

SIAM CSU NEWS

EDITION: SUMMER 2012

PAGE 1

A Letter from the President

- Lori Ziegelmeier

The Society for Industrial and Applied Mathematics (SIAM) Student Chapter at Colorado State had a very successful first full academic year of activities. Highlights of the year include a workshop on MATLAB programming, a field trip to Google, invited guest speakers, attending the Front Range Applied Math conference in Denver, and social meetings. These chapter activities were generously supported by the national SIAM organization, the Department of Mathematics at CSU, and the Associated Students of Colorado State University (ASCSU). Without this support, the chapter would not have been as effective.



Chapter members share a meal after the spring business meeting

Officers for the 2011-2012 academic year were:

- President: Lori Ziegelmeier
- Vice President: Christopher Strickland
- Treasurer: Jaime Shinn
- Secretary: Eric Hanson
- Liaison Officer: David Hopkins
- Webmaster: Chuan Zhang

As the outgoing president, I have found SIAM to be an excellent venue for interdisciplinary networking. Although our current membership base is primarily from the department of mathematics, any student with an interest in mathematics and its applications is encouraged to participate. The executive board encouraged members to suggest guest lecturers and activities, and member input and participation greatly increased the success of the chapter.

We held elections in June, 2012, and I am proud to introduce our new CSU SIAM Chapter Officers:

- President: Eric Handon
- Vice President: Steve Ihde
- Treasurer: Sofya Chepushtanova
- Secretary: Brent Davis
- Liaison Officer: Tim Marrinan
- Webmaster: Drew Schwickerath

It has been a pleasure serving the CSU SIAM chapter, and I wish the new officer board well. If you are interested in becoming a chapter member, please contact the new chapter president Eric Hanson at hanson@math.colostate.edu and visit our website (www.math.colostate.edu/~siamcsu/).

Field Trip to Google

- Lori Ziegelmeier

On April 26th, the chapter went on a field trip to visit the Google offices in Boulder, CO. This was a rewarding experience for all involved. We were able to tour the facility as well as speak to active researchers about working at Google.

Amy Ho, an employee of Google, took the chapter on a tour of the facility. Keeping

SIAM CSU NEWS

EDITION: SUMMER 2012

PAGE 2

employees happy is a key feature of the Google life, and thus, their facilities are full of activities such as a rock climbing wall, ping pong, shuffle board, a relaxation/massage room, and plenty of food stations. The lively and creative atmosphere at the facility as well as the strong work ethic of employees is quite apparent. After touring the facilities, the SIAM chapter was treated to lunch in the Google cafeteria. We learned that all employees may eat at the cafeteria for breakfast, lunch, and snacks throughout the day as one of the perks of working at Google.



Chapter members visit Google's office in Boulder, CO.

After lunch, a presentation about the culture and impact of Google as well as career opportunities was given. A panel of 'Googlers' in various career stages--Rob Judd, Mike Goss, and Guy Cobb—described projects that they had each worked on, hiring practices of Google, and a question and answer session between the attendees and researchers.

The event was sponsored by the CSU SIAM chapter and Google and included transportation, lunch, and the tour. Over 20 graduate students from applied mathematics,

pure mathematics, and chemistry participated in the field trip, all of whom indicated the field trip was an enjoyable experience.



Chapter members in front of the Google climbing wall.

MATLAB Workshops

- Christopher Strickland

Over several days in October and November of 2011, the SIAM Student Chapter at Colorado State University hosted a series of MATLAB workshops targeting audiences that ranged in experience from MATLAB beginners to experts. Justin Marks provided an hour long MATLAB "Crash-course" in which he described the basics of MATLAB functionality and programming. The event was well attended, and a few days later, he presented a follow-up workshop focusing on digital photograph processing as an introductory example of MATLAB programming toward a specific application.

Christopher Strickland hosted two advanced MATLAB workshops focusing on the specific topics of parallel programming using the MIT

Lincoln Laboratory package MatlabMPI, and object-oriented programming in MATLAB. The first workshop was focused on setting up MatlabMPI on a unix cluster, understanding the basic paradigms behind MPI (message passing interface) programming, and certain considerations that arise when running MATLAB in parallel across a cluster. The second workshop was given as a broad introduction to object oriented programming in general, but set within the context of MATLAB. Christopher discussed the basics of class files, methods and properties, inheritance and organization, and finally presented a fully working calendar class as a practical example.

Around 100 people attended the workshop series, and the SIAM student chapter provided refreshments and computers for all attendees. Additionally, all m-file examples were made available online at the SIAM student chapter webpage after the event.

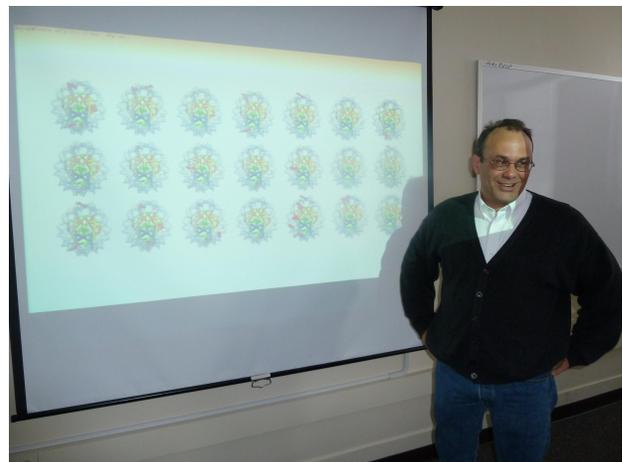
SIAM CSU Speaker Series: Biology & Math

- David Hopkins, Jaime Shinn, & Eric Hanson

During the 2011-2012 academic year the SIAM CSU student chapter organized a speaker series focused on Biological Mathematics. This speaker series was made possible through the generous support of SIAM, Associated Students of Colorado State University (ASCSU), and the Department of Mathematics at CSU. Many of the speakers were brought to campus through collaborations with the CSU Applied Mathematics Seminar and various Mathematics faculty members, including Prof. Dan Bates, Prof. Patrick Shipman, Prof. Simon Tavener, and Prof. Yongcheng Zhou. The chapter is grateful for these funding sources and collaborations with faculty.

Professor Tom Bishop - Louisiana Tech University

In early February, the Flexible and Extendable Scientific Undergraduate Experience (FEScUE), the CSU Mathematics Applied Mathematics Seminar, and the SIAM CSU Student Chapter welcomed Professor Tom Bishop from the biomedical engineering center of Louisiana Tech. Prof. Bishop gave the first talk of our Biological Mathematics lecture series. His work on the molecular biology and dynamic simulations of DNA piqued the interest of not only the math and science students, but the computer science community as well.



Prof. Tom Bishop discusses DNA

To better understand the structure and function of nucleosomes at the atomic level, Prof. Bishop utilizes parallel processing methods for the expensive numerical integration techniques. He ended by presenting results that the DNA kinking self-heals at the nanosecond time scale, showing that asymmetries occur from more than just the DNA sequence or chromosome location.

Professor Zoi Rapti
- University of Illinois, Urbana Champaign

In March, Prof. Zoi Rapti, Assistant Professor at University of Illinois at Urbana-Champaign, visited the CSU campus and presented a talk titled 'DNA modeling and Klein-Gordon equations'. This talk focused on the Peyrard-Bishop-Dauxois DNA model and how the equations of motion of this model relate to the Klein-Gordon equations. Focusing on breather solutions of the Klein-Gordon equations, Prof. Rapti presented an algorithm for a multibreather system and discussed the implications and analysis of this algorithm.

Prof. Rapti also met with several students and faculty members during her visit to Fort Collins. Several SIAM members had the opportunity to have lunch with Prof. Rapti. SIAM members were able to ask Prof. Rapti questions about her research, which includes Differential Equations, Dynamical Systems, and Mathematical Biology.



Prof. Zoi Rapti during her talk, 'DNA modeling and Klein-Gordon equations'

The SIAM Student Chapter at CSU was very happy to have Prof. Zoi Rapti as a SIAM lecturer. Her research in Applied Mathematics has brought many people together from various fields of study, thereby promoting the interdisciplinary nature of Mathematics.

Professor Reinhard Laubenbacher
- Virginia Tech

Dr. Franziska B. Hinkelmann
-Mathematical Biosciences Institute,
Ohio State University

Prof. Reinhard Laubenbacher and Dr. Franziska B. Hinkelmann visited CSU during the spring 2012 semester as guests of Prof. Dan Bates. Members of the CSU SIAM Student Chapter were invited to attend a talk by Dr. Hinkelmann, titled 'Algebraic Theory for Discrete Models in Systems Biology.' In this talk, Dr. Hinkelmann discussed how computer algebra can be applied to polynomial dynamical systems for model construction and parameter estimation in systems biology.

Both Prof. Laubenbacher and Dr. Hinkelmann participated in a discussion about mathematical careers during lunch in Old Town Fort Collins. At the lunch, chapter members asked questions about the various types of academic and nonacademic career paths for young mathematicians. Prof. Laubenbacher and Dr. Hinkelmann offered a lot of useful advice and chapter members are grateful for the opportunity to speak with them.

SIAM CSU NEWS

EDITION: SUMMER 2012

PAGE 5

Members Attend FRAM 8

- Eric Hanson

The 8th annual Front Range Applied Mathematics (FRAM) Student Conference was held on Saturday, March 3rd, 2012 at the University of Colorado – Denver. FRAM is sponsored by the Front Range SIAM Student Chapters. The conference promotes interest in the field of Applied Mathematics and is open to both undergraduate and graduate students.

In just our second year as a chapter, the CSU SIAM Student Chapter was one of the sponsoring chapters. Many chapter members attended the conference. Both Lori Ziegelmeier and Eric Hanson gave talks and chaired sessions at the conference.

The plenary speaker was Prof. Michael Waterman of the Biological Sciences, Mathematics, and Computer Science Departments at the University of Southern California. Prof. Waterman's talk, 'Eulerian Graphs and Reading DNA Sequences,' outlined the mathematical and computational challenges of sequencing DNA, from the Sanger experimental method in 1975 to the current refinements of this method, that allow for the sequencing of the human genome.

Chapter members enjoyed attending and participating in FRAM 8. The CSU SIAM Student Chapter looks forward to co-sponsoring and participating in the next FRAM Conference. Members interested in participating next year should expect a call for abstracts in late Fall 2012 or early Spring 2013.

Newsletter Editing and Preparation by Eric Hanson, Jaime Shinn, and Lori Ziegelmeier.

Photos and Announcements:



Dinner after the spring business meeting

Next Business Meeting Fall 2012 Please come and share ideas for activities during the 2012-2013 school year.



Members leaving for the field trip to Google!

Upcoming & Nearby Conferences:

- *SIAM AN12 – Minneapolis, MN, July 9-13
- *Joint Meetings – San Diego, CA, Jan. 9-12
- *FRAM9 – Spring 2013
- *SIAM Conference on Applications of Dynamical Systems, Snowbird, UT May 2-4 2013
- *SIAM Conference on Applied Algebraic Geometry, Fort Collins, CO, Aug. 1-4 2013