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DEPARTMENT OF MATHEMATICS NEWSLETTER

June 2015

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CHAIRPERSON'S MESSAGE

Greetings from the Chair. I hope that everyone has had many things to celebrate over the past year. We had several in the Mathematics Department. Enrollment at UD continues to be healthy. As I write, there are 2125 new students who have deposited for the fall. Seventeen of these students are taking a major offered by the Department of Mathematics. Of course, this also creates challenges to offer sufficient courses to meet the needs of these large classes. We were able to add another tenure line to the department last year and we are happy to welcome Dr. Alan Veliz to our department in August. Dr. Veliz obtained his Ph.D. at Virginia Tech in 2010 and has held post-doctoral positions at the University of Nebraska and the University of Houston. Dr. Veliz works with biologists modeling complex systems. We hope to obtain more tenure lines in the future to keep up with the increasing number of students majoring in the STEM areas.

At the same time, I am sorry to announce the retirement of Dr. Robert Gorton. Bob began his career at UD in 1969, so his

absence leaves a very visible void in the department. Bob is a knowledgeable and skilled mathematician who directed many students in independent studies of topics they could not get in the classroom, especially things related to algebra and geometry. We will miss him and wish him the best in his retirement.

This was our first year of the Dr. Kenneth Schraut Faculty Research Award in Mathematics, established by Doc's daughter Marilyn Szorc. Dr. Lynne Yengulalp, a researcher in set theoretic topology and graph theory, used these funds to bring two collaborators to campus. The recipient of next year's award is Dr. Catherine Kublik.

We welcomed Dr. Aparna Higgins back into the faculty full time this year as she stepped down from her leadership position at Project NExT. She held the position of Director for five years, from August 2009 to August 2014. She brought her usual energy and enthusiasm to Project NExT and the MAA has expressed its appreciation for her strong contributions to this important organization.

Congratulations are due to Dr. Shannon Driskell and Dr. Lynne Yengulalp for their promotions. Dr. Driskell was awarded promotion to Professor and Dr. Yengulalp was awarded tenure and promotion to Associate Professor. Dr. Driskell is a mathematics education specialist and Dr. Yengulalp studies set theoretic topology. Both are making significant contributions to our department and their field of study.

We would appreciate hearing from you and, if you get the chance to drop by Dayton, visiting with you. I hope that the year to come has many blessings in store for you.

Joe Mashburn
joe.mashburn@udayton.edu

Readers may navigate this newsletter by clicking the links in the Table of Contents (TOC). At irregular intervals, there is a link entitled "[Back to TOC](#)" that will take the reader back to the first page of this newsletter. Other links in the newsletter take you to related items within this document or to related websites.

Photographs used in this newsletter were provided by Wiebke Diestelkamp, Pete Hovey, and Lynne Yengulalp, and by families of individuals featured. Photographs do not necessarily correspond with the text near which they appear.

THANK YOU!

Thank you for your generous support of the Department of Mathematics and its activities. Your support helps us to fund conference travel for our undergraduate and graduate students, to host annual events such as MathEvents, the Integration Bee, and the High School Mathematics Competition, and to provide lunch on the day of the Putnam Competition. The photographs scattered throughout this newsletter give you a glimpse of some of these events.

We are deeply grateful to all of you who contribute to the department. The University Development Office reports that the following people made donations to the Department of Mathematics during 2014:

Mr. & Mrs. Ronald L. Beisel ('63)	Mr. & Mrs. Donald J. Kavalunas ('65)
Mr. & Mrs. David E. Brown ('65)	Mr. & Mrs. David L. Kramer ('68)
Dr. & Mrs. Robert E. Buck, Jr. ('69)	Mr. & Mrs. George G. Morrison III ('82)
Dr. and Mrs. Gregory Campbell ('70)	Dr. Charles F. Mott ('61) & Ms. Alicia Fernandez-Mott
Dr. & Mrs. Joseph J. Chmiel ('69)	Mr. & Mrs. Timothy J. Rice ('88)
Dr. & Mrs. Paul Eloë ('84)	Mr. & Mrs. Randall J. Smith ('77)
Mrs. Marla Prenger Gross ('90)	Dr. Susan Miller Thompson ('81)
Dr. Jane Pendergast ('74) & Mr. Mark P. Hale	Mr. & Mrs. Donald R. Wojciechowski ('72)
Mrs. Gayatri Horowitz ('04) & Mr. Ethan R. Horowitz	

The following corporations and foundations provided matching gifts:

The Abbott Fund
AON Foundation
Fidelity Charitable Gift Fund
IBM Foundation

The following donors contributed to the Kenneth C Schraut, Ph.D., Memorial Scholarship:

Mr. & Mrs. Richard L. Iannarino ('71)
Mr. & Mrs. Donald J. Kavalunas ('65)
Mr. Edward Neuschler ('69)
Mr. & Mrs. Ronald Steinkirchner ('76, '76)

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CONGRATULATIONS!

Faculty and alumni have distinguished themselves recently. Our congratulations go to them. We list below those whose accolades we know of.

Shannon Driskell, who joined our department in 2003, was promoted to the rank of Professor.

Lynne Yengulalp, who joined us in 2009, was granted tenure and promoted to the rank of Associate Professor.

Franklin Demana ('60) was one of the three recipients of the National Council of Teachers of Mathematics (NCTM) Lifetime Achievement Award this year (2015). The award is given to those who have exhibited a lifetime (at least 25 years) of achievement and service in mathematics education at the national level. The write-up about him says, in particular, that Frank “developed specifications for graphic applications, first for personal computers, and then for handheld graphing calculators. In fact, his ideas inspired the introduction of special capabilities of the calculators themselves.” His nominators praise Frank for his teaching, his leadership and his service. They mention his research in mathematics education, his teaching in inner-city schools, and his professional development of teachers. The complete citation can be found at http://www.nctm.org/Grants-and-Awards/Lifetime-Achievement-Award/Franklin-D_-Demana/.

Sean Donahue ('84) received the 2014 University of Dayton Distinguished Alumnus Award in September. This award is the highest honor accorded by the Alumni Association and recognizes a graduate of the University of Dayton who has sustained a record of accomplishment, whose reputation is widespread, and whose accomplishments “embody the University’s goal to participate effectively in the quest for a more perfect human society.” (from <https://www.udayton.edu/advancement/about/alumni-assoc/alumni-awards/distinguished-alumni.php>) Sean works in pediatric neuro-ophthalmology. He currently holds the Sam and Darthea Coleman Endowed Chair in Ophthalmology at the Vanderbilt Eye Institute. In addition to publishing his research, he has engaged in training doctors in many countries to diagnose and treat cataracts.

Jeff Diller ('88) was one of the 2015 recipients of the Rev. Edmund P. Joyce, C.S.C. Award for Excellence in Undergraduate Teaching from the University of Notre Dame, where he is a Professor in the Department of Mathematics. The Joyce awards “honor faculty members who have had a profound influence on undergraduate students through sustained exemplary teaching, and, in particular, creating environments that stimulate significant student learning, elevate students to a new level of intellectual engagement, and foster students’ ability to express themselves effectively within their disciplines.” (from <http://kaneb.nd.edu/rsracs/awards-for-outstanding-teaching/joyce-award/#2015>)

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MathEvents



The 2014 MathEvents was held on Saturday, October 25, 2014. Adam Volk, President of the Math Club, welcomed the audience and introduced **Rafe Donahue ('87)**, who delivered the 15th annual Kenneth C. Schraut Memorial Lecture. Rafe is a Senior Director of Statistics at BioMimetic Therapeutics, Inc. He presented an interesting, informative and entertaining talk on “Data Stories and Pictures; Discovering Lessons and Principles for Statistics and for Life.” Rafe has served on the panel for

several past Biennial Alumni Seminars and he has repeatedly insisted, “Show me the data,” or pointed out, “There is information in those outliers.” With this year’s Schraut Lecture, Rafe illustrated these comments with very interesting examples.

Rafe’s enthusiasm and passion for learning were evident and seemingly undiminished from the time he was a student at UD. Rafe presented our department with a replica of the UD chapel (pre-renovation) made entirely of LEGO® bricks. He had studied pictures and plans of the chapel and then designed and built this model. In a dramatic finish to his talk, Rafe uncovered the model, and then proceeded to lift off its roof to show us the intricately constructed interior as well. The model of the UD chapel is in a showcase outside the mathematics office – please stop by to see the display on your next visit.



The 26th Biennial Alumni Seminar was held following the Schraut Lecture, with **Claire Sonneborn**, President of UD’s Pi Mu Epsilon Chapter, moderating the panel discussion. Alums, faculty and friends of our department contributed their time to serve as panelists, and to give students an insight into their professions and valuable advice

on how to get the most of their UD education. **Neil Bitzenhofer ('69, '72)** led off and spoke of his career in software and engineering; **Rafe Donahue ('87)** and **Cheryl Edelman ('92)** shared their knowledge of statistics careers; **Robert Phipps ('01)** told us about actuarial careers; **Tom Filloon ('83)** discussed the emerging fields of data science and analytics; **Megan Miller ('11)** told us about her work with engineering at WPAFB; Michael Gorman, a UD faculty member in the School of Business Administration, talked about operations research as a career; **Jordan Orr ('09)** talked about high school teaching, while Glen Lobo, a faculty member with Sinclair



Community College, talked about community college teaching, and **Jonathan Brown**, a first-year faculty member in this department, talked about college/university teaching; **Charles Suer ('10)** recounted his journey through graduate school in mathematics. As is traditional, the panelists met with students in breakout sessions to continue the discussion about their fields and careers and to answer students’

questions.

Paul Eloe did a wonderful job of planning and organizing the day. Details of this event and other MathEvents can be found at <http://academic.udayton.edu/MathEvents/>

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FACULTY UPDATES

Full-time faculty

Atif Abueida, 2000
Jonathan Brown, 2014
Arthur Busch, 2006
Wiebke Diestelkamp, 1998
Shannon Driskell, 2003
Paul Eloe, 1980
Robert Gorton, 1969
William Harrison, 2009

Aparna Higgins, 1984
Peter Hovey, 2001
Muhammad Islam, 1985
Rebecca Krakowski, 2000
Catherine Kublik, 2013
Ruihua Liu, 2004
Joe Mashburn, 1981
Shirley Ober, 1977

Maher Qumsiyeh, 2008
Youssef Raffoul, 1999
Dan Ren, 2013
Paula Saintignon, 1983
Julie Simon, 2010
Lester Steinlage, 1969
Muhammad Usman, 2007
Lynne Yengulalp, 2009

Adjunct Faculty

Nick Axmaker, 2014
Robert Bennington, 2014
Matthew Brenneman, 2012
Steve Buerschen, 2014
Karen Connair, 2010
Mark de Saint-Rat, 2011
Roger Erich, 2014

Lauren Ferguson, 2014
Robert Flavin, 2008
Steve Fuchs, 2005
Mark Hoffman, 2014
Susan Holloway, 2011
Sandra Johnson, 2014
Fred Kingrey, 2014

John Loomis, 2007
Michael Mennett, 2014
Eileen Nolan, 2012
Richard Peterson, 1998
Lawrence Schmitt, 2011
Michael Stuebner, 2014
Samuel Wright, 2011

Professors Emeriti

Stanley Back, 1998
([died 22 November 2014](#))
Jack McCloskey, 2001
Ben Rice, 1998
Bill Friel, 1999

Harry Mushenheim, 2006
Carroll Schleppi, 2001
Tom Gantner, 2001
Jerry Neff, 1999
Ralph Steinlage, 2001

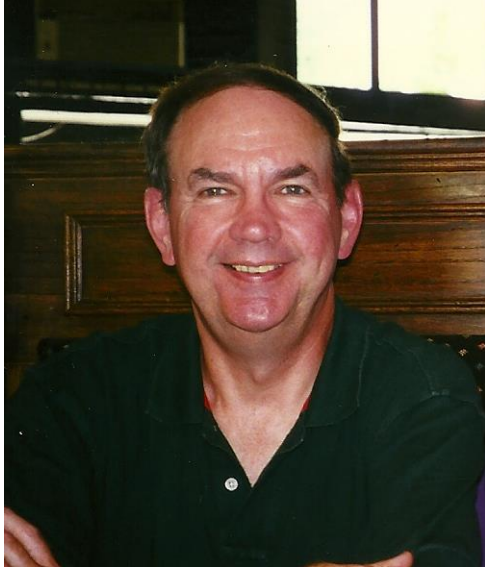
John Kauflin, 2006
Richard Peterson, 1998
Gerry Shaughnessy 2012
Jerry Strange, 1999

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IN MEMORIAM

The Department of Mathematics regrets to report the deaths of two former faculty members.

Stan Back ('57) passed away on 22 November 2014. A lovely memorial service was held for him on 2 December 2014, in the Chaminade Hall Chapel on campus. In attendance were Stan's children, Laura and Brian (both of whom are UD alums), and their families, along with many former and current faculty members of UD's Department of Mathematics, colleagues from UDRI and some of Stan's students.



Born in Indiana in 1936, Stan was an alumnus of UD, and earned an M.S. degree from Purdue University in 1959. He worked as a research statistician and as a faculty member at UD for forty years. Stan retired in 1998. After retiring, Stan did a lot of traveling to spend quality time with his children and their families. He was a very dedicated and loving grandfather to Skylar, Anja, Elin and Anabel.

Paula Saintignon remembers Stan being the pitcher on the intramural softball team at UD, comprised of several math faculty and students, and aptly named "Q.E.D." The team later joined a Kettering softball league, and they won several first place trophies. Stan enjoyed bowling and table tennis, and he hosted quite a few table tennis tournaments at his house. Paula and Muhammad Islam remember Stan and his children going on departmental camping trips to various state parks in Ohio. Aparna Higgins remembers Stan as a very helpful faculty member when she first arrived. He was patient in answering her many questions about teaching practices and expectations at UD. Aparna also remembers that Stan was a popular faculty advisor of the Math Club, with many get-togethers at Stan's home. Stan enjoyed a good laugh and a funny story, and we are grateful to have known him and worked with him.

Henry Potoczny passed away on April 19, 2014. Born in 1944, and educated at LaSalle University (B.S.) and University of Kentucky (Ph.D.), Henry taught in our department in the nineteen-seventies. He then went on to teach mathematics and computer science at the Air Force Institute of Technology at the Wright-Patterson Air Force Base.

FACULTY PHOTOGRAPH from 1975

Those of you who were at UD in the nineteen-seventies may enjoy a photograph of the faculty of our department on page 170 of the Daytonian 1975 yearbook, which can be found at http://ecommons.udayton.edu/archives_yrbk/28/

FACULTY ACTIVITIES

Department faculty members work enthusiastically on their scholarship, on teaching activities, on research with students, and on service. Here is a synopsis of our activities for the calendar year 2014.

Scholarship:

Atif Abueida co-authored several papers: (with **Balbach, W. ('12)**, Daven, M.) “On the multidecompositions of the complete multipartite graphs into the graph-pair of order 4,” *Bulletin of the Institute of Combinatorics and its Applications*, 72, 41-48; (with Blinco, A., Clark, S., Daven, M., Eggleton, R.) “On heterogeneous decompositions of uniform complete multigraphs into spanning trees,” *AKCE International Journal of Graphs and Combinatorics*, 11(2), 199-220; (with **Lian, C. ('13)**) “Decompositions of complete graphs into cycles and stars on the same number of edges,” *Discussiones Mathematicae Graph Theory*, 34(1), 113-125; (with **Perkins, C. ('12)**) “Decompositions of complete graphs with holes of the same size into the graph-pair of order 4,” *Journal of Combinatorial Mathematics and Combinatorial Computing*, 91, 291-298.

Jon Brown joined UD in the fall of 2014. He co-authored six papers that appeared in 2014. They are (with Clark, L.) “A groupoid formulation of the Baire Category Theorem,” *Fundamenta Mathematicae*, 226(2), 123-130; (with Clark, L., Farthing, C., Sims, A.) “Simplicity for algebras associated to etale groupoids,” *Semigroup Forum*, 88(2), 433–452; (with Goehle, G.) “The Brauer semigroup for groupoid dynamical systems,” *Transactions of the American Mathematical Society*, 366(4), 1943-1972; (with Nagy, G., Reznikoff, S.) “Generalized Cuntz-Kreiger Uniqueness for k -graphs,” *Journal of Functional Analysis*, 266(4), 2590–2609; (with an Huef, A.), “Centers of algebras associated to higher-rank graphs,” *Revista Matematica Iberoamericana*, 30(4), 1387–1396; (with an Huef, A.) “Decomposing the C^* -algebras of groupoid extensions,” *Proceedings of the American Mathematical Society*, 142(4), 1261-1274. Jon was a co-principal investigator on two grants: (with Reznikoff, S., Nagy, G.) “Great Plains Operator Theory Symposium,” sponsored by the National Science Foundation, and (with Rumsey, C., Bennett, A., Allen, D., Martine, S.) “MILeS,” sponsored by the Kansas Department of Education. Jon gave colloquium talks at Wright State University on “Progress on the classification of etale groupoid C^* -algebras,” and at University of Colorado, Colorado Springs, on “The center of a Leavitt path algebra.”

Art Busch co-authored (with Ferrara, M., **Hartke, S. ('99)**, Jacobson, M. S.), “A Degree Sequence Variant of Graph Ramsey Numbers,” *Graphs and Combinatorics*, 30(4), 847-859. At the Midwest Graph Theory Conference XLV, Art presented

“Strongly chordal k -trees.” Art organized the popular annual [Integration Bee](#) again this year. Art and his wife welcomed a new baby into their family in May. They now have both a son and a daughter.



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Wiebke Diestelkamp co-authored (with Trubee, N. W., Vanderburgh, P. M., Jackson, K.), “Effects of Heat Stress and Sex on Pacing in Marathon Runners,” *Journal of Strength & Conditioning Research*, 28(6), 1673-1678. Wiebke continued work as a statistical consultant on a continuing NSF grant “Roles and regulation of aqua/glyceroporins in a freeze tolerant amphibian” (with Goldstein, D. and Krane, C. as co/principal investigators). Wiebke continues to serve as an Equity Advisor for the College of Arts & Sciences. In this role, she works on issues of recruitment, advancement and professional climate for women in the STEM fields. Wiebke remains active in the MAA. She finished a second term on the Committee on MAA/Department Liaisons. She chaired the Nominating Committee for the Ohio Section of the MAA, and served on the Section's Bylaws Committee. The revised bylaws have since been approved by the Section membership.

Shannon Driskell was promoted to the rank of Professor. Our congratulations and best wishes for continuing fulfillment in her career go to her. Shannon co-authored (with Lee, H. S., Kersaint, G., Harper, S. R., Jones, D., Leatham, K. R., Angotti, R. L., Adu-Gyamfi, K.) “Teachers’ use of transnumeration in solving statistical tasks with dynamic statistical software,” *Statistics Education Research Journal*, 13(1), 25-52; and (with Ronau, R. N., Rakes, C. R., Bush, S. B., Niess, M. L., Pugalee, D. K.), “A survey of mathematics education technology dissertation scope and quality: 1968-2009,” *American Educational Research Journal: Teaching, Learning and Human Development*, 51(5), 974-1006. Shannon participated in a panel discussion at the AMTE Annual Conference, held in Irvine, California, (with Bush, S. B., Rakes, C. R., Niess, M. L., Pugalee, D. L.) on “Professional development shifts in mathematics education technology.” Shannon participated (with Rakes, C. R., Ronau, R. N., Pugalee, D. L., Bush, S. B., Niess, M. L.), in a discussion of “A survey of mathematics education technology dissertation scope and quality: 1968-2009” at the annual meeting of the American Educational Research Association. Shannon was the Chair of the 2014 Eighteenth Annual Association of Mathematics Teacher Educators (AMTE) Conference Program Committee, and a member of the AMTE Conference Leadership Committee. She was also a member of the Editorial Advisory Board for the “Handbook of Research on Teacher Education in the Digital Age”.



Paul Eloe continues as Director of Graduate Studies in our department. His papers this year include (with **Neugebauer, J. ('06, '08)**) “Conjugate points for fractional differential equations,” *Fractional Calculus and Applied Analysis*, 17(3), 855-871; (with **Neugebauer, J. ('06, '08)**), “Existence and comparison of smallest eigenvalues for a fractional boundary value problem,” *Electronic Journal of Differential Equations*, 2014(43), 1-10; (with **Yuchen Zhou ('13)**) “Pricing multi-asset American options with regime-switching by exponential time differencing schemes,” *Transactions on Mathematical Programming & Applications*, 2 (2014), no. 3, 1-18. Paul spoke on “Application of μ_0 positive operators to boundary value problems for fractional differential equations” at the Joint Mathematics Meetings, and on “Multi-term linear fractional nabla difference equations with constant coefficients,” at a sectional meeting of the AMS. Paul also organized a team of our undergraduate students for the COMAP Mathematical Contest in Modeling ([read more here](#)).

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Aparna Higgins completed her term as Director of Project NExT (2009-2014) in August. At MathFest in August, a “Resolution in Honor of Aparna Higgins” was issued by the MAA. It can be found at <http://campus.udayton.edu/~mathdept/MAA%20Resolution%20Higgins.pdf>.

Associated with the end of her directorship of Project NExT, and detailing her service to the MAA (including her work with Project NExT) is an article by Joe Gallian, in FOCUS, the newsletter of the MAA, Vol. 34, No. 5, October/November 2014. The article can be viewed at [http://campus.udayton.edu/~mathdept/Appreciation%20of%20Aparna%20Higgins%20\(Gallian\).pdf](http://campus.udayton.edu/~mathdept/Appreciation%20of%20Aparna%20Higgins%20(Gallian).pdf).



Aparna continues to serve Project NExT as a consultant for the 2014-2015 cohort. Aparna co-authored (with LaRose, G.) “Project NExT Terms End for Covington and Schlicker,” MAA FOCUS, (2014), 5th ed., vol. 34, pp. 17-18, Washington, DC. An electronic version is at

digitaleditions.walworthprintgroup.com/publication/?i=227096.

Aparna also co-authored (with Ludwig, L. and Servatius, B.)

“Papers, posters, and presentations as outlets for undergraduate research,” *Involve – a journal of mathematics*, Vol. 7, No. 3.

Aparna was the keynote speaker at the Bluegrass Undergraduate Math Symposium, hosted by Centre College, Kentucky, and she

presented her course on directing undergraduate research at the JMM in Baltimore and at the Project NExT Workshop held just before MathFest in Portland, Oregon. Aparna directed the Honors thesis of **Claire Sonneborn ('15)**, entitled “Root cover pebbling on graphs.”

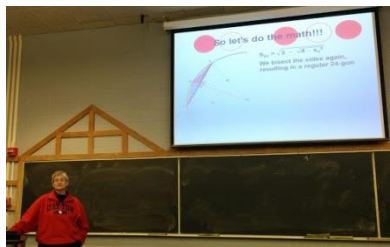


Pete Hovey ('75) serves as co-principal investigator (with Smith, F. R., Boehnlein, T. R), on the continuing contract “A-10 Fleet Management Analysis Tool,” sponsored by USAir Force through Northrup Grumman, and as supporting investigator on the contract “Quick Reaction Evaluation of Materials and Processes,” sponsored by US Air Force Research Laboratories. Pete presented a poster (with Eustace, D., Almutari, O.) on “Using Decision Tree Modeling to

Analyze Factors Contributing to Injury and Fatality of Run-Off-Road Crashes in Ohio” at the Transportation Research Board’s annual conference in Washington, D.C. An article with the same title was published in the proceedings of the conference.

Muhammad Islam authored “Bounded, asymptotically stable, and L^1 solutions of Caputo fractional differential equations,” *Opuscula Mathematica*, 35, (2015), 181-190. He co-authored (with Adivar, M.) “Asymptotically stable solutions of a nonlinear Volterra integral equation,” *Communications in Applied Analysis/ Dynamic Publishers*, 18 (2014), 155-162; co-authored (with **Raffoul, Y. ('87)**) “Periodic and asymptotically periodic solutions in coupled nonlinear systems of Volterra integro-differential equations,” *Dynamic systems and applications/ Dynamic Publishers*, 23 (2014), 235-244; and (with **Masry B. ('12)**, **Mikael, E. ('12)**) “Bounded, L^1 , and asymptotically stable solutions of a perturbed nonlinear integral equation”, *Dynamics of Continuous, Discrete and Impulse Systems*, 20, (2013), 83-93.

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Becky Krakowski continues to serve as the director of the Master of Mathematics Education (MME) Program. Becky played a role as support personnel on a grant from the Ohio Department of Education – High School & Higher Education Alignment. She will be on sabbatical leave next fall, and will use this time to visit classrooms in Singapore, Australia, and Finland to gain a better understanding of mathematics and teacher education internationally. Becky spoke on Archimedes' approximation of pi at this year's high school mathematics competition.

Catherine Kublik co-authored (with **Raffoul, Y.**) "Lyapunov functionals that lead to exponential stability and instability in finite delay Volterra difference equation," *Acta Mathematica Vietnamica*, link.springer.com/article/10.1007%2Fs40306-014-0098-4. She received a seed grant from the University of Dayton Research Council for the summer of 2014 for her project "A new boundary integral algorithm for implicit surfaces." Catherine served as the Math Club faculty advisor this year. (Read more about [the Math Club](#).) Catherine was the speaker at the Pi Mu Epsilon initiation ceremony and banquet. Her talk was entitled "Two reasons why mathematics is beautiful," in which she spoke about the Mandelbrot set and showed how pi, although irrational, can be written as an infinite series of rational terms. (Read more about the [Pi Mu Epsilon Chapter](#).)

Ruihua Liu authored "Optimal Investment and Consumption with Proportional Transaction Costs in Regime-Switching Model," *Journal of Optimization Theory and Applications*, 163(2), 614-641, and "A Finite-Horizon Optimal Investment and Consumption Problem Using Regime-Switching Models," *International Journal of Theoretical and Applied Finance*, 17(4). Ruihua delivered an invited talk "Optimal Investment and Consumption with Proportional Transaction Costs in Regime-Switching Model" at a special session on mathematical finance, at the AMS Sectional Meeting held at the University of New Mexico, Albuquerque. He spoke on "Optimal Stopping and American Option in Switching Diffusion Models with State Dependent Switching Rates" at the departmental colloquium at Wayne State University.



Maher Qumsiyeh co-authored (with Patterson, M., Hansen, K., Subramanyam, G., Yue, H., Walker, D.) "Construction of a Twin-Pier Platform for Biological Sensing," in the *Proceedings/IEEE NAECON Aerospace and Electronics Conference*, pages 5-8, DOI: 10.1109/NAECON.2014.7045764. Maher wrote the questions and solutions for the [Integration Bee](#) again this year.

Youssef Raffoul ('87) had several papers published this year. They include (with **Muhammad Islam**) "Periodic and asymptotically periodic solutions in coupled nonlinear systems of Volterra integrodifferential equations," *Dynamic systems and applications/ Dynamic Publishers Inc*, 23(2 & 3), 235-244; "Stability in functional difference equations using fixed point theory," *Communications of the Korean Mathematical Society*, 29(1), 195-204, <http://pdf.medrang.co.kr/kms01/CKMS/29/CKMS-29-1-195-204.pdf>; "Stability In Nonlinear Delay Volterra Integro-differential Systems," *Journal of*

Nonlinear Sciences and Applications, 7(2014), 422-428; (with Adivar, M., Koyuncuoğlu, H. C.) “Existence of periodic solutions in shifts δ_{\pm} for neutral nonlinear dynamic systems on time scales,” *Advances in Applied Mathematics*, 242(1), 328-339; (with **Alsaifi, S. ('13)**, **Sanbo, A. ('14)**) “Qualitative Analysis of Solutions in Volterra Nonlinear Systems of Difference Equations,” *International Journal of Mathematical Analysis*, 8(31), 1505-1515. www.m-hikari.com/ijma/ijma-2014/ijma-29-32-2014/raffouliIJMA29-32-2014.pdf; (with **Kublik, C.**) “Lyapunov Functionals That Lead to Exponential Stability and Instability in Finite Delay Volterra Difference Equations,” *Acta Mathematica Vietnamica* link.springer.com/article/10.1007%2Fs40306-014-0098-4; (with **Yankson, E. ('05)**) “Existence of Bounded Solutions for Almost Linear Volterra Difference Equations Using Fixed Point Theory and Lyapunov Functionals,” *Nonlinear Studies*, 21(4), 663-674. Youssef also gave several talks in many parts of the world in 2014. He spoke on “Qualitative Analysis of Functional Stochastic Differential Equations” and “Comparison between fixed point theory and Lyapunov functionals” at Notre Dame University in Beirut, Lebanon, on “Exponential Stability And Instability In Finite Delay Nonlinear Volterra Integro-Differential And Difference Equations” at Balamand University in Lebanon, on “Qualitative Analysis of Functional Differential equations Using Fixed Point Theory” at American University of Beirut, on “Fixed Point Or Lyapunov Functional?” at Canakkale Onsekiz Mart University, Turkey, on “Boundedness And Exponential Stability In Highly Nonlinear Stochastic Differential Equations” at an AMS Sectional Meeting at the University of New Mexico, Albuquerque, and on “Qualitative Analysis of Solutions of Nonlinear Delay Dynamic Equations” at SEARCDE-2014, at the University of Memphis, Tennessee.

Dan Ren was a principal investigator on a seed grant and on a grant-in-aid, from the University of Dayton Research Council. She spoke on “Shortfall Aversion” at the AMS Sectional Meeting held at the University of New Mexico, Albuquerque, and at the SIAM Conference on Financial Mathematics & Engineering, held in Chicago.

Muhammad Usman co-authored (with Khan, Y.) “Modified Homotopy Perturbation Transform Method: A Paradigm for Nonlinear Boundary Layer Problems,” *International Journal of Nonlinear Sciences and Numerical Simulation*, 15(1), 19-25. Usman gave several invited talks at venues around the world in 2014. He was sponsored by the Government of Pakistan for a visit to that country, and was invited to speak at the College of Information Technology of Punjab University and Lahore College for Women University, both in Lahore, Pakistan, and spoke on “Applications of Computational Mathematics in Science, Technology, Engineering and Mathematics (STEM) Disciplines.” He delivered a workshop (jointly with mathematicians from Kent State University and Tata Institute India) on “Option Pricing using Finite Difference Methods” at the conference on “Equity Pricing: Black Scholes and Beyond,” at Lahore University of Management Sciences, Pakistan. He also gave an invited talk on “Sinc Collocation Methods to Study Problems of Korteweg-de Vries and Kuramoto-Sivashinsky type Equations” at SEARCDE-2014 held at University of Memphis, Tennessee.



Lynne Yengulalp was granted tenure and promoted to Associate Professor. Our congratulations and best wishes for a productive and fulfilling career go to her. Lynne was the first recipient of the Dr. Kenneth

Schraut Faculty Research Award in Mathematics (in 2013) and she reports that she utilized the funds to bring in guests (Dr. Carl Mummert from Marshall University and Dr. Lon Mitchell from AMS) to work with her in 2014 and to give talks in our departmental colloquium. Lynne spoke on “From subcompact to domain representable” at the Spring Topology and Dynamics Conference, held at University of Richmond, Virginia, and has been invited to speak at the Summer Topology spoke Conference in Galway, Ireland, which will take place in June 2015. She continues to serve as Honors thesis advisor to **Matt DeVilbiss ('16)**, and as faculty advisor to our [Pi Mu Epsilon chapter](#).

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News about teaching initiatives

Beyond research, professional development and service, the faculty of the department spend much of their time and effort in teaching activities. Some of us are working new techniques into our teaching. Recently, many of the new initiatives use technology.

The textbook that we use for our mainstream calculus sequence (taken by mathematics, physics, engineering majors) now has online support (an e-book, an online homework delivery system, etc.). Several of us assign homework online. Students can get instant feedback on the correctness of their answers. Depending on the options their instructor has allowed them to use, students can get online help to find and correct their errors (if any). Of course, students may always seek help from their instructors in person.

Some of the faculty in our department had been using “skills tests” in calculus courses for several years. These are timed tests with no partial credit and with a passing grade set at 80%. The skills tests are used in addition to the usual hour-long tests and other graded events in our calculus courses. **Art Busch**, **Muhammad Usman** and **Lynne Yengulalp** have built skills tests within the online system available via the textbook publisher so that instructors can give the tests electronically. We used those skills tests this year in the first two calculus courses and are figuring out ways to administer these tests efficiently, given the large volume of students and the scarcity of testing space with secure computers.

Shannon Driskell, who teaches the courses for students who intend to teach in middle schools with a concentration in mathematics, had her students use iPad minis to locate apps that they could use with middle school students to teach geometric concepts. **Lynne Yengulalp** used Google Docs for homework in her upper-level classes. Students typed their homework in a Google Doc and shared it with Lynne in Google Drive. This allowed her to add comments to the students’ drafts so that they could edit their work before a final due date. **Aparna Higgins** assigned projects in the first calculus course. The exercise showed that much more needs to be done for students to be able to make the connections with the mathematics that they are learning in the course and the real-world problem that they considered.

Several faculty members use mathematical software to demonstrate ideas in class. All our mathematics classrooms now have computer projectors, and it is not uncommon to walk down the hall and get a glimpse of Maple, GeoGebra, SAS, Desmos (computer algebra systems, statistical software, visualization software, etc.) in use in our classrooms. The black/white boards continue to be utilized fully as well!

Department colloquium

The faculty and graduate students gather weekly for a department colloquium, during which we have guest speakers from other institutions, or Master's degree students presenting their MathClinics, or faculty members talking about their recent research, or occasionally, an undergraduate student presenting work done in an REU or other activity. The complete schedule for the colloquium can be found at

<http://campus.udayton.edu/~mathdept/Colloquium/ColloquiumSchedule.htm> (click on "Archives," if you want to see activity in a term other than the current term).

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UNDERGRADUATE STUDENT ACTIVITIES

Our undergraduate students were very active this year, individually and in groups.

UD Math Club and Pi Mu Epsilon Chapter

Members of the Math Club and of Pi Mu Epsilon meet jointly during the year, and the two groups have some joint officers. (We will refer to this student group as "The Math Club," for convenience.) The Math Club was led very capably this year by the following officers:

President of the Math Club: **Adam Volk ('16)**

President of Pi Mu Epsilon Chapter: **Claire Sonneborn ('15)**

Vice-President: **Matthew DeVilbiss ('16)**

Secretary: **Luke Bugada ('16)**

Treasurer: **Megan Brown ('16)**



The Math Club held regular meetings that comprised of a short talk, followed by students and faculty exploring ideas from the talk in groups, or playing mathematical games (like SET®). Of course, there was plenty of free pizza and pop at the meetings. The meetings were well-attended and the officers did a good job of publicity. Speakers at these meetings included **Jon Brown** talking on check digits, **Art Busch** encouraging students to solve the instant insanity puzzles, **Paul Eloe** explaining fractional calculus, **Aparna Higgins** trisecting angles using origami, **Maher Qumsiyeh** explaining the probability of matching letters and

envelopes, **Lynne Yengulalp** explaining how to hang pictures with knots, a recruiter from a graduate program in Ohio, and students who had been to an REU in the last two years recounting their experiences. The Math Club held its annual picnic, and new this year, "Art Street takeovers," a fixed time period during which some percentage of the profits of food bought at ArtStreet went towards the Math Club. Elections for officers for 2015-2016 resulted in **Adam Volk ('16)** being elected President of the Math Club, **Matthew DeVilbiss ('16)** being elected as PME President, **Megan Brown ('16)** being elected as Vice-President, **Luke Bugada ('16)** being elected as Secretary, and **Katie Posey ('18)** being elected as Treasurer.

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Pi Mu Epsilon inductions

The department holds two inductions for Pi Mu Epsilon each year. The spring induction includes the traditional banquet, while the fall induction is held during a Math Club meeting. Pi Mu Epsilon requires that inductees must have completed two courses beyond two calculus courses. A student who has completed some calculus prior to coming to UD often meets this requirement by the end of her/his first year at UD. In the past, with only an annual spring induction, such a student had to wait until the end of her/his sophomore year to be aware of Pi Mu Epsilon, the Math Club, and extra-curricular mathematics activities and opportunities. A fall induction helps a qualified student to get involved with mathematics outside the classroom earlier in her/his college career.

Fall 2014 inductees

Saeed Fahad S AlQuraishi
Megan Brown
Emily Erdman
Charles Fiorenza
Ryan Martin
Melissa Siegel
Devin Smarra
Melissa Wills

Spring 2015 inductees

Courtney Arand
Jon Ashbrock
Michael Coladipietro
Tyler Masthay
Madeline Miller
Mark Rasmussen

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High School Math Competition

The Math Club hosted the 19th Annual High School Math Competition on Pi Day. As always, it was a success, with profuse thanks from the teachers of the participating high schools. This year, forty-six students from four different high schools participated. The high schools represented were Carroll, Bellbrook, Stivers and Walnut Hills, with one of the teams from Carroll winning the competition.

Becky Krakowski gave a talk on Archimedes' approximation of pi while the scores were being tallied by the Math Club members and volunteers. This competition is a team competition, with the teams moving from station to station. Each station represents a topic (say, geometry) and a team entering that room is presented with three problems at three levels of difficulty and, consequently, three levels of points obtainable. The team must turn in the solution to at most one of those problems, and may not return to that station during the course of the competition. The team with the most points wins. Math Club members write the problems and solutions, and department faculty check them for clarity of questions, correctness of solutions and assignation of difficulty level. It was an exciting day!



Here is an example of the three kinds of problems provided on one topic.



Easy (25 Points):

You are required to take a math, science, English, and history course next semester. You can choose from 3 math courses, 4 science courses, 1 English course, and 2 history courses. How many combinations do you have to choose from? (order does not matter)

Medium (50 Points):

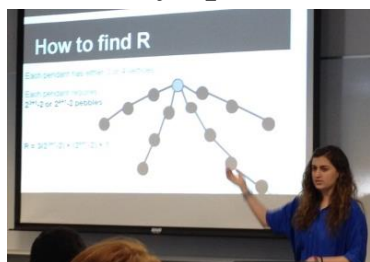
Suppose there are 20 players on a soccer team, 11 of which are on the field at the same time. How many unique starting lineups are there for this team? (don't worry about player positions)

Hard (100 Points):

Your friend's seven digit phone number is a palindrome (same forward and backward). No digit appears more than three times, and no digit is "0". How many possible phone numbers satisfy this condition? You do not need to simplify your answer.

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Honors Symposium



Claire Sonneborn presented a talk on her Honors thesis, “Root Cover Pebbling on Graphs,” advised by **Aparna Higgins**, thereby fulfilling the requirement of the Honors Program for students working on the thesis option to present a poster at the Stander Symposium and a talk at the Honors Symposium.

Competitions external to UD

Our students participated in regional and national mathematics competitions. We did not provide any training or advance preparation for their participation, and so all the credit for the students’ performance goes to them.

The seventy-fifth annual **William Lowell Putnam Mathematical Competition** was held on the first Saturday of December 2014. Participants compete as individuals, attempting six questions in each of two three-hour sessions. Each problem is graded out of 10 points, and the median score nation-wide this year was 3. Our department provides lunch on that day – we went to Milano’s! We were delighted to have nineteen students participate this year, many in their first year at UD! Their names are listed below. We are very proud of all these students who showed their dedication to mathematics by devoting an entire Saturday at the end of the first semester to participate in the Putnam competition. Those students who scored above zero and gave us permission to reveal that are marked with an asterisk (*).

Sean Cedeno
Maggie Daniels
Matt DeVilbiss *
Rachel Ecker
James Fagan
David Gross

Oliver Harmon
Yiyang He
Vignesh Krishnaraja
Madeline Lickenbrock
Kelli Marquardt
Tyler Masthay *
(UD’s high scorer)

Stephanie Miller
Hannah Porter
Kathryn Posey
Nicholas Schleuter
Kathryn Stephen *
Adam Volk *
Michael Zahorec



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The team comprised of **Tyler Masthay**, **Dayne Nussman** and **Jamie Stanton** received a Certificate of Achievement in this year's **COMAP's Modeling Contest in Mathematics**. The contest runs for four days during which the team may seek help from only inanimate sources to research and model one of two problems and submit a written solution. We are proud of our team's work on the problem entitled "Eradicating Ebola."



Archimedean Order was the name of the team of **Matt DeVilbiss**, **Tyler Masthay** and **Adam Volk** that took second-place (with a cash prize) in the **Leo Schneider Student Team Competition**, which is sponsored by the Ohio Section of the MAA annually at its spring meeting. The Student Competition is a one-hour competition, with 10 questions, proofs required. About a dozen teams competed. **Adam Volk** also won a Sudoku contest that was held during the pizza party at the meeting. Congratulations to Adam, Matt and Tyler.

REUs and internships

Some of our students have been fortunate enough to spend a summer in a National Science Foundation-sponsored Research Experiences for Undergraduates (REU). **Megan Brown** attended the JMM in San Antonio, where her 2014 REU group (from Sam Houston State University) spoke on their work in a mathematics education project, "Statistical Content in Elementary Textbooks." At the same meeting, **Adam Volk** presented "Gridline Graphs in Higher Dimensions," work done by his group in the 2014 REU at Grand Valley State University. Adam also presented this work at MathFest in 2014 and at Western Kentucky University's 34th Annual Mathematics Symposium. This summer, **Jon Ashbrock** will participate in the REU at West Virginia University, **Megan Brown** will be at the REU at the University of Connecticut, and **Kelli Marquardt** will participate in the REU in statistics at Carnegie Mellon University.

Our students are keen for internship experiences that provide them with an understanding of how mathematics can be used outside academe. **Katie Campbell**, who passed the actuarial Exam P (on the first try!) will be interning this summer at AON Hewitt Consulting.

Undergraduate Awards

This year, the Sophomore Award for Excellence in Mathematics was given to **Tyler Masthay**. This award is based on academic excellence and on participation in extra-curricular mathematics activities. The Award for Excellence in Support of Mathematics, given annually to the student of any class who is judged to have demonstrated outstanding support of mathematics activities and events, went to **Adam Volk**. The Department of Teacher Education awarded The Brother Joseph W. Stander, S.M., Award of Excellence to a Graduating Senior in the Teacher Licensure Program with a Principal Teaching Field in Mathematics to **Samantha Potocek ('15)**.

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STANDER SYMPOSIUM

The Department of Mathematics participates energetically in the Stander Symposium. Some of our students are involved in the Celebration of Arts, some present posters, and many participate in the Integration Bee.

Integration Bee



The thirteenth annual Integration Bee was preceded by a pizza lunch, providing participants a measure of relaxation as they checked in. Art Busch organized the Integration Bee again this year, with Maher Qumsiyeh writing all the questions and solutions, and Vicki Withrow managing all the logistics for lunch and ordering the prizes. It is always a thrill to watch as students fill up the seats in Chudd Auditorium, and in particular, to watch the expressions on the faces of many first-time participants who simply did not expect such a large room to be full of students all wanting to win a contest in integration! Students may pre-register for the Bee in teams of at most three, and may choose their own family-friendly team name. The Bee is conducted in rounds, with only about fifteen teams being given an integral at a time. If a team solves the integral correctly, it moves on to the second round.

In later rounds, only the first few teams to turn in correct solutions move on to the next round. Art reports that the early rounds were a rousing success, but the questions became harder as the Bee progressed, and a couple of integrals stumped the final four teams.



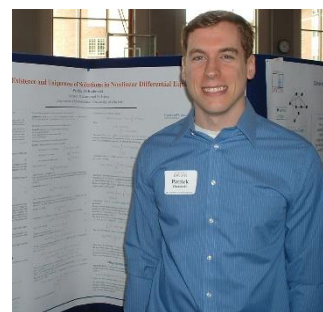
The winning team was Marky Mark and the Twain Brothers, consisting of **Dan Jennings, Nathan Volk** and **Christopher Ricci**, all first-year students. The three other teams in the Final Round were “Kaity Jones” featuring **Kaity Jones** and **James Althoff**, “Our Limit Does not Exist” featuring **Tyler Masthay** and **Matt DeVilbiss**, and “The Integreatest” with **Kelsey Mason, Kelli Marquardt** and **Adam Volk**. The team that won the prize for the best name was “We’ll Busch Liu Ober the Limit,”

consisting of **Rachel Kessler, Leland Merling, and Kayla Pariser**.

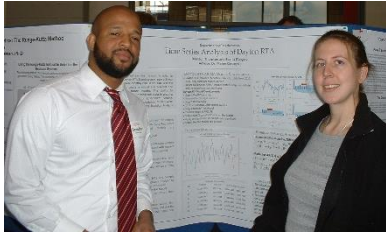
The Poster Sessions at the Stander Symposium

Patrick Chadowski presented a poster entitled “Existence and Uniqueness of solutions in nonlinear differential equations,” advised by **Muhammad Islam**.

Lawrence Kondowe presented a poster “Estimating Value at Risk and Expected Shortfall with Extreme Value Theory” under the direction of Serigne Diop of VERO Capital Management, New York City.

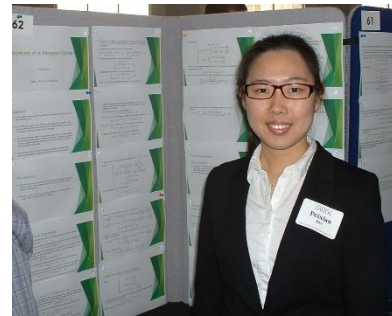


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Brandon Thornton presented a poster under the guidance of **Maher Qumsiyeh** on “Time Series Analysis of the Dayton RTA bus system.”

Paul Eloe guided the research of several graduate students in our Master’s degree programs. **Sami Aljhani** and **Adel Alshammari** jointly presented “A Green’s Function for a two-term second order differential operator.” **Nasiba Albatni** presented a poster on “A Study of Nonlinear Interpolation for Third Order Ordinary Differential Equations,” **Samerah Al Mosa**’s poster was entitled “An Analysis of Monotone Methods Applied to Boundary Value Problem for Ordinary Differential Equations,” **Alaa Almansour**’s poster was on “Boundary Value Problems for Ordinary Differential Equations.” **Ieman Algowal**’s poster was entitled “Existence and Uniqueness of Solutions of Boundary Value Problems for Third Order Differential Equations,” **Naher Alsafri** presented his poster on “A Boundary Value Problem for a Fractional Differential Equation,” and **Peixian Han**’s poster was on “Valuation of a Passport Option.”



Several students from **Muhammad Usman**’s undergraduate course on differential equations and graduate course on numerical analysis presented posters on projects done for those courses.

Claire Sonneborn presented a poster on her Honors thesis, “Root Cover Pebbling on Graphs,” advised by **Aparna Higgins**.

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UNDERGRADUATE DEGREES CONFERRED

UD has two commencement ceremonies each year, in December and May. We list the students who graduated during this past academic year with a major in mathematics. Students who major in mathematics sometimes have another major. Some students even earn dual degrees. Several graduates are designated as “[University Honors](#),” (awarded to selected students for having successfully completed a series of special honors seminars and an honors thesis), and others as “[Core Program](#),” (awarded to selected students for having successfully completed an integrated academic curriculum program in religious studies, philosophy, English, history and the social sciences).

Ryan Aiello (Bachelor of Science in Business Administration in Accounting, and a second major in Applied Mathematical Economics). Ryan has accepted a position as an Audit Associate with PricewaterhouseCoopers in Pittsburgh.

Christopher Bell (Bachelor of Science in Business Administration in Finance, and a second major in Applied Mathematical Economics)

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Michelle Connor (dual degrees Bachelor of Science in Mathematics, Bachelor of Music in Music Performance), cum laude, University Honors. Michelle has accepted a graduate teaching assistantship position at Tufts University in the field of Music Theory with research focus in mathematics connecting with 19th and 20th century music.

Sean Dant (Bachelor of Science in Mathematics)

Brittney Dietz (Bachelor of Science in Mathematics), cum laude

Michael Halloran (Bachelor of Science in Applied Mathematical Economics)

Wenye He (Bachelor of Science in Applied Mathematical Economics)

Rachel Lawless (Bachelor of Science in Applied Mathematical Economics), magna cum laude. Rachel accepted a position in quality assurance at Epic Systems.

Ryan Martin (Bachelor of Science in Mathematics). Ryan is studying for the actuarial Exam P, which he will take in July.

Luke McCrate (Bachelor of Science in Mathematics and a second major in Computer Science), magna cum laude

[Samantha Potocek](#) (dual degrees Bachelor of Science in Mathematics, Bachelor of Science in Education in Adolescence to Young Adult Education), magna cum laude. Samantha has accepted a position teaching Algebra 1 and Geometry at Troy High School in Troy, OH.

Matthew Putbrese (Bachelor of Science in Applied Mathematical Economics)

Chengwen Qu (Bachelor of Science in Mathematics and a second major in Computer Science)

Elizabeth Shields (dual degrees Bachelor of Arts in Mathematics, Bachelor of Science in Education in Adolescence to Young Adult Education), cum laude

Claire Sonneborn (Bachelor of Science in Mathematics), magna cum laude, University Honors

Andrew Stine (dual degrees Bachelor of Science in Mathematics, Bachelor of Chemical Engineering), cum laude. Andrew has a summer internship at Los Alamos National Laboratory in New Mexico, and will return to UD to pursue graduate studies in chemical engineering in the fall.

Megan Sullivan (dual degrees Bachelor of Arts in Mathematics, Bachelor of Science in Education in Education and Allied Studies) cum laude, Core Program, University Honors

Elizabeth Yorke (Bachelor of Science in Applied Mathematical Economics) cum laude, University Honors. Lizzy now works as a Crew Planning Analyst for American Airlines in Fort Worth, TX.

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Qifan Zhang (Bachelor of Science in Applied Mathematical Economics)

Daniel Zillich (dual degrees Bachelor of Arts in Mathematics, Bachelor of Science in Education in Adolescence to Young Adult Education). Danny has accepted a teaching position with Olmsted Falls High School in Olmsted Falls, OH, and will enjoy teaching geometry and algebra 2 this fall.

MASTER'S DEGREES CONFERRED:

Our department had many graduate students complete their degrees this year. UD has two commencement ceremonies each year, in December and May. Our department offers three Master's degree programs: Master of Financial Mathematics (MFM), Master of Science in Applied Mathematics (MAS), and Master of Mathematics Education (MME). We list the students who graduated during this past academic year with a Master's degree from our department, along with the title and advisor of their Mathematics Clinic.

Mohammed Aldandani (MAS) A Green's function for a two-term second order differential operator (advisor: **Paul Eloe**). Mohammed has accepted a position as a lecturer at Aljouf University in Saudi Arabia.

Shuruq Alharbi (MAS) Boundedness of solutions in Volterra integro differential systems (advisor: **Youssef Raffoul**)

Hanan Aljubran (MFM) Asset pricing in policy uncertainty periods (advisor: **Carl Chen**)



Alaa Almansour (MAS) Boundary value problems at resonance for ordinary differential equations (advisor: **Paul Eloe**)

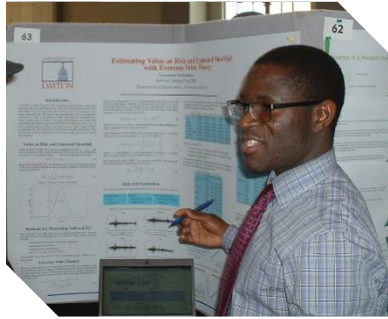
Mashaal Alshammari (MAS) Exponential stability in finite delay equations (advisor: **Youssef Raffoul**)

Fatimah Alshehri (MAS) Decoding with the Golay and extended Golay codes (advisor: **Atif Abueida**)

Patrick Chadowski (MAS) Existence and uniqueness of solutions in nonlinear differential equations (advisor: **Muhammad Islam**).

Peixian Han (MFM and MAS) Valuation of a passport option (advisor: **Paul Eloe**)

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Lawrence Kondowe (MFM) Estimating value-at-risk and expected shortfall with extreme value theory (advisor: **Serigne Diop**, of VERO Capital Management, New York City). Lawrence is currently working at the Dayton office of Gresham Risk Partners LLC as an analyst, where he performs risk analyses and models fixed income securities.

Brian Krilov (MFM) A comparison of day ahead forecasting in AEH Dayton Hub using GARCH and ARMAX modeling techniques (advisor: **Peter Hovey**)

Najlaa Khuder (MAS) Decoding with the Golay and extended Golay codes (advisor: **Atif Abueida**)

Chris Lammlein (MME) The Effect of PowerPoint Presentations on High School Precalculus Students' Academic Success (advisor: **Becky Krakowski**)

Jiaqi Li (MFM) Valuing corporate pension risk: evidence from analyst earning forecasts (advisor: **Jeffrey Zhang**, Department of Finance)



Martin Morris (MFM) Case studies on market explosion (advisor: **Carl Chen**, Department of Finance). Martin has accepted a position as a Model Development Analyst for Regions Financial Corporation in Birmingham, AL.

Elizabeth Nehring (MME) The Effects of an Algebra and Functions Content Course for Pre-Service Middle School Teachers on Mathematical Conceptual Knowledge (advisor: **Becky Krakowski**)

Jing Nie (MFM) Efficiency comparison of Moody's KMV model and Altman's Z-score model predicting corporate default with empirical U.S. data (advisor: **Carl Chen**, Department of Finance)

Chenyu Qiu (MFM) An analysis of American companies (1900 – 2000) using the KMV model (advisor: **Carl Chen**, Department of Finance)

Jason Rader (MME), currently participating in the Lalanne Program.

Abdualrazaq Sanbo (MAS) Boundedness of solutions in Volterra systems of difference equations (advisor: **Youssef Raffoul**)

Yidan Shi (MFM) Valuation of a stock loan (advisor: **Ruihua Liu**)

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Huachun Yu (MAS) Exponential stability and instability in nonlinear Volterra integro-differential equations with functional delay (advisor: **Youssef Raffoul**)

Richelle Zbinden (MME) Do the results of the ACCUPLACER placement exam and Algebra 2 final grades influence one another? (Advisor: **Becky Krakowski**)

Jing Dan Zhang (MFM) Pricing options using the tree method in a switching model with state dependent switching rates (advisor: **Ruihua Liu**)

Tianhui Zhang (MFM) Comparison of optimal consumption-investment models using Monte-Carlo simulations (advisor: **Dan Ren**)

Zhiyang Zhang (MFM) Pricing options in jump diffusion models using the fast Fourier transform (advisor: **Ruihua Liu**)

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ALUMNI/AE NEWS

We were delighted to hear from so many of you in response to our request for news to include in this year's newsletter. Please know that we look forward to seeing you if you are in town, and hearing from you by email or telephone or any other means. We enjoy hearing about your lives and your families and your professional activities. We are grateful for your continuing involvement with our department and with UD, and for your continued support. We are happy to pass on to our current students advice or opportunities for internships or employment that you have to offer them. (Feel free to send news or address updates to Vicki Withrow at vwithrow1@udayton.edu.)

Franklin Demana ('60) was one of the three recipients of the National Council of Teachers of Mathematics (NCTM) Lifetime Achievement Award this year (2015). ([Read more about the award here.](#))

Bob Lewand ('66) wrote, saying he was delighted to share the news that after 44 years of teaching mathematics, the last 38 of which have been at Goucher College, he has hung up his cap and gown. He officially retired on 22 May, 2015. We wish him an active yet restful retirement.

Frank Lad ('70), of the University of Canterbury, Christchurch, NZ, wrote to inform us of a recent article he has co-authored (with Giuseppe Sanfilippo and Gianna Agro, of the University of Palermo, Sicily): "Extropy: Complementary Dual of Entropy," Statistical Science, Vol 30 Number 1, pp 40-58.

Sean Donahue, ('84) M.D., Ph.D. received the 2014 University of Dayton Distinguished Alumnus Award in September. ([Read more about the award here.](#)) Sean sends a shout out to all his former math buddies. Sean is currently Vice Chair for Clinical Affairs, Chief of Pediatric Ophthalmology and Coleman Chair of Ophthalmology at Vanderbilt University Medical Center

where he specializes in Pediatric Ophthalmology, Pediatric Neuro-Ophthalmology, and Adult Strabismus.

Greg Goodhart ('85) has been a professor at Columbus State Community College, OH, for 23 years and was appointed chair in April 2015.

John Sengewalt ('86) retired after 26 years with the Department of Defense. He continues to reside in Berryville, VA.

Jeff Diller ('88) received one of the Rev. Edmund P. Joyce, C.S.C. Award for Excellence in Undergraduate Teaching from the University of Notre Dame, where he is a Professor in the Department of Mathematics. ([Read more about the award here.](#))

Dan Simon ('91) sent us a newsy note beginning with “I loved every minute of my time at UD.” Dan is completing his second year as Principal of Colts Neck High School in NJ. He spent ten years as Principal of High Technology High School (ranked in the top 5 U.S. high schools) and a year as a Superintendent in Wall Township Public Schools. Catching us up on his career, Dan explains that he spent the first half of his education career in mathematics teaching and supervisory positions. Since Dan is still passionate about teaching, he teaches mathematics at night for a local community college. On a personal note, Dan and his wife Linda have six children and welcomed their first granddaughter last summer. Dan says that his children are following in his footsteps, since their first college graduate was a mathematics major and the next in line is a mathematics education major.

Cheryl Edelmann ('92) has been a full-time lecturer in the School of Business Administration at UD since the fall of 2013. She teaches the statistics sequence for the business students which, she says, is a great fit for her background and interests. She continues to assist Dr. **Christine Schubert Kabban ('92)**, an associate professor of statistics at the Air Force Institute of Technology, with research. Their current project deals with classification trees.

David Jessup ('92) reports that he lives in Washington, DC, and is moving to a new home with more room to accommodate the impending addition to their family. David and his wife Margaux are expecting a baby boy next month.

Sara Miner More ('96) just completed her first year in the Department of Computer Science at Johns Hopkins University where she is an Associate Teaching Professor.

Erich Morman ('96) dropped in to chat during March Madness. He had come to Columbus to cheer on the Flyers. He works in Arlington, VA, as a data analyst for Goldbelt Glacier Health Services supporting the Department of Defense Suicide Prevention Office. Erich met **Rob Pratt ('95)**, who works for SAS, at a recent INFORMS conference.

Christian Hampson (MAS '05) has been working at Microsoft as a Data Scientist for about a year. He says he is constantly using the statistics he learned at UD. He and his family live in Bellevue, Washington.

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David Prier ('06) teaches at Gannon University in Erie, PA, where he was granted a promotion to Associate Professor of Mathematics this year. He and his wife, Maria, have two children, Andrew (3 years) and Hannah (4 months).

Chris Cabanski ('07) wrote that he enjoys both living in California and his job at Genentech. Chris writes that he volunteered to co-teach an undergraduate course in statistics at San Quentin State Prison, CA, this year. This course was part of the Prison University Project, a program that offers college-level courses to inmates and allows them to earn credit towards an Associate's Degree. He said the students learned a lot, and that he enjoyed the experience.

Thomas Marlowe ('07) is a high school math teacher at Hawken Upper School in Gates Mills, OH. He is also completing his M.A. in Mathematics at John Carroll University.

Jenny Diemunsch ('09) earned her Ph.D. degree this year from the University of Colorado Denver. She was named an outstanding Doctor of Philosophy degree graduate of the College of Liberal Arts and Sciences. She has accepted a tenure-track position at Saint Vincent College in Latrobe, PA. **Art Busch** (who advised Jenny's Honors thesis at UD) visited the University of Colorado Denver on a research trip, timing it so that he could attend Jenny's doctoral defense.



Charlie Suer ('10) happily announces his successful dissertation defense. He will graduate with his Ph.D. from the University of Louisville in August, and will spend the next academic year in a visiting position at Centre College.

Phil Erford ('11) moved to Anaheim, CA, and got married in October of 2014. He then started a position as a Campus Recruiter for Deloitte's AERS (Audit and Enterprise Risk Services) Advisory practice in Southern California. He recruits from campuses such as USC, UCLA, and UC Irvine, and he recruits students from a wide array of disciplines including business, accounting, computer science, and (of course) mathematics. He informs us that he welcomes being contacted by students, alumni, or faculty who may be traveling to or through the LA/Orange County area.

Joe Dorocak ('12) has passed his third Actuarial Exam and is working at the Cleveland Clinic. He and **Leanna Komanecky ('12)** will be married in July.

Leanna Komanecky ('12) writes that she and **Joe Dorocak ('12)** are getting married in July.

Carla Nietfield ('12) received an M.S. in economics in December 2013 and is currently a fourth year Ph.D. candidate in economics at The University of Kentucky with an expected graduation date of May 2017. Her research is primarily in the field of public economics. She is studying the impacts of state educational spending on the economic growth of states.

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Chester Lian ('13) has completed his second year in the Ph.D. program in mathematics at Duke University, has passed all qualifying and oral exams and has finished his coursework.

Zi Ouyang ('13) has completed two years in a doctoral program in applied physics at the University of Massachusetts Lowell. Recently, her undergraduate research in mathematics (with **Paul Eloe**), “Multi-Term Linear Fractional Nabla Difference Equations with Constant Coefficients,” appeared in *International Journal of Difference Equations*, 10 (1) (2015), 91—106.

Yuchen Zhou (MFM '13) has returned to Hangzhou City in China where he works in the finance district. His Mathematics Clinic work (with **Paul Eloe**) has recently been published: “Pricing multi-asset American options with regime-switching by exponential time differencing schemes,” *Transactions on Mathematical Programming & Applications*, 2 (2014), no.3, 1—18.

Dan Esposito ('14) has completed his first year of a dual Master’s program in public affairs and environmental science at Indiana University, where he is focusing on energy policy. In addition to devoting time to his academic endeavors, Dan was elected Vice President of the Energy Leaders Student Association and President of the Graduate Student Association. He also conducted some research for the Indiana Department of Transportation and hopes to present an independent research paper in September at the Energy Policy Conference in Denver. This summer, Dan is interning in San Francisco for the Center for Resource Solutions’ Green-e Energy Program. Dan wrote that he definitely gets nostalgic when thinking about his time at UD! He said that the skills that he learned in the math program surely sharpened his mind and prepared him surprisingly well for this rigorous policy program.

Aparna Higgins edited this newsletter. She thanks all those who responded to her call for news. She cannot adequately express her gratitude to two people for their help and advice: **Paul Eloe**, who edited the newsletter for many years prior to this one, and **Vicki Withrow**, our department’s Senior Administrative Assistant, without whose cheerful help Aparna could not have completed this assignment. Please write to Vicki at vwithrow1@udayton.edu to alert us to changes in your contact information, or to alums who you believe are not on our mailing list.

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