

CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Financial Mathematics and Engineering (SIAG/FME). The SIAG/FME was originally formed under the aegis of SIAM on December 7, 2002 by the SIAM Board of Trustees and on March 26, 2003 by the SIAM Council with its initial operating period beginning January 1, 2003 and ending December 31, 2005. Its charter has been renewed by the council and board two times thereafter. This SIAG has 503 members as of December 31, 2007.

According to its Rules of Procedure, the objective(s) of the SIAG are:

- To foster collaborations among mathematical scientists (including probabilists, statisticians, functional analysts interested in stochastic control and dynamic programming, numerical analysts interested in the numerical solution of parabolic PDEs), computer scientists, computational scientists, and researchers and practitioners in finance and economics;
- To foster collaborations in those areas of research related to theory and to the development and use of mathematical and computational tools in quantitative finance in the public and private sector;
- To promote and facilitate the development of financial mathematics and engineering as an academic discipline.

Within the framework of SIAM, the SIAG/FME will conduct activities that implement its purposes.

Its proposed functions are:

- 1) Organize minisymposia at the SIAM Annual Meeting on years where there is no SIAG conference.
- 2) Organize a track of at least six minisymposia at the SIAM Annual Meeting at least once every five years. The SIAM Vice President for Programs and the SIAM Vice President at Large will coordinate the scheduling with the SIAG/FME chair.

Other activities can include:

- 3) Broker partnerships between academia, industry, and government. The SIAG will seek to facilitate the establishment of academic programs in FME and to foster its development as an academic and research discipline. The SIAG also will facilitate the placement of undergraduate and graduate students in internships in industry and government.
- 4) Work with other societies (such as the AMS, IMS, and INFORMS) to promote financial mathematics and engineering. The SIAG will work with other professional societies and industry groups to promote FME. For example, SIAM and another society might organize a workshop on a topic of mutual interest. The SIAG also would attempt to increase government support for FME through various outreach activities.
- 5) 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.

The SIAG/FME 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?

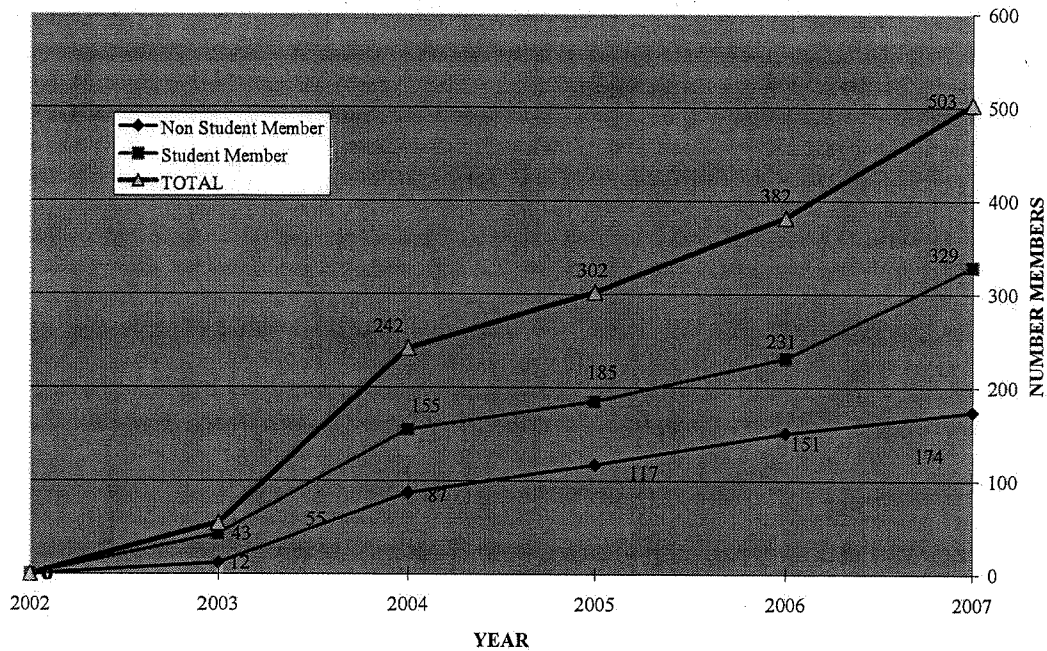
The field of Financial Mathematics and Financial Engineering still has many facets, stretched in many directions, ranging from the compounds of financial economics in business schools to the trenches of trading desks and quant groups often led by holders of physics PhDs. Somehow in the middle, the part of financial mathematics driven by semi-martingale models and arbitrage theory remains active, especially in Europe. But this group of academics, well represented by the Bachelier Society, seems to be shifting gears and work in mass on problems within the scope of the theory of risk measures. Even though all these emphases are covered by the charter of the SIAG, the niche carved by the FME SIAG is more focused on applications involving computations (e.g. to solve pricing PDEs, to run large scale Monte Carlo simulations, etc.) and the public recognition by main journal of the Bachelier Society, Finance & Stochastics, that it should cover more of computational issues in the field is a vindication for the SIAG's choices.

Also, new sets of important applications such as high frequency electronic trading, liquidity modeling and order book managements to name a few, have recently brought to the forefront new needs for technical skills that the SIAG is perfectly positioned to offer.

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 Activity Group is now over its growing pains and it seems to be settling in a niche of its own. The SIAG membership has continued to increase, and interestingly, the pace at which it is increasing is also increasing. Up until 2006, the numbers of students and of non-student members were growing at the same pace. However, the number of student members increased faster in 2006. This phenomenon is presumably linked to the boom in employment and salaries in investment banking which triggered a burst of interest in the student population contemplating a job in industry. It will be interesting to see if this growth is sustainable as we witness the dire consequences of the subprime crisis and the ensuing credit crunch: will the numerous downsizing moves and the significant slow down in recruiting efforts tame the interest of students in the FME SIAG.

SIAG/FME MEMBERSHIP HISTORY



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.

First SIAM Conference in Financial Mathematics, Boston July 8-9-10 2006

This conference was considered as extremely successful. We had 254 registered participants, 36 Invited Minisymposium papers, 51 contributed submissions (we needed to add a full day the Sunday before the conference to accommodate the accepted submissions), and 4 poster submissions.

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 of minisymposia at an annual meeting?

In 2006, the SIAG organized the First SIAM Conference in Financial Mathematics in parallel with the Annual meeting in Boston and during this conference

** 8 Invited Minisymposiums*

** 9 Contributed Minisymposiums*

took place. At the 2007 ICIAM Meeting in Zurich there were 8 Minisymposiums on Financial Mathematics, Modeling and Computation organized by SIAG members. An article on these symposia appeared in SIAM News in the Fall of 2007.

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

1) An article on energy trading was written by SIAG members for the SIAM News

2) Officers and Members of the SIAG organized and participated in, a very successful two days series of Minisymposiums at the Annual AMS Meeting in San Diego in January 2008.

3) The FME SIAG has created a web site. Unfortunately, it has remained "amateurish" and it still is at a development stage.

4) Discussions for the creation of a prize fell through, mostly because of the lack of a clearly identified target. With the creation of a peer reviewed journal, the SIAG will revive the idea of a "Best Paper Prize" will be revived and pitched to possible industrial partners for endorsement and funding.

5) Financial Mathematics will be one of the "nodes" of the WhyDoMath web pages sponsored by SIAM

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

1) **2nd SIAM Conference in Financial Mathematics and Engineering (FM08)**
November 21-22, 2008, The Heldrich Hotel, New Brunswick, NJ

2) **Launch of the SIAM Electronic Journal of Computational Financial Mathematics**
Building on the momentum created during the July 2006 business meeting in Boston, two officers of the SIAG prepared and circulated a first draft of a proposal for a journal. After significant revisions, a proposal for the creation of the SIAM Electronic Journal of Computational Financial Mathematics was submitted in January 2008.

3) **3rd SIAM Conference in Financial Mathematics (joint with the SIAM Annual Meeting)**

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

1) Providing technical support for the design and the maintenance of a more professionally looking Web site.

2) Supporting the creation of the proposed journal EJCFM.

3) The SIAG originally wanted the 2nd SIAM Conference in Financial Mathematics to be held in a major financial center such New York or Chicago. We were informed by SIAM's staff that this was prohibitively expensive, because SIAM's preference to hold meeting at hotels. While we do not have any particular suggestion, it would be nice if SIAM staff could come up with a way around this problem for a future meeting.

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

More than in many other fields of applications of mathematics, cutting edge research is done in the industry. Despite a veil of secrecy, "quants" do make papers available to the general academic population, even if with a significant delay. They also participate in conferences and contribute to the livelihood of the financial mathematics community. Since many of these quants have a physics or applied mathematics background, they should be naturally drawn toward the FME SIAG, and engaging them will increase the footprint of SIAM in industry.

Risk management and the control of financial risk is not limited to investment banking, and many industrial sectors at the fringe of the financial industry (insurance, energy, high tech, ...) are in need of the tools developed by and for the financial investment world. Moreover, government agencies and policy makers are more than ever relying on market mechanisms to help control societal problems like the proliferation of Green House Gases and global warming. Here again, the FME SIAG could be the right conduit for scientists involved in environmental economics and sustainable systems to reach out to SIAM.

Financial applications have been very successful for attracting students to classes in probability, statistics, scientific computing. By embracing Financial Mathematics as a field of Applied Mathematics, SIAM will increase the likelihood that these quantitative students will come to Applied Mathematics Programs.

This SIAG requests that the SIAM Council and Board of Trustees renew its charter for a two-year operating period beginning January 1, 2009.

Rene Carmona
SIAG/FME Chair
4/29/2008