

6-2012

Math Department Newsletter, 2012

University of Dayton. Department of Mathematics

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Recommended Citation

University of Dayton. Department of Mathematics, "Math Department Newsletter, 2012" (2012). *Department of Mathematics Newsletters*. Paper 4.
http://ecommons.udayton.edu/mth_newsletter/4

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CHAIRPERSON'S MESSAGE

The College of Arts and Sciences continues to recognize the outstanding faculty of our department. This year Dr. Ruihua Liu won the College of Arts and Sciences Award for Outstanding Scholarship and Mr. Les Steinlage won the College of Arts and Sciences Award for Outstanding Contributions by a Non-Tenure Track Faculty Member. Dr. Liu has made significant contributions to the field of financial mathematics and is viewed by experts in this field as an eminent researcher. His publications appear in top journals. Mr. Steinlage has been associated with the University of Dayton for over 50 years, as a student, a part-time instructor, and a lecturer. He is our invaluable supervisor of the business mathematics sequence (MTH 128 and 129), teaching 4 sections each semester and one in the summer, helping organize extra study sessions for struggling students, and giving aid and advice to part-time instructors or new teachers of these courses. I appreciate the contributions of these two faculty members, and indeed all of our faculty members, in making this a great department.

On a more bitter-sweet note, we are saying goodbye to Gerald Shaughnessy, who retired this May. Gerry had a long career of working for the Department, having joined UD in 1967. While here he became an expert in quality control. He worked with the UD Research Institute as well as area industries and national organizations. He will continue to help develop the Probability Test for the Society of Actuaries. We wish him the best in his retirement and look forward to seeing him from time to time in his new role as Professor Emeritus.

Two more of our faculty members move into new roles in 2012. We are pleased to say that Dr. Arthur Busch was granted tenure and promotion to Associate Professor. We are also proud to announce that Dr. Wiebke Diestelkamp assumed office as President of the Ohio Section of the MAA.

Finally, I would like to ask for your assistance. More and more of our students, both undergraduate and graduate, are looking for careers outside of academics. We would love to be able to direct these students towards internships which can give them job experience before they try to enter the competitive arena of the job market. If any of you are aware of summer internships for which our students can apply I would greatly appreciate your passing that information along to me. Thanks. I wish the very best for you until next year.

Joe Mashburn

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 and graduate student travel. Your support is appreciated, and we purposefully use it to support the educational experience at UD.

The University Development Office reports that the following people made valuable donations to the Department of Mathematics during 2011:

Mr. and Mrs. Greg Bishop (86)	Mr. and Mrs. James Booth (83, 11)
Mr. and Mrs. William Brockman (61)	Mr. and Mrs. Joseph Chmiel (69)
Mr. and Mrs. Paul Eloe	Marla Gross (90)
Colleen Galligher Hoover (91)	Mr. and Mrs. Donald Kavalunas (65)
Mr. and Mrs. David Kramer (68)	Melvin Kuhbander (56)
Mr. and Mrs. Patrick MacVeigh (79)	Christine Mitchell (72)
Mr. and Mrs. George Morrison (82)	Mr. and Mrs. Charles Mott (61)
Jane Pendergast (74)	Timothy Rice (88)
William Scharf (68)	Mr. and Mrs. Richard Segers (50)
Robert Springer (77)	Mr. and Mrs. Philip Vukovic (62)

The following corporations and foundations provided matching gifts:

The Abbott Fund	Cytology Pathology Services, Inc.
Fidelity Charitable Gift Fund	Hewitt Associates LLC
IBM Foundation	The Procter & Gamble Fund
Towers Perrin Co	Fidelity Charitable Gift Fund

MATH EVENTS AT UD

Through generous contributions to the Kenneth C. Schraut Memorial Lectureship fund and to the department's restricted funds, our alumni have enabled us to host the annual *Math Events* which features the Kenneth C. Schraut Memorial Lecture. Since 2002, the Schraut Lecture has anchored *Math Events* annually. 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.

THE 12th ANNUAL KENNETH C. SCHRAUT MEMORIAL LECTURE, 11/5/2011

Dr. Jeffrey Diller (88), Professor at the University of Notre Dame, delivered the 12th annual Kenneth C. Schraut Memorial Lecture to a diverse audience with high school students, undergraduate and graduate students and faculty members. **Courtney Perkins** (12) provided introductory remarks and introduced Jeff. Thank you, Courtney.

Jeff spoke on “Imaginary numbers, unsolvable equations, and Newton’s method.” He spoke on Newton Basins (without giving away any punchlines) giving an informative and amusing history. He provided many interesting examples with excellent computer graphics. More than once, he stressed the importance to learn to program and then would delight the audience with an extraordinary Julia set.

UNDERGRADUATE MATHEMATICS DAY November 5, 2011

The Schraut Memorial Lecture once again anchored Undergraduate Mathematics Day (UMD). This is now the fifth such undergraduate mathematics conference hosted at UD and once again, the conference received funding from the National Science Foundation through the Mathematical Association of America.

In addition to the Schraut Memorial Lecture, Judy Holdener of Kenyon College delivered an invited address entitled “Perfect and abundant numbers – a perfect and abundant source for undergraduate research projects.” Judy earned her undergraduate degree at Kent State University and she continues to keep in touch with her favorite professor, **Joe Diestel** (64). So, although Judy could not share Doc Schraut stories with us, she did share a few enjoyable Joe Diestel stories. Judy was introduced by **Lydia Kindelin** (13). Thank you, Lydia.

Twenty-eight contributed papers were delivered. UMD is an opportunity for students (primarily UD students) to participate in a mathematics conference. In addition to UD students presenters, we had presenters from Kenyon College, the University of Notre Dame, Fort Lewis College (Colorado), Millikin University, Wright State University, the University of Toledo, Ohio Northern University, Sinclair Community College, Central State University and Fairmont High School.

The conference was supported by alumni (primarily through the Schraut Memorial Lecture fund) and a grant administered by the Mathematical Association of America from the National Science Foundation, DMS-0846477. In addition, the Dean of the College of Arts and Sciences, Dr. Paul Benson, graciously provided financial support and our own chair, Dr. Joe Mashburn, generously donated from the department’s restricted fund, a fund that is replenished by annual donors. So, again, thank you for your interest and your support. You can find the program and abstracts for talks and all other information about UMD 2011 at <http://academic.udayton.edu/MathEvents/>.

AN INVITATION TO THE 26th BIENNIAL ALUMNI SEMINAR ON CAREERS IN MATHEMATICS, 11/10/2012

You are invited to participate in *Math Events 2012*, which will take place on Saturday, November 10, 2012. This year’s program will consist of the *12th Annual Kenneth C. Schraut Lecture* and the *25th Biennial Alumni Seminar on Careers in Mathematics*. We are pleased to announce that **Dr. Lilian Wu** has graciously accepted the invitation to serve as the *12th Kenneth C. Schraut Memorial Lecturer*; undoubtedly, she will also be asked to serve as a panelist on this year’s Career Panel.

Dr. Wu is Program Executive, Global University Programs, IBM Technology Strategy and Innovation and a research scientist. She is currently Chair Emeritus of the National Academies of Science, Engineering, and Institute of Medicine's National Research Council Committee on Women in Science, Engineering, and Medicine and is a Councilor of the Association for Women in Science (AWIS). She is a member of the S&E Workforce Committee of the Government-University-Industry Research Roundtable of the National Research Council; and a member of NSF's Advisory Committee on International Science and Engineering and NSF's Corporate Alliance.

She received her PhD in Applied Mathematics from Cornell University and an Hon LHD (Honorary Doctor of Humane Letters) from Marymount College. Her major research interests are analysis of technology enabled and people intensive complex systems, particularly in the services sector. She is also a member of the Board of Trustees of the New School University and Fordham University in New York City, and the President's Council of Olin College.

She was a member of President Clinton's Committee of Advisors on Science and Technology (PCAST), NSF's Committee on Equal Opportunity in Science and Engineering and served on the Advisory Committee of NSF's Engineering Directorate. Among her other professional services, she served on AAAS's Committee on Public Understanding of Science and Technology and DOE's Secretary of Energy's Laboratory Operations Advisory Board.

Pete Hovey, phovey1@udayton.edu, is organizing this year's career seminar. Currently, there is no further information; in general, the most current information can be found at <http://academic.udayton.edu/MathEvents/>.

FACULTY UPDATE

Full Time Faculty

Atif Abueida, 2000
Art Busch, 2006
Wiebke Diestelkamp, 1998
Shannon Driskell, 2003
Paul Eloë, 1980
Bob Gorton, 1969
William Harrison, 2009
Aparna Higgins, 1984

Peter Hovey, 2001
Muhammad Islam, 1985
Virginia Keen, 2007
Becky Krakowski, 2000
Ruihua Liu, 2004
Joe Mashburn, 1981
Shirley Ober, 1977
Maher Qumsiyeh, 2008

Youssef Raffoul, 1999
Paula Saintignon, 1983
Gerry Shaughnessy, 1967
Julie Simon, 2010
Les Steinlage, 1969
Muhammad Usman, 2007
Lynne Yengulalp, 2009

Part Time Faculty

Lisa Alexander, 2010
Brett Bush, 2011
Karen Connair, 2010
Mark de Saint-Rat, 2011
Cheryl Edelmann, 1999

Robert Finnegan, 1985
Bob Flavin, 2008
Steve Fuchs, 2005
Susan Holloway, 2011
John Loomis, 2007

Scott Mitter, 2001
Donovan Ross, 2008
Larry Schmitt, 2011
Ed Wingham, 2011
Sam Wright, 2011

Professors Emeriti

Stanley Back, 1998
Bill Friel, 1999
Tom Gantner, 2001
John Kauflin, 2006

Jack McCloskey, 2001
Harry Mushenheim, 2006
Jerry Neff, 1999
Richard Peterson, 1998

Ben Rice, 1998
Carroll Schleppe, 2001
Ralph Steinlage, 2001
Jerry Strange, 1999

FACULTY ACTIVITIES

Atif Abueida co-authored (with J. Lefevre and M. Waterhouse) “Equitable edge colored Steiner Triple Systems,” *Australasian Journal of Combinatorics*, 50, 153-161. He presented “The spectrum of non-polychromatic equitable edge colored Steiner Triple Systems” at the Canadian Discrete and Algorithmic Mathematics Conference held at the Fields Institute of the University of Victoria.

Arthur Busch was invited to present “Ramsey-type Numbers for Degree Sequences” at the 2011 Joint Mathematics Meetings in New Orleans. He also co-authored the reports “Induced/distance-k matchings and min-max relations” and “Largest induced matching: computation and min-max relations”. The first of these was presented by R. Sritharan (of UD’s Department of Computer Science) at the Fifth Workshop on Graph Classes, Optimization, and Width Parameters held in Daejeon, South Korea. The second was presented by R. Sritharan at the Canadian Discrete and Algorithmic Mathematics Conference held at the Fields Institute of the University of Victoria. Dr. Busch was also granted tenure and promoted to Associate Professor.

Wiebke Diestelkamp co-authored (with C.M. Krane and M.F. Pinnell) “Design of a factorial experiment with randomization restrictions to assess medical device performance on vascular tissue,” *BMC Medical Research Methodology*, 11(75), 1-6. She was the project statistician for “Tissue Welding Assessment,” a contract funded by Ethicon Endo-Surgery, PIs Carissa Krane (BIO) and Margaret Pinnell (MAE). The team of PIs consisting of Kim Bigelow (MAE), Wiebke Diestelkamp (MTH), Carissa Krane (BIO) and Margaret Pinnell (MAE) won the grant "Multi-disciplinary STEM Grant Preparation Support in Bioengineering" funded by NSF ADVANCE – LEADER. Wiebke reviewed the book "Design of experiments: An introduction based on linear models" by Max Morris for MathSciNet and she delivered the workshop "Advising undergraduate mathematics students" for the incoming 2011-12 Project NExT Fellows at the Project NExT Workshop in Lexington. In April 2012, Wiebke began her one-year term as the President of the Ohio Section of the Mathematical Association of America. She continues her work as Equity Advisor for the LEADER Consortium (funded by NSF ADVANCE) to improve the recruitment, retention and advancement of women in STEM fields at the four consortium institutions.

Shannon Driskell was co-author of “Research in mathematics educational technology: Current trends and future demands” and “Prospective teachers’ use of representations in solving statistical tasks with dynamic statistical software”, both published by the North American Chapter of the International Group for the Psychology of Mathematics Education. She also co-authored “Using calculators for teaching and learning

mathematics” which appears at the National Council of Teachers of Mathematics website <http://www.nctm.org/news/content.aspx?id=31192>. Dr. Driskell was co-author and co-presenter of the following talks: “Preparing teachers to integrate technology in teaching mathematics: What the research tells us” at the Association of Mathematics Teacher Educators 15th Annual Conference held in Irvine, CA; “Geometry and PreCalculus Investigations using GeoGebra” at the 61st Annual Ohio Council of Teachers of Mathematics Conference held in Toledo, OH; “Research in mathematics educational technology: Current Trends and future demands” at the 33rd Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education held in Reno, NV; “Interactive geometry in more dimensions using Google SketchUp” at the Annual Meeting of the National Council of Teachers of Mathematics held in Indianapolis, IN; “Creating a framework to examine mathematics teachers’ exploratory data analysis” at the Research Pre-session of the Annual Meeting of the National Council of Teachers of Mathematics held in Indianapolis, IN; “Prospective teachers’ use of representations in solving statistical tasks with dynamic statistical software” at the 33rd Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education held in Reno, NV; “Research in mathematics instructional technology: Current trends and future demands” at the 15th Annual Conference of the Association of Mathematics Teacher Educators held in Irvine, CA.

Paul Eloë co-authored several articles including (with F. Atici) “Two-point boundary value problems for finite fractional difference equations”, *JDEA*, 17 (2011), No.4, 445-456 and “Linear systems of fractional nabla difference equations”, *Rocky Mountain Journal of Mathematics*, *Rocky Mountain Journal of Mathematics*, 41 (2011), pp. 353-370, (with J. Henderson) “Uniqueness implies existence and uniqueness conditions for a class of $(k+j)$ – point boundary value problems for n th order differential equations”, *Mathematische Nachrichten*, 284 (2011), No 2-3, 229–239, and “Optimal Intervals for Uniqueness of Solutions for Nonlocal Boundary Value Problems”, *CANA*, 18 (2011), 89-97, with (N. Asif and R. Khan) “Existence of positive solutions to a singular system of boundary value problems”, *Dynamics of Continuous and Impulsive Systems, Series A: Mathematical Analysis* 18 (2011), 353-361 and (with M. Rehman and R. Khan) “Positive solutions of nonlocal boundary value problem for higher order fractional differential system”, *Dynamic Systems and Applications*, 20 (2011), pp 169-182. He continues serving as the departmental graduate program director and this year he has taken on new responsibilities as co-editor in chief of *Fractional Differential Calculus*, a fairly new *Ele-Math* journal.

Aparna Higgins continued her term as Director of Project NExT (New Experiences in Teaching, a professional development program of the MAA for new faculty). In 2011, for the first time in its eighteen years, Project NExT conducted a search to fill two positions on the Project NExT Leadership Team, as part of the limited-term appointment that the MAA envisions will make Project NExT more in line with other MAA programs. The MAA has also promised to sponsor a fixed number of Project NExT Fellows for the next three years, thus making the job of selecting Project NExT Fellows independent of renewals from external funders. Such changes are always

exciting and challenging, and Aparna is learning to both enjoy them and cope with them! Aparna continues to be involved with undergraduate research at the national level, delivering minicourses on how to get started with undergraduate research, and being part of an organizing team for a conference of undergraduate research directors (sponsored by grants from the NSF and the NSA) to be held in the fall of 2012. In 2011, Aparna gave talks about pebbling and undergraduate research at the Carleton Summer Mathematics Program, at the annual meeting of the Metropolitan New York Section of the MAA, and at the Pi Mu Epsilon Ohio Zeta Chapter Initiation (that's UD's chapter!). In addition to the usual joys of teaching mathematics courses at UD, Aparna had a special treat this year -- a talented high school senior took classes with her (and others in the department) in both semesters. Aparna helped this student prepare and present a talk at Undergraduate Mathematics Day.

Peter Hovey co-authored (with D. Eustace and V.K. Indupuru) "Identification of Risk Factors Associated with Motorcycle Related Fatalities in Ohio", *ASCE Journal of Transportation Engineering*, 136 (7), 437-480. He also co-authored (with F.R. Smith, T.R. Boehnlein, P.C. Miedler, and A.P. Berens) the following technical report: "Probability of Failure Aging Aircraft Risk Analysis Update (PRoF v.3.1)", "Probability of Failure COM Manual (PRoF v.3.1)", and "Probability of Failure User's Manual (PRoF v.3.1)". Dr. Hovey co-authored (with D. Eustace, V. Griffin, and M. Chowdhury) and presented "Empirical Bayes Estimation of Roadway Improvements" in the poster session of the Joint Statistics Meeting held in Miami Beach, FL.

Muhammad Islam published "Periodic solutions of Volterra type integral equations with finite delay, *Communications in Applied Analysis*", 15 (2011), 57-68 and he published "Three fixed point theorems: periodic solutions of a Volterra type integral equation with infinite heredity", *Canadian Mathematical Bulletin*, doi: 10.4153/CMB-2011-123-5. He presented an invited lecture, "Bounded solutions of nonlinear Volterra integrodifferential equations" at the Sixth International Conference on Dynamic Systems and Applications in Atlanta in May, 2011 and he presented "Bounded solutions of almost linear Volterra equations" at the Southeastern Atlantic Regional Conference on Differential Equations in October.

Virginia Keen co-authored (with A. Rose) "The Pen Pal Partnership Project: Connecting Theory to Practice", *Journal of Urban Mathematics Education*, 4(2), 15-25. She presented "Transforming Instruction and Assessment Using Student-created Video" at the workshop "Turning Dreams into Reality: Transformations and Paradigm Shifts in Mathematics Education, The Mathematics Education into the 21st Century Project" held in Grahamstown, South Africa, and "Connecting Mathematics Learning with Teaching" at the Joint Mathematics Meetings held in New Orleans, LA. Dr. Keen was co-author (with K. Ertle and J.L. Bucher) and invited presenter of "Strengthening Mathematical Knowledge through Video Creation" at the Annual Meeting of the National Council of Teachers of Mathematics held in Indianapolis, IN. She was co-author (with K. Smethurst and S. Kleiner) and invited presenter of "Student-created Geometry Books for Kids: A Transforming Partnership" given at the Annual Meeting of the National Council of Teachers of Mathematics held in Indianapolis, IN.

Ruihua Liu co-authored (with **P. Eloe**) “Upper and Lower Solutions for Regime-Switching Diffusions with Applications in Financial Mathematics”, *SIAM, J. Appl. Math.*, 71 (2011), pp 1354-1373. He co-authored (with Q. Zhang) “Valuation of guaranteed equity-linked life insurance under regime-switching model”, *Dynamical Systems and Applications*, 20, 101-128, and contributed a chapter “Recombining Tree for Regime-Switching Model: Algorithm and Weak Convergence” to the book “Stochastic Analysis, Stochastic Systems, and Applications to Finance” published by World Scientific Publishing.

Maher Qumsiyeh co-authored (with **Kraig Kirchner (11)**) Estimation methods for missing data in un-replicated 2^k factorial and 2^{k-p} fractional factorial designs, *Journal of Statistics*, 4 (2011), 91-106. He also co-authored (with **Gerry Shaughnessy**) “Bootstrapping un-replicated two-level designs with missing responses, *Journal of Statistics: Advances in Theory and Applications*, 4 (2010), pp 91-106. This citation did not make last year’s newsletter so we print it here. He presented a poster at the Joint Statistical Meeting of the American Statistical Association in Miami in August.

Youssef Raffoul authored “Large Contraction and Existence of Periodic Solutions in Infinite Delay Volterra Integro-differential Equations”, *Journal of Mathematical Sciences: Advances and Applications*, 11(2), 69-77; “Classification of Positive Solutions of Nonlinear Systems of Volterra Integral Equations”, *Annals of Functional Analysis*, 2(2), 34-41; “Exponential Stability and Instability in Multiple Delay Differential Equations”, *International Journal of Mathematics Sciences and Applications*, 1(2), 120-134; “Inequalities and Exponential Decay in Time Varying Delay Differential Equations”, *Mathematical and Computer Modeling*, 54(2011), 794-802; “Positive Periodic Solutions in Neutral Dynamic Equations on a Time Scale”, *Nonlinear Studies*, 18(1), 75-85. He also gave the following presentations: “Necessary and sufficient conditions for uniform stability in Volterra systems of integro-dynamic equations on time scales” at the Fall Central Section Meeting of the AMS held in Lincoln, NE; “Classification of positive solutions of nonlinear systems of Volterra integro-dynamic equations on time scales” at the 31st Southeastern-Atlantic Regional Conference on Differential Equations held in Statesboro, GA; and “Positive periodic solutions in neutral equations on time scales” at the Spring Southeastern Meeting of the AMS held in Statesboro, GA.

Muhammad Usman co-authored (with **P. Eloe**) “Fully Nonlinear Boundary Value Problems with Impulse”, *EJQTDE*, 21 (2011), pp 1-11; (with S.T. Mohyud-Din and A. Yildirim) “Homotopy Analysis Method for Fractional Partial Differential Equations, *International Journal of the Physical Sciences*, 6 (2011) (1), 136-145; (with I. Rivas and B.-Y. Zhang) “Global Well-Posedness and Asymptotic Behavior of a Class of Initial-Boundary-Value Problems of the KdV Equation on a Finite Domain”, *Mathematical Control and Related Fields*, 1 (2011) (1), 61-81; (with Amit Singh) “A New Undergraduate Curriculum on Mathematical Biology at the University of Dayton”, *Journal of STEM Education*, 12 (2011) (5&6), 58-66; and (with A. Yildirim and S.T. Mohyud-Din) “A Reliable Algorithm for Physical Problems”, *International Journal of Physical Sciences*, 6 (2011) (1), 146-153. He was invited to speak on “Development of

Interdisciplinary Mathematical Biology Course at the University of Dayton” at the Ohio NEXT Workshop held at Findlay, OH. He also presented “A Study of Bifurcations in Steady State Solutions of the Forced Kuramoto-Sivashinsky Equation” at the Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory held in Athens, GA.

Lynne Yengulalp presented “non-normality points and beta X” at the Spring Topology and Dynamical Systems Conference held at Tyler, TX, and at the Spring AMS Southeastern Section Meeting held at Statesboro, GA.

AWARD CITATION

We are very pleased to announce that **Dr. Ruihua Liu** has received the 2011 Faculty Award for Outstanding Scholarship in the College of Arts and Sciences. **Lester Steinlage** (65), (69) has received College Non-Tenure Track Faculty Award.

Citation for Ruihua Liu
2011 Faculty Award for Outstanding Research
College of Arts and Sciences
April 19, 2012

The 2011 winner of the Award for Outstanding Scholarship in the College of Arts and Sciences is Dr. Ruihua Liu, Associate Professor in the Department of Mathematics. Professor Liu received his B.E., M.E., and Ph.D. degrees in Control Theory and Application from Nankai University in China. Founded in 1919, Nankai is consistently ranked among the top 10 universities in China. Its many distinguished alumni include two Nobel laureates in physics and the First Premier of the People’s Republic of China, Zhao Enlai. Professor Liu also holds an M.S. in Computer Science and a Ph.D. in Applied Mathematics from the University of Georgia. He has been at the University of Dayton since 2004.

Professor Liu is a core faculty member in the Professional Science Masters (PSM) program in Financial Mathematics. His research interests include operations management, stochastic control and optimization, and computational finance. Beginning as a collection of applied mathematical techniques in macroeconomics and microeconomics, financial mathematics has evolved over the past 50 years to become the quintessential systematic study of financial risk management. Because of the complexity of market forces, which include the murky world of human decision making, those working in this field require an extensive mathematical and statistical background. Unlike theoretical developments in other scientific disciplines, those in financial mathematics are rapidly implemented in the financial sector due to its inherent volatility.

Professor Liu’s scholarly output is remarkable in scope and in quality. His articles have appeared in some of the most prestigious journals in the field, including the *International Journal of Theoretical and Applied Finance*, the *Journal of Applied Mathematics*, the *Journal on Control and Optimization*, and the *International Journal of Computer Mathematics*. His papers are included in the annual *Proceedings of the IEEE Conference on Decision and Control*, and he has given invited addresses at the University of

Cincinnati, Kent State University, Wayne State University, Florida International University, and the Stevens Institute of Technology, among others.

Dr. Liu's colleagues both here at UD and elsewhere recognize the exceptional quality of his scholarship. George Yin, Professor of Mathematics at Wayne State University, notes that his work on mathematical and computational finance has helped to develop pricing models and algorithms for various derivatives in European, American, and Asian stock and bond markets. Professor Yong Zeng of the Department of Mathematics and Statistics at the University of Missouri praises Dr. Liu's skill in applying stochastic calculus to the prediction of the well-documented "bull" and "bear" recursive business cycles.

In his letter of nomination for this award, Joe Mashburn, Professor and Chair of the Department of Mathematics, observes that Dr. Liu's articles appear in "journals [that] apply high standards for papers submitted for publication, which often creates delays in the referee process. This makes it even more impressive that Dr. Liu has been able to publish as many articles as he has. He is not submitting his work to outlets [that] provide quick publication, but rather to journals [that] scrutinize submissions and subject them to intense screening."

In summarizing Dr. Liu's research accomplishments, Paul Eloe, his colleague in the Department of Mathematics, refers to him as an "absolutely outstanding ... mathematician ... [who] has wonderful patience." For those of us who have ever struggled with mathematics, this last quality is most admirable.

For these accomplishments and others, the College of Arts and Sciences is pleased to present the 2011 Award for Outstanding Scholarship to Dr. Ruihua Liu.

Citation for Lester Steinlage
2011 Faculty Award for Outstanding Contribution by a Full-Time, Non-Tenure-Track Faculty Member
College of Arts and Sciences
April 19, 2012

The 2011 faculty award for outstanding contribution by a full-time, non-tenure-track faculty member in the College of Arts and Sciences is granted to **Lester J. Steinlage**, Lecturer in the Department of Mathematics.

For the last 51 years the University of Dayton has not seen a semester without Les Steinlage. Les began his UD career as an undergraduate in 1961. He graduated from the University of Dayton with a BS in mathematics in 1965 and with an MS in mathematics in 1969. He has been an instructor of mathematics all his professional life, having taught in Minster, at Chaminade High School, Oakwood High School, Sinclair and the University of Dayton. From 1969 to 2000 he taught part time for the University of Dayton, and in 2000 became full-time lecturer in the Department of Mathematics. During this time he has been a significant part of our department.

Les is our MTH 128/129 expert. He has guided the curriculum for these courses and impacted how they are taught. He has created an important bridge between the School of Business and the Department of Mathematics which informs us of the needs of their students and how we might best meet those needs. We rely on Les to choose quality texts for these courses and to set appropriate expectations for student outcomes.

Les's ability to reach the students in his classes cannot be overstated. Mathematics is not their favorite subject. Many have had negative experiences with it in high school and only want to end the ordeal as soon as possible. They are hard to motivate and a less dedicated teacher would soon give up on them. Their attitude towards mathematics and those who teach it is often reflected in the ratings that they give their instructors in the teaching evaluations. Les not only helps them to succeed in the course, but actually gets them engaged. He does this even with a heavy teaching load. Earlier in his career, Les routinely helped the Department of Mathematics cover its courses by teaching more than a full load. He would take on five or even six courses in a semester.

In 2000, before the age of SI instructors at UD, Les helped to initiate a program which offered tutoring and extra study sessions for at risk students. For the leaders of these groups he searches out students from his classes whom he believes have the ability to help their peers understand the material. These tutors benefit as much as the students that they help. This program is a crucial part of our attempt to make sure that the students can succeed in their mathematics courses. Les keeps tabs on these sessions and makes sure that the tutors know what to stress and what is giving the students particular trouble.

Les's experience with the courses and his understanding of the students in them make him an invaluable mentor for those who teach them for the first time. He is generous with his time and materials. We rely on part time instructors to cover a number of sections of these courses each term. I can send them to Les, confident that he will give them a thorough introduction to the courses. He will check on the new teachers during the semester as he is able, answer their questions and share with them from his expertise.

For these accomplishments, the College of Arts and Sciences is pleased to present the 2011 Award for Outstanding Contribution by a Full-Time, Non-Tenure-Track Faculty Member to Lester Steinlage.

RETIREMENT

Gerald Shaughnessy has announced his retirement as of May 15, 2012. Gerry remarkably served the University of Dayton as a faculty member for 45 years. His retirement citation follows.

CITATION

On the occasion of his RETIREMENT

GERALD SHAUGHNESSY

Gerald Shaughnessy has been an important part of the Department of Mathematics since joining us in 1967. Over the years Gerry established a solid reputation as a teacher of

statistics and as a consultant to a variety of committees and organizations both locally and nationally.

He became interested in the statistical aspects of quality control early in his career. This interest led him to team with Jack McCloskey in developing a short course on experimental design which was conducted at GM and other area industries. He also created MTH 547, Statistics for Experimenters, which remains a popular course for graduate students. His work with quality control and curriculum development has produced strong ties with the engineering programs, and Gerry has served on innumerable PhD committees.

Gerry's expertise in statistics and quality control also led to numerous consulting opportunities. His activities include work done for UDRI, WPAFB, and the Mound Laboratories. In 1988 he was appointed to a multi-year position as technical adviser to a national committee of the Institute of Environmental Science which worked to create standards for cleanroom work areas. Gerry served as head consultant for WPAFB on their project to find a replacement for halon. For this project Gerry had the pleasure of setting jet engines afire, then measuring the effectiveness of various chemicals at putting out the blaze. Gerry also served many years as a writer of test problems for the probability test given by the Society of Actuaries. Many novice actuaries have struggled over his challenging questions.

We will miss Gerry and his contributions to our department. We are pleased to know that he has achieved Professor Emeritus status and hope that we can still find him visiting the Science Center in the future.

SERVICE TO MATHEMATICS COMMUNITY

Wiebke Diestelkamp is the current President of the Ohio Section of the Mathematical Association of Ohio. She joins **J. William Friel, Thomas Gantner, and Aparna Higgins** as the fourth UD faculty member to serve in that role. Information published at the time of her nomination can be found in the Ohio Focus, the newsletter of the Ohio Section of the MAA (page 14). The newsletter is online at <http://www.jcu.edu/math/OhioFocus/FocusSpring2011.pdf>

ACTIVITIES OF UNDERGRADUATE STUDENTS

The **Math Club and Pi Mu Epsilon Chapter** of the University of Dayton (<http://academic.udayton.edu/mathclub/>) was very active this year. The officers were **Alyssa Lesko** (Math Club President), **Danielle Bott** (PME President), **Lydia Kindelin** (Vice-President), **Sara Jordan** (Secretary) and **Christina Haas** (Treasurer). **Maher Qumsiyeh** served as the faculty advisor for Math Club and **Lynne Yengulalp** served as faculty advisor for Pi Mi Epsilon. Drs. Qumsiyeh and Yengulalp will continue in their respective roles next year. Math Club kept an informative web page this year at <http://academic.udayton.edu/mathclub/>

Elections for officers for 2012-13 resulted in **Alyssa Lesko** being re-elected President of the Math Club, **Lydia Kindelin** elected as PME President, **David Fan** elected as Vice-President, **Carly Gross** elected as Secretary, and **Alan Rosanski** elected as Treasurer. It appears that a new officership was created; **Chester Lian** was elected as Webmaster. An informative web site is maintained at <http://academic.udayton.edu/mathclub/>

Remarkably, Math Club organized and hosted the **16th annual High School Mathematics Contest**, a tradition initiated by **Andrew Hetzel** (98) when he served as Math Club President. This year, 27 teams representing 5 different schools participated. The winners were:

1st Place: Bone Crushers, Walnut Hills High School, Cincinnati, Ohio

2nd Place: Rubber Duck Brigade, Walnut Hills High School, Cincinnati, Ohio

3rd Place: Alpha Omega, Carroll High School, Beavercreek, Ohio.

Wiebke Diestelkamp gave a presentation entitled "How to lie with statistics" to the participants during lunch.

The seventieth annual **William Lowell Putnam Competition** was held on the first Saturday of December. Five students, **Nick Fry**, **Lydia Kindelin**, **Chester Lian**, **Zi Ouyang**, and **Brandon Williams**, participated. We congratulate Chester who scored 21 and Brandon, who scored 11.

The formal induction ceremony for Pi Mu Epsilon, the national mathematics honorary society, was conducted on Thursday April 19th. The ceremony was quite nice this year. It included a banquet dinner and a presentation by **Arthur Busch** who spoke on tournaments. This year's inductees are:

David Fan, **Nick Fry**, **Carly Gross**, **Zi Ouyang**, **Alan Rozanski**, **Kathryn Schaber** and **Emily Stieknecker**.

The Ohio Section of the Mathematical Association of America hosts the Leo Schneider Student Team Competition at the Spring Meeting of the Ohio Section of the MAA. This year, the UD team consisting of **Chester Lian** and **Brandon Williams** won second place.

THE STANDER SYMPOSIUM

The **Stander Symposium** is a very special event at UD. We can't really even characterize the dates this year. Activities related to the Symposium were spread across several days. The Integration Bee and the posters sessions were held on Wednesday April 18. We enjoyed seeing **Diane Schulte (75)** and **Bob Bolz (66)** who were in town for a meeting with the Dean's Advisory Board. Student presenters this year included:

- **Alyssa Lesko**, Numerical Study of a Mathematical Model of IL-2 Adoptive Immunotherapy on Patients with Metastatic Melanoma
- **Jungmi Johnson**, Mathematical Study of the Foot and Mouth Outbreak Model
- **Karoline E. Hoffman**, Qualitative Study of an SIR Epidemic Model with an Asymptotically Homogeneous Transmission Function
- **Nicholas Haynes**, Comparison of Numerical Methods for Analysis of the Diffusion of Soluble Proteins Through Sensory Cilia
- **Michael Ciesa**, Infectious Disease Mathematical Modeling of the 2001 Foot and Mouth Outbreak
- **Brian Bradley**, Applying Genetic Programming to Develop a Rubik's Cube Solver
- **Ziqi Qiao**, Idiosyncratic Risks in Different Regimes and the Cross-section of Expected Stock returns
- **Jacob Rosen**, Minor League Baseball from 1998-2011: Tradition, Success and the Recession
- **Joshua Craven**, Numerical Investigation into a Computational Approximation of Bifurcation Curves
- **Christopher Yakopcic**, Stability Analysis of a Model for in Vitro Inhibition of cancer Cell Mutation
- **Junyao Zhang**, A Numerical Algorithm to Value an American Option
- **Dan Zhang**, A Synthesis of Finite Difference Methods and the Jump Process Arising in the Pricing of Contingent Claim
- **Tao Tian**, Option Pricing Based on Regime-switching Recombining Tree
- **Jieai Zheng**, Road Travel Time Estimation with GPS Floating Car Data
- **Daniell Bott**, Case Studies: The Experiences of Gifted Females in Mathematics

Integration Bee continues to be a popular event during the Stander Symposium. **Arthur Busch** and **Maher Qumsiyeh** organized this year's Bee. First place went to **Chester Lian**, who was on the winning team last year. Chester competed under the name, "Turtles." Second place went to the team, "ID 2.0," consisting of **Zi Ouyang** and **Derek Mirre**. This team, under the name "ID," took second place last year. We will need to mix it up a little for next year.

THE HONORS STUDENTS SYMPOSIUM

In recent years, the University Honors Program has been hosting the Honors Students Symposium. This year it was held on Friday afternoon, March 23, 2012. In the Stander Symposium, the vast majority of the students present their work in the form of a poster.

In the Honors Students Symposium, students present their work in the form of fifteen minute talks. This year three math majors participated.

Brian Bradley, *Applying Genetic Programming to Develop a Rubik's Cube Solver*

Danielle Bott, *Case Studies: The Experiences of Gifted Females in Mathematics*

Jacob Rosen, *Minor League Baseball from 1998-2011: Tradition, Success and the Recession*

AWARDS

The recipient of the 2012 Faculty Award for Excellence is **Brian Bradley**.

The recipient of the 2012 Award of Excellence in Support of Mathematics is **Lydia Kindelin**.

The recipient of the 2012 Brother Joseph W. Stander, S.M., Award of Excellence goes to **Courtney Perkins**. This award of excellence goes to a graduating senior in the teacher licensure program with a principal teaching field in mathematics.

The recipient of the 2012 Reverend Charles L. Collins, S.M., Award of Excellence is **Justine Raterman**. This award of excellence goes to an athlete for outstanding citizenship.

A co-recipient of the 2012 Carl I. Michaelis Scholarship Award is **Alyssa Lesko**. This award goes to a deserving junior or senior majoring in chemistry.

A co-recipient of the 2012 Caesar Castro Award of Excellence to a Sophomore for Outstanding Scholarship in the General Physics Lecture and Laboratory Sequence is **Zi Ouyang**.

PLANS OF RECENT GRADUATES

Danielle Bott plans to teach high school mathematics in the Dayton area. She student taught at Centerville High School.

Brian Bradley enters the workforce as an Air Force contractor. He will remain in the Dayton area.

Robert Deis will pursue a master's in financial mathematics degree at UD as part of the new Bachelor's Plus Master's program at UD.

Christina Haas will pursue a master's in financial mathematics degree at UD as part of the new Bachelor's Plus Master's program at UD.

Sara Jordan enters the workforce as a Project Coordinator for an IT firm in Indianapolis.

Erin Murphy plans to teach high school mathematics in the Cleveland area. She student taught at Stebbins High School.

Carla Nietfeld plans to pursue a graduate degree in economics.

ACTIVITIES OF GRADUATE STUDENTS

Ahlam Alraddadi (May 12) earned the MFM degree. She worked with **Wiebke Diestelkamp** and wrote a math clinic project entitled "Modeling volatility in financial time series: ARCH and GARCH models." Ahlam will return with her family to their home in Madina, Saudi Arabia.

Willy Balbach (May 12) earned the MAS degree. He worked with **Atif Abueida** and wrote a math clinic project entitled "Decomposition of complete multipartite graphs into the graph pair of order 4." Willie plans to relocate to the Chicago area.

Wesley Jones (May 12) earned the MAS degree. He worked with **Youssef Raffoul** and wrote a math clinic project entitled "Exponential stability and instability via Lyapunov functionals."

GRESHAM RISK INSTITUTE

Robert Geiger (81), CEO of Gresham Risk Partners, contacted the Department of Mathematics during the summer of 2011 to initiate the development of a risk institute at the University of Dayton. The concept has developed over the past year. A UD student has been to New York to serve an internship. A dedicated room for UD student interns with five dedicated computers is maintained in the Science Center. This summer, a financial engineer with Gresham Risk Partners will deliver a case studies course in financial modeling for the Master's in Financial Mathematics Program.

The mission statement for the institute follows. It is a work in progress; it is off to a good start.

Mission Statement

The **Gresham Risk Institute** (GRI) is a partnership between Gresham Risk Partners and the University of Dayton created to promote holistic risk management through the collaboration of academic and professional risk experts.

GRI will provide a platform for students, academicians, risk practitioners and chief risk officers to exchange ideas on both theory and practical implementation of financial risk management. GRI will seek to provide exchange and learning opportunities for risk professionals, with a view to promote excellence and enhance risk management best practice. GRI will provide educational and research opportunities for students as well as practical experience; GRI will provide theoretical and applied research opportunities for faculty.

ALUMNI NEWS

Joe Coyle (93) is an associate professor at Monmouth University in New Jersey. He has served as co-chair of the Department of Mathematics; currently he serves as Director of the Graduate Program in Financial Mathematics, a new graduate program.

Geoff Dietz (00) is currently a faculty member at Gannon University in Erie, PA, where he earned tenure and promotion to Associate Professor. He and Amber (00, BS CHM) happily announce the birth of their fourth child, Julia, on November 13, 2011. Geoff can be reached at dietz005@gannon.edu

Jeff Neugebauer (06, 08) has completed his first year as an assistant professor at Eastern Kentucky University. He visited UD in March and delivered a colloquium to the faculty and graduate students.

Christopher Cabanski (07) defended his Ph.D. dissertation on Tuesday March 27. He earned a Ph.D. from the Department of Statistics and Operations Research, University of North Carolina. He wrote his dissertation on “Statistical Methods for Analysis of Genetic Data”. He has accepted a position as Postdoctoral Research Associate at the Genome Institute and Washington University School of Medicine in St. Louis.

Dan Roberts (07) earned a Ph.D. in mathematics from Auburn University. He has accepted a position at Illinois Wesleyan University.

Veronica Respress (09) lives with her two sons in Cleveland Georgia where she now serves as an assistant professor at Truett-McConnell College.

Craig Birkemeier (11) landed a teaching position at Sinclair Community College.

OBITUARY

Dr. John E. Orban (74)

ORBAN Dr. John E. Orban, 60, of Columbus, entered into eternal rest Saturday, April 21, 2012. He was born January 22, 1952 in Cleveland, Ohio the youngest of five children. John was a 1970 graduate of St. Ignatius High School in Cleveland. He received his Bachelor's Degree from the University of Dayton and his Ph.D. from The Ohio State

University in 1978. John worked for the National Institute of Standards and Technology in Gaithersburg, MD and taught at the University of Binghamton before gaining employment at Battelle Memorial Institute where he retired as the manager of the Statistics and Information Analysis group after 26 years. He was an elected fellow of the American Statistical Association. John was a member of St. Joan of Arc Catholic Church, where he sang in the choir and was an active member of the Men's Club. John enjoyed spending time with his family and friends. His passion in life was playing golf. Preceded in death by his parents Alex and Elizabeth Orban and sister-in-law Kathleen Orban. John will be missed by his loving wife of 34 years, Paula; daughter, Katie (Clinton) Jenkins; siblings, Alex Orban, Carol (Berj) Shakarian, Alexis (James) Ballrick, and Carl (Delores) Orban; and many nieces and nephews. Family will receive friends Wednesday, April 25, 2012 from 4-8 p.m., with a prayer service at 4 p.m. at SCHOEDINGER WORTHINGTON CHAPEL, 6699 N. High St., Worthington (Just south of I-270). Mass of Christian Burial will be held at 11 a.m. Thursday at St. Joan of Arc Catholic Church, 10700 Liberty Rd., Powell, Ohio, Rev. Raymond Larussa, Officiating. Interment to follow at Flint Cemetery. Contributions may be made in John's memory to HomeReach Hospice, c/o Ohio Health Foundation, 180 E. Broad St., Columbus, OH, 43215. To share memories of John, visit www.schoedinger.com

Published in The Columbus Dispatch on April 23, 2012

Rose M. Schoen 100, Fort Recovery, Ohio, died on January 19, 2012, at Briarwood Village, Coldwater, Ohio. She was born November 8, 1911, in St. Henry, OH, to the late Bernard Heitkamp and the late Catherine Gehle . On November 8, 1933, she married the late Arnold P. Schoen , who died April 4, 1986. Surviving are 7 daughters - Mary (Harvey) Thornton of Portland, IN, Eileen (Carl) Barhorst of Ft. Loramie, OH, Janice (Harold) Hemmelgarn of Centerville, OH, Patricia (Neil) Diller of Fort Recovery, OH, Doris (Doug) Runyon of Sequim, WA, Linda (Adrian) Noll of Celina, OH, Marilyn (Eric) Greenrose of Dayton, OH; 5 sons - Harold (Theresa) Schoen of Indianapolis, IN, James (Mary Ann) Schoen of Kettering, OH, Richard (Doris) Schoen of Palo Alto, CA, Dan (Peg) Schoen of Fort Recovery, OH, Dave Schoen of Ansonia, OH; 39 grandchildren; 94 great grandchildren; 7 great great grandchildren; son-in-law - Bill (Jane) Boeckman of Coldwater, OH; sister-in-law - Helen Heitkamp of Fort Recovery, OH;. Also deceased are daughter, Virginia Boeckman, 7 brothers, Joseph, Ray, Bernard, Clarence, Alphonse, Vincent, and Melvin Heitkamp; 5 sisters, Mary Everman, Elizabeth Bruggeman, Bernadetta Heitkamp, Rita Post, and Cecelia Kuntz; daughter- in-law, Patricia Schoen; and 4 grandchildren. She was a member of St. Paul Catholic Church, Sharpsburg, Ohio and it's Altar Rosary Sodality. Funeral mass is 10:30 am, Monday, January 23, 2012 at St. Paul Catholic Church, Sharpsburg, Ohio, Fr. Thomas Dorn officiating. Burial is at St. Paul Cemetery. Calling is 1:00 pm-6:00 pm Sunday and 9:00 am-9:45 am Monday at Brockman - Boeckman Funeral Home, Fort Recovery, Ohio. Contributions can be made to State of the Heart Hospice.