



UMKC RooMath News

Department of Mathematics & Statistics Newsletter

<http://cas.umkc.edu/Mathematics>

Greetings from the Interim Chair

Volume 6, Issue 1

2013



Hello, again, from the UMKC Department of Mathematics & Statistics!

In January, our Chair, Dr. Jie Chen, began a well-deserved research leave, working down the road from us at the Stowers Institute for Medical Research. (For more, see later in this newsletter.) It is my privilege to take on administrative responsibility for the department as interim Chair for the calendar year 2013.

In the last year, the Department has made a change to the nomenclature of our Master of Science de-

grees. We now offer an MS degree in Mathematics and an MS degree in Statistics. Previously (as you may recall from the previous edition of this newsletter), we offered an MS degree in Mathematics and Statistics, with concentration in either Mathematics or Statistics. The new names are simple and should better communicate the nature of each degree. The course work and other program requirements have not changed, so this is a minor change. Now, there are tremendous advantages to being part of the large University of Missouri system. However, the bureaucratic work undertaken by the Department (and thanks to Dr. Chen in particular for her efforts) to move this little change through the system was considerable, and took more years than you might imagine.

Our last newsletter described our pilot college algebra redesign, and I'd like to give a brief update. Our first semester of full implementation went without any major hiccups, and we are very happy with the progress we've made. We were greatly encouraged to see that the college algebra final exam scores were on average about 10 percentage points higher than they had been in recent years, although I want to be careful not to attach too much significance to this single data point. Perhaps in a couple more years the newsletter will be ready for a full update. In the meantime, we plan to expand our redesign efforts to include intermediate algebra.

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Lastly, I want to mention a retirement (the first retirement in our department since I joined in Fall 2003). Congratulations to Becky Roberts, Lecturer in our department for 28 years.

Please enjoy the second ever issue of the RooMath Newsletter!

Students Views and Student News

(Continued on page 3)

Jesse Hamer Wins a Paper Contest and Departmental Honors

Each year a Student Expository Paper Contest is sponsored by the History of Mathematics Special Interest Group of the Mathematical

Association of America (HOMSIGMAA). Jesse Hamer has been one of the 2012 winners. Congratulations to him and his advisor Dr. Richard Delaware. Jesse has also been the only 2013 Departmental Honors winner this year. He has been accepted to the University of Iowa graduate school and we wish him lots of success in his graduate studies.



Jesse Hamer, May 2013

Department Welcomes New Faculty

Naveen Vaidya joined our department in



January 2013, having come from Western University, London, Ontario, Canada, where since 2010 he has been a Postdoctoral Research Fellow in the Department of Applied Mathematics. From 2008-2010, he was a Postdoctoral Re-

search Associate in the Theoretical Biology and Biophysics Group at the Los Alamos National Laboratory in Los Alamos, New Mexico. Dr. Vaidya's research interests include applied mathematics, with specific areas of interest in mathematical biology (viral dynamics and immune systems, epidemiology, and ecology), mathematical and computational modeling, differential equations, dynamical systems, optimal control, and biostatistics. Currently, his primary focus lies on developing within-host and between-hosts models of infectious diseases, particularly HIV and influenza. He has published his research work in numerous peer-reviewed international journals.

Majid Bani-Yaghoob completed his Ph.D. in Applied Mathematics from Carleton University, Ottawa, Ontario, Canada. In January 2010, as a postdoctoral research associate, he joined the department of veterinary integrative biosciences at Texas A & M University, where he could develop mathematical models to unpack the complex dynamics of disease spread in Cattle farms. In January 2011 he was offered a visiting assistant professorship at Texas A & M Department of Mathematics to teach mathematical modeling and to facilitate the collaborative research on Mathematical Epidemiology. Dr. Bani-Yaghoob joined UMKC in August 2012.



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Donghui Yan completed his Ph.D. in Statistics from University of California, Berkeley. In Fall 2012 Dr. Yan joined our department as a visiting assistant professor in Statistics. He has been a Postdoctoral Researcher at the Fred Hutchinson Cancer Research



Center in Seattle, WA. Before that, in 2008 he was a Research Scientist at the Intel Research Lab in Berkeley, CA. His research interests broadly include statistical methodology and machine learning algorithms as well as applied statistics in various domains such as Ensemble methods for statistical learning and inference and domain adaptation, and High dimensional statistical inference.

David A. Spade completed his degree in Statistics in May 2013 from Ohio State University and he will be joining the faculty in Fall 2013. Prior to his Ph.D. degree, he earned his Bachelor's degree in Mathematics in 2006 at West Liberty University in West Virginia and his Master's degree



in Statistics in 2010 at Ohio State University. Dr Spade's research interests include Bayesian methodology, Markov chain Monte Carlo methods, statistical phylogenetics, and statistical computing. He has taught a wide variety of undergraduate statistics courses during his time at Ohio State. He has run the gamut from introductory statistics for the social sciences to statistics for engineering and a mathematical statistics course that is designed for senior mathematics majors. "I most enjoyed the mathematical statistics course because it gave me the opportunity to teach a lot of the theoretical principles that are necessarily omitted from the introductory and intermediate level courses. I am very excited to be joining the faculty at UMKC," he says.

Xianping Li obtained his Ph.D. in Mathematics from the University of Kansas in 2011. He has since been a Visiting Assistant Professor at the University of Central Arkansas till May



2013. He enjoys both research and teaching. He has taught Calculus I and II, Differential Equations, Discrete Structures, Transition to Advanced Mathematics, and co-taught Finite Element and Finite Volume Methods for graduate students. He is enthusiastic about research in scientific computation and mesh adaptation, especially for anisotropic diffusion problems. He has publications in peer-reviewed journals including Journal of Computational Physics (JCP) and Numerical Methods for Partial Differential Equations (NMPDE). His current research focuses on parallel computing and mesh adaptation for 3D anisotropic diffusion problems. He is also interested in numerical computation in many fields including engineering, biology, finance, and physics.

Bill Kalahurka obtained his Ph.D. from the University of Texas - Austin in 2010, with a dissertation on the topology of tiling spaces. He has been working since then in Austin as an Assistant Professor at Huston-Tillotson University. Bill



will return to his hometown of Kansas City, and join our department this fall as Assistant Teaching Professor. In addition to teaching various courses, Bill will join the department's course redesign team, serving as coordinator for the redesigned college algebra project that we began in Spring 2012.

Students Views and Student News

What do students say about the Department of Mathematics and Statistics? And what have they been up to? Perhaps, it will take several pages to fully answer these questions. Below is a small collection of student views followed by top student news in the year 2012-2013. You can always send us your viewpoints and news about your achievements. We will certainly publish them if appropriate. Just drop a few lines to baniyaghoubm@umkc.com



"During my two years as a math major in the UMKC Department of Mathematics & Statistics, I have had the privilege of learning mathematics from some truly fantastic

professors. The UMKC Department of Mathematics and Statistics offers a diverse selection of courses that seamlessly combine a rigorous introduction to the pure theory of mathematics without losing sight of its numerous applications. For example, I had the opportunity of participating in three group projects in an introductory linear algebra course that provided hands-on, problem-solving introductions to the applications of mathematics to the fields of computer science, economics, and ecology. This experience deepened my understanding of both the pure and the applied aspects of linear algebra and helped open my eyes to the incredible versatility and usefulness of mathematics in almost every modern field of study. I am very proud to be studying mathematics at UMKC!" David R. Ward, (Math Major, undergraduate)



"As a non-traditional undergraduate student with a full-time job and family, I've been very pleased with how understanding and helpful all of my professors have been. I

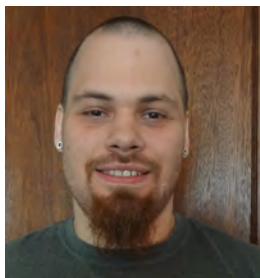
love how diverse the faculty is, both in background and place of origin. I appreciate opportunities I've been given to get hands on with applications and software such as Matlab in class. I would actually

like to see even more applications, perhaps in collaboration with the Physics, Computer Science, or Geosciences departments. Upon returning to college, my intention was originally to just get my B.S. to help me advance in my career as a business analyst, but after my time with the UMKC math program I've decided to continue my studies, most likely in Statistics or Applied Mathematics." Nathan W. Gearhart, (Math Major, undergraduate)



"As a part-time graduate student, I have been honored by great Mathematics and Statistics Professors at UMKC. They have been very supportive and

they have continuously helped me going towards the finish line. I have been a Mathematics instructor at Donnelly College since June 2009 and I believe studying at UMKC has made a great impact on my career and life." Dhuha Shareef, (Part-time Master's student)



"I am pursuing a dual major degree in Computer Science and Physics which involves taking several courses in mathematics. Without mathematics neither

of my degree choices would be possible. Taking mathematics courses has allowed me to discover various mathematical applications that apply to my area of study. I hope to one day further develop both areas of studies through the use of skills obtained from mathe-

tical courses." William J. Freeman, (UMKC-Student)

"It's not easy going from a math class



where you spend an hour thinking about one part of a proof, to a biology class where you cover over 100 pages of the textbook in only 50 minutes. But these challenges have provided great opportunities. Not

only in developing diverse problem-solving skills, I can also clearly see how these two departments can work together to solve problems. This summer I am excited to begin my own research, studying modeling and analysis of probiotics." Megan Oldroyd IPHD student (Primary discipline: mathematics Co-discipline: cell biology and biophysics)

Graduate Student Takes the First Step

May 8, 2013: Ashley Walker (Master's student), presented her research on modeling hepatitis C virus dynamics. It is great to see that our graduate students are becoming interested in presenting their research.

Teaching and Mentoring at Center High School

May 2013: We hear that the graduate student Kris Everson has been a teacher at Center High School. She says "I love work-



ing at Center High School. I ended up substitute teaching in the Learning Lab at Center for the remainder of the 2011-2012 school year, and got hired on full time for the current school year. So I started

Students Views and Student News (Continued from page 3)

off grad school teaching 2 sections of College Algebra at UMKC, taking two grad level classes, and working full-time. And on top of that, I was the new grader for the VSI program at UMKC. Needless to say, I had no time to do my school work, and ended up having to leave Center in January. Since then, I have been substitute teaching on semester breaks, and again at the end of the current school year. I adore the students at Center and I try to keep in contact with the school in hopes that I can teach there once I finish grad school."

GTA Excellence in Teaching Award

December 7, 2012: We presented our first Departmental GTA Excellence in Teaching Award to GTA Ashley Walker. The award includes a \$100 stipend, and we will be presenting such an award each December going forward.



Congratulations, Dr. Paul Plummer!

November 2012: Interdisciplinary Ph.D candidate, Paul Plummer, has successfully defended his dissertation entitled "Detecting Change Points in a Compound Poisson Process". Congratulations, Dr. Paul Plummer! Paul's primary discipline is Mathematics (with emphasis in Statistics) and his co-discipline is Economics. Paul's doctoral dissertation advisor is Dr. Jie Chen, and his committee members are Drs. Yong Zeng and Hristo Voulvov from the Department of Mathematics and Statistics, and Drs. Karen Vorst and James Sturgeon from the Department of Economics. Paul's doctoral degree was conferred in the Commencement of December 2012.

Research Papers Published in LUCERNA

September 2012: We hear the good news that the Honors Undergraduate Journal Lucerna has published two expository mathematics papers written by Mathematics majors, one by Alex Karanevich titled "Trigonometry Development in Ancient and Medieval India", and one by Jesse Hamer titled "Indivisibles and the Cycloid in the Early 17th Century". Congratulations Alex and Jesse!

Infidel Mathematicians!

July 24, 2012: We hear the good news that undergraduate mathematics major Jon Ross will have his expository paper "Berkeley Contra the 'Infidel Mathematicians'" published in the UMKC Fall 2012 Sosland Journal. The paper was written during Spring 2012 for Math 464 WI (History of Mathematics, Writing Intensive).

Undergraduate Students Inducted Into Mu Sigma Rho

May 2012: Two students were inducted into Mu Sigma Rho, the

National Statistics Honorary Society: Dustin Nicolaisen and Paul Plummer, each of whom was given a certificate and a pin of the honor society, as well as a one year student membership in the American Statistical Association (ASA), paid by the Kansas-Western Missouri Chapter of the ASA.

2012 Departmental Honors

May 2012: Five undergraduate mathematics majors, Eric Bowman, Kris Everson, Alex Karanevich, Dustin Nicolaisen, and Jon Ross, all graduate with the distinction of Departmental Honors. Congratulations all!

Undergraduate Student Wins a First Prize at the 12th Annual SEARCH Symposium

April 2012: Undergraduate student Brent Rogers presents a poster titled "Mathematical Model to Quantify Dosing and Evaluate Effects of Modifications of Cancer Virotherapy" at the 12th annual Student Engaged in Artistic and Academic Research (SEARCH) Symposium for Research and Creative Achievements in Pierson auditorium, winning First Prize in the "Biological and Health Sciences" category. Congratulations to Brent and his faculty mentor Dr Swati DebRoy!



Brent Rogers (Left) & Dr. DebRoy (Right)

Department Seminars

Seminars are held Friday afternoons from 3:00-4:00 pm in Haag Hall. You're invited to these department talks every semester. For dates and locations please contact Dr. Naveen Vaidya at vaidyan@umkc.edu

Departmental News: February 2012—May 2013

RooMath Recruitment Event a great success!

Friday February 10, 2012: The first "RooMath 2012" Recruitment Event took place in Royall Hall. About 100 students from Kearney High School, Southwest Early College Campus, and Winnetonka High School attended. Events included five presentations on Careers in Statistics, Careers in Mathematics or Applied Mathematics, Cryptography, The Monty Hall Problem, and a Mini Math Video Fest, followed by pizza in Royall Hall Room 111; a great day for our department.



High School students attending RooMath 2012 Recruitment

Over 28 Years of Excellent Teaching!

April 2012: Our colleague Becky Roberts, who has been a member of this department for 28 years, retired this month. During those years she won the Dean's Award for Outstanding Teaching. In addition to her teaching duties, she has been our HSCP Coordinator, our College Algebra Coordinator, and worked hard this past year on the new Course Redesign for College Algebra. In 2004 she was honored at the Activity & Program Council's UMKC Faculty and Staff Appreciation Day, having been nominated by students she teaches, advises, or mentors. Since 1984, Becky has taught full time in the Department. From 1972-1979 she taught high school mathematics, then from 1980-1983 worked as a Programmer-Analyst for a law firm. During 1983-2012, in addition to becoming a well-respected teacher, Becky has been a partner in a company creating custom database applications. We will miss her steady and constant presence.



Help us go Green! Please join the Alumni e-mail list to receive newsletters by email! www.umkcalumni.com

Dean Wayne Vaught Attends Departmental Picnic

Thursday August 30, 2012: Our department held a Welcome Picnic on the Quad between Scofield and Manheim Halls. Dr. Wayne Vaught, Dean of College of Arts & Sciences (second from left) accepted our invitation and joined us for a friendly chat.



Eric Hall, Dean Wayne Vaught, Jie Chen, et al.

Promotion to Full Professor

September 1, 2012: We hear that Dr. Yong Zeng has been promoted to Full Professor. Congratulations Professor Zeng! His current research includes Stochastic Calculus and Filtering, Numerical Solutions to Filtering Problems, Stochastic Models for Ultra-High Frequency Data, Econometrics, Market Microstructure Theory, Mathematical Finance, and Statistical Analysis of Network Traffic.



Professor Yong Zeng

Graduate Seminar Series Hosts Great Research Talks

Fall 2012-Spring 2013: The Graduate Seminar Series completes a busy year with more than 20 talks. This includes research talks from nationally recognized research institutes such as Department of Statistics at Ohio State University, Computational Finance Program at Purdue University, Department of Agriculture and Biosystems Engineering at University of Arizona and the Stowers Institute for Medical Research in Kansas City.

(Continued on page 5)

Departmental News (Continued from page 5)

Weller Overstreet Lectures in Science Brings Professor Tom Kurtz Home!

November 14, 2012: Professor Thomas G. Kurtz presented his work titled "Identifying Separated Time-scales in Stochastic Models of Cellular Reaction Networks". Dr. Kurtz is a top researcher at the University of Wisconsin-Madison, who has greatly contributed to stochastic partial differential equations and filtering for Markov processes. He was born in Kansas City and graduated from the University of Missouri-Columbia.



Department Launches "Math Success Lab"

February 4, 2013: The Department launches a new tutorial lab known as "Math Success Lab". The new tutorial lab is mainly designed for students taking upper level mathematics courses such as Math 210, Math 216, Math 220, Math 250, Math 300, Math 301, and Math 345. The tutorials will be held in Miller Nichols library, 4th floor, Rooms 420 and 422 for a few hours each day during Fall and Spring semesters. For additional information, contact Dr. Noah Rhee at rheen@umkc.edu

Why study Mathematics and Statistics?

There are several published articles about the job market for mathematics and statistics graduates. Yet another highly regarded report indicates that Applied Mathematics, Mathematics, and Statistics are among top 15 college majors that are the most valuable in terms of salary and career prospects. The following table is obtained from the U.S. Bureau of Labor Statistics, which ranks fields according to PayScale's massive compensation database and job growth projections through 2020.

2020 Projections	Applied Math	Mathematics	Statistics
Rank	10	11	15
Starting Median Pay	\$52,600	\$47,000	\$49,000
Mid-Career Median Pay	\$98,600	\$89,900	\$93,800
Growth In Pay	88%	91%	91%
Projected Job Growth	16.7%	16.7%	14.1%

What do our faculty do while on leave?

The University of Missouri System rules and regulations state that "Leaves of absence provide faculty with an opportunity for reflection, research, and professional development essential in a scholarly community."

During Fall 2011, Associate Professor Eric Hall spent most of the semester on leave at the **University of the Aegean in Greece**, an international research oriented university situated in the Aegean Archipelago, dispersed as a network of schools and

departments over five Aegean islands: Lesvos, Chios, Samos, Rhodes, and Syros. Dr. Hall lived on the island of Samos in the city of Karlovassi, working with colleagues Kyriakos Keremidis and Eleftherios Tachtsis in research on ultrafilters and other areas of set theory. Samos is famous as the home of the ancient Greek mathematician Pythagoras. While there, Dr. Hall taught a graduate class in exchange for housing, and had time to visit the small island of Patmos. For the last part of his leave, he moved to **Hebrew University in Jerusalem, Israel** to work with internationally known mathematician Saharon Shelah (who has published more than 1,000 papers) working on models of ZFA set theory without the Axiom of Choice.

During Fall 2012, Associate Professor Liana Segal



Dr. Segal (front row, 3rd from right) at MSRI with colleagues

began her year-long leave by remaining home-based but attending workshops at the **Mathematical Sciences Research Institute (MSRI) in Berkeley, California**, where she initiated a new collaboration with Marilina Rossi visiting from the University of Genoa, Italy. In January 2013, she participated in a National Science Foundation panel in Arlington, Virginia. During Spring 2013, Dr. Segal moved to Berkeley as a research member of MSRI meeting researchers in her area from around the world, and in particular attending the workshop on Representation Theory, Homological Algebra, and Free Resolutions held Feb. 11-17. As Spring continued, she and Dr. Rossi completed work on a substantial paper they have submitted to the top journal: *Advances in Mathematics*.

From Spring 2013 through Fall 2013, Department Chair, Professor Jie Chen, is in the middle of a research leave as a Visiting Scientist at the prestigious **Stowers Institute for Medical Research (SIMR) in Kansas City, MO** just north of the UMKC Volker campus. She is collaborating with researchers at the Bioinformatics Center of SIMR on research projects that involve bioinformatics and statistics.

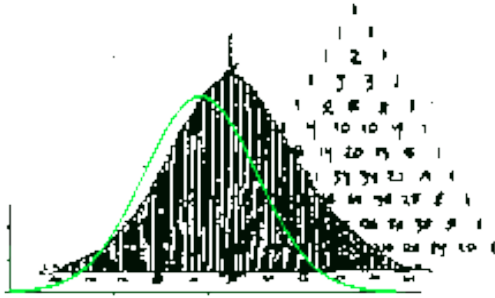


Dr. Hall on the island of Patmos

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If you would like to donate to UMKC, please visit the **UMKC Foundation** web pages at <http://www.umkc.edu/umkc-foundation/>, where you will find links to Gift Planning, the Alumni Fund, creating a scholarship, and so on. **Our department is one of the few with no department scholarships for our undergraduate majors, and you might be the first to initiate one.**

Send Us Your News!

We're always happy to hear from you. Send a paragraph or two and let us know what you have been up to. Pictures are welcome.

Please include your name, mailing address, and email address so we can contact you.

Send to: Richard Delaware at delawarer@umkc.edu

or
 RooMath News, Dept. of Mathematics & Statistics, HH206, University of Missouri-Kansas City, 5100 Rockhill Rd, Kansas City, MO 64110

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College Algebra Coordinator: Dr. Bill Kalahurka
Calculus Coordinator: Dr. Liana Segal
Seminar Organizer: Dr. Naveen Vaidya
Administrative Assistant: Tanya Henderson hendersontg@umkc.edu

Math Puzzler

"Thirteen teachers are in Paradox, New York attending a math conference. When they arrive at the Enigma Hotel to check in, they are told that only 12 rooms are available. Since their school had made reservations for 13 rooms, the teachers are a bit upset that they will have to find another place to stay. As they are preparing to leave and find another hotel, the manager comes out and asks if there is a problem. When she hears of their situation she assures them that the Enigma Hotel has enough space to accommodate each teacher in his or her own room. She takes two of the teachers to room #1 and promises to come back in a few minutes and take one of them to another room. She takes the third teacher to room #2, the fourth teacher to room #3, the fifth teacher to room #4 and so on, taking the twelfth teacher to room #11. She then returns to room #1 and escorts the extra teacher waiting there to room #12. All of the teachers are now happily settled in their own rooms. Is this possible?"
 Source: AIMS Education Foundation