6-2006

Math Department Newsletter, 2006

University of Dayton. Department of Mathematics

MATHEMATICS DEPARTMENT NEWSLETTER
JUNE 2006

CHAIRPERSON'S MESSAGE

This year, I will comment briefly on the new facilities and our ability to host special events. I will talk briefly about some curriculum issues in the Department and I will update you with the hiring plans in the Department.

We have been living in the renovated Science Center for two years now. Vast spaces in Sherman and Wohlleben Halls are still Sherman and Wohlleben Halls. However, the renovated classrooms and the new construction have given us opportunity to host special events, an opportunity we enjoy.

Each year we host Math Events and those of you who have returned have enjoyed the new facilities. Two years ago **Jane Pendergast** (74) delivered the Schraut Memorial Lecture in the auditorium; this past year **Pat Flinn** (72) was scheduled to deliver the Schraut Memorial Lecture in the auditorium but it was moved to O'Leary Auditorium in Miriam Hall at the last second due to large numbers of attendees at this year's Undergraduate Mathematics Day. I recall that following Jane's lecture, **Cynthia Morrison** (74) commented on the outstanding quality of the facilities.

In October 2005, **Muhammad Islam** served as the conference organizer and we hosted the 25th annual Southeastern-Atlantic Regional Conference on Differential Equations (SEARCDE). Several of us participate in this conference frequently; our graduate students in the applied mathematics program are frequent contributors, and for years, we have discussed the possibility of hosting the event. With the renovated Science Center, the time was ripe. It was extremely successful and several of the participants commented on the quality of the facilities, echoing precisely what Cynthia had said one year earlier.

In 2003, **Pete Hovey** made the local arrangements for the 10th Spring Research Conference on Statistics in Industry and Technology. This conference took place in Kennedy Union. Now, we are pleased that we can host these events in the Science Center.

Maintaining the curriculum is always an active agenda item in the Department. In recent years, we have introduced two new master's programs and we developed a mathematics curriculum specifically for the pre-service middle school mathematics teachers. We have built up the courage to systematically review the curriculum for the majors. A first big step was taken this year with the development of a three credit hour course that introduces methods of proof with discrete topics. The new course is numbered MTH

308. It is required for all mathematics majors and students will take the course during the semester that they take third semester calculus. Third semester calculus and MTH 308 are prerequisites for linear algebra; linear algebra has been renumbered as MTH 310 to help with advising.

You can think of MTH 308 as an expanded version of the one credit hour MTH 301 which is eloquently put to rest below in this Newsletter. A first year or second year course like MTH 308 appears to be quite common at other universities and is common in computer science programs as well. Our own Department of Computer Science already offers a similar course geared for second or third year students. So we are behind the curve on this issue.

I take this opportunity to invite suggestions as we continue to evaluate the curriculum for the major. Please alert us to programs that you think are of interest, or effective. Please send ideas from your perspective as an employer or as a faculty member in graduate school. Please feel free to send them to me at Paul.Eloe@notes.udayton.edu.

The B.S. in mathematics degree needs to prepare students for graduate school as well as prepare students for nonacademic degrees. With the introduction of MTH 308, students complete the calculus sequence, sophomore level ordinary differential equations, MTH 308, linear algebra, abstract algebra, two courses in analysis and four electives. Electives include set theory, number theory, graph theory, probability, topology, geometry, and a variety of applied courses. Questions we ask are: (1) should we require more mathematics courses? (2) should we offer the courses in sequences so that the students gain more depth (possibly at the cost of breadth)? (3) should we consider a capstone research or seminar experience at the undergraduate level? Other questions we ask apply to preparing students for nonacademic careers. We are evaluating the statistics curriculum, we are looking for ways to introduce computation and modeling more effectively, and we intend to introduce applied discrete courses in coding theory or design theory.

I close with an update on the changing faculty. Last year, John Kauflin and Harold Mushenheim retired. We searched for one position only and we hired Arthur Busch, a graph theorist. Art earned a Ph.D. in mathematics from the University of Colorado at Denver where he worked with Michael Jacobson. He then spent one year on a post-doc at Lehigh University where he worked with Garth Isaak.

This year, following a leave of absence, Tim Sheng has accepted a position at Baylor University. We wish Tim all the best; I thank Tim for his efforts and successes to build the computational mathematics component in the Department. We are still down two positions and so, we should be back on the job market again this winter. If all goes well, we should be looking for a third specialist in mathematics education and a specialist in numerical partial differential equations.

We keep a current web page at http://www.udayton.edu/~mathdept/. Under Archives, you will find the Newsletters dating back to 1996. I hope you enjoy this year's newsletter.

Thanks.
Paul Eloe

THANKS!

Thank you again for your generous support. As you read through the undergraduate and graduate activities sections, you can read about the activities you have supported this past year. You have helped support Math Events, Integration Bee, the High School Mathematics Competition, and undergraduate student travel and graduate student travel. Your support is very much appreciated.

Our records, in conjunction with those of the University Advancement Office, indicate the following people donated a total of $4,775.00 to the Department of Mathematics during 2005:

Stephen L. Adams (73)
Timothy P. Bahmer (91)
Gregory and Julie Ruschau Bishop (86)
Franklin and Christine Demana (60)
David (93) & Cheryl (92) Prenger Edelmann
Paul and Laura Schneider (84) Eloe
Patrick and Barbara Flinn (72)
Anne Farley Flynn (86)
Michael E. Foley (73)
Marla Prenger Gross (90)
Michael & Mary Ann Gold Hartke (66)
William J. Huster (78)
Melvin & Pauline Foley Kuhbander (56)
Patrick & Kathleen Kern MacVeigh (78)
Mr. & Mrs. George G. Morrison, III (82)

Charles & Alicia Fernandez-Mott (61)
Jane F. Pendergast (74)
Edward & Joyce Ray (74)
Timothy & Pamela Schultz Rice (88)
David & Barbara Kieltyka Schwallie (81)
Richard & Elizabeth Harrison Segers (50)
Robert W. Springer (77)
Julie Anne Suwalski (92)
Kevin A. Thomas (76)
Susan Elaine Thompson (81)
Mark Turella (80)
Daniel & Nancy J. Voss (79)
Christopher Wagner (71)
James & Joan Kilsheimer Wiggenhorn (70)

The above total includes employee matching gifts from the following corporations and foundations:

Cinergy Foundation
Motorola Foundation

IBM Foundation
Scientific Atlanta Foundation

The Procter & Gamble Fund
Towers Perrin Co.

THE KENNETH C. SCHRAUT MEMORIAL LECTURESHIP FUND

Thank you also for your continued generous support of the Kenneth C. Schraut Memorial Lectureship Fund. As of March 31, 2005, the market value of the fund is: $45,668.22.

This past fall, **Pat Flinn (72)** (see below) delivered the **6th Kenneth C. Schraut Memorial Lecture**. This year's lecture is scheduled for Saturday November 4, 2006. The Lecture will be held in conjunction with the *22nd Biennial Seminar on Careers in Mathematics*. Please see http://academic.udayton.edu/MathEvents/ for continual updates with respect to this year's Lecture and undergraduate conference. The following individuals donated an additional $4,175.00 to the endowment during 2005:

Philip & Kathy Kolesar-Aftoora (69)
Eugene & Lois Scaife Bolzan (69)
Richard & Leslie Kirchmer Iannarino (71)

William J. Scharf (68)
Ronald & Pamela Steinkirchner (76)
C. Eugene Steuerle (68)

The above total includes matching gifts from the following corporations and foundations:

Lockheed Martin Corporation

MATH EVENTS AT UD

Through their generous contributions to the Kenneth C. Schraut Memorial Lectureship fund, our alumni have enabled us to host the annual Kenneth C. Schraut Memorial Lecture. Since 2002, the Schraut Lecture has anchored *Math Events* each year. In even-numbered years, we hold the Biennial Alumni Seminar, and in odd-numbered years, we organize Undergraduate Mathematics Day, a conference for undergraduate students. This year's *Math Events* will be held on Saturday, November 4, 2006. The most current information can be found at http://academic.udayton.edu/MathEvents/.

UNDERGRADUATE MATHEMATICS DAY November 5, 2005

This was the fourth annual MathEvent that Wiebke Diestelkamp and Aparna Higgins had organized together, and all the preparations for the conference were coming along nicely. Two alumni had consented to give the plenary addresses, rooms had been reserved, a lunch menu had been selected, undergraduate advisors around Ohio had been alerted that this year would be an undergraduate conference and that their students were invited to present in it. On Wednesday, the 26th of October, two days before the deadline for registration, we had 70 people registered, and we were pleased that we had reached the number of participants who attended this biennial conference last time. But then online registration picked up volume on the next day, and by the deadline, we were very excited (and a touch panicky!) to find that the number of registrations had doubled to 140!

Thus the week before Undergraduate Mathematics Day 2005 was a frenzy of giving up previously selected rooms, booking more rooms for contributed papers and a bigger one for the plenary addresses, adjusting the menu to accommodate the bigger numbers within approximately the same budget, and increasing the numbers of handouts and folders that needed to be prepared. And by Friday evening, we were ready! Saturday November 5, 2005 turned out to be a day full of people excitedly talking about mathematics, meeting old friends and making new ones, giving talks, asking questions, and in general, unabashedly celebrating their passion for mathematics.

The two invited addresses were informative and delivered with style and energy. We are indebted to **Patrick Flinn** (72) of the National Security Agency, who presented the **Sixth Annual Kenneth C. Schraut Memorial Lecture**, "Gröbner Bases: A Natural Extension of Gaussian Reduction and the Euclidean Algorithm." He did a great job of explaining an advanced topic in such an elementary way that even high school students could follow his talk. Pat's story-telling skills came to the fore as he recounted his first meetings with Doc Schraut. **Kristen Lampe** (93), of Carroll College in Wisconsin, delighted the participants with her entertaining talk entitled "Shuffle Up and Deal; Should We Have Jokers Wild?" Her talk set the right tone for the day, and it was very well received by the diverse audience. Participants at all levels of mathematics study – from high school students to college students to faculty – loved her talk.

Of the 168 participants, one hundred twenty-seven were students. Most of the participants were from Ohio, but we did have some people attend from places as far away as Chicago and Atlanta. We had thirty-six contributed papers in five parallel sessions. Thirty of the contributed papers were by students, including two by high school students. The topics of the presentations varied greatly. Some undergraduates spoke about their own research projects ("Orbit Representatives in Multitwisted Codes," "Bisections and

Reflections: A Geometric Investigation," "A Statistical Investigation of Obese and Diabetic Mice Through Islet Observation"), while some spoke on their own experiences in mathematics or mathematics competitions ("The Moore Method: A Student Perspective," "Undergraduate Experience at a Statistical Consulting Center," "Modeling Traffic Flow Through a Toll Plaza"). The presenters were invited to submit articles based on their presentations for refereed publication in electronic proceedings of this conference, which is now published as Volume 2 of the Electronic Proceedings of Undergraduate Mathematics Day (http://academic.udayton.edu/EPUMD/).

Some traditions are now established. We provided free lodging for out-of-town students. We had a buffet-style luncheon, for which we arranged the seating so that each table had a mix of faculty and students from institutions other than their own. We had plenty of time built in during the day for socializing and networking while being fueled by snacks.

Wiebke and Aparna had written a proposal and were awarded a grant from the Mathematical Association of America through its NSF Regional Undergraduate Mathematics Conference program (NSF Grant DMS-0241090). We are grateful for the generous (and annual) support of MathEvents by Dr. Panagiotis Tsonis, Bro. Mann Chair of the Sciences at UD. The UD Women's Center, the UD Bookstore and the Department of Mathematics were quick to help us with generous donations. And we were touched by the donations from several alums of our department. Thank you.

The program, the abstracts, pictures, the Proceedings and other details of the conference can be found by clicking on the Undergraduate Mathematics Day 2005 link on the web page http://academic.udayton.edu/MathEvents/.

INVITATION TO MATH EVENTS 2006 ON SATURDAY, NOVEMBER 4, 2006

You are invited to participate in *Math Events 2006*, which will take place on Saturday, November 4, 2006. This year's program will consist of the 7th *Annual Kenneth C. Schraut Lecture* and *the 22nd Biennial Seminar on Careers in Mathematics*. We are pleased to announce that **Greg Campbell** (70), Director, Division of Biostatistics, Food and Drug Administration, will deliver this year's Schraut Lecture. Plans are quite preliminary at this point. You will be able to keep up with details at http://academic.udayton.edu/MathEvents/.

We are always considering ideas to improve the *Biennial Seminar*. At the last *Biennial Seminar*, we broke tradition and held the session in one centralized space. We received sufficient feed back to know that this was not an improvement due to limited space and increased noise and distraction. If you have ideas you would like to share, please pass them along. The current organizing committee for this year's *Biennial Seminar* consists of Paul Eloe and Pete Hovey.

FACULTY UPDATE

Full Time Faculty

Atif Abueida, 2000	Aparna Higgins, 1984	Shirley Ober, 1977
Art Busch, 2006	Peter Hovey, 2001	Darren Parker, 2001

Wiebke Diestelkamp, 1998	Muhammad Islam, 1985	Youssef Raffoul, 1999
Shannon Driskell, 2003	Becky Krakowski, 2000	Paula Saintignon, 1983
Stephanie Edwards, 2001	Ruihua Liu, 2004	Gerry Shaughnessy, 1967
Paul Eloe, 1980	Joe Mashburn, 1981	Les Steinlage, 1969
Bob Gorton, 1969		

Part Time Faculty

Cheryl Edelmann, 1999	Joe Huelsman, 2003	Jane Nesbit, 2005
Robert Finnegan, 1985	Karen Mickel, 1992	Betty Schneider, 1989
Steve Fuchs, 2005	Scott Mitter, 2001	David Tsui, 2005

Professors Emeriti

Stanley Back, 1998	Jack McCloskey, 2001	Ben Rice, 1998
Bill Friel, 1999	Harry Mushenheim, 2006	Carroll Schleppi, 2001
Tom Gantner, 2001	Jerry Neff, 1999	Ralph Steinlage, 2001
John Kauflin, 2006	Richard Peterson, 1998	Jerry Strange, 1999

AWARD CITATION

Youssef N. Raffoul received the 2005 College Award for Outstanding Research. Congratulations, Youssef. The citation reads:

The 2005 award for outstanding scholarship in the College of Arts and Sciences is granted to Dr. Youssef N. Raffoul, Professor of Mathematics. Dr. Raffoul obtained B.S. and M.S. degrees in mathematics from the University of Dayton, an M.A. from Indiana University and his Ph.D. in mathematics from Southern Illinois University. He served as Mathematics Department Chair at Tougaloo College in Mississippi before joining the UD faculty in 1999.

In the words of one of his former students, "Dr. Raffoul displays an unparalleled enthusiasm for mathematical research and consistently utilizes his unique ability to inspire and direct students to conduct their own research."

The phrase, "unparalleled enthusiasm," is well chosen. Indeed, it characterizes Dr. Raffoul's approach to all facets of the research endeavor, including productivity, collaboration, student engagement, and scholarly impact.

By any standards, Dr. Raffoul is a rapid producer of leading-edge mathematics. He has published over 40 peer-reviewed papers in some of the most prestigious journals in his field of differential and integral equations. More than 20 of these were published in the last three years.

Good research often comes about through the integrated contributions of several scholars. Dr. Raffoul's research accomplishments include collaborations with UD students and with junior and senior mathematicians and scientists both here and abroad. One researcher chose to spend his sabbatical leave at UD in order to work with Dr. Raffoul.

Dr. Raffoul has fostered student engagement in research in many ways. His dedication to mentoring individuals and teams of students is exemplary. He has made major contributions to the Department's interdisciplinary graduate programs in applied mathematics and financial mathematics and to its undergraduate programs by developing

courses in discrete dynamics and mathematical modeling, both of which provide students with a variety of research opportunities.

Dr. Raffoul has become a leader in modeling the long term behavior of nonlinear dynamical systems. By constructing and applying a variety of energy functions, Dr. Raffoul has been able to provide solutions that predict the asymptotic behavior of fundamental system parameters, including periodicity, stability, and rate of decay. One reviewer has pointed out that Dr. Raffoul "shows boldness and imagination" in the construction of such functions. It is now common to find other researchers applying Dr. Raffoul's constructions to their own particular problems.

More recently, Dr. Raffoul has turned his attention to the application of fixed-point methods to the study of dynamical system stability. Dr. Raffoul is considered a pioneer in this area. Indeed, he was the first to apply fixed point methods to discrete system dynamics, thereby opening the door to a vast new area of research.

A clear sign of Dr. Raffoul's growing reputation as a first-rate mathematical researcher, several of his articles have appeared recently on the "ScienceDirect TOP 25 Hottest Articles" list, a quarterly compilation of the most frequently downloaded journal articles in every major academic discipline. One of his articles reached number 3.

For these accomplishments, the College of Arts and Sciences is pleased to present the 2005 Award for Outstanding Scholarship Award to Dr. Youssef Raffoul.

Goodbye, "Proof Course"

"Proof Course," otherwise known as MTH 301, Essentials of Mathematical Reasoning, was offered for the last time in the winter semester of 2006. For those of you who were students here in the last twenty years, you may remember it as a 1 credit-hour elective course which was offered every winter, met once a week, had no required textbook, had no tests or final exam, and in which the grade was entirely based on weekly homework. Students from the first part of these past two decades may remember the course as being team-taught.

A new course, which includes most of the content and all of the intent of the old "Proof Course," will be offered starting in the fall of 2006. This course is called MTH 308, Foundations and Discrete Mathematics. It will be a 3 credit-hour course, and will be required for the mathematics major. In fact, it will be a prerequisite for several upper-level courses. Hence, there will be tests and a final exam, in addition to the writing-intensive homework.

Aparna Higgins taught "Proof Course" for most of the years that it was offered. She thanks Tom Gantner, Joe Mashburn, Jack McCloskey, Harry Mushenheim and Ralph Steinlage, who team-taught the course with her for the first few years – their willingness to be part of something very different taught her much about collegiality, and their classroom styles and preparation efforts taught her much about how to teach (she sat in on every class). In particular, she is grateful to Jack McCloskey's vision, who reacted to her proposal for such a course in proof techniques enthusiastically enough to join her in teaching it the first year, and cautiously enough to make her work with a seasoned faculty member (Ralph Steinlage) to shape it for formal approval.

Aparna will teach the inaugural version of MTH 308 this fall, and thinks that she may be able to retain some aspects of the old "Proof Course" like students working at the boards during class, and viewing the NOVA program "Proof," but that she will have to re-think her strategy of holding class outside on the last day (of the fall semester in Ohio) to talk about "Hotel Infinity" and to show that the reals are uncountable! Thanks to all the students who took the one credit hour "Proof Course" in the past, making it one of Aparna's favorite teaching assignments.

FACULTY ACTIVITIES

Atif Abueida was promoted to the rank of Associate Professor. The new rank is effective August 16, 2006. He co-authored the article, with departmental colleagues **Wiebke Diestelkamp, Stephanie Edwards,** and **Darren Parker,** "Determining properties of a multipartite tournament from its lattice of convex subsets," Australasian J. of Combinatorics, 31 (2005), pp. 217-230. He also co-authored, with Mike Daven and Ken Roblee, "Multidesigns of the λ-fold complete graph for graphs-pairs of orders 4 and 5," Australasian J. of Combinatorics, 32 (2005), pp. 125-136. In March, Atif served as the plenary speaker of Troy MathFest 2006, an NSF supported undergraduate mathematics conference at Troy University in Troy, Alabama.

An article on *Conversations among Women in Mathematics* by **Wiebke Diestelkamp** and **Aparna Higgins** appeared in the AWM Newsletter, Vol 35, No. 4, July-August 2005. Wiebke has been enjoying her first sabbatical leave of absence during the winter term.

Shannon Driskell authored the article, "Learning and leading with technology," Tinkerplots, 33(2), pp. 41-42 and she co-authored, with S.R. Harper, "Capturing video of dynamic computer activity," Mathematics Teacher, 99(2), (2005), pp. 126-130. Shannon continues to serve as an editor for the "Tech Tip" column in the National Council of Teachers of Mathematics *Mathematics Teacher* journal. She invites submissions from those of you who are teaching out there. She can be reached at Shannon.Driskell@notes.udayton.edu.

Stephanie Edwards authored the paper, "Using level curves to count non-real zeros of f''," Advances in Analysis: Proceedings of the Fourth ISAAC Congress, Int. Soc. Anal. Appl. Comput., World Scientific Publishing Co. (2005), pp 531-537. She also delivered "Some old and new polynomial problems" at the Summer Undergraduate Mathematical Science Research Institute at Miami University in June (2005). This year **Stephanie** and **Darren** became proud new parents of Isabella (born 4/1/06), who joins her brother Eli.

Paul Eloe authored "Positive operators and maximum principles for a family of nonlocal boundary value problems," Cubo, 7, No. 2 (2005), 237-260. He co-authored (with B. Ahmad) "Positive solutions of a nonlinear nth order boundary value problem with nonlocal conditions," Applied Mathematical Letters, 18, No. 5 (2005), 521-527 and (with **Youssef Raffoul** and C. Tisdell) "Existence, uniqueness and constructive results for delay differential equations," Electron. J. Differential Equations, 2005 (2005), no. 121, pp. 1-11. He accepted an invitation to serve on the national Council of Graduate Schools/ Sloan Foundation Advisory Board for Professional Masters programs.

Aparna Higgins continues to be active on the national scene. She delivered: "Demonic graphs and undergraduate research" in the Undergraduate Colloquium Series at Loyola

University, Chicago in September 2005; "Pebbling on graphs" at the Carleton College Summer Mathematics program for Women in June 2005; "Getting students involved in undergraduate research" in the Undergraduate Research Seminar and "Pebbling on Graphs" in the Landscape Seminar at the University of Nebraska in October 2005; "Undergraduate research: how to make it work" a Project NExT course at the MAA Mathfest in Albuquerque, August 2005; "Getting Students Involved in Undergraduate Research," an MAA minicourse at the Joint Mathematics Meetings in San Antonio in January 2006; "Undergraduate research – how to make it work" to the Section NExT Fellows of the Louisiana-Mississippi Section of the MAA in February 2006, and "Demonic Graphs and Undergraduate Research," a plenary talk at the April 2006 meeting of the Allegheny Mountain section of the MAA. Aparna continues as Co-director of the Project NExT (New experiences in Teaching), a professional development program of the MAA for new faculty.

Pete Hovey co-authored a paper (with **Al Berens** (55)) "Aging aircraft maintenance planning," Proceedings of the 9th International Conference on Structural safety and Reliability, (ICOSSAR '05), Rome, Italy, June 19-23, 2005 and he coauthored (with L. Petry, L. Laudbach, N. Rogers, B. Towne, and W.C. Chumlea), "Development and validation of an anthropometrically based prediction equation for estimating the percent body fat of post-menopausal black females," J. Exercise Physiology, On-line, 8 (2005).

Muhammad Islam co-authored the article, "Boundedness and stability in nonlinear delay difference equations employing fixed point theory," (with **Ernest Yankson** (05)), Electron. J. Differential Equations, 26, (2005), pp. 1-18 and he coauthored (with **Youssef Raffoul**), "Stability in linear Volterra integrodifferential equations with nonlinear perturbation," J. Integral Eqns. and Appl., 17, (2005), pp. 259-276. He also served as the co-organizer (with Mark Oxley of the Air Force Institute of Technology) for the 25th Annual Southeastern-Atlantic Regional Conference of Differential Equations. The conference was jointly sponsored by UD and AFIT and was held in early October. Islam secured an NSF grant to provide travel support to graduate students and recent Ph.D.s.

Becky Krakowski continues to work with Beth Basista of Wright State University to deliver summer institutes in physical science and mathematics for secondary school teachers. They have been funded for three straight years by the Ohio Board of Regents Improving Teacher Quality Grant. She is also busy implementing the new Master's in Mathematics Education program (http://academic.udayton.edu/MthEd/). This summer marks the second summer of implementation of the program. Currently, six students are enrolled in the program.

Ruihua Liu co-authored the article (with Q. Zhang and G. Yin), "A near optimal selling rule for a two-time-scale market model," SIAM J. Multiscale Modelling and Simulation, 4, (2005), 172-193.

Joe Mashburn presented a paper on "The weakly way-below relation" at the 40th Spring Topology Conference in Greensboro, North Carolina in March.

Youssef Raffoul authored or co-authored 10 articles that appeared in 2005. In addition to those listed with co-authors above, these are:

"Existence of periodic solutions in neutral nonlinear difference systems with delay," J. Difference Equations and Applications, 11, 2005), pp. 1109-1118.

"Positive periodic solutions of systems of functional differential equations," J. Korean Math. Soc. 42, No. 4 (2005), pp. 749-759;

(with **Mariette Maroun** (03)) "Periodic solutions in nonlinear neutral difference equations with functional delay," J. Korean Math. Soc. 42, No. ? (2005), pp. 255-268;

(with **Mariette Maroun** (03) and **Youssef Dib** (02)) "Periodicity and stability in neutral nonlinear differential equations with functional delay," Electron. J. Differential Equations, (2005), pp. 1-11.

(with C. Tisdell) "Positive periodic solutions of functional discrete systems and population models," Advances in Difference Equations, 3 (2005), pp. 369-380;

"Periodic solutions in nonlinear neutral difference equations with functional delay," J. Korean Math. Soc. 42, No. 2 (2005), pp. 255-268;

(with A. Peterson) "Exponential stability of dynamic equations on time scales," Advances in Difference Equations, 2 (2005), pp. 133-144.

(with **E. Kaufmann** (91)) "Positive solutions for a nonlinear functional dynamic equation on a time scale," Nonlinear Analysis, 62, (2005), pp. 1267-1276.

Gerald Shaughnessy serves on the Education and Exam Committee of the Society of Actuaries.

Tim Sheng has accepted a position in the Department of Mathematics at Baylor University.

UNDERGRADUATE ACTIVITIES

Math Club opened the year with a picnic at the Mashburn home where the students swam, played volleyball, and played basketball. It was a wonderful way to begin the year! During the fall semester, they had a movie night (they watched "Good Will Hunting") and a games night where they played "SET". In December, the Math Club co-hosted the End-of-the-Semester Christmas Party with the department faculty. This is a potluck luncheon during the finals week.

Patrick Coate, Alex Giffen, David Prier, Emma Stull, and Brian Meredith participated in the sixty-sixth annual William Lowell Putnam Mathematics Competition in December. Patrick was leading UD scorer!

In January, junior mathematics major **Alex Giffen** presented his research at the MAA poster session at the National Joint Mathematics Meetings in San Antonio, Texas. Alex's poster, "An Examinations of the Lights Out Game on Paths, Cycles, and Caterpillars," won a prize at the meetings. Alex's research is supervised by **Darren Parker**.

In February, **Rachel Bade, Nancy Buck, Christopher Cabanski, Megan Johns, Erin Landers, Jeremy Lynch, Dan Roberts,** and **Victor Velten** were inducted into Pi Mu Epsilon, the national mathematics honorary society. Pi Mu Epsilon invited the Pi Mu Epsilon National Past-President, Dr. Robert Smith, to speak at the banquet.

The fourth annual **Integration Bee** was held in conjunction with this year's Stander Symposium. More than 55 students participated this year. First place went to defending champion **Edward Timko**, second place went to **"Ong Bak": Elizabeth O'Gorman** and **Victor Velten**, and third place went to **"West Chester Ballers": Joe Stempky, Matthew Peters, and Michael Peters**. **Stephanie Edwards** continues to organize this popular activity. Although Stephanie was at home with her newly-born daughter Isabella and her son Eli on the day of the Bee, the rest of the department stepped in and pulled off the event.

The outgoing officers did an outstanding job this year. The officers were: **Mary Hickey**, Math Club President; **Matt Kocoloski**, Pi Mu Epsilon President; **Patrick Johnson**, Vice President; **Sarah Poe**, Secretary; **Paul Abdelnour**, treasurer. They organized a fund raiser this year and sold smart looking blue polo shirts with a UD logo above the phrase "Department of Mathematics." If you are interested to support Math Club, contact Vicki Withrow at Vicki.Withrow@notes.udayton.edu with your shirt size. They are selling for $30 per shirt.

Next year's student officers are:

MAA/Math Club President	**Nancy Buck**
Pi Mu Epsilon President	**Sarah Poe**
MAA/Math Club/PME Vice President	**Patrick Johnson**
MAA/Math Club/PME Secretary	**Christine Morgenthaler**
MAA/Math Club/PME Treasurer	**Chris Cabanski**

Math Club sponsored the **10th annual High School Mathematics Competition** on Saturday March 4, 2006. This continues to be an impressive undertaking. This year, **Mary Hickey,** Math Club President, coordinated the efforts to host the competition that included 123 participants from 6 high schools. Beavercreek High School fielded all three teams that placed. The students who helped out in preparation of, and during, the contest included: **Paul Abdelnour, Rachel Bade, Rob Broderick, Nancy Buck, Danielle Carleton, Robert Dence, Rick Henfling, Patrick Johnson, Matt Kocoloski, Jeremy Lynch, Sarah Poe, David Prier, Jon Prier,** and **Danielle Williams. Dr. Shannon Driskell** spoke to the students on "Geometer's Sketchpad." The Department of Mathematics, UD Food Services, and United Dairy Farmers co-sponsored the event.

Joanne Sklodowski was named to the Atlantic 10 Commissioner's Honor Roll for the Fall 2005. She is honored as a student-athlete (Rowing) in the Atlantic 10 with a 3.5 GPA or better.

THE BRO. JOSEPH W. STANDER SYMPOSIUM & HONORS CONVOCATION

The 18th annual **Brother Stander Symposium** illustrated that the Symposium and Honors Convocation has blossomed. This year, Jane Goodall served as the keynote speaker. In addition to posters and performances, the symposium boasted panels, presentations and other venues. The Department of Mathematics continues to contribute with Integration Bee (see above), and the noontime session on Mathematics through Origami. We served pizza, chips and soda to the Bee and Origami participants.

Students participated actively in the popular Poster Session. Their names and poster titles are given below. The wide range of topics illustrates the many interests and double majors of the current group of students.

Undergraduate:

Chris Cabanski, *Forbidden Pebbling Numbers;*

Angela Caracciolo, *Analysis of Differentiated Instruction's Effectiveness and Ease of Implementation;*

Alexander Giffen, *An Exploration of the Lights Out Solitaire Game on Paths, Cycles, and Caterpillar Graphs;*

Patrick Johnson, *Transport Characterization of Semiconductors*;

Matthew Kocoloski, *A Review of Energy Harvesting Potential*;

Mary Hickey and **Jeremy Lynch**, *Modeling the Cost of Evolutionary Intermediates Using Graph Theory*;

Jeremy Lynch, *The Effect of Gaze Direction on the Assessment of the Likeability of an Individual;*

Graduate:

Ran Huang, *Advanced Financial Option Pricing;*
David Martin, *Advanced Financial Package for Excel;*
Masako Yatsuki, *Implied and Realized Volatility for Soybean Option.*

AWARDS

The recipient of the 2006 Faculty Award for Excellence is **Matt Kocoloski.** Matt was a double major: mathematics and mechanical engineering. He wrote a Berry Scholars Thesis with Dr. Hallinan (Mechanical Engineering) entitled "A Review of Energy Harvesting Potential." He presented his work to the mathematics faculty in a colloquium. The abstract of his colloquium is found at http://www.udayton.edu/~mathdept/ . Click on Colloquium (at the top of the page) and then click on talks from previous semesters at the bottom of that page.

The 2006 Pi Mu Epsilon Award recipient is **Christopher Cabanski**. This is an award for excellence among second year students in mathematics. Chris is working on an Honors thesis in pebbling on graphs under the direction of Aparna Higgins.

The 2006 Brother Joseph W. Stander, S.M., Award of Excellence in Mathematics Education recipient is **Kenneth Lee Barrett.** This award for excellence goes to a graduating senior in the teacher licensure program with a principal teaching field in mathematics.

David Prier (who majored in mathematics and religious studies) received several honors this year. He is the recipient of this year's Rocco M. Donatelli Award as the senior humanities student with the strongest quantitative and qualitative record in science courses. He received the Maureen E. O'Rourke Award as the senior who lives and practices the aspects of Marianist charism. Finally, he received this year's William

Joseph Chaminade Award of Excellence as the outstanding undergraduate student in theology. David was also UD's nominee for the Jack Kent Cooke Foundation Graduate Scholarship. A university can nominate at most one candidate per year; the scholarship is meant to assist outstanding individuals meet their potential. The criteria for the award include academic ability and achievement, unmet financial need, leadership and public service, appreciation or participation in the arts or humanities.

GRADUATE ACTIVITIES

David Martin (04) and **Masako Yatsuki** earned the Master's degree in Financial Mathematics (MFM) in May. **Ran Huang** is expected to earn her MFM degree in August. This marks the first graduating class of the new MFM program. **David** wrote a Math Clinic project entitled: An Advanced Financial Analysis Toolkit for Excel. **Masako** worked with **Pete Hovey** and **Ruihua Liu** and wrote a Math Clinic project entitled: Implied and Realized Volatility for Soybean Option. **Ran** has worked with **Ruihua Lui** and wrote a Math Clinic project entitled: FFT and Moment Match Based VUL Rider Pricing.

Ran spent the summer of 2005 as an intern with Nationwide Financial in Columbus. Her Math Clinic project began with her work with Steve Ginnan who served as her supervisor at Nationwide. The Department of Mathematics has recently submitted a proposal to the NSF which has an initiative to strengthen research connections between academics and industry. The concept of the proposal was based on Ran's experience with Nationwide. The graduate student, as an intern, is introduced to a problem posed by industry. The student serves as the focal point of a research team that contains the student, a corporate research advisor and an academic research advisor.

PLANS OF RECENT GRADUATE

Paul Abdelnour will begin work as an actuary with Perrin-Towers in Detroit in June.

Brian Bisignani will teach mathematics in the high schools.

Lubomir Bogdanov seeks a career as a soccer player.

Eric Bozymski will teach mathematics in the high schools.

Erin Collins will work for a law firm in Dayton. She intends to enter law school after one year.

Mary Hickey will begin a Ph.D. program in statistics at Ohio State University in June.

Matt Keck will work for a year before deciding on graduate school.

Matt Kocoloski will begin a Ph.D. program in engineering and public policy at Carnegie Mellon University this fall. He envisions kicking back this summer.

Jeremy Lynch will return to Rochester, N.Y. and anticipates working in a hospital environment.

Jeff Neugebauer will begin graduate study in the applied mathematics program at UD this fall.

David Prier will begin a Ph.D. program in mathematics at Auburn University this fall.

Emma Stull will study in a graduate program in statistics at the University of Cincinnati. She accepted an internship with Buck Consulting in Cincinnati.

Masako Yatsuki accepted a position with Honda in Marysville, Ohio.

Justin Zrenner will take a year away from school and then look for graduate programs in English.

ALUMNI NEWS

Bill Scharf (68) continues to stay in touch. He came to town the first weekend of December to get his annual date with the UD Flyers at the Arena. He came over to the Department on Friday. We enjoyed lunch at Milanos which has relocated to a new location on Brown Street.

Frank Lad (70) sends greetings from Christchurch, New Zealand where he serves as a Research Associate in the Department of Mathematics and Statistics at the University Canterbury.

Lawrence Bommarito (75) and his wife Josie live in Kirkwood, MO with their children Daniel, Patrick, Timothy and William. Lawrence is an institute administrator for Saint Louis University.

Diane Wendeln Schulte (75) lives in Burke, VA. She was recently named Vice President for Mitre Corporation, for whom she has worked since 1983. She now heads the company's Center for Enterprise Modernization which operates the IRS's federally funded research and development center. She recently completed the Advanced Management Program at the Harvard Business School.

John Nash (82) lives with his family in Thailand where he is employed in the computer industry. John's mother passed away this year. Several of us enjoyed visiting with John who had returned to Dayton for her funeral.

Rafe Donahue (87) and his family have moved from North Carolina to Nashville, TN. Rafe has moved to a position as a Research Associate Professor at Vanderbilt University. He works in the Department of Biostatistics in the Section of Surgical Sciences in the Vanderbilt University School of Medicine.

Beth Arnold (88) teaches high school mathematics in Greenville OH. She is a regular participant in the summer institutes in physical science and mathematics for secondary school teachers that are implemented by **Becky Krakowski** and Beth Basista of Wright State University.

Don Duckro (90) completed a Ph.D. in statistics at the Air Force Institute of Technology (AFIT) in 1999. He currently serves as an Assistant Professor of Statistics in the Department of Mathematics and Statistics at AFIT.

Eric Kaufmann (91) attended the SEARCDE meeting in October with several colleagues and students from the University of Arkansas at Little Rock.

Barbara (Buck) Kowalcyk (91) recently moved with her family to OH in the Cincinnati area. She is active in national health awareness issues and had served as a biostatistician at the University of Wisconsin.

Chikako Mese (91) and Karen Jones have recently been joined by twins, Kei Leigh Mese-Jones and Miya Elise Mese-Jones, who were born on January 15, 2006.

Kristen Lampe (93) was on campus in November 2005. She served as a plenary speaker at this year's Undergraduate Mathematics Day. The paper she delivered can be found at http://academic.udayton.edu/EPUMD/.

Amie Gill Wood (96) and her husband, Michael, announce the birth of Kyle Edward who joins brothers Joshua and Ryan at their home in Wadsworth, OH.

Nick Kuprowicz (96) earned a Ph.D. in mechanical engineering at UD in May, 2006. His dissertation title is "A Predictive Modeling Approach to Simulate Liquid-Phase Oxidation and Deposition of Jet Fuels." Nick is employed by the Air Force Research Lab in Dayton.

Geoff Dietz (00) and his wife **Amber** (CHM, 00) announce the birth of Joseph Karl Dietz. Geoff has completed one year of a three-year post-doc at Oklahoma University, and he has accepted a tenure-track position at Gannon University in Erie, PA, starting this fall. He has also been selected as a 2006-07 Project NExT Fellow.

Curtis Schultz (01) is a Senior Associate for Buck Consultants, An ACS Company in Cincinnati. He keeps the Department informed with actuarial opportunities for students and alumni.

Todd Sarver (01) earned a Ph.D. in Economics from Boston University. He has accepted a position in the Department of Economics at Northwestern University.

Youssef Dib (02) continues to work on a Ph.D. in mathematics at the University of Louisiana. He attended the SEARCDE meeting in October.

Julia Tosi (02) completed Law School at the Ohio State University. She has completed her first year as an attorney. She now lives in Cleveland.

Marriette Maroun (03) will earn a Ph.D. in mathematics at Baylor University in August, 2006. She attended the SEARCDE meeting in October. She has accepted an offer at the University of Louisiana at Monroe.

Ruth Hinde (05) teaches mathematics and religion to 6th, 7th and 8th graders in St. Petersburg FL. In addition, she is a middle school coach for soccer and for volleyball.

Chunlei Zhang (05) earned a Ph.D. in electrical engineering from UD in May, 2006. His dissertation title is "Numerical Optimization and Perturbation Based Extremum Seeking Control and Applications". Chunlei has been employed by Applied Materials. He and his spouse, **Ran Huang** (06) have recently relocated to the Bay area in California. In June, Chunlei and Ran ran into **Muhammad Islam** and his family as they vacationed in California.

UD BRUNCH IN SAN ANTONIO

We had a great time at the winter meetings in San Antonio and we had a great time at the UD brunch. We brunched at the historic Menger Hotel and brunch included: **Youssef Dib** (02), **Stephanie Edwards, Paul Eloe**, **Bill Friel**, **Alex Giffen** (07), **Stephen Hartke** (99), **Colleen Hoover** (91), **Eric Kaufmann** (91), **Bob Lewand** (66), **Mariette Marioun**

(03), **Darren Parker**, and **Youssef Raffoul** (87, 89).   Regulars, **Aparna Higgins** and **George Lang** (66) could not join us. **Kelly Chambers Barrett** (86) who lives in Austin made efforts to join us. Unfortunately, due to a screw up once we were in San Antonio, Kelly did not learn of the final arrangements.

IN MEMORIAM

Julie Rice (57) passed away on March 8, 2006. Julie is survived by her husband, **Ben Rice**, long time faculty member and Professor Emeritus. She is survived by four sons, John (85), Tim (88), Patrick (89), and Rob (90), and by 13 grandchildren. She is preceded in death by son Mark (94). Julie has always been very active in parish life, most recently with St. Francis of Assisi Parish in Centerville. She was very active in UD related groups during Ben's tenure, and more recently she has been active in the Life-Long Learning Institute at UD. We will always remember Julie for her zest for life and we will miss her dearly at the Math Department get-togethers.