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## Fall 2009, Volume 12, Number 2

## Upcoming Meeting

## Hope to See You at University of North Dakota in Grand Forks!

The University of North Dakota will host the MAA-NCS Fall Meeting, October 23-24.

Our two invited speakers for the fall meeting are Francis Edward Su (Harvey Mudd College) and Brett Goodwin (University of North Dakota).

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

## Invited Speakers and Biographies

- Francis Edward Su, Harvey Mudd College

Francis Edward Su is a Professor of Mathematics at Harvey Mudd College, and earned his Ph.D. from Harvard University. His research is in geometric combinatorics and applications to the social sciences, and he has co-authored over a dozen papers with undergraduates. He also has a passion for teaching and popularizing mathematics.

From the Mathematical Association of America (MAA), he received the 2001 Merten M. Hasse Prize for expository writing, the 2004 Henry L. Alder Award for distinguished teaching, and was the 2006 James R.C. Leitzel Lecturer, and was recently elected First Vice-President of MAA. He also serves on the Council of the American Mathematical Society and the editorial board of the American Mathematical Monthly. In his spare time he enjoys working on his "Math Fun Facts" website, which receives nearly 4,000 hits each day.

Dr. Su's talk is entitled Voting in Agreeable Societies.

Abstract: When do majorities exist? How does the geometry of the political spectrum influence the outcome? What does mathematics have to say about how people behave? When mathematical objects have a social interpretation, the associated theorems have social applications. We give examples of situations where sets model preferences, and show how extensions of classical theorems on convex sets can be used in the analysis of voting in "agreeable" societies. This talk also features research with undergraduates.

- Brett Goodwin, University of North Dakota (Department of Biology)

I received my B.Arts.Sc. (honours) in Biology from McMaster University (Hamilton, Canada) in 1993 and my Ph.D. in Landscape Ecology from Carleton University (Ottawa, Canada) in 2000. I was a Postdoctoral Research Associate at the Cary Institute of Ecosystem Studies (Millbrook, NY) from 2000-2002. In 2003 I took up my position in the Biology Department at UND where I teach Ecology and Biometry courses.

My research interests include insect population and community responses to landscape spatial structure, the role of space in predator-prey and host-parasite interactions, and measuring and modeling insect movement. For all these research interests I utilize a mix of empirical and modeling studies.

Dr. Goodwin's talk is entitled Math, Moths and Mice: Using Math to Help Solve a Biological Riddle.


#### Abstract

It is increasingly being argued that the interaction between math and biology will have a huge impact on both fields. As an example of how math can inform a biological investigation I will describe a recent ecological investigation that was only possible via mathematical tools. Gypsy moths are an invasive species in North America that have persisted and spread over the last century or so. During part of their life cycle gypsy moths are preyed upon by white-footed mice to such an extent that mice should drive the moths extinct. Hence, the riddle of how moths persist in the face of ferocious mouse predation. Piecing together biological information using computer simulations and mathematical models my collaborators and I have demonstrated how spatial patterns of mouse predation and details of moth movements can lead to an intrinsically unstable species interaction persisting.


## Officer Reports

## Governor's Report

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

The Board of Governors had an extra long meeting at MathFest. There are several important items we'd like you to know about.

- The NCS continues its not so quiet takeover of the MAA with the election of Paul Zorn as President Elect. Paul is currently heading up the Strategic Planning Group on publications. And Barbara Faires (not in the NCS) has been chosen as the new Executive Secretary as Martha Siegel's term has concluded.
- Not too surprisingly, money matters were on the agenda. On the one hand, our investments tanked, but not too badly as we are fairly conservatively invested. On the other hand, thanks to careful cost cutting from the staff, we expect to be able to cover the deficit without cuts in programming. All members are invited to take a look at the budget numbers which you can find on the Treasurer's page in the Members Only section at http://www.maa.org/treasurer/.
- We discussed extensive reports from the various strategic planning work groups, including final reports from the committee on sections and on STEM issues. Final reports from all working groups are posted on the MAA site at http://www.maa.org/StrategicPlanning/.
- The item that got the most attention, and gave Parliamentarian Wayne Roberts a serious work out, was the proposal for electronic memberships. These motions are detailed and affect the regular, departmental and student membership categories in slightly different ways. The general idea, however, is to offer electronic membership as an option. Such a membership would, in addition to the usual privileges, offer electronic access to all three journals for essentially the same price as receiving one print journal. So watch for this option soon.


## President's Report

## John Holte, Gustavus Adolphus College

Section Officers' Meeting from MathFest, Portland, OR:
Rick Gillman of Valparaiso University chaired the section officers' meeting at the MathFest in Portland, Oregon.

As a fixed agenda was flashed on a screen at the start of the meeting, I asked whether there would be an opportunity to consider the problems of promoting attendance at section-sponsored summer seminars. I was told there might be an opportunity later in the meeting, but that opportunity had not arisen by the time the meeting adjourned $21 / 2$ hours later-but see the notes at the end of this report.

At the start of the meeting, MAA President Bressoud announced that attendance at this MathFest would set a new record of more than 1500 attendees. He also announced that the MAA would establish a new electronic membership category starting in 2010. For the price of The American Mathematical Monthly, one would get all the main journals electronically. Student memberships will also become electronic.

Executive Director Tina Straley attended the whole meeting. I asked her whether free memberships could be re-established for student presenters at section meetings. She answered that the national office would not do that, but that sections or departments could pay for the memberships. She went on to say that the original purpose of the free memberships was to encourage student participation in the MAA and that now $40 \%-50 \%$ of the speakers at section meetings are students, so the policy has already served its purpose.

Most of the meeting time was spent on the draft report of the MAA strategic planning working group on sections. To read the full report, go to www.maa.org, select the Organization tab, go down to the Governance section and click on Strategic Planning Reports (Members Only). Once you have logged in, select Sections Report.

The working group--Carolyn Connell, Rick Gillman, Nancy Hagelgans (chair), Elgin Johnston, John Koker, Reggie Luke, Tina Straley, and Eve Torrence--developed the following mission statement:

[^0]As far as anyone there knew, there was no pre-existing mission statement. The working group consulted various reports and gathered opinions from focus groups and a "dot activity" at spring 2008 section meetings and other sources. Part of the report was a SWOT analysis: Strengths, Weaknesses, Opportunities, and Threats. Strengths included the organizational structure with members belonging to both the section and the national organization, the subvention system, its grass roots nature, national administration of programs that benefit sections, and project NExT. Weaknesses include the variability of geographical regions, no clear sense in some sections of how the MAA mission is realized locally, weaknesses in section governance structure, communication among sections and between sections and the national office, and lack of coordination between sections and the MAA. Opportunities exist to form partnerships with other mathematical organizations, to reach out to the many mathematicians who are not MAA members, and to provide nearby, hence economical, venues for professional presentations. Threats include the current economy, competing programs, the perception that MAA meetings are not suitable for research faculty, pressures on junior faculty to publish and present in other venues, and possibly insufficient senior faculty encouragement of MAA participation by their junior colleagues.

The section officers broke into six groups to get general reactions, ideas on what to do first, and advice on which recommendations should be omitted. The responses did not always fall neatly into these three categories. The general reaction was positive, but numerous suggestions were made-more than I could keep track of. (Some concerns/issue/suggestions: focus on undergraduates, promotion of MAA membership, separation of the duties of program chair and section chair, coordination with other groups, increasing the participation of research institutions, uniform website design, updating officer guidelines, guidelines for joints meetings, strong support of NEXT and Polya, a section-national disconnect, having HQ take over online registration, implementation timeline.) One group recommended getting reactions from the sections. Rick Gillman's idea is to send the report to the chairs' list-serve for them to bring the report to their executive committees. Several groups were concerned about the section on "ideal" section characteristics and geographical boundaries. Tina noted that the bylaws prevent the national office from redrawing the boundaries.

Ivars Peterson (publications) reported that Focus now has a calendar, and it could have limited section news that would be of value to others. MAA Math Alert email once a month will have notices of section meetings and links to articles. MAA Online has started a Twitter service, "MAA now," and Twitter reviews alerts, "MAA reviews."

Notices relayed from Michael Pearson: 1. Kerry Sullivan is his new staff contact person. 2. Secretaries: Turn in your annual reports. 3. The PREP workshop bulletin can list summer seminars. 4. He is interested in opportunities to coordinate workshops with sections, and funding exists. 5. Platforms for hosting web resources for membership services are imminent. Tina noted that the MAA has gone to Personify, that it is still not working, and that they are upgrading to a stable version.

Respectfully submitted, John Holte

NCS President

## Treasurer's Report

## Randy Westhoff, Bemidji State University

The North Central Section enters the new academic year in good financial shape. Our summer seminar ACTUALLY DOING IT!: A Hands-On Approach to Computational Combinatorial Geometry with Jesús De Loera received great reviews from participants. Thanks to Jennifer Galovich for all her work organizing the event. Unfortunately, we did not meet attendance expectations and had to use part of the Summer Seminar Fund to make up the difference.

As in previous years I will be sending out letters to the section's department chairs asking their institutions to become institutional members of the NCSMAA. Last year a total of twenty-three colleges and universities became institutional members raising a total of $\$ 575$ to support our section's Project NExT activities. Institutional memberships are again only \$25 a year.

I look forward to your continued support and hope to see all of you at the fall meeting at the University of North Dakota.

## Information Officer's Report

## Shawn Chiappetta, University of Sioux Falls

Thank you for all the submissions for the fall newsletter. It has been a wonderful opportunity to learn more of what my colleagues have been doing and I'm sure that the reset of the section appreciates the information also!

Over the summer, the North Central Section webpage received a facelift! The new pages should be more user friendly in navigation and load times. If you have suggestions, feel free to send them to shawn.chiappetta@usiouxfalls.edu.

## Campus News

## Augsburg College

Prof. Tracy Bibelnieks, a St. Olaf alumna, was the recipient of Augsburg's 2008-09 Distinguished Service in Teaching and Learning award. Prof. Bibelnieks is returning from a fall sabbatical. It is curious that she won a teaching award in the year she was on sabbatical.

Prof. Jody Sorensen, another St. Olaf alumna, is the newest tenured faculty member of the Augsburg Mathematics Department. Congratulations, Jody! You two done St. Olaf proud!

Prof. Su Dorée, not a St. Olaf alumna, is on sabbatical leave for fall 2009. Her departure is met by the return of Prof. Ken Kaminsky after a year in Spain. The department wasn't the same without him as was evidenced by the empty Volume 22 of Augarithms, the department newsletter. We are looking forward to the content-ridden Volume 23.

Prof. Pavel Belík worked with four undergraduate students this summer. Two of the students worked on related projects modeling organic photovoltaic cells while the other two students worked on modeling heat-shrinkable films.

Profs. Matt Haines and John Zobitz, St. John's alumni, did nothing of note since the last newsletter. St. Olaf 2, St. John's 0. (submitted by Matt Haines)

## Bemidji State University, Bemidji

This year we welcome a new tenure-track faculty member Jie Cheng to our Computer Science Program. Jie recently received her doctorate from Southern Illinois University and is replacing Jim Richards who retired last spring after 33 years on our faculty. Sue Rosselet, also a member of our Computer Science Program, is retiring at the end of this semester after 26 years of service to BSU.

Derek Webb and Glen Richgels received additional funds from MnSCU to support their work with the Northern Minnesota College Readiness Partnership. They are working with several area high schools and community, technical and tribal colleges to develop curriculum that uses technology to introduce students to mathematics, statistics and computer science concepts. They are targeting high school students who would otherwise not take mathematics courses. (submitted by Randy Westhoff)

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

Kris Nairn and Gary Brown have semester sabbaticals this year. Kris is doing research at the Mathematical Sciences Research Institute at U. C. Berkeley and loving it. Gary will be writing next semester somewhere--perhaps as far afield as Central America.

Tom Sibley received the Teacher of Distinction award at St. John's University in May.
The College of St. Benedict has started a special program (MAPCORES) to encourage more women to pursue the study of mathematics, physics and computer science. Our first class of first year women are now here with impressive scholarships and are in a common first year seminar focusing on scientific and mathematical themes as well as other course work, including a math class for each. (This is the only single sex first year seminar and definitely the only one with a theme remotely close to mathematics.) We are applying for an NSF grant to continue this program. (submitted by Tom Sibley)

## Concordia College, Moorhead

Dr. William Tomhave and Dr. Xueqi Zeng served as co-authors of the Test Bank for Calculus Concepts \& Concepts, 4th edition by James Stewart. This is the fifth project of its kind undertaken by Tomhave and Zeng, including all previous editions of Calculus Concepts \& Concepts as well as the 4th edition of the more familiar Stewart Calculus text. Rounding out the team for this most recent project, in the role of compiler and proof reader, was Dr. Jesse Lenarz.

Several Concordia students took part in REUs and other summer research. Rachel Vega took part in the Undergraduate Program in coding theory at MSRI. Ben Tetlie participated in the Summer Institute for Training in Biostatistics at the University of Wisconsin-Madison. Lisa Moats researched voting theory at the REU at Grand Valley State University, presenting her research at MathFest in Portland. Finally, Sam Benidt and Will Hall did research in group theory at Concordia over the summer with Dr. Anders Hendrickson.

In late May, Anders Hendrickson spoke on "Constructions of Supercharacter Theories" at the Zassenhaus Group Theory Conference at Franklin \& Marshall College in Lancaster, Pennsylvania. (submitted by Anders Hendrickson)

## Concordia University, St. Paul

Concordia University in St. Paul has lots of good news to share.
Last spring, Dr. Sarah Jahn was promoted to Associate Professor, and last summer, Dr. Sharon Mosgrove taught the first math module at the Summer Research Institute for high school students hosted jointly by the Science departments at CSP and Northwestern University. The high school students prepared a hypothesis testing project which they will present to the sponsoring corporations.

We also had several students participate in selective summer experiences. Sandra James (Math Major with Secondary Licensure) participated in the NSF-REU program in Extremal Graph Theory at the Rochester Institute of Technology and helped produce a paper for publication; Christine Mennicke (Double major in Math and Biology) completed a research project on Pre-Biotic Chemistry at an REU at the National Radio Astronomy Observatory in Green Bank, West Virginia; and Tiffany Goodchild (Math Major with Secondary Licensure) taught math to underserved Middle School students in the prestigious Breakthrough St. Paul program. (submittd by Sarah Jahn)

## Gustavus Adolphus College, St. Peter

Professor Michael Hvidsten is in China. He is spending his sabbatical year at United International College (UIC) in Zhuhai together with his wife and youngest child.

Professor Barbara Kaiser has moved from teaching to administration for the next three years. She is Gustavus's new Associate Provost and Dean of Academic Programs. (submitted by John Holte)

## Macalester College, St. Paul

Alicia Johnson (PhD in statistics, UMN 2009) joins our department this fall in a tenure-track position.
Jessica Striker (mathematics PhD, UMN 2008) and Eric Theriault (PhD student in CS at UMN) will be teaching for us this fall.

Chad Topaz will spend a year-long sabbatical at the IMA as a New Directions Research Professor. (submitted by Tom Halverson)

## Minnesota State University, Mankato

Minnesota State University, Mankato is short on faculty causing us to reduce the number of sections of our largest courses. Dr. Christopher Danielson, mathematics education, left us to join Normandale Community College so he would not have so far to drive to work everyday.

We had a failed search leaving us short in statistics. Dr. Mezbahur Rahman, statistics, is on leave this Fall semester. Dr. Ernest Boyd, applied mathematics, announced his plan to retire at the end of this year so we may have trouble covering courses in mathematics for business, finance and information technology next year.

With the cuts in funding throughout the university, we may have difficulty getting authorization to fill all of our positions. For this year we hired temporary faculty to help us - Ms. Kimberly Kaufeld in introductory statistics as a fixed term instructor, Mr. Jerry Burkhardt in college algebra as an adjunct instructor, and Ms. Sharon Crowley also in college algebra as an adjunct instructor. The debate about fixed term and adjunct positions versus tenure track positions is affecting our department and many others within our university.

These are financially difficult times, we are facing, making it a challenge to offer the quality and quantity of courses we would like.(submitted by Earnest Boyd)

## Minnesota State University, Moorhead

Long time department member Derald Rothmann goes on full retirement after fall semester. Derald joined the faculty in 1962. He and wife Maxine will divide their time between Sun Lakes, Arizona, and Moorhead, with other travels to see children and grandchildren.

The department this fall welcomes back Professor Ron Jeppson after a twelve year stint as Dean of the College of Social and Natural Sciences. Ron is on sabbatical this fall and will be teaching for us again in spring, 2010.

Also returning to the department this fall is Professor Sayel Ali, who spent the last three academic years at the Petroleum Institute in the United Arab Emirates.

New to the department this fall and yet a long time friend is Professor Jim Forde, who is teaching three classes for us this semester. Jim is a retired Concordia College mathematics professor, department chair, and dean. (submitted by Wally Sizer)

On 1 June 2009 Sister Andrea J. Lee, IHM, 10th president of the College of St. Catherine, cut the ribbon at the newly refurbished gate at Randolph and Cleveland Avenues to begin the formal celebration of the renaming of the College of St. Catherine to St. Catherine University. After a short ceremony, the participants walked to Our Lady of Victory chapel for prayers and music of praise and thanksgiving. Andrea J. Lee, IHM thus became the 1st president of St. Catherine University. The change to university more clearly conveys the reality of an institution offering certificates, associate degrees, bachelor degrees, master degrees, and clinical doctorates. The baccalaureate college for women remains the heart of the university. All other programs are open to women and men.

Within the new structure of the university, the Department of Mathematical Sciences and the Department of Physics are combined. We are happy to welcome Professor Terry Flower and Assistant Professor Erick Agrimson.

Early June again found Dan O'Loughlin and Adele Marie Rothan, CSJ in Louisville along with about 700 other college/university statistics teachers and AP Statistics teachers grading about 150,000 AP Stat Exams. Dan O'Loughlin is on sabbatical fall semester. His plans include work at the University of Minnesota and the development of new applied math courses. Yvonne Ng continues as director of the Center of Excellence for Women, Science and Technology where she administers the college's Science, Technology, Engineering and Mathematics (STEM) scholarships and related projects. Ann Sweeney continues as the MCTM Virtual Math Mentor for preservice and beginning math teachers. (submitted by Sister Adele Marie Rothan)

## University of Minnesota, Morris

The following students presented their undergraduate research at either the UMM's Campuswide Undergraduate Research Symposium in April 2009, or Math Fest 2009 or at the Joint MAA/AMS Meeting in 2009 or Pi Mu Epsilon meeting in 2009.

1. David Nieves, UMM 2010, on the topic:
"Advanced Techniques for Summing Divergent Series."
David's research was supported by the Morris Academic Partnership.
(Adviser: Barry McQuarrie.)
2. Samuel Potter, UMM 2009, on the topic:
"Impact of Seasonality, Spacial Heterogeneity, and Disease on Competitive Grassland."
Sam's research is partially supported by the University of Minnesota's Undergraduate Research Opportunities Program.
(Adviser: Peh Ng.)
3. Charles Rudeen, UMM 2009, on the topic:
"Solving the Maximum Weight Connected Subgraph Problem on a Subclass of Graphs." Charles's research was supported by the Morris Academic Partnership. (Adviser: Peh Ng.)
4. Tyler Sable, UMM 2010, on the topic:
"Computational Monodromy: Visualizing the Behavior of Polynomials."
(Adviser: Dave Roberts.)
5. Kate Struss, UMM 2009, on the topic:
"A Chaotic Image Encryption."
(Adviser: Barry McQuarrie.)
6. Jeremy Davis, UMM 2010, on the topic:
"Sierpinskii Fractals."

Math faculty, David Roberts, was promoted to Professor at the University of Minnesota in August 2009. (submitted by Peh Ng)

## University of North Dakota, Grand Forks

Congratulations to Ryan Zerr and Shuzo Takahashi, both of whom now have tenure.
Tim Prescott is now spending his time teaching online courses for us.(submitted by Richard Millspaugh)

## University of St. Thomas, St. Paul

Dr. Michael Axtell of the University of St. Thomas will be the keynote speaker 3rd annual Millikin Undergraduate Mathematics Research Conference at Millikin University, Decatur, IL, Saturday, October 3, 2009.

Mike is also a professor at the NSF funded Wabash Summer Institute in Mathematics (REU). Mike research area is in commutative ring theory it blends the theory of zero divisors and elementary graph theory.

Dr. Eric Rawdon received an NSF grant of $\$ 150,000.00$ to fund computer purchases and student research in knot theory. The grant runs from 2008 to 2011. The tile of the grant is RUI: Structure of Entanglement in Macromolecules.

Cheri Shakiban will continue to work at the Institute for Mathematics and Its application (IMA) as the Associate Director for Diversity and through a grant from the National Science Foundation she is organizing the Modern Math Workshop. This is the second workshop on contemporary research in mathematics sponsored by all the US-based Math Institutes and will take place in Dallas Texas, on Oct 14-15. On another note, together with a colleague from the Engineering department, she will lead a study aboard course on Math and Architecture or Incas in Peru during January 2008. (submitted by Doug Dokken)

## University of Sioux Falls

Dr. Joy Lind's paper "Real world graph connectivity," co-authored with Darren Narayan, appears in the September 2009 issue of Teaching Mathematics and its Applications.

Dr. Jason Douma enjoyed a sabbatical during Spring 2009, during which he continued some current investigations into dot voting theory and conducted some foundational work toward writing a book on the counterintuitive side of mathematics.

Shawn Chiappetta received his doctoral degree this past May with his dissertation entitled "NonOverlapping Domain Decomposition Parallel Algorithms for Convection-Diffusion Problems". Dr. Chiappetta was also awarded promotion to the rank of Associate Professor of Mathematics at the Spring 2009 meeting of the USF Board of Trustees. (submitted by Jason Douma)

## 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 October 23, 2009 at the University of North Dakota in Grand Forks, North Dakota immediately prior to the NCS Fall Meeting. Details about the MAA-NCS Section NExT program and its fall meeting may be found at http://pages.usiouxfalls.edu/maa/next/index.html.

## Conferences and Activities <br> MAA-NCS Team Competition

Saturday, November 14, 2009

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

All presentations will be held in the 3 M Auditorium in the Owens Science Hall, starting at 4:30 PM.

- September 23, 2009: Bahman Kalantari, Rutgers University
- October 21, 2009: Eric Rawdon, UST
- November 18, 2009: Chad Topaz, Macalester
- December 9, 2009: Gary Hatfield, Securian Financial Group


## Regional AMS Meeting

April 10-11, 2010, Macalester College

## Pi Mu Epsilon

April 16-17, 2010, St. John's University

## MCTM

April 29-May 1, 2010, DECC, Duluth

## Future Section Meetings

Spring 2010
Fall 2010

University of St. Thomas
University of Sioux Falls

April 23-24
October 22-23

## Information for Contributors

Submissions should be sent electronically (preferred method) to the shawn.chiappetta@usiouxfalls.edu or mailed to:


[^0]:    The sections of the Mathematical Association of America (MAA) will advance the mission of the MAA on a regional level; offer guidance to the MAA as it forms and fulfills its mission; provide professional development and networking activities for section members and mathematics students within geographically accessible locations; and promote discussion and action on issues affecting mathematics teaching, learning, and research in the region.

