

University of Idaho

Mathematics News

2009-2010 Academic Year

Letter from the Chair

The 2009-10 academic year began with great sadness as we were all dealing with the loss of Dora Bialostocki. We continue to be inspired by the ways in which she shared her love for mathematics with her students. The semester began with the Mathematics Department's fall picnic, with students, faculty members, staff, and retirees sharing conversation and pizzas. The students on our William Lowell Putnam team worked hard throughout the fall semester – you'll want to read about their success in this newsletter! The department was recognized by the university with an *Innovation Award for Impacting Society* for our licensing of a collection of videos used in our Polya Mathematics Learning Center. As always, Polya had many visitors from colleges and universities interested in adopting some of our ideas as to how best to teach introductory math classes. A Policy Analyst from the Washington D.C. think tank Education Sector visited the Polya Center and wrote a most interesting article. He proclaimed that when our students studied in the Polya center, they were "heirs to their school's pioneering venture in course transformation, they all were sitting at the forefront of 21st century higher education." I know that a lot of the readers of our newsletter



worked in Polya; this quote is a compliment to all of you.

This fall also saw us open a new chapter in our collaborations with WSU in a search for a new UI faculty member, partially funded by a WSU grant, to participate in an exciting joint research project. When Matthew Rudd decided to leave UI to pursue his dream of teaching at a liberal arts college, we hired two analysts from the pool of candidates: Somantika Datta and Linh Nguyen.

Besides recruiting, I had two delightful experiences at the MAA meetings in January. One was from yesteryear as I became acquainted with Newman Fisher, the first PhD student from our Mathematics Department (1963) who had a distinguished career in higher education and who retired as Chair of the Mathematics Department at San Francisco State University. The other was all about tomorrow as I visited the two research posters (both of which led to publications) presented by Benjamin Coté, one of our graduating seniors. Elsewhere in this newsletter, you can read about the accomplishments of several other extraordinary students from this year's graduating class. Those of you who have contributed to our scholarship programs can be very proud of the accomplishments of the students like these all of whom have benefited from your generosity. I particularly want to mention the most generous contributions by the Misterek family adding to their scholarship endowment supporting outstanding graduate students.

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Zaid Abdo Receives College of Science Faculty Early Career Award!

Article prepared by Paul Joyce

Dr. Zaid Abdo received the College of Science Faculty Early Career Award. Zaid has excelled in all phases of his performance as an Assistant Professor at the University of Idaho but this award is focused on research accomplishments. Zaid's substantial research contributions in the area of statistical methods for analysis of terminal restriction fragment length polymorphism (T-RFLP) data were the basis of this award. His research contributions in this area are a set of papers that have been widely cited, and have led to several grants including being one of four project directors on the latest \$9.5 million COBRE award. In all he has participated in funded grants totaling approximately \$14 million in awards.



(Continued on page 4)

Remembering Dora Bialostocki

Article prepared by Ralph Neuhaus



Dora was there for her students, her colleagues, her family and her friends. She taught large classes of advanced math, primarily to engineering and physics majors. She put great effort into her lectures, and welcomed students having problems to her office. Dora

greeted her colleagues with a big smile, giving them sympathy and understanding. At home, her husband Arie, and her children, Guy and Taly, were the center of her life. On Friday evenings, celebrating the Jewish Shabbat, she would cook a traditional meal for the local Israeli university students, reminding them of home.

Dora died in Moscow on July 25, 2009 after a long struggle with terminal breast cancer. While her students and colleagues may have been told that she was having chemotherapy, they could not tell it from her spirit in class and in the department.

Dora was born on July 17, 1948 in Vilnius, Lithuania and, when she was 8, immigrated with her parents via Poland to Israel. Upon graduation from high school she joined the Israeli Defense Forces in a program that would lead to an academic degree and a commission as an officer. For her B.Sc. at Tel-Aviv University she studied mathematics and physics with emphasis on mathematics. Later on, as an intelligence officer in the military, Dora became a highly adept Fortran programmer during the early days of computers. There she attained the rank of Captain.

At the conclusion of her military service Dora continued her education in mathematics at Tel-Aviv University, meeting Arie, one of the many fellow graduate students in the Math Department. Because of their different disciplines they didn't actually have a class together, except for one. Arie needed to take one more class in analysis and he chose an easy, but unpopular one, *Approximation Theory*. Unfortunately, he was the only student registered, and the class was about to be canceled. Arie asked Dora and a friend to register for the class in order to save it from cancellation. The two young ladies could not resist, registered for the course, and the class stayed open. After a few weeks Arie was called to active duty in the IDF, and

Dora and the friend were stuck as the only students in the course.

In 1978 Dora earned her M.Sc. in Applied Mathematics. The title of her masters' thesis was *Super Sonic Flows Past Blunt Objects*. She proceeded to study for a Ph.D. under Professor David Gottlieb, who later immigrated to the US and joined the faculty of the Math department at Brown University. During that period Dora worked as a research assistant of Professor Saul Abarbanel, investigating numerical solutions of systems of partial differential equations. After completing her course work, she wrote her research proposal on the Euler differential equation and passed the exam on the proposal. Her studies were discontinued in 1983 when, then husband, Arie completed his Ph.D. and the family moved to University of Calgary in Canada, where Arie landed a postdoctoral research position. Dora planned to finish her thesis when they would return, however the family moved to Moscow in 1984 and never returned permanently to Israel. Arie became a professor of Mathematics at the University of Idaho, and Dora immediately began her long career of teaching differential equations, complex variables, partial differential equations, and numerical analysis.

Dora is survived by her husband Arie, their son Guy, and their daughter Taly. Guy graduated from Carnegie Mellon University with a degree in Mathematics and Computer Science and now works for Amazon.com in Seattle. Taly graduated from Yale University with a degree in History and, this year, received a J.D. degree from Yale Law School. Next year she will clerk for an Alaskan Supreme Court Justice.



Dora was buried in Israel according to the Jewish tradition. Her students, her colleagues, her friends and her family greatly miss her.

Student Honors Spring 2010

Article prepared by Mark Nielsen

The 2010 crop of mathematics graduates featured many outstanding students. Two students stood out as the recipients of this year's **Outstanding Graduating Senior** awards: **Brian Faulkner and Faith Snyder**.

Brian graduates with degrees in both Mathematics and Physics, a University Honors Certificate, and a perfect 4.0 GPA. He is a talented student with a very interesting story. He is a "local product" and grew up here in the Moscow area. By the time he started his senior year of high school he was already taking 2nd semester calculus and linear algebra here at UL, and he decided to just move on to the university instead of finishing high school. He's never looked back, except to return to his old school (Montrose Academy) to teach mathematics during the 2008-09 year. That teaching experience had a powerful effect on Brian and changed the way he looked at his education and everything else: "When you have responsibility for another person, it really changes the way you think about things." Brian also is the recipient of this year's John B. George Award from the College of Science, given to the college's outstanding graduating senior. Brian won the George Award on the strength of being nominated by both the Mathematics and Physics Departments. Brian will begin graduate study this fall at the University of Illinois in computational electrodynamics.



Faith Snyder of Kennewick, Washington also graduates with a perfect 4.0 GPA. Her math degree included the Actuarial Science option, but she also completed a degree in secondary education and did her practicum teaching this spring. After a lot of thought, she's decided to pursue the actuarial profession for now, and will enter the University of Connecticut's graduate program this fall after a summer internship with Standard Insurance Company.

Faith's experience here at Idaho has been enriched by membership in the Honors Program, the Phi Kappa Phi Honor Society, the Ballroom Dance team, and as a section leader for the flag team performing with the marching band.

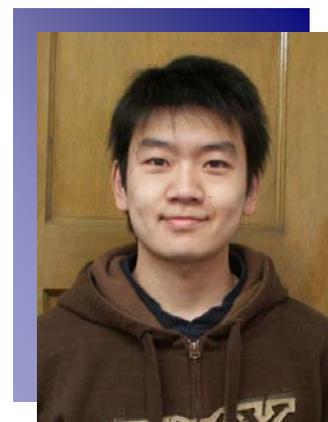
This year's graduating class is exceptionally talented, and many students besides Brian and Faith deserve recognition. **Jason Fitch** of Boise has been awarded the **Mathematics Undergraduate Research Award** for outstanding work he did with Professor Monte Boisen. Jason worked on a project of visualization for abstract groups and presented his work at MathFest, the summer meeting of the Mathematical Association of America, held in San Jose California.

Additionally, **Benjamin Cote** of Issaquah, Washington, **Seth Ewing** of Grangeville, **Kevin Joyce** of Richland, Washington, **Jonathan Marler** of Kennewick, Washington, **Michael Eldredge** of Idaho Falls, and **Nathaniel Brand** of Coeur d'Alene are all recipients of the Chair's Award for Excellence. Each of these students completed their Mathematics degrees with outstanding academic records and accomplishments. We're proud of all of our graduates, and the 2010 class is exceptionally good!

Outstanding Teaching Assistant Award: At the Spring commencement **Jodi Frost, Lixing Jin, Zhenxia Liu, and Doug Torrance** received the Outstanding Teaching Assistant Award.



Jodi Frost



Peter Kim



Zhenxia Liu



Doug Torrance

Congratulations!

Putnam Team Places in the Top 12%

Article prepared by Monte Boisen

The William Lowell Putnam Mathematical Competition is the premier national mathematics contest for undergraduates. Virtually all of the major universities in the United States participate by fielding a three-member team and a number of other students who compete as individuals. The Mathematics Department's 2009-10 team consisting of Michael Eldridge, Gunnar Miller and Benjamin Coté placed 65th in this year's competition. This is a very strong performance given that there were 546 participating institutions and 4036 participating students. The median score for participants nationally is zero. All of the members of our team solved at least one complete problem. Meredith Sargent and Nathan Matur also participated as individuals. The students participating in the contest were coached by Matthew Rudd with an assist by Hunter Snevily. Students wanting to join in with the excitement for next year, should contact the Mathematics Department at math@uidaho.edu.



Abdo Award Continued...

(Continued from page 1)

Dr. Abdo's publication record has led to a number of research grants. He currently has two grants from Proctor and Gamble with Professor Larry Forney, and another from the Institute of Translational Health Sciences with Professor Forney and another scientist. Especially notable is that Zaid is one of four project directors on the recent \$9.5 million COBRE renewal – he is the only Assistant Professor among the project directors. One of the purposes of the COBRE award is to increase the number of NIH funded investigators. One measure of success for the COBRE program is when an investigator transitions from COBRE funding to independently obtained NIH funding. Since Zaid was the only Assistant Professor who was a COBRE project director, it was assumed that he would likely be the last to transition off of the COBRE. In fact, he was first to transition to independent funding. The reviews of his most recent proposal with Dr. Eva Top ranked in the top two percentile. In May 2010, Eva and Zaid learned that their proposal would be funded at the level of 1.7 million dollars.



Zaid is the only statistician on these P&G and NIH grants, and thus his reputation as an emerging leader in this field is being recognized in the funding of these proposals. With Zaid's set of highly influential papers in this area and the subsequent set of grants that have been funded, he is a recognized leader in a field that is going to continue to be important in the coming years.

New Graduate Students

Christopher Ahlman received his Master's Degree in Mathematics from University of California , Santa Cruz . He is pursuing a Ph.D. in Mathematics.

Matthew Petersen is an M.S. candidate in Mathematics, having graduated from the University of Idaho with a Bachelor's Degree in Mathematics in 2009.

Michael Shively received his Bachelor's Degree in Mathematics from Lewis Clark State College in 2003. He is pursuing an M.S. in Mathematics.

Ben Tschida received his Bachelor's Degree in Mathematics from the University of Idaho in 2009. He is pursuing a Ph.D. in Mathematics.

Graduate Student Highlights



Jodi Frost, Awarded a UI Graduate Professional & Student Association (GPSA) travel grant to attend the American Educational Research Association (AERA) Annual Meeting, where she presented a paper entitled "Experiencing and Resolving Cognitive Induced by the Infinite" on the research project she and Rob Ely worked on.



Pavitra Roychoudhury, Awarded the College Studies Bioinformatics and Computational Biology (BCB) Fellowship for 2010-2011.

Doug Torrance, Received the Sigma Xi Award at the College of Science Student Research Exposition in the fall semester 2009 for his poster presentation entitled "Using graph theory to classify arrangements of four planes"



New PhD

Manuel Welhan received his PhD in Mathematics in the Spring of 2010. The title of his dissertation is "Tree Reconstruction, Directed Cycles and Flow Decompositions"

Manuel's plans: "This summer my plans are to publish the remaining two papers found in my dissertation and another paper with Hong. As far as employment goes, I plan to search for a postdoc position. In general, while I will likely primarily rely on my teaching skills for employment, I want my career to offer me ample time to pursue my research interests. So until I can land that job I need to participate further in my field. Next semester, while teaching the intro real analysis class to get me by, I plan to attend more conferences and seek a more collaborative approach to my research."



New Faculty



Linh Nguyen will join the faculty in the Spring of 2011 filling our Mathematics Analysis Position.

BIRTHPLACE: Quang Binh (a central province of Vietnam)

DEGREES: Ph.D at Texas A&M University

RESEARCH AREA: inverse problems, PDEs, integral geometry.

FAVORITE LIVING MATHEMATICIAN: Maybe, Terrence Tao.

FAVORITE DEAD MATHEMATICIAN: Riemann (he is not unrivaled though).

FAVORITE THEOREM: Riemann Hypothesis (although it has nothing to do with my research)

FAVORITE AREA IN MATHEMATICS: currently, Integral Geometry.

FAVORITE AMERICAN FOOD: steak (the best one I have had is at Outback Steakhouse).

FAVORITE NON-AMERICAN FOOD: Vietnamese food (however it is hard to identify which course I like best)

FAVORITE MOVIE: probably "Roman Holiday"

FAVORITE TV SHOW: used to be "Hannah Montana" (I have

stopped watching TV for a while)

FAVORITE BOOK: The thorn bird (a novel)

FAVORITE SPORT: tennis or table tennis (to play), soccer (to watch)

IN MY SPARE TIME I LIKE TO: practice Yoga or take pictures.

PEAK EXPERIENCE: well, not yet, I guess :).

I CAN'T STAND: not eating rice for a week

I WISH I KNEW: how to play some music instrument (or, at least, sing properly)

I WOULD MOST LIKE TO MEET: my parents (more than I did)

FUN FACT ABOUT ME: I keep telling my (close) friends that "I am gracefully short".



Somantika Datta will join the faculty in the fall of 2010 filling our Mathematics Analysis Position.

BIRTHPLACE - Calcutta, India

DEGREES (and which universities)
B.Sc., M.Sc. - Indian Institute of Technology, Kharagpur, India

Ph.D. - University of Maryland, College Park, Maryland, USA.

RESEARCH AREA - Applied Harmonic Analysis

IN MY SPARE TIME I LIKE TO - read, walk/hike, do yoga

UI Math Club Has an Active Year

Article prepared by Mark Nielsen

The UI Math Club had a great year of well-attended activities. This year's officers included Meredith Sargent as President, Michael Eldredge as Vice President, and Ryan Nickerson as Scribe (or, as the position has unexplainably come to be known, the "Transcendental Geometer"). Fall club activities included a very successful Halloween discussion of "scary math stories" (logical paradoxes) led by the Math Club advisors, Professors Rob Ely and Mark Nielsen, and an evening of watching some favorite episodes of the TV show "Numb3rs". One of the favorite Spring semester activities was devoted to demonstrating mathematical card tricks.



March brought the 7th annual "Pi Day Celebration" with its now-famous Integration Bee to crown the year's UI Calculus Champion. A crowd of over 70 shared a feast of pi(e) before the competition, which

was won this year by Michael Eldredge, with Daniel Zeck and Lee Van Gundy as runners-up. The color-coded paper chain representing the digits of pi (now in its fourth year of construction) passed a milestone during the Pi Day party with the addition of its 1000th link.

The club leadership passes next year to newly-elected president Neil Sing. The new VP is Sara Ortiz, and Ryan Nickerson will fill another term as the "Transcendental Geometer".



Meredith Sargent, Lee Van Gundy, Michael Eldredge, Daniel Zeck, and Monte Boisen.



Scholarships Awarded for 2009-2010

Several scholarships are available to mathematics 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 2008-2009 academic year:

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:

Benjamin Gote, Amanda Downen, Danielle Milligan, Kevin Joyce, Kenneth Sjoren, Gunnar Miller, Jason Fitch, Kelly Miller, Faith Snyder, Dylan Tracy, Jonathan Marler, and Alec Bowman

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.

Danielle Milligan is this year's recipient.

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.

Faith Snyder 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. It is based on merit. The recipients this year were:

Nishelle Klinkhamer, Thomas Eggers, Kyle Tylor, Shannon William, Brandt Pedrow, Christopher Ross, Kayla Chinnock, Jordan Jackson, Meredith Sargent, and Sara Dramstad.

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.

Gunnar Miller is this year's recipients

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.

Kevin Joyce and Kelly Miller are 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:

Jon Fledderjohann, Zhenxia Liu, Yanling Peng, Amanda Larson, and Ben Tschida.

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.

Faculty News

Zaid Abdo was awarded several multiple-year National Institute of Health (NIH) grants to fund many different projects in Mathematical Biology. (Please see the article about his early-career faculty award for more detailed information about his recent accomplishments). He also received the top cited author award from the Journal of Environmental Microbiology in January 2009. He presented at one international meeting (e-Biosphere, in London, UK) and two national conferences (Evolution meetings and Western region COBRE-INBRE scientific conference).

Zaid Abdo and Paul Joyce obtained a patent for categorization of microbial communities. The other investigators involved are L.J. Forney, J. Foster, C. Brown, A. Johnson, and X. Zhou.

Hirotschi Abo was awarded a three-year National Science Foundation (NSF) grant to fund work in Algebraic Geometry. He gave presentations at two international meetings (one is Effective Methods in Algebraic Geometry 2009 in Barcelona, Spain, and the other one is the workshop on tensors and interpolation in Nice, France). He also organized Macaulay2 (computer algebra system) workshops at the American Institute of Mathematics (AIM) and the Mathematical Science Research Institute (MSRI).

Jessica Cohen has resigned her position at UI. She has accepted a position at Western Washington University in Bellingham, Washington, where she continues to work in the area of mathematics education.

Rob Ely was awarded an Idaho State of Education grant to fund the development of a professional developmental course called "Mathematical Thinking for Instruction". He gave presentations at several meetings including MathFest in Portland, Oregon and Research in Undergraduate Mathematics education Conference in Raleigh, North Carolina, where he was a leader of the working group "Infinity and Limits in Undergraduate Mathematics Education". He also published his paper in the Journal for Research in Mathematics Education, one of the most prestigious journals in mathematics education.

Frank Gao took a sabbatical leave in the academic year 2009-2010. He spent the fall 2009 in Stanford University and is currently visiting Zhejiang University in China, where he gave a lecture series for the 2010 summer program in probability and statistics. He attended the 2010 International Conference in Applied Analysis in Shanghai, China, and the International Conference in Memory of Kai Lai Chung in Beijing, China, and presented invited talks at Stanford, Berkeley, Hangzhou, Shanghai, and Beijing.

Jennifer Johnson-Leung attended the Park City Mathematics Institute on L-functions in arithmetic in July 2009, she also organized a Special Session in Arithmetic Geometry and delivered a talk at the Joint Mathematics Meetings in San Francisco in January 2010. In March, she also spoke in the Undergraduate Colloquium at UBC and at the joint UBC/SFU Number Theory Seminar. In May, Jennifer was pleased to give a talk in the Number The-

ory Seminar at her alma mater, Caltech.

Paul Joyce was awarded a two-year NIH grant to fund the interdisciplinary study of viral host switching with M. Ytreberg (Physics) and H.A. Wichman (Biology). He gave invited talks at several national/international meetings, which include Institute for Mathematical Statistics Meetings in Portland, Oregon, and in Gothenburg, Sweden, the workshop on New Mathematical Challenges from Molecular Biology at Banff International Research Station for Mathematical Innovation and Discovery in Banff, Canada and the workshop in Human Population Genetics Analyses in Copenhagen, Denmark.

Steve Krone continued work on two NIH-funded projects. The first one involves using spatial mathematical models and biological experiments in UI biologist Eva Tops's lab. The second one centers on the evolution of viruses in response to changes in environmental conditions. He delivered several invited lectures at CIMAT spring School in Probability and Statistics in Guanajuato, Mexico, Stochastic and Deterministic Modeling in Spatial Population Dynamics at AIM and Probability Models in Evolutionary Biology at the Centre International de Rencontre Mathematiques in Marseille, France.

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

Matthew Rudd has resigned his position at UI. He has accepted a position at the University of the South in Sewanee, Tennessee, which is very close

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.)

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

Department of Mathematics
300 Brink Hall
PO Box 441103
Moscow, ID 83844-1103

2009



2010

Prize Problems

1. Find the smallest natural number n which has the following properties:
 - (a) Its last digit is 6.
 - (b) If the last digit 6 is erased and placed in front of the remaining digits, the resulting number is four times as large as the original number n .
2. Determine all real numbers x which satisfy the inequality: $\sqrt{3-x} - \sqrt{x+1} > 1/2$.
3. How many ways are there to arrange the digits 123456789 so that each digit is either greater than every digit preceding it or less than every digit preceding it.

Solve one of the three 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.

You can learn more about the UI Math Department and see a full color version of the newsletter by visiting our website:

www.uidaho.edu/math