

UofL Math Gazette 2006-2007

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



Contents

Chair's Corner
Bullitt Lecture
Faculty Highlights and Notes
Student Highlights and Notes
Scholarship Endowments and Gifts
Puzzle

How to Reach Us

Te. (502) 852-6826
Fax. (502) 852-7132
Email: math@louisville.edu or
www.math.louisville.edu

Chair of the Department:

Dr. Thomas Riedel

Professor of Mathematics

Email: Thomas.Riedel@louisville.edu

Co-editors of the Gazette:

Dr. Ryan Gill

Assistant Professor of Mathematics

Shelly Schroll

Administrative Assistant

Chair's Corner



Dr. Thomas Riedel

The Department is having another very successful year in teaching and research. The faculty continues to publish in high quality journals, make presentations at national and international meetings and receive grants. Our Ph.D. program is in full swing with many students now working on their dissertations; two Ph.D. students graduated: Dr. Joseph Twagilimana (May 2006) and Dr. David Nfodjo (December 2006). We expect several more to graduate this Spring. At the same time we have added many new talented students at the undergraduate and graduate level and more of them are involved in research and international experiences.

Let me thank the many of you who have contributed to the success of the Department. The success is due to the dedication and hard work of our faculty, staff and students who are the main source of our accomplishments. But in a time of shrinking state support the numerous financial contributions made by you, our alumni and friends are essential for our continued success. Over the years several large donations have helped establish several undergraduate

scholarships, graduate fellowships and a lecture series, while smaller ones have helped us to provide a better experience for our students. The Mathematics Commons Room was made possible by such donations and is a place for students and faculty to gather, discuss mathematics, do home work as well as relax. A small kitchen area has been finished thus completing the room. I encourage you to stop by the department and see this first hand.

This past year the Department hosted several workshops as well as the 44-th International Symposium on Functional Equations, an annual conference that brought together 53 researchers from 12 countries. The Symposium was dedicated to Professor Dr. Walter Benz on the occasion of his 75-th birthday.

The departmental colloquium series hosted several prominent mathematicians, including Dr. Melvin Janowitz, Associate Director of DIMACS and President of the Classification Society of North America. His talk entitled "*Cluster Analysis: An application of Posets?*", drew the largest audience for a departmental research colloquium with over 50 people attending and many more who had to be turned away.

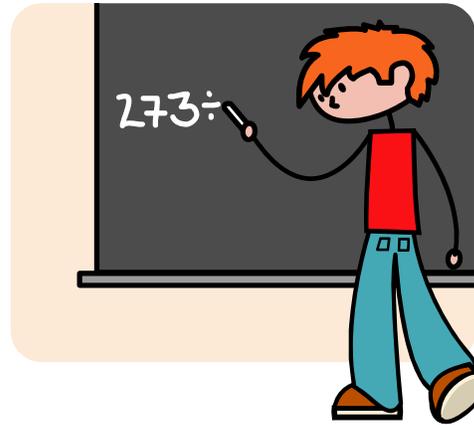
Some changes have occurred in the past year; Ms. Nannette Dix, who was our Administrative Assistant, has moved to a new position in the College of Business. We were fortunate to hire Mrs. Shelly Schroll in December, who had worked for us on a temporary basis earlier in the year. Shelly has previous experience from our Physics Department and has quickly adjusted to her new position; we are fortunate to have her.

We were fortunate to hire one new tenure-track assistant professor: Dr. Hamid Kulosman, who is working in commutative algebra and obtained his Ph.D. from the University of Illinois, Urbana-Champaign. Previously he spent one year as a post-doc at the University of California, Riverside and one year visiting in our Department.

Finally, I would like to draw your attention to our 2007 William Marshall Bullitt Lecture, which will be given by Dr. Roger Nelsen from Lewis and Clark College, Portland, Oregon. Dr. Nelsen is an internationally known mathematician who works in the area of probability theory. He published more than 100 articles and books including several on popular mathematics topics such as the Proofs Without Words series. The title of this year's Bullitt Lecture is "*Proofs Without Words and Words Without Proofs*" and it will be held on Thursday March 29, 2007 from 7:00 pm to 8:00 pm in Williams Auditorium, 103 Ernst Hall; **please note the change of location.**

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>



**2007 Bullitt Lecture Features
Celebrated *Proofs Without Words*
Author**

The Mathematics Department's 2007 Bullitt Lecture, a free lecture aimed at the general public, will take place Thursday, March 29, 2007 from 7:00 to 8:00 p.m. in 103 Ernst Hall, the large auditorium in Speed School. This year's speaker will be Dr. Roger B. Nelsen, Professor of Mathematics at Lewis and Clark College in Portland, Oregon. Professor Nelsen is much in demand as a speaker, and the U of L Mathematics Department is delighted that he accepted our invitation.

Professor Nelsen is the author of the celebrated *Proofs Without Words* and *Proofs Without Words, Part II*, both published by the Mathematicians Association of America (MAA). Nelsen regularly publishes new "proofs without words" in *Mathematics Magazine*. Links to some of his recent articles are available at his website:

<http://www.lclark.edu/~mathsci/nelsen.html>.

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

Proofs Without Words and Words Without Proofs

Can pictures prove theorems? Rather than argue that they can or can't (words without proofs), I will present some which may (proofs without words). In English, the verb "to see" often means "to understand," and I think this is especially true in mathematics. To illustrate, we will explore the role of visualization in mathematics by examining a little-known elementary but powerful idea (the Fubini principle) in a variety of settings, including combinatorics, infinite series, geometry, calculus, mathematical induction, and fast food.

In addition to his "proofs without words" series, Nelsen has recently published a research monograph, "Introduction to Copulas." Nelsen describes his book as follows: "Copulas are functions that join multivariate distribution functions to their one-dimensional margins. The study of copulas and their role in statistics is a new but vigorously growing field. In this book the student or practitioner of statistics and probability will find discussions of the fundamental properties of copulas and some of their primary applications."

Since 1993, the Mathematics Department's Bullitt Lecture has annually presented a distinguished mathematician to a Louisville audience of 200 to 500 people. Ronald Graham, former Chief Scientist at AT&T, and Douglas R. Hofstadter, Indiana University College Professor of Cognitive Science and Computer Science, computer scientist, and author (of *Gödel, Escher, Bach*), are among the former Bullitt Lecturers. The Bullitt 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.

William Marshall Bullitt corresponded with many mathematicians and scientists of his time, including Albert Einstein. Bullitt collected a large number of rare mathematical manuscripts that he kept on display at his law office in downtown Louisville. His collection, one of the world's most extraordinary collections of first-edition mathematical works, is now housed in Ekstrom Library on U of L's Belknap Campus. Professor Richard Davitt of the Mathematics Department has done extensive work studying and publicizing the Bullitt Collection. Davitt's work came to the attention of the Bullitt family and led to the establishment of the Bullitt Endowment.

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 Lecture in large numbers. Everyone is welcome!

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

Faculty Highlights and Notes

Dr. Patricia Cerrito completed a book, Introduction to Data Mining with SAS Enterprise Miner that had a publish release date of December 1, 2006.

Dr. Udayan Darji gave a plenary talk at the Biannual Conference on Measure Theory on the Island of Ischia and also another plenary talk at a Conference on Analysis and Set Theory in Torino, Italy.

Dr. Manav Das was invited by the American Institute of Mathematics at Palo Alto, CA to attend a Workshop on Self-Similar Groups in June. He was also the Principal Speaker at this year's annual Real Analysis Symposium in Asheville, NC in June. In addition, he presented a talk at the Summer Topology Conference in Statesboro, GA in July and gave a talk at the International Congress of Mathematicians in Madrid, Spain in August. Also, he attended a CPE Faculty Development Conference in Lexington, KY, organized by the Kentucky Council on Postsecondary Education.

Dr. Ryan Gill gave an invited talk on logistic joinpoint regression at the 2006 Anomaly Detection Mid-Year Workshop hosted by the Centers for Disease Control and the National Center for Health Statistics in Hyattsville, MD. He also presented related work at the 2006 Joint Statistical Meetings in Seattle, WA.

Dr. Jon-Lark Kim served as a co-organizer with W. Cary Huffman of the 2006 AMS Fall central section meeting, Cincinnati, OH, Oct. 21-22, 2006 in the special session on Algebraic Coding

Theory -- Honoring the Retirement of Vera Pless. He also was presented a 2004 Kirkman medal by President Ron Mullin of the Institute of Combinatorics and Its Applications (ICA) in March 2006 at Boca Raton, FL. The Kirkman Medal is awarded for distinguished research by an ICA member who is within four years of receiving his/her doctoral degree.

Dr. Bingtuan Li received a National Science Foundation grant awarded \$93,452. This 3-year NSF grant will provide funds for the development of mathematical theory regarding spreading speeds and traveling waves of mathematical models that describe the growth, interactions, and migrations of species, in the form of reaction-diffusion equations or integro-difference equations with dispersal kernels.

Dr. Greg Rempala, a UofL professor of mathematics and biochemistry has been selected to be included in a biographical directory published by Marquis Who's Who®, the leading biographical reference publisher of the highest achievers and contributors from across the country and around the world. Rempala will be profiled in the 2007 edition of Who's Who in America®, which will be available in January 2007. Since 1899, when A.N. Marquis printed the First Edition of Who's Who in America®, Marquis Who's Who has chronicled the lives of the most accomplished individuals and innovators from every significant field of endeavor - including politics, business, medicine, law, education, art, religion and entertainment. Today, Who's Who in America® remains an essential biographical source for thousands of researchers,

journalists, librarians and executive search firms around the world.

Student Highlights and Notes

Chakib Battioui, Mussie Tesfamicael, Hamed Zahedi, and Guoxin Tang presented their work at the annual M2006 Data Mining Conference in Las Vegas on October 23-24. Hamed and Guoxin received awards from the conference, with all travel expenses provided.

David Nfodjo graduated in December, 2006. His dissertation is, "Social-economic factors to utilization of the Emergency Department at a Jefferson County Hospital". David works at Mercer Human Resources, also in Louisville.

Christiana Petrou, Fariba Nowrouzi-Kashan, Chakib Battioui, Mussie Tesfamicael, and Joseph Twagilimana presented papers at the Southeast SAS User's Group meeting in Atlanta on October 9-10. All 5 received scholarships from the conference.

Mussie Tesfamicael and Hamed Zahedi received an award to present their work at the annual Global Forum Conference in Orlando in April of 2007. They will have all travel expenses paid by the conference.

Joseph Twagilimana is the first graduate of our PhD program (May, 2006). His dissertation is entitled, "Combining Data Mining and Statistical Techniques for Analysis of Outcomes in a Hospital Emergency Department". Joseph is currently employed at Wellpointe, Inc. in Louisville.

Susan White gave a talk at the Summer Symposium on Real Analysis at Ashville, NC and another talk at the Biannual Measure Theory Conference on the Island of Ischia, Italy.

Scholarship Endowments and Gifts

As always, we appreciate the kindness and generosity of alumni and other friends of mathematics. During the 2005-2006 academic year, designated donor gifts increased the principal of various department endowments. In addition, the department received some unrestricted gift donations, which are used to supplement departmental activities for the mathematics community at U of L. 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 their generosity, we would be unable to provide many of the offerings that make our department unique.

* The **Mary Brookover Award** was awarded to **Alyssa Cramer**.

* The **C. Coleman Petty Scholarships** were awarded to **Amanda Sutherland, Joseph Moore, and Nathan Olds**.

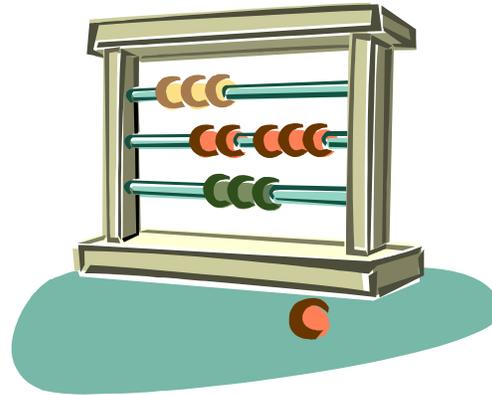
* The **Robert J. Bickel Scholarship** was awarded to **Kelly Houston**.

* The **Bullitt Fellowship** was awarded to **Kim Meyer**.

* The **Ken F. & Sandra S. Hohman Graduate Fellowships in Mathematics** were awarded to **Esteban Chavez, Douglas Lorenz, and Christiana Petrou**.



Thanks to **Steve Edgell**, **Dave Melendy**, **Barbie Wimsatt**, **Robert White**, and **Dave Zimmermann** for their solutions to last year's puzzler.



Puzzle

Last year's puzzle - A boy goes off to college and after the first semester he's run out of money. In fact, he's so broke he doesn't have enough money to call home, or to even send a letter. However, he manages to find a postcard with a stamp already on it. He sends the following message, "Send. More money."

Here's how the message looked:

$$\begin{array}{r} \text{send} \\ +\text{more} \\ \hline \text{money} \end{array}$$

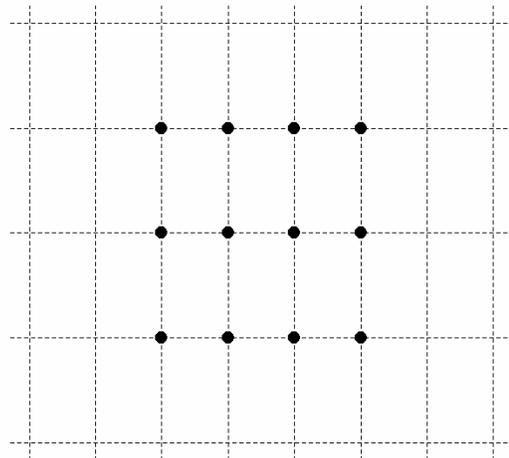
The question is, how much money do they send him? Believe it or not, taking each letter that appears in the message to be a digit from zero to nine, there's only one solution.

Solution -

Assuming that each letter is a unique digit from 0 to 9 and that m is not 0, the only solution is

$$\begin{array}{r} 9567 \\ +1085 \\ \hline 10652 \end{array}$$

New Puzzle -



Suppose that we wish to connect the twelve points on the grid above by drawing straight line segments with a pencil so that we never lift the pencil off the paper and the last line segment ends where the first started. What is the minimum number of line segments needed to accomplish this task?

Please mail or e-mail your solution to: Dr. Ryan Gill rsgill01@louisville.edu - Math Dept, Louisville, KY 40292.

Mathematics Department Donation Card

Name: _____

Address: _____

Enclosed is my gift of \$ _____ to enhance the activities of the Mathematics Department.

I would like my gift to go toward:

_____ Student Activities
_____ General Gifts

All gifts are tax deductible and will be acknowledged. Please make checks to The University of Louisville Foundation and indicate for "Mathematics Department" on your check. You can return your donation in the enclosed self-addressed envelope.

Thanks for your generosity!