

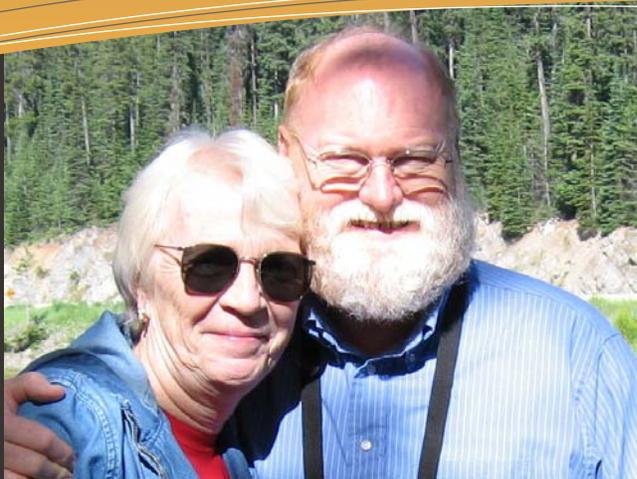
Math News

2012-2013

UI Math Club

By Rob Ely Math Club Advisor

The UI Math Club had a grand year, playing ultimate frisbee, watching Stand and Deliver, playing games, and running around with GPS units for a math scavenger hunt. And of course, a terrific Pi Day celebration with an integration bee and plenty of tasty pie (the pi paper chain is up to 1310 digits -- I think we're almost done...!) A special thanks to our officers Jordan Jackson, Jordan Dovale, and Peter Brown. For more information about the UI Math Club, contact Rob Ely at ely@uidaho.edu.



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Letter from the chair

As you read this newsletter, you will see that this has been a most busy year and we have much of which to be proud. Of course, we are most proud of our students who achieved great things. As you will see, we graduated five PhD students. Some of them pursued and obtained teaching positions at good institutions. They were competitive for these positions because of the fine work they had done as teachers at UI. In fact, two of them were awarded at least one outstanding teaching award from the department. This year four outstanding teaching awards were earned by our Teaching Assistants. These teachers did a truly tremendous job in the classroom. Six outstanding B.S. degree-earning students were recognized for their excellence in the classroom and their other activities. There is also some exciting faculty news. Mathematics Professor Paul Joyce was chosen to be the Dean of the College of Science. Since our Professor Mark Nielsen continues to be the Associate Dean of the College of Sci-

ence, the Mathematics Department is providing most of the leadership in the college. Rob Ely was promoted to Associate Professor. Stefan Tohaneanu has joined our faculty as an Assistant Professor. He brings a strong research program in Commutative Algebra and Algebraic Geometry to our department. He has already engaged one of our undergraduate students in a successful undergraduate research project. We continue to receive valuable support from our donors. An anonymous donor just funded the William J. Perry Mathematics Scholarship Endowment, a wonderful scholarship in honor of William Perry who taught for a short time in the University of Idaho Mathematics Department and went on to a distinguished career of service to our nation including serving as the Secretary of Defense under President Bill Clinton. We are very excited about this new opportunity to support worthy students. Also, the Misterek family added to their already generous scholarship endowment which supports our graduate program.

Excellence in Teaching

Awarded to graduate students who demonstrate excellence in teaching.

At Spring commencement Douglas Torrance, James Cockreham, Jesse Oldroyd, and Masaki Ikeda, received the Outstanding Teaching Assistant Award.



DOUGLAS



JAMES

Interview with Stefan Tohaneanu

Article prepared by
Hirotschi Abo

BIRTHPLACE

Bucharest, Romania

FAMILY

Wife: Polixenia; Daughter: Emma (18 months)

DEGREES

- 1997 - Bachelor of Science
- University of Bucharest
- 1999 - Master of Science (Algebra)
- University of Bucharest
- 2001 - Master of Arts (Analysis)
- University of Bucharest
- 2007 - PhD - Texas A&M University

RESEARCH AREA

Commutative Algebra and Algebraic Geometry and applications

FAVORITE LIVING

MATHEMATICIAN: The list is too long and includes David Eisenbud, Aron Simis, Graham Denham, Juan Migliore, Tony Geramita, Hiro Terao, etc., but the first name that comes to mind is Hal Schenck, my PhD advisor.

FAVORITE DEAD

MATHEMATICIAN: Gauss

FAVORITE THEOREM:

Cayley-Bacharach Theorem

FAVORITE AREA IN MATHEMATICS:

Commutative Algebra applied to other areas of Mathematics

FAVORITE AMERICAN FOOD:

Hamburgers, potato soup, pecan pie



FAVORITE NON-AMERICAN FOOD:

Almost any dish in the Romanian cuisine

FAVORITE MOVIE:

Lord of the Rings

FAVORITE TV SHOW:

The King of Queens

FAVORITE BOOK:

"One hundred years of solitude" by Gabriel Garcia Marquez and "The Catcher in the Rye" by J.D. Salinger.

FAVORITE SPORT:

Soccer

IN MY SPARE TIME I LIKE TO:

Spend time with my family.

PEAK EXPERIENCE:

2012-2013 at UWO. This year was very good for my research, and it led to being hired as Assistant Professor at University of Idaho. I believe this is not the peak of my career, and I think this year is just one mark on an ascendant path towards the peak of my career.

I CAN'T STAND:

Lies and Violence

I WISH I KNEW:

More Mathematics

FUN FACT ABOUT ME:

I like to compose music. The style of music I like is known as "epic music" and favorite song is "My name is Lincoln" by Steve Jablonsky.

Professor Paul Joyce Tapped as Permanent Dean of the College of Science

Article prepared by
Monte Boisen

We are very pleased that Professor Paul Joyce has been chosen to be Dean of the College of Science. Paul came to UI, as an Assistant Professor of Mathematics, in 1991 after earning his PhD at the University of Utah and serving as Post Doc at the University of Washington and the University of Southern California. He was promoted to Associate Professor in 1994 and then full Professor in 2001.

Paul's research interests include: statistics: probability and stochastic modeling, with an emphasis on interdisciplinary research involving statistical inference in population genetics; molecular evolution; molecular ecology; systematic biology; molecular biology; and bioinformatics. Currently, he is a principal investigator on a \$1.2 million, multi-year grant from the National Institutes of Health, researching patterns of adaptive evolution. During his tenure, he has earned and worked as collaborative investigator on competitive grants totaling more than \$25 million. Because of his contributions to the field of Statistics, his appointment became 80% in the Math Department and 20% in the Statistics Department.

Paul has been involved in many ways in the graduate program of the Mathematics Department, the Statistics Department and the Bioinformatics and Computational Biology (BCB) graduate program. He has been the major professor for five

PhD students. In recognition for his great work in this area, he was awarded the Donald Crawford Graduate Faculty Mentoring Award.

He has received three Alumni Awards for Excellence and was awarded the Distinguished Faculty Award. He is an active member in the Institute of Mathematical Statistics and the Society of Mathematical Biology, and served a one-year term as the chapter president of the American Statistical Association.

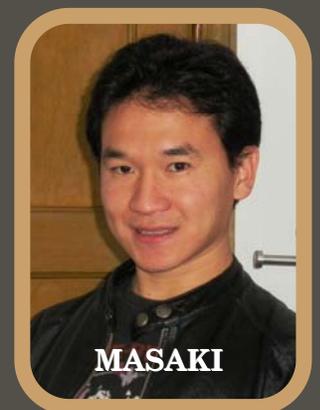
Paul is well prepared for his new role as dean as he has provided much leadership to the Math Department in many ways as a faculty member. He has served as the director of the Bioinformatics and Computational Biology graduate program. In addition, he also served as vice chair and chair of the university's Faculty Senate.

Paul's duties as dean will include strengthening collaborative and participatory processes to develop integrative solutions, continuing to build strong relationships with stakeholders and donors, emphasizing the STEM disciplines at the University of Idaho, and working to help faculty be successful.

Paul said this about his approach to the deanship: "Science students at the University of Idaho receive excellent preparation for exciting careers — we're a research university, and as such, we have a world-class research

(Continued on page 6)

Excellence in Teaching Continued



Career Information for Math Majors

Article prepared by Hirotachi Abo

Are you wondering about what you can do with a degree in mathematics?

Are you wondering about what you can do with a degree in mathematics? Because mathematics provides useful tools for studying the qualitative and quantitative features of problems that arise in many areas of science and engineering, studying mathematics prepares you for careers in a variety of fields and many job options are open to graduates with bachelor's degrees in mathematics. The aim of this article is to provide resources that answer questions you might have about career planning.

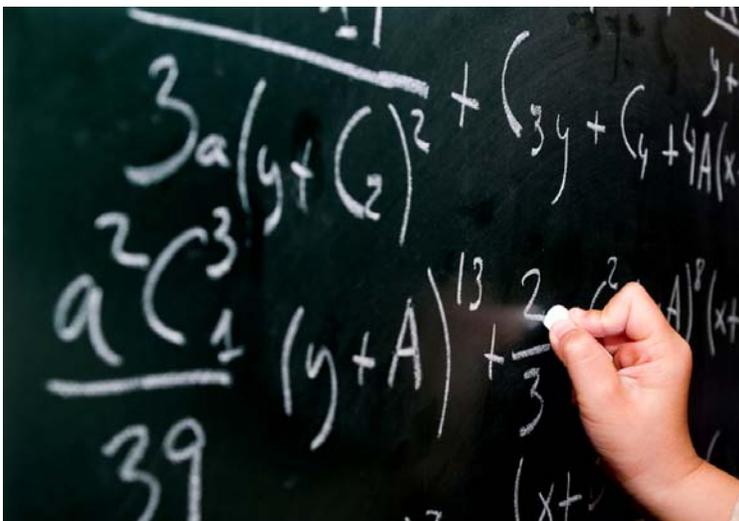
Popular jobs for math majors are mathematicians, high school teachers, actuaries, statisticians, computer scientists, and operations research analysts. Occupation Outlook Handbook (the website created by The U.S. Department of Labor, Bureau of Labor Statistics) covers hundreds of occupations including the above-mentioned professions and describes career conditions such as the nature of the work, work conditions, training and other qualifications, job outlook, earnings, and related occupations.

The major mathematics associations such as American Mathematical Society (AMS), Association for Women in Mathematics (AWM), Mathematical Association of America (MAA), and Society for Industrial and Applied Mathematics (SIAM) also have career information for mathe-

matics graduates, which contains employment listings, advice on finding a job, and other useful information pertaining to a career in mathematics.

While there are positions for those whose highest level of education is a bachelor's degree, some jobs require a graduate degree in mathematics. If you are interested in graduate school, a good place to start is the AMS applying to graduate school website, where there are several resources available to those applying to a graduate program in the mathematical sciences. If you would like to see school-by-school information about available support for graduate study, the AMS finding a graduate website is a convenient source of comparative information on graduate programs in the mathematical sciences. Applications for most graduate programs are due December of January. So if you are planning to apply to graduate school, it is better to start early.

Are you wondering what research in mathematics is all about? If you are interested in exploring mathematical research, you should check the AMS REU website, which contains a link to REU programs. What is REU? REU stands for the Research Experience for Undergraduates. An REU program is a summer program (ranging 8 to 10 weeks) funded by the National Science Foundations (NSF). It is designed to provide undergraduate students with a research experience at an institution. REU participants work on a research project under the direction of a faculty member. Thus participating in an REU program prepares you for graduate study in mathematics.





Undergraduate Award Winners

Several of our outstanding students have received recognition for their achievement.

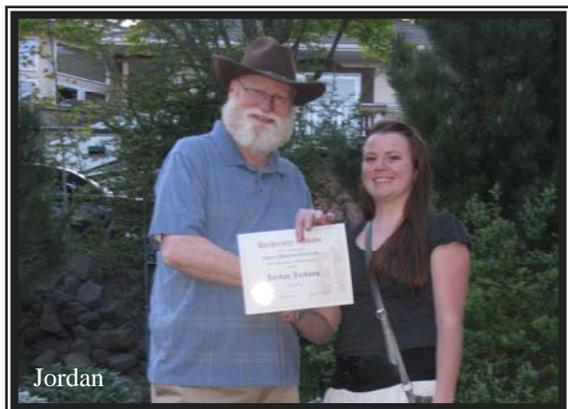
Chair's Award for Excellence

Awarded to graduating seniors in recognition of excellent academic performance.

Meredith Sargent was selected for a Chair's Award for Excellence. She served as President and as Vice-President of the Math Club. She is from Helena Montana and plans to attend Washington University in St. Louis to pursue a PhD in Mathematics. Her long term goal is to become a professor.



Meredith



Jordan

Jordan Jackson was selected for a Chair's Award for Excellence. She served as President of the Math Club. She is from Boise, Idaho. Jordan enjoyed playing intramural soccer with her friends. She plans to return to Boise, find a job, spend time with her family and do some travelling.



Hannah

Hannah Hallock was selected for a Chair's Award for Excellence. She has earned two B.S. degrees, one in Mathematics and the other in Animal and Veterinary Science. She also won an Alumni Award of Excellence. She represented the university as an Ambassador (in the College of Agriculture). She is from Olympia Washington. Hannah plans to pursue a graduate degree in Applied Economics at the University of Idaho.

Rob Ely's Promotion and Tenure

Rob Ely has earned tenure and been promoted to the rank of Associate Professor. He joined our faculty in 2007 directly after finishing his PhD degree in Math Education at the University of Wisconsin. He has distinguished himself at UI both as a teacher and a researcher. He has mentored one PhD student and is currently working with a couple of graduate students supported by a grant on which he is a Co-PI. This NSF grant entitled *Making Mathematical Reasoning Explicit* is a five-year \$5 million collaboration between WSU and UI. The grant focuses on building mathematics teacher leaders in rural districts who foster a culture of mathematical reasoning, generalization, and justification in their schools. Besides his teaching, many students know Rob as an organizer of our student math club.

Paul Joyce Dean College of Science

(Continued from page 3)

faculty. As dean, I am committed to enhancing the role and visibility of the faculty, raising awareness for our research and outreach efforts and continuing to build and foster a culture of optimism, trust and innovation." The Mathematics Department, the College of Science and the University will greatly benefit from his service as dean.



University of Idaho Mathematics Department Investigates Teacher Coaching

In an effort to understand ways that K-8 mathematics teachers can transform their practice to meet the demands of modern curriculum and Common Core Standards, the Examining Mathematics Coaching (EMC) Project is investigating the types and depths of knowledge needed for effective mathematics coaching.

Coaches are mathematics specialists who work with teachers to plan, deliver, and reflect on lessons. Dr. David Yopp, a joint member of the Mathematics Department and Curriculum and Instruction at the University of Idaho, is one of three EMC co-PIs and part of a research team that includes Montana State University at Bozeman (Dr. Elizabeth Burroughs, PI) and RMC Research Corporation in Denver (Dr. John Sutton, co-PI). EMC is a five-year, partnership-driven project funded by The National Science Foundation Discovery Research K-12 program, Award No. 0918326.

Currently EMC is in its final year. At present, more than 200 coaches and teachers participate in the project across eight states: Colorado, Georgia, Idaho, Montana, Nebraska, North Dakota, Washington, and Wisconsin. Idaho is well-represented with participants across seven districts and 23 schools, from Coeur d'Alene to Idaho Falls. The study will enhance the knowledge and understanding of mathematics coaching as it contributes to developing teacher quality, resulting in enhanced student learning in mathematics. This work is critical and timely because coaching has become a popular model for improving teacher practice.

"Although these school systems have made considerable investments in coaching programs, very little research exists—and al-

most none that defines what makes a coach effective," Yopp says.

What must a coach know about mathematical content, and how to coach teachers, to be an effective coach? EMC's groundbreaking research will help answer that question by using its data to model the knowledge types that contribute to successful coaching in these two domains: coaching knowledge and mathematics content knowledge. In addition, the research will examine impacts on teachers' knowledge, attitudes, and classroom practice based on their coaches' knowledge of coaching and mathematics content.

The project employs hierarchical linear modeling and structural equation modeling to examine relationships between changes in coaches' knowledge for coaching and changes in teachers' knowledge, beliefs, and practice. At present, with four years of data collected and analyzed, EMC researchers have identified knowledge of coaching, coaching self-efficacy, and coaching intensity as important in improving teacher practice.

Project staff have been busy disseminating findings across the nation, as well as sharing instruments for assessing coaching effectiveness with educators and researchers. In 2012-13, the project gave 11 talks at national venues and published two conference proceedings, including papers at the American Educational Research Association (AERA) Annual Meetings in Vancouver and The Mentoring Institute Proceedings at the University of New Mexico. EMC instruments have been used by projects around the nation and in Canada.

New PhDs

This academic year, five of our graduate students earned their PhD degrees. Christopher Ahlman (advisor: Brooks Roberts), Zhenxia Liu (advisor: Frank Gao), Doug Torrance (advisor: Hirotachi Abo), and Jia Wan (advisor: Hirotachi Abo) earned their PhD degrees in Mathematics. Pavitra Roychoudhury (advisor: Steve Krone) earned her PhD degree in Bioinformatics and Computational Biology.

Christopher Ahlman defended his PhD thesis in May 2013. The title of his dissertation is "Local newforms for the special linear group of 2 by 2 matrices over a nonarchimedean local field."



varieties formed by homogeneous polynomials that decompose into a product of linear forms). Doug started in the fall as a Visiting Assistant Professor of Mathematics at Monmouth College. Monmouth College is a four-year private liberal art college located in Monmouth, Illinois.

Zhenxia Liu came to the University of Idaho in fall 2008, and graduated in

August 2013 with a Ph.D. degree in Mathematics. In her dissertation, she studied "Conditional Persistence of Random Walks." Zhenxia likes to work as a university professor as her career after graduation.



However, as a loving wife, she finally decided to give up a position offer in Hong Kong and other opportunities in USA to move to Sweden, where her husband found a good position at Linkoping University. She will continue to look for a similar position there.

Doug Torrance finished his PhD in Mathematics in June 2013. His dissertation focused on computing the secant dimensions of Chow varieties of zero cycles (i.e., algebraic



Jia Wan defended her PhD dissertation in November 2012 and received her PhD in Mathematics in May 2013. Her research focused on Waring's problem for systems of skew-symmetric forms, a variation of the problem that E. Waring suggested in 1707. Jia is now working at Randolph College, Virginia, as a tenure-track Assistant Professor of Mathematics.



Pavitra Roychoudhury defended her PhD dissertation in the Bioinformatics and Computational Biology degree program in June 2013. Her research was on spatial structure and adaptive evolution in bacteriophages and included both mathematical/computational modeling and lab experiments. She is now doing a postdoc at the Fred Hutchinson Cancer Research Center in Seattle.



Several scholarships are available to math majors. 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 change their major to mathematics or add mathematics as a second major. The selection is made by the faculty of the department in March. The generosity of our donors makes it possible to award scholarships to some of our best students. The following students received the following awards for the 2010-2011 academic year:



Scholarships Awarded for 2012-2013

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. **Michael Solomon and Sasha Solomon** and this year's recipient.

Mathematics Graduate Student Scholarship

This scholarship is supported by annual contributions of friends of the department and is awarded to mathematics graduate students. This one time gift is awarded at the discretion of the Math Department. The recipients this year were: **James Cockreham, Cory Druffel, Michael Eldredge, Jon Fledderjohann, Masaki Ikeda, Esther Lynch, Jesse Oldroyd, Timothy Trammel, Jeffrey Winter, and Xian Wu**

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: **Monica Agna, Paul Bailey, Agatha Caleo, Ryan Cook, Hannah Hallock, Benjamin Knapp, Kyle Morgan, Christopher Pratt, Chelsea Small, and Justin Stoddard**

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. It is based on merit.

Lesley Williams is this year's recipient.

Math Department Scholarship

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

Clancy and Barbara Potratz Math Education Scholarship

This scholarship was established by Clancy and Barbara Potratz. Clancy was on the Mathematics Department faculty from 1966 to 1994. He served as head of the department from 1990 to 1994. The scholarship will be available to full time students majoring in the Department of Mathematics. Students with sophomore, junior, or senior standing are eligible. First preference will be given to students preparing for a career teaching mathematics at the middle through high school levels. This scholarship is based on merit.

Katrina Werlinger 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. It is based on merit.

Zach Tolmie is this year's recipient.

Arnold Misterek Family Scholarship

The Misterek Scholarship was established by Arnold R. and V. Kay Misterek in 2007. Mr. Misterek earned a master's degree from the University of Idaho in 1965. He was a high school math teacher for 25 years. Two of the Mistereks' children graduated from the University of Idaho with math degrees. Mr. Misterek passed away in 2009. The Misterek Scholarship is awarded to graduate students majoring in mathematics, with preference to United States citizens. Selection is based on merit. **Jesse Oldroyd** is this year's recipients.

Elna Grahn Math Scholarship

Established in honor of Elna Grahn and awarded to full-time students pursuing a degree in mathematics at the University of Idaho.

Casey Stevens is this year's recipient.

Faculty News

Hirotschi Abo continued to work on the projects in Algebraic Geometry funded by National Science Foundation. He attended the Western Algebraic Geometry Conference (WAGS) held at the University of Utah, October 20-21. WAGS is a twice-yearly meeting of algebraic geometers in the western half of the United States and Canada. The University of Idaho plans to host WAGS in Fall 2014. He, with Zach Teitler (Boise State University), **Alex Woo**, co-organized the special session on combinatorial and computational commutative algebra and algebraic geometry at the 2013 Spring AMS Western Sectional Meeting held at the University of Colorado, Boulder.



Lyudmyla Barannyk was awarded an NSF MRI Grant "Acquisition of an Adaptive Computation Server for Support of STEM Research at the University of Idaho" (PI: J. Alves-Foss, Co-PIs: L. Barannyk, G. Potirniche, T. Xing, F. Ytreberg). She was also awarded an IGEN grant "High Speed Digital Package Measurement and Modeling for Next Generation Memory Modules" (PI: F. Barlow; Co-PIs: A. Elshabini, L. Barannyk, G. Potirniche) for the partnership with Micron Technology Inc., to help measure, model and develop techniques for new, high-speed computer memory products. She received research fellowship from the University of Idaho Foundation, Micron Mechanics Modeling. She organized a minisymposium "Multiscale Modeling, Microstructure, and Local Field Properties of Heterogeneous Media" jointly with Yuliya Gorb (University of Houston) and Silvia Jimenez (Worcester Polytechnic Institute) at the SIAM Conference on Mathematical Aspects of Materials Science 2013, Philadelphia, June 9-12, 2013. She also delivered a talk at this conference entitled "Fast Algorithms for Mesoscale Evolution of Large Particle Systems". She attended an IEEE Workshop on Microelectronics and Electron Devices (WMED 2013) in Boise, April 12, 2013 where two of her PhD students Hazem Aboutaleb and Dalia Elgamel gave talks "A New Method for Causality Enforcement of DRAM Package Models Using Discrete Hilbert Transforms" and "Comparison of Passive Enforcement Techniques for DRAM Package Models", respectively.



Somantika Datta continued to work on a project sponsored by the Air Force Office of Scientific Research. She gave an invited talk titled "Deterministic compressed sensing for efficient image reconstruction" at the Pacific Northwest Numerical Analysis Seminar in Boise State University. She also attended the Joint Math Meetings of the AMS in San Diego and the February Fourier Talks at the University of Maryland, College Park, MD.



Rob Ely presented on mathematical justification at three conferences: the Psychology of Mathematics Education conference in Kalamazoo, the Research in Undergraduate Mathematics Education conference in Denver, and the MSP Learning Networks Conference in Washington D.C. He taught at the summer Mathematical Reasoning



Institute at WSU (as did Dr. Johnson-Leung). He also presented, with Walter Hesford, on "Useful Fictions" at the UI Renfrew Interdisciplinary Colloquium in the spring.

Jennifer Johnson-Leung was an invited speaker at the Automorphic Forms seminar at Purdue University in April as well as the Pacific Northwest Number Theory conference in Seattle in June where she spoke about joint work with Brooks Roberts on Siegel Paramodular Newforms. This summer, she also continued her work with Rob Ely and Anne Adams on the NSF project "Making Mathematical Reasoning Explicit." This was the second year of the Summer Institute at which Jennifer taught Geometric Reasoning to teachers from Eastern Washington and Northern Idaho.



Steve Krone gave an invited talk on "Antibiotic resistance plasmids and spatial structure" at the CIRM conference on Probability, Population Genetics and Evolution in Marseille-Luminy, France. He taught a 2-day graduate workshop on "Individual-based stochastic spatial models" as part of the MBI Summer Graduate Workshop series on Stochastics Applied to Biological Systems (Columbus, Ohio). He was main speaker, giving plenary talks: "Individual-based stochastic spatial models and population biology" (2.5 hours); "Spontaneous pattern formation in spatial populations with cyclic dynamics" (1 hour) at PIMS International Graduate Training Centre in Mathematical Biology—Annual Summit (Naramata, BC). He was participant in IMA workshop on Stochastic Modeling of Biological Processes (Minneapolis). He served as an associate editor for Journal of Mathematical Biology and Annals of Applied Probability.



Linh Nguyen received a three-year grant from NSF to work on Mathematics of Thermo-acoustic/Photo-acoustic tomography. He presented his work on "Spherical mean transform arising in thermo-acoustic tomography" at the AMS Western Sectional Meeting, University of Arizona, Oct 27-28, 2012. He gave the invited talk "Mathematics of Thermo-acoustic tomography" at the PDE Seminar, University of Houston, September 28, 2012. He also presented a colloquial talk at Brigham Young University, Provo, Utah, in April 2, 2013.



Mark Nielsen continues to serve as Associate Dean in the College of Science.



Alexander Woo attended the annual conference on Formal Power Series and Algebraic Combinatorics and the annual Permutation Patterns conference, both held in Paris. He gave a colloquium talk entitled "Some local properties of Schubert varieties" at Boise State University and a talk "The Vandermonde determinant as a sum of powers of linear form" in our own department colloquium. He was also awarded a grant from the National Security Agency to help support his research in algebraic geometry and combinatorics.



Outstanding Seniors

Awarded to seniors who have shown exceptional mathematical talent.

Jacob Bow was selected for an Outstanding Senior Award. He was instrumental in the creation of the successful university-wide game of Zombies and Humans. He is from Gooding Idaho and spent his summer working at Boeing's R&D department. He began pursuing his PhD in Materials Science at Stanford University this fall. His long term goal is to pursue applied research either in academia or in the private sector.

Ailene MacPherson was selected for an Outstanding Senior Award. She co-authored a published research paper while an undergraduate! She is from Deary, Idaho. After com-



pleting her B.S. in Mathematics, she entered the University of Idaho's graduate program in Bioinformatics and Computational Biology. Her long term goal is to get a PhD and go on to study evolutionary epidemiology.

Chelsea Small was selected for an Outstanding Senior Award. She won numerous awards as an outstanding soccer player on the university of Idaho soccer team as well as winning an Alumni Award of Excellence. She is from Solana Beach, California. She is currently participating in soccer by being a member of the coaching staff for the soccer team at the same time that she is pursuing a graduate degree in Accounting.



I want to support students and faculty in the Department of Mathematics!

My Gift of \$ _____ is enclosed (Please make checks payable to University of Idaho Foundation, Inc.)

Please Direct my gift to:

Department of Mathematics General Fund (MF963)

Other (Please Specify Mathematics Department Fund Name) _____

Name _____

Address _____

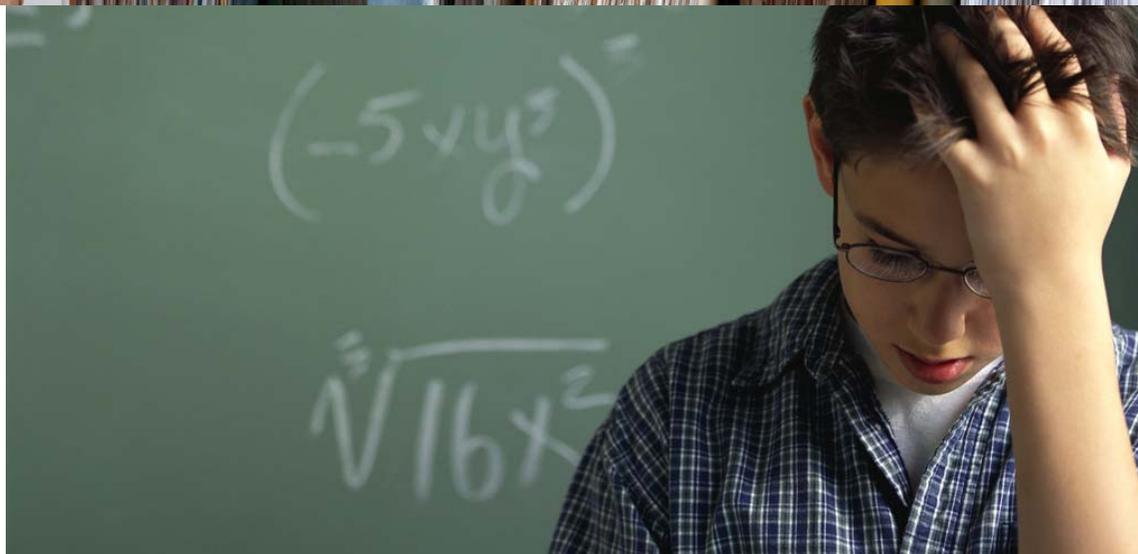
City _____ State _____ Zip _____

Phone _____ E-Mail _____

University of Idaho Degree _____ Year _____

News (Family, Career, Etc.) _____

Please return to: Gift Administration Office, PO Box 443147, Moscow, ID 83844-3147



Prize Problems

Solve one of the two Prize Problems and you win a prize!!! Some problems may appear hard or impossible, but all have a clear solution if you approach them in the right way. Prizes will be awarded while supplies last. Show or send your written solution to the math department: math@uidaho.edu.

Rules for participating:

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

Problem 1

Determine all functions $f : \mathbb{R} \setminus \{0\} \rightarrow \mathbb{R}$ so that $xf(x/2) - f(2/x) = 1$ for each $x \in \mathbb{R} \setminus \{0\}$.

Problem 2

You have a 20×12 rectangular checkerboard made of one-inch squares. For a given counting number r , a checker can be moved from one square to another provided the centers of the squares are \sqrt{r} inches apart. The goal is to find a sequence of moves that takes a checker from one corner to the other corner that is on the same long side of the board.

- (a) Show that the task cannot be done if r is divisible by 2 or 3.
- (b) Find 5 values of r for which the task is possible.
- (c) (Bonus) Find all of the values of r less than 100 for which the task is possible.