Dear alums, colleagues, students and friends,

The Department of Mathematics had a busy year. Several of our faculty were recognized for their contributions:

- Youssef Raffoul received the 2018 Award for Career Excellence in Scientific Research from the Lebanese Association for the Advancement of Science.
- Becky Krakowski won the College of Arts & Sciences Faculty Award for Outstanding Teaching.
- Tessa Chen and Lynne Yengulalp are part of F3USE, a group of women faculty at UD that was honored with the 2018 Miryam Award, which “recognizes the efforts of people on our campus to change the atmosphere and the potential for women's achievements here at the University of Dayton.”

In November 2017, we hosted Undergraduate Mathematics Day, our biennial undergraduate conference. It was a great success: We had about 200 participants from many different colleges. A number of our undergraduate and graduate students gave talks, and many others were given by students from elsewhere. A number of presenters submitted papers for the Electronic Proceedings of Undergraduate Mathematics Day.

Many of our students have been active in other ways. Several completed internships or research projects last summer. The Math Club continues to be active, advised by Catherine Kublik. Our majors now have to complete a capstone project as part of their major requirements, and many present their results at the Brother Joseph W. Stander Symposium.

Thanks in part to donations by our generous alums and friends of the department, we were able to fund a number of other student activities. Here is a sample:
• Tessa Chen recruited a team of students to participate in DataFest at Miami University. DataFest is a three-day data analysis competition organized by the American Statistical Association in which teams of students are given a large, complex data set to explore and analyze.

• Muhammad Usman recruited and coached a group of students to participate in the weeklong SCUDEM 2018 (Student Competition Using Differential Equations Modelling). The competition culminated on a Saturday at a regional host site, where each team presented their solutions to a panel of judges.

• Twenty-one students took part in the annual William Lowell Putnam Mathematical Competition. They were mostly recruited by Aparna Higgins, who also provided coaching sessions ahead of the competition. Aparna also continued to post “Problems of the Fortnight.”

• We were able to fund students’ participation in a number of conferences, ranging from the Nebraska Conference for Undergraduate Women in Mathematics to regional AMS meetings. We are happy to help our students build networks in the mathematical community and present their research to an audience of mathematicians.

We thank our generous alums and friends whose contributions to the Mathematics Department allow us to sponsor these kinds of student activities.

We are particularly grateful to Donna Koler, whose late husband Alexander Koler was a 1964 alum of our department. Donna has made a $25,000 gift in memory of her husband. The donation is in honor of Dr. Kenneth Schraut and Dr. Harry Mushenheim, of whom Alex Koler thought very highly. This gift will enable us to continue funding student activities, including the Math Club, student conference travel and participation in individual and team competitions. We will be able to sustain robust support of our faculty, funding travel to conferences and to collaborate with others. Gifts like these allows us to support our growing number of faculty despite limited travel budgets.

There has been a change in the administration of our graduate programs. After many years of service, Paul Eloe stepped down as the Graduate Director. Please join me in thanking Paul for this immense service to the department, the university and, of course, the many students who benefitted from his guidance. Youssef Raffoul took over as Graduate Director in August 2018.

There are some sad news we have to convey as well. We lost four long-time faculty members, who left their imprint on our department, and who greatly influenced the lives of many students. Ben Rice passed away on December 7, 2017, after a long battle with cancer, and Bob Gorton passed away on May 31, 2018. Bill Friel died on June 11, 2018, and we lost Jack McCloskey on December 15, 2018. An appreciation of their lives and contributions to the university, the department and their students can be found elsewhere in this newsletter.

After a long summer of construction, the renovation of the third-floor south hallway in Sherman Hall was completed in August 2017. The two newly renovated classrooms are used extensively. We are particularly happy that the mathematics education classroom is now large and bright, with movable tables and writing space on three walls. We also gained some much needed study and collaboration space. The previously dark and narrow hallway has been transformed into a
bright space that accommodates a number of study areas with different types of tables and chairs and whiteboards everywhere. I am happy to report that students love this space, and that it is being used all the time.

In the summer of 2018, we renovated the Schraut Lecture Hall. The classroom has been reoriented and equipped with plenty of board space along the walls and movable tables to allow for maximum flexibility in teaching styles. We are very grateful to George Morrison ('82) and his wife Sarah, who made a sizeable donation toward the renovation of this classroom in honor of Doc Schraut.

The size of the incoming class in the fall of 2017 broke all records, and we welcomed a similarly large number of students last fall. This is great news for UD, but it also challenges our capacity to deliver mathematics courses to everyone. Last summer, we hired two lecturers for one-year appointments to alleviate this crunch in the short run. We are currently conducting searches for a tenure-track faculty position in number theory and a lecturer position in statistics.

I know you enjoy reading this newsletter. I am sure you agree that it is an informative and immensely enjoyable snapshot of our activities.

Warmest wishes for the remainder of the year,

Wiebke Diestelkamp

About this newsletter:
Readers may navigate this newsletter by clicking the links in the Table of Contents (TOC). Clicking on “Back to TOC” will take the reader back to this page of this newsletter. Other links in the newsletter take you to related items within this document or to related websites. This newsletter reports on the activities of those associated with the Department of Mathematics. Faculty news reported in this newsletter is from the calendar year 2017; news of students and their activities covers the academic year 2017-2018 and the summers preceding and following that period. There is no time restriction on alumni news.

Photographs are courtesy of Art Busch, Wiebke Diestelkamp, John Erdei, Aparna Higgins, Pete Hovey, Youssef Raffoul, Muhammad Usman and Lynne Yengulalp. Photographs may not correspond with the text near which they appear. We adhere to the University of Dayton guidelines on publishing photographs, so we try not to include photographs of those who attended our activities but are not associated with the University of Dayton.
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 2017:

Dr. Stephen L. Adams ('73)
Mr. David A. Bryan and Ms. Marcia J. Boyle ('74)
Dr. and Mrs. Robert E. Buck, Jr. ('69)
Drs. Gregory and Patricia F. Campbell ('70)
Drs. Joseph and Joan Chmiel ('69)
Mr. Nicholas J. Continisio ('74)
Dr. Paul W. Eloe and Mrs. Laura Schneider Eloe ('84)
Mr. and Mrs. Donald P. Hart, Jr. ('83)
Mr. and Mrs. Donald J. Kavalunas ('65)
Ms. Kathleen M. Kern ('79) and Mr. Patrick J. MacVeigh ('79)
Ms. Megan M. Miller ('11)
Mr. and Mrs. George G. Morrison III ('82)
Dr. Charles Mott ('61) and Ms. Alicia Fernandez-Mott
Dr. Jane E. Pendergast ('74) and Dr. Mark P. Hale, Jr.
Mr. Edward L. Ray and Mrs. Joyce Thomas Ray ('74)
Dr. Thomas J. Santner ('69)
Mrs. Gail DeFord Santner ('69)
Mr. Robert W. Springer ('77)
Mr. Kevin A. Thomas ('76)
Dr. Susan Miller Thompson ('81)
Mr. Mark A. Turella ('80)
Mr. and Mrs. Donald R. Wojciechowski ('72)
Mr. and Mrs. Peter P. Zelek ('73)

The following corporations provided matching gifts:
AON Foundation
Fidelity Charitable Gift Fund
IBM Foundation
Network for Good
The Procter & Gamble Fund
Towers Watson Co.
The **Kenneth C. Schraut, Ph.D., Memorial Scholarship** was established in honor Dr. Schraut. We thank the following donors for their generosity and support.

Mr. Eugene Bolzan (’69) and Ms. Lois V. Scaife  
Dr. and Mrs. Richard J. Fox (’63)  
Mr. Richard L. Iannarino (’71) and Mrs. Leslie Kirchmer Iannarino (’72)  
Mr. Robert A. Nero (’68) and Mrs. Mary Strozdas Nero (’70)  
Mr. and Mrs. James R. Peters (’74)  
Mr. Ronald J. Steinkirchner (’76) and Mrs. Pamela Strevell Steinkirchner (’76)  
Mr. James T. Wiggenhorn (’70) and Dr. Joan Kilsheimer Wiggenhorn (’70)

The following corporations provided matching gifts:

Network for Good

**Gift in memory of Alex Koler (’64)**

Donna Koler generously donated $25000 to our department in memory of her husband Alex Koler, a 1964 mathematics alum. (See the “In Memoriam” section of our 2017 department newsletter, [https://ecommons.udayton.edu/mth_newsletter/21/](https://ecommons.udayton.edu/mth_newsletter/21/)) Mrs. Koler shared with us that Alex always thought highly of Dr. Ken Schraut and Dr. Harry Mushenheim and made this gift in their honor. More information can be found at [https://www.udayton.edu/blogs/artssciences/2018-stories/18-10-29-math-alumnus-gift.php](https://www.udayton.edu/blogs/artssciences/2018-stories/18-10-29-math-alumnus-gift.php).

**Mathematics Scholarships**

The names of mathematics scholarships established by alums and the undergraduate students who were their recipients this year are listed below.

**Arnold P. and Rose M. Schoen Scholarship**  
Cathrine Erbacher

**Kenneth C. Schraut Memorial Scholarship**  
Amelia Pompilio and Kathryn Quinn

**Bill and Barbara Scharf Scholarship**  
Mary Ghiloni

**Katherine Koffel Bruning Scholarship**  
Mary Ghiloni

**The Ben Rice Scholarship**

After Ben Rice died in December 2017, his four surviving sons, along with our retired colleague (and a co-author with Ben on several books) Jerry Strange, founded this scholarship fund. The scholarship will provide support for undergraduate students who demonstrate financial need, with a preference for mathematics majors. Please go to
https://udayton.edu/blogs/artssciences/2018-stories/18-03-15-ben-rice-memorial-scholarship.php for more details. To contribute to the Ben Rice Scholarship fund, please call the University’s advancement division at 937-229-3217 or use the online donation form and specify the Bernard “Ben” Rice Scholarship.

We are grateful to all alums who make contributions to our department and/or to the University. The University’s Advancement Office would like us to remind you that you should go through that office if you would like to donate to any scholarship funds or to any department funds at UD, so that there is a record of your donation.

CONGRATULATIONS!

Our faculty and alums received several kudos this year. We list those that we know of.

Faculty awards

Becky Krakowski was the recipient of the 2017 Faculty Award for Outstanding Teaching, from the College of Arts and Sciences at the University of Dayton. Becky’s expertise in mathematics education has been instrumental in the department’s delivery of the curriculum for pre-service middle school and high school teachers. Becky was the leading force behind the creation of UD’s Master of Mathematics Education program. This program is conducted entirely in the summers and is targeted to in-service teachers. Becky is an innovative teacher, believing strongly in, and modeling, student-centered classrooms in all the classes that she teaches. The award was presented at the annual College Faculty Recognition Event on April 6, 2018.

Youssef Raffoul ('87) is the recipient of the 2018 Award for Career Excellence in Scientific Research, awarded by Lebanese Association for Advancement of Science. Youssef is a prolific researcher in differential and integral equations with over 125 publications in peer-reviewed research journals. The citation mentioned Youssef’s impressive set of international collaborators. It also said that Youssef “believes in the value of higher education and encourages those students who want advanced degrees.” The award was presented on April 26, 2018 at the University of Balamand, Lebanon.
Tessa Chen and Lynne Yengulalp were members of F3USE. The 2018 Miryam Award, which annually recognizes the efforts of people on our campus to change the atmosphere and the potential for women’s achievements here at the University of Dayton, was awarded to F3USE. More information can be found at https://udayton.edu/ministry/csc/advocacy/miryam_award.php.

Alan Veliz-Cuba received a grant from the Simons Foundation for his proposal “Stochastic models of neural and gene networks” for the years 2017-2022. The grant of $42,000 is designed to increase collaborative contacts between mathematicians. The funds are used for collaboration, travel and research expenses for the awardee. Alan also received $15,000 in computational resources from the Ohio Supercomputer Center for his project "Computational Modeling of Microbial Consortia."

Alumni Awards

Paul Judd (’82) was awarded the 2017 David E. Lawrence Outstanding Undergraduate Teaching Award for the College of Business and Public Administration at Drake University. Paul was presented this award in 2007 also. Paul is an Associate Professor of Actuarial Science at Drake.

Rick Schoen (’72) was awarded the Lobachevsky Prize and Medal in 2017. (We reported in the previous newsletter on the Wolf, Schock and Hopf prizes that Rick won that year.) Rick and his wife traveled to Kazan, Russia, where Rick was awarded the prize on December 1, 2017, the 225th birth anniversary of Nikolai Lobachevsky.
Paul Eloe and the Graduate Program in Mathematics: a change, and a retrospective with many thanks

This piece is being written as an appreciation of the efforts of Paul Eloe as Director of the Graduate Program of the Department of Mathematics. He has served as Director of the Graduate Program from 1989 to 2000 and again from 2008 to 2018. His work as Director of the Graduate Program was performed willingly, efficiently and with good humor. Youssef Raffoul has been appointed as the Director of the Graduate Program in our department, starting in the fall of 2018. Aparna Higgins asked Paul to answer a few questions and share his thoughts on our graduate program(s) over the years.

Paul Eloe has always felt that being part of our department’s Master’s program was one of his purposes of being at UD. He was hired in 1980 to support the Master’s program. He taught courses in that program beginning with his first semester here. Paul succeeded Ralph Steinlage as Director of our Graduate Program in 1989. Ralph (with Fred Bogner of the School of Engineering) had successfully developed a degree called Master’s in Applied Mathematical Systems. Paul credits Ralph with designing the program with a very progressive concept, the Mathematics Clinic. The initial concept of Mathematics Clinic was to organize teams of students and help them find and study business/industry/government/defense motivated real-life problems. Solutions and results produced by a Mathematics Clinic team would be presented to the sponsoring business/industry/government/defense firm in the form of a report and possibly an oral report. Thus, the students were to gain research skills as well as communication skills vital for the business world.

Paul directed this program through the 1990s, and then asked for a name change to Master of Science in Applied Mathematics, changing the program from a professional Master’s degree to a Master of Science degree. This change had to be approved by the Ohio Board of Regents. Paul said that he was motivated to initiate the name change because he had to continually explain what a program in applied mathematical systems was about, but everyone seemed to think they knew what a Master’s in Applied Mathematics was!

Paul started his first four-year term as Chair of our department in 2000, so he stepped away from being Director of the Graduate Program. Muhammad Islam took on the responsibilities of directing the graduate program. During that period, the Council of Graduate Schools (CGS) with funding through the Sloan Foundation challenged US institutions to develop the concept of Professional Science Master’s programs. Paul embarked on a three-year process to win start-up funds from the CGS to develop and implement a Professional Science Master’s programs in financial mathematics. The initial round of CGS funding was open only to departments with Ph.D. programs. Our department received funding in the second round (which was the first round that included departments without Ph.D. programs). Paul says, “So I like to say we were in the initial pool of winners.” Students were first admitted to the Master’s of Financial Mathematics (MFM) in the fall term 2004.
Since our department gained the status of a Professional Science Master’s program, Paul was invited to give several talks and participate in panel discussions. He wrote a chapter for inclusion in a booklet of best practices, and he published papers in two conference proceedings. He also served for several years on the Advisory Board of the Professional Science Master’s Programs, sponsored by the CGS. Later on, Paul decided to let our affiliation with the Professional Science Master’s programs lapse because the administration required was greater than were our resources. But Paul says, “It has been a great ride.”

A few years after the start of the MFM program, our department developed and implemented a Master of Mathematics Education degree. Paul says it is a great concept (a summers-only program for in-service teachers), and that although he gave Becky Krakowski a lot of support and guidance as Chair, he gives Becky all the credit for developing, designing and implementing this program.

Paul is a great educator because he is a continual learner. His musings on graduate programs illustrate this facet of his professional life. He said that prior to arriving at UD, he had never been in a department that was not a Ph.D. degree-granting department. Hence, he had no experience with terminal degrees that were not doctoral degrees. So, Ralph Steinlage’s program here and the Professional Science Master’s concept caused him to struggle with the concept of a terminal Master’s degree. Paul has since understood that a Ph.D. degree in mathematics being the terminal degree is a concept of academic perspective, while a terminal Master’s degree in mathematics is a concept of professional perspective. Paul has now gained a lot of experience with professional programs. He emphasized admiringly that Ralph Steinlage’s program at UD was a very progressive professional program.

Further, Paul elaborates that a Master’s degree program that serves as a stepping stone to a Ph.D. program has a minor purpose and is the easiest one for faculty to deliver. However, for a Master’s program to serve as a collection of appropriate experiences and qualifications for entry into the work force is a major purpose and, for most faculty, a difficult service to deliver.

Paul described the structure of our Master’s in Applied Mathematics, saying he was comfortable with our efforts. The program provides rigor in real analysis and linear algebra, creates a concentration of four courses in which research is carried out, and requires four electives for breadth. Paul believes that the research in both the applied mathematics and the financial mathematics programs is the strength of our Master’s degree.

Paul’s efforts included a plan of study with elective courses and Mathematics Clinic tailored to each student individually. Although this personalization was time-consuming, Paul felt it was the right thing to do with regard to the student’s future career. When asked how he works with a Master’s candidate in a Math Clinic, Paul said he first needs to know what the student’s next step will be. If academics, then he will work with the student on an academic problem, on a par with a Master’s thesis and seek publication in a peer-reviewed
outlet. Then, in a letter of recommendation, he can vouch that this student has had a significant research experience. With several Ph.D. programs abroad promoting three-year programs, and expecting students to find a priori advisors who share their research interests, Paul has tried to facilitate our students’ ability to enter such programs. Over the years, Paul has co-authored twenty-one papers with seventeen Master’s candidates! If the student expects to enter or continue in the work force, Paul will look for a research experience that gives the student hard skills for her/his resume – some examples of such research directed by Paul include numerous experiences using simulation methods on finance models, some statistical analysis on sets of data (primarily related to finance), an attempt to quantify the porosity of melting iron ore pellets, and some problems in human factors.

When urged to provide numbers of students, Paul said that through the 1990s, we awarded perhaps two Master’s degrees per year, but since about 2008, we have been averaging fifteen MS or MFM degrees a year. He credits these healthy numbers to several factors: The new and exciting MFM program, UD’s commitment to international student recruitment and the economic situation a decade ago. He also mentions the Bachelor Plus Master’s program, which serves some international students well, and which provides course work for students who have a Bachelor’s in Applied Mathematical Economics, but feel they need more quantitative skills to compete for the more exciting quant jobs.

Asked to speak about what our graduates are doing now, Paul responded geographically. Most students from Saudi Arabia return to teaching positions in that country. They had received scholarship money to earn an advanced degree in support of their teaching position. Many go back to Saudi Arabia and then go abroad again to earn a Ph.D. degree. Most of our students from China earn the MFM degree and seek experience working in the USA for a few years before returning to China. Several have continued in Ph.D. programs, including one who earned a Ph.D. in finance and is currently a university faculty member in a Department of Finance. Domestic students with a Master’s degree from our department obtain entry level positions in business or finance, or contracts and research, often regionally. One graduate was one of the founders of a start-up company in business data who has interviewed more recent graduates for employment. Several alumni have moved into careers of college teaching at the community college level. Paul is wonderful at staying in touch with alums of our graduate programs, inviting them back to serve on the Careers Panel during Biennial Alumni Seminars, and networking with them for job opportunities for current graduate students.

When asked which achievements as Director of our graduate program meant a lot to him, he answered in three sentences, each containing a wealth of ideas and experience: “The experience to coordinate the development of a new graduate program, a professional graduate program and the connections that developed through the Advisory Board period of time has had impact on my
career and my own professional development. Supporting graduate students in research, advising graduate students as they move to the next step in their careers has impacted my professional development. Teaching many different courses at the master’s level has been instrumental in developing my knowledge of mathematics and on more than just a few occasions strengthened my capabilities as a research mathematician.”

Paul, our department is richer for your long service as Director of its graduate program. Alumni of our graduate programs were fortunate to have you care for their graduate education, tailoring it to meet their interests, and encouraging their efforts. The Department of Mathematics is grateful for all you have done with the graduate programs and for its students, and we thank you.

MathEvents

Undergraduate Mathematics Day
Undergraduate Mathematics Day was held on Saturday, November 11, 2017, and was a great success! We had 199 participants. Students and faculty from 23 different colleges (some were regional, but some from states other than Ohio) and four area high schools attended. We also had five participants from business/industry. The focus of the event is an undergraduate mathematics conference. We had 38 contributed talks, given by 42 students. The student presenters were mostly undergraduates, but there were some graduate students, and one talk was given by high school students. The full program can be found at https://udayton.edu/artssciences/academics/mathematics/events/undergrad-math-day/_resources/umd-program.pdf

Fifteen of the talks were presented by sixteen UD undergraduate students:

- Investigation of Matrix Multiplication, **Chloe Beckett**
- Volumes of Solids of Revolution Using Double Integrals, **Brian Blakely**
- Closest Point Mapping and Dimension of Sets, **Dylan Flaute**
- Area Under an Interesting Metric, **Matthew Forte**
- The Number of Fixed Points of AND-OR Networks with Chain Topology, **Lauren Geiser**
- How One’s Risk Preferences Affect Their Investment Decisions, **Kari Hayes** and **Anna Petrick**
- Option Pricing in Discrete Time: A General Theory, **Peter Kawiecki**
- Prime Factorization and Series, **Junyu Lin**
- A Mathematical Model to Evaluate Iodide Concentration Dynamics and Its Effect on Neurological Development, **Marina Mancuso**
- Newton’s Law of Cooling and a Modified Newton’s Method, **Aidan Murphy**
- An Interesting Proof by Leonhard Euler, **Qijing Pan**
- Euler’s Phi Function, **Amelia Pompilio**
• Approximating the Traveling Salesperson Problem, Kathryn Posey
• The Mathematics of Existence, Paul Scheeler
• Steady State Patterns in Differential Equation with AND gates, Zeyu Wang

Five graduate students from UD presented talks:
• Existence of Solutions of Boundary Value Problems at Resonance for Ordinary Differential Equations, Jabr Aljedani
• Extreme Points and Taylor’s Theorem of Functions with Caputo Fractional Order Derivatives, Saleh Almuthaybiri
• Stability in Nonlinear Infinite Delay Volterra Intro-Differential Systems, Sarah Alshammari
• Forecasting Rain Using Logistic and Time Series Regression Analysis, Amal Alsomali
• Introduction of Binomial Tree Model and Option Pricing, Ying Ding

All the student speakers were invited to submit their talks as papers for our online electronic proceedings. Seven talks appear in the Proceedings. Jon Brown served as editor-in-chief.

Volume 5 of the Electronic Proceedings of Undergraduate Mathematics Day can be found at https://udayton.edu/artssciences/academics/mathematics/events/undergrad-math-day/umd_proceedings/proceedings_05.php

The day was anchored by the 18th Annual Kenneth C. Schraut Lecture, presented by Dr. Joseph Gallian, University of Minnesota Duluth. He spoke on “Breaking Driver's License Codes.” Another plenary talk, “It’s All Fun and Games Until Someone Becomes a Mathematician,” was presented by Dr. Allison Henrich, Seattle University. Both talks were interesting and well-received.

The organizers were Jon Brown, Aparna Higgins and Dan Ren.

Biennial Alumni Seminar
The 28th Biennial Alumni Career Seminar was held on Saturday, November 3, 2018. (More details will be reported in next year’s newsletter.) This year’s program was anchored by the 19th Annual Kenneth C. Schraut Lecture, presented by Dr. Kennon Copeland (’75). Dr. Copeland is Senior Vice President of Statistics and Methodology for the National Opinion Research Center at the University of Chicago.

Thanks to Jon Brown and Paul Eloe, who organized the Biennial Alumni Seminar. More information, including the details of the career panel, can be found at https://udayton.edu/artssciences/academics/mathematics/events/alumni-seminar/index.php
2019 Undergraduate Mathematics Day
This biennial student conference will be held on Saturday, November 2, 2019. We welcome contributed talks by students (high school, undergraduate, and graduate). The Schraut Lecture will be given by Dr. Tommy Ratliff, Wheaton College, while Dr. Rachael Kenney (BS, ’99, MS ’00), Purdue University, will deliver a plenary lecture. Jon Brown and Dan Ren are the organizers of this MathEvent. (More details will be provided on the website https://udayton.edu/artssciences/academics/mathematics/events/undergrad-math-day/.)

32nd Conference on Topology and its Applications
Jon Brown, Joe Mashburn, and Lynne Yengulalp organized and hosted the 32nd Summer Conference on Topology and its Applications, http://go.udayton.edu/sumtopo2017, at UD in June, 2017. The conference had around one hundred and twenty participants from all over the US and 16 foreign countries, including Brazil, Canada, Georgia, Germany, India, Italy, Mexico, the Netherlands, Poland, Saudi Arabia, Spain, South Africa, and Turkey. The conference featured twenty invited lectures/workshops and an additional 80 contributed talks within five special sessions (Topology + Algebra and Analysis, Topology + Asymmetric Structures, Topology + Dynamics and Continuum Theory, Topology + Foundations, and Topology + Geometry). The conference was awarded a $35,000 grant from the NSF to support invited speakers and other participants. The College of Arts and Sciences and the Department of Mathematics also supported the conference.

FACULTY UPDATES
Full-time faculty (with date of appointment)

Atif Abueida, 2000
Jonathan Brown, 2014
Arthur Busch, 2006
Ying-Ju (Tessa) Chen, 2017
James Cordeiro, 2017
Wiebke Diestelkamp, 1998
Shannon Driskell, 2003
Paul Eloe, 1980
William Harrison, 2009
Aparna Higgins, 1984
Peter Hovey, 2001
Muhammad Islam, 1985

Rebecca Krakowski, 2000
Catherine Kublik, 2013
Andres Larrain-Hubach, 2016
Ruihua Liu, 2004
Joe Mashburn, 1981
Shirley Ober, 1977
Maher Qumsiyeh, 2008
Youssef Raffoul, 1999
Dan Ren, 2013
Paula Saintignon, 1983
Julie Simon, 2010
Muhammad Usman, 2007

Alan Veliz-Cuba, 2015
Lynne Yengulalp, 2009

Adjunct Faculty

Bob Bennington
Steve Buerschen
David Carr

Martha Carter
Karen Connair
Jacob Daniel

Mark de Saint-Rat
Bob Flavin
Steve Fuchs
Mark Hoffman
In addition, the Department of Mathematics employs over thirty students (undergraduate and graduate) each semester to help in delivering our courses. Most of these students are teaching assistants to faculty, but some of the graduate students teach their own classes, usually precalculus or the course for liberal arts majors.

Retired faculty (with date of retirement)

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<th>Name</th>
<th>Date of Retirement</th>
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<tr>
<td>Tom Gantner</td>
<td>2001</td>
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<tr>
<td>John Kauflin</td>
<td>2005</td>
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<td>Harry Mushenheim</td>
<td>2005</td>
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<td>Jerry Neff</td>
<td>1999</td>
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<td>Richard Peterson</td>
<td>1998</td>
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<td>Carroll Schleppi</td>
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<td>Jerry Strange</td>
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<td>Gerry Shaughnessy</td>
<td>2012</td>
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<td>Lester Steinlage</td>
<td>2016</td>
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<tr>
<td>Ralph Steinlage</td>
<td>2001</td>
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<tr>
<td>Jerry Strange</td>
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IN MEMORIAM

We are sad to report that four of our retired faculty members have passed away since the last newsletter was issued. Ben Rice died in December 2017, Bob Gorton died in May 2018, Bill Friel died in June 2018, and Jack McCloskey ('60) in December 2018. As we mourned their deaths, we remembered their extensive contributions to the department. Several of us had personal recollections of words of advice and acts of friendship from each of these four educators. We know that many of you were taught by them and have your own memories of them. We are grateful to Ben, Bob, Bill and Jack for their many years of service to our department and to UD. They touched, and changed, the lives of many of the students they taught, and their passion for mathematics made itself felt in their classes.

BEN RICE

Ben Rice taught in our department for thirty-eight years, starting in 1960. He was honored by being named Professor of the Year twice – in 1972 and 1978. Ben had a Bachelor’s degree in engineering (Saint Louis University) and a Master’s degree in mathematics (The Ohio State University). He taught many courses in our department’s curriculum. He loved writing, and wrote over ten textbooks, many of them were co-authored with Jerry Strange. He was active in campus governance, often asking hard questions in meetings. He served on the committee that drafted the constitution for the Academic Senate. Even in retirement, Ben continued teaching, sharing his love of cinema by conducting seminars for the University of Dayton Osher Lifelong Learning Institute. Ben was a presence in our department. He voiced his opinions vigorously. He was a mentor to several of our faculty, connecting us with
professional activities that he thought we might enjoy. Aparna remembers Ben suggesting her name as a judge for the MathCounts competition. Ben was gregarious and attended many department-related events even after he retired.

Jerry Strange remembers Ben as a colleague, a friend, and a co-author of mathematics textbooks. Jerry had heard from Ben’s students that Ben was a dedicated teacher, who inspired his students. Jerry says, “In addition to the positive impact that he had on the lives of so many of his students, Ben loved the University of Dayton and it is a better place today because of the 38 years he was on the faculty.”

In remembering Ben, retiree Carroll Schleppi says she has many memories, “from the days of UD Faculty Wives and many of their parties, to working with Ben and Jerry on books, to the retirees’ reunion lunch we had last year.” Carroll says that all her memories of Ben include his warm smile and sense of humor.


BOB GORTON
Bob Gorton came to the University of Dayton in 1969, after earning his Ph.D. from Illinois Institute of Technology. He taught all levels and genres of our course offerings, from precalculus to graduate courses, courses for engineering students, and courses for pre-service teachers, and our upper-level mathematics major courses. He developed the upper-level courses in Number Theory and Set Theory. He retired and was granted professor emeritus status in 2016.

Bob was a popular professor among the students, some of whom referred to him as "Flash." Bob had a dry sense of humor, and some students enjoyed that very much. Besides mathematics, Bob was interested in comic books – he served as the former chairman of Pulpcon. (http://www.pulpfest.com/2018/06/pulpcon-chairman-bob-gorton/)

Every so often, some students had Bob as an instructor for at least four courses, and jokingly said they had earned “a minor in Gorton.” (Our mathematics minor requires four courses at the 300-400 level.) As the number of our majors dropped, students planning on graduate work in mathematics were grateful to Bob as he offered them independent readings in Galois Theory and other advanced topics in algebra.

Aparna Higgins says that Bob was a thorough teacher with very clear explanations. She sat in on both his Higher Geometry and Number Theory courses in her first four years of teaching at UD. Bob wrote new notes every time he taught a course. He said it kept his teaching fresh. Aparna and Bob talked often about pedagogical matters – Bob was a good listener. In particular,
they devised the first version of a "skills test" in our department – a part of their tests was graded “all or nothing.” This helped them identify those skills that a student did not know and isolated those skills from complex multi-step problems in which points for partial credit could have disguised the student's inability to perform that skill. Aparna served on many committees with Bob and says that she benefited much from his comments and suggestions.

We received many email messages from alums (including Jeff Diller ('88) and Stephen Hartke ('99)) regarding Bob Gorton’s influence on their mathematical development. Several of you mentioned his “great” courses and that “Flash Gorton” was your favorite math professor. Geoff Dietz ('00) says, “A lot of people at Dayton greatly altered the course of my life. In Dr. Gorton’s case, I am not sure if I would have gone in the direction of algebra if I had not taken his Abstract and Number Theory courses during my second year. Those classes wrapped up exactly 20 years ago.”

Jeff Vaughn and Dan Riehle (both BS ’70 and MS ’72) told us of an episode when they were in one of Bob’s courses. In Riehle’s words, “We were in a graduate class on algebra studying Galois Theory – not trivial. In the key theorem of the theory, that has as corollaries that you can’t trisect an angle nor square a circle, Bob’s lecture was disrupted by the bell. Note Jeff and I were very competitive, more painful for me because Jeff was better and I tried harder. Between the suspended session and the subsequent session I went to Bob, telling him I couldn’t wait to see the conclusion for the proof, which Bob then shared with me. I scribed, I studied, I memorized and went to the next class, sitting next to Jeff. As Gorton started into the continuation of the proof, I whispered to Jeff what would come next, doing so until the end of the proof (without taking notes). Given that Jeff and I were (and are) friends, it was devastation for Jeff and delightful for me. After class, Bob informed Jeff (as we were both students and friends of Bob) of my devious behavior.” Vaughn mentions that he remembers the story well and has re-told it a few times over the years. He still remembers the devastating feeling of “Dan gets it and I don’t!” Vaughn adds, “I think Galois theory was the most challenging subject I ever studied. If we had a question and went to Dr. Gorton, he would say, “Your question is illogical; go back and study until you can ask it correctly.” We would – often multiple times. But when we could ask it correctly, we would also know the answer without asking. We learned a lot from Bob Gorton, including how to really study math.”

BILL FRIEL
Bill Friel came to the University of Dayton in 1963, after earning degrees from Loras College and Duquesne University. In addition to the courses he taught in our department, Bill taught FORTRAN courses in the Department of Computer Science, and later was one of the pioneers of using Maple in our calculus courses. Jerry Strange says he knew Bill as a friend and colleague for forty years, and that Bill was devoted to the University of Dayton and the Department of Mathematics. Jerry remembers Bill as a perfectionist, who held himself to a high standard and expected his students to strive to do their best in the mathematics course that he taught.

Aparna Higgins remembers Bill Friel’s support as she learned how to send and receive email messages – using a modem and a DECWriter, which was located in the main
office of the Department of Mathematics. Aparna sometimes rode in Bill’s car to meetings of the Ohio Section of the MAA, and spent hours chatting about teaching, and using technology to teach mathematics. Bill enjoyed taking students in his car to Section meetings. He was advisor to UD’s Math Club around the time that the MAA created Student Chapters, and Bill gladly served as faculty advisor to our Student Chapter.

Bill served the Ohio Section of the MAA in many capacities, including a term as President in the late 80s, and as Secretary-Treasurer in the late 90s. He was eager to have the Section meeting at UD, serving as the point-person for local arrangements for three meetings at UD.

Bill worked to improve the academic environment at UD by his active participation in UD’s chapter of the AAUP (American Association of University Professors). Bill also served UD by being a University Marshal for sixteen years, including four as Head Marshal.

Carroll Schleppi recalls that Bill was a regular at their daily 9:30 a.m. “staff meeting” in Kennedy Union for coffee, that Bill loved UD basketball, and sometimes followed UD football on the road to some post season games, then sharing details of the trips with the coffee group. Carroll remembers that Bill and his wife Bev were supportive members of “UD Faculty Wives,” which morphed into “UD Women’s Association.” Carroll says, “Tirelessly supporting whatever he believed in is a perfect description of Bill. We all appreciated that support.”


**JACK McCLOSKEY**

Jack McCloskey was an alumnus of our department (BS ’60). A mourner at his wake mentioned that Jack was in the first group of mathematics majors to be introduced to the new invention – computers! – and that Jack quickly learned to use them well.

Jack earned his Master’s and Ph.D. degrees in statistics from Michigan State University in 1965, and returned to the University of Dayton to teach statistics. **Pete Hovey** (’75) was taught by Jack when Pete was a student at UD. Pete says, “Jack was one of the special teachers at UD that helped inspire my career in Statistics. I really enjoyed his lecture style and found great insights as a result of his clear presentations.”

Jack chaired the department from 1976 to 1988. He hired many of the (now) senior faculty in the department. Aparna Higgins, who was hired in 1984, remembers that Jack gave her a very diverse teaching load her first three semesters. When she proposed the idea of a “proof course” to Jack, he said he liked the idea so much that he would co-teach the course with her, and

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proposed the name “Essentials of Mathematical Reasoning.” Later, Jack asked Aparna to work with Ralph Steinlage, then a senior member of the faculty, to prepare the proposal needed for the course to be approved as a regular course offering. The course still exists, in expanded form, as MTH 308, Foundations and Discrete Mathematics. (See Goodbye, “Proof course” on page 7 of the 2006 newsletter.) Jack retired in 2001.


The faculty members of the department were pleased to be able to spend some time with Jack and Norma at the annual Department of Mathematics TGIF during the last few years.

The personal remembrance printed below was written by Paul Eloe, who was hired by Jack. Paul served as Chair of the department during 2000-2008.

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**Jack McCloskey** served as chair of the Department of Mathematics for three four-year terms, 1976-1988. Hence, Jack was chair when I was hired in 1980. I will always remember Jack for his enthusiasm, his passion for diverse interests, and I will always remember Jack, the administrator, for his skill to treat people, students and faculty alike, with fairness and with respect.

Jack is the reason I am at UD. When I was looking for my first job, my ambitions had me looking for a position in a Ph.D. granting department. Being cautious, I applied to several schools (like UD) that did not have Ph.D. programs in mathematics. When Jack called me to offer me a position, I was actively talking to two other schools (each in the process of developing Ph.D. programs). Jack gave me a generous amount of time to consider the offer and then gave me a generous extension. (Having served as chair myself, I now understand better the strain I put on Jack.) The night before I had to respond to UD, yes or no, I received a somewhat incoherent phone call from one of the other schools in which I am pretty sure a verbal offer was given. With that incoherent phone call, I realized that Jack was treating me fairly and with respect, and that working in that kind of environment was more important than landing a position with a Ph.D. granting department. I called Jack the next day, accepted the UD offer and spent the first eight years of my career with Jack as chair. I made a great decision and I have never looked back.

Jack was certainly an enthusiastic teacher. When he went back to full-time teaching (after his terms as Chair), he would teach large sections of statistics classes. Rooms
114 and 214 in Sherman Hall were tiered classrooms at that time and could hold sixty students. We had an unwritten policy to cap sections at forty. Jack once told me that if he is assigned a class and a room, just fill it up; he could teach to forty and he could teach to sixty, no big deal. He would lecture with the door open and his voice carried; everybody in that wing knew when Jack was lecturing. More than a few of Jack’s students have told me that they found his enthusiasm to be contagious and they would get pumped to study statistics.

I always enjoyed talking to Jack at socials. He was known as John W. McCloskey in numismatic societies. His specialty was dimes and he co-authored multiple books. Searching web sites for numismatic societies, I have learned that he co-founded the Liberty Seated Collectors Club and served as a longtime president. He was editor of the Club’s printed publication, The Gobrecht Journal. He is credited with significant contributions to seated coin research. Jack was also a climbing enthusiast and climbed more than 30 peaks over 14,000 feet. Conversations with Jack were always interesting and informative.

FACULTY ACTIVITIES

Department faculty members are active in all aspects of their work as productive researchers, as caring educators, as mentors for students, and as members of the University and our profession. Here is a synopsis of faculty activities for the calendar year 2017.

Atif Abueida worked with Rabab Alzahrani (MS, ’17) on her Math Clinic project entitled “Decomposition of Various Complete Graph into Isomorphic Copies of 4-cycle with Three Pendant Edges.” Her project was accepted for publication at a refereed journal.

Jonathan Brown (with Dawn Archey of the University of Detroit Mercy) received a $22,000 NSF conference grant to fund young US based researchers to travel to Leuven, Belgium, to attend the Young Mathematicians in C*-algebras conference held August 10-17, 2018. Along with Adam Fuller (Ohio University), David Pitts (University of Nebraska Lincoln), and Sarah Reznikoff (Kansas State University), Jon received an American Institute of Mathematics SQaREs award, which funds that research group to travel to the American Institute of Mathematics for a week in 2018. The paper “Simplicity of algebras associated to etale groupoids” by Jonathan Brown, Lisa Clark (University of Victoria Wellington), Cynthia Farthing (University of Iowa), and Aidan Sims (University of Wollongong), received the 2017 Kalman Prize for best paper written by a member (or members) of the New Zealand Mathematical Society. Jon Brown (and Alan Veliz-Cuba) continued to volunteer at the Dayton Regional STEM Center in the 2016-2017 school year. The object was to work with local teachers to develop inquiry-based units which incorporated aspects of the engineering design process. These units have been implemented in schools throughout the Dayton area during the 2017-18 school year and are available for teachers to use through the Dayton Regional STEM Center website.
Art Busch saw several projects come to fruition this year. He worked with a student on a readings course and on her capstone project. Art implemented a mathematics placement test for the 2018-19 academic year. Art (along with Maher Qumsiyeh) organized the Integration Bee again this year as part of the Stander Symposium. Art served on a committee that re-designed a third-floor area of Sherman Hall, transforming it into a student study area that is heavily used.

Ying-Ju (Tessa) Chen arranged the participation of UD students in DataFest, held at Miami University in the spring of 2018. She co-advised the students for the competition.

James Cordeiro developed plans for an Applied Probability Seminar at UD along with colleagues at AFIT (Air Force Institute of Technology). The first presentations were held in the spring of 2018. James submitted a grant proposal to the internal Research Seed Grant committee on “(S, s) Inventory Models with BMAP Demand and Stochastic Leadtimes.” It was partially funded. James will use the funding to get help from a student in programming a queueing system simulation during the summer of 2018. James helped Paul Scheeler prepare a talk for Undergraduate Mathematics Day. James was a reviewer for Operations Research Letters, and reviewed a book chapter in a book entitled “Big Data Analytics in Future Power Systems.”

Wiebke Diestelkamp co-authored (with Reinert, S. S., Kinney, A., Jackson, K., Bigelow, K. E.) “Age Stratification and Sample Entropy Analysis Enhance the Limits of Stability Test for Older Adults,” Journal of Applied Biomechanics, 33(6), 419-423, and “Identification of Key Outcome Measures When Using the Instrumented Timed Up and Go and/or Posturography for Fall Screening,” (with Sample, R. B., Kinney, A., Jackson, K., Bigelow, K. E.), which appeared in Gait and Posture, 57, 168-171. Wiebke served as a reviewer for the University of Dayton STEM Catalyst grant program, an initiative to invest in and support faculty and student STEM research at the University of Dayton. In the summer of 2017, she was appointed to the Faculty Merit Evaluation Task Force convened by Provost Benson. The task force delivered its report and recommendations in the spring of 2018. Wiebke chaired the Mentoring Grant Selection Committee of the Association for Women in Mathematics, and she served as a mentor for a new faculty member at Ohio Wesleyan University through the Mathematical Association of America’s Early Career Mentoring Network. With Art Busch, Wiebke oversaw the extensive renovation of the third floor of Sherman Hall. After an extensive planning phase, the work took place in the summer of 2017. As a result, we now have two newly renovated classrooms, and we gained two new faculty offices and much needed study and collaboration space for students.

Shannon Driskell was on sabbatical from August 2017 through May 2018. With Dr. Margie Pinnell (Associate Dean, School of Engineering) as the PI, Drs. Mary-Kate Sableski (Teacher Education), Todd Smith (Physics), and she were funded in two separate grants (Using Engineering Design to Increase Literacy and STEM Interest Among Third Graders, Engineering and Science Foundation of Dayton, $122,562, and STEM/Literacy Afterschool Program, Marianist Foundation, $10,000) to support an afterschool STEM program for local schools. She
Shannon co-wrote innovative, engaging, fun, and highly integrated literacy and STEM activities that reflect research-based best practices for improving literacy and attracting underrepresented populations to STEM. She worked closely with Ms. Caelin Micks (undergraduate Early Childhood major), Lisa Musselman and Haley Rusnak (both undergraduate engineering majors), along with two classroom teachers to help integrate these activities into the afterschool program. Shannon also worked with six colleagues throughout the United States in writing two different NSF grants and one IES (Institute of Education Sciences) grant to research implications of web-based curricula for mathematics learning and teaching in elementary classrooms. She also presented at the Association for Mathematics Teacher Educators Annual Conference.


**Aparna Higgins** presented an MAA minicourse “Directing Undergraduate Research” at the Atlanta Joint Mathematics Meeting. This was the nineteenth edition of this minicourse. Aparna was invited to present the 19th Annual George Kitchen Memorial Lecture, a public mathematics lecture, held at Kalamazoo College this year. She also presented at colloquia in the mathematics departments of Kalamazoo College and Franklin College. She enjoyed putting together two short talks, one at Mathfest in Chicago on online assessment, and the other at the fall meeting of the Ohio Section of the Mathematical Association of America on an idea for a calculus project inspired by the solar eclipse in August. Aparna was one of the organizers of Undergraduate Mathematics Day. Aparna ran “Putnam prep” sessions for students who were going to participate in the Putnam competition.

**Pete Hovey** (’75) continued serving as chair of the Section on Physical and Engineering Sciences of the American Statistical Association. **Allyson Pacifico** (’18) completed her Honors Thesis, entitled “Probabilistic Modeling of Student Interactions During a Passing Period at the University of Dayton,” under Pete’s direction with R programming help from **Tessa Chen**. With the data that Allyson was able to collect from students travelling between classes in Fall 2017, she built a simulation model to investigate the probability of two students meeting between classes. The probabilities were broken down by the Schools of enrollment for the two students. Allyson presented her results at the Honors Symposium and again at the Stander Symposium. This also served as her capstone project.

solutions of a Volterra integrodifferential equation” at the 37th Southeastern-Atlantic Regional Conference on Differential Equations, Kennesaw State University, Georgia, in October.

“Asymptotic stability of no-unique solutions of differential equations by fixed point theory,” in a special session at the American Mathematical Society Sectional meeting, University of Central Florida, Orlando, Florida, in September, and “Periodicity in quantum Volterra equations,” in our department colloquium in March. Islam served on a number of doctoral students’ advising committees in the School of Engineering. Islam worked with Emily Seals on her capstone project, which Emily presented at the Stander Symposium.

Becky Krakowski worked with Michael Paulus on his Master of Mathematics Education Math Clinic, “Impact of Entrance Tickets on Students’ Ability to Learn and Recall Vocabulary,” in the summer of 2017. Becky was awarded the College of Arts and Sciences 2017 Faculty Award for Outstanding Teaching.

Catherine Kublik co-authored (with Chieh Chen and Richard Tsai) an article “An implicit boundary integral method for interfaces evolving by Mullins-Sekerka dynamics,” in Mathematics for Nonlinear Phenomena & Analysis and Computation, Maekawa Y., Jimbo S. (eds), MNP2015, Springer Proceedings in Mathematics & Statistics, vol 215, Cham. Catherine gave two invited talks: at the PIMS (Pacific Institute for the Mathematical Sciences) Workshop on Numerical Methods for PDEs on Surfaces in Maple Ridge, Canada, and at the MIMS (Meiji Institute for Advanced Study of Mathematical Sciences) Workshop on Modeling and Numerical Analysis of Nonlinear Phenomena: Fluid Dynamics, Motion of Interfaces and Cell Biology at Meiji University, in Tokyo, Japan. Catherine was awarded an AWM (Association for Women in Mathematics) Travel Grant that she used to travel to the PIMS Workshop held in Canada in June 2017. She was also awarded a University of Dayton Research Grant-in-aid for the summer of 2017. Catherine is the recipient of the 2018 Dr. Schraut Faculty Research Award. She will use the funding to visit her research collaborators. Catherine mentored two undergraduate students: Brian Blakely and Dylan Flauta, each of whom presented a talk at Undergraduate Math Day. Catherine was the faculty advisor for the Math Club and is the faculty advisor for the MTH and MTE majors who started at UD this year.

Catherine Kublik
The Schraut Faculty Research Award is designed to aid faculty members of the Mathematics Department in their research. Established by Doc Schraut's daughter, Marilyn Szorc, the fund is not yet ready to support payments, but the Department has committed to fund the initial awards. The award provides $1200 to be used by the recipient in their research. Applications are due in February of each year, with the Chair selecting the recipient (in consultation with the Dean) in March.

Recipients are:
2014 Lynne Yengulalp
2015 Catherine Kublik
2016 Alan Veliz-Cuba
2017 Muhammad Usman
2018 Catherine Kublik

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Ruihua Liu published (with Liu, J., Ren, D.) “Investment and Consumption in Regime-Switching Models with Proportional Transaction Costs and Log Utility,” Mathematical Control and Related Fields (MCRF), 7(3), 465-491. He supervised the clinic project of Ying Ding (MFM 2017), “Spread Option Pricing with Two Underlying Assets in A Regime-Switching Model.” Ruihua hosted Dr. Jiapeng Liu of Jiliang University, China, as a visiting scholar from May 2017- May 2018, and they worked on several research projects together. Ruihua served as the co-chair of the Program Committee of the SIAM Conference on Control and Its Applications (CT17), held in Pittsburgh, July 10-12, 2017.

Joe Mashburn was an organizer (with Jon Brown and Lynne Yengulalp) of the very successful conference, “The 32nd Summer Conference on Topology and its Applications,” held at the University of Dayton.


Dan Ren published (with J.P. Liu and R.H. Liu) “Investment and Consumption in Regime-Switching Models with Proportional Transaction Costs and Log Utility,” Mathematical Control and Related Fields, Vol. 7, No. 3, September 2017. She received a research grant from the College of Arts and Sciences of $1250 for “Optimal asset allocation with stochastic interest rates with regime-switching models,” for the summer of 2017. Dan was an invited speaker at SIAM Conference on Controls and Its Applications, held in Pittsburgh, during July 2017. She spoke on “Optimal Consumption and Investment on a Finite Horizon.” Dan was the faculty speaker at our Pi Mu Epsilon banquet in April, speaking on “Some experiments in behavioral finance.” Dan directed the study and Mathematics Clinics of graduate students Chenwei Liu (2017) and Runze Hu (2017). She also advised the capstone projects of five undergraduate students. Dan was one of the organizers of Undergraduate Mathematics Day (along with Aparna Higgins and Jonathan Brown).

an invited talk on “A Study of Bifurcation Parameters in Travelling Wave Solutions of a Damped Forced Korteweg de Vries-Kuramoto Sivashinsky Type Equation.” Usman also spoke to a “Discover Science’ class at UD on “Applications of Computational Mathematics in Various Disciplines,” in September, and he spoke at the International Symposium on Biomathematics and Ecology Education and Research, held at Illinois State University, in September, on “KEEN in Differential Equation and Entrepreneurial Mindset.”

Usman directed Lijun Lin’s Math Clinic. Part of this Math Clinic, “The comparison of FD and RBFs collocation methods for the solution of the heat equation” was presented at the Stander Symposium. Usman directed Eman Allassaf’s Math Clinic, entitled “A Nonlinear Analysis of an Oscillator Equation with Damping and External Forcing Using a Perturbation Method.” Usman helped several students present the results of their individual research on capstone projects or independent studies. Usman also recruited and coached students for UD’s participation in the 2018 Student Competition Using Differential Equations Modeling. Usman continued his service as an elected member of the Tenure and Promotion Committee of the College of Arts and Sciences. He also serves on the university’s Advisory Committee on Public Safety.

Lynne Yengulalp attended the Auburn Topology Conference in Alabama in October. She was elected the chair of the steering committee of the Summer Conference on Topology and its Applications and started the planning of the 2019 conference, which will take place in Johannesburg, South Africa. Lynne continued her participation in the Greater Miami Valley Math Circle. She served as a co-instructor for the middle/high school group. On two Saturdays each month, the Circle meets and explores mathematics that is outside the usual school curriculum.

Alan Veliz-Cuba published two articles: “Bistability and oscillations in corepressive synthetic microbial consortia,” (with M. Sadeghpour, G. Orosz, K. Josic, and M. Bennett) in Quantitative Biology, 5(1): 55-66, 2017, and (with A. Radillo, K. Josic, and Z. Kilpatrick) “Evidence accumulation and change rate inference in dynamic environments,” Neural Computation, 29(6): 1561-1610, 2017. Alan gave invited talks at the SIAM Conference on Applied Algebraic Geometry (Georgia Tech), at the Networks Seminar (University of Houston), and at the Algebra and Discrete Mathematics Seminar (Clemson University). Alan was selected as one of the 20 speakers to talk at the symposium for the installation of President Spina in April 2017. Alan served as a panelist for the National Science Foundation (Division of Mathematical Sciences). Alan mentored Lauren Geiser in mathematical biology research. Alan (along with Jon Brown) volunteered at the Dayton Regional STEM Center, working with local teachers to develop inquiry based units which incorporated aspects of the engineering design process.

Retirees Carroll Schleppi (page 39) and Jerry Strange (page 42) were featured in the digital edition of the Summer 2018 University of Dayton Magazine in an article entitled “Happy Retirement.” Carroll said in a recent email message that she has busied herself with quilting after retirement, and then mentioned what she misses: “Most of all I miss the students... learning from them and laughing with them.”
Capstone requirement for graduation:
As mentioned in the previous newsletter, every student at UD must fulfill a capstone requirement. Although the capstone experience varies from department to department, it should provide students the opportunity to integrate and use the knowledge and skills they have gathered in their major courses, and to be able to reflect on their vocations. In our department, students also prepare a product, such as a paper, or a talk, or a poster. Many of our students present their work at symposia or conferences at UD or elsewhere.

Jon Brown worked with Jennifer L. Brustoski and Hang Luo.

Art Busch was Kathryn Posey’s capstone project advisor. They worked on approximating the traveling salesperson algorithm. Katie presented her work at Undergraduate Mathematics Day.

Pete Hovey advised Matt Forte on his capstone project, “Factors that Affect National Basketball Association All-Star Selection,” in which Matt used logistic regression to build a model that relates various performance statistics of professional basketball players to the probability of them being selected for their all-star team. As expected, the most important statistic related to scoring points, and not surprisingly, committing more fouls reduced the chance of making the all-star team. Pete also worked with Allyson Pacifico, whose Honors thesis “Probabilistic Modeling of Student Interactions During a Passing Period at the University of Dayton” also functioned as her capstone project.

Muhammad Islam worked with Emily Seals on her capstone project, which was presented as a poster at the Stander Symposium.

Becky Krakowski worked with Caitrin A. Holohan, Qijing Pan and Kathryn Quinn. Qijing presented his work at Undergraduate Mathematics Day.
Andres Larrain-Hubach worked with Junyu Lin.

Dan Ren worked with Anna Petrick and Kari Hayes, on “How One’s Risk Preferences Affect their Investment Decisions,” and with Peter Kawiecki, on “Option Pricing in Discrete Time: A General Theory.” Hayes, Petrick and Kawiecki presented their work at Undergraduate Mathematics Day, and it has appeared in the Proceedings of Undergraduate Mathematics Day. Dan also worked with Wyatt Ohm, on “Prospect Theory: An analysis of decision under risk,” and with Matthew Hooper, on “Determination of Interest Rate’s Behavioral Movement Utilizing the Brownian Motion.”

Muhammad Usman worked with Elizabeth Boeke on “Runge-Kutta Methods to Explore Numerical Solutions of Reactor Point Kinetic Equations.” He also worked with Alicia Talarico.

Alan Veliz-Cuba worked with Zeyu Wang on “Gene Networks with AND Gates.” Zeyu presented her work at Undergraduate Mathematics Day. Alan also worked with Yiwei Jiang on “Effects of Cell Cycle Noise,” and with Tamier Bao on “A Discrete model of Pricing with 2 Sellers.”

Department colloquium
Every Thursday, the faculty and graduate students gather for a department colloquium. Our speakers include graduate students presenting their Math Clinic projects, our own faculty, and visiting faculty (who are sometimes alums!). The complete schedule is at https://udayton.edu/artssciences/academics/mathematics/events/colloquium/index.php

Origami Workshop
A workshop on modular origami was hosted jointly by the departments of Art & Design, Mathematics and Physics in April, with Dr. Robert Lang as presenter. Dr. Lang is well-known as a leading origami artist. He has a doctorate in applied physics and worked in that area for many years before becoming devoting his full attention to origami. Dr. Lang was visiting Dayton (where he was born) in connection with the exhibit “Above the Fold: New Expressions in Origami” at the Dayton Art Institute. The workshop at UD was held in the Schraut Room. We spent an interesting hour in folding (and in occasional frustration!) with Dr. Lang helping us to fit the modules correctly.

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Problem of the Fortnight

The Problem of the Fortnight is a fun problem that is meant to draw in anyone who enjoys a puzzle. Here is one problem, and part of a solution that was submitted by Mary Ghiloni, an undergraduate, who mentioned that she had fun putting it together.

There are three wooden barrels. One of the barrels holds only apples. One of the barrels has only oranges in it. The remaining barrel has both apples and oranges in it. Each barrel has a wooden lid, which is labeled with “Apples” or “Oranges” or “Apples/Oranges,” but NONE of the lids correctly describes the contents of the barrel that it covers!

Can you decide what fruit each barrel contains if you are permitted to reach into exactly one barrel and pull out exactly one piece of fruit (no peeking inside the barrel)? If so, describe carefully how this process tells you the contents of each barrel and if not, explain why this process will not work to determine what is in each barrel.

Yes, I can accurately determine which barrels contain which fruit. I would pick out of the Apples/Oranges Barrel. I know this barrel is falsely labeled and does not contain Apples/Oranges, so it must contain either Apples or Oranges.

Case 1: Pulling an Apple out of the Apples/Oranges Barrel

<table>
<thead>
<tr>
<th>Barrel</th>
<th>Could Contain</th>
<th>Known Contents</th>
<th>Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples/Oranges</td>
<td>Apples or Oranges</td>
<td>Apple</td>
<td>I pulled an apple out, the barrel contains either apples or oranges therefore the barrel must contain apples.</td>
</tr>
<tr>
<td>Oranges</td>
<td>Apples or Apples/Oranges</td>
<td>Apples/Oranges</td>
<td>The Apples/Oranges barrel contains apples so this barrel cannot contain apples or oranges, therefore it must contain Apples/Oranges.</td>
</tr>
<tr>
<td>Apples</td>
<td>Oranges or Apples/Oranges</td>
<td>Oranges</td>
<td>The Oranges barrel contains Apples/Oranges so this barrel cannot contain apples or Apples/Oranges therefore it must contain Oranges.</td>
</tr>
</tbody>
</table>
**Eclipse-watching event**
*Aparna Higgins* organized an “eclipse-watching party” on the twenty-first of August, 2017, the day of the total solar eclipse (we experienced about 89% coverage – quite awesome!), which was also the day before the start of the fall semester. Several faculty, spouses, friends, and many students dropped by to watch the eclipse with us. We were equipped with some eclipse-watching glasses, and with home-made pinhole viewers fashioned from cereal boxes and foil (which fascinated some of the new students walking by on their orientation tours). Aparna borrowed, from the Department of Physics, a solar cell and a connected meter that measured the amount of light that the solar cell was picking up. We had a crude graph on an easel on which observers could record what the meter said. And, we also had eclipse cookies!

**UNDERGRADUATE STUDENT ACTIVITIES**

Our undergraduates keep busy all year with many extra-curricular mathematics-related activities.

**UD Math Club and Pi Mu Epsilon Chapter**
The UD Math Club meets jointly with our Pi Mu Epsilon chapter during the year. An exception is the annual Pi Mu Epsilon dinner at which new members of this national honorary society are inducted into the Ohio Zeta Chapter (our Chapter!). We refer to this combined student group as “The Math Club” for convenience.
The officers for the academic year 2017-2018 were:
President: Katie Posey ('18)
Vice-President: Amelia Pompilio ('19)
Treasurer: David Gross ('18)
Secretary: Tom Weckesser ('18)
Pi Mu Epsilon President: Peter Kawiecki ('18)

The faculty advisor for the Math Club was Catherine Kublik, and Lynne Yengulalp was advisor to the Pi Mu Epsilon chapter.

Math Club meetings are held about once a month. There is a short talk; there are games; there is pizza and pop. Above all, it is a meeting of energetic students and faculty, all of whom are interested in mathematics. Speakers this year were faculty members James Cordeiro, with an introduction to Operations Research; Becky Krakowski, who made a comparison of mathematics at the elementary school level taught in various countries – from her recent sabbatical experience; Catherine Kublik, speaking on Catalan numbers; Youssef Raffoul, explaining the role of ordinary differential equations in population dynamics, Julie Simon, telling us about the four-color theorem, and Muhammad Usman, who provided an introduction to computational mathematics and convergence rates. Marina Mancuso, an undergraduate, spoke, in general, about applying to Research Experiences for Undergraduates (REUs) and, in particular, about her REU experience.

Elections for officers for 2018-19 resulted in Amy Pompilio being elected President, Benjamin Wilson was elected Vice-President, Mary Ghiloni elected to be Secretary, and Christian Hemsath as Treasurer. Peter Kawiecki was re-elected as PME President.

Pi Mu Epsilon Induction
Pi Mu Epsilon held its annual banquet on April 19, 2018. Eight new members were welcomed into the chapter:

Cathrine Erbacher
Junyu Lin
Mary Ghiloni
Thao Truong
Leah Squiller
Gabrielle Vouk
Elisabeth DeNardo
Robert Mumma
New members joined current members and faculty for dinner and an induction ceremony followed by a presentation on geometry by Andrés Larrain-Hubach.

High School Mathematics Competition

On Saturday, March 10, 2018, UD held its 23rd Annual High School Math Competition. It was a big success and the students who participated had a lot of fun. A lot of them were looking forward to next year's competition!

Features of the High School Mathematics Competition

- Team competition, with the teams moving from station to station.
- Each station represents a topic (say, geometry).
- At each station, three problems at three levels of difficulty and, consequently, three levels of points obtainable.
- The team must turn in a solution to at most one of those problems.
- A team may not return to that station during the rest of the competition.
- The maximum number of points is 1000. The team with the most points wins. In case of ties, the team with the earlier finish time 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.
- Math Club officers organize the event, order the food, set up proctors and runners and graders.

Eighty-five students from eight different high schools participated. The high schools represented were Alter, Carroll, Dayton Regional STEM School, Fairfield, Fairmont, Oakwood, Stebbins and Stivers. The winning team was Mathohondria from Fairfield with 800 points. In second place was The Algebros from Oakwood also with 800 points but finishing later than Mathohondria. In third place was The Debaters from Alter with 750 points. The maximum number of points is 1000.

While the answers were being graded and the points tallied, Tessa Chen provided a very nice introduction to conditional probability with her talk on Bayes Theorem.
Here are the three questions from one of the topics:

**Easy (25 Points):** What is the greatest common divisor of 51, 34, and 136?

**Medium (50 Points):** An “emirp” is a prime number that becomes another prime number when its digits are reversed. For example, 13 is an emirp because 13 and 31 are both primes. Find three emirps and their reverses that are less than 100 (and you can’t use 13 or 31).

**Hard (100 Points):** 2018 is the sum of these twelve consecutive integers… but ONLY IF all terms are raised to what power?

\[
2018 = 7^2 + 8^2 + 9^2 + 10^2 + 11^2 + 12^2 + 13^2 + 14^2 + 15^2 + 16^2 + 17^2 + 18^2
\]

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**Honors Student Symposium**

The symposium provides a venue for students in the University Honors Program to present the results of their research in a professional conference setting to an audience of peers and faculty from across the University. The symposium was held on March 9, 2018. **Allyson Pacifico**, whose major is Applied Mathematical Economics, presented “Probabilistic Modeling of Student Interaction during a Passing Period at the University of Dayton.” Her thesis advisor was **Peter Hovey**.
Participation in mathematics activities external to UD

The Putnam Competition

The seventy-eighth annual William Lowell Putnam Mathematical Competition was held on Saturday, December 3, 2017. Twenty-one UD undergraduates participated in the Putnam competition. (Students with an asterisk earned a positive score.) The competition is an individual competition, attempting six questions in the morning and six more in the afternoon. It is a tough commitment to make – three hours in the morning, and three more hours in the afternoon – on a Saturday a week before the semester ends. We are very proud of these students.

Putnam “prep sessions” continued this year. These voluntary sessions were held every school day for the three weeks prior to the competition. Aparna Higgins ran these sessions. Interested students work with her on old Putnam problems and perhaps learn a little mathematics and a little writing along the way.

The Department of Mathematics (funded by generous alumni donations) paid for lunch at Milano’s (on Brown Street).

| Ian Beach    | Josh Kinser * | Amy Pompilio | Michael Simpson |
| Shannan Becks| Junyu Lin *   | Kathryn Posey| Alex Smith      |
| Brian Blakely| Sean Mahoney  | Samuel Ray   | Thao Truong    |
| Austin Dias  | James McAtee  | Stephen Reynolds| Zeyu Wang |
| Dylan Flaute | Lauren Morgan | Ellie Rizzo  | Johnathon Webb |

DataFest

Tessa Chen and James Cordeiro co-advised a team of students from UD to participate in DataFest, a data analysis competition organized by the American Statistical Association, held at Miami University this year. Our student participants were Jonathan Conrad, Qidi Han, Weiguang Liang, Yue Qin and Peimin Shi. Teams of students are given a large, rich, complex data set that is secret until the competition begins. Teams have the weekend to explore and
analyze the uncharted data before finally presenting their findings to an open audience and a panel of judges.

**Student Competition Using Differential Equations Modeling (SCUDEM 2018)**

Muhammad Usman recruited and prepared three engineering students to participate (as a team) in SCUDEM 2018, organized by SIMIODE. Part of the preparation by Usman included six to eight hours of lectures on theory, computation and qualitative analysis of the systems of differential equations. The students, Junda Jiang, Madeline Lickenbrock and Marina Mancuso, worked on a project for a week and presented their work at the local conference for this competition at Ohio Northern University, in Ada, in April, 2018.

**Actuarial Exams**

Peter Kawiecki and Kari Hayes passed the Actuarial Exam FM in 2018.

**Internships**

Dillon Balk held a co-op position during the spring of 2018 with Allied Motion Technologies. He was a tutor for a local Mathnasium in the summer of 2018.

Christian Hemsath served as a research fellow in the dean's summer scholarship program at UD in the summer of 2018, working with Lynne Yengulalp on research into topological spaces and game theory.

Peter Kawiecki was an IT Business Intelligence Intern during a summer 2017 Internship with Ace Hardware Corporation, Oak Brook, IL. He spent his time working with statistical forecasting models, data mining and visualization. He interned on campus for “Business Research Group,” working essentially as a research assistant and data analyst on Dayton high school/preschool initiatives. Peter also interned in the summer of 2018 with Goldman Sachs, New York. He worked in the “Model Risk Management” division as a quantitative modeling/data analyst.

James McAtee worked with Lynne Yengulalp on measure theory in the summer of 2018. He served as a research fellow in the dean's summer scholarship program at UD.

Amy Pompilio was an Innovation Engineer Co-op at the Emerson Helix Innovation Center. She worked on a machine learning project May-August 2018. Amy presented a talk entitled "Topology of Fractals" on her Honors thesis at MathFest in Denver in August 2018.
The Twentieth Annual Nebraska Conference for Undergraduate Women in Mathematics

Our department sponsored Allyson Pacifico to attend this prestigious, popular and empowering conference. At our request, she wrote to us about her experience. Her account, which has been lightly edited for clarity and details, is printed below.

“As a female math major minoring in computer science, I’ve never really been in a class that had more than 5 women in a class size of 20-40. At first I never thought much of it until I added on a communication minor and saw the contrast between a male dominated field and a women dominated field. I wasn’t sure if any other females in the STEM field felt the same way I did but after attending a conference this past weekend, I feel more connected and empowered than ever. The Nebraska Conference for Undergraduate Women in Mathematics was not anything like I’d expect it to be. Being the only student from UD attending made it a little daunting but it all seemed to evaporate after the plenary talk. For the entirety of this conference, I learned about what research is being conducted by other undergraduate women in mathematics, how other key women in mathematics have succeeded post-graduation, and most importantly how to be confident in myself. Other than the talks, poster sessions, and breakout sessions, networking was a huge portion of the conference. I met women from all over the nation and concentrating in various topics within mathematics. Seeing 250 undergraduate women in mathematics is not only empowering but gave me hope about the future female leaders in the STEM field. For any undergraduate women in math or computer science, I would highly suggest attending this conference. It truly is an eye opener to the bigger picture of women empowering women and the success of future female leaders.”

Student Awards

Many of our students major in more than one discipline. Many excel academically. We congratulate all our mathematics majors who received accolades at their Commencement ceremonies.

Awards determined by the faculty of the Department of Mathematics

The Mathematics awards are presented at the Senior Banquet each year. The Senior Award of Academic Excellence in Mathematics in recognition of exceptional achievement and high academic standing in mathematics went to Kathryn Posey, who was also the recipient of The Award for Excellence in Support of Mathematics in recognition of exceptional achievement in support of mathematics. Dillon Balk and Yitian Wang were the recipients of The Sophomore Award for Excellence in Mathematics in recognition of exceptional achievement and high academic standing in mathematics.
Other awards received by Mathematics majors

From the Department of Teacher Education:
- **Jennifer Brustoski** was the recipient of The Brother Joseph W. Stander, S.M., Award of Excellence to an Outstanding Student with a Concentration in Integrated Mathematics.
- **Caitrin Holohan** was the recipient of The Dr. Mary R. Sudzina Award for Demonstrated Excellence in Case Study Analysis in Adolescence to Young Adult Education.

From the Department of Religious Studies:
- **William Gross** was the recipient of The William Joseph Chaminade Award of Excellence, in memory of Mr. and Mrs. George W. Dickson, to the Outstanding Student in Theology.

From the Department of Economics:
- **Kari Hayes** and **Peter Kawiecki** were two of the three recipients of The Dr. E.B. O’Leary Award of Excellence to the Outstanding Senior Majoring in Economics.

THE STANDER SYMPOSIUM

The Department of Mathematics enthusiastically participates in this “alternative day of learning,” which is a campus-wide event that celebrates academic excellence. The day is named after Bro. Joseph W. Stander, S.M., who was a long-time faculty member in our department, and then served as Provost at UD. The Integration Bee, the poster sessions, the presentation sessions, and the Celebration of the Arts are some of the activities that are popular with our students. **Shannon Driskell** served on the Program Committee.

The Poster Sessions at the Stander Symposium

**Graduate student presenters:**

“Forecasting Rain Using Logistic Regression,” by **Amal Ibrahim Y Alsomali**, advised by **Maher Qumsiyeh**.

“The comparison of FD and RBFs collocation methods for the solution of the heat equation,” **Lijun Lin**, advised by **Muhammad Usman**.

“Interpolation Methods,” **Mohamed Khalifa I Aburakhis**, **Mohammed Mutlaq Almatrafi**, advised by **Muhammad Usman**.
Undergraduate student presenters:

“Runge-Kutta Methods to Explore Numerical Solutions of Reactor Point Kinetic Equations,” by Elizabeth Boeke, advised by Muhammad Usman.

“Finding the probability of being selected an NBA All-Star,” Matthew Forte, advised by Peter Hovey.

“Determination of Stock Prices and Interest Rate’s Behavioral Movement By Utilizing the Brownian Motion,” by Matthew Hooper, advised by Dan Ren.


“Minimal perimeters of triangles with fixed area and foot,” Hang Luo, advised by Jonathan Brown.

“A Business Application of Markov Chains,” Emily Seals, advised by Muhammad Islam.


Presentation of Talks at the Stander Symposium

Graduate student presenters:


Undergraduate student presenters:


“STEM Stories After-School Program,” by Caelin Micks, Lisa Musselman, Haley Rusnak, advised by Shannon Driskell, Marie Pinnell, Mary Sableski, Todd Smith.
“Prospect Theory: An Analysis of Decision Under Risk,” by Wyatt Ohm, advised by Dan Ren.

“Probabilistic Modeling of Student Interaction during a Passing Period at the University of Dayton,” by Allyson Pacifico, advised by (Tessa) Ying-Ju Chen, Peter Hovey.


The Integration Bee at the Stander
The Integration Bee starts with a lunch of pizza and pop in the atrium of the Science Center, which allows faculty and students to mingle. Registration of the teams (which may have at most three players each) takes place during lunch. The activity then moves to Chudd auditorium. The Integration Bee is conducted in rounds, with several problems in each round so that not all teams (this year, forty-four) participate at the same time. Winning teams move on to the next round; others may stay to cheer their friends on. The winners in the 16th Annual Integration Bee were students in Calculus II, in which techniques of integration are taught. Alex Slicer, competing by himself, won the Integration Bee. He was in James Cordeiro’s Calculus II class. The second place team was JET, consisting of Joe Cloud, Astella Walsh and Tim Stahl, all students in Catherine Kublik’s Calculus II class. In the final round, JET submitted a solution first, but it was incorrect, and Alex subsequently submitted the correct answer to win.

Sample Integration Bee Problems

Round 1
\[ \int \frac{x^3 - 2}{\sqrt{x}} \, dx \]

Round 2
\[ \int x^2 \sqrt{x + 1} \, dx \]

Round 3
\[ \int \frac{\tan^3 x}{\cos^3 x} \, dx \]
Degrees Conferred
Our congratulations, and best wishes for successful careers, go to our graduates.

Undergraduate Degrees
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. Three degree programs are offered: Bachelor of Arts in Mathematics, Bachelor of Science in Mathematics, Bachelor of Science in Applied Mathematical Economics. 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). Other designations are “Dayton Civic Scholars,” (awarded to selected students for having successfully completed a special social science sequence focused on a career in public service), “Berry Summer Thesis Institute Fellows,” (awarded to selected students for having successfully completed the Berry Summer Thesis Institute, which provides a 12-week, on-campus program of intensive disciplinary research and scholarship opportunities, and professional development and leadership workshops, along with community service opportunities), “Berry Thesis Fellows,” (awarded to selected students for having successfully completed the Berry Summer Thesis Institute and an Honors thesis). “Global Flyers Fellows” is awarded to selected students for having successfully completed a Global Flyers program as a thesis fellow in Oxford, England. “DC Flyers Fellows” is awarded to selected students interested in exploring careers in public service through 10-week internships in our nation’s capital.

Erica Michelle Beebe (Bachelor of Arts in Mathematics), cum laude

Allyson Jean Bolos-Pacifico (Bachelor of Science in Applied Mathematical Economics), magna cum laude, University Honors with Distinction. Allyson joined Appirio in Indianapolis this summer as a Cloud Based Technology consultant on the functional track.

Jennifer Lynn Brustoski (Bachelor of Arts in Mathematics and Bachelor of Science in Education in Adolescence to Young Adult Education) 

Back to TOC
Matthew Paul Forte (Bachelor of Science in Mathematics, and a second major in Economics), magna cum laude. Matthew will attend Carnegie Mellon University, starting in the fall of 2018, pursuing a Masters of Statistical Practice.

William Joseph Gross (Bachelor of Science in Applied Mathematical Economics and Bachelor of Arts in Religious Studies), magna cum laude. William is working as a Coordinator in UD’s Advancement Services.

Kari Elizabeth Hayes (Bachelor of Science in Applied Mathematical Economics), summa cum laude, University Honors. Kari is pursuing a career in actuarial science.

Caitrin Anne Holohan (Bachelor of Arts in Mathematics and Bachelor of Science in Education in Adolescence to Young Adult Education), magna cum laude. She is interested in getting a graduate degree.

Matthew Scott Hooper (Bachelor of Science in Applied Mathematical Economics), cum laude

Peter David Kawiecki (Bachelor of Science in Applied Mathematical Economics), summa cum laude, University Honors. Peter is a graduate student in the Master’s in Financial Mathematics program at UD, having completed a Bachelor’s degree in three years.

Hang Luo (Bachelor of Science in Applied Mathematical Economics)
Benjamin Alden Rogness (Bachelor of Science in Applied Mathematical Economics)

Emily Lynn Seals (Bachelor of Science in Applied Mathematical Economics). Emily started working in the summer of 2018 at Safe Auto Insurance as a Reporting Specialist in Columbus, Ohio.

Ye Shen (Bachelor of Arts in Mathematics)

Alicia Caroline Talarico (Bachelor of Arts in Mathematics and Bachelor of Science in Education in Adolescence to Young Adult Education), magna cum laude. Alicia is searching for a position teaching high school mathematics in the Northeast Ohio area.

MASTER’S DEGREES CONFERRED:

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, if we know these.

UD has two commencement ceremonies each year, in December and May. (August graduates are invited to participate in the December ceremonies.)

Eman Allassaf (August 2017) earned the MAS degree. She worked with Muhammad Usman and wrote a mathematics clinic project report entitled “A nonlinear analysis of an oscillator equation with damping and external forcing using a perturbation method.”

Budur Alshammari (August 2017) earned the MAS degree. She worked with Youssef Raffoul (and Sarah Alshammari) and wrote a mathematics clinic project report entitled “Lyapunov functionals and stability in nonlinear infinite delay Volterra discrete systems.”

Rabab Alzahrani (August 2017) earned the MAS degree. She worked with Atif Abueida and wrote a mathematics clinic project report entitled “Decomposition of various complete graph into isomorphic copies of 4-cycle with three pendant edges.”

Saleh Almuthaybiri (December 2016) earned the MAS degree. He worked with Paul Elo and wrote a math clinic project entitled “Quasilinearization and boundary value problems at resonance for Caputo fractional differential equations.” Saleh delivered a contributed talk at the 37th Southeastern-Atlantic Regional Conference on Differential Equations at Kennesaw State University on October 7, 2017 and he delivered a contributed talk at Undergraduate Mathematics Day on November 11, 2017. Saleh has gained admission to the Ph.D. program in mathematics at the University of New South Wales.
Sarah Alshammari (December 2017) earned the MAS degree. She worked with Youssef Raffoul (and Budur Alshammari) and wrote a mathematics clinic project report entitled “Lyapunov functionals and stability in nonlinear infinite delay Volterra discrete systems.” Sarah also earned the Certificate in Statistical Finance. Sarah delivered a contributed talk at Undergraduate Mathematics Day.

Ying Ding (December 2017) earned the MFM degree. She worked with Ruihua Liu and wrote a mathematics clinic project report entitled “Spread option pricing with two underlying assets in a regime-switching model.” Ying delivered a contributed talk at Undergraduate Mathematics Day on November 11, 2017.

Runze Hu (December 2017) earned the MFM degree. He worked with Dan Ren and wrote a mathematics clinic project report entitled “Optimal stopping problems for a Brownian motion with a disorder on a finite interval.”

Kaity Jones (December 2017) earned the MAS degree, with concentrations in Applied Statistics and Computational Mathematics. She worked with Peter Hovey and wrote a mathematics clinic project report entitled “The search for an improved estimator in determining the probability of jet engine failure.”

Qasim Alharbi (May 2018) earned the MAS degree. He worked with Youssef Raffoul (and Mohammed Alharthi) and wrote a mathematics clinic project report entitled “Boundedness and stability of solutions in nonlinear difference equation.” Qasim has earned admission to the Ph.D. program in mathematics at Southern Illinois University.

Mohammed Alharthi (May 2018) earned the MAS degree. He worked with Youssef Raffoul (and Qasim Alharbi) and wrote a mathematics clinic project report entitled “Boundedness and stability of solutions in nonlinear difference equation.” Mohammed has earned admission to the Ph.D. program in mathematics at Southern Illinois University.

Jabr Aljedani (May 2018) earned the MAS degree. He worked with Paul Eloe and wrote a mathematics clinic project report entitled “Uniqueness and existence of solutions of boundary value problems at resonance for ordinary differential equations.” Jabr delivered a contributed talk at Undergraduate Mathematics Day on November 11, 2017 and he delivered an invited talk
at a Special Session of the American Mathematical Society at The Ohio State University on March 18, 2018.

**Amal Alsomali** (May 2018) earned the MFM degree. She worked with **Maher Qumsiyeh** and wrote a mathematics clinic project report entitled “Forecasting using logistic regression and Box-Jenkins (ARIMA) models.” Amal delivered a contributed talk at Undergraduate Mathematics Day.

**Ashley Mailloux** (May 2018) earned the MAS degree. She worked with **Maher Qumsiyeh** and wrote a mathematics clinic project report entitled “Bootstrapping a moving average time series data.”

**Michael Kent Paulus** (August 2017) earned the MME degree.

**ALUMNI NOTES**

**IN MEMORIAM:**

**Joe Diestel** (’64) passed away in August 2017. Joe was Emeritus Professor of Mathematics at Kent State University. He presented the inaugural Schraut Lecture in 2000, and attended several MathEvents at UD. Joe attended gatherings of UD mathematics alums at various Joint Mathematics Meetings. He was a great story-teller! His passion for mathematics and baseball came through in almost every conversation with him. A distinguished mathematician, author of several mathematics books, including “Sequences and Series in Banach Spaces,” Joe was the doctoral dissertation advisor to twenty-nine students (according to the Math Genealogy Project). Beyond those mathematicians, Joe influenced the mathematical development of many students. More information on Joe can be found in his obituary at [http://hosting-24190.tributes.com/obituary/show/joseph-diestel-105117178](http://hosting-24190.tributes.com/obituary/show/joseph-diestel-105117178), in a tribute that appeared in the August 2018 Notices of the American Mathematical Society, [https://www.ams.org/journals/notices/201807/rnoti-p845.pdf](https://www.ams.org/journals/notices/201807/rnoti-p845.pdf), and on the web page of the Informal Analysis Seminar at Kent State University [http://www.math.kent.edu/~zvavitch/informal/Informal_Analysis_Seminar/Joe_Diestel.html](http://www.math.kent.edu/~zvavitch/informal/Informal_Analysis_Seminar/Joe_Diestel.html).

**Reports from Alums:**


**Brian Donahue** (’85) MD, PhD has been promoted to the rank of Professor as of April 2015, in the Departments of Anesthesiology and Pediatrics at Vanderbilt University Medical Center. He also now holds an FCC Amateur Extra radio license, and can be reached at the call sign of KM4LHG.
Joe Dorocak (’12) has passed his last actuarial examination to now be designated an Associate in the Society of Actuaries.

Kristin (Blenk) Duncan (’99) joined some of the faculty and Rick Schoen for dinner at the Joint Mathematics Meetings at San Diego in January 2018. Kristin teaches at San Diego State University.

John Giorgio (’91) reports that he completed the MS in Analytics degree at Dakota State University in 2018 and started work with Avera Health as a Principal Clinical Intelligence Analyst on June 25. John says, “After being a professional counselor most of my adult life, I am excited to put my interests in people and mathematics together after all these years!” (John Giorgio was known as John George when he was at UD.)

Kaity Jones (MAS, ’17) Kaity began her career working both for UDRI and The Perduco Group part time in mid-January 2018. Her work at UDRI was a continuation of the work she did the previous summer in the ATR Center Summer Internship Program. It culminated in the presentation of a paper (with Dr. Ed Watson of UDRI and Electro-Optics at UD) titled “Object recognition using low light level 3D point clouds” at a conference of the International Society for Optics and Photonics, in Orlando, FL, in April 2018. Kaity started working full-time in May for The Perduco Group as a research associate to Dr. Ray Hill of the Ops Research department at the Air Force Institute of Technology (AFIT). Her current field of study is wavelet analysis.

Julie Jung (’98) was on our campus recently, attending a conference in English. She earned her Master’s degree in English from Washington State University in 1991, and her doctoral degree, also in English, from University of Arizona in 1999. She is an Associate Professor of English at Illinois State University.

Barbara Kowalczyk (’91) started a tenure-track faculty position at The Ohio State University as part of its Translational Data Analytics Initiative. Her home department is the Department of Food Science and Technology but she expects to have a courtesy appointment in the Department of Epidemiology. Her research efforts will focus on utilizing data analytics to improve food safety and expand our understanding of foodborne disease epidemiology using a One Health approach. Barbara says that she is very excited to start this new adventure.

Marina Mancuso (’18) applied for graduate school in mathematical biology and is a graduate student in the School of Mathematical and Statistical Sciences at Arizona State University.
Marjorie Mascolino ('88) lives in the UK. She teaches mathematics as a private tutor and teaches middle school level mathematics classes for an online academy.

Conor McCormick ('17) joined the Software Systems group in Sensor Systems at UDRI as an associate research software engineer in October 2017. He specializes in mathematics and computer science.

Mike Minardi ('79) wrote to say that one of this year’s seniors, Anna Petrick, is his niece. Mike also mentioned that he got to know William Gross ('17) on a four day bike ride. Mike exhorted us to keep up the good work.

Maura Moran ('77), a partner at Cambridge Technology Law, Cambridge, MA, advises on Intellectual Property, technology transfer, licensing, and strategic alliances. She conducts patent prosecution for tech ranging from software and robotics to sporting goods. Maura was IEEE-USA’s 2016 – 2017 Vice President for Government Relations and is a member of Eta Kappa Nu (HKN), the international electrical and computer engineering honor society of the IEEE. Currently, Maura is a candidate for IEEE-USA’s presidency. Maura was a panelist at the 2018 Biennial Alumni Seminar at UD.

Erich Mormon ('96) reports that after twenty years of defense contract work in Washington, D.C., he accepted an appointment as an assistant professor with the Naval Postgraduate School, Monterey, CA, in the fall of 2017. He teaches in the Defense Resources Management Institute at the Naval Postgraduate School. The curriculum focuses on military applications of resource management, budget preparation, economics, decision analysis, and operations research. In his words, “I’m extremely excited about the new opportunity and as a bonus not only is the weather wonderful here, I’m also living less than five blocks away from the ocean!”

Julie Niederhoff ('99) Julie was awarded tenure at Syracuse University in May 2018. She earned her Ph.D. in operations research in 2007. She has been at Syracuse University since then doing research in behavioral operations management.

Allyson Pacifico ('18) Allyson joined Appirio after graduating. Appirio is a consulting company that helps businesses to move to cloud-based technology. She invites UD graduates to apply to work at Appirio in roles such as business or data integration analysts, and digital integration specialists.

Bro. Bernie Ploeger ('71) writes that, on June 30, 2017, he concluded 16 years of service at Chaminade University of Honolulu – the first eight as Executive Vice President and Provost and the second eight as President. He spent the fall of 2017 participating in the Hesburgh Sabbatical Program at Catholic Theological Union in Chicago. At the end of November he was appointed by the Society of Mary’s Superior General to be the Assistant Provincial for the US Province effective August 1, 2018. Congratulations, Bernie! Bernie spent the Spring of 2018 undertaking special projects such as spending time with the brothers in Kenya helping them with planning for the financing and construction of new schools and a social service center, and working with the incoming Provincial and other members of the incoming Province leadership team and
concluding Province leadership team in making the transition. Bro. Bernie was on campus in May 2018 UD for a Board meeting.

**Amy Reed Protos** (‘87, and MS in interdisciplinary studies ’92) tells us that she is in her 24th year of teaching high school mathematics. She loves her current assignment – teaching AP Statistics at James Clemens High School in Madison, Alabama. Last year, she was named National Board Certified Teacher for adolescent and young adult mathematics.

**Eric Roemmele** (’14) is a fourth year graduate student in the Department of Statistics at the University of Kentucky.

**Rick Schoen** (’72) joined some of the faculty and Kristin Blenk for dinner during the Joint Mathematics Meetings in San Diego in January 2018.

**Brandon Thornton** (MAS ’16) holds a full-time faculty position at Austin Community College. He is teaching a variety of courses, including statistics. He also reports becoming very involved in promoting live music events in Austin, and has started an entertainment company name Encore ATX. He and his fiancée will be married in the summer of 2018. Brandon says, “None of this would have been possible if it wasn't for UD and the opportunity to attend such a great institution,” and says he learned a lot from all the professors.

**Jeff Vaughn** (BS ’70, MS ’72) retired in 2005 from the Department of Energy after 32 years of federal service. For the last few years, he has been teaching mathematics part-time at Shawe Memorial High School in Madison, Indiana (dual credit and AP classes in trigonometry, precalculus, and calculus) and teaching as an adjunct professor of mathematics at Hanover College (calculus, statistics, discrete mathematics, and mathematics for elementary school teachers). He says, “It all began at U.D. with being a senior teaching assistant for Doc Schraut.” (Read Jeff’s and Dan Riehle’s remembrance of Bob Gorton.)

**Danielle (Carleton) Winegardner** (’09) works in Retirement Consulting at Nyhart in Indianapolis. Nyhart is an employee-owned company that offers nationwide consulting, actuarial and administration services. Danielle is now a Fellow of the Society of Actuaries. Congratulations, Danielle! She generously credits the UD Department of Mathematics for preparing her well. In her words, “While we didn't have any exam-focused classes I was able to study on my own and pass the exams.” Danielle enjoys her job, which involves mathematics and problem solving but also requires working well with clients and internal teams. Danielle is married to Bret Winegardner, and they have two children, Eli (3) and Claire (1). Danielle recommends the children’s book “The Boy who Loved Math” about the life of Paul Erdos.

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**Aparna Higgins** edited this newsletter. She thanks all who responded to her request for news. **Vicki Withrow**, the Senior Administrative Assistant, cheerfully helped in gathering information and checking data. Please write to Vicki vwithrow1@udayton.edu with your news items, or with changes in your contact information, or to alert us to alums who you believe may not be on our mailing list. Aparna takes all blame for errors in the newsletter – please write to her ahiggins1@udayton.edu with corrections. Aparna also sincerely apologizes for the late edition of this newsletter. The fault is entirely hers.