



# North Central Mathematical Bulletin

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

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## Spring 2009, Volume 12, Number 1

### UPCOMING MEETING

#### Hope to See You at Hamline University in St. Paul!

Hamline University will host the MAA-NCS Spring Meeting, April 24-25.

Our two invited speakers for the spring meeting are [George Andrews](#) (The Penn State University) and [Jason Douma](#) (University of Sioux Falls).

A program for the Spring 2009 meeting will be posted approximately one to two weeks on the MAA-NCS website prior to the meeting.

### INVITED SPEAKERS AND BIOGRAPHIES

- [George Andrews](#), The Penn State University

George Andrews is Evan Pugh Professor of Mathematics at Penn State University and an expert on the theory of partitions.

He has a long-term interest in the work of S. Ramanujan, whose last notebook he unearthed in 1976. He is now collaborating with Bruce Berndt on a series of volumes explicating the brilliant and sometimes enigmatic ideas in this notebook.

Andrews was elected to the National Academy of Sciences (USA) in 2003.

Note: Much more information, including a complete list of publications, is available at [www.math.psu.edu/andrews/](http://www.math.psu.edu/andrews/).

Dr. Andrews' talk is entitled *The Lost Notebook of Ramanujan*.

Abstract: In 1976 quite by accident, I stumbled across a collection of about 100 sheets of mathematics in Ramanujan's handwriting; they were stored in a box in the Trinity College Library in Cambridge. I titled this collection "Ramanujan's Lost Notebook" to distinguish it from the famous notebooks that he had prepared earlier in his life. On and off for the past 32 years, I have studied these wild and confusing pages. Some of the weirder results have yielded entirely new lines of research in number theory are related topics. I will try to provide a gentle account of where these efforts have led. I will conclude the talk with an account of Ramanujan at the Tribeca Film Festival.

- [Jason Douma](#), University of Sioux Falls

Jason Douma is the product of an educational and professional background that is closely tied to the liberal arts tradition.

He earned his B.A. from Gustavus Adolphus College, completed his M.S. and Ph.D. in Mathematics at Northwestern University, and has taught at three liberal arts colleges: Lake Forest College, Carthage College, and now the University of Sioux Falls.

While he maintains many of his original scholarly interests in group theory and representation theory, Dr. Douma's current investigations extend into the philosophy of mathematics and its implications for mathematical pedagogy. A passionate educator, Professor Douma has taught courses throughout the field of mathematics, and has also taught or co-taught courses in the philosophy of mathematics, Western intellectual and cultural heritage, and issues in science and theology.

In 2008 he was recognized by the Mathematical Association of America - North Central Section with its Distinguished Teaching Award. Jason has served as the MAA-NCS Information Officer, and is a new member of the MAA CUPM Subcommittee on Mathematics Across the Disciplines. Dr. Douma has served as a principal investigator for several federal and private foundation grants, and currently serves on the steering committee for the USF Forum for Conversations in Theology and Science.

Dr. Douma's talk is entitled *Gotta Have My Dots: Strategies for Dot Voting*.

Dot voting is a popular form of approval voting, in which each voter is awarded a fixed number of "dots" that may be allocated strategically by the voter among the various selections being considered. Our own section employed dot voting last spring as a way of identifying priorities which would be recommended to MAA leadership at the national level. In a dot voting environment, a voter might choose to concentrate her dots in one or two favorite selections, as a way to help ensure that her top choice is elected; alternatively, a voter may choose to spread out her dots among many desirable selections, hoping to push multiple choices across the threshold of victory. This talk will employ game-theoretic concepts to examine risk-averse and risk-loving behavior in the dynamics of dot voting.

## OFFICER REPORTS

### Governor's Report

#### **Jennifer Galovich, College of St. Benedict/St. John's University**

The Board of Governors met as usual at the JMM in Washington. In addition to the usual items, we were all interested in hearing from the Treasurer, John Kennelly.

Bottom line: We have a bottom line! Like everyone else, we have lost money in our investment portfolio, but we have invested conservatively, so the loss is not devastating. In recent years, we had operating losses that we were able to cover with investment income, but that's a non-starter in the current environment. So the national office is examining programs and services to see what might be trimmed (not eliminated). We anticipate savings from a variety of strategic initiatives, e.g., moving to electronic membership, decreasing the number of issues of Focus, and a small increase in registration

fees for Mathfest. We are also reviewing some longer term strategies, such as a simplification of the membership categories.

Membership dues did not increase from 2008 to 2009 and the increase from 2009 to 2010 will be no more than 2.5% over all categories.

On the strategic planning front, we move along: Cycles I and II (Professional Development, Revenue, American Mathematics Competition (AMC), Students, Membership and Governance) have been completed and III (STEM Issues, Sections, Meetings, and Publications) is well underway. After Cycle III is completed, there will be a general review to integrate these reports.

At the JMM we marked the end of Jim Tattersall's many years of service as Associate Secretary with a grand luncheon at which everyone wore red bowties. Gerard Venema is the new Associate Secretary. We also marked the end of Martha Siegel's term as Secretary of the Association. The newly elected Secretary is Barbara Faires. Dr. Faires will serve as Secretary-Elect from April 1, 2009 until the conclusion of the Joint Meetings in January 2010. At that time she will begin a five-year term as MAA Secretary.

## **President's Report**

### **Su Dorée, Augsburg College**

I wanted to take this opportunity to thank those members of our section who are completing terms of service: past-President Tom Sibley, secretary Co Livingston, at-large representative Kris Nairn, distinguished teaching award committee chair Keith Agre, and meritorious service award committee chair Steve Leonhardi. I want to particularly acknowledge the amazing behind-the-scenes work that Co, Randy, and Shawn have done (as secretary, treasurer, and information officer) to support our section. They have truly made my job a breeze. Special thanks also to Jennifer Galovich for organizing what looks like a fascinating Summer Seminar, with help from Jason Douma.

## **Treasurer's Report**

### **Randy Westhoff, Bemidji State University**

I would like to thank the following colleges and universities for becoming institutional members of the North Central Section. As in previous years all proceeds will be used to support our Section NExT program.

Augsburg College	Concordia College	North Dakota State University	University of Manitoba
Anoka-Ramsey Community College	Concordia University, St. Paul	Northern State University	University of Minnesota, Duluth
Bemidji State University	Gustavus Adolphus College	South Dakota State University	University of Minnesota, Morris
Bethel University	Macalester College	Southwest Minnesota State University	University of Minnesota, Twin Cities
Carleton College	Minnesota State University, Mankato	St. Cloud State University	Williston State College
College of St.	Normandale	St. Olaf College	

If your institution is not listed and you would like to become an institutional member the cost is \$25 and checks (made out to NCS-MAA) can be sent to me at the address below. If you would like an invoice, please let me know and I will send one out. Thanks again and I'll see you at the spring meeting.

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## CAMPUS NEWS

### Augsburg College

Augsburg College was pleased to install the Minnesota Iota Chapter of Pi Mu Epsilon on February 27. We inducted sixteen junior and senior math majors as charter members with Professor **Jody Sorensen** as the chapter's advisor.

Prof. **Tracy Bibelnieks**, Augsburg College, will succeed Prof. **Wayne Roberts**, Macalester College, as Director of the Minnesota High School Mathematics League at the end of this academic year.

**Tracy Bibelnieks** and **Matt Haines**, along with their Education Department colleague **Linda Stevens**, are lead instructors for a Math and Science Teachers Academy grant working with middle school teachers on Connecting Algebra to Number Sense. They also continue their year-long work with elementary and middle school teachers at charter schools in the Minneapolis/St. Paul metropolitan area funded by a Mathematics and Science Partnership grant. *(submitted by Matt Haines)*

### Bemidji State University, Bemidji

**Jim Richards** of our Computer Science Program is retiring at the end of spring semester after 33 years of service to BSU. Jim was the chairman of the Department of Mathematics and Computer Science from 1997 to 2006.

**Derek Webb** and **Glen Richgels** received a large grant from the Blandin Foundation to create the Northern Minnesota College Readiness Partnership. They are working with eight area high schools and six community, technical or tribal colleges to develop curriculum that uses technology to introduce students to mathematics, statistics and computer science concepts. They are targeting students who would otherwise stop taking mathematics courses before completing high school. *(submitted by Randy Westhoff)*

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

The St. John's and St. Ben's Math Department congratulates **Kris Nairn** on receiving tenure and promotion to Associate Professor. Kris and **Gary Brown** will have sabbaticals next year. **Mike Gass** is on sabbatical this year.

**Jennifer Galovich** has been selected, together with Biology colleague **Barbara May**, to participate in the Undergraduate Research Program in Microbial Genome Annotation sponsored by the US Department of Energy's Joint Genomics Institute. Biology colleagues will adopt an as yet unannotated "orphan" microbial genome which CSB/SJU students in biology and bioinformatics will annotate. *(submitted by Tom Sibley and Jennifer Galovich)*

## Minnesota State University, Moorhead

We are sorry to report the death of a colleague, Professor **Jim Drouilhet**. Jim came to Moorhead State University in 1981 following instructorships at the University of Texas Austin, the University of Utah, and Yankton College. He got bachelor's, master's and doctor's degrees from Rice University. He worked for several summers at the NASA Jet Propulsion Laboratory in Pasadena, where his work included tracking space debris. Other interests included the history and culture of St. Lucia, where earlier generations of his family lived for a while, and the performing arts.

We look forward to the return in the fall of Professor **Sayel Ali**, who has been on for leave three years teaching in the United Arab Emirates. *(submitted by Wally Sizer)*

## Normandale Community College

The Math/CSci department welcomed three unlimited full-time faculty members at the start of fall '08 semester: **James Carr**, **Xiaosheng Li**, and **Ghidei Zedingle**. This spring, the department is hiring two tenure-track positions in mathematics.

In July, 2008, NCC received an NSF / S-STEM scholarship grant of approximately \$600,000 to support students over the next four years in science, technology, engineering and mathematics programs. This continues and expands the CSEMS grant which is now in its last year.

The Math Science Academy began its second full year at Normandale in fall semester, 2008. This student development program is supported by the Normandale Foundation and seeks to increase the number, persistence, and diversity of STEM majors by mentoring, financial aid and personal/professional development.

Normandale is participating in two Math and Science Teacher Academies, developed by the MN Department of Education, to improve middle school mathematics instruction in preparation for statewide implementation of algebra for all 8th graders. **Ed Donahue** (Director of Teacher Education at NCC), **Peggy Rejto** and **Judy Stucki** (math faculty at NCC) have participated at Minnesota State University, Mankato in training sessions for Region 9 and at metro area sites throughout the year. *(submitted by Peggy Rejto)*

## University of St. Thomas, St. Paul

The University of St. Thomas is in the first year of a project funded by the NSF program on Computational Science Training for Undergraduates in the Mathematical Sciences (CSUMS). The three-year award is for \$549,000 with an opportunity for two additional years. Project Director **Patrick Van Fleet** and a group of faculty colleagues have developed courses and student research projects that emphasize computational mathematics and statistics along with applications in a number of areas. The projects underway for this year's cohort of students focus on problems in the areas of tornadogenesis, cell motility and thermal treatments for cancer. The project will sponsor a CSUMS national student research conference in early August.

Prof. **Eric Rawdon** received an NSF RUI grant of \$150,000. The grant supports undergraduate research and a computer cluster to model knots in the physical sciences.

After serving as associate director for Institute for Mathematics and Its Applications at the University of Minnesota (IMA), **Cheri Shakiban** has returned to St. Thomas as a full time mathematics professor. However, she has been appointed as the associate director for diversity at IMA on a part-time bases and has been serving in that capacity since September 2008. Currently Shakiban is organizing a workshop at IMA on Career Options for Women in Mathematical Sciences, to take place April 2-4, 2009 at the IMA. This workshop aims to familiarize women in the mathematical sciences with professional

opportunities in industry and government labs and to help them thrive in these fields. There are over 100 women who have registered to participate in this workshop. Please see <http://www.ima.umn.edu/2008-2009/SW4.2-4.09/> for details.

The Department of Mathematics welcomed Dr. **Inna Baygusheva** a visitor from Russia. Her host was Prof. **Arkady Shemyakin**. She observed courses in Actuarial Science and discussed the Actuarial program at St. Thomas with St. Thomas faculty. She and her colleagues in Russia are creating an Actuarial Science program at her home institution. *(submitted by Doug Dokken)*

## University of Sioux Falls

**Joy Lind** presented "Mathematical Modeling with Graphs" at the annual Women in Science Career Day at Southeast Technical Institute in Sioux Falls, South Dakota, on March 12. Over 400 eighth grade girls from middle schools in and around Sioux Falls attended this event. *(submitted by Shawn Chiappetta)*

## 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.

The MAA-NCS Section NExT will meet April 24, 2009 at Hamline University in St. Paul, Minnesota immediately prior to the NCS Spring Meeting. Details about the MAA-NCS Section NExT program and its spring meeting may be found at <http://pages.usiouxfalls.edu/maa/next/index.html>.

## CONFERENCES AND ACTIVITIES

### 30th Annual Pi Mu Epsilon Conference

Come and bring your students to the  
**30th Annual Pi Mu Epsilon Conference**  
April 17 and 18, 2009 at St. John's University  
featuring the inimitable Joe Gallian and many student speakers.  
Contact Kris Nairn ([knairn@csbsju.edu](mailto:knairn@csbsju.edu)) for more information.

### North Central Section Workshop on Program Review

Friday, April 24, 2009  
3:30 to 5:30 pm  
at Hamline University  
Robbins Science Center - 5

Program review can be a valuable way to renew a department, but it can also be intimidating. This workshop will provide a useful introduction to both the self study and outside consultant parts of program review. Matt Richie (St. Olaf), who serves on the national MAA Committee of Program Review, will give an overview of the process, the MAA committee's insights and a discussion of brand new MAA materials for program review. (These materials will be available for the first time at the book sale.)

Participants will then split into two parallel sessions. One session, led by Jennifer Galovich (St. John's) and Jeff Anderson (Winona State), will discuss the internal self study. The second, led by Matt Richie and Deanna Haunsperger (Carleton), will discuss outside consultants - both what to look for in a consultant and how to become one yourself.

## **CAM Colloquium Series (University of St. Thomas)**

All presentations will be held in the 3M Auditorium in the Owens Science Hall, starting at 3:00 PM.

- February 18, 2009

Scot Adams, University of Minnesota

Abstract: We will talk about "coin-flipping in the large", i.e., estimating probabilities of events that involve a large number of coin-flips. The main tool for such problems is called The Central Limit Theorem. We will discuss how this result is used in financial applications. This talk requires some understanding of calculus.

- March 18, 2009

Megan Frericks, Anna Meyers, Jennifer Woychik, University of St. Thomas (Student)

Abstract: The research is based on a data set collected by the Minnesota Department of Health, which contains information about those people who have been diagnosed with HIV in Minnesota during the last 25 years. Using the given dates of HIV diagnosis, AIDS diagnosis, and death, the length of time between HIV and AIDS diagnosis (also known as the incubation period), and AIDS diagnosis and death were computed. Statistical analysis methods, such as time series analysis and multiple regressions were then used to analyze patterns in the mortality data that occur over time. The work is directed at determining the dependence of the incubation period on a person's age at the time of HIV detection and the time in the last 25 years that HIV detection took place. These models may then be used to forecast future patterns of HIV/AIDS mortality in Minnesota.

- April 15, 2009

Karen Shuman, Grinnell College

Abstract: In this talk we'll survey some recent work by Escribano, Sastre, and Torrano and Jorgensen, Kornelson, and Shuman about how moments are related to and can be approximated by iterated function systems. We will encounter interesting matrix structures and orthogonal polynomials. No specialized knowledge is needed.

- May 13, 2009

Joseph Gallian, University of Minnesota, Duluth

Abstract: We use video animations to illustrate how mathematics can be used to create computer generated symmetry patterns. Polynomials, exponential functions, logarithms and modular arithmetic are used to transform basic images into symmetry patterns. These methods were used to create the image for the 2003 Mathematics Awareness Month poster.

## **MAA-North Central Section 2009 Summer Seminar**

**ACTUALLY DOING IT!:**  
**A Hands-On Approach to Computational Combinatorial Geometry**

**Principal Lecturer: Professor Jesús De Loera, University of California, Davis**

**Location: St. John's University, Collegeville, MN**

**Dates: July 19-24, 2009**

**Contact: Jennifer Galovich [jgalovich@csbsju.edu](mailto:jgalovich@csbsju.edu)**

**The Program:** It is undeniable that computers have changed the way we create and teach mathematics. Even classical old subjects such as geometry have not been immune to this influence. Among the most beautiful parts of geometry is combinatorial geometry, which deals with questions of geometric structures composed of finitely many elements. Examples of key structures include convex polytopes, hyperplane arrangements and point configurations. In this short course we introduce the audience to some fascinating computational problems that are at the same time profoundly deep and important but are beautiful and simple to understand. We will include daily hands-on laboratories using POLYMAKE and TOPCOM. Each day will be divided into theory and practice/exercise sessions. Topics of study include:

1. Geometry of points, planes and lines: An quick introduction to combinatorial geometry.
2. Polyhedra: Their faces, graphs, convex hulls, shadows, and nets.
3. Thinking algorithmically: efficiency of computation in geometry or what you wanted to know about NP, P and all that but were afraid to ask.
4. The real reason why calculus is hard: Volumes and Integrals of polyhedra.
5. How to find the best solution: geometry to the rescue!

**The Lecturer:** Jesús De Loera is a member of the Mathematics faculty University of California, Davis, where his interests in discrete and computational geometry have afforded him regular crossover contacts as a member of the graduate groups in Applied Mathematics and Computer Science programs. Dr. De Loera received his B.S. in Mathematics from the National University in Mexico, and his Ph.D. in Applied Mathematics from Cornell University. Prior to his current role at UC Davis, Professor De Loera has held positions at the Geometry Center at the University of Minnesota, the Swiss Federal Technology Institute, the Mathematical Sciences Institute at Berkeley (where he organized a special semester on Discrete and Computational Geometry), and the Universität Magdeburg in Germany. Dr. De Loera's research has been recognized through an Alexander von Humboldt Award. His teaching and service to students has been widely recognized; among the honors he has received at UC Davis are 2003 Chancellor's Fellow, 2006 Diversity Award, and 2007 Award for Excellence in Service to Graduate Students.

## **FUTURE SECTION MEETINGS**

Fall 2009	University of North Dakota	October 23-24
Spring 2010	University of St. Thomas	April 23-24
Fall 2010	University of Sioux Falls	TBA

## **INFORMATION FOR CONTRIBUTORS**

Submissions should be sent electronically (preferred method) to the [shawn.chiappetta@usiuouxfalls.edu](mailto:shawn.chiappetta@usiuouxfalls.edu) or mailed to:



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