

Mathematics and Computer Science

Department Newsletter

Department News

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The end of the semester is fast approaching and faculty, staff and students at NMU will soon be thinking about summer. Before we hit the beaches, look for that summer job



or head to our favorite spot for that much anticipated reprieve from school, work and snow, one thing must be faced - final exams! Exams must be written, printed, studied for, taken, and graded. Good luck to all!

Our semester, to this point, has been very busy. In addition to teaching, grading homework, giving and grading exams, a brief rundown of activities and events will show that students and faculty alike continue to be involved in a variety of activities in and out of the classroom.

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A look at our graduates

What is possibly the most important ongoing news about a professionally vibrant group such as our Mathematics and Computer Science Department here at Northern Michigan University? What is one of the main places to which we ourselves turn to get a sense of whether what we are doing makes sense, is productive and progressive? What group, closely tied to our professional efforts, are we most proud of? Our own GRADUATES, of course!

This is the second annual edition of our departmental newsletter. Certainly it was appropriate for our first issue, last year, to take a brief look back at the evolution of the department over the last few decades, to communicate some sense of the challenges and strengths of the various

efforts of the department as they have developed over the years, and to highlight one of our areas of current effort - robotics!. (If you are a reader who has yet to read last year's newsletter, let me invite you to visit our web site at math.nmu.edu and read our first newsletter and then come back here.) But, just as appropriately for this second issue, let's concentrate this year on our graduates.

Our world is certainly loaded with challenges -- tough problems that need to be solved so that we can build a better world. Of course, these *problems* are usually referred to as social, economic, and/or political in nature. However, and especially in this modern era of great complexity, it is increasingly the case that *our work in addressing these problems* involves the careful appli-

cation of **scientific perspectives and methodologies**.

Further, in the core of these scientific perspectives and methodologies we most certainly find, with an undeniable prominence, both MATHEMATICS, *that most important builder of models for understanding the structural complexity of these problems*, and COMPUTER SCIENCE, *that creator and implementer of the crucially important computer-based intelligent systems which aid in the analysis and solution of these problems*. (The reader is invited to further elaboration of this view in my old (1989) paper "*What is Mathematics?*" as well as "*Computer Science*" in the INTERNATIONAL JOURNAL OF MATHEMATICAL EDUCATION IN SCIENCE AND TECHNOLOGY 20, 307-315.)

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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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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.

A look at our graduates continued from pg. 1

With this broad-brush perspective concerning the nature of the professional work of our graduates in mathematics, mathematics education, and computer science, let us take a brief look at a number of our graduates and the variety of professional activities in which they are productively engaged.

Jay Bitely graduated in 2000 with a major in Secondary Education Mathematics. He then joined the Peace Corps. After training, he served in Tanzania in Eastern Africa as a mathematics teacher. Completing his two years as a Peace Corps volunteer, Jay has now returned to the United States. He seems at present to be, as he might say, and as he (with his fine sense of humor!) would certainly allow me to say, in some sort of *interim period* of the greater dance of his life, wintering contemplatively this year in a remote cabin in Alaska.

Tony Caduto is a 1994 graduate in Computer Systems. Tony is a senior programmer/analyst at M&I Trust and Investment Management Company in Milwaukee and also runs his own software company called AM Software design.

Marj Jarvi graduated in 1974, has worked with Lockheed Martin Corporation for the past twenty years, and is now a senior staff network data communications analyst.

Randall Hughes, a 1961 graduate with majors in both Mathematics and Physics, is having a very interesting and productive career in the computer industry. Randall got into and has kept up with this field "on his own" since at the time he was at Northern there was not (naturally enough) a computer program yet available. Beginning with a long association with Lockheed 1961-1978, Randy has, since 1971, been involved in founding and building a number of companies of his own as well as working in senior positions

with such companies as Fairchild and National Semiconductor. Many of these professional efforts have led to, and continue to lead to, international entrepreneurial forays in Europe and Southeast Asia (Randy studied Japanese a while in the 1980s and more recently has even begun to study a bit of Chinese). His career clearly indicates a life-long penchant for seeing needs for scientific innovation and development and doing whatever is required to fulfill those needs.



Hats off to all our graduates!

Michael Kowalczyk, a 2001 graduate having the unusual *double major* of Mathematics and Computer Science, is in the midst of his graduate study at the University of Wisconsin at Madison. Mike is working on a Ph.D. in Computer Science and hopes to have it completed by 2008.

Zach Owens is a 2001 graduate with a *double major* of Computer Science and Spanish. (He also studied Spanish in Spain in 1998 and earned a Certificate of Proficiency in Spanish from the University of Granada.) Zach worked as a software engineer with the Game and Fish Agency of the state of New Mexico, and is currently an application developer with the consulting firm Akimeka LLC on the island of Maui in Hawaii.

Rick Reinacher graduated in 2000 and is now a project manager in the IT department of SBC Communications in the Chicago area.

Stacey Rhodes, a 1996 graduate in Computer Science Education who has applied that degree in her professional work, has taught computer science at all levels of middle school through community college over the past years. Stacey is currently in the last steps of completing a master's degree (M.Ed.) at Wayne State University in Instructional Technology.

Alan Tomsic is a 1967 graduate and is a systems engineer and client representative in the IBM Corporation. In addition, Alan is serving his profession as a member of the Louisiana Technology Council.

Certainly even the above brief survey of professional activities of just a few of our graduates indicates clearly how engaged they are in productive work addressing important problem areas. We are indeed proud of them.

It is the hope of all of us here in the department that you, our GRADUATES, will keep in touch with us. Let us know what you are doing in your professional lives. Ponder, for a moment, your growth at Northern and then drop us a short note about some of the parts of your experience here you feel now to have been most (and least!) beneficial for you. As I said initially, we need the help of our graduates, we need YOUR help, in trying to serve our *current* students better. Don't forget to write!

Finally, I bid farewell as editor of the newsletter. I have enjoyed working on the first two issues of 2004 and 2005. I feel that the newsletter is a welcome addition to the department's efforts, and am sure it will carry on long and excellently over the coming years.

- Don Faust

2005 Outstanding Students

Outstanding Graduate Student

Jennifer Pera

Jennifer teaches mathematics at Jeffers High School in Painesdale, MI, where she coaches the Math Counts team (a national scholastic competition for middle school mathematics students). She is also the National Honor Society advisor and the eighth-grade class advisor.



Jennifer has twice been nominated by her students for *Who's Who Among American Teachers*. She is active in the National Council of Teachers of Mathematics, the Michigan Council of Teachers of Mathematics, the Adams Township Education Association, and the Girl Scouts. She is married and has one son. Jennifer graduated from Hancock High School and earned her Bachelor of Science degree Summa Cum Laude from Michigan Technological University. She received the Master of Science in Mathematics Education from NMU in December 2004.

Outstanding Graduating Senior

Michael Plourde

Mike learned of his award while doing a portion of his student teaching at Macleans College in Auckland, New Zealand, and just returned to Marquette last week. He will be completing his student teaching requirement at Aspen Ridge and Westwood.

A Marquette native, Mike will graduate in May, Summa Cum Laude, with a Bachelor of Science degree in Secondary Education Mathematics. He is a member of Pi Lambda Theta International Honor Society and Professional Association in Education, Golden Key International Honour Society, Gamma Theta Upsilon Geographic Honor Society, and the National Council of Teachers of Mathematics.



Mike has been active in local sports, first as a player and later coaching youth football and Legion baseball. He also played football for Northern Michigan University in 2001 and 2002.

Outstanding Students of the Past

This department has a long history of 'outstanding' graduating seniors and graduate students. In choosing an outstanding student, a committee must consider the student's GPA as one possible credential, but other factors such as campus activities, community service and membership in math-related organizations are also considered.

Perhaps you will recognize someone, or even yourself, in the following list of past outstanding seniors and graduate students.



Outstanding Graduating Seniors

1995 - Chad M. Gross
 1996 - Julie L. Tillison
 1997 - James H. Cotey
 1998 - Jodi L. Cowling
 1999 - Jeremiah J. Willcock
 2000 - Nathaniel D. Alwine
 2001 - Michael R. Kowalczyk
 2002 - Nathan Raiche
 2003 - Bryan E. Langer
 2004 - Denny R. VandenBerg
 2005 - Michael P. Plourde

Outstanding Graduate Students

1998 - Sherilyn R. Duesing
 2000 - Mandy P. Frantti
 2003 - Renee M. Yake
 2004 - Tricia A. Frantti
 2005 - Jennifer Pera

2005 NMU Distinguished Faculty Award

In February of this year, faculty, staff and students nominated Dr. Peggy House for the 2005 NMU Distinguished Faculty Award.

A screening committee comprised of the Provost and Vice President of Academic Affairs and the academic deans reviewed all the nominations and based its final decision on the faculty member's record of significant contributions to NMU and to his/her professional discipline in the following areas: teaching or other assigned responsibilities, research, scholarship, creative or other appropriate professional activities and university or professionally-related community service. Up to three faculty members may be selected in one year. This year, faculty receiving the award, in addition to Dr. House, are Dr. Robert Kulisheck (Political Science) and Dr. Peter Goodrich (English).

Dr. Peggy House joined Northern Michigan University in 1993 as Director of the Glenn T. Seaborg Center for Teaching and Learning Science and Mathematics; in 2003 she joined the Department of Mathematics and Computer Science as Professor of mathematics and mathematics education.

Dr. House is nationally recognized for her dedication to improving mathematics education. She has been the thesis advisor for 83 graduates of Ph.D., Specialist, or Master's Degree programs and has mentored hundreds of undergraduate students. Many of her students have themselves become leaders in mathematics education who directly attribute their success, interest, motivation, and dedication to Dr. House.

Dr. House has edited and authored more than 100 published books, chapters, and journal articles and has made more than 235 presentations nationally and internationally. She is director, author, and series editor of the National Council of Teachers of Mathematics *Navigations* project that, with 35 books and supplemental CDs, is the largest series of publications in National



Council of Teachers of Mathematics history. Dr. House's academic background is in both mathematics and physics, and she has had a lifelong dedication to integrating mathematics and science that led to her selection as lead author and editor of the *Mission Mathematics* program developed by NASA and NCTM. While at NMU, Dr. House has written grant proposals that resulted in more than \$2 million in external funding.

Dr. House has held leadership positions in the National Council of

Teachers of Mathematics, the School Science and Mathematics Association, the National Council of Supervisors of Mathematics, and the Minnesota and Michigan Councils of Teachers of Mathematics. She received the Lifetime Achievement Award from the National Council of Teachers of Mathematics and was the first recipient of the Outstanding Contributions to Mathematics Education Award from the Michigan Council of Teachers of Mathematics.

She was honored by the School Science and Mathematics Association for her efforts in integrating science and mathematics instruction. For her work on the *Mission Mathematics* Project, NASA presented her with a certificate and a mission patch that was flown aboard the Space Shuttle. Dr. House received a Distinguished Teaching Award from the University of Minnesota where she was Professor and coordinator of the mathematics education program before coming to NMU. She has also been recognized as a Distinguished Alumna by her graduate, undergraduate, and high school alma maters.

Dr. House is a prodigious scholar whose work exudes elegance, maturity, competence, and intellectual luster; she is a nationally prominent science and mathematics education leader, an exemplary teacher, an eminently imitable role model, and a caring and compassionate mentor.

For all these truly impressive and stellar accomplishments, it is appropriate that Dr. Peggy House be honored as a distinguished member of the Northern Michigan University faculty.

6th Annual Programming Contest

How do you assemble a jigsaw puzzle? How many valid moves are there in a popular puzzle? What is the area of the intersection of two circles?



6th Annual Programming Contest Organizers
Professors Andy Poe and David Powers and
ACM President Trisha Wells

Students from four universities attempted to write programs to solve these and other problems at the Sixth Annual Northern Michigan University Invitational Programming Contest held on Saturday, March 19, 2005.

Northern Michigan University has hosted this competition since 2000. Every year NMU competes with Michigan Technological University, Lake Superior State University, and Algoma University College for various trophies and certificates. Occasionally, other universities compete as well. This year, UW-Green Bay was slated to compete, but they had to bow out due to bad weather.

The contest rules are quite simple. There are six programming problems to be solved in a five-hour period by the various three-

member teams. Every correct solution is worth one point. Every program that is only 99% correct is worth no points. The winning team is the one that has the most points when the time is up. Ties are broken in favor of teams who solve the problems more quickly, and there are penalties for submitting incorrect programs.

Schools may submit as many teams as they like. Each school then earns a composite



Computer Science Major and 'Byte Smith' team member
William Smith

score generated from its three top-scoring teams. The schools themselves are then ranked based on these composite scores.

The contest is open to the general public—although few non-students take advantage of it—and this year the contest was won by two NMU alumni, Rocco Carello and Chris Martello, who decided to “experience the contest again

for the first time.” The second-place team was from NMU, consisting of Will Kim, Roland Scott, and Trisha Wells. Lake State took third place. Despite not having any teams in the top three, Michigan Tech had the highest composite score and won the event, with NMU a very close second.

A contest of this nature requires a great deal of participation from a great many people, and a lot of Math/CS faculty and students contributed either before, during, or after the contest to ensure its success. The contest was principally organized by Professors Andy Poe and Dave Powers, as it has been in the last several years.

- Andy Poe



Second Place Team 'Byte Smith'
Trisha Wells, William Kim and Roland Scott

The complete list of problems, solutions, and results can be found at <http://euclid.nmu.edu/~apoe/NMUCONTEST6>.

LEGO Robotics

We have all heard of LEGO blocks, in fact, many of us have played with them. But have you ever heard of LEGO Robotics? For several years, Math and Computer Science professor David Buhl has been coaching a team of area school children in LEGO Robotics as part of the FIRST LEGO LEAGUE.

The FIRST LEGO League (FLL), considered the "little league" of the FIRST Robotics Competition, is the result of a partnership between FIRST and the LEGO Company. FLL extends the FIRST concept of inspiring and celebrating science and technology to children aged 9 through 14, using real-world context and hands-on experimentation. These young participants build robots and compete in events designed for their age group. Using LEGO bricks and other elements such as sensors, motors, and gears, teams gain hands-on experience in engineering and computer programming principles as they construct and program their unique robots.

FIRST's mission is to design accessible, innovative programs to build self-confidence, knowledge and life skills while motivating young people to pursue opportunities in science, technology and engineering. They focus on team building, problem solving, creativity, and analytical thinking.

Teams may consist of up to ten members ages nine through fourteen. Dave's team, LEGO 'Bots, which consisted of eight fifth-grade girls and two sixth-grade boys, competed in the 2004 FIRST Lego League (FLL) Robotics Competition. The competition was announced to registered FLL teams in September. In preparation for a regional tournament, teams determine a strategy to accomplish various competition missions and accumulate points. In addition, the competition theme and related research project requires each team to investigate current issues facing our modern world.

The 2004 competition, "No Limits" focused on increasing awareness of the physical barriers that many people face on an everyday basis.

For the robotics component of the competition, tasks included designing and programming a robot to: (i) go up a set of stairs, (ii) retrieve a pair of glasses, (iii) shoot a ball through a hoop, and (iv) push a set of chairs into a table.

The research component required team members to: (i) decide how their school or community is not accessible to people with a particular disability, (ii) design a clever invention or solution to assist people with this disability, and (iii) develop a marketing plan for their solution.

For their project, the 'Bots researched how the stage at Kaufman Auditorium (a local auditorium used for a large number of school and area events each year) is not accessible for blind students to dance. After some brainstorming, the team came up with the solution of using light sensors (similar to a garage door safety beam) to alert the participant when they were approaching the edge of the stage. Using LEGOs, flashlights, light sensors, and a Mindstorm RCX brick, the team built a prototype of Kaufman Auditorium incorporating their solution to the problem. Once the RCX was programmed, the team had a working model.

At the regional tournament at Michigan Tech, the team was awarded the Research Award for their innovative solution to the problem.

Along with eight other teams from the Upper Peninsula, the 'Bots qualified for the state tournament at Novi, Michigan. At the tournament, the team finished in the top half of all qualifiers and 2nd out of the teams from the U.P. The 'Bots were especially boastful about scoring higher than the other three teams from Marquette County and considering that they were one of the younger and more inexperienced teams at the state tournament, they did quite well.

For more details about the competition, check out <http://www.firstLEGOleague.org>.



Department News continued from pg. 1

Students and faculty participated in weekly colloquia as part of the department's colloquium and seminar series. This year seven Math and Computer Science faculty and 10 students participated. We also hosted four guest speakers from Indiana University, Michigan Tech, the University of Iowa and the University of Connecticut. As part of this series, the Colloquium Committee held its first 2-way interactive Web-based teleconference with Cathy Seeley of the National Council of Teachers of Mathematics. A follow-up session was held at a later date with Johnny Lott (NCTM).

On a related note, Dr. Peggy House is piloting the delivery of a graduate class to students in Sault Ste. Marie using the 2-way interactive Web-based teleconference. Class originates from the mathematics education classroom using the portable equipment (half the students are here on campus, half at the EUPISD). This is the first time at NMU that an ITV class has been taught from a classroom location rather than from a dedicated distance-learning facility.

Faculty and students hit the road during the 2004-2005 school year.

- Six Secondary Education Mathematics undergraduate students attended the National Council of Teachers of Mathematics regional meeting in Minneapolis, Minnesota. Faculty advisors attending were Peggy House and Don Zalewski.
- 13 Computer Science majors attended the ACM North Central/North American Regional Programming Contest at Lake Superior State University where they took 3rd and 7th place. Faculty advisors attend-

ing were Andy Poe and Dave Powers.

- 12 Math and Computer Science majors attended the 15th Annual Argonne Symposium for Undergraduates in Science, Engineering and Mathematics, at Argonne National Laboratories, Illinois. Four students gave presentations at the symposium. Attending Faculty advisor was Jeff Horn.

Math and computer science student-related organizations continued this year with the Math Club experiencing a revival after several dormant years. A new club for future mathematics teachers is being organized while the existing chapter of the Association of Computing Machinery (ACM) continues to be popular among computer science students.

The NMU student chapter of the ACM organized and hosted the 6th Annual Programming Contest on campus in March. Twenty teams from 5 universities signed up to participate. (See page 5 for the complete story.)

This semester has been especially exciting as faculty member Dr. Peggy House was the recipient of NCTM's Lifetime Achievement Award as well as NMU's Distinguished Faculty Award (see page 3 for the story). Mathematics major Mike Lemke received a "TLC Award for Students" and two of our students were nominated for the "Non-traditional Student Achievement Award": Christina Faymonville (Math Education) and Scott Wyzlic (Computer Science).

The department's Colloquium Committee has accepted the responsibility of hosting the Mathematical Association of America's

(MAA) 2005 Regional Fall Conference. Planning for the conference, which will be held on September 30 - October 1, 2005, has already begun.

New equipment acquired by the department this year for use in the classroom include: 39 new TI-89 calculators, software, manuals and instructor's view-screen and 24 new computers for the computer lab.

Finally, it may interest you to know that during the 2004-2005 school year, faculty and/or students gave 50 presentations throughout the country and the world, had 41 books, papers and articles published, won (or were nominated for) 8 awards, and have one patent pending.

- Sue LaForais



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Northern
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"When I am working on a problem I never think about beauty, I only think about how to solve the problem. But when I have finished, if the solution is not beautiful, I know it is wrong."

Buckminster Fuller (1895-1983)

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