

# Math News

A publication of the Mathematics Department at the University of Idaho

2015-2016



## Inside this issue

Recent PhD Graduates	P. 4
Undergraduate Research	P. 6
Semester Abroad	P. 7
Undergraduate Awards	P. 8
Scholarships	P. 10-11
Faculty Updates	P. 12-14
Tenure & Promotions	P. 15
Crossword Puzzle	P. 16

## Letter from the chair



Greetings!

Welcome to this year's edition of the Mathematics Department newsletter. There are many exciting developments to report about the department, but also one very sad event to report. Professor Paul Joyce passed away on April 22nd in a car accident. Paul was Dean of the College of Science, but we in the department remember him as one of our own outstanding faculty members. He was known for his teaching, research, and leadership excellence and equally so for his friendship and caring about the students, staff, and faculty of the department. We have more about Paul's life and career on page two.

As our Dean, Paul was very proud of the accomplishments of the department, and some examples of these accomplishments are new research awards to Rob Ely, Linh Nguyen, Christopher Remien, Alexander Woo, and David Yopp, which are highlighted on page 14 of the newsletter. Another exciting accomplishment in the department is Frank Gao being awarded the Distinguished Faculty Award in the College of Science, which is described on page 9. Our faculty updates starting on page 12 discuss other news about our faculty.

We are preparing for an external review of the department in the coming year, our first

external review since 2006. As part of our preparation for the external review, we are interested in obtaining information from alumni about their experiences here, including aspects that were valuable in their careers as well as things that could be added or done better. Please take the time to fill out the survey we will send out to graduates early next year about your experiences in the Mathematics programs at UI!

This year we graduated 36 students with a Bachelor's degree, 2 with an M.A.T. degree, 2 with an M.S. degree, and 2 with a Ph.D. degree. Congratulations to our graduates!

We have started a list of donors in this issue to acknowledge the outstanding support that we receive from alumni and friends of the department. Donations to the department allow us to offer scholarship support to undergraduate students, and are also a key to supplementing the teaching assistantship offers that we are able to offer prospective graduate students.

One way to keep in touch with developments in the department and with contacts is to join the department LinkedIn group. LinkedIn is free to join at [www.linkedin.com](http://www.linkedin.com).

- Chris Williams

## Remembering Paul Joyce



Paul was a great friend, wonderful colleague, and supportive mentor to many people in the University of Idaho and throughout the world. His contributions in probability theory, mathematical statistics, population genetics, phylogenetics, and modeling experimental evolution are well known throughout the scientific community.

Paul is survived by his wife, Jana, a long-time Mathematics Department staff member, and their son, Andrew.

It is with heavy hearts that we share the news of the death of Paul Joyce, Professor of Mathematics and Dean of the College of Science. Paul was born September 26, 1958 in Butte, Montana. He passed away on April 22, 2016, at the age of 57, in a car accident.

Paul earned a B.S. degree in Mathematics in 1980 from Montana State University, an M.S. degree in Mathematics in 1982 from Montana State University, and a Ph.D. in Mathematics in 1988 from the University of Utah under advisor Simon Tavaré. He joined the Mathematics Department at the University of Idaho in 1991. Paul served as Director of the Bioinformatics and Computational Biology Program from 2009-2012, as Chair of the Faculty Senate from 2011-2012, and in 2013 he was appointed as the Dean of the College of Science.

During his time at the University of Idaho, Paul received many honors and awards, including the University Distinguished Professor Award, the College of Science Distinguished Faculty Award, three Alumni Awards for Academic Excellence, and a Graduate Faculty Mentoring Award.

An endowment has been set up in Paul's name to support students in the graduate program that Paul helped to create. Donations can be made to the **Paul Joyce Memorial BCB Fellowship Endowment** by sending checks to the UI Foundation/ Paul Joyce Memorial at the following address: University of Idaho Foundation Gift Administration Office, 875 Perimeter Drive, MS 3147 Moscow, ID 83844-3147. Donations can also be made online by visiting: <https://www.sites.uidaho.edu/giving/givingform.aspx>.



## University Distinguished Professor Award

Paul Joyce was named University Distinguished Professor in 2016. The award was given posthumously during the University Awards for Excellence ceremony. His son, Andrew Joyce, accepted the award in his honor on April 26.

Pictured below are Andrew and President Staben.



## UI Math Club

Article prepared by Stefan Tohaneanu

During the academic year 2015-2016, the Math Club at UI continued its tradition to organize the "Pi Day" event and held regular monthly meetings. The topics and the activities of the meetings were interesting as always: Math Mysteries, Holly Jolly Polyhedron Party, Frozen Fractals, Math Jeopardy, Games with Math, etc. One meeting in the Fall was organized for the attendees to see the play *Proof*.

Starting with Spring 2016 semester, the committee decided to have a problem solving competition with fun

prizes awarded; this was well received by the undergraduate students at UI. We must mention the participation of our late Dean Paul Joyce in the "Games with Math" meeting, when he talked about all the stir around the "Monty Hall problem" when it first occurred, him being an active participant in the debate at the time, and a supporter of Marilyn Vos Savant.

For more information about the UI Math Club, contact the Math Department, [math@uidaho.edu](mailto:math@uidaho.edu).

## Math Donors for 2015-2016

We are grateful to all of our friends who have contributed amounts, both large and small, to the Mathematics Department this year.

Daniel Arthur '76 and Martha M. Bath  
Benevity Causes  
Carl W. '63 and Candace L. Berner  
Karl C. '60 and Doris H. Bittenbender  
The Boeing Company  
Monte B. and Helen R. Boisen  
Celeste Jane Brown '00 and Christopher J. Williams  
Sharon K. Buehler '64  
E. Thomas II '69 and Judith A. '69 Cain  
Monika V. '61 and Francis X. Caradonna  
John A. '74 and Ellen D. Christensen  
Caroline O. Christenson  
Somantika Datta  
Philip G. '58 '74 and Lorraine J. Engstrom  
Joanne Fahrenwald '74  
Newman H. Jr. '63 and Neah Fisher  
David A. and Catherine Fitch  
William T. Fletcher '66  
Gary Walter Garrabrant '78 '81  
Linette Ann Gregg '86 '08  
Kevin Alan Grundy '85  
Robert Eugene '72 '83 and Yvonne Holmes '70 '73 '03 Hallock  
Jeanne K. Hamilton '66  
Eileen P. '72 and Norbert Hartmann

James W. Hill '56  
Lixin Huang '00 '00  
Joseph Peter '75 and Diana C. '77  
Johns  
Jennifer M Johnson Leung  
Jana Joyce  
Elizabeth J. Leslie  
Lynn A. Marsh '70  
Paul Henry Meier '79  
David J. and Ann S. Mercaldo  
Brent Jack '86 and Judy J. Morris  
Roy Christian '70 and Carmen R. Olson  
Frank Wesley Ostertag '78 and Neall Burger  
Robert Reeve Park Jr. '90 and Jana Pandula-Park  
Clarence J. '60 and Barbara G. Potratz  
Shelly Jo Quinton  
William M. '60 and Rea T. Rich  
Sharon A. '74 and R. Michael Schwenk  
Jeffrey A. Scott '90  
Simons Foundation  
John J. Solin '69  
Timothy Edward Sprano '06  
Andrew D. and Anne Marie Suk  
Toyota Matching Gifts to Education  
William Drake '87 and Eleesha Sue Wallick  
Jia Wan '13  
Jon A. '68 and Vera H. Wellner  
Neil Ray Young '09

## Actuarial Science Club

The Actuarial Science Club is looking for new student leadership! The club has three purposes:

- 1) To bring actuaries to UI to speak on their chosen occupation and provide guidance to those considering the field.
- 2) To get practice materials to students looking to take qualifying exams.
- 3) To establish a supportive network for those considering a career in Actuary Science.

If this sounds useful or interesting to you, please consider joining the club! This is a low-commitment student organization that exists to serve and help prepare students for the future.

Contact the Math Department for more information (email us at [math@uidaho.edu](mailto:math@uidaho.edu) or stop by Brink Hall room 300).

## Department Events

The Math Department holds several fun events each academic year. Events for 2016-2017 include:

Math Department Fall Picnic,  
Thursday, September 15th

Pi Day Celebration  
Thursday, March 9th

Math Graduation Reception and Awards Banquet, and Pi Mu Epsilon initiation  
Friday, May 12th

For more details about these events, please contact the Math Department:

[math@uidaho.edu](mailto:math@uidaho.edu)



(left to right) Somantika Datta, Jesse Oldroyd, Jim Cockreham, Frank Gao

### New PhD: Jesse Oldroyd

Article prepared by Somantika Datta

Jesse Oldroyd received a B.S. degree in mathematics from the University of Alaska, Anchorage in 2010. He joined our graduate program in the fall of 2010. As a graduate teaching assistant he taught calculus II and III, ordinary differential equations, and linear algebra. He greatly enjoys teaching and was awarded the Excellence in Teaching Award by the Department of Mathematics in the years 2012, 2013, and 2014. As a Ph.D. student, Jesse focused on applied harmonic analysis and worked on problems in frame theory. He presented his research at the Joint Mathematics Meetings in San Antonio (2015) and Seattle (2016) as well as the February Fourier Talks (2015) at the University of Maryland, College Park. He defended his dissertation titled “Generalizations and Approximations of Equiangular Tight Frames” in March, and received his Ph.D. degree in May 2016. He accepted a tenure track faculty position in mathematics at Wesleyan College in West Virginia where he began his new job in Fall 2016. Aside from mathematics, he also likes hiking and taking long road trips to explore the country.

### New PhD: Jim Cockreham

Article prepared by Frank Gao

James Cockreham graduated in May 2016 with a Ph.D. degree in mathematics. The title of his doctoral dissertation was “metric entropy under generalized convexity.” Among other things, in his dissertation, completed under the supervision of Dr. Frank Gao, the celebrated theorem of Bronshtein on metric entropy of bounded convex sets was extended to bounded sets with positive reach. This result may serve as a theoretical basis for the study of convergence rate of image reconstruction algorithms.



Jana Joyce and Jim Cockreham

## Idaho Alpha Chapter of Pi Mu Epsilon

The University of Idaho has the first chapter of the Pi Mu Epsilon Mathematical Honor Society in the state of Idaho. The Idaho Alpha chapter, with 19 charter members, was installed on April 21, 2015.

On May 13, 2016, ten new members were inducted into the Idaho Alpha Chapter:

Aaron Allen, Alexander Omlin, Dorothy Catey, Eduardo Ramos-Arteaga, Jieun Lee, Jordan Hardy, Krystal Wasankari, Nicholis Chinault,

Jennifer Johnson-Leung, Somantika Datta.

The 2015-2016 officers for the Idaho Alpha chapter of Pi Mu Epsilon were:

Shannon Foss, *President*  
Alex Wezensky, *Vice President*  
Mahalingam Dhamodharan, *Secretary/Treasurer*

Alex Woo is the Chapter Advisor and Mark Nielsen is the Faculty Correspondent.



*Some of the members of the Idaho Alpha Chapter of Pi Mu Epsilon*

## Integration Bee 2016

The 14th Annual Integration Bee took place during the 2016 Pi Day Celebration in March. An integration bee is like a spelling bee, but you solve integrals instead of spelling words.

The winners of this year's bee were:

- 1st place: Michael Moldenhauer
- 2nd place: Benjamin Price
- 3rd place: Melissa Dow
- 4th place: Simon Shindler

The deciding integral was

$$\int x^x (\ln(x) + 1) dx$$

Can you solve it?



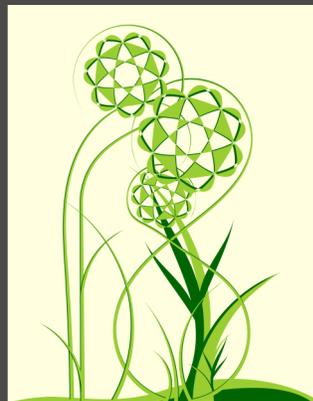
*(left to right)  
Lyudmyla Barannyk (judge), Simon Shindler, Melissa Dow, Michael Moldenhauer, Benjamin Price, and Manuel Welhan (judge)*

## Pi Mu Epsilon

Interested in joining Pi Mu Epsilon?

The Idaho Alpha chapter will induct new members to the chapter during our spring awards reception on Friday, May 12, 2017. Students must meet certain minimum requirements to qualify for membership. Qualifying students will be contacted in the spring.

Contact the Math Department for more information (email us at [math@uidaho.edu](mailto:math@uidaho.edu) or stop by Brink Hall room 300).



# Undergraduate Research

## Dorothy Catey

Article prepared by Bert Baumgaertner

Dorothy finished her second year as an honors student, double majoring in Mathematics and Chemistry. This summer she attended the Undergraduate Research Program on Dynamics and Stochastics at Brown University. Dorothy intends to pursue graduate work in applied mathematics, with a focus on complex systems.

Dorothy has worked in both chemistry and modeling labs on campus, but is now focusing on her modeling project. Her work with Bert Baumgaertner (Philosophy) focuses on

modeling helping behavior during epidemics of infectious disease. This year she will investigate how to incorporate the role of trust into her models. Her proposed work won her the Brian and Gayle Hill Undergraduate Research Fellowship.

Outside of academia, Dorothy enjoys running and spending time with her family.



*Dorothy Catey*

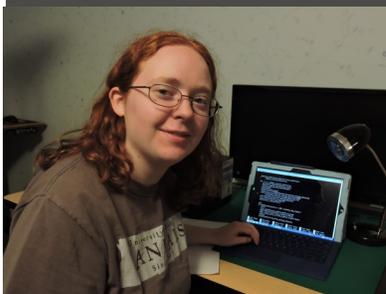
## Alison LaDuke

Article prepared by Francesca Sammarruca

Alison LaDuke is both a Physics and Mathematics major. She will graduate in Spring 2017 and plans to go on to graduate studies in theoretical physics. She was recently awarded the College of Science Hill Fellowship for the undergraduate research proposal entitled "Predictions for the properties of neutron stars in the high-precision era". Her faculty advisor is Francesca Sammarruca (Physics).

This research belongs to the field of theoretical nuclear physics. It involves applications of fundamental nuclear interactions to systems of astrophysical relevance, specifically neutron stars. Neutron stars (also known as pulsars) are the remnants of supernova events and are perhaps the most fascinating systems found in nature. With masses between about one and two solar masses and radii in the order of 10 to 12 kilometers, these compact stars have central densities com-

parable to those found in the interior of nuclei, namely, 14 orders of magnitude higher than the densities of ordinary solids. Just to provide a simple image, a sugar-cube-sized amount of neutron star matter would weigh as much as Mount Everest. In 1967, strange new objects outside the solar system were first observed and named pulsars, as they emitted periodic radio signals. To date, about 2,000 pulsars have been detected. Remarkably, the pressure which supports the star against gravitational collapse is related to the force which keeps the atomic nucleus together. Hence, the connection between compact stars and nuclear physics. Because the modeling is based on first principles, the predictions resulting from this project will have a good theoretical foundation and will contribute to advance knowledge in the field.



*Alison LaDuke*

## Semester Abroad: Krista Stanley



In the spring I studied abroad in Budapest, Hungary as part of the Budapest Semesters in Mathematics program. For me, Budapest was a place both of great charm and great mathematical thinkers. Throughout the program, I was given the chance to work with other students from a variety of different backgrounds, delving deeper into advanced mathematical concepts with a focus on problem solving. It reminded me why I love math. I love the problem solving and the creativity necessary to solve difficult problems by looking at them in different ways or from different perspectives. It was great to study alongside such amazing people, who I am confident will make up the next generation of brilliant mathematicians. It's not everywhere that a cool or interesting math problem is

normal dinner conversation. But, beyond the intense atmosphere of mathematics, studying abroad gave me so much and allowed me to see the world in many new ways. I went places I never imagined going and saw things I could not have dreamed up. I had the chance to travel and to see the world. Who knew that I would go caving under the Buda hills, master "escape rooms" in the heart of the Budapest, swim in the Danube river, attend a concert in Berlin, or watch the sunset from the top of a mountain in Spain. I learned to embrace differences and to recognize similarities. I came to see how small and connected our world really is. And, most importantly, I built friendships and memories to last a lifetime. Studying abroad in Budapest was probably the best choice I could have made. I would highly recommend that anyone interested study abroad with the Budapest Semesters in Mathematics or the Budapest Semesters in Mathematics Education programs. But, at the very least, I would encourage everyone to study abroad somewhere. It is an experience you won't regret.

## Semester Abroad: Ben Anzis

Ben Anzis spent the fall of 2015 in Hungary through the Budapest Semesters in Math program, which is a rigorous study abroad program. When asked about his experience, Ben had this to say: "It gave me the opportunity to learn from some very, very intelligent professors alongside many gifted students, all while living life in the beautiful city of Budapest. All-in-all, it was an incredibly rewarding experience."



## College of Science Dean's Award



(left to right)  
*Kelly Christensen, Hayden Smotherman, Mark Nielsen*

Congratulations to Kelly Christensen and Hayden Smotherman on each receiving a College of Science Dean's Award during the College of Science Graduation Reception in May.

This award is given to the outstanding graduating senior in each department.

*Congratulations,  
Kelly  
and  
Hayden!*

## Undergraduate Award Winners

Several of our outstanding students received recognition for their achievements during the May 2016 commencement celebrations.

### Outstanding Seniors

*Awarded to seniors who have shown exceptional mathematical talent.*



*Tyler Jaszkwski, Chris Williams, Kelly Christensen*

**Kelly Christensen** is from Ririe, Idaho.

**Tyler Jaszkwski** is from Challis, Idaho.

### Chair's Award for Excellence

*Awarded to graduating seniors in recognition of excellent academic performance.*

**Brooke Tucker** is from Spirit Lake, Idaho.

**Shanshan Zhang** is from China, a city called Wuxi in Jiangsu Province.

**Daniel Schmalz** is from Boise, Idaho.

**Hayden Smotherman** is from Coeur d'Alene, Idaho.



*Hayden Smotherman, Daniel Schmalz, Chris Williams, Brooke Tucker*

## Alumni Award for Excellence



Congratulations to Kelly Christensen on receiving an Alumni Award for Excellence in May.

This award is given to students who have achieved outstanding academic success and have demonstrated career and professional preparation; campus and community leadership and involvement.

*Congratulations, Kelly!*



*Some of the 38 Math graduates at the Spring 2016 commencement. Congratulations to all of our Math graduates!*

## Frank Gao Receives Distinguished Faculty Award

Dr. Frank Gao received a College of Science Distinguished Faculty Award during the May commencement celebration. This award is given to a faculty member who has, through outstanding work in teaching and scholarship, gained wide recognition by national and international peers. Their achievements have had a demonstrable impact on their profession and on the teaching and scholarship of others in the United States and abroad. Dr. Gao has made significant contributions to two major distinct research programs: analysis and probability and stochastic processes.



Frank Gao and Mark Nielsen

*Congratulations, Frank!*

## John B. George Award



Hayden Smotherman with College of Science Interim Dean Mark Nielsen

Congratulations to Hayden Smotherman on receiving the John B. George Award during the College of Science Graduation Reception in May.

This award is given to the outstanding graduating senior in the college based on academic achievement and service.

*Congratulations, Hayden!*

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## Recent Graduates

In May 2016, five students earned graduate degrees in mathematics:

Jim Cockreham, Ph.D.  
Jesse Oldroyd, Ph.D.

John Pawlina, M.S.  
Mahalingam Dhamodharan, M.S.  
Robert Nathe, M.A.T.

*Congratulations, graduates!*

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## Excellence in Teaching

Awarded to graduate students who demonstrate excellence in teaching.

At the Spring 2016 Mathematics Graduation Reception, five math graduate students received the Excellence in Teaching Award:

Doug Decock  
Mark McDonald  
John Pawlina  
Daniel Reiss  
Brad Wiest



(left to right) Brad Wiest, Daniel Reiss, John Pawlina, Chris Williams, Mark McDonald

*Congratulations!*

# Scholarships

Several scholarships are available to math majors. Scholarship amounts range from \$500 up to \$6500.

All mathematics majors are automatically considered for a scholarship.

Non-mathematics majors are eligible for scholarship consideration if they change their major to mathematics or add mathematics as a second major.

Scholarship 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.

## 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. ***Shanshan Zhang was the 2015-2016 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 2015-2016 recipients were: Cailin Bary, Jacob Behm, Brian Carter, Kelly Christensen, Cassandra Clark, Leanna Dann, Keegan Hedge, Tyler Jazzkowiak, Erin Johnson, Alison LaDuke, Eduardo Ramos-Arteaga, Daniel Schmalz, Marie Shannon, Brooke Tucker, Joseph Uberuaga.***

## 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. ***Krista Stanley was the 2015-2016 recipient.***

## 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 is available to full time sophomore, junior, or senior students majoring in mathematics. Preference is given to students preparing for a career teaching mathematics at the middle through high school levels. This scholarship is based on merit. ***Christine Woeller was the 2015-2016 recipient.***

## Linn Hower Honor Scholarship

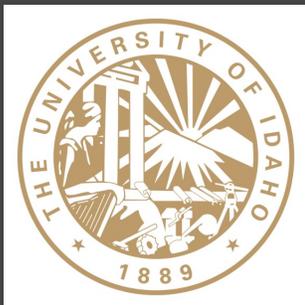
This scholarship was established in 1991 by Mildred and Loyal L. Hower, parents of Linn Hower, who graduated from the University of Idaho in 1979 with a B.S. in Mathematics. This scholarship is awarded to junior and senior applied mathematics majors, preferably from rural Idaho, with a high potential for success in a mathematics or scientific field. It is based on merit. ***Alexander Ling was the 2015-2016 recipient.***

## Pyrah Family Scholarship

The Pyrah Scholarship was established in 2012 in memory of J. Karen Pyrah, her parents, Walter Glen Pyrah and Georgia Anderson Pyrah, and her brother, David Anderson Pyrah. The scholarship is for undergraduate mathematics majors, with preference to students from Idaho. ***The 2015-2016 recipient was McKayla Smith.***

## 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. ***The 2015-2016 recipient was Kileen Sutherland.***



# Scholarships

## Perry Math Scholarship

The William J. Perry Mathematics Scholarship was established in honor of William Perry and his connection to the University of Idaho. Dr. Perry was the nineteenth Secretary of Defense for the United States. He previously served as Deputy Secretary of Defense and as Undersecretary of Defense for Research and Engineering. He taught in the University of Idaho Mathematics Department during the 1950-1951 academic year. The scholarship is awarded to mathematics graduate students. ***The 2015-2016 recipient was Daniel Reiss.***

## Mathematics Graduate Student Scholarship

This scholarship is supported by annual contributions of friends of the department and is awarded to mathematics graduate students at the discretion of the Math Department. ***The 2015-2016 recipients were: Jim Cockreham, Mahalingam Dhamodharan, Josh Duran, Kevin Meek, John Pawlina, Daniel Reiss, Kileen Sutherland, Brad Wiest.***

## Boisen Mathematics Graduate Scholarship

The Boisen Mathematics Graduate Scholarship was established in 2014 by Helen and Monte Boisen to enhance the support the department can give to teaching assistants. Monte served as the Chair of the Mathematics Department from 2001-2015. The scholarship is awarded to full-time mathematics graduate students. It is based on merit. ***Daniel Reiss was the 2015-2016 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 and Kileen Sutherland were the 2015-2016 recipients.***

## Malcolm and Carol Renfrew Scholarship

The Malcolm and Carol Renfrew Endowed Scholarship in Mathematics was established in 2014 through a bequest from Malcolm and Carol Renfrew. Malcolm earned B.S. and M.S. degrees in chemistry in 1932 and 1934, respectively. Carol earned a B.A. in economics in 1935. After a successful career in industry, Malcolm returned to the University of Idaho as head of the Department of Physical Sciences and later the Department of Chemistry. During his time on the faculty, Malcolm helped to raise the research profile of the university and played a leading role in establishing a Ph.D. program. Following retirement, the Renfrews remained incredibly supportive of the University of Idaho and the Moscow community. The scholarship is open to all students in the math department. ***The 2015-2016 recipient was Josh Duran.***



## New Graduate Students

In the Fall of 2016 the Math Department welcomed six new graduate students:

Kelly Christensen  
*M.S. student*

Jordan Hardy  
*M.S. student*

Thomas Jacobs  
*M.S. student*

Ronald Mason  
*M.S. student*

Joshua Parker  
*Ph.D. student*

Tuan Pham  
*M.S. student*

**Welcome  
to our  
department!**

## Faculty Updates

### Alumni News Request

We would like to hear from you!

If you have some news/information about yourself that you would like printed in the next Math News, please send your information to [math@uidaho.edu](mailto:math@uidaho.edu) or to:

Department of Mathematics,  
University of Idaho,  
875 Perimeter Drive  
MS 1103,  
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 the newsletter



During the academic year 2015-2016, **Dr. Stefan Tohaneanu** published six articles in peer-reviewed journals: Discrete Mathematics, Journal of Algebra, Journal of Combinatorial Theory - Series A, Journal of Symbolic Computation, Archiv der Mathematik, and Advances in Applied Math, for some of these being a sole author and for some having coauthors: Ben Anzis (undergrad), Ricardo Burity (postdoc), Mehdi Garroushan (postdoc), and Prof. Aron Simis. Also, Stefan gave a talk at CLaN Seminar at Washington State University, and two talks at AMS Sectional Meetings organized at University of Utah, and at University of North Dakota. Stefan's research revolves around problems in Combinatorics, Coding Theory, Algebraic Geometry, all with the strong Commutative Algebra common denominator. Stefan continued mentoring on the above mentioned topics, UI undergraduate student Ben Anzis.



**Lyudmyla Barannyk** received the IEEE WMED 2015 Best Paper Award in recognition of the best paper presentation at 2015 IEEE Workshop on Microelectronics and Electron Devices that took place in Boise, Idaho on March 20, 2015. This was awarded to Lyudmyla, her graduate student Hung Tran, as well as professors Aicha Elshabini and Fred Barlow, currently at the University of Alaska Anchorage. The paper is related to differential signaling that is used in high-speed digital systems to effectively reduce electromagnetic interference and improve signal quality. In particular, it studies accurate conversion and extraction of differential scat-

tering parameters utilized in characterization of a differential network.



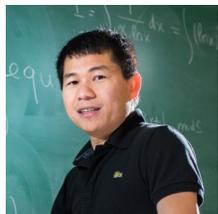
**Kirk Trigsted** was invited to speak during "Math Week" at Richland College in Dallas, Texas. He was also invited to speak at regional Precalculus conferences in Austin, Texas and Orlando, Florida. Last March, Kirk spoke at the International Conference on Technology in Collegiate Mathematics (ICTCM) in Atlanta where he presented a talk detailing the last 15 years of the Polya Mathematics Center. Kirk has consulted with many institutions that have been interested in Course Redesign during the last several years. He recently assisted the faculty at North Dakota State University who just completed their first year of an Emporium Model College Algebra and Intermediate Algebra design that was modeled after our Polya Mathematics Center. Kirk is on sabbatical for the 2016-17 academic year researching the corequisite model of teaching College Algebra and Precalculus. He will also visit many institutions that use the Emporium model to hopefully bring back valuable best practices to further the success of the Polya Mathematics Center.



During the 2015-2016 academic year **Rob Ely** was on sabbatical. In the fall he was in Utrecht, Netherlands, a city of many delights, including great math educators at the Freudenthal Institute, canals to paddle around on, and 50 times more bikes than cars. In the spring he was in Corvallis, Oregon, running an ex-

## Faculty Updates

perimental Calc I class at Oregon State University, followed by a month in Moab, Utah to dry off and analyze the results. Rob enjoyed being able to focus on researching student reasoning in calculus for the year, including attending two conferences focusing on the topic.



**Linh Nguyen** spent the summer of 2015 traveling around the world for his research activities:

Helsinki (Finland), Innsbruck (Austria), Henri Poincaré Institute (France), Banff International Research Station (Canada), Washington University in Saint Louis, ICERM (Brown University), and Virginia Tech. In the fall of 2015, he went to the University of Michigan for research collaboration. He gave a talk at Texas A&M University in the spring of 2016.



**David Yopp** has continued his work on *teaching and learning with and through viable argumentation* funded by the National Science Foundation. The project focuses on transforming Grade 8 mathematics by asking students to make claims about the content they are learning and supporting those claims with arguments akin to proofs as a daily feature of instruction. He has found that in his exploratory sample, students who experienced this type of instruction outperformed comparison students who experienced business-as-usual instruction. He has also found that Grade 8 students can and are willing to produce and understand indirect arguments such as proof by contradiction and proof by contrapositive.



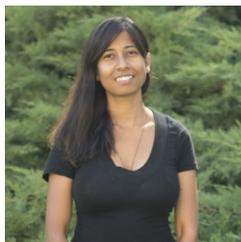
**Frank Gao** was invited to give a presentation on “some connections between small and large deviation of Gaussian processes” at the International Conference APSP 2015 in June 2015 at Changchun, China. Frank also attended the SQuARE on Persistence probabilities at the American Institute of Mathematics in July, 2015.



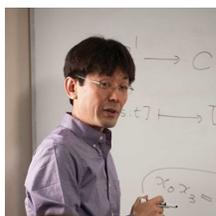
**Jennifer Johnson-Leung** was pleased to participate in the L-functions and Modular Forms Database conference in Corvallis, Oregon in July 2015 which she attended with two graduate students, Malcolm Rupert and Daniel Reiss. LMFDB.org was launched to great acclaim in May 2016. As part of her work with the Teaching and Advising Committee, Jennifer presented on problem-solving at the University of Idaho Advising Symposium in September, 2015. Also in September, Jennifer had the opportunity, along with Brooks Roberts, to speak at the ICERM workshop on Modular Forms and Curves of Low Genus in Providence, Rhode Island. In December, she represented the department at the state-wide General Education Summit in Boise. In January 2016, Jennifer gave two presentations at the Joint Meetings of Mathematics in Seattle, Washington. Jennifer was awarded tenure this spring and received a promotion to Associate Professor. She kicked off her sabbatical year with a conference in Banff on New Directions in Iwasawa Theory in June.



## Faculty Updates, continued



**Aditi Ghosh**, joined the Mathematics Department as a postdoc in Spring 2016. She is interested in Bio-Mathematics and Computational Math. Her thesis is on solving a Biharmonic problem in a unit disc using RRFFT method. She is currently working with Dr. Chris Remien in an exciting project that models liver injury after an overdose of acetaminophen. She was previously working as a postdoc in Simon Fraser University after her Ph.D completion from Texas A&M University in December 2013. As a postdoc in Simon Fraser University, she had worked on BioMath problem in Chemotaxis. She has submitted a paper on fast direct algorithm to solve Biharmonic problem in a unit disc in December 2015.



**Hirotachi Abo**, together with Giorgio Ottaviano (University of Florence), co-organized the mini-symposium entitled "Spectral Theory of Tensors and Tensor Rank" at the SIAM Conference on Applied Algebraic Geometry which was held in Daejeon, South Korea, at the National Institute for Mathematical Sciences during August 3-7, 2015. He also gave two different presentations at the same conference. In December 2015, he participated in the "Algorithms and Complexity in Algebraic Geometry" reunion workshop at the Simons Institute for the Theory of Computing as a long-term participant in the program of the same title held in the Fall 2014 semester and gave a talk on his recent joint work with Nick Vannieuwenhoven (University of Leuven). He also gave a similar talk at the Joint Mathe-

matics Meetings which was held in January 2016 in Seattle.



**Alexander Woo** gave talks at AMS Sectional Meetings (in New Jersey and Salt Lake City) and at the University of Washington about his research in algebraic combinatorics.



## New Grant Awards for 2015-2016

**Alexander Woo** (PI), Simons Foundation, Collaboration Grant, \$35,000  
9/15/2015 – 08/31/2020

**Christopher Remien** (PI), UNLV, UNLV Modeling Acet. Liver Injury, \$71,453.00, 07/01/15 – 06/30/2016

**Christopher Remien** (Co-PI), NSF, Collaborative Research: A Mathematical Theory of Transmissible Vaccines, \$1,009,921, 08/16/2016 – 04/30/2020 (**Scott Nuismer**, PI, James Bull, Co-PI)

**David Yopp** (PI), NSF, Longitudinal Learning of Viable Argument in Mathematics for Adolescents, \$2,999,640, 09/01/2016 – 08/31/2020 (**Rob Ely**, Co-PI, Anne Adams, Co-PI, Chandra Lewis, Co-PI, Xin Wang, Co-PI)

**Linh Nguyen** (PI), NSF, Mathematics of Tomography, \$155,971.76, 08/01/2016 – 07/31/2019

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/sci/math](http://www.uidaho.edu/sci/math)



## Faculty Tenure and Promotions

Four Mathematics faculty members were tenured and/or promoted this year:



**Lyudmyla Barannyk** was tenured and promoted to Associate Professor. Lyudmyla's research is in applied mathematics with emphasis on applications from fluid dynamics, electrohydrodynamics, and in multiscale computational methods. She has taught courses at the undergraduate level such as Calculus (Math 175, 275), Ordinary Differential Equations (Math 310), Analysis of Algorithms (Math/CS 395), and Numerical Analysis (Math/Eng/Phys 428) and graduate courses such as Complex Variables (Math 531), Partial Differential Equations (Math 540), and Functional Analysis (Math 571).



**Somantika Datta** was tenured and promoted to Associate Professor. Somantika's research is in harmonic analysis including its applications to signal processing. She has taught courses at the undergraduate level such as Calculus (Math 175, 275), Complex Variables (Math 420), Advanced Linear Algebra (Math 430), and Analysis (Math 471, Math 472), and graduate courses such as Complex Variables (Math 531), Real Variables (Math 535), and Special Topics in Approximation Theory (Math 504).



**Jennifer Johnson-Leung** was tenured and promoted to Associate Professor. Jennifer's research is in number theory, particularly work related to two conjectures called the paramodular conjecture and the equivariant Tamagawa number conjecture. She has taught courses at the undergraduate level such as Introduction to Higher Mathematics (Math 215), Linear Algebra (Math 330), and Cryptography (Math 415), and graduate courses such as Groups and Fields (Math 555, 556), Ring Theory (Math 557), and Algebraic Geometry (Math 558).

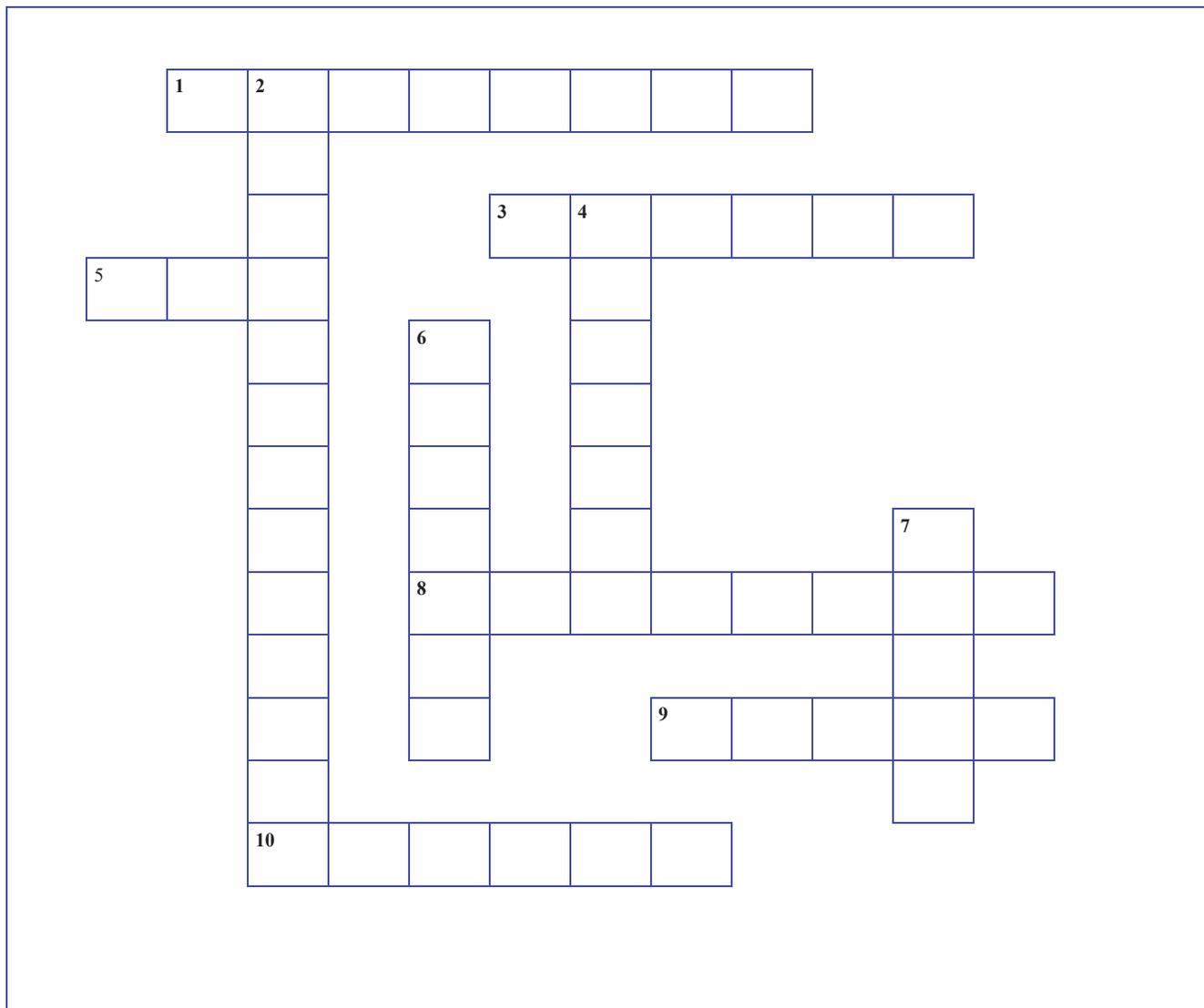


**David Yopp** was promoted to Full Professor. David has a joint appointment with Mathematics as well as with the Department of Curriculum and Instruction in the College of Education. His research is in mathematics education with specific focus on reasoning and viable argumentation in middle school. He has taught courses at the undergraduate level such as Introduction to Higher Mathematics (Math 215), Transformational Geometry for Teachers (Math 404), Geometry for Middle School Teachers (EdCI 411), Secondary Math Methods (EdCI 434), and Proof and Argumentation (Math 499), and graduate courses such as Teaching Algebra and Argument (Math 505), and Transformational Geometry for In-service Teachers (Math 505).

*Congratulations to our recently tenured and/or promoted faculty!*



# Math News Crossword Puzzle



## ACROSS

1. Undergraduates Krista Stanley and Ben Anzis spent a semester abroad as part of the \_\_\_\_\_ Semesters program.
3. The two recipients of the Outstanding \_\_\_\_\_ Award were Kelly Christensen and Tyler Jaszkwiaak.
5. Join our Pi Day Celebration and Integration Bee while eating free \_\_\_\_\_.
8. The Math Department has a social media group on \_\_\_\_\_. We would love to have you join our group!
9. Successfully solve the \_\_\_\_\_ Problem on page 17 and you could win a prize!
10. The \_\_\_\_\_ and Osa Taylor Mathematics Scholarship is one of several scholarships available to math majors. Thank you to the generosity of our donors that makes it possible to award scholarships to some of our best students!

## DOWN

2. There are several opportunities for undergraduate students to get involved with \_\_\_\_\_ research.
4. The second installation of members in the Idaho Alpha Chapter of Pi Mu \_\_\_\_\_ took place during a reception in May. Interested in joining? Contact the Math Department for membership requirements!
6. Frank Gao was awarded a College of Science Distinguished \_\_\_\_\_ Award.
7. The Math Department Fall Picnic features free \_\_\_\_\_ and fun times. Come join us!

## Prize Problem

Solve the Prize Problem and you win a prize! The problem has a clear solution if you approach it in the right way. Prizes will be awarded while supplies last.

Show or send your written solution to the Math Department: [math@uidaho.edu](mailto:math@uidaho.edu).

### Rules for participating:

- ◆ You must be an undergraduate, an alumnus, or an alumna.
- ◆ You must solve the problem, giving a full explanation.
- ◆ One prize per person.

### Problem:

Three frogs are situated at 3 of the corners of a square. Every minute, 1 frog is chosen to leap over another chosen frog, so that if you drew a line from the starting position to the ending position of the leaper, the leapee is at the exact midpoint.

Will a frog ever occupy the vertex of the square that was originally unoccupied?

***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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- Other (Please Specify Mathematics Department Scholarship Name) \_\_\_\_\_

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News (Family, Career, Etc.) \_\_\_\_\_

Please return to: Gift Administration Office, 875 Perimeter Drive - MS 3147, Moscow, ID 83844-3147