North Central Mathematical Bulletin

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

Fall 2010, Volume 13, Number 2

UPCOMING MEETING

Hope to See You at the University of Sioux Falls in Sioux Falls!

The University of Sioux Falls will host the MAA-NCS Fall Meeting, October 22-23.

Our two invited speakers for the spring meeting are **Tim Peil** (Minnesota State University-Moorhead) and **Stacey Brook** (University of Iowa).

A program for the Fall 2010 meeting will be posted approximately one to two weeks on the MAA-NCS website prior to the meeting.

OFFICER REPORTS

Govenor's Report

Steve Kennedy, Carleton College

I represented the North Central Section at the MAA Board of Governors meeting on August 4 in Pittsburgh. I was surprised by Pittsburgh; it is architecturally stunning. The Gothic roof of the Pittsburgh Union Trust building was outside my hotel room window, the Allegheny County Jail (I saw only the outside!) has its own Bridge of Sighs modeled after Venice's (only Venice has more bridges than Pittsburgh) and the PPG Palace is a glass fairyland castle. I didn't expect the city to be so beautiful---I also didn't expect my French fries to be inside my sandwich, but that's another story.

Some agenda items from the BoG meeting that you might find interesting:

1. The MAA can and does submit grants to federal agencies. National MAA is actively seeking fundable ideas from members and wishes to cooperate with members on developing proposals. Some examples of current projects are: an NSF-funded project to identify characteristics of successful calculus programs, an NSF proposal providing a home for WeBWork at the MAA, a curriculum project funded by NSF in college algebra, a proposal to NSA to fund undergraduate student travel. If you've got an idea for a project that could be better coordinated through MAA than through your home institution, Michael Pearson at the MAA would like to talk to you.

2. The MAA secretary, **Barbara Faires**, would like to hear from governors nominations for service on MAA committees. There are hundreds of volunteers needed. If you would like to serve on an MAA committee, send me (skennedy@carleton.edu) a brief note indicating your interest and any relevant special qualifications and I'll forward it to Barbara.

3. The Section Visitors Program has been reconfigured so that the journal editors are no longer among the possible invitees. However, we will be allowed to invite (at no cost) an editor once

every five years in addition to our regular Section Visitor.

4. We were encouraged to look at MAA books when considering textbooks. All such are priced under $100.

5. The only (mildly)controversial item on the agenda of the daylong meeting was draft language to be included with the MAA's college math placement material. The draft language recommends strategies for effective placement tests. There are five points:

    a. Measure developed mathematical reasoning skills (this means don't use SAT or ACT scores, they measure the wrong thing).

    b. Emphasize realistic/current expectations (if your courses are evolving your placement test should, too).

    c. Avoid singular focus on computational skills.

    d. Incorporate appropriate technology.

    e. Use appropriate testing methods.

The controversy surrounded item d). It seemed clear to me that the point of the recommendation (with its amplifying language) was that your students might have become accustomed to taking mathematics tests with a calculator in hand and if you administer a placement test forbidding that aid, you should not expect accurate results. Others read the item as advocated an MAA position in favor of calculator use. After some animated discussion we adopted the language presented to us.

President's Report

Jason Douma, University of Sioux Falls

I hope that you are looking ahead to the promise of the new academic year with hopeful anticipation and joyful expectation. We certainly have good things awaiting us in the North Central Section this year.

My colleagues at the University of Sioux Falls eagerly join me in welcoming the section to USF for our fall meeting on October 22-23, 2010. The meeting will provide an opportunity to showcase our recently expanded and updated Salsbury Science Center. More importantly, the meeting will feature interesting talks from you and your colleagues, including invited talks from our own 2010 Distinguished Teaching Award winner, **Timothy Peil**, as well as University of Iowa economist **Stacey Brook**, co-author of The Wages of Wins: Taking Measure of the Many Myths in Modern Sport.

Our friends at Carleton College will host the Spring 2011 section meeting; stay tuned for program details as they continue to come into focus. Also, be sure to place the 2011 MAA-NCS Summer Seminar high on your summer to-do list. This year's presenter will be **Glen Van Brummelen** of Quest University (in British Columbia), who will be guiding us through turning points in the historical development of trigonometry. Details—including seminar dates—should be announced later this fall.

I wish to express my personal appreciation to the section officers who have just completed their terms of service. I follow **John Holte** as President of our section; during my year as President Elect, I appreciated the opportunity to learn from his quiet, confident example, just as I did in the role of his student at Gustavus some years ago. To our good fortune, John continues his work on the Executive Committee—now in the role of Past President—for the coming year. **Su Dorée** has been a tireless and productive President for our section. Even after officially completing her term as Past President, Su pulled through for our section once again by serving as our representative at the section officers' meeting during Mathfest 2010. Wisecracks about our "outgoing" Governor **Jennifer Galovich** aside, I

cannot measure the value she has provided to our section through her attention to detail, her frequent communication, and her enthusiastic advocacy for good mathematics and good mathematicians everywhere. I also extend my admiration and appreciation to **Namyong Lee** for his valuable insight and faithful contributions to the work of the Executive Committee during his term as Member-at-Large. Finally, special thanks go to "the Dans"—**Dan Kemp** and **Dan O'Laughlin**—for their leadership as chairs of the Meritorious Service Award and Distinguished Teaching Award committees, respectively.

We welcome incoming officers **Mike Hvidsten** as President Elect, **Steve Kennedy** as Governor, and **Sayel Ali** as Member-at-Large—as well as our re-elected Information Officer, **Shawn Chiappetta**—to the Executive Committee this year. Thank you in advance for your service.

One final word of encouragement to each of you. We are privileged to count among our colleagues in the North Central Section a truly impressive collection of teachers and professionals. Although it requires some care and effort, please seriously consider nominating an outstanding colleague for our Distinguished Teaching Award or Meritorious Service Award. Nominations for the teaching award should be sent to **Karen Saxe** at Macalester College; nominations for the service award go to **Deanna Haunsperger** at Carleton College. Details may be found in the Awards section on the MAA-NCS website.

Secretary's Report

Joel Iiams, University of North Dakota

The Spring Meeting of the North Central Section was held at the University of Saint Thomas on April 23-24. There were 64 people in attendance. Invited speakers were Ivars Peterson from the MAA, and Danrun Huang from St. Cloud State University.

The Fall meeting is scheduled for October 22-23 at the University of Sioux Falls. Details and a call for papers will be posted on this webpage.

Treasurer's Report

Randy Westhoff, Bemidji State University

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

This fall student speakers can request reimbursement for up to $100 in travel, lodging and meal expenses. To receive funds they should fill out a reimbursement request form which can be downloaded (here) and give it to me at the meeting. I look forward to your continued support and hope to see all of you at the fall meeting at the University of Sioux Falls.

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Information Officer's Report

Shawn Chiappetta, University of Sioux Falls

Thanks to everyone who submitted reports from their schools. It is always a pleasure to be the first one to read about the great things going on in the section. If you are not sure if requests are getting to your program, you can send me an email to check.

From the time the Fall meeting is over, the Section's web page will be migrating to the MAA's servers. The new web address will be **sections.maa.org/northcen** (not functioning yet). A message will be placed on the old page to help direct users to the new address. Thank you for your patience as we make the transition.

CAMPUS NEWS

Augsburg College

One full-time non-tenure track faculty member joined Augsburg's Mathematics Department this fall. Our newest hire is **Catherine (Katy) Micek** who recently finished her Ph.D. from the University of Minnesota on mathematical models and numerical methods for polymer gels used in biomedical applications under the direction of Dr. **Carme Calderer**. Katy is a graduate of the University of St. Thomas. So now Augsburg Mathematics Department is the full-time home of three Olies, two Johnnies, and a Tommie. Thank you to those fine institutions! We are awaiting contributions from other area schools. Also joining the department in adjunct roles are **Eleonore Balbach** (Mathematics Education, MAE, Hamline 1998, Macalester undergraduate), **Rob Edman** (Mathematics, MS, University of Minnesota 2008, ABD), and **Jessica Striker** (Mathematics, Ph.D, University of Minnesota, 2008).

Continuing in the Mathematics Department are professors Pavel Bělík, Tracy Bibelnieks. Su Dorée, Rich Flint, Matt Haines, Ken Kaminsky, Jody Sorensen, John Zobitz and our adjunct faculty Anna, Alyssa, Fran, Rebekah, Sue, Tami, Todd, and Troy.

Prof. **John Zobitz** guided 5 research students this summer on different projects of modeling ecosystems. Four of these students presented at MathFest in Pittsburgh, and one won an award for outstanding presentation. The four students also put in a solid showing in the MAA Math Jeopardy competition. John recently established a Augsburg Mathematics twitter page http://twitter.com/AugsburgMath. His goal is to have more followers that Justin Bieber. Who's Justin Bieber???? Current Follower Count: AugsburgMath followers: 10. JustinBieber: 5,174,714.

With support from 3M, Prof. **Pavel Bělík** led an undergraduate research project this summer on modeling heat-shrinkable thin films.

Prof. **Jody Sorensen** is on sabbatical this fall.

Under the direction of Prof. **Tracy Bibelnieks**, Augsburg hosted the MN State High School Mathematics League Coaches Conference this summer. The coaches attended a Saint Paul Saints game where Tracy and the Math League Head Problem Writer **Mike Reiners** participated in a Pizza Toss, winning pizzas for their section of the stadium. Tracy also spend time on her farm this summer in Wisconsin tending to the donkeys, goat, dogs and cat. Reportedly she enjoys shoveling manure better there than anywhere else! *(Submitted by Matt Haines)*

Augustana Collge

Our department has experienced a couple of recent staffing changes. Dr. **Tim Sorenson** has stepped down as chair of the Mathematics and Computer Science Department after three years of excellent service; Dr. **Dan Swets** is taking over the position. Dr. **Curt Olson**, long-time chair of the mathematics department at USD, has kindly left retirement again to join us as an adjunct faculty member. Another new hire is Dr. **Martha Gregg**, who joined us in the fall of 2008 shortly after completing her studies in functional analysis at University of Nebraska at Lincoln.

On the undergraduate research front: Dr. Tim Sorenson is overseeing students (Nicole Winkler, '10, Drew Doshier, '12) researching the mathematics of swarming, while Martha Gregg is working with senior Trent Anderson on a modeling project, and supervised the senior project of recent graduate Peder Thompson. We are excited to see growth in this area of our program. *(submitted by Dan Swets)*

Bemidji State University, Bemidji

We have several new faces in our department this fall. Dr. **Ryan Walker** joins our mathematics faculty after fours years in research positions, most recently at Pennsylvania State University. Ryan completed his Ph.D. in Atmosphere-Ocean Science and Mathematics at New York University in 2006.

Dr. **Chad Williams** joins our computer science faculty after completing his Ph.D. last spring at the University of Illinois at Chicago. Chad is replacing **Sue Rosselet** who retired last winter. Our computer science program also welcomes Dr. **Fabio Guerinoni** and Ms. **Kanwal Gagneja**. Fabio comes to us after several years as a faculty member at Virginia State University and is filling in for **Marty Wolf** who is on sabbatical this year. Kanwal is currently a doctoral candidate at North Dakota State University and is filling in for **Jie Cheng** who resigned over the summer.

This year Dr. **Heidi Hansen** rejoins our mathematics faculty in a tenure-track position after completing her Ph.D. at the University of Minnesota. *(submitted by Randy Westhoff)*

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

Five of our math graduates wrote honors theses last year. One of them, Jason Lutz, won the prize for the best thesis in all disciplines in both schools. His advisor was **Bret Benesh**.

We have five students writing theses this year. One of them, Kristin Reinsvold, won the CUR prize for her research talk at Mathfest this past summer. Her advisor was **Tom Sibley**.

Gary Brown spent his spring sabbatical in Costa Rica and California writing another mathematical fiction book. It is called "*The Continued Adventures of the Parrot, The Case of the Missing Heroine*" and due out sometime in the fall 2010 from North Star Press.

Tom Sibley and two of his students are part of an NSF grant to foster teams of undergradaute researchers.

Mark your calendars for our next Pi Mu Epsilon conference, **April 8 and 9, 2011** at St. John's University. Featured Speaker: **Bill Dunham**, speaking on Euler. Encourage your students to prepare and present talks. For more information, contact Kris Nairn knairn@csbsju.edu. *(submitted by Tom Sibley)*

Concordia College, Moorhead

Doug Anderson is back after a year's sabbatical, which consisted of one semester researching at the University of New South Wales in Sydney, and one semester teaching at United International College in Zhuhai, China. *(submitted by Doug Anderson)*

Gustavus Adolphus College

Professor **Michael Hvidsten**, our NCS President-elect, has returned from a one-year leave at United International College in Zhuhai, China. One of the courses he taught there, a robotics course modeled on one he taught here at Gustavus, was a real hit with his students.

The Gustavus MCS department is pleased to welcome its newest computer scientist, **Choong-Soo Lee**. He earned his B.A. in computer science and physics at Wesleyan University and his M.Sc. and

Ph.D. in computer science at Worcester Polytechnic Institute.

The Gustavus student team of Eric Cox, Sam Rethwisch, and Chenyu Yang, advised by Dr. **Thomas LoFaro**, was designated as a Meritorious Winner in the 2010 Mathematical Contest in Modeling. *(submitted by John Holte)*

Macalester College

We are happy to welcome **Michael Weimerskirch**, who joins our department as a visiting assistant professor. Mike earned his PhD from the University of Minnesota in 2005 and has been teaching most recently at Saint Olaf. Professor **Andrew Beveridge** will spend the academic year on sabbatical.

Ed Belbruno, Research Associate at NASA, will give our annual Math and Society Lecture on Tuesday October 12 at 4:30 PM in the Davis Lecture Hall.

Minnesota State University, Mankato

Drs. **Ernest Boyd** and **Gary Rockswold** retired in Spring 2010.

Dr. **Han Wu** joined the department as our new statistics faculty. Dr. Wu moved from Austin Peay State University in Tennessee.

We also have two new fixed term faculty members, **Matthew Priem** and **Binod Shrestha**.

The department is searching for tenure track positions, one in applied mathematics and another in mathematics education. *(submitted by Namyong Lee)*

Minnesota State University, Moorhead

New to the department this fall (in a fixed term appointment) is Dr. **Damiano Fulghesu**. He got his PhD from the Scuola Normale Superiore in Pisa, Italy. His specialty is algebraic geometry.

Dr. **Bette Midgarden** will be returning to the Mathematics Department following a sabbatical. She served MSUM as Vice President for Academic Affairs for the past 14 years and was on assignment in the Office of Academic Affairs for several years prior to that.

Dr. **Tim Peil** was one of two MSUM faculty members recently presented with a 2010 University Excellence in Teaching Award. *(submitted by Wally Sizer)*

St. Catherine University

Our internal structure has changed and continues to evolve as we begin our second year as St. Catherine University (now SCU – but still St. Kate's!). Four schools constitute SCU: School of Humanities, Arts, and Science; the School of Business and Leadership; the Henrietta Schmoll School of Health; and the School of Professional Studies. Our department is now the Department of Mathematics and Physics. We also provide a home for computer science and are in the process of hiring an engineer for a half-time position to work with STEM students.

Professor **Terry Flower**, on sabbatical this fall, is planning to work with Dr. Robert Gehrz and Dr. Terry Jones at the University of Minnesota. He was interested in working with projects on either the SOFIA airborne observatory or the Herschel Space Telescope if the opportunities are present.

Erick Agrimson and **Terry Flower** with students Elizabeth Fosse and Elizabeth Bernhardt attended the American Association of Physics Teachers (AAPT) meeting in Washington, D.C. February 13-15th 2010 where Elizabeth Fosse presented a poster "Meteorite or Meteor-wrong" and Elizabeth Bernhardt presented a talk "Stability of Long Range Wave Propagation". Terry Flower presented a talk "Astronomy

Online - Boon or Boondoggle?". Erick Agrimson presented a talk "The Physics of High Altitude Ballooning".

Dan O'Loughlin and **Adele Marie Rothan**, CSJ were in Daytona Beach grading AP Stat Exams in June. **Ann Sweeney** continues as the MCTM Virtual Math Mentor for preservice and beginning math teachers. **Yvonne Ng** continues as the director of the Center for Women, Science and Technology where the math/physics students taught over 100 4th-8th girls the basics of cryptography. She continues to be active with the computer science and engineering courses on campus, teaching over 100 teachers the basics of engineering in 2009-10. *(submitted by Adele Marie Rothan, CSJ)*

St. Olaf College

St. Olaf's Department of Mathematics, Statistics, and Computer Science (MSCS) has seen many recent comings, goings, events, and changes.

- **Adam Berliner** joined us in fall 2009 (sorry for the late notice!) after earning his PhD from the University of Wisconsin--Madison. His research area is combinatorial matrix theory and in his spare time he enjoys Twins baseball and reality television.

- **Zajj Daugherty** joined us this fall from the University of Wisconsin--Madison. She completed her PhD in combinatorial representation theory under the mentorship of Arun Ram. Zajj looks forward to getting to know her new Minnesota-area colleagues.

- **Ryota Matsuura** joined us this fall from Boston University. After completing his PhD in algebraic number theory in 2008, Ryota spent two years as a postdoc at BU's School of Education. He will direct St. Olaf's mathematics education program.

- **Adam McDougall** joined us this fall from the University of Iowa. He completed his PhD in knot theory, and looks forward to leading an undergraduate research project involving random fractions and, in occasional spare hours, playing mathematical, computer, and board games.

- **Kaisa Taipale** joined us this fall from the University of Minnesota, where she completed her PhD in algebraic geometry, specializing in Gromov--Witten theory. Kaisa looks forward to further study of string theory (both mathematical and lace knitting) in her free time.

- **Martha Wallace** officially retired after the 2008-9 year, but she spent much of the 2009-10 year both teaching in and managing the transition to "new management" in our mathematics education program. We recognized her "second retirement" with a gala farewell party last spring.

- Continuing faculty members **Olaf Hall-Holt**, **Bruce Hanson**, and **Kay Smith** will be on sabbatical during part or all of this academic year, while **Dick Brown**, **Paul Humke**, and **Paul Roback** are returning from sabbaticals in 2009-10. Two role-related changes loom for calendar 2011: **Tina Garrett** will become North American director of the Budapest Semester in Mathematics (following our own Paul Humke) , and **Paul Zorn** will assume the MAA presidency (following **David Bressoud**, from Macalester).

St. Olaf MSCS students have been active, too, participating in REU's and other research projects here and elsewhere. To cite just one example, four Oles presented or co-presented talks at national meetings last summer: Benjamin Simmons (Modular tableaux and their conjugates); McKenzie West (On Subbarao's Conjecture on the parity of the partition function); Bjorn Wastvedt (Counting modular tableaux); Cathryn Holm (Equivalence classes of zero divisor graphs). *(submitted by Paul Zorn)*

University of Minnesota, Morris

Anne Dillon, UMM 2010, presented her research topic, "Convergence and stability of matrices in Google's PageRank algorithm" at the Spring 2010 MAA-NCS Meeting in St. Paul. Anne's research is partially supported by the University of Minnesota's Undergraduate Research Opportunities Program. (Adviser: **Peh Ng**.)

In Fall 2010, we welcome a new faculty member, Dr. **Jennie D'Ambroise**. Jennie earned her Ph.D. from the University of Massachusetts in Amherst, and her research area is in mathematical physics. *(submitted by Peh Ng)*

University of North Dakota, Grand Forks

Congratulations to Dr. **Joel Iiams**, who was just promoted to the rank of professor and is now free of adjectives.

Congratulations also to Dr. **Michael Minnotte**, who just received tenure. *(submitted by Richard Millspaugh)*

University of Sioux Falls

Chad Birger continues to serve as research mentor under the NIH funded BRIN (Biomedical Research Infrastructure Network) program; his work applies statistical methods to biological model selection.

Two USF students presented talks based on their undergraduate research at the 2010 Math on the Northern Plains conference, and again at the 2010 University of Sioux Falls Undergraduate Research Conference. Matthew Rieck presented "Hidden Markov Models, with a Focus on Their Role in Bioinformatics" (completed through the BRIN program under the mentorship of Chad Birger). Timothee Bryan presented the results of his independent investigation, "Do Quarterbacks or Defenses Win Championships?: Measuring the Impact of Quarterbacks and Team Defenses upon Wins in the National Football League."

In April 2010, **Shawn Chiappetta** officially joined the ranks of USF's tenured faculty. Congratulations, Dr. C! *(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.

This fall, we will be asking for time (15-20 minutes) to get those not able to make it for the typical early Friday afternoon session to be involved and help come up with suggestions for future topics, invited speakers, other activities and other ideas to help improve our services to new (or new-ish) faculty in our Section. If you are a part of Section NExT (or want to be), please keep an eye for the meeting time this fall and make plans to participate during the spring!

CONFERENCES AND ACTIVITIES

CAM Colloquium Series (University of St. Thomas)

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

- September 22, 2010

  "Mathematics that Swings: The Math Behind Golf"

  Doug Arnold, Rutgers University

  Abstract: Mathematics is everywhere, and the golf course is no exception. Many aspects of the game of golf can be illuminated or improved through mathematical modeling and analysis. We will discuss a few examples, employing mathematics ranging from simple high school algebra to computational techniques at the frontiers of contemporary research

- October 27, 2010

  "Using Mathematical Modeling to Answer Insurance Business Questions"

  Susan Witcraft, OneBeacon Insurance Companies

  Abstract: This Colloquium will begin with an introduction to several key business questions that insurance companies face. Economic capital modeling, the primary mathematical tool used to address these questions, will then be explained. The remainder of the presentation will focus on how math and statistics are used to parameterize the model and interpret the results to provide meaningful information for senior management.

- November 17, 2010

  "Numerical Simulation for Medical Device Design"

  John Abraham, University of St. Thomas

  Abstract: Numerical simulation techniques are now commonly used in the biomedical industry to accomplish a wide number of tasks including product development, verification and validation, safety analysis, and the study of physiological responses to medical treatments. A series of case studies is presented which illustrate recent biomedical applications of ANSYS Mechanical and ANSYS CFX. The cases which are presented here are intended to be illustrative of the generic application of ANSYS to this class of problems. Among the illustrative examples are: (1) the study of the trajectory of particulates within an artery which are released during an atherectomy procedure, (2) bioheat transfer calculations of a microwave prostate therapy, (3) calculations of heat transfer within the wall of a uterus during endometrial ablation, (4) simulations of pulsatile blood flow within healthy and unhealthy Posterior-Tibial arteries, and (5) predictions of the impact of embolizing agents on hemodynamics. In each case, the simulations allow for efficient design of medical devices, for improvements to existing devices, or the elucidation of physiologic responses to medical treatments.

- December 8, 2010

  Pavel Belik, Augsburg College

32th Annual Pi Mu Epsilon Conference

Mark your calendars for our next Pi Mu Epsilon conference,

April 8 and 9, 2011 at St. John's University.

Featured Speaker: **Bill Dunham**, speaking on Euler.

Encourage your students to prepare and present talks. For more information, contact Kris Nairn knairn@csbsju.edu.

Iowa Section Fall Meeting

October 22-23, 2010 (webpage)

FUTURE SECTION MEETINGS

Spring 2011	Carleton College	April 15-16
Fall 2011	Minnesota State University - Moorhead	TBD
Spring 2012	TBD	
Fall 2012	University of Minnesota - Duluth	TBD

INFORMATION FOR CONTRIBUTORS

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

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