



North Central Mathematical Bulletin

The Newsletter of the North Central Section
of the Mathematical Association of America

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Fall 2013, Volume 15, Number 2

UPCOMING MEETING

Hope to See You at South Dakota State University!

South Dakota State University will host the MAA-NCS Fall Meeting, October 18-19.

A program for the Fall 2013 meeting is here [Fall 2013 program](#)

INVITED SPEAKERS AND ABSTRACTS

- Cedric Neumann - South Dakota State University

Title: A statistical model for the quantification of the weight of fingerprint evidence

Abstract: Forensic Science has been described as the "science of individualization". For most of the past century, forensic scientists have exclusively relied on the idea that nature doesn't duplicate itself to form categorical conclusions on the source of evidence recovered from crime scenes, and to report them with absolute certainty. The introduction of DNA profiling 20 years ago has led scientific and legal scholars to increasingly challenge the lack of scientific foundations of pattern-based evidence such as fingerprint, shoe impressions and tool marks. The determination of the source of prints recovered on crime scene is essentially a probabilistic inferential process, which can be supported by statistical models quantifying the weight of evidence of fingerprint comparisons. An ongoing research project, aiming at developing and validating a model to support fingerprint examiners in casework, has resulted in several iterations of such model. This presentation will report the latest development of our model and will address the implications of its use for forensic practice. More generally, some myth in the purpose of statistical research in forensic science will also be discussed.

- Frank Farris - Santa Clara University

Title: Polyhedral Symmetry in the Plane?

Abstract: When we classify plane patterns by their symmetries, we meet a time-honored trichotomy : These

patterns may be rosettes, friezes, or wallpaper patterns. The symmetries of a rosette all share a single fixed point; a frieze pattern is invariant under translation in one direction, a wallpaper pattern in two. In this talk, we undercut tradition, which normally insists that symmetries must preserve distances, by allowing certain distance-deforming transformations to play the role of symmetries. In particular, we show how the polyhedral groups can act on the plane. To make patterns with these new transformations as symmetries, we construct functions invariant under the polyhedral actions. One of these is shown below. Do you believe that it has the same symmetry as a tetrahedron? This talk, accessible to undergraduate mathematics students, combines a little group theory, a little complex analysis, and several other ingredients in the service of mathematics and art.

OFFICER REPORTS

Governor's Report

Tom Sibley, CSBSJU

After a great sabbatical in Virginia I am looking forward to seeing all my friends in the North Central section. I am honored to represent all you good people. There was definitely a learning curve before the Board of Governors' meeting at Mathfest. Here are some highlights from that meeting.

The wonderful MAA journals will now be primarily available on line as part of your membership, although you can still get print copies for an extra cost. This policy is one of the MAA changes in response to changing reading habits and the spiraling costs of publishing.

Other changes also affect the MAA: We have been running deficits recently, partially because of reduced rates of membership renewals. If your membership has lapsed, please renew. (The overall financial picture is still healthy, partially because our investments have recovered after the recession. The national office is actively addressing the issue of deficits. They have made structural investments aiming for future cost reductions.)

The MAA website is up and running. Take a look. There is a lot of information and it is more readily accessible.

As governor, I have been asked to nominate section members for national committees. While a number of you already do great work on committees, I'm sure that there are many more who are willing and capable. Please let me know of your interest. (To see a list of committees and their charges, go to <http://www.maa.org/about-maa/governance/council-and-committees-list> .)

Respectfully submitted,
Tom Sibley

President's Report

Welcome back everyone! The Fall NCS-MAA meeting will be at South Dakota State University and I hope to see many of you there. Our featured speaker on Friday night will be Cedric Neumann from South Dakota State University. He is a new faculty member in statistics and will give a presentation on

his work in Forensic Science. Our Saturday morning speaker will be Frank Farris of Santa Clara University. Frank is the former editor of Mathematics Magazine and will give a presentation on Polyhedral Symmetry in the Plane. As always other talks will be presented by members of our section.

Our section will honor members with a Distinguished Teaching Award an Distinguished Service Award at the spring meeting at St. Cloud State University. Please be thinking of colleagues you would like to nominate for these awards. See the section website for more information and nomination forms.

We will also honor several other members by electing them to office. Several NCS offices will be open this year. If you are interested in serving the NCS and therefore the MAA please get in contact with myself or any of the other section officers. Again, see the section website for all their names and contact information.

Secretary's Report

Namyong Lee, Minnesota State University - Mankato

This summer, MAA launched newly designed website at www.maa.org, where one can now login to access member profile and benefits, check membership status, renew online, etc.

Also from 2014 membership, MAA simplified membership categories by Member, Member Plus, or Students. MAA membership will includes all MAA journals and magazines by electronic subscription.

Our section is updating Liaison list at this Fall. Please let me know if your institute has any change. If your institute has no MAA liaison, please volunteer the position. Liaison gets the national/ sectional MAA announcement at first hand.

Treasurer's Report

Dale Buske, St. Cloud State University

The North Central Section enters the new academic year in solid financial shape.

In mid-September, I sent out letters to the section's department chairs asking that their institutions become institutional members of the NCSMAA. These institutional memberships cost only \$25 a year and support Section NExT activities.

Members sometimes ask whether the NCS team contest held each fall earns or loses money. While it currently generates a tiny profit, the contest is so good at engaging students in the section, I think the board would push to continue the activity even if it did not.

Once again I want to remind members that the book sale at section meetings is no longer "cash and carry." Instead, the book sale is an opportunity to browse and order at a discount rate (during the meeting only). The MAA is pushing for these orders to be done online (and you can do so with a discount code if you are in attendance at the meeting or not). All books are mailed to you shortly after the meeting.

CAMPUS NEWS

Augsburg College

Augsburg is pleased to welcome **Erin Manlove** in a visiting position for this year. Erin comes to us from the University of Minnesota. We are also fortunate to have **Ismael Talke** back for a second year as a visiting statistician.

Augsburg will be hosting the Twin Cities Math Jeopardy tournament again this year. Also in hosting news, we were happy to host the section's summer seminar in July. The program was excellent and the attendees all learned a lot.

Two of our faculty are chairing MAA committees this year: Su Doree is chair of CRAFTY which addresses curriculum in the first two years of college, and Jody Sorensen is chair of the Committee on Panels, Posters, and Workshops. *Jody Sorensen*

College of St. Benedict/St. John's University

Three students did summer research at CSBSJU: **Zach Silbernack** did summer research with Robert Campbell, **Sarah Lange** and **Mike Terhaar** did summer research with **Anne Sinko**. Both Zach and Mike presented at Mathfest. Seven other students did REUs and two had paid internships this past summer.

We had our first cohort of women in MapCores (Mathematics, Physics, Computer Science Research Scholars) graduate this past spring. The program is partially funded by the NSF which provides \$600,000 in student scholarships. **Kris Nairn**, the PI, reapplied for the scholarship this past summer and we hope to have it renewed given the incredible results we have had with the program to date. *(submitted by Kris Nairn)*

Concordia College-Moorhead

Concordia College--Moorhead welcomes **Nathan Axvig** as a tenure-track faculty member. Nathan, originally from North Dakota and a graduate of the University of North Dakota, received his Ph.D. at the University of Nebraska-Lincoln, and spent the past three years at the Virginia Military Institute. **Daniel Biebighauser** has been awarded a sabbatical for this coming spring; he will return to Vanderbilt University to continue work on a monograph in graph theory. **Oksana Bihun** worked with physicist Francesco Calogero in Rome over the summer; she has also organized a week-long visit for Calogero, a 1995 Nobel Peace Prize winner, to visit Concordia in November to give a series of talks on mathematics, nuclear disarmament, and responsibilities of scientists. Douglas Anderson published his 100th research article. *(submitted by Douglas Anderson)*

Concordia University, St. Paul

The Department of Mathematics at Concordia University, St. Paul, is pleased to introduce our newest department member, **Daniel Maroncelli**. Dan is a recent Ph.D. graduate from North Carolina State University. His area of expertise is the analysis of the existence of solutions to nonlinear boundary value problems in the fields of continuous, discrete, and impulsive dynamical systems. Sarah Jahn is serving as interim department chair while Rob Krueger is on sabbatical. Rob is expanding his knowledge in areas of higher education leadership. *(submitted by Robert Krueger)*

Macalester College

Karen Saxe is on sabbatical for the academic year and is serving as the 2013-14 American Mathematical Society Congressional Fellow (more information). She was also elected to be the MAA Second Vice President starting in January 2014.

We welcome two full-time visitors this year. **Rob Thompson** finished his PhD at the University of Minnesota in September and studies PDE's. **Lori Ziegelmeier** earned a PhD from Colorado State in May and studies computational topology and geometry. *(submitted by Tom Halverson)*

Minnesota State University - Moorhead

The MSUM Actuarial Program has been recognized by the Society of Actuaries as an Advanced Undergraduate Program. In the past year a student Actuarial Club was formed and a course offered for the first time to prepare students for the second actuarial examination, the results of efforts by Professor Aggie Chadraa. *(submitted by Wally Sizer)*

Minnesota State University - Mankato

The department of mathematics and statistics has two new tenure track faculty: Brandon Rowekamp (Geometry, who is also a new MAA NExT fellow), and Hyekyung Min (Stochastic Processes & Mathematical Finance). We also have four new fixed term faculty this year: Tony Nelson, Jimmy Throne, Yuyoung Park, and Rebecca Targove. The department has hosted a mini workshop on "Algebraic Geometry and It's Applications" during September 5-8, 2013. *(submitted by Namyong Lee)*

St. Cloud State University

St. Cloud State University This fall we have a total of eight faculty members returning to the department after taking leave for at least part of the last academic year. Combined with a slight decline in enrollment, we look forward to more 'sane' workloads this year. We also welcome a 'new' tenure track faculty member in Dr. **Melissa Hanzsek-Brill**. Melissa will support our math education activities - primarily those focus on teaching mathematics in the elementary school. Having earned tenure one year ago, Dr. **Hui Xu** in statistics is on sabbatical this year. Joining the department this year in a fixed-term capacity to replace Hui is **Nadeesha Lihinikadu Arachchige**, most recently of Kansas State University. We are looking forward to hosting the spring 2014 section meeting where we hope to showcase our new \$44 million Integrated Science and Engineering Lab Facility. *(submitted by Dale Buske)*

St. Olaf College

The Department of Mathematics, Statistics, and Computer Science is happy to welcome **Tom St. George** to the hill. Tom is a very recent PhD (defending in September) from Northern Illinois University who will be teaching Calculus and Differential Equations this year. We're also happy to welcome back **Rich Allen** from his spring semester sabbatical. Julie Legler, Steve McKelvey, and Paul Zorn are all enjoying full year sabbaticals this academic year.

St. Olaf's **Tina Garrett** and Macalester's **Chad Topaz** spent much of last academic year working on an Associated Colleges of the Midwest project at the behest of the ACM presidents and deans to offer the first all-ACM online summer course. Their modeling approach to calculus was offered this summer and by all accounts was a success. We look forward to hearing more from Tina and Chad about their experiences developing and delivering a SPOC (Small Participatory Online Course).

Paul Humke gave an invited talk at the Erdos Centennial Conference in Budapest in July.

Olaf Hall-Holt ran a computer science camp for middle school girls over the summer.

Under the leadership and directorship of Becky Vandiver, the college has a new Mathematical Biology "concentration" (a concentration is essentially an interdisciplinary "minor"). The first set of math bio concentrators will graduate in 2014. *(submitted by Jill Dietz)*

University of North Dakota

Doojin Hong was promoted to Associate Professor, **Ryan Zerr** and **Anthony Bevelacqua** were promoted to full professor.

Even more exciting, we had our inaugural Ed Nelson Memorial Lecture. Ed's daughter Prof. Gail Nelson, Carleton College, presented "Magical Properties of Farey Sequences". Our fall lecture is scheduled for Oct. 11th and will feature Prof. Rick Gillman, Valparaiso University, presenting "Why fo Left-handed People Survive?" (*submitted by Joel Iiams*)

University of Sioux Falls

Last spring, the University of Sioux Falls celebrated (with much joy, but little surprise) the news that **Joy Lind** had been awarded tenure and promotion to the rank of Associate Professor, and **Chad Birger** has been promoted to a tenure-track position with the rank of Assistant Professor.

USF is pleased to continue its Careers in Mathematics Series this year, under the direction of **Joy Lind**. This semester, the series will feature presentations from imaging specialist Dr. John Aarsvold on September 26. Each event in the series, which is funded in connection with a grant from the National Science Foundation, includes an address open to the general public at 7:00 pm in Zbornik Lecture Hall on the USF campus.

USF will also be hosting the first meeting of a new regional R User Group on Friday, November 15, from 1:00 – 6:00 pm in the McDonald Center Conference Room. For details about attending the event, please contact **Chad Birger**.

On April 20, 2013, USF hosted the annual Math on the Northern Plains Undergraduate Conference. The event brought together 50 students and faculty representing 7 institutions. The 2014 Math on the Northern Plains Conference will be held on April 12 at the University of South Dakota.

Bobby Menzie and Mike Tolkamp completed collaborative research under the NIH funded BRIN (Biomedical Research Infrastructure Network) program during Summer 2013. Their work (which led to a poster titled "Software for Next-Generation Sequencing data Analysis") was performed under the direction of **Chad Birger**. (*submitted by Jason Douma*)

Univeristy of Mary, Bismark, ND

The University of Mary has hired a new, full-time faculty member in Mathematics. He is Dr. **Travis Wolf**. A native of Bismarck, he did his undergraduate work at the University of North Dakota and his graduate work at the University of Iowa, completing his degree in Summer 2013. His field of specialization is operator theory, and his dissertation was "Coisometric Extensions". Since this is his first year of teaching, he is involved in a variety of courses to determine the best fit. (*submitted by Fr. Victor Feser*),

SECTION NEXT

Designed for new college and university faculty in the mathematical sciences, Section NExT (New Experiences in Teaching) is a professional development program that addresses the full range of faculty responsibilities including teaching, scholarly activities, and service.

Each year, applications will be solicited for new MAA-NCS Section NExT fellows to serve for a two year term. We will accept applications from faculty who are within the first four years of beginning full-time employment with teaching responsibilities at the college or university level. The application consists of a short personal statement and a letter of support from the department chair, guaranteeing financial support for transportation, meals, and lodging at the fall and spring meetings of the North Central Section.

CONFERENCES AND ACTIVITIES

35th Annual Pi Mu Epsilon Conference

Plan to come with your students to the 35th Annual Pi Mu Epsilon Conference April 11 and 12 at St. John's. Have your students submit titles and abstracts of talks to Kris Nairn (knairn@csbsju.edu), whom you can also contact for more information. Or go to our web site <http://www.csbsju.edu/Mathematics/Pi-Conference.htm>.

This spring, we are please to announce that our guest speaker is **Hal Schenck** from University of Illinois at Urbana-Champaign. Please see our website for further details of the the talks: <http://www.csbsju.edu/Mathematics/Pi-Conference.htm>.

FUTURE SECTION MEETINGS

Spring 2014 St. Cloud State University April 25-26

INFORMATION FOR CONTRIBUTORS

Submissions should be sent electronically (preferred method) to the knairn@csbsju.edu or mailed to:

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