

Mathematics and Computer Science

Department Newsletter

Department News

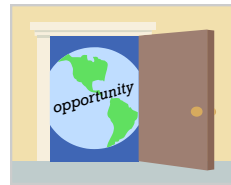
Inside this issue:

Like a Lion	2
Outstanding Students	3
A Major in Mathematics?	4
Department News	5

Have you ever heard the old saying “there’s a world of opportunity out there”? Well, this may be true, but have you visited our department lately? We believe that opportunity starts here and the door is always open! Students are welcome to come in anytime and find out about opportunities for scholarship, research, and travel, as well as opportunities to participate in outreach programs and scholarly competition.

This year, new opportunities for our students included planning, hosting and participating in the Upper Peninsula Computing Conference (UPCON), a very successful

all-day conference that we hope will become an annual event. (see pg. 2)



Students and faculty also planned and hosted the first annual U.P. High School Math Challenge, an exciting event that gave high school students the opportunity to show off their mathematical skills. (see pg. 2)

During the school year, students found many oppor-

tunities for research, as well as opportunities to present their research to peers and faculty at several different venues on campus. Students and faculty also traveled to conferences across the U.S. and around the world.

Yes, we agree, there is a world of opportunity out there, but if you haven’t visited us lately, consider this your invitation to stop in and see us - there’s a world of opportunity right inside our door! (cont. on pg. 5)

We must open the doors of opportunity. But we must also equip our people to walk through those doors.
- Lyndon B. Johnson

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

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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.

New Department Head, J.D. Phillips

Yup. I’m the new guy. So I suppose an introduction is in order.

I’m approaching my 20th year as a practicing algebraist (groups and their generalizations) and a mathematics teacher. This is my third tenured position, and hopefully my last; Northern is a great fit for me, and Marquette is a great fit for my family (my wife Cathy and me, and our three boys: Jack, Evan, and Zane). We hike, bike, ski, and fish; moving to the North Woods was like

coming home.

And what about *your* old home - the Mathematics and Computer Science Department? Well, as you’ll see in the following pages there’s a lot going on here. We now host two annual academic competitions as well as an annual undergraduate computing conference. We place interns at Intel each summer; our student teachers do their practicums all over the U.P.; and our students participate in an annual undergraduate research conference at

Argonne National Laboratories. We’re building an exciting new program in actuarial science, as well as a master’s degree in applied mathematics. We’re preparing a comprehensive review of our undergraduate mathematics curriculum (the first one in nearly 30 years). And of course, the faculty is heavily involved, as always, with research, giving talks hither and yon, and (naturally enough) teaching.

What about you? What have you been up to? Drop us a line, we’d love to hear from you.

Like a Lion...



March came roaring in like a lion with our first ever department-sponsored U.P. High School Math Challenge. This was quickly followed by our student organized and led Upper Peninsula Computing Conference (UPCON). The month then went out like, well, a lion, with our 11th Annual Programming Contest.

Thanks to all the faculty and students who worked so hard to make our March activities a *roaring* success.

Upper Peninsula High School Math Challenge

Thirty-six students competed on nine teams representing five U.P. high schools in the kickoff to what we hope will be an annual event.

The first-ever Upper Peninsula High School Math Challenge was held on Saturday, March 13. High schools across the U.P. were invited to attend. The event was the brain-child of Dr. Andy Poe and, with the help of other department faculty and students, went off without a hitch.

In Part I of the contest, students competed individually. The students were given 10 problems to be solved, one at a time, with relatively short time limits. Newberry High School students Mamiko Ozawa and

Brian Ronquist came in first and second, respectively, with Munising's Kori Baij taking third.

In Part II, the team challenge portion of the contest, teams of four students competed. Five questions were distributed as a packet and worked on collectively by the entire team. Newberry High School's team took first with two of Munising's four teams coming in second and third.

Part III was a relay competition, a fun event that took place while the scores from parts I and II were being tabulated.

Each student received a contest t-shirt, lunch was provided and prizes were distributed at the awards assembly following the event.

Upper Peninsula Computing Conference

The first Upper Peninsula Computing Conference (UPCON) was held on Saturday, March 20, in Mead Auditorium, on the campus of NMU. Terry Seethoff, dean of the College of Arts and Sciences, gave the welcome and opening remarks. Math and computer science related projects and talks were presented by faculty and students from NMU and other U.P. universities including Michigan Tech and Lake Superior State University.

This one day mini-conference was organized by Esther Su, senior mathematics major, and hosted by our department along with the NMU Unix User Group (UUG), a computer science student organization.

The 11th Annual Programming Contest

On Saturday, March 27, the Mathematics and Computer Science Department, along with the NMU student chapter of the Association for Computing Machinery (ACM), hosted the 11th Annual Invitational Programming Contest. This year, 66 students on 27 teams representing five schools competed in the contest. In addition to NMU, schools participating included: Algoma University, the College of St. Scholastica, Lake Superior State and Michigan Tech.

Students organized themselves into teams of three players. Each team was given a computer (but no Internet access) and five hours to solve six problems using their mathematical and computer science skills.

NMU finished second among the participating schools with Michigan Tech coming in first.

In addition to the competitors, programmers, runners, judges and tech support people were also involved in the smooth running of this exciting annual event.



As always, 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

2010 Outstanding Graduating Senior

Emily E. Engelhardt

Emily Engelhardt graduated in December 2009 *summa cum laude* with a double major in secondary mathematics and integrated sciences education after earning Dean's List honors every semester, half with a perfect 4.0 record. Emily is an alumna of both the Student Leader Fellowship Program and all four edges of the Superior Edge Program. She was a team-member recipient of the 2009 TLC Student Award (Learning Category), and for four years tutored in the Mathematics Department's help center. Last fall, Emily returned to her home state of Minnesota to student teach and was so successful that the Rushford, Minn., district where she student taught hired her as a full-time teacher starting in January for the remainder of the school year.



2010 Outstanding Graduate Student

Cynthia F. Brooks

Cynthia Brooks graduated from high school in Brandon, Miss., after which she joined the Air Force where she earned honors in electronics communications studies. Cynthia attended Northern Michigan University as a nontraditional student and graduated *summa cum laude* with a bachelor's degree in elementary education. In 2008, she completed a Master of Science in guidance and counseling. In 2009, she completed her second master's degree, this time in mathematics education.

Cynthia is a kindergarten and junior kindergarten teacher at Birchview School in Ishpeming. She is married and has two grown children.



Other Outstanding Students

Esther Su graduated in May, *summa cum laude*, with a major in mathematics and a double minor in computer science and accounting. Esther has been a volunteer and coordinator for several events sponsored by this department and has served as an officer in the student chapters of the Association for Computing Machinery (ACM) and Unix User Group (UUG). She has presented at the Argonne National Symposium in Chicago, participated in ACM and NMU programming contests, worked in the math tutoring lab and was chair of the organizing committee for the first annual Upper Peninsula Computing Conference (UPCON). Esther will be staying in Marquette for the summer, working with Upward Bound as its resident director.

Cory Perry graduated in May, *cum laude*, with a double major in computer science and physics. Cory presented twice at the Argonne National Symposium, was active in the campus computer science and physics clubs for four years, and was a tutor in the computer science tutoring lab. He was also chosen to receive an internship with Intel Corp. in Portland, Ore., during the summer of 2008 where he worked to bring WiMAX to NMU students. Cory will be attending grad school at the University of Michigan in the fall.

Angela Murray Vakharia graduated in May with a Master of Science in mathematics education. Her master's project (MAED 594) is titled "A Review of Selected Computer-Based Instructional Aids for Teaching Introductory Algebra." Her adviser is Dr. Peggy House.

In addition to our Bachelor of Science in secondary mathematics education, we offer a Master of Science in mathematics education.

A Major in Mathematics?

If you or someone you know has ever wondered what exactly you can do with a degree in mathematics, the following information may be helpful. Pass it on!

Are you good with numbers? If so, a major in mathematics may be a good choice for you.

In today's fast-paced and highly technological workplace, a background in mathematics is a highly valued credential.

Mathematical skills are in greater and greater demand in today's workforce. The government, private industry, health and environmental fields and the academic world all require sophisticated mathematical skills to help solve various problems.

Employers require their employees to possess a variety of useful analytical skills and knowledge, and to be able to apply such knowledge and skills in an effective and practical manner.

Students pursuing a mathematics degree will have the opportunity to study traditional core courses in mathematics, as well as covering some major topics related to actuarial science and operations research.

Graduates of NMU's mathematics program are prepared to either join the professional workforce or continue related studies at the graduate level.

Starting salaries vary by geographic location and applicants' specific qualifications. Potential careers include, but are not limited to: actuary, statistician, research, industry and government. Of the career options available to those with a degree in mathematics, some will require education beyond the baccalaureate level or additional certifications.

Internship experience and professional organization affiliations are beneficial in helping to secure job placement.

As in most other fields, strong inter-

personal communication and organizational skills are a must for any professional. Other valuable skills and competencies specific to these majors are:

- Ability to analyze and interpret substantial amounts of data
- Advanced quantitative skills
- High level of efficiency, an independent worker and team player
- Skills in interdisciplinary teamwork



Other considerations

- Graduate school for further study
- Elementary or secondary-level teacher with state certification
- College-level instructor or professor

Students Attend Conference



NMU mathematics education students participated in the National Council of Teachers of Mathematics (NCTM), regional conference in Minneapolis in November.

Pictured at the conference are:

(front row, l to r) current student teachers Jared Bowerman and Emily Engelhardt and students Barbara Homann, Renee Kivioja and Daniel Champion

(back row, l to r) Barrett Willard, Andrew Granger, NCTM president Henry Kepner, Heather Leisner, Karla Shandonay and NMU Professor Peggy House

Department News continued from pg. 1

Opportunities of every kind were available during the school year for faculty and students, as noted in the following year-end summary.

Our department enjoyed hosting a number of activities throughout the year. In addition to those noted on page 2, several other opportunities presented themselves as well.

- In October, **Mike Kowalczyk** hosted prospective mathematics and computer science students, as did **Jeff Horn** in February. These students and their families visited the NMU campus as part of Wildcat Weekend.
- Throughout the school year, the department also hosted 34 prospective students and their families through the university's campus visit program. Various faculty members provided a tour of our facilities and labs, a description of our majors, and a question and answer period as part of this recruiting opportunity.
- The department's Colloquium and Seminar Series came to a close in April after hosting six outside speakers, two alumni, four faculty, two adjunct faculty, one emeritus faculty and 21 students. All presented their research and/or scholarly work.
- The Colloquium and Seminar Committee will be hosting the Mathematical Association of America's (MAA) Upper Peninsula Fall Regional Meeting, a two-day event to be held on October 8-9. Guest speakers and a number of contributed talks will provide topics of interest to faculty and students in areas of mathematics, computer science, and mathematics education.
- **Andy Poe** and 11 computer science students represented NMU at the ACM North Central North America Regional Programming Contest at Lake Superior State University, Sault Ste. Marie, Mich.
- **Randy Appleton** and 18 mathematics and computer science students attended the 20th Annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics at the Argonne National Laboratory in Argonne, Ill. Ten students presented four research projects.
- **Andy Poe** and 12 computer science students competed in the 3rd Annual BonzAI Brawl at Michigan Tech. The BonzAI Brawl is an Artificial Intelligence (AI) programming contest held at Michigan Tech and sponsored by the Women in Computer Science organization.
- **Jeff Horn** and three students attended the 5th Annual International Seminar at Haaga-Helia University in Helsinki, Finland. These upper-division IT students participated in four days of learning, sharing, international team-building and socializing with students from other countries.
- **Peggy House, Dave Buhl** and **Carol Bell** accompanied nine mathematics education students to the National Council of Teachers of Mathematics (NCTM) regional conference in Minneapolis, Minn.
- Six secondary education mathematics students participated in the NMU 2010 Celebration of Student Research, Creative Works and Academic Service Learning on the NMU campus. **David Buhl** and **Carol Bell**, advisers.
- During the school year, 11 faculty presented their research at 24 conferences locally and abroad traveling to Vietnam, China, the Czech Republic, Finland, France and Italy, while closer to home, attending conferences in

Colorado, New York, Illinois, Minnesota, California, and North Carolina.

And finally, congratulations to the following faculty and students whose accomplishments and opportunities speak for themselves.

- Computer science major, **Jaclyn Beck**, was the recipient of the 2010 Martha Griffiths Award, which is awarded to a graduating senior with a good academic background and generally in a field that is not historically associated with women. Jaclyn will attend graduate school at the University of Wisconsin-Madison
- Computer science majors **Darren St. Amour** and **Jeff Scanlon** were chosen for the Intel internships for 2010-11. This includes a year-long, dual-campus internship program beginning with the summer at Intel Corp. headquarters in Hillsboro, Ore., and continuing the following two semesters on the NMU campus.
- **Qinghong Zhang** and **J. D. Phillips** were invited to present plenary talks and **Peggy House** was invited to give the keynote address at conferences this year.
- **Bao Truong** and **Roxin Zhang** were each awarded \$6,000 through the NMU Faculty Research Grants Program.
- Seven faculty authored or co-authored 23 research papers that were published in the form of journal articles, conference proceedings, online journals and manuscripts.

Thanks to all for another successful school year. Now take the opportunity to enjoy your summer!

Faculty and students attended conferences and competitions locally, nationally and internationally to learn, present and compete.

Northern Michigan University

Mathematics and Computer Science
1001 New Science Facility
Northern Michigan University
1401 Presque Isle Ave.
Marquette, MI 49855

Phone: 906-227-2020
Fax: 906-227-2010
E-mail: math_cs@nmu.edu



We're on the Web!
www.nmu.edu/math

"Mathematics is the gate and key to the sciences." - Roger Bacon

Did you know. . .

Before graduating, seniors majoring in computer science or network computing must take **CS 480 (Senior Project in Computer Science)**, a course that involves creating a significant software and/or hardware project. Work is supervised by an adviser. Topics must be approved first by an evaluation committee, which will later review and grade the completed project.

Students will be expected to create significant new computer applications (e.g., writing over 1,000 lines of new code, building integrated hardware and software systems, or making diverse technologies work together in novel ways). Students will use algorithms and expertise developed from material in earlier courses. They are expected to begin the project prior to registering for CS 480 by finding and working with a project adviser (CS faculty). Enrollment in this class allows the student to wrap up the project, including testing, documentation and a presentation to an evaluation committee of CS faculty for feedback and grading.

E-mail us anytime at math_cs@nmu.edu or visit us at www.nmu.edu/math