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# Saint Louis University

## Department of Mathematics and Statistics

July, 2018



The dolphin pond with Gauss, Euler, Leibniz and Hilbert in the foreground and Eudoxus, Archimedes and Euclid further back.

## Message from the chair

Congratulations to SLU's class of 2018! The department graduated 20 students with mathematics majors this spring. Some are moving on to graduate school, others are spending a year volunteering, and many are heading to work in science and industry. Pin Huang and Zi Wang were co-winners of this year's Garneau award for achievement in mathematics. Three students received Master's degrees, and Benjamin Peet received his Ph.D. in Mathematics under the direction of professor John Kalliongis. Dr. Peet's dissertation, "Finite, fiber-preserving group actions on orientable seifert manifolds" is in the field of geometric topology, and he will be joining the faculty at Saint Martin's University in Washington beginning this Fall.

In the Spring, the department welcomed Pam Elie, who joins Bobbette Penrod in our front office. Pam is a graduate of SIU Edwardsville, and comes to SLU with considerable experience: she worked in the education department of the Saint Louis Art Museum, was a case manager for elderly care, and most recently taught art history and art appreciation at Lewis and Clark College. Pam is also a "shade tree mechanic" who loves to work on her vintage Camaros.

Finally, SLU is beginning a major construction project this year just to the East of Ritter Hall, and with it we will be saying goodbye to the dolphin pond. Completed in 1992, the dolphins were affectionately

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named after famous mathematicians by former department chair and current Professor Emeritus John Cantwell. The cluster of three near Ritter are Greek: Euclid, Archimedes, and Eudoxus, while the four at the other end are the German (and Swiss) mathematicians Gauss, Euler, Leibniz and Hilbert. Visit campus this summer and dip your feet in the mathematical water before it disappears!

Bryan Clair, Ph.D.

Chairperson, Department of Mathematics and Statistics

## Professor Charles Ford

**1941-2018**

Charles Ford, Ph.D., a professor emeritus of mathematics and former director of the computer science program, died March 19. He was 76.

Ford joined the Saint Louis University faculty as an assistant professor in the Department of Mathematics in 1976. He was promoted to associate professor in 1979 and went on to retire from SLU as professor emeritus in 2010.



Bryan Clair, chair of the Department of Mathematics and Statistics, joined the faculty in 2000 and found both a colleague and a good friend in Ford.

“I hit it off with Charles from the day I came to St. Louis, when he took me on an unconventional tour of the city and its old buildings. He helped me get started teaching computer science and mentored me through my development as a professor at SLU. We loved talking about algebra, urban issues, religion and the history of mathematics, and he drew many a student into these conversations as well.”

James Hebda, professor and previous chair of the department, said Ford was instrumental in the development and advancement of the computer science program in the 1980s and 1990s, when he served as director of the certificate program, developed courses in statistics and data processing, and later became director of the computer sciences program.

“Charles E. Ford had been a friend and colleague who contributed significantly to the Department of Mathematics and Computer Science. He provided effective leadership to the CS program during a critical time in its development. However, Charles was not someone who was narrowly focused on math or CS. He had wide ranging interests and strongly held beliefs and would talk to anyone about them. He also had a deep faith which must have been a comfort to him during the difficulties of the last few years.”

Ford received his undergraduate degree in mathematics at the University of Chicago before earning his Ph.D. at the University of Oregon. He went on to do post-graduate work at the University of Toronto and Washington University. Ford is survived by a sister, Geraldine Jensen, and a brother, Daniel Ford.

# SLU involved in NSF education grant

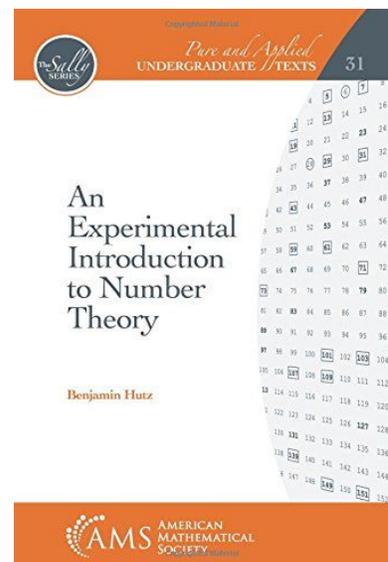
Saint Louis University is one of eleven higher educational institutions involved in a \$2.6 million dollar National Science Foundation Education grant to renew the lower division undergraduate mathematics curriculum based on research about the needs of partner disciplines. This project started as a response to listening sessions, where faculty in other disciplines described what they wanted from mathematics courses. Mike May, S.J., Dr. Anneke Bart and Professor Debbie Pike are leading the investigation at SLU. Father May says that “what other disciplines want students to learn is remarkably coherent: they want more modeling, more context, appropriate use of technology, and less abstract symbol manipulation.”

With eleven participating institutions, this is an unusually large collaboration. According to Father May, this gives the investigation the power to handle many different education scenarios, from private schools such as SLU to large public schools, community colleges, historically black colleges and universities, and liberal arts colleges. This year, each institution was supposed to “steal” ideas from another in the grant. SLU faculty visited Virginia Commonwealth and came back with course material for college algebra, and this April, SLU hosted faculty from LaGuardia Community College in New York.

At SLU, the Department of Mathematics and Statistics is partnering with the Richard A. Chaifetz School of Business to improve Survey of Calculus and College Algebra courses. Students in these sections use Excel in place of graphing calculators, and emphasize modeling real problems to underline the importance of mathematics in their career paths. As an example, Father May describes how one might fit a curve to actual sales price data, then use that formula to make predictions about sales at other prices. From the business school side, students are evaluated and then given additional support to ensure they are confident enough in mathematics to allow a complete focus on the business content of their courses. Debbie Pike, from the business school, sums it up: “The victory lap is when students realize that math is not just a checkbox on the way to their diploma”.

# Dr. Hutz publishes number theory textbook

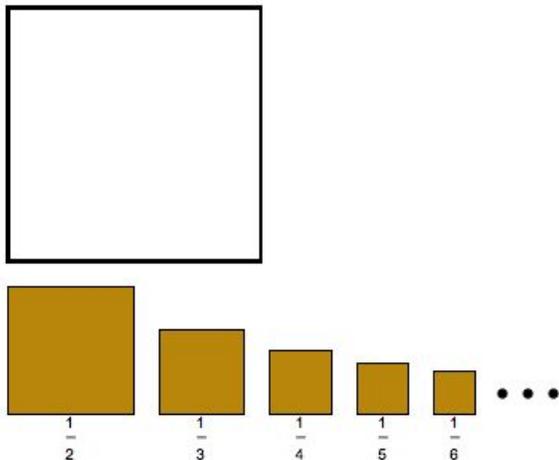
This Spring, the American Mathematics Society published “An Experimental Introduction to Number Theory”, by SLU professor Benjamin Hutz. The book presents elementary number theory from a computational perspective. It introduces readers to standard topics in elementary number theory, such as prime factorization and modular arithmetic, but also explains how to formulate and test precise conjectures from experimental data. There are numerous opportunities to engage in open-ended exploration. At the end of this book, the reader will understand how mathematics is developed from asking questions to gathering data to formulating and proving theorems. Congratulations to Dr. Hutz!



# The Billiken challenge

## Harmonic Squares

The square shown below has side length 1. Underneath that are infinitely many squares with side lengths  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{6}$ , ...

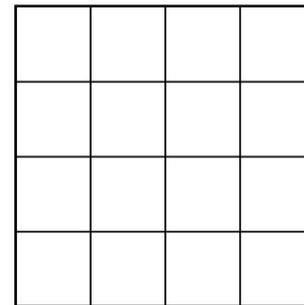


Can you fit all the small squares into the big square without overlapping?

## Odd Checkers

It is possible to place checkers into the 4x4 grid shown below so that every square on the grid is adjacent to an odd number of checkers.

Adjacent squares share an edge (not diagonal) and “every square” includes the squares with checkers.



How many ways can this be done?

For solutions, see our department website or <http://math.slu.edu/~clair/challenge>

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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.*