Mathematics and Computer Science

Spring 2012

Department Newsletter

Department News

What comes to mind when you hear the words *quality products*? Reliability, excellence, something really top-notch? We all have our own idea of what this means, but in our department we're all in agreement, we consider our students to be quality products.

As such, in addition to attending classes and completing homework, our students can be found at any time during the school year taking the lead in organizing clubs and fundraisers, helping with contests and programs or tutoring other students in math and computer science. Some of our students are also busy applying for and receiving internships, traveling to conferences, presenting their research, competing in contests and even studying for actuarial exams.

But perhaps in addition to our students we should consider our faculty quality products. This year our faculty have also been doing some top-notch things. Check out the articles in this issue to read about the awards they have received and their undertakings with other universities and industry.

Reliability, excellence, something really top-notch. Maybe our faculty and students have never thought of themselves as *quality products*. Perhaps they should!

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"Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skilful execution; it represents the wise choice of many alternatives."
~ William A. Foster

New Faculty

We are very pleased to announce the addition of Joshua Thompson, Michael Kowalczyk, and John Sarkela to our department. Josh and Mike will be tenure-earning at the rank of assistant professor and they will all join us in the fall.

Josh Thompson will be joining us as an assistant professor of mathematics. Josh received his bachelor's degree from Wofford College (where he was captain of Wofford's football team), his master's degree from Wake Forest University and his doctorate from the University of Utah. He is currently wrapping up a post-doc at Colorado State. Josh's research lies at the intersection of topology and geometry, with an emphasis on visualization and computation. Josh is a great addition to our department.

Mike Kowalczyk graduated *summa cum laude* in 2001 from NMU with a bachelor's degree, double majoring in mathematics and computer science. He completed his education at the University of Wisconsin-Madison, earning a master of science in computer sciences in 2005, a master of arts in mathematics in 2008 and his doctorate in computer science, minoring in mathematics, in 2010. He has published several paper papers in his research area of Holant Problems.

John Sarkela will also be joining us as a member of our computer science staff. John brings to the department his extensive experience in industry, including work with the Smalltalk language and object-oriented design. We are pleased to have him with us on a three year-term appointment.

Network Computing Transfer Agreement

Northern Michigan University has announced a three-year articulation agreement with Bay de Noc Community College of Escanaba. The agreement allows graduates of Bay College's new two-year associate degree in network administration to transfer to NMU and complete a bachelor of science degree in network computing.

"This agreement benefits the students because it guarantees that the courses taken at Bay College will transfer completely into the bachelor's degree," said Randy Appleton, NMU computer science professor. "It will also benefit Northern by ensuring that incoming students have had courses that will provide a strong background for the degree."

Shown left to right are: Randy Appleton, Computer Science, NMU; Karl Linderoth and Mark Highum, Computer Network Systems and Security, Bay College

According to Beth Noreus, Bay transfer adviser and coordinator, "Articulation agreements provide a clearly defined set of courses that will allow students to have a seamless transfer while

identifying all of the courses that will be needed for degree completion. This is a win-win agreement for our respective colleges and students."

NMU's network computing major is designed to emphasize skills in Internet and network programming while concentrating on the latest concepts, architectures and algorithms for network computation. Students learn the fundamentals of computer science while focusing on aspects most important to network computing. The goal is to prepare graduates to design the next generation of network application architectures.

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Story courtesy of
NMU Communications and Marketing

INTEL-NMU Computer Science Collaboration

The 2011-12 academic year witnessed unprecedented growth in the Intel-NMU CS relationship. We moved from summer-only internships to year-round engagement, including a new Intel lab on campus, a winter internship program, an Intel app programming contest, and new initiatives with other Intel groups and other Intel sites.

The year began with the return of summer interns Axel Kingsley and Nicole Ross from the Mobility Wireless Group (MWG) at Intel headquarters in Hillsboro, Ore. Upon returning, they established the Intel lab in LRC 117, bringing in funding and equipment such as computers, networking devices, robots and Smart TVs. The lab serves as a permanent home for Intel-NMU-CS collaboration, including the training of future interns.

By September, Nicole had taken on the role of lab manager, coordinating with the MWG, while Axel interacted with the Netbook-Tablet Group (NTG). In October, Intel asked to hire new winter interns to serve for at least six months starting in January. Thirty of NMU's computer science and network computing majors applied.

In November, Intel selected seven interns: Stephen Willson, Travis Clark and Eric Smith for the MWG, and Bruce Olson, Steve Jarvis, Kristina Tickler and Sara Foster for the NTG. In addition to the interns, Intel also selected three new Intel lab engineers: Adam Jacques, David Pfeiffer and Bryan Denslow.

Meanwhile, Larry Averitt of Intel's Peer-to-Peer Group (PPG) became involved in Intel's System Developers' Kit (SDK). Through Larry, Intel sponsored the first Intel-NMU SDK App Programming Contest, providing software, technical support and prize money in exchange for our students submitting app ideas and testing the SDK version 1.0. Twenty students from our department entered the contest, with five teams submitting apps to the judging event in January. The SDK supports cross platform ad hoc communications among mobile devices, from Apple iPads to Android smartphones, and our students took advantage of this.

Intel was impressed enough to immediately support a second contest, held in March and April, using version 2.0 of the SDK. The top prize this time was an Intel UltraBook for each team member!

So important has student feedback been to Intel that they have made the programming contest a permanent budget item, funding up to three contests per year. More importantly, the contests are seen as training and selection for SDK internships for our students. Already two of the contest winners, Josh Fridstrom and Kurt Kilpela, have been selected for seven-month internships this summer and fall in Austin, Tex.

Also heading out to internships this summer are freshman fellow Joshua Chomicki and Megan Kelley, both to Hillsboro. Meanwhile, our winter interns have had their stays extended, some through the end of 2012! Also going west is Nicole Ross, who earned a permanent position at Intel's Research and Development site in Folsom, Calif. Axel Kingsley and Jeffrey Scanlon have both been promoted from post-graduate internships to permanent status. Back on campus, Intel has hired new lab engineers Zac Dowd, Taylor Rolison and Matt Menze, and trainees Elizabeth Klarecki and James Harju. Adam Jacques has been promoted to lab manager, replacing Nicole who graduated in May.

Student News

Outstanding Graduating Senior

The Mathematics and Computer Science Department is proud to name Andrea L. Clark as its Outstanding Graduating Senior for 2012.

Andrea came to Northern in 2009, eleven days after the birth of her youngest child and ten years after earning an associate degree in accounting from Davenport University. She graduated from Northern in December 2011 *summa cum laude* with a double major in economics and mathematics and a perfect 4.0 grade point average.

Andrea lives in Marquette with her husband and six children, ages 2 to 14, whom she home schools. She is active in her church as a teacher and as the secretary of the women's Relief Society. She enjoys needlework crafts, hunting, target shooting and archery, and is a compulsive reader. Andrea is presently enrolled in Northern's graduate program and is studying for the first two actuarial exams.

Shown from left to right are: Alyssa Cherry, John Goodney, Ben St.Aubin, Michelle Owens, Kurt Kilpela, Kristina Mattson, Shaun Anderson, Andrea Clark and Elizabeth Roemisch

Above, students from each of the department's student organizations are shown in green contest t-shirts at the third annual U.P. High School Math Challenge held in March, which they helped organize and run.

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Elementary Education Math Club

The objective of the club is to promote math education in the community while educating its members on the fundamentals of mathematics. Members of the newly

Front row: Shannon Yaroch, Danielle Seitter, Audrey Manderfield, Samantha Bricker
Back row: Mallory Westerburg, Sarah Burns, Jessica Powell, Michelle Owens, Elizabeth Roemisch Andrew Mills and Dr. Steve Smith

organized club sponsored a bake sale, helped with the High School Math Challenge and volunteered at a benefit banquet held at the Marquette Children's Museum.

Math Club

Math Club - The goal of the math club this year was to create a balance of social, mathematics and community service related activities for members. Activities included a Pi Day bake sale, movie nights, Make a Difference Day involvement and homework support.

Members of the Math Club who participated in Make a Difference Day in October include: Yuriy Drubinskiy, Elizabeth Momont, John Goodney and Shaun Anderson

Association for Computing Machinery (ACM)

Association for Computing Machinery (ACM) - The ACM was created as a safe haven for all things computer. The group discusses and collaborates on projects related to the field of computing technology. This year the group hosted the annual NMU-ACM programming competition, which saw record attendance.
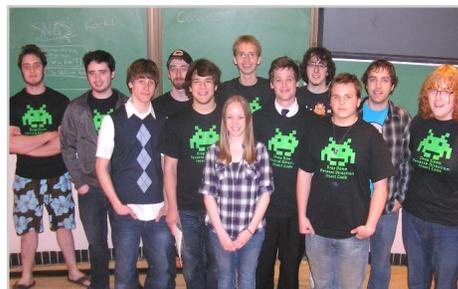
Members of ACM are: Matt Menze, Taylor Rolison, Josh Fridstrom, Joe Mills, Kyle Nosar, Megan Kelley, Kurt Kilpela, Dave Pfeiffer, Zac Dowd, Josh Johnson, Clayton Powell and Kara Hoig

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."

Award Winners

NMU's Development Education Advisory Committee, which included math faculty **Carol Bell, Ken Culp, Gwendolyn Hetler,** and **Rosanne Parks,** was selected to receive the university's Distinguished Team Award for 2012. The award recognizes the team that demonstrates exemplary performance and/or innovation while working together in an open and collaborative manner to achieve a task or charge that furthers the university's mission and goals.

Carol Bell, Gwen Hetler, Rose Parks and Ken Culp

The responsibility of the committee was to identify and recommend practices and procedures which will serve to increase the long-term performance and retention of the large numbers of new freshmen who are currently being admitted in restricted status and may be at academic risk. The committee reviewed current practices in areas such as, but not limited to, placement testing, advising and registration, as well as adequacy and effectiveness of current developmental support courses.

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At its February meeting, **Peggy House** was elected by the Minnesota Council of Teachers of Mathematics (MCTM) Board of Directors as an honorary member of MCTM. Honorary membership is awarded to individuals who have demonstrated outstanding leadership and service to the council. Her extensive work and outstanding leadership in mathematics education throughout her career makes her very deserving of this honor. Her notification letter stated, "MCTM is extremely proud to have a person of your national stature as an honorary member."

In May, Peggy was presented with an honorary membership plaque at the MCTM spring mathematics conference luncheon in Duluth.

Dr. Peggy House

At the Friday evening reception, she was honored again as an honorary member as well as the current winner of the Presidential Award for Excellence in Mathematics Teaching for Minnesota.

CONGRATULATIONS
CONGRATULATIONS

Retirement

Hal Martin retired in May after 28 years of teaching mathematics at NMU. Hal is in the process of starting Martin Capital Management (MCM), a fee-based (no sales) investment advisory firm. In January he passed two professional financial exams, the FINRA Series 63 exam and the NASAA Series 65 exam. The Series 65 exam is a requirement in order for MCM to be a registered investment adviser in Michigan.

Beyond MCM, Hal is looking forward to spending more time (including international travel) with his partner, Cindy Nelson, six grandchildren, a grandnephew and a grandniece.

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Cheryl Peterson retired from the Mathematics and Computer Science Department in December after teaching mathematics classes for over 30 years. She was an especially popular teacher, with her class sections filling up almost immediately each semester.

Cheryl, along with husband, Barry, is an avid hiker, having traveled all over the world hiking in such exotic places as South and Central America, as well as Europe, India and Indonesia. Retirement plans include more of the same.

Department News *continued from pg. 1*

The department has introduced an actuarial sciences component to the curriculum. **Linda Lawton** is working with several students who are already studying for, and plan to take, one of the first two actuarial exams this summer.

Inasmuch as handheld devices may well be the future of computing, iOS and iPhone Programming, an experimental course taught by **Andy Poe,** was offered by our department for the first time this semester. Students learned an overview of the Objective C language and learned how to use the various libraries and frameworks for iPhone app development. This is the only course offered by the department that distinctly focuses on the Macintosh Operating System. If interest continues, the course will be offered on a regular basis.

The math department offered MA 111 (College Algebra) to high school students in the Van Buren Intermediate School District through interactive TV, taught by **Richard Balding** (adjunct). The students were dual enrolled and received college credit. This fall, the course will be offered with MA115 (Precalc) as a follow-up in the winter semester. With at least three sites in the Van Buren ISD available, there is a potential to include several more school districts.

Grad student **John Sokol** completed his master's project and received his master of science in math education in May. His master's project is titled *Effects of Integrating Technology into a College Algebra Classroom: Using* The Geometer's Sketchpad *to Facilitate Lessons on Conics.* John is presently a faculty member at Gogebic Community College. His advisor is **David Buhl**.

The 13th Annual Invitational Programming Contest was held in March and drew a record 84 graduate and undergraduate students comprising 30 teams from six universities, including schools from Canada and Minnesota as well as upper and lower Michigan.

The 3rd 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, this year attracting a record 85 students from various high schools across the region. In addition to individual student and team awards, a large traveling trophy is presented to the winning school each year.

J.D. Phillips, Jill Leonard and Matt Smock are co-PIs on a $160,000 NSF grant designed to increase active learning on campus. The grant includes the redesign of the LRC 108 classroom into a technologically sophisticated, state-of-the-art active learning facility. Faculty university-wide have been teaching in the classroom. A central goal of the grant is to increase active learning across the campus. **Qinghong Zhang** is also a participant in this grant.

Randy Appleton and **Barry Peterson**, along with 18 mathematics and computer science students, attended the 22nd Annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics at the Argonne National Laboratory in Argonne, Ill. Computer science students **David Pfeiffer** and **Clayton Powell** presented their research projects at the symposium.

Nine secondary and elementary mathematics education students and one graduate student attended the MCTM (Minnesota-CTM) spring mathematics conference in Duluth in May. Faculty advisors who also attended were **Carol Bell, David Buhl, Peggy House,** and **Steve Smith.** Several of the students and faculty also presented their research.

The department is offering free test preparatory sessions for those students intending to take the GRE. The test sessions cover the quantitative, verbal, and writing analysis sections, as well as prep for those interested in taking the

mathematics or computer science subject tests. The course is open to all students, irrespective of major, and also to members of the community. The sessions are sponsored by the McNair Scholarship program and taught by **Andy Poe**.

Throughout the school year, the department hosted 21 prospective students and their families through the university's campus visit program and 13 students and their families as part of Wildcat Weekend. 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 these recruiting opportunities.

The weekly Colloquium and Seminar Series came to a close in April after hosting presentations by six undergraduate students, two graduate students, seven faculty, one outside speaker, seven position applicants and one presentation held via Skype from the University of Illinois at Urbana-Champaign, a first for our series.

This year, eight faculty authored or co-authored 17 research papers that were published in the form of journal articles, conference proceedings and online journals, while 17 faculty presented their research at 23 conferences locally and abroad.

Looking Forward

J.D. Phillips will host ADAM 12, an annual invitation-only workshop on automated deduction, on the campus of NMU in June.

The Colloquium and Seminar Committee will host the Mathematical Association of America's (MAA) Upper Peninsula Fall Regional Conference, a two-day event to be held on October 12-13. Guest speakers and a number of contributed talks will provide topics of interest to faculty, students and community guests in areas of mathematics, computer science and mathematics education.

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Northern
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University

"The study of mathematics, like the Nile, begins in minuteness, but ends in magnificence."

~ Charles Caleb Colton

Did you know. . .

No matter the source, actuary is consistently rated as one of the best jobs in America. So what is an actuary, anyway?

"Actuaries are experts in:
- Evaluating the likelihood of future events—using numbers, not crystal balls.
- Designing creative ways to reduce the likelihood of undesirable events.
- Decreasing the impact of undesirable events that do occur.

It takes a combination of strong analytical skills, business knowledge, and understanding of human behavior to manage today's complex risks facing our society.

Like other top-ranked professions (such as law and medicine), one must pass a set of examinations to achieve professional status as an actuary. Unlike other professions, in actuarial science you'll have the opportunity to work as an actuary while completing the examination process—employers often allow study time during working hours, pay exam fees, provide internships, and even award raises for each exam passed." *- from www.beanactuary.org*

The new actuarial program at NMU is under way, with several students planning to take one of the exams by the end of the summer. The program should appear formally in the catalog for Fall 2013.

In addition to our bachelor of science in secondary mathematics education, we offer a master of science in mathematics education.