UofL Math Gazette 2008 - 2009

The Newsletter of the
Department of Mathematics
College of Arts & Sciences
University of Louisville

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Despite the recent economic down turn and its negative effect on funding, our Department, students, staff and faculty continue to be very productive. Fortunately, research and teaching in mathematics is not nearly as costly as in many other areas of science. Our faculty members continue their work, resulting in grant proposals and publications, but fewer presentations at conferences. Each year more students are involved in research and many publish their results and make presentations. Two of the outstanding successes among our recent graduates include Dr. Lesley Wiglesworth, who received a Graduate Dean's Citation, the Award of Best Graduate in Mathematics from A&S, and who is now an Assistant Professor at Centre College. Mrs. Kelly Funk, received a prestigious NSF graduate fellowship to study Mathematics at the University of Illinois, Urbana-Champaign, after graduating with a BS and an MA from our Department. At the same time we have added many new talented students at the undergraduate and graduate level. All our graduates are finding employment and actuarial students often have many offers to choose from. It is noteworthy that the three top jobs in the Wall Street Journal's Best and Worst Jobs in the U.S. are

1. Mathematician
2. Actuary
3. Statistician

(see http://online.wsj.com/article/SB123119236117055127.html);
our department has programs preparing students for each of these careers.

Many of you have contributed to the success of the Department through your time, effort and donations; a heartfelt "Thank You" to all. Our success is due to the dedication and hard work of our faculty, staff and students who are the main source of our accomplishments. In this time of continuing severe budget cuts, the

numerous financial contributions made by you, our alumni and friends, are essential for our continued success. Scholarships help our students deal with the increases in tuition, necessitated by lower and lower state contributions. Gifts help us enrich the undergraduate and graduate experience of our students by helping fund MathClub activities, and for those students who present papers and posters at local and regional events, at least partial support is provided.

Due to the budget crises we have not been able to fill several positions that became vacant in the past two years. We remain hopeful that the cuts will not be as severe as originally expected and that we will be able to fill these positions this year.

Finally, I would like to draw your attention to our 2009 William Marshall Bullitt Lecture, which will be given by Dr. Jennifer Quinn, Professor of Interdisciplinary Arts & Sciences at the University of Tacoma, Washington. Dr. Quinn served as Executive Director of the American Association of Women in Mathematics, and as a professor at Occidental College in Los Angeles. She is an award winning teacher, author and scholar, who thinks that beautiful proofs are as much art as science and as such, should be enjoyed by everyone. The title of this year's Bullitt Lecture is "***Fibonacci Fascination***" and will be held on Thursday, March 26, 2009 at 6:00 pm in Strickler Hall 101 (Middleton Auditorium).

Hopefully you will find something of interest in this issue and I encourage you to contact us and let us know your thoughts. We appreciate your comments and support; if you are in the area please stop by for a visit or just check us out at our website: http://www.math.louisville.edu

THE ANNUAL WILLIAM MARSHALL BULLITT LECTURE

The Mathematics Department's Bullitt Lecture is a free, public lecture that has brought to Louisville each year, beginning in 1993, a distinguished mathematician to speak to 200-500 audience members about important and cutting-edge mathematics. The emphasis has been drawing people from outside academia. Talented high school students, area professionals, and other parties interested in the impact and excitement that mathematics has generated, especially in the last decade, have attended the Bullitt Lecture in surprisingly large numbers.

The Lecture is endowed through a grant from the family of William Marshall Bullitt, the Solicitor General of the United States under President William Howard Taft. More information about the Bullitt Lectures and the celebrated William Bullitt Collection of Rare Mathematics and Astronomy Books can be found at the website http://www.math.louisville.edu/Bullitt/.

BULLITT LECTURE 2009

Jennifer Quinn

The Mathematics Department's 2009 Bullitt Lecture, a free lecture aimed at the general public, will take place Thursday, March 26, 2009 at 6 p.m. in Middleton Auditorium, Strickler Hall 101. This year's speaker will be Dr. Jennifer Quinn.

Jennifer Quinn (jjquinn@u.washington.edu) earned her BA, MS, and PhD from Williams College, the University of Illinois at Chicago, and the University of Wisconsin, respectively. She recently joined the faculty at the University of Washington, Tacoma where she is a Professor of Interdisciplinary Arts & Sciences working to build a mathematics curriculum on the expanding campus. Prior to joining UWT, she served as Executive Director of the Association for Women in Mathematics and before that, spent more than a decade as a faculty member at Occidental College in Los Angeles. An award winning teacher, author, and scholar, Jenny thinks that beautiful proofs are as much art as science and as such, should be enjoyed by everyone.

Here are the title and abstract of Professor Quinn's talk:

Fibonacci Fascination

Behold, the Fibonacci numbers 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ... , a number sequence which has long fascinated scholars because of its frequent occurrence in art, architecture, music, magic, and nature. You may have seen them in Dan Brown's novel The DaVinci Code or perhaps a FoxTrot cartoon. The next number of the sequence is generated by adding the two preceding. This talk will exhibit many natural examples of Fibonacci numbers while exploring the unusual (and aesthetically pleasing) patterns of the sequence itself. History and popular culture weave together with deep and rigorous mathematics, plus a Fibonacci trick for good measure!

College and high school students, teachers, and many others from the community interested in the impact and excitement that mathematics has generated have attended recent Bullitt Lectures in large numbers. Everyone is welcome!

For more information about the Bullitt Lectures, please visit
http://www.math.louisville.edu/Bullitt/.

FACULTY HIGHLIGHTS AND NOTES

Dr. Patricia Cerrito put together an edited book, A Casebook on Pediatric Diseases, which has been accepted for publication by Bentham Science which includes papers based on research projects completed in Math 560 during the Fall 2008 semester. In addition, IGI Publishing accepted a book, Cases on Health Outcomes and Clinical Data Mining: Studies and Frameworks. She will also be co-authoring a book with Fariba Kashan (accepted by Bentham Science) entitled, Applied Survival Data Mining in Health Outcomes Research.

Dr. Manav Das was awarded the Fulbright Scholarship, and has been appointed as a Fellow at the Jawaharlal Nehru Institute of Advanced Studies in New Delhi, India.

Dr. Jon-Lark Kim has been elected to and been serving on the Editorial Board of International Journal of Information and Coding Theory (IJICoT), 2008-2010. He

will also serve as one of the guest editors of a special issue on Algebraic and Combinatorial Coding Theory: in Honor of the Retirement of Vera Pless associated with IJICoT. He also served as an organizing committee member of Applied and Pure Math Symposiums at the US-Korea Conference on Science, Technology, and Entrepreneurship in 2008.

STUDENT HIGHLIGHTS AND NOTES

Dr. Christiana Petrou graduated in Spring 2008 after completing her PhD dissertation "Use of text mining to predict patient compliance".

Xiao Wang won an international competition to become a SAS Ambassador. This includes full expenses paid to present her work at the annual SAS Global Forum meeting. There are ten student winners from around the world.

Dr. Lesley Wiglesworth graduated in Spring 2008 after completing her PhD dissertation "A study of unit bar-visibility graphs".

IGI Publishing accepted a book, Cases on Health Outcomes and Clinical Data Mining: Studies and Frameworks which will feature the research of some of our current and former graduate students: **Hamed Zahedi, Fariba Nowrouzi, Ram Neupane, Jason Turner, Beatrice Ugiliweneza, Gouxin Tang, Jennifer Ferrell, Xiao Wang, Christiana Petrou, Pedro Ramos, Joseph Twagilimana, David Nfodjo, Mussie Tesfamicael, Chakib Battioui, and Mohammed Khan**.

STUDENT HONORS/AWARDS

As always, we appreciate the kindness and generosity of alumni and other friends of mathematics. In many cases contributions were received in response to the department newsletter, the U of L Math Gazette. The department is thankful to alumni, friends and family who support the department endowments. Without your generosity, we would be unable to provide many of the offerings that make our department unique.

The **Ken F. and Sandra S. Hohman Fellowships** were awarded to Timothy Brauch, Chenchen Shen, Lyle Smith, and Matthew Zapf.

The **Robert J. Bickel Scholarship** was awarded to Amanda Sutherland.

The **C. Coleman Petty Scholarships** were awarded to Austin Levi Carver, and Brian Hamilton.

The **Lois Pedigo Scholarship** was awarded to Nathan Olds.

The **Mary Ruth Brookover Award** was awarded to Lindsey Strobo.

The **William Marshall Bullitt Scholarship** was awarded to Joseph Moore.

PUZZLE

<u>Last year's puzzle –</u>
Suppose that a king designs a game to decide which of his C children will inherit all of his wealth. The king places N rocks in a covered box; one of these rocks is gold and all the others are not. Suppose that the king lets each child draw a rock from the box one-at-a-time, starting with the oldest. If the oldest child draws a gold rock, then this child inherits the fortune. Otherwise the rock that was drawn is returned to the box, the box is mixed, and the second oldest child draws from the box. If this child draws the gold rock, then he/she inherits the fortune, otherwise the next child draws. The process continues until someone draws the gold rock. (If the youngest child draws a rock which is not gold, then the oldest child gets the next opportunity.) Assume that other than the color, all of the rocks are the same and that the box is well-mixed so that on any particular draw, each rock has the same chance to be chosen. What is the probability that the ith oldest child will win the fortune?

Solution – On any particular attempt, the probability that a child will win the fortune is $\dfrac{1}{N}$ and the probability that the child will not win the fortune is $\dfrac{N-1}{N}$.
So, the probability that the ith oldest child will win the fortune is the sum of an infinite geometric series

$$\left(\frac{N-1}{N}\right)^{i-1}\frac{1}{N}+\left(\frac{N-1}{N}\right)^{i-1+C}\frac{1}{N}+\left(\frac{N-1}{N}\right)^{i-1+2C}\frac{1}{N}+\ldots=\frac{N^{C-i}\left(N-1\right)^{i-1}}{N^{C}-\left(N-1\right)^{C}}.$$

<u>New Puzzle</u>

Consider a game show in which there are 3 closed doors, and you are given the opportunity to choose one of the doors and win the prize behind that door. One of the doors has a new car behind it, but the other two doors have only a glass of water behind them. The game show host knows what is behind each of the doors. Once you choose a door, at least one of the other doors will have a glass of water behind it. The host will open a door which has a glass of water behind it for you and give you the option to switch to the remaining door.

Suppose that you pick door #1. Then the game show host opens door #2 and shows you a glass of water behind it. Then the host asks you if you would like to switch to door #3. What should you do?

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Mathematics Department.

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"Mathematics Department" on your check.
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