

University of Idaho

Mathematics News

2008-2009 Academic Year

Letter from the Chair

The 2008-2009 academic year has been filled with wonderful successes and incredible challenges. The year began with a departmental picnic that brought together our new students, our established students, staff, faculty, retirees and their families. We had a great time reminiscing as well as anticipating the opportunities that the new academic year might bring. Jessica Cohen joined the faculty this year. Jessica earned her PhD in Mathematics with an emphasis on Mathematics Education from Oregon State University. This makes 7 faculty members—about half of our tenure track faculty—that have been hired in the last three years. We are very excited about the new ideas and energy they all contribute to the department. This year, we continued to provide new and exciting undergraduate research opportunities to our students. One of those projects earned Bryan Wilson recognition as the College of Science Outstanding Undergraduate Research Award (details on page 3). Another of our students (we share her with Chemistry), Laken Top was selected as the recipient of the John B. George Award honoring the College of Science's outstanding graduating senior. Of course, we are equally proud of all of the 41 mathematics students who graduated this past year. Because of a very active dual credit program, where we provide University of Idaho quality courses to rural students in Idaho and Oregon, we now count well over 200 high school students as Vandals.



We use state-of-the-art technology to reach out to these students and they have been very successful. We expect that many of these students will choose to come to the University of Idaho for their undergraduate degrees. The Polya Mathematics Learning Center continues to be a vibrant learning community that takes advantage of the talents of many of our advanced students (as tutors) and supporting student success of our freshmen at a level that greatly exceeds the national average.

In research, our faculty have received millions of dollars of funding to support their research projects. Our relationship with the Bioinformatics and Computational Biology (BCB) degree program remains strong. To recognize the quality of his mentoring activities in the BCB program and in the Mathematics Department, Paul Joyce was awarded the Donald Crawford Graduate Faculty Mentoring Award. The success of the faculty in their research and teaching is the cornerstone of a successful department. The success of our established faculty that we are enjoying now and the great value that our new faculty promise to bring to the department in years to come makes me extremely optimistic about our future.

Like everyone else, we have encountered serious financial challenges due to budget cuts caused by the recession. In facing these challenges, we are fortunate to be blessed with enormously talented faculty, staff and students and with generous friends and donors. Using technology and some restructuring

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U of I Putnam Team ranks 55th In the Nation!

Article prepared by Matthew Rudd

The 69th William Lowell Putnam Mathematical Competition took place this past December, and the University of Idaho's Putnam Team performed brilliantly once again, placing 55th out of the 405 teams involved. Our team members this year were Michael Eldredge, Gunnar Miller, and Bryan Wilson, each of whom got full credit for at least one problem. As you may recall from last year's

report, most students receive a score of zero on this fiendishly difficult exam, so we should all be very proud of our team's individual and collective accomplishments! Arie Bialostocki, Dora Bialostocki and I enjoyed helping Michael, Gunnar, and Bryan prepare for this year's exam, and we can't wait to see how well our team does next year!



Pictured left to right: Putnam team members Bryan Wilson, Gunnar Miller and Michael Eldredge

Remembering Charlie Christenson

Article prepared by Ralph Neuhaus



Charles O. Christenson, 72, passed away on September 20, 2008. He was a Professor of Mathematics at UI for 35 years. He did many, many things in many different areas.

He taught topology, calculus and many other courses with zest. Students will remember him for his beard, his sandals (whatever the weather), and his dry humor. He expected the students to work hard, but was very supportive of their efforts. He was active in the topology seminar, he wrote research papers on knot theory, and he co-authored a popular Topology text with Bill Voxman. He was the major professor for five Ph.D. students: Wes Stone, Bob Mathews, Bryan Smith, Mohammad Azram, and Ken Meerdink. For many years he was the new graduate student adviser. Christenson, the late Leo Boron, and Bryan Smith translated several Mathematics books from French, Ger-

man, and Russian into English. Their partnership, BCS Associates, then published the books. At Leo Boron's death he founded the Boron Scholarship Fund to provide scholarships for Asian students in Mathematics. He was a regular participant, with his colleagues and graduate students, at the Friday seminar. He was most proud of his Ph.D. students, and of the thousands of students that he taught who went on to become engineers, mathematicians or politicians.

Charles was a believer in faculty governance. He served on the UI Faculty Council twice, the Graduate Council, the Faculty Affairs Committee, and the Committee on Committees, always as an advocate for the faculty viewpoint and for student learning. Within the department he served on the Calculus Committee, and later on the Algebra Committee, and many other committees.

In his private life Charles was a bicyclist, an accomplished pianist, a Master Gardener, and an avid reader, especially of mysteries and science fiction novels. He completed all the requirements for a Bachelors degree in Music, except for the senior recital. He and his wife Linda farmed a small acreage outside of town, selling the produce at Moscow's Farmers Market. They experimented with growing unusual indoor and outdoor plants. He frequently bicycled into town and took bicycle trips throughout Idaho, Montana and New Zealand. During the year that he spent in the Virgin Islands he became a SCUBA diver. Charles was truly multi-talented.

Charles earned his Bachelors' and Masters' degrees in Mathematics



from the University of Kansas. He then worked for one year as a programmer for North American Aviation in California. He said that this drove him back to graduate school. He came to the University of Idaho in 1965 after getting his Ph.D. in Topology from New Mexico State University. He was a member of the American Mathematical Society, Phi Beta Kappa and the American Association of University Professors. He retired from UI in 1999, but he continued to tutor in the Polya Math Center through the Spring of 2008.

Charles is survived by his wife, Linda, 4 daughters, seven grandchildren, two great-grand children, and three sisters. His family suggests that memorial donations be made to the Leo Boron Scholarship Fund at the University of Idaho.

New Faculty Interview

Jessica Strowbridge Cohen joined the faculty in the fall of 2008 filling our Mathematics Education position.

Birthplace – Corvallis, OR

Research Area – Mathematics Education

Education – PhD, Oregon State University, 2008

Favorite Living Mathematician – Shari Ultman

Favorite Dead Mathematician – George Polya

Favorite Theorem – The Law of Large Numbers

Favorite Area in Mathematics – Probability

Favorite Foods – Homemade soft pretzels, stuffed grape leaves & any kind of cake

Favorite Movie/TV Show/Book – White Christmas / Dallas / The Fountainhead, The Time Traveler's Wife

Favorite Sport – Football

In My Spare Time I Like To – Cook, read, go hiking in the woods, knit

Peak Experience – Getting married to Joel. Our wedding was a great, relaxed experience in a beautiful location, and being married has been even better than we imagined!

I Can't Stand – being told what to do

I Wish I Knew – how to play the guitar

Fun Fact About Me – I read one or two novels every week - and I still manage to get all my work done!



Student Honors Spring 2009

Article prepared by Mark Nielsen

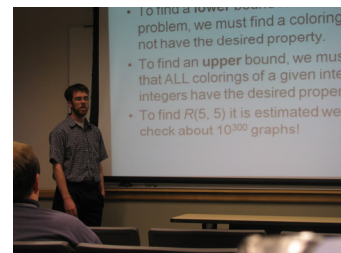
Several of our outstanding students have received recognition for their achievements recently. In December, Bryan Wilson and Tim Karr (both graduating seniors) received Awards for Excellence from the UI Alumni Association, along with faculty members Matthew Rudd and Mark Nielsen. These awards are given each year to approximately 40 seniors across campus. Winners are judged on the basis of academic achievement, leadership, and campus and community involvement.

Graduating senior Laken Top has been awarded the College of Science John B. George Award, given to the outstanding graduating student from the college. Laken is a Mathematics and Chemistry double-major from Sunnyside, Washington, and has truly excelled at both disciplines, becoming one of the outstanding graduates from both departments. Her mathematics advisor, Professor Jennifer Johnson-Leung, reports that "Laken's analytical skills are among those of the very best students that I have ever encountered." In addition to her excellent academic achievements, Laken also demonstrated commitment to service through her work with the Tutoring and Academic Assistance Center, as a tutor in the Polya Math Center and as a Disability Action Center employee providing care for a mentally and physically challenged woman. She is also a talented and versatile musician: she is an excellent pianist, and plays bass with her own Bluegrass band, "Top String".



This fall Laken will enter graduate school at MIT where she will pursue a PhD in Chemistry.

Bryan Wilson has had an enormously successful senior year. Following up on being awarded the nationally prestigious Goldwater Scholarship last year, Bryan was awarded one of the Brian and Gayle Hill Undergraduate Research Fellowships this year by the University of Idaho College of Science. His work with Professor Arie Bialostocki (dealing with Ramsey Theory on the integers) as a result of that fellowship has yielded excellent results, with a research paper soon to be submitted. Bryan also conducted undergraduate research with Professor Hirotschi Abo, plus did research on his own that was the basis for his Goldwater Scholarship application last year. For all of this, Bryan is being recognized as this year's winner of the College of Science Outstanding Undergraduate Research Award.



Additionally, the Department of Mathematics has announced its awards to outstanding students for the May 2009 commencement. Laken Top, Bryan Wilson, and Matthew Brookhart are the Outstanding Graduating Senior Award winners, and graduate students Ryan Bauer, Doug Torrance, Lixing Jin, Charles von Tagen, Jia Wan, and Manuel Welhan are receiving the Excellence in Teaching recognition.

Student Honors Spring 2009 Continued

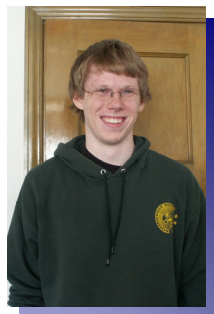
Outstanding Seniors: At the Spring commencement reception **Bryan Wilson, Laken Top** and **Matthew Brookhart** were each given the 2008 Outstanding Senior Award in Mathematics. This award is presented annually to the seniors that have shown exceptional mathematical talent. Each student honored is given a cash award and is recognized on an engraved plaque in the Mathematics Department office.



Laken Top



Bryan Wilson



Matthew Brookhart

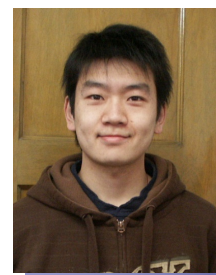
Outstanding Teaching Assistant Award: At the Spring commencement **Charles von Tagen, Manuel Welhan, Lixing Jin, Doug Torrance, Jia Wan, and Ryan Bauer** received the Outstanding Teaching Assistant Award.



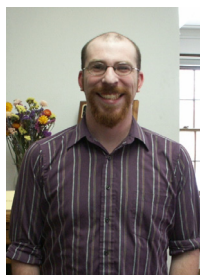
Charles von Tagen



Manuel Welhan



Lixing Jin



Doug Torrance



Jia Wan



Ryan Bauer

Congratulations!

Paul Joyce Wins Mentoring Award

Article prepared by Monte Boisen

The Mathematics Department has benefited greatly from its connection with the Bioinformatics and Computational Biology (BCB) interdisciplinary degree program. It has enriched the lives of our students and faculty and has brought very positive international attention to our program. One of the key individuals who has made essential contributions to the success of the program is our own Paul Joyce. Besides the strong leadership he has provided the program through its development, he has also set a very positive tone as to how students should be mentored within the program. Therefore, it is fitting that Paul has been chosen as this year's recipient of the prestigious Donald Crawford Graduate Faculty Mentoring Award. Professor Paul Joyce joined the department in 1991. He is well known for his enthusiasm and ability to mentor graduate



Professor Paul Joyce receiving his Faculty Excellence Award from Provost Baker and Interim President Daily-Laursen.

students from multiple departments and programs. Chris Williams, director of BCB noted, "One of Paul Joyce's biggest accomplishments was his most impressive contributions to BCB graduate students in the newly formed graduate program. Of the first 14 graduates, Paul has been the major professor to four and a committee member to six of them, thus having a direct impact on the dissertation or thesis for over 70 percent of the first crop of BCB graduates." Reflecting on his mentoring philosophy, Joyce wrote, "Students do not work for me, they work with me. I have never been comfortable with the role of all-knowing professor dispensing wisdom. I prefer the give and take, the flow of ideas, and the excitement of working together to solve problems that comes from the interaction with colleagues." I know that the hundreds of math students that Paul has taught over the years join me in congratulating him for being awarded this well deserved honor.

New Graduate Students



Jon Fledderjohann received his Master's Degrees in Mathematics from UCLA in 2005. He is pursuing a Ph.D. in Mathematics.

Amanda Larson is a M.S. candidate in Mathematics, having graduated from the University of Idaho with a Bachelor's Degree in Mathematics in 2006.



Zhenxia Liu received her Master's Degree in Probability Theory and Stochastic Analysis from Donghua University (China) in 2008 and her Bachelor's Degree in Mathematics from Liaocheng University (China) in 2006. She is an M.S. candidate in Mathematics.

Pavitra Roychoudhury received her Bachelor's degree in Electrical Engineering from the National University of Singapore in 2004 and Masters in Biomedical Engineering from Nanyang Technological University (Singapore) in 2007. She is pursuing a PhD in Bioinformatics and Computational Biology.



Niu Yang received his Bachelor's Degrees in Mathematics from the University of Idaho in 2008. He is pursuing a M.S. in Mathematics.

Letter from the Chair Continued...

(Continued from page 1)

of the in-class experience, we plan to continue to support student success in our pre-calculus and our entry level calculus courses at the same time we are meeting the budget goals we have been given.

We are gratified by the support we have received from our friends this past year. Thanks to the generosity of the Misterek family we are now supporting graduate students through their Arnold Misterek Family Scholarship fund which they endowed last year. Because it is an endowment, it will be available for students in perpetuity. This is also the first year that we have awarded the Clancy and Barbara Potratz Math Education Scholarship to encourage students interested in teaching middle and high school mathematics. This year we received a gift of \$127,000 from the Taylor family from the estate of Paul Taylor that will further strengthen our scholarship endowment in the Eugene and Osa Taylor Mathematics Scholarship. Details about these scholarships and others appear on page 6. We are grateful to all of our friends who have contributed large and small amounts to the Mathematics Department. These gifts are particularly needed and appreciated in the difficult economic times in which we are living.

We look forward to next year to be one of growth and new opportunities. Please stay in touch and stop by the department whenever you are in town.

Monte Boisen, chair of the Department of Mathematics.

New PhDs

Article prepared by Mark Nielsen

This is an eventful spring commencement for our graduate program, as four students earn their PhD degrees. Two are earning their degrees in Mathematics, while two others graduate with degrees in Bioinformatics and Computational Biology, working with Mathematics faculty as their major professors. The graduates are:

Ryan Bauer (advisor, Hong Wang). Ryan's dissertation is "Disjoint Cycles and Tree Packing in Graphs". He plans a career teaching at the college level.

Tran Luong (advisor, Arie Bialostocki). Tran's dissertation is "Nonlinear Extensions of the Erdős-Ginzburg-Ziv Theorem". He will be returning to take his held position at Quy Nhon University of Education in Vietnam.

Xue Zhong (advisor, Steve Krone). Xue's dissertation is "Spacial Structure, Mating Pair Formation and Estimation of Plasmid Transfer Rates". Her future plans are not yet determined.

Erkan Buzbas (advisor, Paul Joyce). Erkan's dissertation is "Likelihood Methods to Infer Balancing Selection Under k-allele Models". Erkan will take on a post-doctorate position in July at the University of Michigan, working under Dr. Noah Rosenberg in the Departments of Human Genetics and Biostatistics.



Ryan Bauer



Tran Luong



Xue Zhong



Erkan Buzbas

Math Club Annual Pi Day Celebration

Article prepared by Mark Nielsen

In what has become a widely anticipated tradition, the UI Math Club held the 7th annual Pi Day Celebration in March. As usual, the event featured an array of pies to sample, pi-related fun activities, and of course, the highly competitive Integration Bee (like a spelling bee, but with integrals). The 2009 bee winners are:

1st: Tasha Brown (a freshman!)

2nd: Brian Faulkner

3rd: Long Ly

The deciding integral in the bee was this one:

$$\int \frac{dx}{\sqrt{x^2 - 2x}}$$

Can you do it?



Attendance at the event was great, with nearly 70 people present. Some of those not participating in the bee continued work on our color-coded "digits of pi" paper chain. Now in its third year of construction, the chain passed 1000 digits with this year's work.



A well-deserved thank you goes out to this year's Math Club officers, some of whom are graduating now after working with the Math Club for several years. This year's officers are Michael Eldredge, Tim Karr, and Bryan Wilson.

Scholarships Awarded for 2008-2009

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:

Eric Bryant, Ben Cote, Brian Faulkner, Tim Karr, Michael Logsdon, Heather Wethington, Brandon Morton, Matthew Brookhart, Jesse Maclure, Suguru Yamada and Bryan Wilson

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.

Michael Eldredge 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.

Laken Top 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:

Kevin Joyce, Nishelle Klinkhamer, Maria Perez Barrios, and Meredith Sargent

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.

Jonathan Marler is this year's 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 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.

Faith Snyder is 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 recipient this year was:

Jon Fledderjohann

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. The recipient this year was:

Doug Torrance

Faculty News

Monte Boisen-Monte is Chair of the Idaho Science Mathematics and Technology Coalition. As such, he helped organize a conference on the Idaho Math Initiative in the fall attended by teachers, administrators and business leaders. He organized a follow-up work shop with 11 Professors from 6 institutions in the state to create appropriate strategies for improving the quality of math education in Idaho.



Jessica Cohen -Jessica presented at the annual meeting of the National Council of Supervisors of Mathematics in Washington DC with research colleagues from the Northwest Regional Educational Laboratory. She has also been involved in a project organized by Texas Instruments to create a set of classroom activities for use in Algebra I classes with the new TI-Nspire handheld device.



Frank Gao - Frank Gao attended a workshop on "Small Ball Inequalities in Analysis, Probability, and Irregularities of Distribution" at the American Institute of Mathematics in Palo Alto, visited the University of Delaware and gave a seminar talk, and



participated in the "Seminar in Stochastic Processes 2009" at Stanford where he presented a talk titled "How many Laplace Transform are there?" (March 26-28).

Jennifer Johnson-Leung - Jennifer attended two conferences during the past year, the Women in Numbers workshop in Banff where she reported on a joint project with several of the other participants, and the Joint Meetings of the AMS and the MAA.



Paul Joyce - For 08-09, Paul was a co-pi on an NSF grant that funds undergraduate and graduate student scholarships, presented at the IDEA conference, gave a talk in the statistics seminar, was on an NSF panel, taught a course in Mexico, had a PhD student finish and another win an award as the outstanding student in statistics



Steve Krone - Steve is currently funded on grants with total awards in excess of 10 million through NIH to model the spatial dynamics of plasmid transfer and to study the spatial structure and adaptive evolution of viruses. He has made a number of invited talks at international meetings.



Mark Nielsen - Mark Nielsen continues to serve as half-time Associate Dean in the College of Science. In December he received an Alumni Award for Excellence, nominated by graduating senior Tim Karr.



Kirk Trigsted-Kirk gave presentations about the success of the Polya Mathematics Learning Center at a National Center for Academic Transformation/Pearson Redesign conference in Tucson, Arizona and then at another such conference in Orlando Florida. He also co-presented at a course redesign meeting in New Orleans. In all, over 500 people attended his presentations. He personally consulted with 6 institutions on higher learning as they attempt to implement course redesigns similar to our approach in Polya.



Hong Wang - Hong presented a talk entitled "Two Disjoint Large Cycles in Graphs" at the 22nd Midwest Conference on Combinatorics, Cryptography and Computing. He was awarded an NSA research grant for 2009-2010.



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.)

Department of Mathematics General Fund (MF963)

Other (Please Specify Mathematics Department Fund Name) _____

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University of Idaho Degree _____ Year _____

News (Family, Career, Etc.) _____

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

2008



2009

Prize Problems

1. Let p be an odd integer between 2 and 12. Is it always true that $n^p - n$ is divisible by p for any integer n ?
2. Connect every city on a map of Idaho with the nearest neighboring city, assuming that no distance is ever repeated. Prove that no city will be connected to more than 5 other cities.
3. What is the maximum number of rational points that can lie on a circle in the plane whose center is not a rational point? (A point (x,y) is rational if both of its coordinates are rational numbers. This was problem B1 on the 2008 Putnam Exam - see the related story on the front page!)

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 Matthew Rudd.

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