

Mathematics News University of Idaho



Members of the Math Club wearing the new Math Club t-shirt

Math Club

The UI Math Club had an active fall semester, beginning with a pizza social to get to know each other and plan future activities. There was a math knowledge bowl competition, in which the team of Matt Benke and Matt Labrum was victorious. Faculty member Paul Joyce gave a presentation to club members on his research – the math club will be sponsoring a series of such presentations to allow undergraduates to see what the faculty are doing mathematically. Several math club members made a trip to Pullman to meet with and get to know their WSU counterparts. A few of the Pullman crowd then joined us in Moscow for our Math Club holiday party at semester’s end. In addition to enjoying holiday goodies and music, we constructed and decorated ornaments in the shape of the five Platonic solids (see photo on page 7). The club also produced their first-ever Math Club T-shirt. The shirt, designed by student Michele Valiquette, can be seen on the Math Club web page at

<http://stuorgs.uidaho.edu/~mathclub/>

There are still a few shirts available for purchase.

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An Interview with Mary Voxman



How did you become interested in Mathematics?

In high school I liked manipulating mathematical expressions. Algebra really interested me, so did Geometry. So, I worked hard, did fairly well in Math and continued taking Math courses.

What made you decide that this was what you wanted to study in college?

I didn’t decide this until my junior year in college. I was an International Studies major but kept studying mathematics because I liked it so much; when I was a junior I switched to a double major, International Studies and Mathematics.

Were your parents, sister, or any of your brothers mathematical?

My father was an engineer and he liked math.

Where did you go to high school?

I was born in Cochabamba, Bolivia and came to the United States when I was in the eighth grade. We lived in Iowa City, Iowa where I went to Iowa City High School and then on to the University of Iowa in Iowa City. We did not have much money and if I wanted to go to college I needed to live at home. I would have liked to go away to school somewhere but later I realized that the University of Iowa was a good school.

What mathematics excited you when you were in graduate school? Was there any particular mathematics that excited you?

Interview with Mary Voxman, continued on Page 3

Spring Actuarial Exam Dates

BECOMING AN ACTUARY

To become an actuary you need to pass a series of exams. The first two exams are on calculus, probability, economics, finance, and the theory of interest. At UI the course requirements for the Applied Mathematics major, Actuarial Science option cover this material. However, the problems are challenging and many questions apply the mathematics to a risk setting. To help prepare you for these exams the department has review seminars. Ralph Neuhaus, in Brink 302, can provide you with information on the actuarial profession, the review seminars, and on the exams.

The exam for Course 1 will be given:
Wednesday, May 21, 2003

The exam for Course 2 will be given:
Thursday, May 22, 2003

Both exams can be taken at UI. The deadline for applications to reach the Society of Actuaries for the May exams is: April 1, 2003.

Application forms can be obtained from Ralph Neuhaus, Room 302, Brink Hall.

Review for Exam 1 can be arranged by contacting Ralph Neuhaus



A wealth of information is just a click away...

www.uidaho.edu/LS/Math

The website for the Mathematics Department at the University of Idaho.



Mathematics Outreach



On the left, Monte Boisen



On the Right: Heather Howell & Rodolfo Long

Polya Extended is one of the efforts of the Math Department to reach out to the elementary and secondary schools in Idaho. This project aims to help high school teachers in Idaho develop multidimensional learning environments for their classrooms, similar to what is done in the Polya Mathematics Learning Center on campus. Professor MONTE BOISEN, HEATHER HOWELL, and RODOLFO LONG talked with teachers at the Idaho Council of Teachers of Mathematics October meeting in Pocatello about the project. In addition, Heather Howell and Rodolfo Long visited several high schools in Idaho who are participating in the project.



Fall Picnic 2002



The Math Department 2002 Fall Picnic was a huge success. We held the picnic in the new amphitheater in the Shattuck Arboretum at the University of Idaho. The pictures show the great turnout.



Let's start with high school. In high school I was really turned on by Geometry, I liked that given certain parameters and some axioms and definitions, one could just work and arrive at all sorts of conclusions. That was so unlike the real world. When I went to the University of Iowa I took a course on set theory taught by Professor Harry Muhly, and it was so enjoyable. When I started graduate school I took algebra and liked that area very much, much more than analysis.

Did you have Sterling Berberian?

He was my algebra professor and he scared me to death.

Has there been a teacher/professor that has motivated you that you've especially enjoyed?

Dr. James Jakobsen was one of my professors; he was a quiet, kind and gentle person. Now, I enjoy the memories I have of Dr. Sterling Berberian. I was in awe of him, and I knew he was a very bright and a very good mathematician. However, I could no more have gone to talk to him, he would look down his nose at me and immediately melt me into a spot on the floor.

You were not the only graduate student who had those same feelings, particularly about Professor Berberian.

The impression I have of him is probably due to the fact that I think he was very uncomfortable with people. But he certainly was a good instructor and he certainly gave a very good algebra class.

The other person for whom I have a lot of respect was Dr. Muhly. He was Chairman of the Department and he was the one who gave me my assistantship. When I told him that I was going to stop graduate school with my Masters he was really upset. He thought I had the ability to go on, and especially because I was a woman he thought I should go on, that more women were needed in Math. I really appreciated that attitude, after all that was in 1963 when one didn't hear very often, or at all, that point of view about women students.

You've done a lot of teaching. What excites you about teaching?

I think I have an ability to explain things so that most students can understand. I was hired to teach the Intermediate Algebra course; in that course there are so many students that are just scared to death of mathematics. It's the same with the Pre-Calculus course. I really enjoy being able to turn some of those students around to realize that they, too, can do math. I love being able to explain something and have students be interested in what we're doing in class rather than turning things off. I love it when a student has not been doing well and then there is a turn around and the student begins to understand and begins to enjoy the work.

What courses do you enjoy teaching?

I enjoy teaching Calculus and Algebra and I prefer the traditional way of teaching Algebra.

Why do you enjoy teaching calculus?

The first semester calculus course has so many concepts that are so interesting. I think this is the place where students really begin to have an idea of what mathematics is about. The concept of a function, the limit, the derivative. So in this course it is not just doing one problem after the other to practice techniques. But for example with the limit and the derivatives, seeing how these affect the shape of a graph of a function. I really enjoy teaching calculus with a graphing calculator. All the students in class can have a little computer in their hands; they can see that the analytic work they have done can be verified by the calculator's graph of the function. With the graphing calculator they can visualize functions, which I could never have been able to graph when I was a student. At the same time by using the numerical capabilities of the calculator they can predict and again verify. Finally the applications of calculus to the real world are exciting.



The ancient Incan city of Machu Picchu

You've walked the Machu Picchu trail, that is in Peru isn't it?

Yes, it's one of the most spectacular sights in the world. It's the site of the ancient city of the Incas, situated in a high jungle surrounded by incredibly beautiful mountains and vegetation. I've gone there three times. The first time I went by train. The second time a group of friends from this area and I trekked the Inca trail. That was a 5 day trip starting at 12,000 feet high, going up and down and ending in the Machu Picchu which has an elevation of about 9000 feet. Along the way there are all kinds of Inca ruins, the vegetation is spectacular, there are all kinds of orchids and other beautiful flowers, several kinds of humming birds as well as con-

Scholarship Information

Several scholarships are available to mathematics majors; all are based on merit. The Taylor, Botsford, Wang and Hower scholarships are awarded to mathematics majors entering their junior or senior year. Total awards for these scholarships are \$500, \$1500, and \$2500. The Mathematics Department Scholarship has no class restrictions. All mathematics majors are automatically considered for a scholarship. Non-mathematics majors are eligible if they fill out an application form obtained from the secretary and indicate that they will become a mathematics major or will add mathematics as a second major. The selection is made by the faculty of the department in March.

Mathematics Department Scholarship

This scholarship is supported by annual contributions of friends of the department and is awarded primarily to freshman and sophomore mathematics majors.

Sarah Hird, Peter Marcy, Silas Parks, Stacey Wilkins, and Tyrel Johnson are this year's recipients.

Ya Yen Wang Memorial Scholarship

A long-time member of the Mathematics faculty, Ya Yen Wang died in January of 1995. Acting on her wishes, her family established the Ya Yen Wang Memorial Scholarship. This scholarship is intended for a junior or senior in Mathematics, preferably to be awarded to a woman.

Michele Valiquette is this year's recipient.

J. Lawrence Botsford Scholarship

This scholarship was established by the family of J. Lawrence Botsford who was a member of the department from 1949 until his retirement in 1970. He also served as head of the department from 1950 to 1954. This scholarship is based on merit and is awarded to mathematics majors entering their junior or senior year.

Matthew Benke is this year's recipient.

Linn Hower Honor Scholarship

This scholarship was established in 1991 by Mildred and Loyal L. Hower, parents of Linn Hower, who graduated from the University of Idaho in 1979 with a B.S. In Mathematics. This scholarship is awarded to junior and senior applied mathematics majors, preferably from rural Idaho, with a high potential for success in a mathematics or scientific field.

Matthew Labrum is this year's recipient.

Eugene and Osa Taylor Mathematics Scholarship

This scholarship was established in 1979 by the family and friends of the first head of the department, Eugene Taylor and his wife Osa. He directed the department from the time he came to the department in 1920 until he retired in 1950. In 1981, his family donated many of his personal mathematics books to the University of Idaho library. This scholarship is based on merit and is awarded to mathematics majors entering their junior or senior year. The recipients of the Taylor Scholarship this year were:

*Matthew Benke
Elizabeth Cunningham
Nathaniel Hinds
Toney Jacobson
Matthew Labrum
Erik Mentze
Tim Paulitz
Fauna Samuel
Michele Valiquette*

*Jayne Bird
Brian Dorgan
Jesse Huso
Christopher Johnson
Nathaniel Mercado
David Nadler
Matthew Petersen
Eric Saueracker
Angela Williams*



Student Activities

MATT BENKE and MICHELE VALIQUETTE received the Alumni Awards for Excellence at an Alumni Banquet in December. Each year the Alumni Association honors 40 seniors for their outstanding achievement in both academic and campus activities.



This summer NATE MERCALDO participated in a Research Experience for Undergraduates in Mathematical Biology at Cornell University.

MAY GRADUATION

A reception will be held for mathematics graduates and their guests following the College of Science commencement ceremony on Saturday, May 17, 2003. Last year, parents and guests of graduates enjoyed visiting with the faculty and other graduates. During this semester we will request the addresses of your guests so that we may send them an invitation. We hope that all graduates and their guests will come to the reception.

EMPLOYMENT

One of the bulletin boards outside the department office (300 Brink Hall) is devoted to job opportunities. Career Services' monthly list of campus interviews will be posted there along with other job information the department receives. You can sign up at Career Services to schedule interviews with companies interested in mathematics majors. Your instructors can write letters of recommendation for the Career Services files, and they can also write letters of recommendation to specific employers.

GRADUATE SCHOOLS

Another bulletin board outside the department office is devoted to graduate school posters. Your advisor also has more information that can help you. Your instructors can write letters of recommendation for you that can be sent to each university to which you apply. Several copies of a pamphlet listing assistantships and fellowships in mathematics, statistics, and computer science in the U.S. are available. See Ralph Neuhaus in Brink 302 for a copy.

Past Graduates

RANDY ROSS is working for Taylor-Walker and Associates, a small actuarial consulting firm based in Salt Lake City, Utah. He is working in the property and casualty field. They also employ life and health actuaries. Randy graduated from UI in 1990 with a B.S. in Applied Mathematics.

Since 1994 **JACK OLSON** has worked for U.S. Filter (soon to be National Waterworks, the largest distributor of water works equipment in the U.S.). He is the Information Technology Director. Jack received his M.S. in Mathematics from UI in 1974.

Commander **KEVIN GRUNDY** was installed as Officer in Charge at the Acoustic Research Detachment in Bayview, Idaho on October 2, 2002. This facility of the Naval Surface Warfare Center on Lake Pend Orielle tests technological innovations that improve signature characteristics and hydrodynamic characteristics of submarines. Grundy earned a B.S. in Mathematics at UI in 1986 and was commissioned as Ensign in the U.S. Navy after Officer Candidate School. In 1992 he earned a Master's Degree in Engineering Acoustics from the Naval Postgraduate School in Monterey, California.

DANIEL FRAZIER is a graduate student in Statistics at the University of Idaho. He graduated from UI with a B.S. in Applied Mathematics in 2002.

Request for Alumni News

We would like to hear from you!

If you have some news or information about yourself that you would like printed in the next math news, please e-mail your information to Jaclyn Clark at jjclark@uidaho.edu or send it to the Department of Mathematics, University of Idaho, PO Box 441103, Moscow, ID 83844-1103.

Please include as much of the following as possible:

- Name
- Year you graduated from UI
- Degree and Major at UI
- Current Occupation
- News about yourself
- Comments, corrections, additions for newsletter



dors. The ruins of the Machu Pichu are in such an incredible setting, I really think it must be one of the most beautiful places in the world. The architecture the Incas used as well as the advances in astronomy and agriculture are absolutely amazing for that time. The third time I went was in the summer of 2001, this time it was a different trek, 7 days, ending in the Machu Pichu again. This last one was a very hard trek for me, one day we climbed 2500 feet to the Salcantay Pass which is at 15,300 ft and then the same day went back down to 12,800 feet, we went from alpine regions in the middle of snow covered peaks to jungle regions with coffee plantations, beautiful flowers and spectacular rivers. It is a spectacular place. Every time I am go, I am so struck by the wonder and the beauty of the place; I don't believe I will ever tire from returning for yet another view of the beauty of this place.

You're going to be retired at the end of the year, what achievements at the University are you most proud of?

Three things were really interesting, I think. First, Jim Calvert asked me if I could help set up the Mathematics and Statistics Center. That was really interesting because from a very small math lab we set up the MSAC in a bigger place. It was open many more hours a day and had lots of fine student tutors. The MSAC became very popular with the students taking algebra and calculus courses. After it was set up we hired Cynthia Piez as Director and she was followed by Kirk Trigsted. They both did a great job with the MSAC.

Then Cynthia Piez and I did an experiment using the Harvard Calculus book to teach the first semester Calculus. That was, perhaps, one of the most incredible learning experiences of my life. That book makes you go into the very basics of the various concepts taught and techniques used. That book also taught us the value of using the graphing calculator for extending, visualizing, predicting. That experience probably was one of the most profound ones for me, it has really changed the way I approach the teaching of Calculus.

Another important achievement was the work that Charles Christenson, Cynthia Piez and I did for the Pre-Calculus course. We redesigned the course and created the Algebra Skills Test. The purpose of the test was to see if students were ready for the course, if not they were dropped back to Intermediate Algebra. The Algebra Skills Test was a good predictor of student success in the course. But when we finally got to the point that students got to learn to live with the results of the Algebra Skills Test, the test was dropped due to the current redesign of the Pre-Calculus course in the Polya Center.



What are your goals for the next few years?

Not to grade more papers. I want to put all of my pictures in order, throw out all the junk I have, do some traveling (go back to Bolivia, the Machu Pichu, Europe) and then read a lot. I haven't been able to read very much the last few years.

What do you do in your free time?

Now? I grade papers

So in your free time you're going to visit your two children and your grandchildren? How old are your grandchildren?

I have a son and a daughter and two young grandchildren. My son, Alex, is a lawyer in Los Angeles; he works in corporate law. My daughter, Tanya, teaches Spanish in a college in Wisconsin and also works with English as a Second Language in the school system. They are both very nice people. And my little grandchildren are William, who is 3 years old, and Caroline who is 2 years old. I love to visit them.



Math Web Sites

For all kinds of information about mathematics, mathematical careers, and graduate school opportunities, check out these websites:

1. www.maa.org/ (this is the website of the Mathematical Association of America). Click on:
 - [columns](#) for interesting articles on mathematics.
 - [Read This](#) for reviews of popular books on mathematics
 - [Students](#) for links to undergraduate and graduate career opportunities
2. www.ams.org (this is the website of the American Mathematical Society).
 - Click on [Careers and Education](#) then on Undergraduate Student for information on Graduate schools and Research Experiences for Undergraduates.
 - There are also links for careers in Mathematics, Statistics, Actuarial Science, and Business.



In October at Brigham Young University PAUL JOYCE gave a talk comparing different measures of genetic diversity. He also collaborated with Keith Crandall at BYU on a project to test programs that claim to detect structure in population species.



MARK NIELSEN was given an Alumni Award for Excellence at an Alumni Banquet in December.

In October DAVE THOMAS gave a talk to the teachers at the Idaho Council of Teachers of Mathematics meeting in Pocatello, Idaho about using technology in teaching geometry.



In November DAVE THOMAS gave a mini-course on Geometer's Tool Kit at the International Conference on Technology in Collegiate Mathematics in Orlando, Florida.

Math Club Holiday Party



In October FRANK GAO and STEVE KRONE attended a workshop on Particle Systems at the University of Washington.



Undergraduates decorating their Platonic solid ornaments at the Math Club Holiday Party.

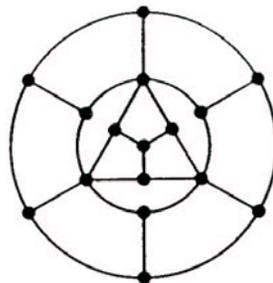


Prize Problems (continued from back page)

3. A device that shuffles cards always re-arranges them in the same way relative to the order in which they were placed into it; that is, the cards are always permuted the same way. The ace through king of hearts are arranged with the ace on top and the king on the bottom. After two shuffles the order of the cards from top to bottom is 10, 9, A, 8, K, 3, J, 4, Q, 5, 6, 2, 7.

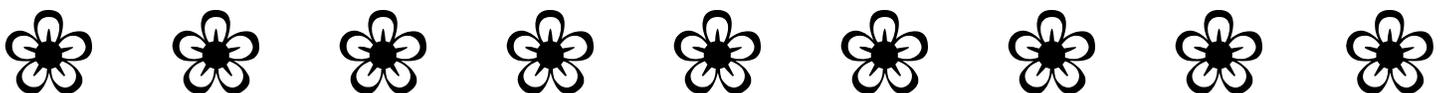
What was the order of the cards after the first shuffle?

4. Is there a path along the lines and arcs that passes through each vertex once and only once? Why?

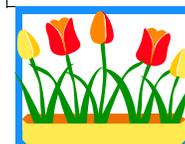


5. From the unit interval $[0,1]$, n real numbers $x_1, x_2, x_3, \dots, x_n$ are selected. Show that no matter which numbers are chosen there exists a real number x in this interval so that the average distance to the x_i is exactly $1/2$; that is, there is an x in this interval so that

$$\frac{1}{n} \sum_{i=1}^n |x - x_i| = \frac{1}{2}.$$



Spring 2003



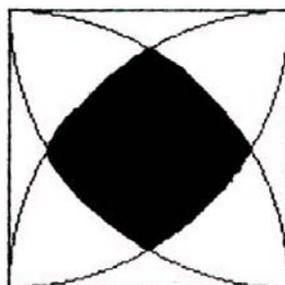
Prize Problems

Solve one of the problems below and you win a book!! You can choose a book about mathematics, the history of mathematics, a collection of famous theorems, a collection of problems, specials topics, etc. Some problems may appear hard or impossible. But all have a brief solution if you approach them in the right way. Prizes will be awarded while supplies last. Show or send your written solution to Ralph Neuhaus.

Rules for participating:

1. You must be an undergraduate, an alumnus, or an alumna.
2. You must solve one of the problems.
3. One prize per person.

1. At each corner of a unit square draw a circle of radius 1. Find the area common to the four circles.



2. Let $S(a, c, b, \dots)$ be the sum of the greatest odd divisors of the integers a, b, c, \dots . For example $S(5, 1, 12)=9$.

Find $S(1, 2, 3, 4, 5, \dots, 2^n)$.

Prize Problems are continued on Page 7