

The Math Log

Newsletter of the University of North Dakota
Mathematics Department



Parking Ramp Nears Completion

The UND campus is continuing to change! A five-level parking ramp is under construction and is nearing completion. The ramp is located on the southwest corner of University Avenue and Columbia Road. The above photo was taken from the north side of University Avenue, not far from Witmer Hall, the home of the Mathematics Department. Construction crews spent much of last summer driving in pilings for the ramp. Since then workers have used cranes to hoist large prefabricated pieces into place. Parking should be a little easier in a few weeks!

Woodrow McBride Dies

If you were here anytime between 1946 and 1981, you may remember Woodrow McBride. Woodrow was born in Milton, North Dakota on May 23, 1918 and passed away in Grand Forks on March 22, 2007. He received a bachelor's degree from Jamestown College in 1940 and for the next few years taught at various public schools in North Dakota and Minnesota. The late 1940s were a period of tremendous growth in enrollment at UND. In 1946, the Mathematics Department was hiring, and Woodrow took a job here. He had a twenty-hour teaching

load during his first semester here. Woodrow undertook graduate study at UND and at other universities, and in 1947, he received his master's degree in mathematics from UND. His adviser was Dr. Raymond C. Staley.

Woodrow was known as "Woody" or "Red," but in the Mathematics Department he was known as "Mac." His main teaching interest was geometry for prospective secondary teachers. If you took geometry (Math 409 or Math 410) here at UND, you may have had Mac as your professor. In 1957, he was promoted to the rank of Associate Professor, and he retired at that rank in 1981. In 1983, McBride wrote a history of the UND Mathematics Department, which is available here in the office.

For several years after his retirement, Mac lived in the University Park area of Grand Forks, devoting considerable time to the care of his wife Ann, who had suffered a stroke. He received frequent visits from **Ed Nelson** and **Tom Petros**. Ed is a retired UND Mathematics professor who still lives here in Grand Forks, and Tom Petros is Mac's son-in-law. Tom currently works in UND's Psychology Department.

In the spring 1994 issue of this Math Log newsletter, retired UND Mathematics professor **Milt Winger** wrote a short article about Woodrow McBride. Milt says "When he carried his briefcase home each evening, it was not just for show . . . there were several hours of grading and preparation needed each night." Woodrow must have been a dedicated teacher indeed: in 1972, he received the Charles DeBruyn Kops Distinguished teaching award.

We extend our sympathies to Woodrow's family. You may obtain more information about Woodrow in the following places:

- The obituary section of the Grand Forks Herald. See
<http://www.grandforksherald.com>
- The March 27, 2007 issue of the University Letter here at UND. See
<http://www2.und.edu/our/uletter>

Most of the information in this article was taken from these sources, from the Spring 1994 issue of the Math Log, and from the department history that Woodrow himself wrote in 1983.

Faculty Footnotes

Dr. Ryan Zerr has published the article "Minimal Bratteli diagrams and the dimension groups of $AF C^*$ -algebras" in the International Journal of Mathematics and Mathematical Sciences.

Distinguished Visitor Presents Talk

On April 17, 2007, Dr. Jean E. Taylor presented a talk here in the Mathematics Department entitled "Soap Bubbles and Crystals." Although things like soap bubbles may seem very simple, a detailed mathematical study of their shapes can be very complicated. We thank Dr. Taylor for explaining some of this to us!

Taylor is currently affiliated with the Courant Institute at New York University and is also a Professor Emerita at Rutgers University. She earned her Ph.D. from Princeton University in 1973 and has authored or edited approximately fifty-nine scholarly articles. She has previously served as president of the Association of Women in Mathematics (AWM), one of the main professional organizations for mathematics in the US.

Several GTA's Graduate

Several Mathematics Graduate Teaching Assistants (GTA's) are graduating with master's degrees this year.

Joel Downs received his M.S. degree this spring under the direction of **Dr. Joel Iiams**. He wrote an independent study report entitled "Stabilizer Codes." He plans to return to work on the family farm near Hillsboro, North Dakota.

Katrina Nagel graduated this past spring. Her adviser was **Dr. Michele Iiams**. The title of Katrina's independent study report is "Multiple Intelligences in the Mathematics Classroom."

Haley Skipper will be graduating this summer. Her independent study report is entitled "Decision Theory," and her adviser is **Dr. Gerri Dunnigan**.

Travis Stepan graduated this past spring. His adviser was **Dr. Ryan Zerr**, and his independent study report is entitled "Banach Spaces."

Scholarships Awarded

The Mathematics Department has selected four students to receive scholarships for the 2007-2008 academic year. The recipients are as follows:

- Sara M. Wacek (Jay O. and Marie Bjerkaas Scholarship)
- Candyce K. Hecker (Ronald C. and Ann C. Bzoch Memorial Scholarship)
- Ruth A. Dockter (Paige Plagge Memorial Scholarship)
- Kelsey N. Larson (Judy Ann Utton Memorial Scholarship)

We are grateful to our benefactors who have helped to make these scholarships possible!

Where They Are and What They Are Up To

Julie Farnum (UND BSCHE 1993, BA 1993) received a Ph.D. from the University of Missouri in 2002 and has recently earned tenure in the Anthropology Department at Montclair State University in New Jersey, near New York City. Julie has many duties, one of which is to teach lab science classes that are part of the General Education Program. She says that she must deal with mathematics education issues on a daily basis, since the mathematics in these classes often presents a challenge to the students! Julie enjoys reading the Math Log. One reason for this is the fact that she grew up in Grand Forks and lives very far from here now!

Chuck Peterka (BA, 1974) is retired after twenty years in the US Air Force and is currently working for the Vanguard Group of mutual funds in Valley Forge, Pennsylvania. He has been happily married to Nancy (Coons, Elementary Education, 1974) for thirty-one years, and they have two beautiful daughters. Nancy also has a master's degree from Penn State University. Chuck has fond memories of **Dave Uherka** and **Mike Gregory**, as well as Mike Gregory's discussions of Zorn's Lemma. You can reach Chuck via Email at sqrt-1@comcast.net.

Jennie (Stannard) Weber (BS, 2002) is currently living in Ravenna, Ohio and is working as an on-line instructor for Lake Region State College and Southern New Hampshire University. She teaches Western Civilization, American Civilization, and Intermediate Algebra. Jennie says that she is spending more time teaching mathematics than she ever thought she would and that she loves it! She says that her math degree has provided job security. Jennie is expecting to earn an MLIS degree from Kent State University this year. "Everyone is always looking for librarians with a background from the sciences," she says. "More students should consider a degree in math!" Jennie also completed a history major in 2002 and an MA in History in 2004. She is married to Raymond Weber (BS Aeronautics, 2002, MS Aeronautics, 2004). (330-296-4811, Jennie.Weber@lrsc.nodak.edu)

Keep your letters coming! The editor enjoys them very much, and no doubt readers of the Math Log do as well!

The Mathematics Track Meet

Every year on Presidents' Day, in February, the UND Mathematics Department hosts the Mathematics Track Meet. This is a competition in which students in grades seven through twelve come to Witmer Hall here on the UND campus and work on several short timed exams. Students are grouped in teams of four students each. At the end of the event, teams and individual students receive awards based on their scores.

This year the Track Meet took place on February 19, under the leadership of Mathematics faculty member **Dr. Tom Richards**. There were 168 students from around the region. Some of the team names were rather interesting: the Red River Pumpkin McPies and the Red River Ether Bunnies (from Red River High School), the Central End Behavior and the Central Lower Bounds (from Central High School), and the Park River Products!

Many current and retired people from the UND Mathematics Department helped out with the preparations for the Track Meet and the grading and score-keeping. In addition, several high school and middle school teachers came to the event and helped to proctor the exams. The Track Meet was an enjoyable experience, and we thank everyone who helped out!

Mathematics Department Participates in College Algebra Study

As you may remember from your school years, “College Algebra” is an important course for many university students. It is a prerequisite for study in a variety of different majors, not just here at UND, but at colleges and universities all over the country. Because of the importance of the course, investigators at the Mathematical Association of America (MAA) have undertaken a study of College Algebra and have received funding for the study from the United States National Science Foundation (NSF). The purpose of the study is to find ways of improving instruction in College Algebra courses. Eleven schools in the US are currently participating in this study. UND is one of them, and the MAA has provided UND with \$5000 in funding to cover the costs associated with the project.

The Math Log editor recently discussed our department’s role in the College Algebra project with UND Mathematics faculty member **Dr. Michele Iiams**. Many people from our department were involved. The department’s role in the project has been to compare two different methods of teaching College Algebra, or Math 103, as is it known here. During the Spring 2006 and Fall 2006 semesters, the UND Mathematics Department offered two different types of class sections of College Algebra. In one of the two types of sections, the instructor taught the course just as he or she would normally teach it. In the jargon of the investigators, these sections are called “control sections.” During the the study, **Stuart Farm, Mohammad Khavanin, Jeanna Schultz,** and **Elena Vinokurova** taught these control sections.

A Modeling Approach to College Algebra

The other sections are called “project sections.” **Joe Champion, Katrina Nagel, Ryan Zerr,** and **Michele Iiams** taught project sections. Instructors in the project sections used what we might call a “modeling” approach to mathematics. The idea was to use mathematics to model real-world problem situations and thus motivate the mathematics that the students are studying. The project sections used a new textbook emphasizing the practical applications of algebra. Each chapter of the new textbook begins with a discussion of some sort of application problem and uses this problem to motivate what follows. Michele says that just about all of the exercises in the textbook differ from the usual drill exercises that one sees in most College Algebra textbooks; they fit into some sort of “context.” These exercises are either word problems, or they relate to some sort of real world situation in some way. Problems that do not fit directly into some type of context are still different from

most of the problems in a typical College Algebra textbook. For example, instead of asking the student to compute a number, a problem may ask him or her to make a subjective judgment or to analyze or comment upon some sort of mathematical expression or problem situation.

Michele says that the project sections used a more “student centered” method of instruction. The teachers of such sections often gave traditional classroom “lectures,” when this was appropriate. But they also devoted a significant amount of class time to activities in which students worked on projects together in small groups. For example, some of these small group projects involved regression analysis. The students would study some sort of data, plot the data points, and then try to find an equation that fits the data. In most cases the students used graphing calculators to perform this regression.

Sonic Motion Detectors

In case you don’t know, a graphing calculator is a small hand-held electronic device with a little screen on which one can display graphs of equations. Most graphing calculators can perform many other tasks as well, such as regression analysis, computing integrals, and even computer programming. Nowadays many students buy their own graphing calculators and use them in their studies. As part of the College Algebra study, the Mathematics Department purchased ten graphing calculators as well as a “calculator-based laboratory,” or CBL. The funds from the MAA covered the cost of this new equipment. The CBL is a small set of gadgets which one can use to make experimental measurements and feed the data into a graphing calculator. The calculator then makes a table of data points. The teacher and students in the project sections used a calculator connected to a projector in the classroom, and viewed their results on a big screen. Michele says that one of the gadgets had a sonic “motion detector” which could track the motion of objects. She explained how a student would hold the motion detector at the edge of a table with a ball directly below it. The student would then drop the ball, and the detector would determine the location of the object at several regularly spaced times over the next couple of seconds and then feed the data into a calculator. Can you guess what type of curve would result? If you plot the height of the ball off of the floor as a function of time, you should get a parabola!

The CBL also includes a “temperature detector.” This is just fancy language for a thermometer! Students can gather data on the rate at which a cup of hot coffee cools, feed the data into a graphing calculator, and then analyze and display the results.

The College Algebra Study itself

As we noted above, the primary objective of the College Algebra study is to compare the modeling instructional

approach to the traditional approach. Michele and her collaborators are doing this in a number of ways. First, one of the study's investigators, Barbara Edwards, of Oregon State University, has visited the UND Mathematics Department several times over the past several months to talk with Michele as well as with the teachers of the control sections and the project sections of College Algebra. Edwards also held "focus group" meetings with students in which she asked them questions about their experiences in College Algebra.

Another obvious way to compare the two instructional approaches is through exam scores. The College Algebra instructors in the control sections and the project sections used the same or similar exam questions. UND will provide the MAA with data on the results. And in the months and years to come, UND will provide the MAA with data on the grades that our college algebra students earn in subsequent mathematics courses and perhaps in other courses that have College Algebra as a prerequisite.

Michele is involved with the MAA College Algebra study in other ways. Every year the main mathematics professional organizations in the US hold a very large joint meeting in which mathematicians and educators from around the country gather to present and listen to a wide variety of talks relating to mathematical research and mathematics instruction. This past January, three people from the UND Mathematics Department (**Katrina Nagel**, **Richard Millsbaugh**, and Michele) attended the 2007 national joint meeting in New Orleans, Louisiana. The group brought a poster describing UND's involvement with the College Algebra project and displayed it at a special poster session. While in New Orleans, the group members also attended meetings in which they discussed College Algebra with participants from some of the other ten schools involved with the MAA's College Algebra project. Funding from the MAA helped make the travel to New Orleans possible.

The Future of College Algebra

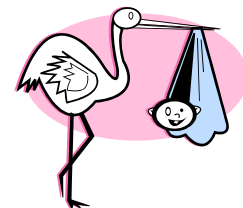
One obvious question for the UND Mathematics Department is what to do after the study is over. Should we use the modeling-based approach of the project sections, should we return to the instructional methods that we have used in past, or should we compromise? Michele says that the new approach has its advantages and its disadvantages. The project sections emphasize problem-solving skills, and the control sections place a higher emphasis on "symbolic manipulations" such as factoring or solving equations. Students need to learn both aspects of College Algebra, and it is difficult to cover both of these thoroughly in one semester.

Another question concerns the country as a whole and what changes in College Algebra instruction will occur in the broader national context. As the MAA study progresses, the MAA and its investigators will no doubt publish various reports and articles describing their findings. In the end, these reports could have a significant impact on College Algebra

instruction across the US, and the work of our department may have a truly far-reaching impact!

CONGRATULATIONS!

Eli Mercer Zerr was born on January 17, 2007. He weighed eight pounds and one ounce and was twenty-two inches long. Eli is the son of **Ryan** and **Jessica Zerr**. Ryan is an Assistant Professor here in the Mathematics Department, and Jessica is a Lecturer in UND's English department.



Matthew Benedict Bevelacqua was born on May 22, 2007. He weighed four pounds and fifteen ounces and was seventeen inches long. Matthew is the son of **Anthony** and **Stacy Bevelacqua**. Anthony is an Associate Professor here in the Mathematics Department.

The Pseudo-Sum

By Larry Peterson

If you have been reading the *Math Log* for several years, you may have noticed that this issue has appeared a little later than usual. There are two main reasons for this.



First, I broke my arm. One morning during spring break this past March, I was walking to work and slipped on the ice. I fell on my left side and cracked my bone. For the next nine weeks I had to wear a sling over the arm. Although I normally walk to work, this was no longer an option. The nurse in the emergency room told me to avoid breaking the other arm! So for several days our secretary, **Lona**, gave me rides to and from work. She willingly gave me a total of thirty-four rides. She was always cheerful and never complained! **Anthony Bevelacqua**, **Donna Boe**, **Michele Iiams**, and **Richard Millsbaugh** also drove me from one place to another on at least one occasion. Despite all of this help, for which I am very grateful, having a broken arm slowed everything down, including the *Math Log*!

The other reason for the *Math Log* being late is simply the busy schedule that we have here at UND. Because of the increasing emphasis on research and scholarly activity, it is better to work on the *Math Log* during the summer and during semester breaks. The next issues of the *Math Log* may thus be a little bit late.

In any case, I hope things are going well for you! Let us know what you are doing! And if you are in Grand Forks, feel free to stop by the Mathematics Department office!

THANK YOU !!

The following persons are responsible for monetary gifts to the UND Alumni Association specifically designated for the improvement of the Department of Mathematics:

Jason Aakhus	Marcia Howland-McCalden	William Lardy	Sylvester Suda
Dr. Gail Nelson	Donovan and Gladys Torbenson	Steven Gustafson	Allen K. Dominek
Dr. Frances F. Gulick	Dennis Winslow	David L. Harpster	Dr. Lawrence J. Lardy
Charles Hillerson	Hilary and Mary Klinicke	Dr. Edward Nelson	CDR Bruce W. Rova
Gregory Stolt	Dr. and Mrs. F. D. Holland Jr.	William F. Grams	Dr. Curtis E. Larsen
Robert Volden	Amanda and Eddie Brown	Ellen R. McKinnon	Kristin Vossler
Paul Lee	Barbara Hinnenkamp	Wells Fargo Bank	Lancey A. Cascaden
A. C. Olson	Dr. Cheryl L. Halcrow	Lowell J. Schweigert	Dr. Howard A. Bird
Cathy D. Adams			

Jay O. and Marie Bierkaas Scholarship

Shell Companies Foundation Inc.

Ronald C. and Ann C. Bzoch Memorial Scholarship

Raytheon Company

Your generosity is gratefully acknowledged and sincerely appreciated!

Your teachers and friends are wondering what you are doing! Help us to satisfy their curiosity. (Photos are also welcome!)

NAME (Include previous if changed.): _____

CURRENT ADDRESS: _____

TELEPHONE: _____

DEGREE AND YEAR RECEIVED: _____

SPOUSE: _____

CURRENT OCCUPATION: _____

NEWS: _____

PLEASE RETURN TO

UNIVERSITY OF NORTH DAKOTA
DEPARTMENT OF MATHEMATICS
WITMER HALL ROOM 313
101 CORNELL STREET STOP 8376
GRAND FORKS ND 58202-8376

Use additional sheets if necessary. You can also send us news items and comments by e-mail! Just send a message to

udmath@und.nodak.edu

Be sure to say that the information is for the Math Log.



Let
us
know
how
you
are
doing