Saint Louis University
Department of Mathematics and Statistics

SLU's Mathematics Team competed in the 2017 William Lowell Putnam Mathematical Competition on December 2, 2017. Left to right: Matthew Graham, Nolan Michniewicz, Rachel Mlsna, Jeffrey Kelley, Nikko Koutas, Sravya Ainapurapu.

Message from the chair

2017 was a year of change for the department, as longtime department chairperson James Hebda stepped down. Dr. Hebda's steady guidance served the department well during a tenure that saw an unusual amount of turnover in university leadership. Dr. Hebda stays in the department, teaching and continuing his research in differential geometry. We all thank Dr. Hebda for his years of service!

Since this is the first newsletter, it's worth catching up on two major events of the last couple of years. As of the Fall of 2016, the former Department of Mathematics and Computer Science split into two departments. Mathematics and Statistics remains the larger, with 24 faculty, while Computer Science now has 9 faculty, with many holding joint appointments. The split was desired by both departments as Computer Science grew larger. Both departments still reside in Ritter Hall, which was renovated in Summer 2016. The building was resurfaced with all new materials, lighting, classrooms, and a modern, comfortable lobby. When you visit SLU, stop in and see the new Ritter.

Last year, the department granted 13 students with Bachelor's degrees. We also graduated four Master's students, and two doctoral students. Three of our Master's students are continuing their education in mathematics or statistics, and one is working at a local nonprofit organization. Our

doctorates in 2017 were Gerrit Smith and Sean Corrigan. Gerrit's Ph.D. dissertation, "Realizing Injective Splittings of Stable 4-Manifolds", was under the direction of Dr. Qayum Khan. Gerrit is now a lecturer at Iowa State University.   Sean's dissertation, under Dr. Kimberly Druschel, was "Morse Numbers and Inequalities and Perfect Morse Functions for Integral Orbifold Borel Homology". Sean is a lecturer at Texas State University.

Our department has reinforced its commitment to education for all by joining the Math Alliance, an organization dedicated to ensuring that every underrepresented or underserved American student with the talent and the ambition has the opportunity to earn a doctoral degree in a mathematical science. Our faculty mentor promising students, attend the Field of Dreams conference, and are working with other local universities to create a Gateway Regional Alliance.

This spring, the department is beginning a colloquium lecture series, with invited speakers at the cutting edge of mathematical research. This spring's colloquium will include talks by Kyungyong Lee from the University of Nebraska, Lincoln and Gregg Musiker from the University of Minnesota, among other speakers to be announced.

Please enjoy this first edition of our bi-annual department newsletter. I wish you the best in 2018!

Bryan Clair, Ph.D.
Chairperson, Mathematics and Statistics Department

Two new faculty join the department
Elodie Pozzi

Dr. Pozzi   obtained her Ph.D. in Pure Mathematics in 2011 at the University of Lyon, in France under the guidance of Isabelle Chalendar. Her thesis established results about universal operators and the open problem of the Invariant Subspace Problem. Interested in how tools in analysis can solve problems in applied mathematics (problems arising from physics and engineering), she did a 2-year postdoc at the French research center in Applied Mathematics and Computer Sciences, INRIA at Sophia Antipolis, France. While there, she developed some aspects of her research around approximation problems and the connection between pure mathematics and approximation theory. Then, in 2013, she spent one year as an Assistant Professor at the University of Lille, France. She was then recruited to the University of Bordeaux as a "Maitre de Conferences", the equivalent of an Associate Professor.   Since Fall 2017, she is a visiting Assistant Professor at Saint Louis University.

Seth Wolbert

Dr. Seth Wolbert is a teaching postdoc in the mathematics and statistics department.   He received his Ph.D. this year from the University of Illinois, Urbana-Champaign. Seth's research interests include symplectic and Poisson

geometry as well as the study of generalized differential structures on singular spaces. In his spare time, he enjoys walking and playing with his two dogs, Ellie and Johnny.

The department welcomes Dr. Pozzi and Dr. Wolbert to SLU!

Boeing scholarship

In Fall 2017, SLU selected junior Nolan Michniewicz to receive a Boeing Opportunity for Leadership Development (BOLD) scholarship.   Nolan is pursuing a major in Mathematics with a minor in Computer Science.   This spring, he is poised to become one of a select few undergraduates who finish our senior level algebra and analysis sequences early. This puts him in great shape to meet his goal for 2018 of finding a summer research program and creating new mathematics.
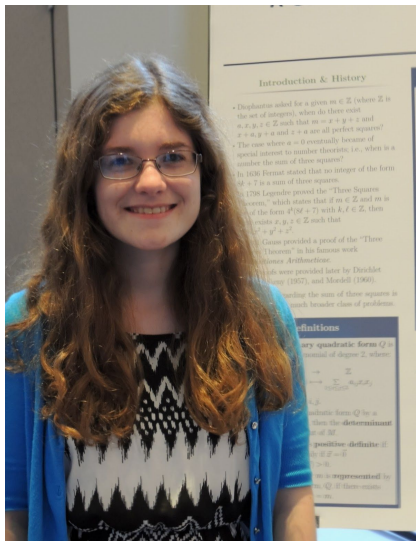
Nolan has a love for intellectual competitions: he was part of a three person team that finished 6th at the 2017 Missouri Collegiate Mathematics Competition, and was a key member of SLU's 2016 Putnam team that received our department's first ever national ranking.

Beyond mathematics, Nolan is interested in Japanese language and culture, and hopes to visit Japan on a study abroad program.

Congratulations, Nolan, on your BOLD scholarship!

Alumni spotlight
Sarah Blackwell, BA 2016

Sarah received her BA in mathematics from our department in 2016, and she is currently a doctoral student in mathematics at the University of Georgia. Sarah's connection to SLU goes way back - her grandfather taught philosophy here, and when she was three years old she would go to work with him on campus. She specifically remembers being "creeped out" by the statues on campus near Xavier hall.

At SLU, Sarah was particularly interested in number theory. With Dr. Ben Hutz, she worked on a project entitled *Good reduction of pre-periodic points*, which investigated the dynamics of rational functions over number fields. As a graduate student, Sarah has found a new love for topology and is considering studying topology for her doctoral work.

When Sarah meets people and introduces herself as a mathematician, they often respond negatively. Some will admit they struggled with math themselves. Others say "oh, you must be a genius", which Sarah says is also damaging because you don't have to be a genius to do mathematics. One of Sarah's goals is to do mathematics outreach to try and change that negative reaction. She is interested in

mathematics education and plans to study secondary educational methodology as part of her graduate work.

For current SLU students, Sarah suggests they get involved in the department, go to Math/CS club, sign up for the competition teams, and get to know the faculty. She says that so many faculty at SLU were willing to drop everything and help her out. And if your goal is graduate school, she says, "take as many math classes as you can".
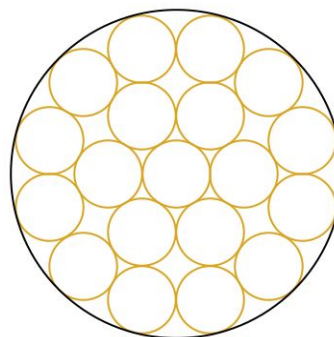
We wish Sarah all the best with her continued studies.

The Billiken challenge

Suppose you flip a coin until you get "heads" four times in a row. What is your expected number of flips?

The picture below shows the smallest circle that can contain 19 unit circles. What is the radius of the big circle?

For solutions, see the newsletter section of our department website.

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The Department of Mathematics and Statistics is people, creating and discovering the structures that underlie science and nature. Our faculty attract funding for research as concrete as medical statistical inference and as abstract as the geometry of infinite dimensional space. We are continually at the forefront of educational methodology, with award winning instructors, integrated instructional technology, and courses customized to meet the needs of all students. Our graduates take their skills to government and to industry, and we train the next generation of teachers. From the ratio studiorum to the internet age, Mathematics and Statistics plays a central role in a Saint Louis University education.

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