Charter Renewal Application for the
SIAM Activity Group on Financial Mathematics & Engineering

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Financial Mathematics & Engineering. 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 three times thereafter. This SIAG had 865 members, including 595 student members, as of 12/31/2011.

According to its Rules of Procedure the purpose of the SIAM Activity Group on Financial Mathematics and Engineering is to foster activity in the area of mathematical modeling in finance, computational finance and financial engineering. Its goals are:

- To foster collaboration among mathematical scientists -in areas including probability, statistics, functional analysis, control theory, numerical analysis, computer science, and computational mathematics- and researchers and practitioners in finance and economics;
- To foster collaboration in those areas of research related 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 financial engineering as an academic discipline.

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

Its proposed functions were:

The SIAG on FME will organize activities in Financial Mathematics & Engineering. The SIAG is expected to:

1. Organize minisymposia at the SIAM Annual Meeting in years where there is no SIAG conference.
2. 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.

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. 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.

5. Organize a biennial SIAM Conference on Financial Mathematics & Engineering. 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. Award of the biennial SIAG/FME Junior Scientist Prize, established in 2010.

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).

Rama CONT (Columbia): Chair

Ronnie SIRCAR (Princeton): Vice Chair

Kay GIESECKE (Stanford): Secretary

Mike LUDKOVSKI (UC Santa Barbara): Program Director

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 interface between mathematical modeling and finance has never been as active as it is now: the recent financial crisis has focused great attention on the importance on the modeling, measurement and management of financial risks as well as the need for better tools in this field, in particular in relation with issues regarding systemic risk and financial regulation. As a result, the field has been greatly expanding its scope beyond its traditional focus on derivatives pricing and hedging; new topics for research, such as
-modeling of liquidity risk
-measurement and modeling of systemic risk and financial instability phenomena
- energy and commodity markets
-high frequency financial data and limit order markets
- model uncertainty and its impact in risk management
have emerged and are being actively pursued by SIAG members and other researchers worldwide. Overall, the focus has shifted from detailed analytical modeling of derivatives to large-scale models (large portfolios, systemic risk) and complex data structures (high frequency data, limit order books, interbank networks) which present computational challenges and stronger links with economics/ finance theory. Significant advances have been made in these topics, which were little explored previously by mathematicians but which now have becomes the focus of a lot of recent research, much of it presented at the SIAM FM12 conference.

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?

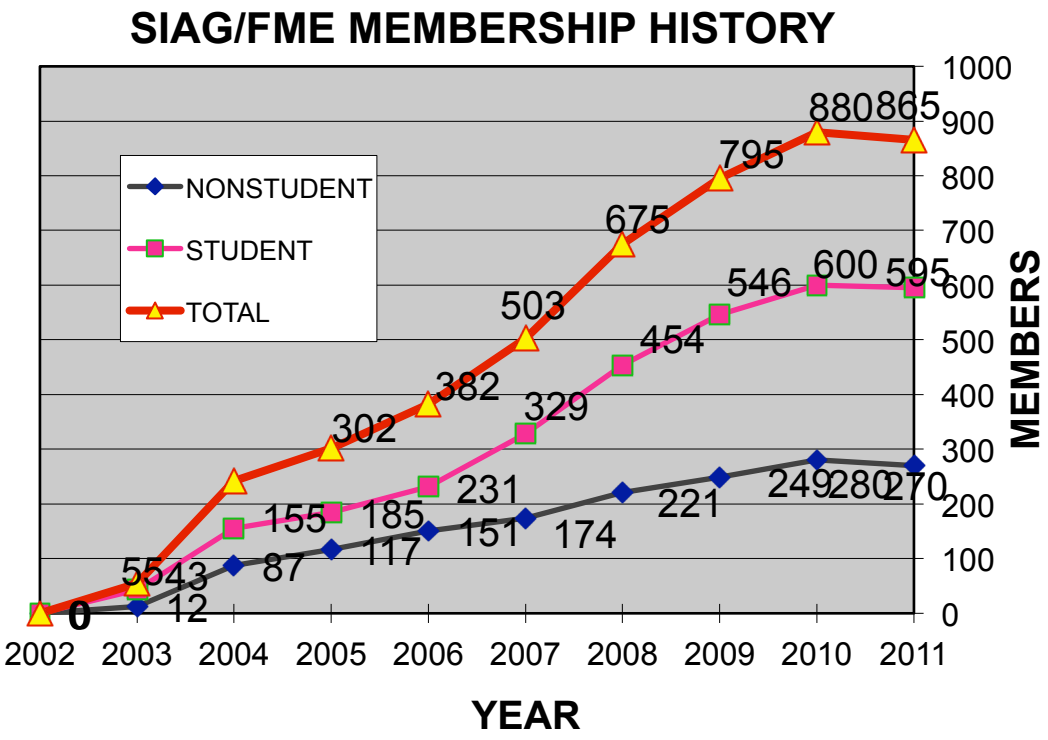
SIAG FME has become SIAM’s outlet to the very active field of quantitative modeling in finance and succeeded in attracting a broader audience to SIAM’s membership and SIAM events.

The activity group is as vibrant as before with a large number of members, including a high percentage of students. Membership includes a substantial fraction of European members (the field is well represented in Europe) and practitioners from the financial services sector (banks, insurance, asset management, regulatory bodies) which creates a good mix at SIAG events, well attended by all categories.

The flagship journal associated with the SIAG FME (SIAM Journal of Financial Mathematics) has established itself as a high quality mainstream journal at the interface of applied mathematics and finance.

The SIAG FME Conference has established a reputation as one of the best conferences in this field and perhaps the only conference were a broad range of mathematical topics are represented alongside many talks of practical interest for industry professionals.

SIAG FME has responded to the changes in the field (see above) by creating minisymposia on novel topics at SIAM FME conferences and at ICIAM. SIAG FME members have responded equally well by submitting contributions related to the emerging topics of the field, making SIAM FM12 quite representative of the current state of the field, which is very satisfactory.



4. 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.

   The SIAG FME organizes the biennial conference on Financial Mathematics & Engineering. This list of conferences may be found at: http://www.siam.org/meetings/archives.php#fm.

   The SIAM Conference on Financial Mathematics & Engineering 2010 was held in San Francisco on November 19-20, 2010 and had 266 attendees including 147 paid non students and 89 paid students attending.

   The SIAM Conference on Financial Mathematics & Engineering 2012 will be held in Minneapolis jointly with the SIAM Annual Congress 2012.
   This meeting has attracted a large number of submissions on a wide range of topics including topics of current interest such as: Systemic Risk, Credit Risk, Stress testing methods, Portfolio theory, Stochastic control, PDEs in Finance, Stochastic analysis, Computational methods in finance, Asymptotic methods in finance, Spectral methods.

   Noteworthy is the international and thematic diversity of contributed and plenary speakers.
   We have also taken the initiative, in this meeting and the previous one, to include a MiniTutorial on topics of current interest, given by a practitioner. This year's Tutorial on 'Mathematical Modeling of interest rates' is given by Dr F Mercurio (Bloomberg Research).

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

   The SIAG FME 2012 Meeting will be held jointly with AN12 in July 2012.

   This conference includes 30 invited Minisymposia as well as 13 Contributed Sessions.

   SIAG FME has also organized 9 Minisymposia on 'Advances in Financial Mathematics' at ICIAM 2011 in Vancouver.

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 SIAG FME sponsors, since 2010, the *SIAG FME Junior Scientist Prize.*

This prize is attributed bi-annually to an outstanding junior researcher for distinguished contributions to mathematical modeling in finance in the three calendar years prior to the year of the award.

This prize is being increasingly publicized in the community and we received a series of high quality nominations for the 2012 edition.

The 2012 Award went to Dr Sergey NADTOCHIY (Oxford) for "impressive contributions to Mathematical Finance and original, sophisticated and rigorous mathematical analysis of challenging problems in volatility modeling and derivative pricing theory."

The members of the selection committee for the 2012 award of the prize were:
Rama Cont (Chair), Damir Filipovic (EPFL, Lausanne), James Gatheral (CUNY), Kay Giesecke (Stanford), Roger Lee (Univ Chicago) and Thaleia Zariphopoulou (Oxford & UT Austin).

- Articles in *SIAM News*

  SIAG FME members have contributed articles to SIAM News on several occasions on issues related to SIAG FME topics and activities. The most recent one was an article by Kay Giesecke and Richard Sowers on Financial Mathematics at ICIAM in 2011: ICIAM 2011: Contagion
  and also
  FME 2010: Global Meltdown Broadens Agenda for Research in Financial Math by Ronnie Sircar in 2011: http://www.siam.org/news/news.php?id=1860

- Dialogue with the US Office of Financial Research:

The Activity Group has also represented the interest of the applied mathematics community in discussions with the newly founded US Office of Financial Research (OFR). Rama CONT (Chair) serves as a scientific counselor to OFR since its inception in Dec 2011. The OFR is an emerging government organization which is expected to play a role in the funding of research in our field and maintaining a link with OFR will enable SIAM to have a say in the orientation of eventual grant/research programs when the time comes.

- Minisymposia at ICIAM

  SIAG FME maintained a strong presence at ICIAM 2011 in Vancouver: SIAG FME organized a series of 9 minisymposia on *Advances in Financial Mathematics: Theory and Applications* at ICIAM 2011, on the following topics:

- 1. Equilibrium & Games in Economics & Finance
- 2. Credit Risk and Modeling
- 3. Computational Finance
- 4. High Frequency Trading
- 5. Portfolio Optimization & Risk Measures
- 6. Stochastic Optimal Control
- 7. Stochastic Volatility Modeling and Derivatives
- 8. Real Options & Commodities
- 9. Systemic risk & Liquidity risk

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

Planned future activites include:

- Organization of the SIAM FME conference in 2014

- Organization of a joint SIAM/SMAI (French applied mathematics society) conference in 2013 or 2014: both SIAG FME and SMAI members have expressed interest in this and the president of SMAI, Maria ESTEBAN, has agreed to the principle of a joint event, details of which remain to be fixed.

-More generally, given the significant proportion of SIAG members in Europe, it is relevant to consider joint meetings of this type in Europe (in particular UK and Germany) in the future.

- Organization of Minisymposia related to mathematical modeling in finance at the ICIAM 2015 meeting in China

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

SIAM can help the activity group achieve its goals by

-renewing its support for SIAG FME through its next term

-including SIAG FME members or scientists in fields represented by SIAG FME in various SIAM Prize committees, ensuring that the growing field of mathematical modeling in finance is represented as it should when it comes to recognition and exposure of its members research activities

-including the topics promoted by SIAG FME (mathematical modeling in finance, computational finance) among plenary talks at the SIAM Annual Congress. Mathematical modeling in finance appeals to a wide range of mathematical and computational techniques and plenary talks on this topic can certainly interest a wide audience among SIAM members, not restricted to SIAG FME members. ICIAM and ICM have followed this path in the recent years.

9. How can the activity group help SIAM in its general role of promoting financial mathematics and engineering?

The SIAG FME has contributed to SIAM's general goals by

- promoting SIAM membership and SIAM meetings to a broader audience including researchers and students involved in mathematical modeling in finance as well as industry professionals and finance academics
- promoting the use of mathematical models and methods in finance and enhancing the visibility of research done by SIAM members to this wide audience
- establishing the importance of SIAM as a serious player and partner for dialogue with industry and government in issues related to the use of mathematical models in risk management and finance.

This SIAG hereby requests that the SIAM Council and Board of Trustees renew its charter for a two year operating period beginning January 1, 2013.

Rama Cont
SIAG/FME Chair New York, May 31, 2012