

MSCS MESS

Department of Mathematics, Statistics, and Computer Science
St. Olaf College, Northfield, MN 55057
March 17, 2017 Volume 45, No. 22



Here are the members of Pi Mu Epsilon who attended the 2017 induction ceremony on Monday, March 13th, including many of the large group of new inductees. Many thanks to Prof. Tina Garrett for her talk at the event as well as to Prof. Kos Diveris for his leadership of the group.

No upcoming talks. . .

Enjoy Spring break! Afterward, the research seminar and colloquium series will take a pause for quiet week, and then we'll enjoy an exciting final stretch of talks for the last couple months of the year.

AWM Wikipedia Edit-a-thon

Reading about women in mathematics is valuable (and the last issue of the Mess included several resources for exploring women's history in MSCS-related fields), and women continue to push the boundaries of mathematics tirelessly, which is exciting to watch. But who records women's history in mathematics? This month, the Association for Women in Mathematics (AWM) is challenging mathematicians everywhere to help remedy the disparities between information available about male and female mathematicians. To accomplish this goal, the AWM is facilitating a Wikipedia Edit-a-thon in which members of the math community can col-

laborate to supplement Wikipedia's dearth of coverage of women in MSCS fields. If you are interested in joining the project, read more on page 31 of the AWM newsletter, which you can access at this link: <https://mail.google.com/mail/u/0/#search/mess/15ad279a6c8a100c?projector=1>

OLE STEM event

The Piper Center will host their first Ole STEM event on Saturday, April 1st, 11am-2pm. This event will give current St. Olaf students a unique opportunity to network with alumni, parents, faculty, and friends of the college who majored and pursued careers in STEM fields — science, technology, engineering, and math. Come hear from a dozen alumni who have developed careers across a wide range of STEM-related fields in academic, government, and industry settings through three-minute lightning talks. These mini-talks will be followed by our keynote speaker, Peter Agre, who was awarded 2003's

Nobel Peace Prize in Chemistry for his discovery of aquaporin water channels.

The event will be held in the Tomson Hall First Floor Atrium and Tomson Hall 280 (Alumni Auditorium); to RSVP, go to Handshake, search “Ole STEM”, click ‘Join Event,’ and complete the form.

In anticipation of quiet week

Unsure of which MSCS classes you should take? Thankfully, faculty members have provided descriptions for upcoming electives to help spark your interest. Peruse these blurbs before your upcoming registration meetings to get a sense of the flavors of next semester’s course offerings.

Math 330: Differential Equations II

Instructor: Matthew Wright

Prerequisite: Math 220

Time: T 8:00-9:25, Th 8:00-9:20

This course covers partial differential equations from an applied perspective and emphasizes simple models involving phenomena such as wave motion and diffusion. Topics and techniques such as separation of variables, boundary value problems, Fourier series, and orthogonal functions are developed carefully. Mathematical computing is used freely.

Math 344: Real Analysis II

Instructor: Paul Humke

Prerequisite: Math 244

Time: T 9:35-11:00, Th 9:30-10:50

The main topics of this course are measure theory on the real line, the Lebesgue integral and its relation to the Riemann integral, and convergence theorems for the Lebesgue integral. Applications to probability and harmonic analysis may be included.

Math 382: Commutative Algebra

Instructor: Kosmas Diveris

Prerequisite: Math 252

Time: T 11:45-1:10, Th 12:45-2:05

Commutative algebra is the study of systems of polynomial equations. The base case, systems of linear equations, is the central topic of linear algebra. To understand the structure

of solutions to more general systems of equations one is naturally led to consider commutative rings, their ideals, and their modules. In this course we will examine these classes of objects and their connections to geometry, number theory, and group theory. Along the way, we will see that these objects are quite interesting in their own right and have generated a lot of powerful, and beautiful, mathematics.

MSCS 342: Algorithms for Decision Making

Instructor: Matthew Richey

Prerequisite: Math 220, CS 125 or 251, or

STAT 272 (or permission of the instructor)

This course introduces students to the subject of machine learning. The primary focus is the development and application of powerful machine learning algorithms applied to complex, real-world data. Topics covered include linear regression, nearest neighbor models, k-means clustering, shrinkage methods, decision trees and forests, boosting, bagging, support vector machines, and hierarchical clustering. Applications are taken from a wide variety of disciplines, including biology, economics, public policy, public health, and sports. Familiarity with a programming language such as R or Python is highly recommended.

Math 382: Directed Undergraduate Research (Algebra)

Instructor: Jill Dietz

Prerequisite: Math 252

Time: flexible

An invitation from Prof. Dietz: “This course is dedicated to the joy and challenge of doing original mathematics research. Just imagine how proud you’ll be when you prove your first theorem that no one else has proved before! It may sound daunting, but plenty of students just like you have done successful research projects in the past – trust me, I’ve worked with more than 90 students on these kinds of projects so I know what I’m doing.

“This is a great course for students who will be getting jobs after graduation, going to graduate school, or going into teaching. You’ll cer-

tainly learn mathematical content, but you'll also learn to take control over a significant project – from start to finish – in a unique setting.

My research area is in algebra, mostly group theory, so yours will be too, and Math 252 is a pre-requisite for the course. I'm not yet sure what the exact topic will be, but have all summer to think about it.

"I'm looking for at least 6 students to work together on two different research projects. Don't fret too much about the 8am MWF time slot. Since there will be just a few students in the course, we can probably meet whenever we want."

Educ 290: Educational Psychology

Instructor: Robert McClure

Time: T 8:00-9:25, Th 8:00-9:20

Are you interested in becoming a math teacher? Have you thought about it, but are unsure if it's the right career path for you? Or are you looking for a fun class to take and satisfy a GE at the same time? If you've answered "yes" to any of these questions, consider ED290. It offers a nice introduction to our Education Department and to the world of education in general. You'll also get some "field experience," where you'll spend some time in actual schools. And you'll come out of the course with a GE – so you really can't go wrong. If you have any questions, contact Prof. Matsuura (matsuura@stolaf.edu).

Stat 322: Statistical Theory

Instructor: Kathryn Ziegler

Prerequisite: Stat 272 and Math 262

Time: MWF 12:55-1:50

This course is an investigation of modern statistical theory along with classical mathemat-

ical statistics topics such as properties of estimators, likelihood ratio tests, and distribution theory. Additional topics include Bayesian analysis, bootstrapping, Markov Chain Monte Carlo, and other computationally intensive methods.

Women's history in MSCS

We sometimes make the mistake of supposing that women's inclusion in the sciences has increased steadily through time and will continue to increase—but computer science history shows us that this is not the case. In fact, women comprised a larger share of computer scientists in the 1980s than now, a well-known statistic often attributed to the asymmetrical marketing focus toward men by the personal computer industry. Noting that many see Ada Lovelace as the first computer programmer, the current dearth of women in CS is both troubling and unnecessary.

To combat the harmful narrative that computer science is an essentially male field of study, we look to Fran Allen, the first woman to win the Turing Award, considered the analogue of the Nobel Prize in CS, a precedent that she hoped would open and inspire "opportunities for women in science, computing and engineering." In a 1976 paper published with John Cocke, Allen introduced a compiler optimization strategy still important today; she also redefined the close interplay between CS and graph theory. Allen served as a liaison between IBM and the NSA during her decades-long career and has continued to work closely with academia, business, and the government even in her post-retirement years.

We hope to see Fran Allen's legacy honored and reproduced, along with the many inspiring women in CS through history and today!

To submit an article or event for publication in the Mess, email brooke@stolaf.edu; to receive the Mess digitally each Friday, email freking@stolaf.edu; visit <http://wp.stolaf.edu/mscs/mscs-mess/> for a digital archive of previous MSCS Mess issues.

Corey Brooke, Editor
Bruce Pell, Faculty Adviser
Ellen Haberoth, Mess Czar