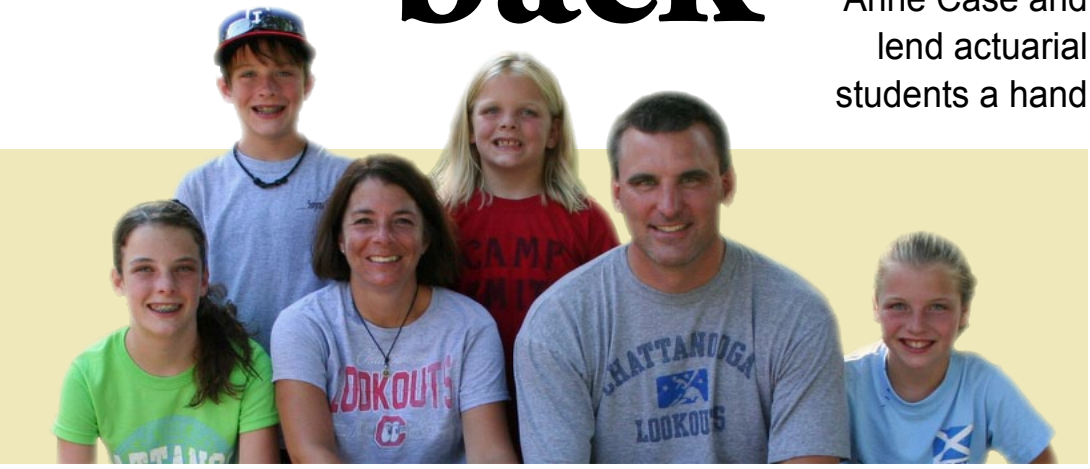
FSUmath
THE FLORIDA STATE UNIVERSITY COLLEGE OF ARTS AND SCIENCES
SPRING 2012

Giving back

Alum Courtney White and wife Shari honor Professor Bettye Anne Case and lend actuarial students a hand



When he was an FSU undergraduate working toward a career in actuarial science, Courtney White spent at least $1,000 on textbooks and other materials to help prepare for a series of exams to be certified in his field.

Now, nearly two decades later and well established as an actuary, he has decided to help defray some of those costs for current FSU students.

To do that—and to honor one of his former professors—Courtney White and his wife, Shari White, have made a gift of $25,000 to establish the Bettye Anne Case Scholarship in Actuarial Science.

"Courtney and Shari White have made a wonderful gift that recognizes Bettye Anne's substantial contributions," says Sam Huckaba, math professor and interim dean of the College of Arts and Sciences. "We are very grateful for their generosity."

White, a big supporter of the education he received from Case and her colleagues in the Department of Mathematics, is encouraging other alums with actuarial careers to pitch in to make the scholarship program even larger. "Please join me in honoring and thanking Dr. Case for starting the program that helped us all," he says.

"Dr. Case began the actuarial program at FSU and became my advisor during my junior year," White says. "I give

continued on page 16

Bettye Anne Case

Top of page: Courtney White with wife Shari and their four children

Photos courtesy of FSU College of Arts and Sciences

In This Issue

2 Letter from the Chair

3 Alum wins NSF award

4 Faculty Profile: Nick Cogan

6 Outreach opportunities

8 Faculty Profile: Eric Klassen

11 First Brennan Professorship

13 Faculty member appointed dean

18 Students from across the globe

Letter
from the chair

by Philip L. Bowers

Welcome to this 2011-12 edition of FSUMath. There is much to report about the department, both past successes and honors as well as future challenges and changes. Looming large in 2012 are some major changes in leadership within the department. This is my last year as Chair with my tenure ending in August 2012. The department has selected, and the Dean has approved, our own Xiaoming Wang as Chair-elect. At this time he is busily scaling the learning curve on departmental administration with enthusiasm by shadowing me in various of my duties as Chair. From what I have seen thus far, the department will be in good hands next academic year when Xiaoming takes full charge as Chair. Our own Sam Huckaba, who has served since 2004 in the Dean's office as Assistant and then Associate Dean, was appointed Interim Dean of the College of Arts and Sciences at FSU when Dean Travis stepped down in August. The college is in good hands as it wrestles with some very challenging problems this year. Congratulations to Sam for the trust placed in him by the Provost and President of the University. Another change in administrative leadership will occur more slowly, with Bettye Anne Case relinquishing her responsibilities as Associate Chair for Graduate Studies over the next academic year as Giray Okten simultaneously transitions into that challenging role. Speaking of Professor Case, please see the lead-in article of this edition of FSUMath that reports on a generous gift from Courtney White and family to honor Bettye Anne for her work in the early nineties in building a program in actuarial science at FSU. Courtney, who pursued work in the actuarial field after his degree in applied mathematics and early training in some of those initial actuarial courses, honors Professor Case by establishing the Bettye Anne Case Scholarship in Actuarial Science.

The department says a fond farewell to two who have figured prominently in our mission to teach basic mathematics to over 5000 students every semester. Will Stiles retired from his position as Director of Basic Mathematics last May, and Karen Burgess retired from her Research Associate position in December. Their dedicated hard work will be missed. Promoted this year were Pene Kirby to Research Associate, Nick Cogan to Associate Professor with tenure, and Eriko Hironaka to Full Professor.

Readers of last year's newsletter may recall the announcement of the Marion Bradley Brennan Professorship in Mathematics, a named professorship funded by a generous gift from Ms. M. Carol Brennan to honor her late mother. Please see on page 12 the announcement of our first Marion Bradley Brennan Professor, Paolo Aluffi, who was awarded this honor after a very competitive selection process. Congratulations Paolo! Two researches are highlighted in this issue, Nick Cogan in biomathematics and Eric Klassen in shape analysis via pure mathematics. Also, two departmental alumni are honored, Mariel Vazquez (PhD 2000) by an NSF CAREER Award, and the late Bettina Zoeller Richmond (PhD 1985) with a new FSU Mathematics Department award named in her honor to recognize excellence among our graduate students. Finally, please read about Emeritus Professor Steve Blumsack's experiences in educational outreach in mathematics.

Let me close by saying a personal and heartfelt "thank you" to my colleagues who over the last seven years have honored me first by entrusting me with the leadership of the department as Chair, and second by working so hard to make this department a world class mathematics department, even with shrinking resources and at times inadequate recognition for a job well done; a "thank you" to my staff that provides the oil that lubricates the administrative engine of the department, and to my students who remind me of the privilege we have in transferring our expertise in this wonderful subject we so love to new generations; and finally a "thank you" to my family who has supported me in ways they will never know, and who inspired me always to give my best to my calling as Chair.

Math department alum wins major NSF award

Mariel Vazquez
Photo courtesy of San Francisco State University

Mariel Vazquez, who earned her Ph.D. in math at FSU, has received a prestigious National Science Foundation (NSF) CAREER Award for her research. She applies pure math to the biological mysteries of DNA, studying its entanglement as it packs tightly into living cells.

Born and raised in Mexico City, Vazquez became fascinated with math and biology in high school.

"I found pure mathematics to be absolutely beautiful but I didn't know how I could apply it to biology," Vazquez said.

That changed when she became an undergraduate at the National Autonomous University of Mexico and attended a series of talks about DNA topology—the application of knot theory to the study of DNA.

Vazquez attended FSU from 1995 until 2000. During her time in Tallahassee, she studied under Professor De Witt Sumners, one of the seminal researchers in the emerging field of DNA topology. After earning her Ph.D., she spent five years as a postdoctoral researcher and visiting assistant professor at University of California, Berkeley, and finally joined the faculty at San Francisco State University in 2005, where she is currently an associate professor of mathematics.

"When DNA is packed into a cell it doesn't look like the straight double helix that we see in textbook pictures," Vazquez says. "In order to fit into the cell, the double helix is twisted and coiled around itself and around proteins."

One of nature's problems is that the two strands of the DNA's double helix must be separated and unwound in order to be copied, allowing the genome to replicate. Scientists have found enzymes which disentangle DNA, allowing it to replicate, but much is still to be learned about how they work.

These enzymes are vital for the functioning of healthy cells in all living organisms. They also play an important role in allowing bacteria and other malignant cells to multiply, making them targets for antibiotics and anti-cancer drugs.

In bacterial DNA, the double helix is bent around and joined in a circle. When the DNA replicates, it produces two interlocked circular DNA molecules—like two links in a paper chain—that can't be separated without the help of an enzyme.

Vazquez and her colleagues at Oxford University are studying the action of an enzyme that disentangles DNA in the bacterium Escherichia coli (E. coli).

"We'll use mathematics to study the enzymatic mechanism and computer simulations to determine the most probable pathways of disentanglement," Vazquez says.

The CAREER grant of nearly $600,000 awarded to Vazquez will help her develop international partnerships with mathematicians, biologists, and computer scientists to investigate how these enzymes work. The grant is awarded to faculty early in their careers who are conducting innovative research and finding creative ways to integrate research and education. •

This article is a modified version of an article by Elaine Bible of the University Communications office at San Francisco State University. The original can be found online at www.sfsu.edu/~news/. Used by permission.

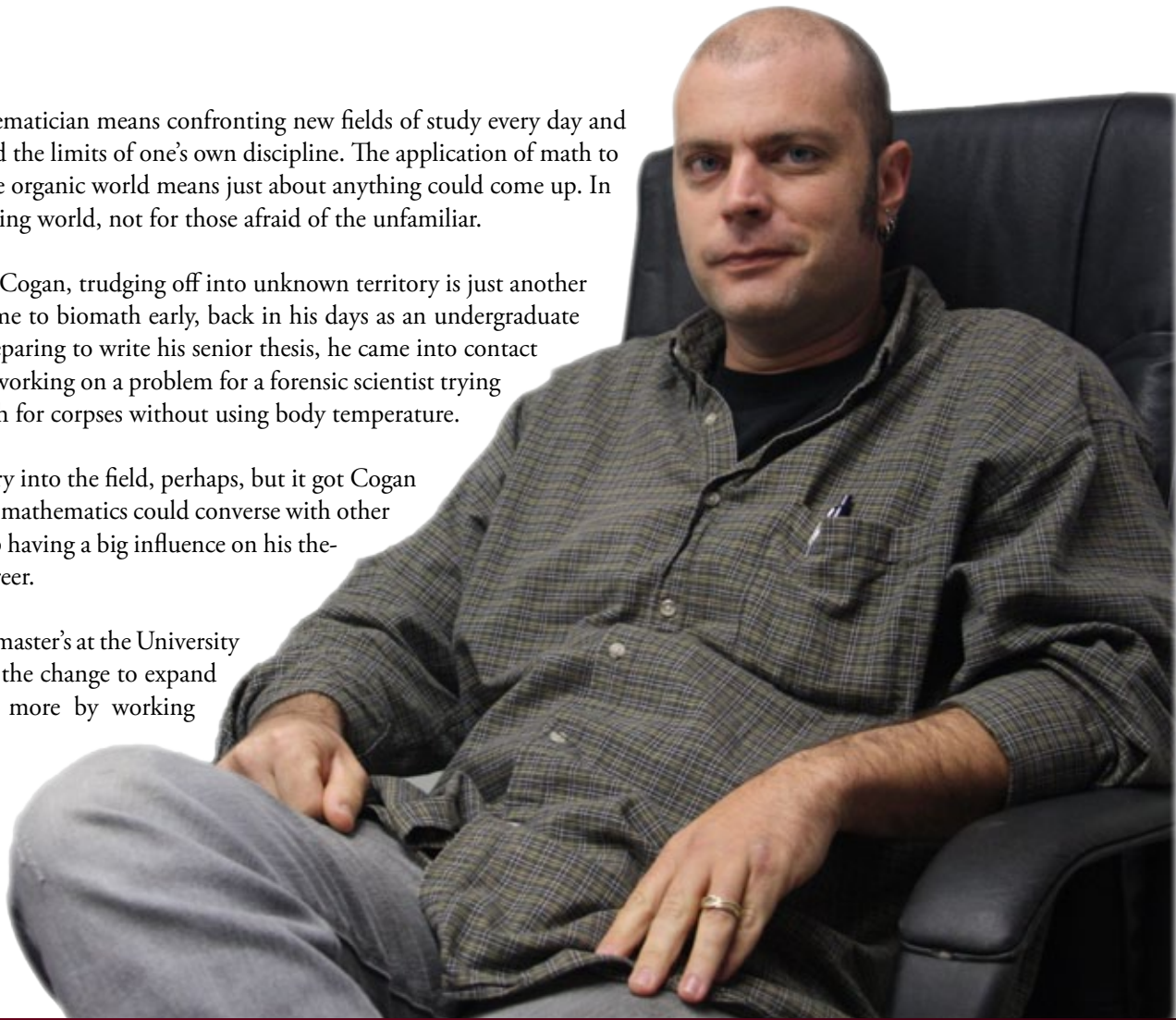
FSUmath
The newsletter of the Department of Mathematics at Florida State University.

Editor
Giray Ökten

Design, copyediting, photography, and writing
Wil Oakes
Oakes Copy and Creative Services
www.oakescreative.com

A life without borders

Associate Professor **Nick Cogan**



Being a biomathematician means confronting new fields of study every day and reaching beyond the limits of one's own discipline. The application of math to any and all aspects of the organic world means just about anything could come up. In short - it's an ever changing world, not for those afraid of the unfamiliar.

But for FSU's Nick Cogan, trudging off into unknown territory is just another day at the office. He came to biomath early, back in his days as an undergraduate at Texas Tech. While preparing to write his senior thesis, he came into contact with someone who was working on a problem for a forensic scientist trying to establish time of death for corpses without using body temperature.

It was a morbid entry into the field, perhaps, but it got Cogan thinking about the ways mathematics could converse with other disciplines and ended up having a big influence on his thesis and the rest of his career.

While pursuing his master's at the University of Montana, Cogan got the change to expand that conversation even more by working

at the Center for Biofilm Engineering, an interdisciplinary National Science Foundation center that brought together faculty from different departments and funded grad students to work with them. The only hitch? He hadn't studied biology since high school, which didn't bother him but did manage to annoy the microbiologist he was paired with.

"He got so mad that I didn't know any biology," says Cogan. "He would sit down with me at lunch and he would say, 'okay, here's a cell,' and start drawing a picture."

He managed to make it through and pick up on what he'd missed. Before long, he and his wife, Keely, who he married right after undergrad, were off to the University of Utah, where Cogan got his Ph.D., then to postdocs at Tulane in New Orleans and Rice in Houston before eventually landing at FSU in January of 2006. It was the fulfillment of a steadfast, if vague, dream he'd had since childhood.

"I think when I was in fifth grade I had a meeting with one of the guidance counselors and said, 'I'm going to get a Ph.D. I had no idea what I was talking about, but that was the plan," Cogan says.

The vagueness of that early ambition may have been a signal that he was perfectly cut out for the flexibility required in biomath. Since finishing his Ph.D., he has helped researchers in several far-flung fields solve real world problems.

He has done disinfection studies, testing the effectiveness of disinfectants, antibiotics, and biocides by using math to calculate the persistence of bacteria over time as well as space.

He has studied biofilms – bacteria that grow on surfaces and impact many different industries like shipbuilding, where biofilm on a ship's hull can greatly decrease its efficiency in the water.

Recently, Cogan's work has focused on plant life and how to find new ways to keep biofilms from developing on crops, particularly grapevines. California winemakers are unwilling to compromise the quality of their grapes by using antibiotics, and are often forced to rip out whole sections of their vineyards to prevent the spread of diseases like Pierce's disease, which can devastate a harvest. Cogan is working on ways to insert different metals into the plants that can kill the biofilm.

A microscopic image of a biofilm. Cogan studies films like these in many different contexts. *Photo courtesy of the Pacific Northwest National Laboratory*

That much variation in focus might be enough to drive some people crazy, but Cogan welcomes the challenges biomath offers and the variation it brings to his study as well as to his teaching. He serves on a number of committees and is currently directing five graduate students, each with a unique and unexpected topic to work on.

"All of them have chosen some really interesting problems," he says. "It's weird, because you're trained to do a lot of things, but you're not really trained to mentor Ph.D. students, so you try to figure out the best way for each student. They've all settled on problems that I never would have chosen myself."

In his five years in Tallahassee, he's finally had time to settle in after so much time spent bouncing from place to place, and has gotten to know lots of FSU students and become comfortable in his teaching role, a far cry from what he remembers of his first experience in front of a classroom, which he describes as "terrifying."

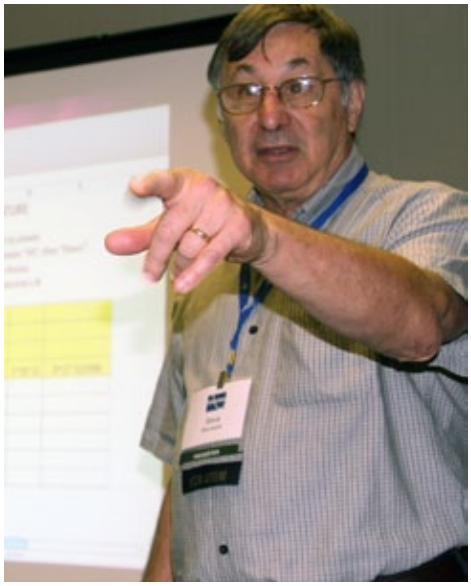
Cogan and his wife have also managed to let their kids settle down – they have a son and two daughters – though they seem to have the same penchant for wandering that Cogan displays in his academic pursuits. After the family recently went to Cincinnati for six month while he was on fellowship, the kids were ready for life on the road.

"When we came back, they were like, 'okay, where are we going to go next?' They want to go to Europe. I'm supposed to get a sabbatical and go to Greece or something."

Fortunately for Cogan, a career in biomath means that there's work to be done anywhere that organic matter exists, so the entire world is, literally, teeming with new opportunities. •

My experiences in outreach

by Emeritus Professor
Steve Blumsack



During my 36 years on the Mathematics faculty and six years of subsequent retirement, I have engaged in many forms of educational outreach. This effort has been valuable for improving my teaching and, I hope, in providing a valuable service to K-12 students and teachers.

Some of these efforts have involved students directly. These include teaching summer programs (FSU's Young Scholars Program for high school students), directing a mathematics camp for girls aged 14-16, leading problem solving in high school classes, mentoring students in science fair projects, organizing a Math Counts team, and leading middle school students during field trips to local environmental sites. These interactions have been especially enjoyable since I did not have to deal with preparations for high-stakes testing. Moreover, I have developed a better understanding of the background of our undergraduate students. In the future I hope to tutor students; this is a task that seems to be in high demand in K-12 education.

Another category of outreach consisted of volunteering to assist the Florida Department of Education in developing priorities, standards, and teacher certification examinations. This can be frustrating since political issues can dominate content aspects. For example, Dr. Okten and I attended a meeting near Orlando at which the State was beginning its transition from the existing mathematics standards to the new "Common Core" national standards. Months later I was invited to represent university mathematicians in Florida at a meeting in Washington DC to begin the actual transition. It seemed clear that the state leadership was reluctant to make the transition. A year later I was invited to St. Petersburg with the stated purpose of approving the transition. This time I declined since it appeared that a decision had already been made and the invitation seemed to be a ploy to justify that decision. It is crucial that professional mathematicians participate when our input will be valued.

A third type of outreach consists of using our expertise to evaluate and produce projects, examinations, and documents. Under the guidance of Ben Fusaro, several of our faculty have graded projects for a national modeling contest for teams of high school students.

I have been involved in the quality control of converting face-to-face workshops to online versions. I detected several major errors in the materials. The most egregious (at least to me) was the suggestion that students prove the Pythagorean theorem by constructing a right triangle, measure the three sides, then test the conjectured relationship. I do not think that we actually need to encourage students "proving by example", especially when the example consists of measurements that are inherently only approximate. Serving as a content expert is a common way for mathematics faculty to participate in outreach.

I have served as an author and reviewer of a FCR-STEM (Florida Center for Research in Science, Technology, Engineering and Mathematics) project with the acronym CPALMS. The idea is to provide K-12 teachers with resources and lesson plans that are aligned with the State and Common Core standards in mathematics and science. The resources are organized on a website in a way that allows teachers easy and efficient access with confidence in the validity and quality of the resource. Since there are so many resources available on the internet these days, the CPALMS group is careful to have content faculty (high school and university) review the resources. The process is not unlike that for research papers. So far I have had five resources published spread across grades K-8 with a total of almost 1000 "hits" and have several other potential resources under construction.

The most common mode of outreach has been in face-to-face workshops with teachers and principals. These usually involve getting paid since the organizing

groups have grants. Most workshops occur in the summer, but sometimes there are opportunities during the academic year provided the funding source provides money for substitutes for the participating teachers.

The State of Florida receives substantial funding from the US Department of Education. In "normal" times, this amounts to about $10 million each year for Math-Science partnerships, with most of that in recent years being used to support teacher training; this amount is now substantially larger due to the very large Federal Race-to-the-Top funding recently awarded to the State of Florida. During the past decade, these funds have supported many workshops and other forms of professional development.

Two organizations in particular have been active recently. The Panhandle Area Education Consortium (PAEC) serves the rural counties in Florida west of the Suwanee River by writing and administering proposals. I have participated in teacher workshops with them in mathematics, physics, space science, and environmental science in recent years. FCR-STEM has had several major projects involving teacher workshops and resource development with a total budget in the tens of millions of dollars.

A few years ago I partnered with Penny Gilmer (FSU Chemistry) in a PAEC-sponsored program for grades 3-10 science teachers in northern Florida. In the spring we broadcast weekly lectures from Harry Kroto's studio to the schools; since there are two time zones involved, we broadcast two one-hour lectures with phone calls available from the participants. This course was designed to provide appropriate science content, focusing on the nature of science. During the summer the teachers were organized into teams and conducted research for 12-15 days; park rangers, other state employees, and scientists at private companies served as mentors. I was fortunate to be able to observe these research experiences—collecting data on oysters near Fort Walton Beach, tracking gopher tortoises at Nokuse Plantation in the Panhandle, measuring plant growth at a huge horticultural enterprise in Altha, monitoring tobacco growth near Marianna, observing butterflies near Tallahassee, and several others. It was important that a faculty member did observe the research. Several times the teachers would gather data that made no sense; in one case the instrument was not calibrated properly, in another, measurements were not made in the proper location. I learned many things, for example brackish water is necessary for oysters because their main predator, the drill, cannot survive in that environment.

In 2010 I participated in a set of FCR-STEM workshops for elementary school principals and teacher leaders. Our team (a recent mathematics education PhD, an elementary school principal and I) visited each group (Tallahassee, Melbourne, Lake Mary, Miami) four times for two day workshops. Since each group consisted of about 50 participants, we stayed in very nice hotels (on the beach in Melbourne and in Coconut Grove near Miami). We focused on mathematics content appropriate for grades K-6 and how principals can support quality teaching in mathematics. It became clear to us how crucial is the role of the principal with respect to what is taught in mathematics. I learned a great deal regarding important issues in elementary school and how we, as faculty, can advise, assist and otherwise support teachers and principals. It was great fun developing the program and traveling with our team.

Steve Blumsack at the Florida Center for Research in Science, Technology, Engineering, and Mathematics Conference in Sandestin, Florida.

Outreach opportunities do exist. Some require more time that is not available until after retirement, others can be accomplished in the summer or for short periods of time during the academic year. But all contribute to the advancement of mathematics and science understanding for K-12 students. And all advance professionals' understanding of K-12 students, teachers, and administrators. •

Shape shifter

The evolving career of Professor **Eric Klassen**

Over the course of his career at FSU, Eric Klassen has evolved as a teacher and researcher. When he arrived, he was focused almost exclusively on pure math, specializing in topology and gauge theory. Now, twenty years later, he puts his expertise to work in the practical world, using computers to solve diverse problems.

As much as his day to day work has changed, however, Klassen can see clearly the threads connecting the different phases of his work.

"For me, the ability to make sense of shapes has always been the unifying principle, all the way back to when I was an undergrad," he says. "To me it's still the same, still thinking about shapes, still using logical mathematics to try and understand shapes."

That unity in diversity has been a theme in Klassen's life ever since his childhood growing up in southern Indiana. His father – a sociologist – worked for a while at Indiana University, and his mother – a housewife back then – finished her bachelor's and master's degrees in writing while raising four kids and later went on to edit magazines and inadvertently wound up a professor of journalism at Temple in Philadelphia.

"She was one of the less academic ones in the family but she was the first to get tenure," jokes Klassen.

His siblings – three sisters – are all over the map as well – one is a nurse; another is a musician, landlady, and Ph.D. student in folklore; and the third, after a couple of different careers, is now a TSA supervisor.

For Klassen, though, the path to mathematics was in no way a roundabout one.

"I always loved math," he says. "I'm pretty sure I have a memory from when I was in third grade, that somebody asked me what I wanted to do when I grew up and I said 'mathematician.'"

His teachers allowed him to work ahead of his math classes, and by the end of his high school career he was commuting to Indiana University to get even further ahead. Even then, Klassen had his sights set on an academic career. He went on to Harvard for undergrad and Cornell for his master's and Ph.D.

After that, during a postdoctoral stint at Cal Tech, he first got interested in gauge theory, which would shape much of his first decade at FSU. It was also while at Cal Tech that he married his wife Anna, a nurse practitioner he'd met while in New York.

After his postdoctoral work at Cal Tech (as well as a one year stopover at UCSD in San Diego) was done, they made their way to Tallahassee, where Eric joined the math department and Anna joined the staff at the Thagard Student Health Center. FSU proved to be a nice fit, and Klassen continued in the work he'd started in California.

The course of his studies shifted, however, when he met Anuj Srivastava of the statistics department.

"I think it was in 2000, 2001 or so," Klassen recalls. "Anuj came looking for somebody to help him with several projects he was doing trying to teach computers to analyze shapes, basically. And he asked

some questions that I found kind of interesting. So I started thinking about those questions and we started writing papers together."

Those papers, and the research that followed, took Klassen into a new world – one dominated by computers and focused on a dizzying array of real world problems. The applications of computer-driven shape analysis come up in fields as diverse as communications – improving the precision of satellite positioning systems, medicine – automated analysis of MRI scans, and national security – using computers for facial recognition.

The biggest adjustment for Klassen has been the interdependence of his collaborations. He now works at any given time with statisticians as well as computer scientists and has to depend on their skills as much as they depend on his. Klassen's contribution to the projects is the underlying mathematics, but he knows he could never do the statistical analyses or the computer programming required to bring the work to fruition.

Throughout the changes he's undergone – both personal and professional – math has always been central. It's not only his work, but his hobby.

"To me, math has to be fun," he says. "I can't do it if it's not fun. Universities have politics and economics, budget problems and all this, but to enjoy myself I can't think about those things. I just have to think about math and talk to people, find other people that are interested in the same sort of things I am."

Two decades in Tallahassee have flown by for Klassen. During that time, he and his wife have also raised a daughter, Rosemary, a soccer star and academic standout while at Leon High School. She graduated last year, number one in her class, and has gone on to college with plans to become a doctor someday.

"We're very proud of her," says Klassen, who admits that his daughter's interest in medicine came from her mother.

Still, the household is one full of a variety of influences, all of which must have shaped her as well as her parents over the years. When Klassen takes a break from math, he also enjoys biking and playing music. While Klassen's daughter managed to teach him to enjoy all types of music—even country—when he sits down at the piano he sticks mostly to classical, especially Bach and Chopin.

He can even be seen on YouTube – a search for "Eric Klassen" pulls him right up – performing Chopin's Ballade No. 4.

Even there, though, he notes that the sort of mind that is fascinated by the patterns of mathematics is likely to find joy in music for similar reasons, and in that way the many diverse strands of Klassen's life once again coalesce around a familiar theme.

"It's sort of been the most constant thing in my life," he says. "We all go through a lot of changes, but math is the thing that's always been there and I've always come back to." •

Klassen enjoys playing classical piano in his spare time, and can be seen on YouTube performing Chopin's *Ballade* No. 4.

Fond farewells

Two long-time faculty members bid adieu to FSU

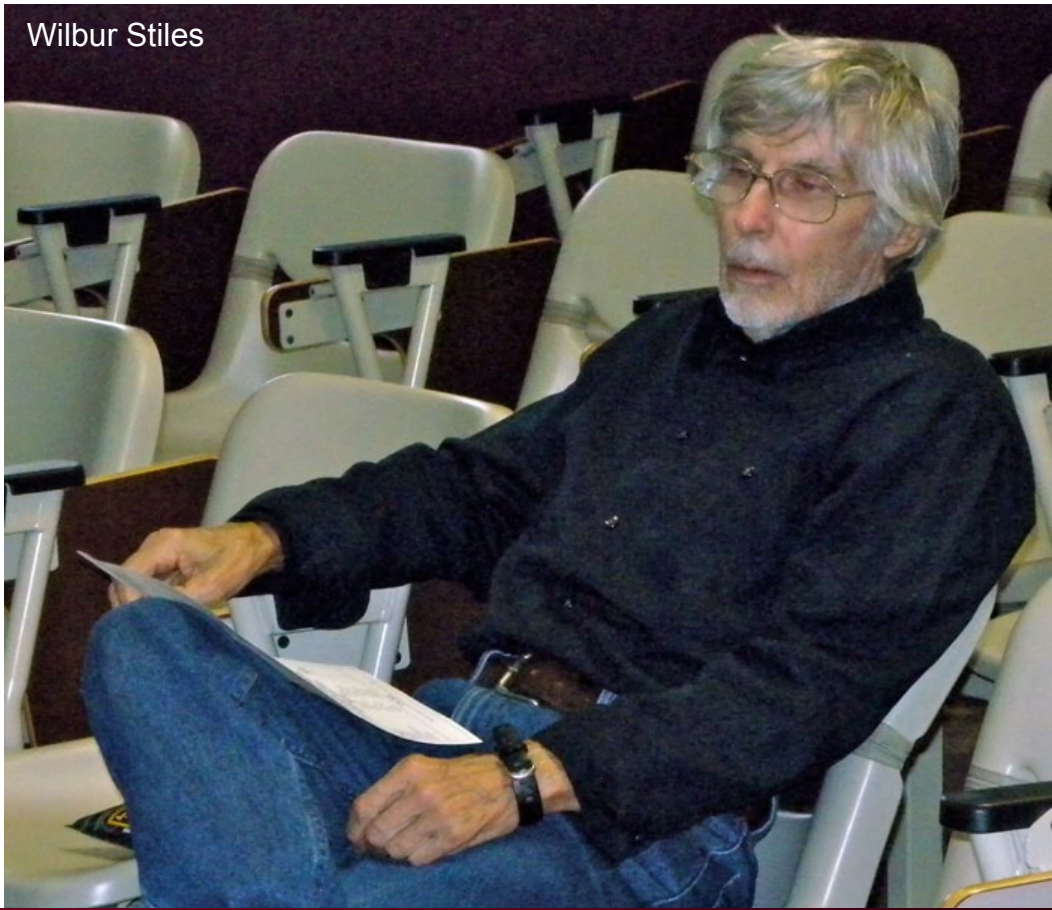
Wilbur Stiles

After a long career at FSU, Wilbur Stiles is retiring. His work, particularly as the Director of Basic Math, a position he first took over in 1994, has had a lasting impact on the quality of instruction as well as the quality of life in the department. His efforts to bring computer assisted instruction into FSU classrooms revolutionized many courses. Under his supervision, the department saw an increase in undergraduate grades, more uniform standards in precalculus and trigonometry classes, and a reduced workload for graduate teaching assistants.

A man with so many responsibilities isn't easy to replace – doing so has required the assembly of a small army and a redistribution of an exhausting list of duties. Major administrative duties have gone to Steven Bellenot, the associate chair and Annette Blackwelder, the new coordinator of basic math. Ken Dodaro, Ishkan Grigorian, and Mary Kutter are coordinating business calculus, trigonometry, and precalculus courses, and Penelope Kirby now coordinates teaching assistants.

Despite handling so many duties, Stiles managed to maintain an accessibility that made him a valuable asset to students and colleagues alike. He maintained an open door office policy for everyone from faculty members on down to undergraduates. In each interaction and with each problem presented to him, Stiles always strove not just for a solution but for the best solution, and was always willing to put in the time necessary to achieve it.

"Dr. Will Stiles has served this department with honesty, fairness, and integrity," says Annette Blackwelder, who has assumed many of Stiles's former duties. "He has significantly impacted undergraduate mathematics education." •



Wilbur Stiles

Karen Everage

After 22 years teaching math at FSU, Karen Everage is retiring. Over the course of a career that spans four decades, she has taught a variety of subjects ranging from English to computer programming to piano, and she has done so in cities and towns all over the South. She joined the math faculty in December 1989, having come to FSU originally for graduate school in 1985.

Everage plans to spend her time after retirement with her children and grandchildren as well as by travelling with her husband, Ed. She will continue to teach through her involvement with the Sunday school at Thomasville Road Baptist Church, where she also indulges her love of music by singing in several different choirs.

Everage has seen many changes around FSU over the last 22 years, but has found a constant in her work in the classroom. For her, teaching is more than just a vocation, it is a lifelong love and a sustaining force. As retirement approaches, she has attempted to reflect on her career by asking herself big questions.

"What is it about teaching that sustained me," Everage asks, "through the death of a child, the death of a marriage, through major wrong choices in my children's lives, the death of a grandchild, and a battle with breast cancer? … I found the answer in a love for more than just teaching. I found it in a deep love for the people I teach."


Karen Everage

The legacy of a long career helping students will surely be felt for years as her example lingers on around the halls of the Love building.

"I may not have succeeded in teaching all of my students to love mathematics," Everage says, "but if I taught some of them to fear it less, I have accomplished my goal. I'd like to think that the problem solving techniques learned under my tutelage have been useful in conquering life's challenges." •

Marion Bradley Brennan Professorship

A generous gift from Ms. M. Carol Brennan has been used to endow a named professorship in mathematics in honor of Carol's mother, Marion Bradley Brennan. The Marion Bradley Brennan Professorship in Mathematics shall be used to "support an internationally known scholar in the field of mathematics, with a proven track record in research, teaching and especially mentoring undergraduates and graduate students."

Carol is an accomplished alumna who earned a Bachelor of Science degree in 1976 and a Master of Science degree in 1978, both in Applied Mathematics. She began her professional career as a software engineer with Bell Laboratories and later joined Telcordia Technologies, where she eventually rose to the level of Corporate Vice President of Quality Operations. After retiring from Telcordia, in 2003, Carol began a consulting career that continues to this day. Carol currently serves on the College of Arts and Sciences Leadership Council. She cites the support and mentorship she received from the FSU math faculty as her reason for endowing this chair, and hopes her contribution will ensure future students the same kind of experience she had.

After an extensive selection process, the first holder of the Marion Bradley Brennan Professorship in Mathematics has been chosen. The committee has combed through a list filled with many deserving candidates and chosen Professor Paolo Aluffi, who has served as a faculty member since 1991. Aluffi was chosen on the merits of his work as both a teacher and a researcher, and comes highly recommended by his colleagues and students.

Paolo Aluffi

"Dr. Aluffi is a great advisor. As a mentor he is without peer. He is patient and caring with his students. His knowledge of his field is great, and his advice is valuable... As a teacher, he is also amazing. His polished presentation style shows that he makes his class presentations a high priority. He has a way of making almost any topic interesting."

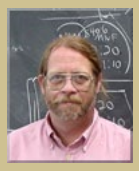
"The classes I have taken with him were all impeccably organized and conducted. Always interesting and challenging, his lectures were suitable for both beginning and advanced students. Algebraic Geometry is a really tough subject to teach and he just knew how to do it!"

Other Nominated Faculty

The quality of the other nominees for the Brennan Professorship is a testament not only to Aluffi's outstanding work, but to the excellence to be found throughout the FSU math faculty.

"David Kopriva is an example of someone that I can concretely say has positively impacted me. My experience at FSU was made more rich because of him. In fact, his impact now goes beyond me, as my students are now benefiting from the training and mentoring that Dave provided during my undergrad years there. Hard to believe that in two years (i.e. my junior and senior years), such a person could have such an impact."

list continued on next page



Craig Nolder

David Kopriva

Alec Kercheval

Dr. Mio gave detailed comments on almost every aspect of my work including my research, publication, presentation and even Curriculum Vitae and essays for my job applications. His comments range from general directions on my dissertation to as small as grammar and spell check... On the other hand, Dr.Mio opens his heart to students and is willing to listen to students' voices. This is very helpful since it improves my capability of thinking independently, which is crucial for a good researcher. Last but not least, Dr.Mio cares about students' personal lives, which provides a harmonious atmosphere for our interaction.

Mark van Hoeij

Washington Mio

"Dr. Cogan also shared his research with me and even took the time to do not only one but two DISs with me as an undergraduate. It is the work I attempted with him that actually changed my mind to go into graduate school for Mathematics (instead of medical school). I also know I am not the only one he has opened up his time to--I know of at least two other people who have also changed their future "plans" because he gave them the chance to see something new and interesting to focus their goals. His passion for his research inspires anyone who works with him."

Mike Mesterton-Gibbons

Nick Cogan

"Dr. Bertram not only patiently helped me choose suitable course loads but was willing to take the time to share his research interests with me when I was only and undergraduate student. In addition, more than once, he has taken on undergraduate students to contribute to his work in addition to his group of graduate students. He is always happily available and willing to help a student."

Amod Agashe

Richard Bertram

Sam Huckaba, longtime faculty member, appointed Interim Dean of FSU College of Arts and Sciences

Photo courtesy of FSU College of Arts and Sciences

Sam Huckaba received a B.A. degree in mathematics from the University of Missouri in 1980 and received his Ph.D. degree in mathematics from Purdue University in 1986. He joined the Department of Mathematics at FSU as an assistant professor in 1987 and was promoted to full professor in 1998.

In the 2004 Huckaba was appointed Associate Dean of the College of Arts and Sciences, serving first as leader of student academic affairs, next as Associate Dean for faculty academic affairs, then serving as senior Associate Dean.

Huckaba was appointed interim Dean of Arts and Sciences on July 28, 2011. The College is the largest at FSU, consisting of 18 departments and 18 programs or institutes. It delivers nearly 50% of the university's student credit hours each year.

Huckaba's research accomplishments include published work in the areas of Commutative Algebra and Algebraic Geometry, two classical areas of pure mathematics. In recent years, prior to joining the Dean's office, his interests had expanded towards applications of algebra, in particular to cryptography and coding theory. He was recognized twice with teaching awards (most recently in 2002) and also received FSU's Developing Scholar Award (1994). •

Recent Ph.D. Graduates

Fall 2010

Yaohong Wang
Applied & Computational Mathematics
Numerical Methods for Two-Phase jet flow
Major Professor: Mark Sussman

Spring 2011

Cesar Acosta-Minoli
Applied & Computational Mathematics
Discontinuous Galerkin Spectral Element Approximations on Moving Meshes for Wave Scattering from Reflective Moving Boundaries
Major Professor: David Kopriva

Yong Jae Cha
Mathematics
Closed Form Solutions of Linear Difference Equations
Major Professor: Mark van Hoeij

Xiao Chen
Applied & Computational Mathematics
4-D Var Data Assimilation and POD Model Reduction Methodologies applied to Geophysical Fluid Dynamics Models
Major Professors: Michael Navon and Mark Sussman

Austen Duffy
Applied & Computational Mathematics
Massively parallel algorithms for CFD simulation and optimization on heterogeneous many-cove architectures
Major Professors: Mark Sussman and Yousuff Hussaini

Philip Lepoudre
Applied & Computational Mathematics
Computational Aeroacoustics Cascade Model of Fan Noise
Major Professor: Christopher Tam

Jamil Mortada
Mathematics
Artin and Dehn Twist Subgroups of the Mapping Class Group
Major Professors: Sergio Fenley and Eriko Hironaka

Chunhong Qi
Applied & Computational Mathematics
Numerical Optimization Methods on Riemannian Manifolds
Major Professors: Kyle Gallivan and Pierre-Antoine Absil

Matthew Willyard
Financial Mathematics
Adaptive Spectral Element Methods to Price American Options
Major Professor: David Kopriva

Summer 2011

Saikat Biswas
Mathematics
Constructing Non-Trivial Elements of the Shafarevich-Tate Group of an Abelian Variety
Major Professor: Amod Agashe

Jay Stryker
Mathematics
Chern-Schwartz-MacPherson Classes of Graph Hypersurfaces and Schubert Varieties
Major Professor: Paolo Aluffi

Qin Li
Applied and Computational Mathematics
Sparse Approximation and its Applications
Major Professor: Gordon Erlebacher and Xiaoming Wang

Yuanying Guan
Financial Mathematics
Asset Market Dynamics of Heterogeneous Agents Models with Learning
Major Professors: Alec Kercheval and Paul Beaumont

Awards, Publications, and Presentations

Alec Kercheval and **Henry Huang**'s article "A generalized birth-death stochastic model for high-frequency order book dynamics" will be published in a forthcoming issue of *Quantitative Finance*.

Alec Kercheval and **Yang Liu** published "Risk forecasting with GARCH, skewed t distributions, and multiple timescales" as Chapter 7 of the *Handbook of Modeling High-Frequency Data in Finance* (Wiley, 2012, pp. 163—218).

James Fullwood published "On generalized Sethi-Vafa-Witten formulas" in the *Journal of Mathematical Physics* (52, 082304 (2011); doi:10.1063/1.3628633).

Richard Bertram and **Margaret Watts** (also J. Tabak, C. Zimliki, A. Sherman) published "Slow Variable Dominance and Phase Resetting in Phantom Bursting" in the *Journal of Theoretical Biology* (276:218-228, 2011).

Richard Bertram and **Margaret Watts** (also J. Tabak) published "Mathematical Modeling Demonstrates How Multiple Slow Processes Can Provide Adjustable Control of Islet Bursting" in *Islets* (3:320-326, 2011).

Richard Bertram and **Arij Daou** (also X. Zhang, T.M. Truong, M.G. Roper) published "Synchronization of Mouse Islets of Langerhans by Glucose Waveforms", *American Journal of Physiology* (301:E742-E747, 2011).

Richard Bertram and **Wondimu Teka** (also K. Tsaneva-Atanasova, J. Tabak) published "From Plateau to Pseudo-Plateau Bursting: Making the Transition" in the *Bulletin of Mathematical Biology* (73:1292-1311, 2011).

Richard Bertram and **Wondimu Teka** (also J. Tabak, T. Vo, M. Wechselberger) published "The Dynamics Underlying Pseudo-Plateau Bursting in a Pituitary Cell Model" in the *Journal of Mathematical Neuroscience* (1:12, doi:10.1186/2190-8567-1-12, 2011).

Xiaoming Wang and **Celestine Woodruff** (also N. Chen, M. Gunzburger, B. Hu) published "Calibrating the exchange coefficient in the modified coupled continuum pipe-flow model for flow in karst aquifers" in the *Journal of Hydrology* (online, Nov. 2011 DOI: 10.1016/j.jhydrol.2011.11.001).

Jamil Mortada published "Artin relations in the mapping class group" in *Geometriae Dedicata* (DOI: 10.1007/s10711-011-9633-9).

Henry Huang delivered a talk titled "A Generalized Birth-death Stochastic Model for High-frequency Order Book Dynamics" at the 2011 INFORMS annual meeting (November 13-16, 2011, Charlotte, NC)

Saikat Biswas gave a talk titled "The Tate-Shafarevich Group, Flat Cohomology and Visibility" and **Randy Heaton** spoke on "Congruences Between Spaces of Cuspidal Modular Forms" at the American Mathematical Society National Meeting (New Orleans, January 2011)

Aaron Valdivia will give a talk titled "Generalizing Penner's Asymptotics For Minimal Dilatation Pseudo-Anosov Mapping Classes" at the American Mathematical Society Joint Mathematics Meeting in Boston (1/7/2012 at 3:45 in the Algebraic Topology Special Session)

James Fullwood gave a talk in the "String-Math" conference at the University of Pennsylvania, 6/8/2011, titled "On generalized Sethi-Vafa-Witten formulas"

Jonathan Bates won a travel award to present a poster at the 2011 IEEE International Symposium on Biomedical Imaging: From Nano to Macro in Chicago, IL

Patrick Fletcher was awarded a fellowship to spend two months at INRIA (National Institute for Research in Computer Science and Control) in Rocquencourt, France to work with Frederique Clement on a joint project with Richard Bertram.

Margaret Watts defended her Ph.D. (Major Prof: Richard Bertram) this fall and will start a postdoctoral fellowship at the National Institutes of Health in Bethesda, Maryland in January.

The actuarial science program received corporate support from TowerWatson ($5000) and D.W. Simpson & Company ($1000). The money is used to reimburse students for the actuarial exam fee.

This year's Dwight B. Goodner Mathematics Fellowship, recognizing teaching excellence among graduate assistants in the math department, went to **Saikat Biswas** and **Guanghong Wang**.

This year, seven graduate assistants were recognized as Distinguished Teaching Assistants for their continued excellence in teaching: **Cesar Acosta-Minoli**, **James Custer**, **Yu Fan**, **Ching Wah Ho**, **Candace Ohm**, **Qin Li**, **Jinhua Yan**.

This year's Kenneth G. Boback Award, recognizing an oustanding student majoring in mathematics, went to **Vivek Pal**.

Randy Heaton and **Candace Ohm** were the winners of the Bettina Zoeller Richmond Award.

Juan Llanos was recognized for successfully completing last year's math prize problem.

The results of the Financial Math Festival Poster Competition were:

1st place: Pierre Garreau; 2nd place: Matthew Willyard: 3rd place: Ahmed Derar Islim.

The following students received reimbursements for SOA/CAS exams:

Bryan Garris, Michael Cremisi, Jennifer Stock, Wei Li, Tamara Langford, Jie Zhao, Nicholas Alicea, Chris Thomas, Thanh Trinh, Rachel McNutt, Song Hanbing, Chris Carswell, Ye Xu, Yang Gao, Dusty Leonard, Juan Yang, Natalie Claus, Patrick Swanson, Felicia Adams, Maria Aguilar, Jade Baumiller, Ka Yam, Binjie Luo, Felicia Adams, Tori Wood, Matt Cade, Chris Briggs, Aysley Casburn, Katie Matthews, Chris Carswell, and Rich Gamret.

The following students were inducted as new members of the Florida Beta chapter of Pi Mu Epsilon:

Dylan Appenzeller, Amber Ferguson, Ching Wah Ho, Celestine Woodruff, Luis Barrera, Sierra Garrett, Dawna Jones, Qiuping Xu, Patrick Carlton, Justin Mohr, Raghu Kanumalla, Tugba Yildirim, Natalie Claus, Vanessa Radzimski, Vijay Kunwar, Nathan Crock, Nathan Smooha, Michael Lewandowski, Kyle Darres, Amanda Vickery, Andrey Manakov, Thomas Erskine, Victoria Wood, and Dong Sun.

'Giving back'
continued from page 1

her a lot of credit for creating and building a great program for students who excel in mathematics and for helping them start a career in a rewarding profession."

Huckaba also gives Case a lot of credit. "Actuarial science at FSU would not exist if not for Bettye Anne Case," Huckaba says. "She is a forward-thinking faculty member if there ever was one, and opportunity met preparation when she and Courtney crossed paths."

Huckaba, who joined the FSU faculty in 1987, remembers White. "I have clear memories of Courtney White the student, who took a linear algebra course from me in 1991," Huckaba says. "He was a good student who was interested in pursuing a career in the actuarial field, and we (led by Bettye Anne) had been discussing an expansion of our degree offerings in that direction."

Case was surprised and thrilled when she learned about the gift. "I am honored that my name is associated with this gift to future students from Courtney and Shari," Case says. "Before Sam sent Courtney to see me, my initial planning for an actuarial program was in the abstract. Courtney's certainty about his goals and willingness to work hard on extra and difficult courses gave life to those abstract ideas so I could make the best curriculum choices for the program proposals.

"It was good to have Courtney in my trial class for our first actuarial course. Most of the students had completed none or few of the related collateral courses; Courtney would cite from an RMI [risk management/insurance] or stat or numerical class to show where what might seem dull was important, hence worth the effort."

With a strong grounding in math, statistics, and finance, actuaries analyze data to determine the risk that organizations might face if certain events occurred, such as accidents, diseases, or natural disasters. For that reason, actuaries typically work in the insurance, financial, health care, and government sectors.

However, entering the field can be difficult, as many companies expect new hires to have already passed at least one professional exam on their way to licensure. Not only are the tests difficult to pass, but they are expensive to prepare

Looking back

by Bettye Anne Case

Case with dean Sam Huckaba and math department chair Phil Bowers
Photo courtesy of FSU College of Arts and Sciences

The undergraduate major in actuarial mathematics was approved at FSU in 1993, a year after Courtney White graduated. He was the test pilot for that new major and its later extension, the state's first Program in Actuarial Science approved by the Board of Regents. The actuarial credentialing societies quickly recognized that the program included their necessary elements for an advanced undergraduate degree—curriculum cooperation from business and statistics, advice from the industry, ethics and professionalism, exam preparation support.... Actuarial science became the department's most-enrolled undergraduate option. It is now coordinated by Steve Paris, who proudly announces at each annual Mathematics Honors Day the many students who have passed credentialing exams.

FSU math's presence in actuarial science at the graduate level has been gaining ground, too. For a decade, Paris and I have advised graduate students in the financial mathematics M.S. who elect an actuarial concentration; currently, two of their Ph.D. students are writing actuarial-related dissertations. If you visit the website of the Society of Actuaries (SOA), you will see that FSU is now listed in SOA education classifications as both "Undergraduate—Advanced" and "Graduate—Education and Research."

for, given that students generally spend hundreds of dollars in exam fees, textbooks and other study aids.

Appreciative of the success he has had in his own career, White wants to help ease that financial burden for some current FSU actuarial students.

"The undergraduate program at FSU taught me how to study and really helped me prepare for the first couple of actuarial exams," says White, who is a fellow of the Society of Actuaries and a principal and consulting actuary with the Atlanta office of Milliman, an international actuarial and consulting firm. "It's an honor to see fellow 'Noles at client and industry meetings as well as see their resumes come across my desk."

White recalls his start in the field. "FSU didn't have an actuarial program when I visited during my senior year of high school," he says, "but I talked with the math department, and they assured me they could be flexible with my coursework to help me work toward my goal of being an actuary.

"While I would have preferred the risk management classes over physics," he says jokingly, "it was too late to change my major. Dr. Case offered the first actuarial course (Actuarial Mathematics) in my senior year, so I was able to take the course and use it as an elective."

White earned his degree in applied mathematics in 1992, around the same time that his wife received her bachelor's and master's degrees in music therapy from FSU.

"FSU is part of our family," he says. "The kids could all sing the fight song and do the Warchant at a young age." The Whites have four children: Melanie, 15; Dylan and Jenna, both 11; and Katie, 8. •

New grad student award honors the memory of math department alum Bettina Zoeller Richmond

Bettina Zoeller Richmond was awarded a PhD from Florida State University in December 1985. Her study of Hopf algebras with Warren Nichols resulted in the celebrated Nichols-Zoeller theorem: every finite-dimensional Hopf algebra is free as a module over each of its Hopf subalgebras. After receiving her doctorate, Bettina continued her research and teaching as a professor in the Department of Mathematics at Western Kentucky University in Bowling Green Kentucky, where she met and married Tom Richmond. Maintaining close friendships with several members of the FSU Math Department over the years, Bettina frequently visited Tallahassee.

Bettina died unexpectedly in 2009. She was a devoted mother to Nathaniel and Valerie; wife to Tom; daughter to Helmut and Gisela; and sister to Angelica and Christian. Bettina enjoyed playing racquetball, and she loved animals, especially dogs.

Bettina always strived for excellence in her own research and teaching. However, she had a special knack for noticing when others could use a little assistance in theirs. She made the time do what she could to contribute to their success. To acknowledge the unique quality to go beyond what is expected to contribute to the success of other graduate students and to the good of the department, the Florida State University Department of Mathematics has created an award in honor of Bettina Zoeller Richmond.

This award is intended to identify graduate students who exhibit Bettina's same kind of giving spirit.

In addition, because a major proponent of the FSU Mathematics Department mission is to prepare graduate students for successful academic careers involving strong research and excellence in teaching, the recipient of this award should, also, exhibit actions that strongly predict future positive service as a faculty member at a college or university.

In 2011, the first of the Bettina Zoeller Richmond awards were presented to Randy Heaton and Candace Ohm.

Contributions to the fellowship fund may be made to the FSU Foundation with designation for the "Department of Mathematics - Bettina Zoeller Richmond Award Fund." •

Is GEOGRAPHY *Destiny?*

by Bettye Anne Case

We certainly hope that the decision of students from far away to come and study with us has good effects in their lives. Many travel half way around the globe... how does that affect their lives, their work, their ... destinies?

When in 2008 we asked how many states and countries were represented among our 137 graduate students, we found 21 states plus Puerto Rico among U.S. Citizens, and 30 other countries. See http://www.math.fsu.edu/~smith/GradProg/Geography.gif.

This Fall, 2011, there are 146 total graduate students and they hail from 20 states and 22 other countries. Students who share offices frequently have several different languages of their childhood homes - but they come together to learn and work and build futures in our fascinating physical geography of swamps and beaches, live oaks and palmettoes.

Across the Country

Alabama
Arkansas
California
Colorado
Florida
Georgia
Illinois
Kansas
Louisiana
Maryland
Michigan
Minnesota
Mississippi
New Jersey
New York
North Carolina
Ohio
South Carolina
Tennessee
Washington

Around the World

Bahamas
Bulgaria
Canada
China
Colombia
Ethiopia
France
India
Iran
Jamaica
Lebanon
Mexico
Nepal
Philippines
Russia
Saudi Arabia
South Korea
Syria
Taiwan
Trinidad & Tobago
Turkey
Vietnam

Support the Future of the Department of Mathematics

You can support the students and faculty of Florida State University's Department of Mathematics with a tax-deductible gift to enhance our teaching and research efforts. Checks payable to FSU Foundation Mathematics Fund No. 0223 may be sent to:

Dr. Philip Bowers, Chair
FSU Department of Mathematics
208 Love Building
1017 Academic Way
Tallahassee, FL 32306-4510

or

FSU Foundation
2010 Levy Avenue
P.O. Box 3062739

Tallahassee, Florida 32306-2739
Questions may be directed to Dr. Bowers by phone (850.645.3338) or email (bowers@math.fsu.edu). Help us support the students who hope to follow in your footsteps.

The math department loves to keep in touch with graduates and is always eager to add new alumni to our database. If you would like to be included on our website or in our alumni communications, please send us your information and update us on your career or personal news. Fill out this form and send it to us by email at alumni@math.fsu.edu or by mail at the address below.

FSU Department of Mathematics,
208 Love Bldg., 1017 Academic Way,
Tallahassee, FL 32306-4510

Name _____ Maiden _____

Degree _____ Program _____ Year _____

Employer _____

Job Title _____

Address 1 _____

Address 2 _____

City _____ State _____ Zip _____

Email _____

Your News _____

_____

_____

THE FLORIDA STATE UNIVERSITY
COLLEGE OF ARTS & SCIENCES
DEPARTMENT OF MATHEMATICS
1017 Academic Way
Tallahassee, FL 32306-4510
www.math.fsu.edu

The Florida State University
Department of Mathematics