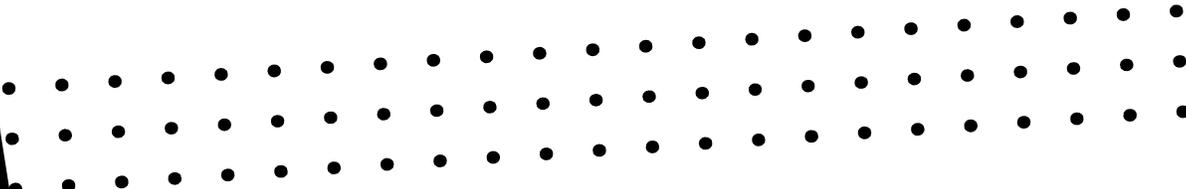
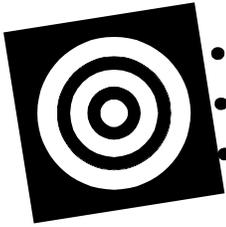
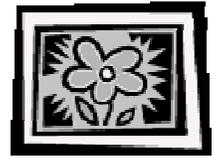


Mathematics News

University of Idaho



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Bill Royalty with his son Adam and wife Ginny

An Interview with Professor Bill Royalty

When did you first become interested in Mathematics?

In high school I was struck by the beauty of the mathematics in physics. The formulae all seemed so powerful and straightforward - making complicated ideas clear and simple . It was exciting to be told that they relied upon something called calculus which anyone willing to make the effort could learn about. This was hard to resist even for someone generally suspicious of effort.

Was there anything in particular that led you to decide on mathematics?

Indeed there was. As a sophomore physics major in college I had an Electricity and Magnetism course from James Van Allen. He was subdued but genial and always took pains to be clear and stimulating. I'd go to his lectures early just to get a good seat. He made the central field equations of the course seem to me the soul of elegance. It made me want to check out some real math courses. I was a bit of a klutz in the lab sections so it's possible that he simply wanted me out of physics so I wouldn't injure myself or others.

Interview with Professor Royalty, continued on Page 2.



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

www.uidaho.edu/LS/Math

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



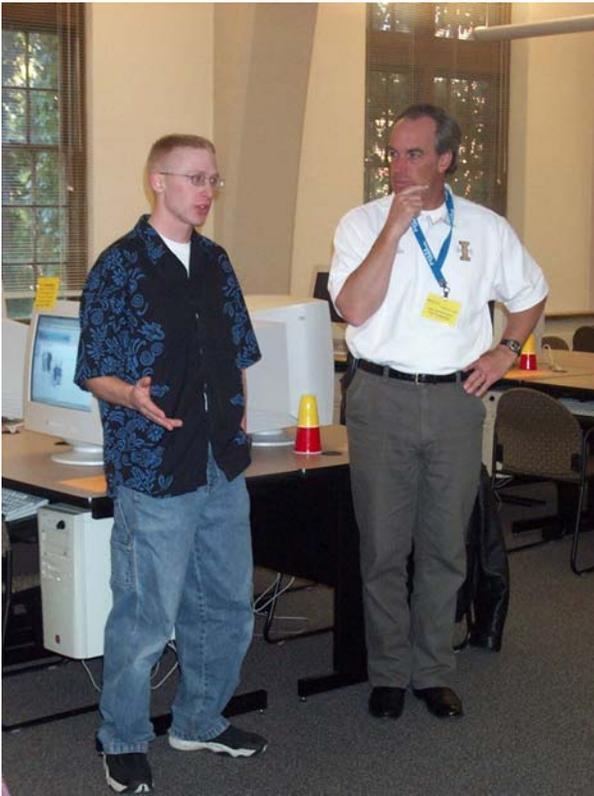
BECOMING AN ACTUARY

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.



Governor Tours Polya

On his visit to UI in October, Governor Kempthorne came to the Polya Center to find out more about this unique learning environment. For two hours he talked with instructors and Polya student tutors. He was also curious about the students reactions to Polya.



Jeffrey Moore, a Math 108 student, describes to Governor Kempthorne his experience in the Polya Learning Center.

Spring Actuarial Exam Dates

The exam for Course 1 will be given:
Wednesday, May 22, 2002

The exam for Course 2 will be given:
Thursday, May 23, 2002

Both exams can be taken at UI. The deadline for applications to reach the Society of Actuaries for the May exams is: **April 1, 2002.**

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

Review for Exam 1 can be arranged by contacting Ralph Neuhaus

STUDENT ACTIVITIES

On November 1, Tom Wortman of Regence Blue Shield of Lewiston spoke to the UI students about careers in Actuarial Science. Wortman graduated from UI in 1989 with a B. S. in Applied Mathematics.

ELIZABETH ALFORD and BRANDY WIEGERS were given Alumni Awards for Excellence in December. Each year the Alumni Association honors 40 seniors for this outstanding achievement in both academics and campus activities.

VLAD MININ and ZACH SAUL attended the workshop in Statistical Genetics and Computational Molecular Biology in December at the University of Washington.

Math Club members enjoyed two events this fall. In November they saw the movie "Planes, Trains, and Automobiles." In December they split into two teams to compete in a Math Knowledge Bowl. This was to prepare for their challenge in the Spring to the WSU math students.

Were your parents or siblings mathematical?

My brother is a psychology professor who seems to enjoy the statistics involved in the design and analysis of experiments. He seems scandalized whenever I ask if the data on rodents in mazes is ever tweaked or massaged. Do you think he's playing with my head?

Where did you go to high school and college?

Where did you go to graduate school and why?

I went to high school in a small rural town in Iowa and college at the University of Iowa. I was undecided between Iowa and the University of North Carolina. Both math departments had a lot of algebra courses, which seemed particularly attractive to me at the time but it was the 60's and the Southeast somehow had less luster. Jesse Helms, then as now, had been so dead for some time that his passing away seemed imminent. Iowa was already a very hospitable place and I knew more about the department and had some friends there. I had some money saved from my stint in the Air Force and didn't need to rely on a TA for a while whereas Chapel Hill insisted I teach from day one. As it turned out so did Iowa.

How did you decide to specialize in analysis?

Two things actually - the intellectual pleasure of a course from Halmos's textbook on measure theory was one. Secondly, the contact I was fortunate to have

with Professor Sterling Berberian. He was idiosyncratic on a heroic scale and it seemed the most natural thing in the world to be in awe of him - a practice he did nothing to discourage. Questions in class were rarely sought and never tolerated but his lectures were sheer perfection. He was every bit as hard on himself as on others. For example, at that time he had set himself the task of writing a measure theory textbook that would challenge the one of Professor Halmos - unfortunately a contest that could have but one possible outcome.

Can you describe the research that you do?

The application of functional and topological methods to singular boundary-value problems in differential equations. My thesis was on fixed-points in Banach spaces so I was fortunate that this department was so strong in differential equations. Some of these problems are rooted in chemistry and physics so I guess I'm back where I started.

Has there been a particular teacher or professor who has motivated you or that you have especially enjoyed?

Mr VanVranken, my high school science teacher, was kind, patient and dead certain that absolutely everyone would eventually come around to appreciating chemistry and physics. Some students were simply worn down by his relentless good will and took to studying

science on a regular basis. Everyone in each of his classes was responsible for a group or an individual project which required more academic persistence than some were used to. He spent a great amount of time after school showing me how to synthesize esters with various floral and fruity fragrances. Just the sort of thing to rouse the curiosity of a young person and I smelled good to boot! His time was always yours and he was encouraging to a fault (a good description of me at the time).

What made you decide to come to the University of Idaho?

A good school, the right size, in the right place.

What courses do you enjoy teaching?

I particularly enjoy teaching Calculus I & II, Differential Equations, Advanced Calculus, Math 480, and Real Variables. 170 because I always think I'm teaching it about perfectly, but never am. 175 because the students always do much better than one has any right to expect at that pace. 310 because the students do so well, reminding me of just how good the science and engineering programs are at this university.

What achievements at the University are you most proud of?

A simple thing really. Each year it's more and more pleasing when former students, especially those who may have struggled or had some difficulties in mathematics, jog my memory by calling, writ-

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.

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.

Sarah Potratz is this year's recipient.

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.

Brian Dorgan, Sarah Hird, Logan Owen, and Matthew Peterson are this year's recipients.

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 Benke 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.

Elizabeth Alford 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:

Elizabeth Alford, Jayne Bird, Aaron Blue, Daniel Brodock, Forrest French, Matthew Labrum, Eric Mack, Patrick O'Connell, Timothy Paulitz, Sarah Potratz, Eric Saueracker, Michele Valiquette, and Brandy Weigers.

GREAT JOBS FOR MATH MAJORS

See the book with the title "Great Jobs For Math Majors" to find out more. It is available on the bulletin board outside the Math Department Office. The first part has suggestions for your job search. The second part describes several career paths: teaching, actuary, mathematician, statistician, operations research analyst. Other options are advanced degrees in Marketing or Finance. There is much more.



MAY GRADUATION

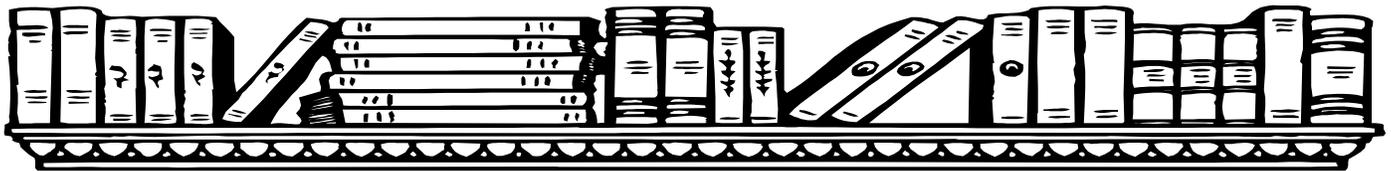
A reception will be held for mathematics graduates and their guests following the Letters and Science commencement ceremony on Saturday, May 18 2002. Last year, parents and guests of graduates enjoyed visiting with the faculty and other graduates. During this semester we will request the addresses of 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.



SUMMER CAMP FOR MATH MAJORS

1. Would you like to spend next summer learning new mathematics and discovering your own theorems? The National Science Foundation sponsors Research Experience for Undergraduates (REU) at several universities throughout the country. Five to ten undergraduate math majors and two or three math professors spend eight weeks in the summer exploring an area of mathematics. NSF provides salaries for the faculty and stipends for the participating students. Two UI students have recently participated. Both students described their REU experiences as outstanding. If you are thinking of going to graduate school in Math, Statistics, or Computer Science this would be very worthwhile. Acceptance into an REU program is competitive. Two of the requirements are that you be a US citizen and that you have at least one semester remaining as an undergraduate. You should have taken at least 461 or 471. Ralph Neuhaus can help you apply for an REU for next summer.
2. Have you considered studying mathematics in Europe for a semester or a year? Each year many American and Canadian students attend the Budapest Semester in Mathematics in Hungary. Almost invariably they consider this an incredible experience. The instruction is in English. The pre-requisites include one semester of Abstract Algebra or Advanced Calculus, and a motivation to study Mathematics. More information about the program and the fees can be obtained from Ralph Neuhaus.





FACULTY and STAFF NEWS

MARK NIELSEN received the Alumni Award for Excellence in December from the UI Alumni Association.

MONTE BOISEN attended the American Geophysical Union's annual meeting in San Francisco in December.

RALPH NEUHAUS and MARK NIELSEN attended the joint national meeting of the Mathematical Association of America and the American Mathematics Society in San Diego in January.

In September, CYNTHIA PIEZ attended a conference on Technology in the Teaching and Learning of Mathematics at Pennsylvania State University.

MONTE BOISEN, HEATHER HOWELL, and RODOLFO LONG attended the Fall meeting of the Idaho Council of the Teachers of Mathematics in Eagle, Idaho in September. Monte Boisen discussed a proposal to extend the ideas of the Polya Learning Center to high school math classes.

GAIL ADELE gave a workshop on Geometry and the Imagination at the Northwest Math Conference in Bellevue, Washington in October.

ZAID ABDO is a new graduate student in Mathematics. He has earned an M.S. in Agricultural Economics and an M.S. in Statistics from UI. Zaid received his Bachelor's degree from the University of Jordan in 1992. He will be a PhD candidate and a research assistant in mathematics.

MARK VESTAL is a new graduate student in mathematics. He earned a BS in Mathematics from the University of Texas at San Antonio. He will be a teaching assistant in mathematics and a PhD candidate.

In October, CYNTHIA PIEZ attended a confer-

ence on the Psychology of Mathematics Education in Snowbird, Utah.

In December, MONTE BOISEN described the UI Polya Learning program to the Pew Grant Program in Course Redesign in Orlando, Florida. The Pew Foundation provided funds to furnish the Polya Learning Center.

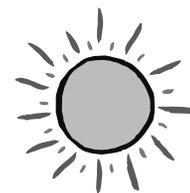
BROOKS ROBERTS was awarded a grant from the National Security Agency. He will continue his study of theta lifts and automorphic representations.

GAIL ADELE received a grant from the Idaho Department of Education to conduct a Creative Geometry Workshop for Elementary School Teachers this summer.

CLANCY POTRATZ received a grant from the Idaho Department of Education to conduct a Data-Driven Mathematics Workshop for Middle and Secondary Teachers this summer.

MONTE BOISEN and Dean KURT OLSSON received a grant for \$620,000 from the United States Office of Education to extend the Polya learning process to rural middle schools and high schools in Idaho. The money will be used to hire 8 teachers to help develop the program and to pay stipends for 25 rural teachers to learn about the program. Infrastructure support will also be provided to schools that participate.

PAUL JOYCE, STEVE KRONE, and FRANK GAO are participants in a \$9 million, 3 year, multi-disciplinary grant awarded to UI by the National Science Foundation. Faculty from biology and geology are also participating. The money will provide summer salary to the participating faculty and will provide support for undergraduate and graduate students for research. Joyce, Krone, and Gao will develop stochastic models for biocomplexity of life in extreme environments.



ing, or looking me up to tell me they are happy and productive scientists, teachers, engineers, etc. When someone drops in to remind you of how you stiffed them on a homework problem 10 years ago, it lends him or her a certain moral authority. A former student of mine visited me in September to introduce her son who was enrolled to take from me the same calculus course as she had. That made me feel so old that the Brink Hall stairway began to seem steeper.

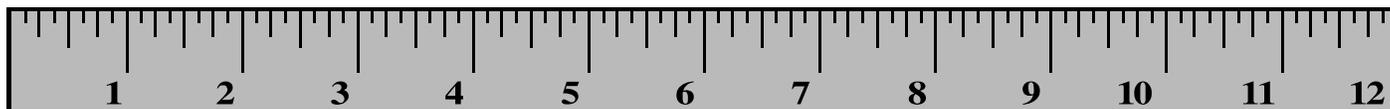
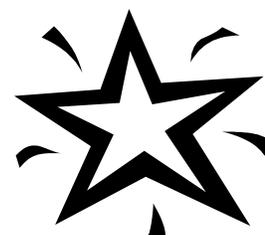
You used to play basketball at noon and now you are climbing mountains. What moun-

*tains have you climbed recently?
What is your next mountain?*

The Cascade volcanoes are a wonder of the Northwest. I've recently summited Mts. Hood, Baker Rainier as well as slogged up Mt Whitney in the Sierra of California. I've recently failed on Mt Shasta and Mt Whitney due to a blizzard and lightning so I'd like to try these again. They're all stunningly beautiful regardless of the altitude one turns around at. I look forward to climbing more at Mt Baker which is my favorite.

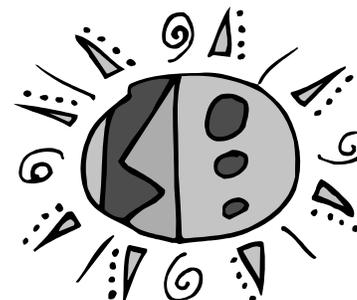
What are your goals for the next few years?

I'd like to learn more about singular stochastic differential equations. I think that the outlook and some of the problems in this area are still sufficiently rooted in the classical setting, with which I'm familiar, to encourage some migration. Finding out what methods might still be as valuable in the new as in the older area could possibly repay some investigation. Many times things work out better than expected.



Prize Problems (Continued from back page)

- 3. Two ferry boats ply back and forth across a river at the constant speed, turning at the banks without loss of time. They leave opposite shores at the same instant, meet for the first time 700 feet from one shore, continue on their way to the banks, return and meet for the second time 400 feet from the opposite shore. Determine the width of the river.
- 4. The increasing sequence 1, 3, 4, 9, 10, 12, 13, ..., consists of those positive integers which are powers of 3 or sums of distinct powers of 3. (The number 6 is not included since it is not the sum of *distinct* powers of 3). What is the 100th term of this sequence?
- 5.



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Spring 2002

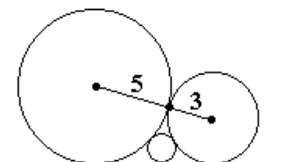


Solve one of the problems below and you win a book!! You can choose a book about mathematics, the history of mathematics, a collection of famous theorems, a collection of problems, specials topics, etc. Some problems may appear hard or impossible. But all have a brief solution if you approach them in 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.

Prize Problems

1. Three circles are tangent to each other and to a common line, as shown. The two larger circles have radii 3 and 5. Find the radius of the smallest circle.
2. A lattice point in the plane is a point in which both coordinates are integers. Show that no matter what five distinct lattice points might be chosen in the plane at least one of the segments that joins two of the chosen points must pass through some lattice point in the plane.



Prize Problems are continued on Page 7

