

## Computer Science and Mathematics alum hired by New York investment firm after earning Ph.D. at University of Illinois

By Isaac Dooley

After graduating from Birmingham-Southern College with majors in mathematics and computer science in May of 2004, I moved to Champaign, Ill., to pursue a doctorate in computer science at the University of Illinois. My research while in graduate school involved making it easier to create high-performance parallel programs that run on the world's largest supercomputers. These supercomputers are used to perform numerical scientific simulations of all scales from the quantum structures of molecules to the gravitational interactions between millions of galaxies. Unfortunately, I graduated just prior to the University of Illinois' acquisition of the new National Science Foundation-funded Track 1 supercomputer which should be the fastest supercomputer in the world once it is brought online. It will be comprised of hundreds of thousands of processor cores and a very fast dense network. This supercomputer, named Blue Waters, will be used for scientific research.

Recently, my career path has changed directions. I had for a few years planned on becoming a researcher at one of the Department of Energy national laboratories. I enjoyed internships at Sandia National Labs in New Mexico and Lawrence Livermore National Labs in California during the



Isaac Dooley and his wife, Amanda

summers of 2006 and 2007, respectively. After recently completing my Ph.D., I have been hired to work at Two Sigma Investments in New York City. Two Sigma leverages various proprietary technologies to manage investments. While in New York City, my wife, Amanda, and I have enjoyed our free time visiting tourist attractions, trying different types of foods, walking around museums, and experiencing the diversity of the city.

## Mathematics alumnae publish research paper

Kelly Bragan '07 and Catherine Dooley '07 recently published the results of research they completed while undergraduates at Birmingham-Southern under the direction of Dr. Barry Spieler, professor of mathematics. Their paper, *The characterization of all (2,3)-regular graphs*, appeared in 2010 in the journal *Congressus Numerantium*. Both graduated with honors from BSC. Dooley has since earned a master's degree, and Bragan is pursuing a Ph.D. in mathematics.

# Junior mathematics major selected for summer research program, co-authors paper

By Amy Schumacher

This summer, I was selected to attend the National Science Foundation-funded Research Experience for Undergraduates in Mathematics at Central Michigan University. The topics of the program were statistics, graph theory, and conformal geometry. Along with a partner, Brian Rooks (Chapel Hill), and our faculty advisor, Dr. Kahadawala Cooray (Central Michigan), I worked on the statistics project. We tested multiple statistical distributions to determine if any could form composite models with the Pareto distribution in order to more accurately model highly-positively skewed data. After we established a composite model, we worked with survival data to test its usefulness. We summarized our findings in a paper entitled *The Power Cauchy Distribution: Derivation, Description and Composite Models*. We presented our research at two mini-conferences with other REU programs during the duration of the

REU, and we also presented at the 2011 Joint Meetings of the American Mathematical Society and Mathematical Association of America.

Going to an REU was a great experience. I was introduced to the intricate procedures, slow and tedious work, and ultimate rewards of mathematics research. I was given the opportunity to learn skills that many undergraduates are not exposed to, such as learning to use statistical programs such as SAS and R and learning to type up mathematical papers in LaTeX. I also enjoyed being able to live in an intellectual community in which we were all dedicated to our specific projects but were also able to talk about our interests and goals with others who understood. In sum, the CMU REU gave me a glimpse into graduate school and helped prepare me for mathematical research.



Yust

## BSC welcomes new mathematics faculty member

Birmingham-Southern College is delighted to welcome Dr. Anne Yust to the mathematics faculty. Anne earned her Ph.D. in mathematics from Carnegie Mellon University in August 2010. Her research focuses

on the application of mathematical techniques to biological problems. Currently, she is exploring immunological issues. Specifically, she is looking into the design of optimal treatments for given harmful pathogens using methods found in control theory.

In her free time, Anne, a former collegiate tennis player, loves playing tennis. She actually enjoys participating in most sports. She has been known to win a poker hand or two, and has also been caught playing the occasional geeky board game. Anne is also always happy to chat about her current favorite microbrew over an NFL game, but not when the Baltimore Ravens are on the field; she demands absolute silence when her team is playing. Anne was one of 10 new faculty members to join BSC this fall.



Mayer

## KME Mathematics Honorary Society presents MAA Southeastern Section Lecturer

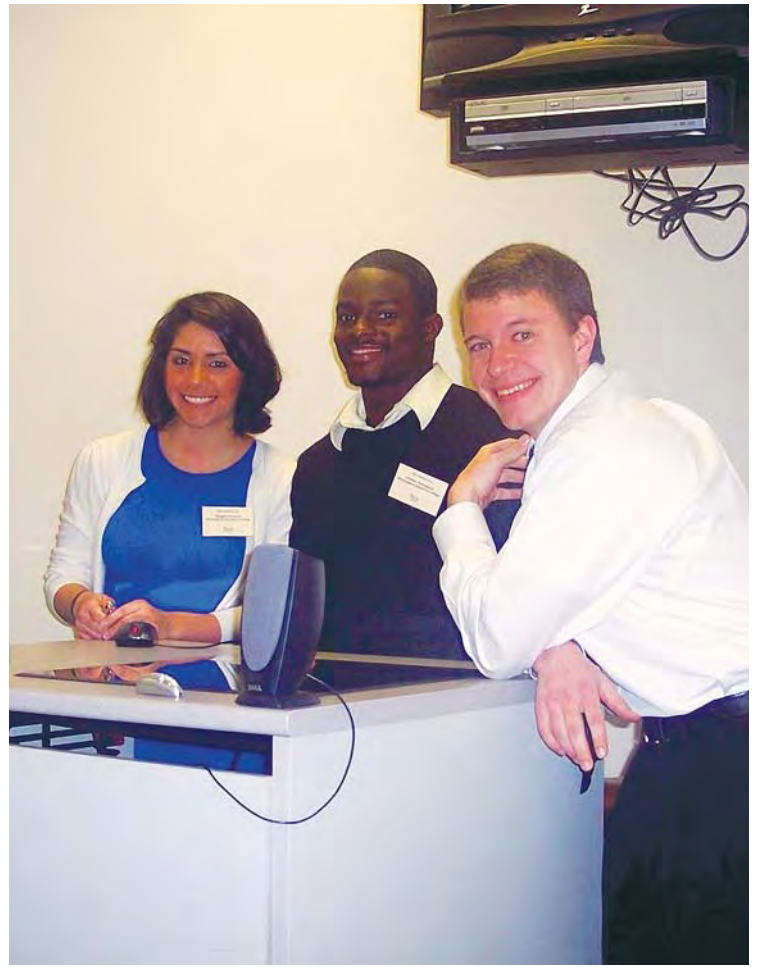
Alabama Zeta, the BSC chapter of Kappa Mu Epsilon, recently hosted Dr. John Mayer, the Mathematical Association of America Southeastern Section Lecturer, who spoke on *Mathematical Models for Fairness*. Mayer presented an interactive colloquium in which the audience was responsible for the fair division of property and power. They wrestled with issues such as that posed by the following problem: Andy, Bert, and Connie are farmers. Their neighbor, who is also a farmer, is retiring next month and wishes to sell her 12 pigs for \$480. Andy, Bert, and Connie can only afford to purchase the pigs if they pool their money. Andy can contribute \$97, Bert can contribute \$210, and Connie can contribute \$173. How many pigs each should Andy, Bert, and Connie get? Explain why your distribution is a fair division of the pigs. (Note: No pigs may be harmed or shared in your solution.)

Kappa Mu Epsilon also held its annual initiation ceremony in which a record 23 new members were honored.





*Rachel Morgan and Niño YuTiamco*



*Maggie Zernick, Walter Arrington, and Artem Juokov*

## **Mathematics students speak at undergraduate research conference, capture first place in calculus competition**

BSC was well represented at the MathFest Undergraduate Mathematics Conference at Troy University in Montgomery in February 2010. There was a packed audience for the following talks by 16 BSC students:

- Predictive yield curve modeling by Jacob Conner and Xinyan Yan
- Optimizing investments in the stock market by Maggie Zernick, Walter Arrington, and Artem Joukov
- Exploring mathematical models of infectious disease by Russell Norris
- Game theory: an introduction by Leslie Ann Kilpatrick and Loree Killebrew
- Number sequences: limits and patterns by Christine Denning and Josh Whitaker
- Spherical trigonometry by Nick Crovo
- Variations of the bead problem by Hunter Graham
- Water clocks by Rachel Morgan and Niño YuTiamco
- An introduction to random walks with an application to Birmingham-Southern College's campus by Ryan Creel and Andrew Stein

The conference also sponsored a Calculus Competition with first, second, and third prizes. BSC senior mathematics major Xinyan Yan won top honors. Yan is now working toward a master's degree in finance at the University of Alabama.



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