

Signed and dated by current SIAG Chair