

SIAM Council  
July 9, 2009

Agenda Item 8(e)

Board of Trustees  
Regular Session  
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## CHARTER RENEWAL APPLICATION

This CHARTER RENEWAL APPLICATION applies to the SIAM Activity Group on Linear Algebra. The SIAG/LA was originally formed under the aegis of SIAM on July 19, 1982 by the SIAM Council and July 20, 1982 by the SIAM Board of Trustees. Its initial operating period began January 1, 1983 and ended December 31, 1985. Its charter has been renewed by the council and board eight times thereafter. This SIAG has 686 members as of December 31, 2008.

According to its Rules of Procedure, the objective(s) of the SIAG/LA are to identify and explore the links between linear algebra and other applied sciences, to stimulate the applications of linear algebra, and to foster research in linear algebra and its applications.

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

Its purposed functions are to conduct sessions at regular SIAM meetings, conduct special meetings, and participate in organizing publications in the areas of linear algebra and its applications. The activity group awards the SIAG/LA Prize, established in 1987. It is awarded every three years to the author(s) of the most outstanding paper, as determined by the prize selection committee, on a topic in applicable linear algebra published in English in a peer-reviewed journal within the three calendar years preceding the year of the award.

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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?

The field of linear algebra continues to grow and thrive. The continuing and even growing importance of linear algebra research can be seen from the number of successful programs which the SIAG/LA is leading and in which it is involved. In particular, the number of conferences and workshops taking place on different aspects of Applied and Numerical Linear Algebra is growing in quantity, in number of participants, and in the quality of the expositions; See the list of meetings co-sponsored by the SIAG below, which provides a sample of the events worldwide. In addition, the number of proposed minisymposia and contributed papers at the forthcoming SIAM Conference on Applied Linear Algebra (the SIAG triennial meeting) is a record.

One especially notable example of the growth of activities is the new International Summer School on Numerical Linear Algebra (ISSNLA), which had its inaugural session in July 2008 and was organized jointly by the SIAG/LA and the Mathematical Modeling and Simulation Science and Technology (SIMUMAT) project and held at the Centro Internacional de Encuentros Matematicos (CIEM) in Castro Urdiales, Spain. The SIAG/LA is already organizing the second ISSNLA, which will take place at the Centro Internazionale Alti Studi Universitari (CIASU), (<http://www.ciasu.it>) located in Fasano, not far from Bari, Italy, June 7-18, 2010. The ISSNLA will take place every three years thereafter.

In order to launch the ISSNLA, the SIAG prepared a "planning document," which was approved by the SIAM Executive Director, and it is the basis for the ISSNLA functioning in the years to come (it is available on the SIAG/LA's website). This document establishes, among other things, an advisory committee, currently having eighteen members. This committee advises on the topics which are most relevant, or those which are most active, and it also suggests possible lecturers for these courses. Thus, the list of courses given at the ISSNLA in 2008 and those slated to be given in 2010 give a good idea of the current trends in the field.

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Four courses were given in 2008: Krylov subspace methods for solving linear systems, Matrix methods in data mining, Mechanics and linear algebra, and Structured eigenvalue problems: modern theory and computational practice. For 2010 the courses will be: Minimizing communication in numerical linear algebra, Nonlinear eigenvalue problems: analysis and numerical solution, From matrix to tensor: the transition to computational multilinear algebra, and Linear algebra and optimization.

The courses are aimed primarily at doctoral students in fields where numerical linear algebra is used. Seventy-five graduate students applied to the 2008 program. Fifty students from eighteen countries were accepted and attended the school.

For the 2008 ISSNLA, the local organizers raised 29,000 Euros, this includes 12,000 Euros from SIMUMAT, 6,000 from CIEM (the conference center belonging to the Universidad de Cantabria), and other Spanish sources. This total figure also includes 1,500 Euros contributed by GAMM through its special interest group in numerical linear algebra. The latter was earmarked to help the expenses of two students from Eastern Europe. In addition, SIAM contributed US\$2,500. The US-based members of the steering committee of the ISSNLA obtained an additional US\$13,000 from an NSF grant which were used to pay all the expenses of five US-based students. There was no registration fee, and many students' local expenses were partially or completely covered.

The 2010 ISSNLA will be the first "Gene Golub SIAM Summer School," partially supported by SIAM funds derived from Gene Golub's estate left to SIAM. SIAM has pledged US\$75,000 for this summer school. Local organizers expect to raise at least 30,000 Euros from Italian sources.

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 membership of the SIAG/LA is growing each year. Our membership is currently 627 members, up from 457 members in 2006.

In addition to organizing the SIAM Conference on Applied Linear Algebra every three years and presenting its prestigious triennial prize in linear algebra, the SIAG/LA has organized and sponsored several contributed sessions and minisymposia on linear algebra and numerical linear algebra at the 2008 SIAM Annual Meeting in San Diego, five international conferences and workshops in 2007 and 2008 with more planned for 2009, and is sponsoring contributed sessions and minisymposia on linear algebra topics at the upcoming SIAM Annual Meeting in Denver and organizing a linear algebra track for the 2010 SIAM Annual Meeting in Pittsburgh.

We continue to have strong ties with other societies, and in particular with the International Linear Algebra Society (ILAS) and with the GAMM activity group on applied and numerical linear algebra.

The SIAG/LA also tries to maintain visibility within SIAM by publishing articles in the SIAM News.

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.

In 2007 and 2008, the SIAG/LA sponsored five conferences and workshops:

The 2007 International Conference on Preconditioning Techniques for Large Sparse Matrix Problems in Scientific and Industrial Applications, Toulouse, France, July 9-12, 2007

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Computational Methods with Applications, Harrachov, Czech Republic, August 19-25, 2007

The IMA Conference on Numerical Linear Algebra and Optimisation, University of Birmingham, UK, September 13-15, 2007

The seventh International Workshop on Accurate Solution of Eigenvalue Problems, Dubrovnik, Croatia, June 9-12, 2008

The fifth International Workshop on Parallel Matrix Algorithms and Applications (PMAA'08), Neuchatel, Switzerland, June 20-22, 2008. .

We also worked in cooperation with ILAS on the Fourteenth ILAS Conference in Shanghai, China, including a SIAG/LA lecture as part of the conference program, and on the Fifteenth ILAS Conference in Cancun, Mexico.

There were seventeen minisymposia and two plenary lectures on different applied or numerical linear algebra at the ICIAM in Zurich in 2007 (a detailed report on these activities at the ICIAM can be found on the SIAG/LA website)..

The SIAG/LA organized two contributed sessions on "Linear Algebra and Applications" and three minisymposia at the 2008 SIAM Annual Meeting in San Diego.

In 2008 the SIAG/LA organized the highly successful first SIAG/LA International Summer School on Numerical Linear Algebra (ISSNLA), which took place at the Centro Internacional de Encuentros Matematicos in Spain.

The 2009 SIAM Conference on Applied Linear Algebra is being organized for October 2009 and will include awarding the triennial SIAG/LA prize. While the schedule has not been formally announced, we can report that there will be 57 minsymposia, and more than 80 contributed talks. We expect a record attendance of about 300 participants.

Several events for 2010 by the SIAG/LA are already planned, including continuing to work with ILAS at its Sixteenth Conference to be held in Pisa, Italy, in June 2010; organizing the second SIAG/LA International Summer School on Numerical Linear Algebra; and organizing a linear algebra track at the 2010 SIAM Annual Meeting.

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

The SIAG/LA organized three minisymposia at the 2008 SIAM Annual Meeting:

"Numerical Linear Algebra and Optimization" (organized by Michael P. Friedlander)

"Adaptive Algebraic Multigrid Methods" (organized by Bobby Philip and Timothy P. Chartier)

"Iterative Solvers for Subsurface Simulations" (organized by Carol S. Woodward)

The most recent track of minisymposia organized by the SIAG/LA at an Annual Meeting was in 2005. The SIAG/LA is organizing a track for the 2010 SIAM Annual Meeting in Pittsburgh, PA.

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?

Articles in SIAM News:

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J. Brandts, B. Fischer, A. Wathen, "Reflections on Sir Henk van der Vorst," SIAM News, Dec. 2006

M. Sipics, "Sparse Matrix Algorithm Drives SPICE Performance Gains," SIAM News, May 2007

Barbara Lee Keyfitz, "Matrices, Epidemics, and Olga Taussky Todd," SIAM News, October 2007

J. Liesen, V. Mehrmann, and R. Nabben, "Householder XVII: Numerical Linear Algebra on the Lake," SIAM News, October 2008

"'Matrices in Action' --- Reflections on Teaching and Learning in a Changing World," an interview by SIAM News with Gilbert Strang, SIAM News, April 2009

#### SIAG/LA Prize:

In 2006, the SIAG/LA prize was awarded to Inderjit Dhillon and Beresford Parlett for their paper "Orthogonal Eigenvectors and Relative Gaps," SIAM J. Matrix Anal. Appl., vol. 25, no. 3, pp. 858-899 (2004).

The 2009 SIAG/LA prize selection committee has already chosen the prize winner for 2009. The prize will be announced in October at the SIAM Conference on Applied Linear Algebra. The selection committee comprises: Michele Benzi (chair), Emory University; Inderjit Dhillon, University of Texas at Austin; Peter Lancaster, University of Calgary, Canada; Julio Moro, University Carlos III, Madrid, Spain; and Henk van der Vorst, University of Utrecht, The Netherlands.

#### SIAG/LA Web Page:

All activities of the SIAG and other items of interest are published on the web page <http://www.math.temple.edu/~siagla/>

#### SIAG/LA Mailing List:

The SIAG/LA maintains a mailing list to which all SIAG/LA members are automatically subscribed and to which announcements are periodically posted. Information about new papers published in SIMAX is automatically forwarded to the mailing list.

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

The SIAG/LA will continue to organize the SIAM Conference on Applied Linear Algebra, the next meeting of which is scheduled for October 2009.

The SIAG/LA is organizing the Second SIAG/LA International Summer School on Numerical Linear Algebra for 2010, which is designated as the first Gene Golub SIAM summer school.

The SIAG/LA is organizing a track at the 2010 SIAM Annual Meeting in Pittsburgh, PA.

The SIAG/LA is continuing to foster its ties with ILAS in the Sixteenth Conference of the ILAS scheduled to be held in Pisa, Italy in June 2010. The SIAG will sponsor an invited speaker. SIAG/LA members enjoy member registration fees at ILAS meetings.

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

SIAM has been generous with its support of the SIAG/LA during the last three years. We note in particular the financial contribution for the first International Summer School on Numerical Linear Algebra in 2008; a new activity of the SIAG in the last three years. In addition, SIAM has recently agreed to consider the SIAG proposal that the second ISSNLA be the first Gene Golub SIAM Summer School, and SIAM has pledged a considerable sum for this event. We are very appreciative for this show of confidence in the SIAG.

SIAM continues to maintain the SIAG/LA mailing list, and this is very much appreciated.

The SIAM journal on Matrix Analysis and Applications, while not officially an activity of the SIAG, plays a major role in the scientific life of the SIAG/LA. SIAM's continuing support of SIMAX is also well received by the SIAG/LA.

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

The SIAG/LA will continue to help SIAM by publishing articles in SIAM News to promote linear algebra and inform SIAM members about the activities of the SIAG. We will continue to have a visible presence and sponsor high quality minisymposia and invited speakers at the SIAM Annual Meetings, including the upcoming track at the 2010 Annual Meeting. The SIAG/LA is the first SIAG to organize a summer school, and it is the first to be awarded the Gene Golub summer school. As a pathfinder, the SIAG/LA will make its experience available to other SIAG's who might want to undertake such projects.

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

Daniel B. Szyld, SIAG/LA Chair  
25 June 2009

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