

Mathematics and Computer Science

Department Newsletter

Memories of NMU

*"The only real treasure is in your head. Memories are better than diamonds and nobody can steal them from you."*  
- Rodman Phibrick

Inside this issue:

Actuarial Offerings	2
Internships	2
Outstanding Students	3
Spotlight	4

Have you ever been told *you take your memories with you*? Memories good *and* bad are what we have left when a particular experience is over. Hopefully, our students will have a plethora of memories to take with them when their NMU experience is complete.

For some of our students, the memory of the first lonely weeks at Northern will be replaced by memories of lasting friendships that were made when they joined a math or computer science student organization.

For many, the memory of a particularly difficult math class may not be pleasant, but it will be hard to replace the memory of what it felt like when after help from a certain professor it all finally fell into place.

Perhaps for others, it might be the unforgettable memory of the first time they nervously presented their research project to an audience of their peers and department faculty.



And finally, what student will ever forget the memory of the pride and accomplishment they felt as they walked across the stage to receive their diploma on graduation day!

Memories made at NMU, good *and* bad, will go with all of our students when they graduate. My hope each year is that when they leave NMU, the memories our students have will be the good ones—the kind they'll *want* to take with them!

*Continued on page 4*

The Mathematics and Computer Science Newsletter is published once a year for alumni and friends of the Mathematics and Computer Science Department.

Spring 2013  
Sue LaForais  
Production Editor

Northern Michigan University does not unlawfully discriminate on the basis of race, color, religion, sex, national origin, age, height, weight, marital status, familial status, handicap/disability, sexual orientation or veteran status in employment or the provision of services, and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities an equal opportunity to participate in all programs and activities.

Gamma Iota Sigma on Campus

After a rigorous application process and unanimous vote by the Grand Chapter, the NMU Beta Eta chapter of Gamma Iota Sigma was chartered on April 22 at a ceremony held in the Marquette Room at the University Center. Mike Hubbel, former advisor to the Alpha Alpha Chapter at Olivet Michigan and former grand chapter president, presided over the chartering and initiation ceremonies.

Beta Eta is the 50th chapter to be chartered for the society.

Fourteen NMU students were initiated into the chapter, more than half of whom major or minor in this department. Inductees included: Sean Coykendal, Troy Cogan, Monica Ahles, Ryan Brown, Mark Cook, Joseph DeLisle, Lindsay Diller, Aaron Kalbfleisch, Marina Macias Sevde, Cayla Moore, Kelsey Moran, Drake Olejniczak, Thomas Olsson, and Kiefer Yates.

Gamma Iota Sigma is an international professional fraternity organized to

promote, encourage and sustain student interest in insurance, risk management and actuarial science as professions. It aims to encourage high moral and scholastic attainments and to facilitate the interaction and cooperation of educational institutions, industry and professional organizations by fostering research, scholarship and improved public relations.

*Our own Dr. Linda Lawton was instrumental in bringing Gamma Iota Sigma to our campus. Thank you, Linda!*

# Actuarial Offerings Announced

Beginning with the fall 2013 semester, the department will offer a mathematics major with a concentration in actuarial sciences. We will also offer a minor in actuarial sciences for non-mathematics majors. Both the concentration and minor focus on the first two actuarial exams, however, electives are available that support all of the preliminary exams and validation by educational experience subjects.

For those unfamiliar with the actuarial profession: Actuaries are experts in evaluating the likelihood of future events, designing creative ways to reduce the likelihood of undesirable events, and decreasing the impact of undesirable events that do occur. Ninety percent of actuaries work for insurance companies in a wide variety of capacities, from product development and pricing to analyzing investment strategies.

Entering the actuarial profession requires passing a rigorous series of exams. Ideally, an undergraduate wanting to enter the field will pass the first two actuarial exams before

graduation. Both the Probability Exam and the Financial Mathematics Exam are three-hour, multiple-choice examinations offered via computer-based testing.

The syllabus for the Probability Exam develops the candidate's knowledge of the fundamental probability tools for quantitatively assessing risk. The application of these tools to problems encountered in actuarial science is emphasized. A thorough command of the supporting calculus is assumed. Additionally, a very basic knowledge of insurance and risk management is assumed.

The national pass rate for this exam is approximately 30%; math majors Troy Cogan and Drake Olejniczak passed the exam on their first attempt. **Our MA 371 Probability course covers the material on this exam.**

The syllabus for the Financial Mathematics Exam develops the candidate's understanding of the fundamental concepts of financial mathematics and how those concepts are applied in

calculating present and accumulated values for various streams of cash flows as a basis for future use in reserving, valuation, pricing, asset/liability management, investment income, capital budgeting and valuing contingent cash flows.

The candidate is also given an introduction to financial instruments, including derivatives, and the concept of no-arbitrage as it relates to financial mathematics. A basic knowledge of calculus and an introductory knowledge of probability is assumed.

The national pass rate on this exam is roughly 40%; Andrea Clark, 2011 graduate of this department, passed the exam on her first attempt. **Our new course MA 370 Interest Theory course covers the material on this exam.**

Actuary is a top-ranked job and the work is intellectually stimulating. In almost every category such as work environment, employment outlook, job security, growth opportunity and salary, a career as an actuary is hard to beat!

## Internships for students

Our computer science students have had a very busy year serving as interns at a number of high-profile companies. In addition to Intel Corp., we have placed students at NASA, Amazon and Hitachi Global Storage Technology.

Our relationship with Intel continues to grow. This past year, we placed a dozen students at the Intel facility in Portland, Ore. These students were working with mobile devices and wireless networking devices. We placed three students in Austin, Texas working on Intel's communication framework for portable wireless

devices. And for the first time, we have a student working on mobile applications at Intel corporate headquarters in Santa Clara, Calif.

The on-campus Intel lab continues going strong. The lab serves as a training facility for future Intel interns by offering a chance to work on testing projects for Intel using standard Intel software tools. The lab has steady turnover, as seasoned campus employees leave for internships in Portland. The lab plans to hire three more students to replace students leaving for internships this summer.

Intel sponsored a programming competition to develop software to show off their communication framework for mobile devices. Three teams completed the competition and all have been declared winners and will be offered internships as well as a share of prize money contributed by Intel. Intel sponsors the competition to identify future programming talent at NMU as well as to develop software that they can use to demonstrate their mobile communication framework.

\*\*\*

*We thank everyone who made a donation to this department through the NMU Foundation. If you would like to see travel opportunities, activities, programs and organizations continue for our students, please mark your donations specifically for "Mathematics and Computer Science."*

# Outstanding Students

## Steve A. Jarvis 2013

### Outstanding Graduating Senior



The Mathematics and Computer Science Department is proud to name Steve A. Jarvis as its Outstanding Graduating Senior for 2013. Steve graduated in May *Summa Cum Laude* with a major in computer science and a minor in mathematics.

As a student athlete, Steve was a resident weightlifter in the U.S. Olympic Education Center and won 11 medals in national and international competitions. He also participated in a year-long internship at Intel Corporation in Portland, Ore., where he helped develop the first generation of Windows 8 tablets. His experience creating applications for the Android market helped him win a first-place finish in Intel's Common Connectivity Framework programming contest.

Steve plans to continue his study of computer science in graduate school in the fields of machine learning and artificial intelligence. As an introduction to the subject area, he created a neural network to recognize handwritten digits as a part of his senior project.

Each year, in addition to its outstanding graduating senior, the department recognizes the outstanding students in its other disciplines as well, and this year we were fortunate to have a number of talented students to choose from.

In choosing an outstanding student, faculty must consider the student's GPA as one possible credential, but other factors such as department and campus activities, community service, and membership in math-related organizations are also considered.

### Outstanding Math Education Student

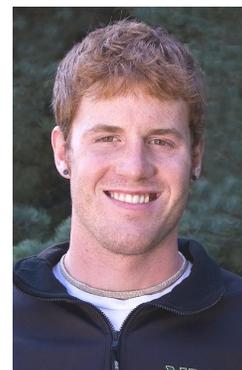
**John Goodney** has always had his heart in mathematics and more recently found his calling in mathematics education. After graduating from NMU in 2008 with a degree in economics and mathematics, he returned to Northern in 2010 to pursue his teaching certification in secondary education. John has presented at the Minnesota Council of Teachers of Mathematics conference twice and was the president of the math club in spring 2012. He also spent time tutoring in the department's math tutoring lab and at Rise Above Tutoring Center. While pursuing his degree, John worked full time and maintained a 3.77 GPA. In fall 2012 he completed his student teaching at Marquette Senior High School and has since been hired to teach their credit recovery class after school.



John Goodney  
2013 Outstanding  
Math Education Student

### Outstanding Mathematics Student

**Christoph Bowler** graduated in May with a double major in mathematics and economics and a minor in political science. Chris came to Northern in 2008 after graduating from high school in Wausau, Wis., and decided to pursue mathematics as a major after his second year at NMU. He is a member and current captain of the Men's Nordic Ski Team and competed for the university at the 2010 and 2012 NCAA Championships. He is a member and treasurer of the university's chapter of the Mortar Board National Honor Society and was named the 2012-2013 Outstanding Graduating Senior for NMU's Economics Department. Chris has enrolled in the University of Minnesota Twin-Cities Law School class of 2016 and will begin classes there in fall 2013.



Chris Bowler  
2013 Outstanding  
Mathematics Student

### Graduate Student News

**Diane Deloria Godlewski** completed her master's project and received her master of science in mathematics education at the May 2013 graduation. Her project is entitled "*Investigating the Impact of Writing on High School Students' Achievement in Mathematics.*" Diane has taught high school mathematics for 12 years; four at Algonac High School, six at Escanaba High School and currently at both the middle and high school levels in the Kohler public schools in Kohler, Wis.

*Congratulations to all!*



## Memories of NMU: spotlight on students continued from pg. 1

Students from our department participated in a variety of activities and received a number of awards this school year. Hopefully, all were memory-making events!

Seven of our students presented their research at the 18th Annual NMU Celebration of Student Research: mathematics majors **Niall Belton** and **Alyssa Cherry**; computer science major **Matt Menze**; and mathematics education majors **Shannon McNab**, **Breanne Young**, **Kaitlyn Hoffman** and **Eric Alexander**.

Nineteen mathematics and computer science students attended the 23rd Annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics at the Argonne National Laboratory in Argonne, Ill. Mathematics major **Alyssa Cherry** presented her research project, *Counting the Number of Schedules by the Round Robin Algorithm*, at the symposium.

Computer science major **Matt Menze** interned with the NASA Ames Research Center's Intelligent Robotics Group in Mountain View, Calif., during the fall semester. Matt worked with a team developing a physics simulator designed to allow the efficient modeling and study of articulated tensegrity structures. In addition, he also worked with a team responsible for developing robotic rovers used extensively for research of proposed missions and exploration technologies.

The NMU student chapter of the Association of Computing Machinery (ACM) hosted the **14<sup>th</sup> Annual NMU Invitational Programming Contest** in April. Sixty-eight students on 25 teams representing four universities participated. Although the weather caused several teams to cancel, those who did participate included: Michigan Technological University, Northern Michigan University, College of Saint Scholastica and Algoma University. The first place school was Michigan Tech and NMU took the second place honors.

Math majors **Christopher Bowler** and **Niall Belton** and computer science major **Zachary Dowd** are members of the NMU chapter of Mortar Board National College Honor Society. Belton also sat on the 2012-2013 Executive Board as treasurer.

Twelve secondary and elementary mathematics education students and four faculty attended the Minnesota-Council of Teachers of Mathematics (MCTM) spring mathematics conference in Duluth in April. **Ariel Dennis**, **Emily Schneider**, **Jacob Creeden**, **Emily Ferguson**, **Hadley Doctor**, **Katie Delaney**, **Michelle Owens**, **Rebecca Smolarek**, **Sara Keppler** and **Christina Mattson** attended as well as **Shannon McNab** and **Eric Alexander**, who presented *Mathemagic to Engage Students in Middle School Mathematics*. Faculty attending the two-day conference included Peggy House, Steve Smith, Dave Buhl and Joann Buhl.



**Elementary Education Mathematics Club**  
Front Row l-r: Emily Ferguson, Rebecca Smolarek, Joan Toivonen and Katie Delaney  
Back Row l-r: Kaylee McIntyre, Michele Owens, Steve Smith (advisor) and Sarah Burns

Not shown: Elizabeth Sabin, Chelsey Rice, Mallory Westerberg and Kathleen Grandahl

The goal of the **Elementary Education Mathematics Club** this year was to create a balance of social, mathematics and community-service related activities for its members. Activities included participating in mathematics events for kids K-8 at the Peter White Public Library and Make a Difference Day, helping at the dog sled races, hosting two bake sales, designing the t-shirts for the High School Math Challenge and working at several Children's Museum events.

Thirteen computer science students attended the 6th Annual BonzAI Brawl at Michigan Tech in April. BonzAI Brawl is a programming competition focused on artificial intelligence (AI) programming. The test of a team's AI agent is how well it performs against other teams in a virtual environment. This is NMU's second year in a row bringing home a trophy – team Neptunia consisting of **Kayla Egner**, **Larry Flint** and **Matt Menze** took second place. (This is especially noteworthy since Kayla and Larry are in the first year of the computer science program!)

Computer science major **Cohen Adair** was honored as the *Outstanding Scholarly Athlete of the Month* for October. Cohen was nominated for the award by Dr. Olga Hocking, his MA 171 Probability and Statistics professor, for being an outstanding student in her class as well as an outstanding freshman hockey player. The NMU Athletic Council and Intercollegiate Athletics sponsor this recognition program.

\*\*\*



The 4th Annual **U.P. High School Math Challenge** was held in March. High school students from across the U.P. were invited to participate in a day of various mathematical challenges. While the program is relatively new, participation continues to grow each year, with this year attracting a record 113 students from nine high schools across the region. NMU students from the department's student organizations, shown above, helped organize and run the math challenge.

## Department News

While our students were busy with clubs, contests, research and classes, faculty were busy attending conferences, presenting their research and recruiting.

In addition to teaching 165 classes and advising 200 students, ten faculty authored or co-authored 17 research papers that were published in the form of journal articles, conference proceedings and online journals, while 15 faculty attended or presented their research at 26 seminars and conferences across the country and around the world.

**Roxin Zhang** visited several Chinese universities over the winter break. The purpose of the trip was to find Chinese universities for 2+2 programs (students spend two years at their home university then two years at NMU). Roxin visited Beijing University of Chemical Technology, Lanzhou University of Finance and Economics, Henan University of Science and Technology, Huaiyin Institute of Technology, Suzhou University of Science and Technology, Changsha University of Science and Technology, Capital University of Finance and Economics, and Beihai Beihang University in locations all over China. The trip was sponsored by the NMU International Programs Office.

While on his recruiting trip, **Roxin Zhang** also presented "Multiobjective Bilevel Programming and Set-valued Analysis" as well as "An Introduction to NMU" at Henan University of Science and Technology and Beijing University of Chemical Technology. His talks are posted on the university Websites.

**Bao Truong** (along with Miriam Moeller, International Programs Specialist) also traveled during the winter break, visiting Ton Duc Thang University, Ho Chi Minh City, Vietnam, to discuss partnerships, specifically a 2+2 program or English as a Second Language program between NMU and their university. They met with faculty

and chairs of the Department of Computer Science and the Center for International Studies.

**Qinghong Zhang** presented "Efficiency conditions for semi-infinite multiobjective optimization problems" at the 21st International Symposium on Mathematical Programming in Berlin, Germany.

**J. D. Phillips** attended the International Congress on Mathematics Education in Seoul, Korea, as part of an official U.S. delegation funded by the National Science Foundation (NSF).

**Don Faust** presented "Using Our Increased Understanding of the Nature of Mathematical Knowledge to Improve Mathematics Teaching and Learning" and "Truth and Provability: Insights Based on the Contemporary Model Theory Emphasis of Mathematical Logic" at the National Mathematics Education Conference, State University of Malang, Java, Indonesia.

**Peggy House** was invited to be a plenary speaker at the Michigan Section – Mathematical Association of America (MAA) annual meeting in Sault Ste. Marie in May. Her talk was entitled "Reasoning and Sense Making in Mathematics: Where Do We Fit In?" This is the first time that the annual meeting was held in the Upper Peninsula.

**Josh Thompson** presented "What if  $Ax=b$  meant  $Ax=Me$ ? Exploring the basics of linear algebra using digital images" at the MAA-AMS joint meetings in San Diego, Calif. He also presented "Penrose Tilings" at the MAA Upper Peninsula Fall Conference on the campus of NMU.

**Randy Appleton** attended WorldComp 2012 (a federation of conferences) in Las Vegas. As part of this conference, Randy presented his talk entitled "Web Servers / Personal Workstations: Measuring Different Ways They Use the File System" at the 2012 International Conference on Internet Computing

and the 2012 International Conference on Wireless Networks. His paper was published in the conference proceedings.

*In other department news:*

The department is working to revise the current network programming major to create a new major—Mobile and Web App(lication) Development. This evolutionary step will build on the strengths of the current major, which include a strong foundation in software engineering and the network technologies that make distributed and mobile computation possible.

The **Colloquium and Seminar Committee** hosted the MAA-Upper Peninsula Regional Fall Conference in October. The two-day conference included talks by three plenary speakers: Paul Zorn, St. Olaf College; Dan Isaksen, Wayne State University; and Gary Johns, Saginaw Valley State University. Rounding out the conference were 11 contributed talks by students and faculty of NMU, MTU and Western Michigan University.

**John Sarkela** has been named the head of student internships for our department. John will work to place students in paid/unpaid and for-credit internships following the university's new internship guidelines.

**Carol Bell** was elected to the Executive Board of the Michigan Council of Teachers of Mathematics (MCTM), as Region 13 Director, a 3-year term.

During the school year, our recruiting efforts included hosting 25 prospective students and their families as part of the Campus Visit program and 14 prospective students and their families during the fall and winter Wildcat Weekend sessions.

*Thank you to everyone for another great year!*

## Northern Michigan University

Mathematics and Computer Science  
1401 Presque Isle Ave.  
Marquette, MI 49855

Phone: 906-227-2020  
Fax: 906-227-2010  
E-mail: [math\\_cs@nmu.edu](mailto:math_cs@nmu.edu)



*"Mathematics is a more powerful instrument of knowledge than any other that has been bequeathed to us by human agency." -- Descartes*

## ***Did you know. . .***

Computer science is the study of what is possible through computation. It is also the creative exploration of how to achieve these possibilities. Computers are the ultimate machines because they can be reconfigured (programmed) in an infinite number of ways. A computer science degree provides a deep and thorough understanding of modern computers, from their theoretical limitations to the next great leap in their practical application.

The study of mathematics develops the critical and analytical skills needed in medicine, law, business, and industry, and supports majors such as physics, chemistry, biology, psychology, economics, sociology, geography, and engineering, among others. It provides an understanding of the contributions of mathematics to philosophy, the arts, science and technology, and provides an exciting intellectual experience.

Programs in secondary or elementary mathematics education prepare teachers for K-12 classrooms.

Successful completion of a computer science, mathematics or mathematics education major prepares students for graduate work in mathematics or computer science and for professions in statistics, applied mathematics, computer science and teaching.

*E-mail us anytime at [math\\_cs@nmu.edu](mailto:math_cs@nmu.edu) or visit us at [www.nmu.edu/math](http://www.nmu.edu/math)*