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# Across the Spectrum

THE FLORIDA STATE UNIVERSITY COLLEGE OF ARTS AND SCIENCES

**Setting fire to  
imagination**

*Legendary scientist Harold Kroto looks back on 10 years at FSU and a career spent inspiring others*



# Letter from the dean

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*Across the Spectrum* is a news publication for alumni, friends, faculty and staff of the Florida State University College of Arts and Sciences. Visit the college online at <http://artsandsciences.fsu.edu/>; also check out our Facebook page at [www.Facebook.com/FSUArtsAndSciences](http://www.Facebook.com/FSUArtsAndSciences) and our Twitter page at [www.Twitter.com/FSUartssciences](http://www.Twitter.com/FSUartssciences).

The 2014-2015 academic year came to a close in early May with commencement exercises and hearty celebrations. As the weather began its transition from spring to the familiar warmth and humidity of a Tallahassee summer, the campus geared up for the start of summer sessions and orientation of incoming freshmen. During the past year, Florida State welcomed a new president, alumnus John Thrasher (B.S. Business, '65, J.D., '70) and formally launched "Raise The Torch: The Campaign for Florida State University." We proudly recognized the numerous academic achievements of both students and faculty, while celebrating another year of athletic success highlighted by a national championship for the women's soccer team.

In this edition of *Across the Spectrum* we visit with Harry Kroto, Nobel laureate and professor of chemistry, who has spent the past decade building a special legacy at FSU. As Harry nears retirement, he and his colleagues reflect on his active career. A companion article reviews the career of our newest Lawton Professor, nuclear physicist Mark Riley. It is fitting to honor both in the same issue, as they are part of the British Invasion.

Other articles explore initiatives under way in the sciences. Continuing advances in genomics research have led to a steadily increasing demand for intellectual tools that are not historically part of the biologist's training. You will read about the newly formed Center for Genomics and Personalized Medicine, which is seeking to join cross-disciplinary talent in one place to enhance genomics research, bringing together biologists, chemists, computer scientists, mathematicians, medical researchers and statisticians. In another article, you will learn about the burgeoning field of statistics, which is finding its way into every corner of research. Our Department of Statistics is well positioned to meet this challenge.

The Institute on Napoleon and the French Revolution, housed within the Department of History, is one of our many success stories on the humanities side. I hope you will enjoy the article highlighting some of its activities. I appreciate and applaud the great philanthropic base that made the institute a reality and has helped make it thrive.

Our alumni continue to excel, and it is a pleasure to share with you the exploits of some of them. I hope you will enjoy reading about the accomplishments of alumnae Elizabeth Belding and Kristen van de Ven, and about the significant commitment to FSU of longtime friends Paula and Stan Warmath.

As always, thank you so much for staying in touch with the College of Arts and Sciences.



## Students reap major awards

Two students in the College of Arts and Sciences were the recipients of prestigious national scholarships this spring. Molly R. Gordon, a junior majoring in biological science, won a Goldwater Scholarship, awarded to the nation's brightest mathematics, science and engineering college sophomores and juniors. With the \$7,500 award, she hopes to gain an understanding of why some genes replicate earlier or later than others and why an abnormal replication timing profile is a hallmark of diseases. (Read more at <http://fla.st/1CGC4T5>.) Meanwhile, junior psychology major Daniel Hubbard, who recently came to FSU after serving for five years as an Army medic, was named a 2015 Truman Scholar. He'll use the \$30,000 award to study the causes of suicide, particularly in the military community. (Read more at <http://fla.st/1JLOWOp>.)





**On the cover**  
 "I think some of the best work I've done has been here with my colleagues at FSU," says Harold Kroto, the legendary chemist and Nobel laureate who is concluding a decade at Florida State. See page 10.

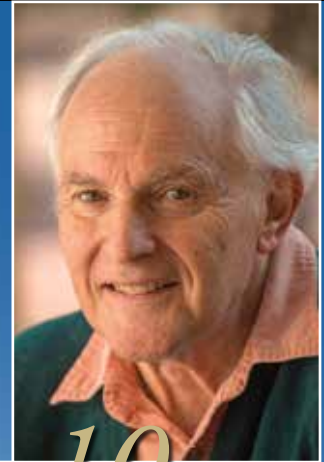
# Across the Spectrum

THE FLORIDA STATE UNIVERSITY COLLEGE OF ARTS AND SCIENCES

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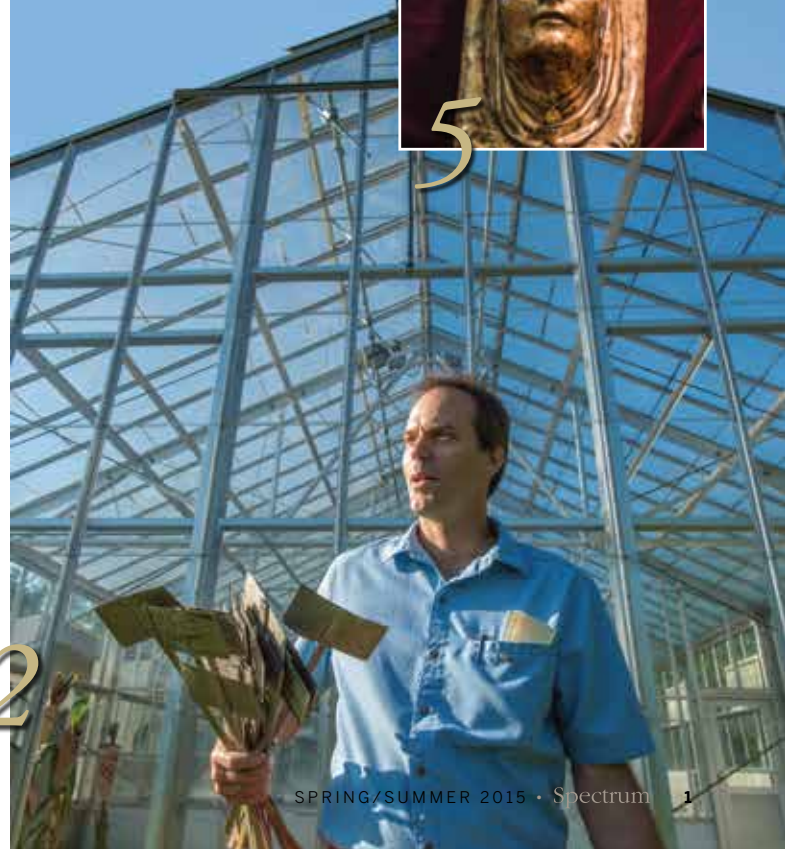
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# Genomics revolution

**Cutting-edge research could lead to new breakthroughs**



**By Kathleen Haughney**

Professor of Biological Science David Gilbert and his research team are examining how DNA replicates and whether that has a particular influence on cells that are found in pediatric leukemia patients.

In a lab at Florida State University, Professor of Biological Science David Gilbert is trying to solve a serious problem.

He's trying to figure out the causes of pediatric leukemia.

The answer may lie in the cell's DNA.

With this particular experiment, Gilbert and his research team are examining how DNA replicates and whether that has a particular influence on cells that are found in pediatric leukemia patients.

"We'll look for clusters or patterns where the DNA replication did not work properly and then see how that matches up with cells of leukemia patients and cells of healthy patients," Gilbert said.

Gilbert is just one of many scientists at Florida State who are delving into the complicated area of genomics with the hope that a better understanding of our genetic material will lead to advances in diseases like diabetes or leukemia. It's an enormous area of research that combines in-depth knowledge of biological systems with complex "big data" analysis.

"I was in computer science in the 1970s and 1980s when it was the hot new thing," said computer science Professor Gary Tyson, who last year helped undergraduate researchers sequence the manatee genome. "Genomics research is exploding at a faster rate than that."

And genomics is enveloping researchers from a number of disciplines.

Scientists in the FSU Department of Biological Science, the Department of Computer Science, the Department of Scientific Computing and the College of Medicine are all working on genomics in some form or another.

Take Hank Bass, an associate professor of biological science. He's a plant biologist who spends a lot of time studying maize.

Why corn, you ask? Well, corn is one of the most genetically diverse plants and it dates back thousands of years, making it a model genetic organism.

Through the study of maize, Bass has discovered that plants share some interesting genetic similarities with humans.

Or you might look at work by Bass' colleague in the Department of Biological Science, Professor Kimberly A. Hughes.

Last year, she found that a genetic rarity in male guppies that affects their color patterns plays a role in how often they mate. This genetic rarity makes a certain group of guppies far more colorful than the traditional male guppy. And as it happens, these colorful guppies mate more often.

Then there is Peter Beerli, a professor of scientific computing. He writes open-source computer programs that can handle a wealth of genetic data and enables researchers to better understand their data.

Right now, genomics research is in demand, and researchers are doing everything they can to keep up.

"Genomics permeates almost everything we do," Gilbert said.

One of the reasons for this is recent advances in technology. Ten years ago, it cost hundreds of thousands of dollars to fully sequence the human genome, but today, with technology breakthroughs, the cost is less than \$1,000.

The burgeoning area of research also recently led Florida State to open a new Center for Genomics and Personalized Medicine.

The idea behind the center is to bring together the expertise of biologists, who are asking



the traditional big questions about plant or animal biology, and computer scientists and mathematicians who are trained to handle big data.

“Just managing that information and analyzing that data is beyond a lot of our expertise,” said Bass. “We know how to ask the questions. For example, you have a new strain of corn that is drought-resistant and you want to know what the difference is in the gene content. I can ask the question, but I don’t have the computational wherewithal to answer it. A lot of these questions we have are longstanding questions, and the tools are just becoming available for us to look at them.”

The whole aspect of figuring out those answers is what led Beerli, who originally trained as a biologist, to start writing computer programs.

During his graduate training at the University of Zurich in the early 1990s, he studied evolutionary genetics of frogs.

“I had all these questions, but I couldn’t analyze the data the way I wanted,” Beerli said.

Beerli authored MIGRATE, a computer program that helps scientists analyze genetic data. Using MIGRATE, scientists can see where different populations of species settled and how their genes adapted or didn’t adapt to suit those areas.

“Sometimes, scientists are interested in how a population ended up on this island or why they crossed a certain geographic boundary, like a river,” Beerli said.

With genomics research, the general idea is that understanding one species might help scientists understand another species and then another. The overall effect of this type of research is wide and varied.

For researchers studying the human genome, the ultimate goal is to find ways to prevent diseases such as cancer or diabetes. For plant biologists, scientists might want to find out new ways for plants to thrive in adverse conditions — knowledge that would be a huge boon for the agriculture industry.

Or it’s possible that knowledge about a plant might lead to knowledge about mammals, even humans.

Bass is among the researchers heavily involved in genetics research. His lab has been searching for the similarities between plants and animals in how genetic structures form and then function.

Most recently, Bass has examined the role of a DNA structure called a G-quadruplex or G4 DNA.

G4 structures regulate genes in humans that affect cancer and cell division, making it a

crucial area of research. But there remains little knowledge of the structures overall. So Bass, a plant biologist, believed that an analysis of maize might yield more answers.

The general public thinks of DNA as two connected strands known as the double helix. But scientists also discovered over the years that those strands regularly separate so they can replicate the genetic material. That material can also twist into different shapes such as a G-quadruplex.

In Bass’ work, he found not only that those same structures existed but that they were suspiciously prevalent at genes associated with energy metabolism, suggesting they have a specific function. The next step is to find out exactly how the G4s affect gene functions.

Bass and Assistant Professor Elizabeth Stroupe, whose lab spearheaded a separate discovery about G4 DNA, are hoping to jointly conduct the first-ever computational screen of the G-quadruplex in the near future.

Peter Beerli is a professor of scientific computing who writes open-source computer programs that can handle a wealth of genetic data and lets researchers better understand that data.



For the new Center for Genomics and Personalized Medicine, all of these projects mean they will be busy with plenty of work over the next several years.

Daniel Vera, who recently completed his doctorate in biology (co-advised by Bass and Assistant Professor Jonathan Dennis), will serve as the center's director.

He'll be helping researchers analyze genomics data, train undergraduate and graduate researchers, offer workshops and assemble interdisciplinary teams to apply for large grants. Tyson, Gilbert, Dennis and College of Medicine Associate Professor Michelle Arbeitman will serve as an advisory committee to the center.

"Genomics technology is such a powerful tool," Vera said. "There's an expectation to use it and if you don't meet that expectation, you're out of the game."

Additional users of genomics within the Department of Biological Science include the following researchers:

- Associate Professor Jim Fadool, who maps the genetic architecture of eye development in the model zebrafish;
- Associate Professor Darin Rokyta, who uses genomics and proteomics to characterize the complex mixtures in snake venom;
- Associate Professor Hong-Guo Yu, who uses proteomics to define the protein complexes that govern chromosome segregation pathways in yeast;
- Assistant Professor Emily Lemmon-Moriarty (with Assistant Professor of Scientific Computing Alan Lemmon), who define the relatedness of species in various naturally diverse groups of animals; and
- Assistant Professor Karen McGinnis, who studies gene silencing pathways in the crop species maize.



Ray Stanyard

Hank Bass, an associate professor of biological science, spends a lot of time studying maize, or corn. He has discovered that plants share some interesting genetic similarities with humans.



Ray Stanyard

Professor of Biological Science Kimberly A. Hughes recently found that a genetic rarity in male guppies that affects their color patterns plays a role in how often they mate. As it happens, these colorful guppies mate more often.





Rafe Blaufarb, FSU's Ben Weider Eminent Scholar Chair in Napoleonic History and director of the Institute on Napoleon and the French Revolution, poses with a death mask of the emperor that dates from May 1821. The death mask is part of the massive Napoleon and French Revolution Collection kept at Strozier Library.

Ray Stanyard

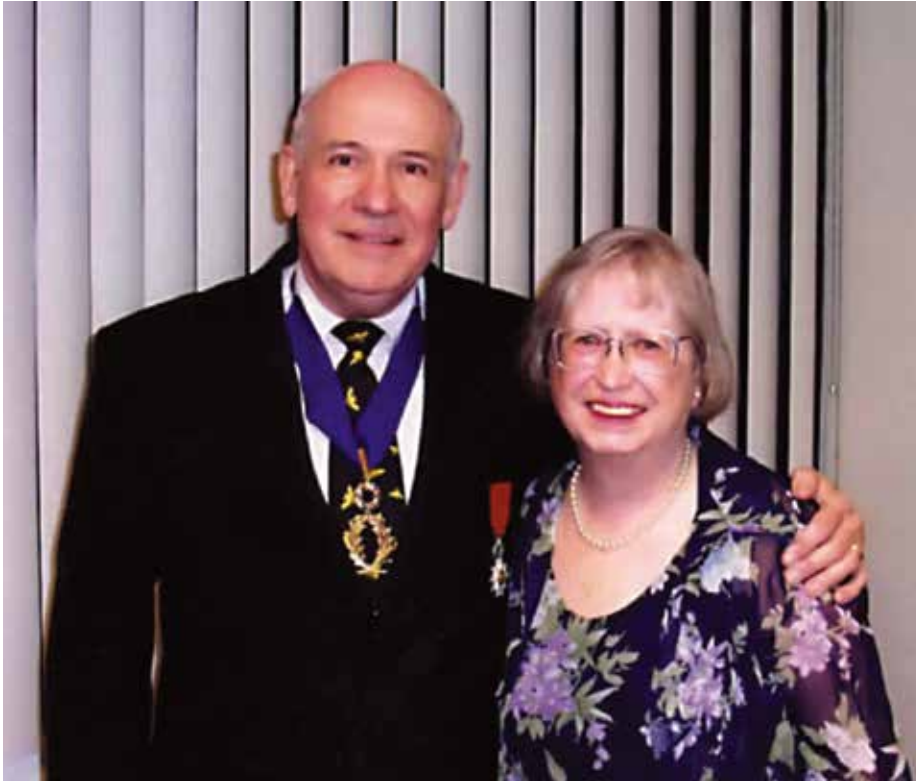
# Keeping history alive

**The Institute on  
Napoleon and the  
French Revolution  
brings top  
scholars to FSU**

By Barbara Ash

**R**afe Blaufarb returned from the annual meeting of the Consortium on the Revolutionary Era, held in mid-February at Highpoint University in North Carolina, with fabulous news. The Institute on Napoleon and the French Revolution, which he heads at Florida State University, had been presented with a \$100,000 gift during the event.

The gift was from a former Florida State student, who earned his Ph.D. in history in 1977, and more recent students. Though the primary donor, whose gifts over the years total more than \$500,000, entered business rather than academia, he has remained passionate about the Napoleonic Era and has supported the institute, its students, faculty and research, which advances knowledge and understanding of the period (1750-1850).



Professor Emeritus Donald Horward and his wife, Annabel, were central figures in the establishment of the Institute on Napoleon and the French Revolution. A major gift from a former student was recently announced to honor Annabel Horward, who was a “second mother” to her husband’s students for 44 years.

The gift, in the form of an endowment, was created in honor of Annabel Horward, wife of Blaufarb’s predecessor, Professor Emeritus Donald Horward. Horward headed a graduate program in Napoleon and the Revolutionary Era for years before establishing the institute in 1990 in the Department of History and served as the director of both for more than 40 years.

“For 44 years, she welcomed students into our home, was a second mother to them, and they recognize what she had done for them all those years and wanted to show their appreciation,” said Horward, who stays in close touch with Blaufarb and former students.

Private donations, like this latest from the anonymous donor, help the institute — the only one of its kind outside of France — maintain its reputation for educational quality, attracting top-echelon students and producing graduates who are among the world’s most distinguished historians on the Napoleonic

Era. They fill positions at universities across the country, and at least a dozen have taught in the history department at the U.S. Military Academy at West Point.

The institute also attracts a steady stream of scholars from some of the most prestigious universities around the globe, giving students access to the finest Napoleonic and Revolutionary authorities in the world. They come as guest lecturers and to present seminars, guest-teach and conduct research at the largest and richest Revolutionary and Napoleonic era rare-book collection (37,000 volumes) from the late 18<sup>th</sup> and early 19<sup>th</sup> centuries in the United States.

While Napoleon’s strategy and tactics are studied at military academies and war colleges worldwide, the French Revolution, of which he played a central role, is regarded as important because of its international repercussions on today’s society and thought, said Blaufarb, whose research explores how the French

revolutionaries and Napoleon transformed the concept of property by separating it from that of formal public power.

The French Revolution also eliminated kings and nobles, abolished hereditary privilege and feudalism, separated church and state, and introduced religious and press freedoms.

“It countered a system where your place in life was determined by your birth, and laid the framework for all of our modern political systems and societies and the concept of economic freedom,” Blaufarb said. “We need to know how the modern world was created and not take for granted things like private property or freedom of religion, for example.”

The study of the French Revolution provides the tools for understanding the current world crises, Blaufarb said. “Property has again found ways of seizing control of power. With rich contributors purchasing political power, we’re heading perversely against what the French Revolution created.”

The author of several books, including the soon-to-be-published “The Invention of Modern Property: From the French Revolution to the Napoleonic Code” (Oxford Press), Blaufarb was appointed the institute’s director upon Horward’s retirement in 2005 and named the Ben Weider Eminent Scholar Chair in Napoleonic History.

Before his death in 2008, the Canadian-born Weider was a world-renowned expert on Napoleon and was founder of the International Napoleonic Society dedicated to the academic study of the era. A recipient of the prestigious French Legion of Honor, a 1984 nominee for the Nobel Peace Prize and a member of the Quebec Sports Hall of Fame, Weider was an avid supporter of the institute. His gift of \$1.2 million in 1998 through Weider Health and Fitness Inc. created Weider Fellowships, travel/research grants and scholarships, visiting professorships, lectureships and prizes.



His son Eric Weider also finds history not only important, but fascinating, and has carried on his father's legacy. The CEO and publisher of Weider History Group, the world's largest publisher of history magazines, he has provided funds for the Weider History Series, which brings distinguished speakers to the institute from around the globe, and enables the institute to sponsor conferences, including the prestigious Consortium on the Revolutionary Era, which it has hosted on campus six times.

As director, Blaufarb has helped raise about \$500,000 in private donations since 2007. A major portion of that supports graduate students in the form of tuition support and stipends. Alumni, such as Tim Fitzpatrick, who earned his Ph.D. in 2013 with a focus on French military history and now teaches history at Pope John Paul II High School in Tallahassee, was the recipient of a Ben Weider award that paid his tuition and provided travel funds for him to do research in Europe. He said he has lent his own financial support so that current students have the same opportunities he had.

One of those students, Joshua Meeks, who joined the institute in 2009 as an undergraduate and defended his Ph.D. dissertation in March, was the recipient of a Ben Weider Fellowship. Along with generous funding from various other institute fellowships, combined with a prestigious dissertation research grant from the Fondation Napoléon in Paris, he was able to travel to England, France, Corsica and Italy for research.



Photo courtesy Institute on Napoleon and the French Revolution

Alumnus Tim Fitzpatrick earned his Ph.D. in 2013 with a focus on French military history, thanks in part to a Ben Weider award that paid his tuition and provided travel funds to conduct research in Europe. Now he lends his own support to the institute so that current students can have similar opportunities.



Photo courtesy Institute on Napoleon and the French Revolution

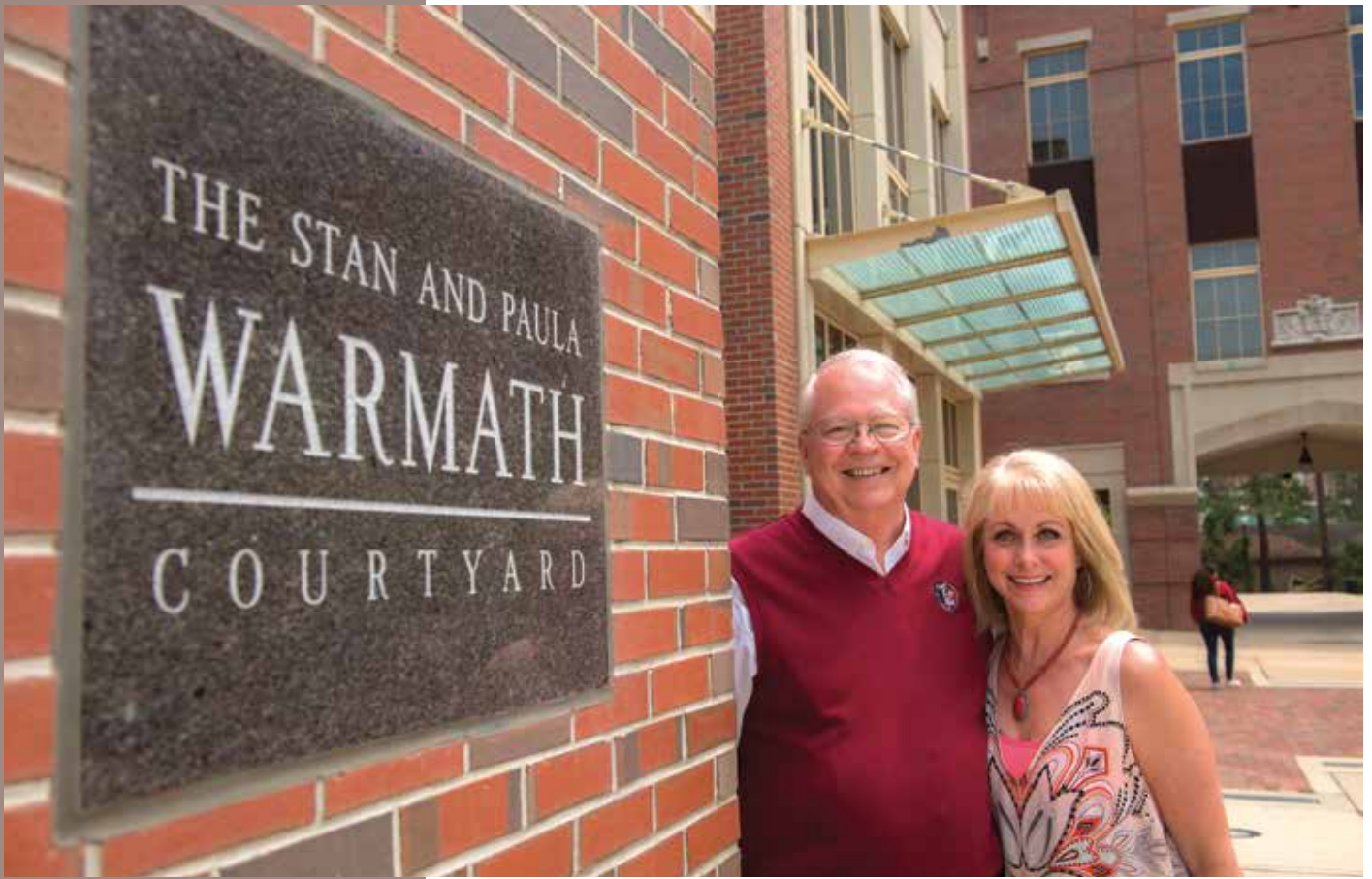
Among the institute's most generous and loyal supporters are Eric Weider, left, the CEO and publisher of Weider History Group, the world's largest publisher of history magazines; and his father, the late Ben Weider, who was a world-renowned expert on Napoleon and was founder of the International Napoleonic Society dedicated to the academic study of the era.

Last summer, Meeks again benefited from institute funding.

"Dr. Blaufarb and I decided that for me to produce a high-quality dissertation, I would need to return to Paris and London to round out my research," he said.

The institute has also assisted Meeks and other graduate students in attending conferences and provided other professional development opportunities. At those conferences, especially the Consortium on the Revolutionary Era, Meeks said, previous members of the institute continue the tradition of mentoring and community.

"This has exposed me to archival material and the more nuanced workings of the historical profession that has been incredibly beneficial to my development as a scholar," he said.



Ray Stanyard

The courtyard of the Department of Psychology building may bear their name, but alumni Stan and Paula Warmath aren't done yet.

**Stan and Paula Warmath are deeply committed to the Department of Psychology**

# A sense of giving

**By William Lampkin**

**T**hese days, when not traveling with his wife, Stan Warmath turns wooden bowls and crafts wooden toys in his garage workshop. The Warmaths give many of those creations to friends and family.

That sense of giving extends to their alma mater, Florida State University, and to the Department of Psychology in particular. Stan and Paula Warmath have funded two endowments in the department and the legacy benches in its 9,000-square-foot courtyard, which bears their name. They have committed to another major endowment as a deferred gift.

Paula, who earned her B.S. in psychology in 1980, worked for the department for two years after graduation, which is where she and Stan met. Shortly after that, Paula began a long career at the Florida Department of Transportation. She retired in 2012 and currently enjoys playing violin with the Big Bend Community Orchestra.

Stan retired from FSU in 2011 after 42 years, most of it spent working for the department.

He arrived as a freshman at FSU in 1965.

“Even in high school, I knew I wanted to major in psychology,” Stan said. “At that time I wanted to be a clinical psychologist and work with juvenile delinquents. I even got my minor in criminology.”



That focus changed during his sophomore year when he became involved in research with Professor Barron Scarborough.

“I was hooked,” he said. By his junior year, he was working for Professor Mark Berkley. “He was my mentor and friend,” Stan said. “I worked for him for 13 years as a lab technician and research associate.”

Stan earned his B.S. in psychology in 1969, and an M.S. in experimental psychology in 1978. He became labs manager in 1980, and ended his time there as the department’s director of facilities and operations. During his last two years at FSU, he was renovation and building coordinator for the College of Arts and Sciences.

Even in retirement, Stan continues working with the department. He has been volunteering time to create the online Department of Psychology Photographic Gallery. The gallery, viewable online at <http://fla.st/1FdS16t>, includes photographs taken by many of the department’s faculty and staff during his time at the department, as well as photographs dating back to 1902 that were found on the Internet.

“It went online this past Thanksgiving,” Stan said. “It has over 6,500 pictures in it, and it reflects our history in many, many ways.”

The Warmaths were profoundly affected by the death of Stan’s longtime mentor and friend, Professor Berkley, in 1995. To honor his memory, the couple decided to endow the Mark A. Berkley Research Fellowship. The Berkley endowment provides an annual award

to support undergraduate research projects in all areas of psychology, as selected by a faculty committee. (Read more about the Berkley endowment at <http://fla.st/1DlSapa>.)

It was the first of two endowments by the Warmaths.

“That was the first thing we did when Mark died,” Paula said. “It was like, ‘We can do this. It’s possible to do this.’ Sometimes people don’t start giving because they don’t know what the possibilities are. They think, ‘Gee, I don’t have that much money.’ Sometimes it doesn’t take a lot of money.”

The Warmaths funded a second endowment, for the annual Dr. James C. Smith Lecture Series, which began in 2008. Given in honor of another of Stan’s mentors and a Robert O. Lawton Professor, the series brings distinguished researchers in behavioral neuroscience to campus for several days for meetings with students and faculty, and to make a public presentation.

While the Warmaths seeded both endowments, “we had help from several other people who contributed to the funds,” Stan said. “We continue to give to both of those.”

“I’ve always been in service roles,” he said. “And to me, that’s what giving is. You’re trying to improve the service of the university and the department.”

“If it hadn’t been for Florida State University, we wouldn’t have been able to do this,” Paula

said. “I don’t think we would have had the careers that we had, and we wouldn’t have met each other.”

The Warmaths used payroll deduction to fund the two endowments. And they plan for their support to continue after they are gone.

“The big endowment is the Janet A. Kistner Chairman’s Fund that will recognize Janet’s contributions to FSU and the department,” Stan said. “She was the first three-term department chair. She just changed the face of that department.”

Kistner, who served as department chair from 2002 to 2012, is currently the university’s interim vice president for Faculty Development and Advancement, and associate vice president for Academic Affairs.

The gifts “never have been about us,” Stan said. “They are about recognizing those people who have made such a big contribution in our lives. Mark Berkley, Jim Smith and Janet Kistner had a huge influence on my career, as well as on the department.”

“The Kistner Fund is something that we wanted to provide to the department chair that was unencumbered by any sort of spending rules,” he said. “It would be funds that the chair could spend to pay for a student to go on a special trip. They could spend it to buy a computer, if they need it.”

Paula said they received a lot of help in setting up their legacy gift from the FSU Foundation.

“We found that there was a lot of flexibility with how we could bequeath the money,” she said. “We could choose exactly where it goes, and that’s what we did.”

“From our perspective,” Stan said, “one of the things we’d like to come out of this is for people to say, ‘Here are some garden-variety, normal people — a lifelong woodworker who makes toys and gives them away. Look what they have been able to do over time.’”

“You don’t have to come up with a large sum; everything helps if there is something people want to do, if they want to make a difference,” he said. “We wanted to make a difference.”



Ray Stanyard

The gifts “have never been about us,” Stan Warmath said. “They are about recognizing those people who have made such a big contribution in our lives.”

# Creative giant

Legendary educator Harold Kroto looks back on 10 remarkable years at FSU

By Kristen Coyne

A few big anniversaries await Sir Harold Kroto this fall.

First, September will mark 30 years since he and colleagues at Rice University discovered  $C_{60}$ , a surprising, elegant form of carbon that would open a new field of chemistry, give rise to nanoscience and nanotechnology, and set fire to the imaginations of countless scientists, science buffs and students. Second, it will be 30 years this November since news of that discovery broke in *Nature*, fixing for Kroto a path toward the Nobel Prize in Chemistry, decades of research devoted to the new molecule and, eventually, Florida State University.

Add to that Kroto's 76<sup>th</sup> birthday in October and you're talking a lot of cake and candles.

It's a fitting image — both literal and symbolic — for contemplating Kroto. First, that career-making  $C_{60}$ , which once only existed in the minds of a few imaginative chemists, can be found, as it turned out, in stars and sooting flames. Symbolically, those flames bring to mind the spark the renowned chemist and professor has lit in minds the world over.

Kroto is a chemist who does graphic design, a player of tennis, a defender of freedom of speech,

a globe-trotter, art lover, oenophile and — last but not least — total skeptic. But of all his accomplishments within and outside chemistry, his power to light a spark, to embolden others to pursue science — or whatever their passion — may well have the most far-reaching impact.

"He inspires people," said Paul Dunk, a research associate at the National High Magnetic Field Laboratory who has worked under, then alongside, Kroto since his undergraduate days at FSU. "That's what he does."

He has been doing it with creativity, energy and style at Florida State for a decade, first within the Department of Chemistry and Biochemistry, where he is a Francis Eppes Professor, then among the broader campus population through the annual "Opening Minds" lecture series.

"We just decided to come here and try it out for five years," Kroto said matter-of-factly. "We've been here 10."

There will be no second decade for the laureate, however. Kroto recently announced plans to return home to England, making this past semester at FSU his last. The transition has been a chance to reflect on his remarkable life — a son of immigrants who rose to receive the highest award in his field, a scientist whose passion for

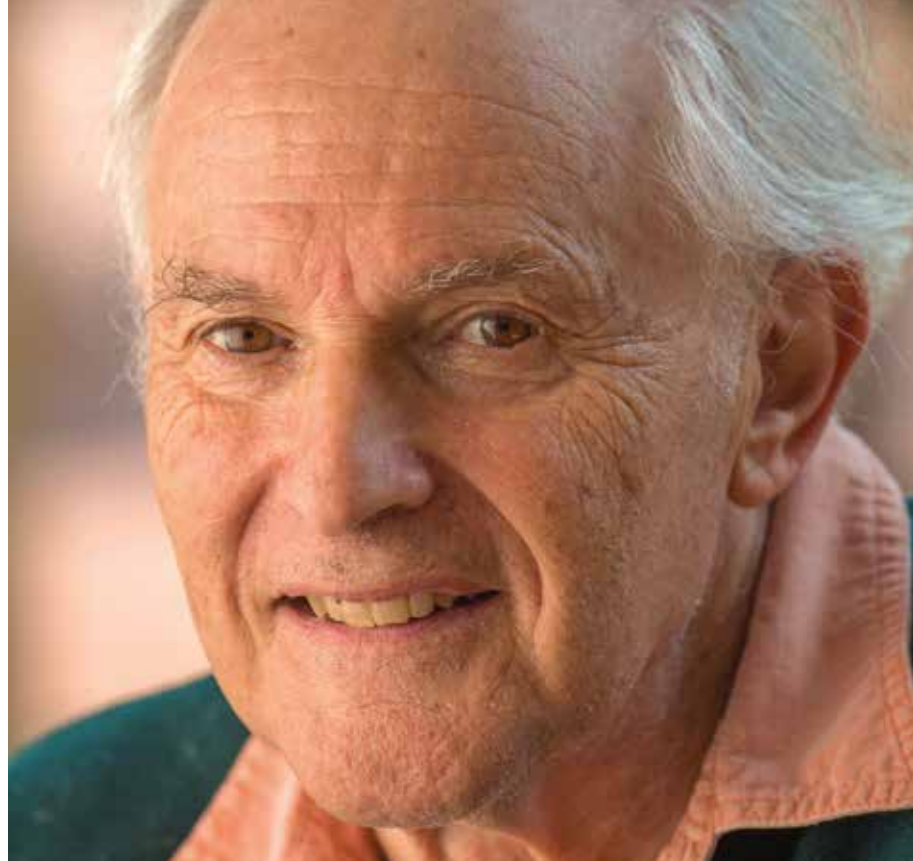
knowledge has overflowed into many other domains and, above all, a teacher with both a great drive and a great gift for his craft.

## Luring a Laureate

Kroto's road to Florida State began a dozen years ago, when the university began the hunt for a high-profile hire in the Department of Chemistry and Biochemistry. Then-FSU President Sandy D'Alemberte asked: Wasn't there a National Academy of Sciences member who could be tempted to Tallahassee?

Naresh Dalal, department chair at the time, and colleague Alan Marshall felt they could up the ante: Why not go for a Nobel laureate? They knew that a chemist of that stature could bring enormous benefits to the department: prestige, great press, top-notch graduate students and postdocs, first-rate faculty, higher rankings and more funding. A good word from a prize-winner confers a certain "luster," said Marshall, a Robert O. Lawton Distinguished Professor. It's as if laureates receive a kind of Midas touch along with their golden medal.

They drew up a list of prospects, with an eye for scientists nearing retirement who might consider a second career at FSU. It did not take long to home in on Kroto. Both men had



Ray Stanyard



known Kroto since their paths had converged in the 1960s and '70s at the University of British Columbia and the National Resource Council in Ottawa, Canada. Short on office space, UBC assigned Kroto a desk inside Marshall's lab. Marshall's first impression: Kroto was "bubbling over with energy and enthusiasm, and able to convey it to other people."

By the late 1980s, both men were rising stars in the field. Marshall was at Ohio State University developing a powerful analytical technique that would later land him at the MagLab. Kroto had co-discovered  $C_{60}$ , which he dubbed Buckminsterfullerene (or, less formally, buckyballs). The feat had not yet won the Nobel Prize (that came in 1996), but it had ignited a research frenzy. Scientists by then had learned the soccer ball-shaped buckyball belonged to a larger class of carbon molecules of varying shapes — all with promising properties and potential. Kroto's *Nature* paper was well on its way to becoming one

of the most cited chemistry papers of the decade.

One day in the late 1980s, when Kroto visited Ohio State to give a talk on buckyballs, Marshall sat in. What he saw, Marshall said, was a "spellbinder" — part comedian, part magician — who drew from a broad knowledge of the world to describe his molecule's remarkable structure and properties. From his pedagogue's hat, Kroto pulled Leonardo Da Vinci drawings, the scutes of turtle shells and beachball-size buckyball models that he lobbed at his audience with relish.

"He comes up with stuff like that," shrugged Marshall from his MagLab office, where a few of his own buckyball models perch on shelves. "If you just talk straight science to people, it rolls off."

Once their sights were set on Kroto, Dalal and Marshall hatched a plan. First invite Kroto to give a guest lecture at FSU; later, ask him to

teach a guest course; finally, when the time was right, pop the question. Along the way, sprinkle in some wining and dining, a few friendly tennis matches, advice on golf lessons for Kroto's wife, Margaret, and tours of the MagLab.

"You have to create circumstances where he can see what's going on at FSU," recalled Dalal, the Dirac Professor of Chemistry and Biochemistry, "and that things are exciting, and he could do what he wanted to do and accomplish his goals at FSU."

After several years of courting, they all but bent down on one knee, according to Dalal: "Tell us what you need and we'll do everything you need, if you come."

The Kroto's deliberated. Would they like Florida? Before FSU called, the globe-trotting couple had never even set foot in the state. In the end, swayed by the prospect of MagLab collaborations with Dalal and Marshall, they said, "We do."

### Nobel Exposure

Now there was a new challenge.

"After we got him to come here the question was, 'What do you do with this guy?'" recalled Marshall. "It was a waste of everybody's time to have him teach regular sequence courses."

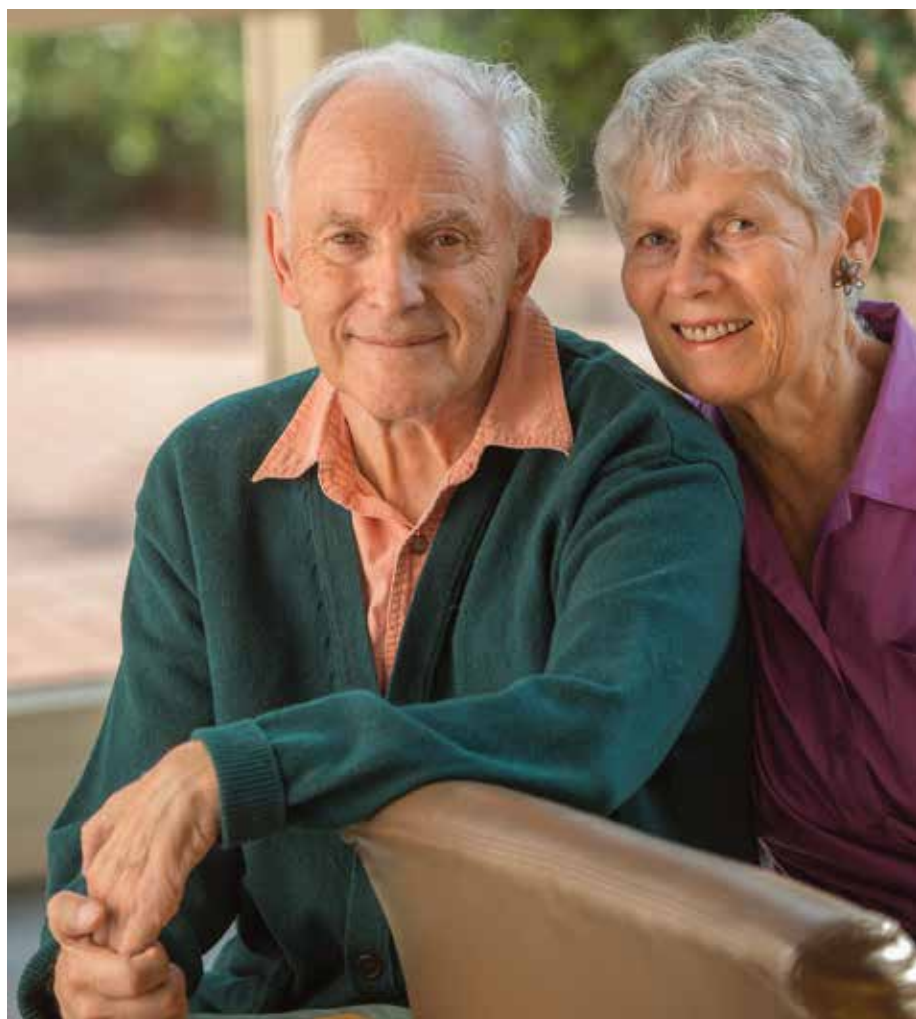
They decided the "Nobel touch" was so potent that a little would go a long way.

"Eventually we hit on the idea that we would like *every* chemistry student to see him once," said Marshall, "so that everybody who comes through here would have a Nobel exposure."

To that end, Kroto has given guest lectures in chemistry classes each semester. Dunk has seen the effect many times.

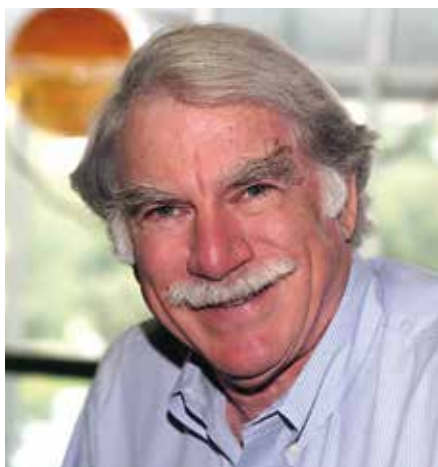
"It's really a big dose of inspiration," he said, "and I think that really plays a huge role."

For students who weren't yet alive when  $C_{60}$  was discovered, it's trippy to meet one of the men behind the buckyball. Found everywhere from the covers of chemistry textbooks to jewelry, bibs and Google doodles, it's as iconic a science image as the double helix or Einstein's  $E=mc^2$ . With the possible exception of  $H_2O$ , few molecules get this kind of love.



Ray Stanyard

Kroto may be leaving Florida State, but he won't be going alone: Margaret, his wife of 52 years, will be by his side.



Longtime colleagues of Kroto, FSU chemistry professors Naresh Dalal, top, and Alan Marshall hatched a plan a dozen years ago to lure the Nobel laureate to FSU.

But Kroto is no brainier-than-thou scientist. Just as his Buckminsterfullerene is more chummily known as a buckyball, he insists on being called Harry — never mind that knighthood and Nobel. With his academic-casual attire, gregarious nature and reflex to swing his feet up on the nearest perch, he's very approachable — even to the lowly undergrad.

After Kroto arrived on campus a decade ago, then-undergrad Dunk got up the gumption to ask for a meeting. Dunk was surprised by the celebrated scientist's prompt reply. He soon found himself in a long discussion with Kroto, who addressed him as an equal. When at one point the chemist jumped to his feet to draw on the white board, Dunk stood at attention. "And I thought the British were stuffy," cracked Kroto, urging the student to retake his seat.

Kroto's Nobel touch has been felt across the FSU campus. He has been an influential guest at the table when the department entertains prospective graduate students or faculty, said Dalal and Marshall. He has helped secure more grants, nominated colleagues for prestigious awards and contributed to a rise in published papers.

"He's always available by phone or email wherever he is, and always ready to help," said Dalal. "My group has benefited tremendously having him around. We have started new areas of research, which should help develop new materials for nanotechnology."

Chalk it up to the Nobel's trickledown effect.

### Going Global

After a half dozen years of working his Nobel magic in the department, Kroto was eager to start reaching outward. In 2012, targeting a broader audience, he launched his "Opening Minds" lecture series featuring presentations not only on science, but also on art, education, philosophy, religion, the Enlightenment and, above all, on humanity and social responsibility. After a successful first year, Kroto repeated the event in 2013 and 2014.

"A larger venue is what I wanted — more students who were thinking," said Kroto. "I wanted them to start *thinking* rather than coming here just to get grades. I thought that was important."

The Opening Minds lectures provided an outlet for many of the key messages Kroto has distilled over his career, such as:

A scientist is a skeptic. Don't believe anything until you see reliable proof.

Great science, like great art, comes from bringing together unexpected things in novel ways.

Work at what you love and you are bound to do good work.

Only do things where your best effort satisfies you personally; in fact, never put in a second-rate effort.

Science is about finding truth, and that's more important than anything else.

Drawing people from all corners of campus and the community, the Opening Minds lectures helped Kroto impact a fresh audience. But he wanted to reach farther still.

Kroto always had a sense of being part of a larger world. The only child of German immigrants who fled the Nazis (his father was Jewish), Kroto learned from a young age to negotiate different languages and cultures. Also, despite his family's limited means, he was able to attend a first-rate school where he learned a lot about the world beyond North West England. When he arrived at the University of Sheffield to study chemistry, his international science career began to take shape.

By the time he arrived at Florida State, Kroto had been sidelining as a kind of science ambassador for years, traveling the world to teach and inspire young people to pursue science. From his Tallahassee base, he has kept up a speaking schedule many would find grueling: In 2013 alone, Kroto made nearly 100 presentations, most of them abroad.

Steve Acquah, who runs a Web-based educational outreach program founded by Kroto called GEOSET ([www.geoset.fsu.edu](http://www.geoset.fsu.edu)), has watched the master teacher in action many times.

"His level of energy — I think it really startles everybody," said Acquah. "To see him just jump in there and go, 'Alright everybody, let's get in there! Let's do something special today! Let's make a buckyball!'"

Kroto is quick to fall on hands and knees to join the fun at one of his workshops. With vivid memories of working in his father's balloon factory and playing with erector sets, he believes hands-on learning is critical.

"I *made* things," Kroto said, recalling his ability to spend hours at a task. "I learned construction and how to make things rigid. You see kids now totally disconnected from the immediate environment. You see them in a restaurant — the parents are chatting and the kid is playing on his iPhone or iPad . . . I think there are far too few able to *make* things with their hands, and I think that should come back."

Still, Kroto appreciates the power of online learning to reach students with limited access to education. At FSU, students and faculty use his well-equipped GEOSET studio to record presentations on science — or any other topic they are passionate about — and share them with the world. This is exactly the type of program, Kroto said, his Nobel clout is worthy of, a "platform to talk to students about issues I think are important."



“The Nobel Prize is not very useful for science, particularly,” he said, “but it *is* useful to be able to be listened to, at least, on issues.”

These issues extend beyond science; Kroto has also brought his Nobel to bear on human rights issues, spearheading with fellow laureates an open signed letter advising against the Iraq war and condemning the flogging of blogger Raif Badawi in Saudi Arabia and with friend from his schooldays the actor Ian McKellen as well as nearly 30 Nobel laureates protesting homophobic legislation in Russia.

“You can take the attitude, I guess, if you’re a Nobel Prize winner that, ‘Science is what I do, I’m not interested in anything else,’” said Margaret Kroto. “Then you can take the attitude, ‘Well, I *can* be influential in things that matter.”

### The Call of the Arts

Creativity is one of the things that matters to Kroto. His father steered him toward science, and he was good at it. But at school and university, he also began a lifelong love for the arts. When he first arrived on the Sheffield campus, Kroto was surprised to find a school of architecture: It had never occurred to him you could earn a degree in something like that.

“I often think that I would have been more comfortable in arts and architecture,” he said. But as his success in science grew, he still kept some time for tennis, graphic design, guitar and other artistic pursuits. Although Kroto finds science creative, it has built-in constraints: You can only discover what actually exists.

“I’ve always felt, when I’ve been doing graphics, I’m in charge,” said Kroto, whose two sons grew up to be artists. “And when you’re doing science, the universe is in charge, and you’re trying to find out what the rules are.”

In 1985, after discovering the existence of  $C_{60}$ , Kroto and his colleagues were wrestling with the rules of its mysterious structure. Among other images floating in Kroto’s mind was the 20-story geodesic dome from the 1967 World’s Fair in Montreal that he and his wife had once visited. Kroto had once dreamed of collaborating with its architect, Buckminster “Bucky” Fuller, to explore mutual interests in science, art and social responsibility. But then the University of Sussex offered Kroto a job, and his artistic aspirations were set aside. The

dome, though, left an impression, and, in a beautiful convergence of science and art, helped inspire the insight into the cage-like structure of  $C_{60}$ . But even that landmark discovery, says Kroto, feels less powerful than the pure self-expression of art.

“The discovery we made ( $C_{60}$ ) — it would have been made within six months to a year if we hadn’t made it,” insisted Kroto. “I don’t see it as anything particularly personal, except for the name. I named it after Buckminster Fuller. That’s the only bit of me personally that’s involved in this whole thing.”

### Time of Transition

Like Fuller’s dome, the Kroto’s Tallahassee home is unique, beautiful and light-filled. The Japanese-inspired structure affords a lake view through a wall of windows. An indoor fountain creates a peaceful feel; above it hangs a nearly life-size take on Da Vinci’s Vitruvian Man, almost certainly Leonardo himself — an image Kroto has customized for one of his lectures, placing Leonardo inside a buckyball.

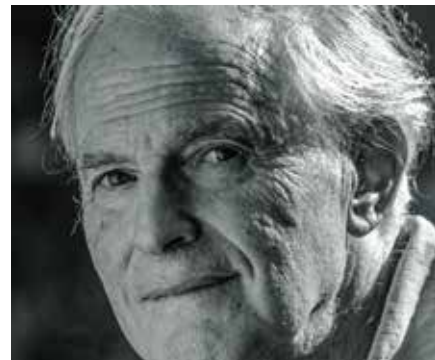
Stretched out on a recliner, a cup of tea by his side, Kroto reflects on his FSU years. Looking off into space as if back in time, he considers his recent research — with Prashant Jain, Tony Cheetham and Dalal on two-dimensional nanolayers in magnetic structures, with Marshall and Dunk on the unusual properties of carbon vapor, and with Steve Acquah on nanotechnology.

“I think some of the best work I’ve done has been here with my colleagues at FSU,” he said. “Very beautiful, well up there intellectually with my previous work, so I am very happy with that. We have been very happy here and made many many close friends.”

Although the upcoming move consumes a lot of time, Kroto seems determined to keep teaching. Using his office as a virtual classroom, he has recorded and uploaded dozens of educational videos in recent months that reflect his broad interests — the Big Bang, photography, books banned by the Nazis, Immanuel Kant — and the uncanny ways they sometimes intersect. In a video about German artist Paul Wunderlich, Kroto points to a detail in a painting. Rogue tufts of white hair hovering around his head, Kroto talks

as if discovering the painting for the first time: “What a magnificent, imaginative conjunction of ideas! Again, synthesis — bringing things together — is the way to a really creative result.”

The talking-head setup has its limitations, but Kroto’s enthusiasm helps transcend them. He raises an eyebrow, scrunches his face, shakes a finger at the imagined student perhaps half a world away. He leans into the camera, brown eyes blazing, as if straining to reach right through the screen to set that unseen mind on fire.



Ray Stanyard

*“I think some of the best work I’ve done has been here with my colleagues at FSU. Very beautiful, well up there intellectually with my previous work, so I am very happy with that. We have been very happy here and made many many close friends.”*

# Champion for change

## Elizabeth Belding discovered her life's calling at Florida State

By Barry Ray



**W**hen Elizabeth Belding came to Florida State University as an undergraduate in the early 1990s, she knew one thing for sure: She enjoyed working with computers.

"I liked my experience with computing in high school, so I took an Intro to Programming class my freshman semester at FSU and decided to major in computer science," the Miami native said.

She may not have known it at the time, but that class would eventually pave the way to a successful career in academia and lead to her current position as a professor of computer science at the University of California, Santa Barbara.

Hard work came naturally to Belding, who earned so many college credits while in high school that she was able to skip many of the undergraduate core education requirements at FSU and move directly into her major while taking honors courses. (Fortunately, she also found time to go to a number of football games as well.)

"I came in with 66 credits from AP classes and from college classes when I was in high school," she said. "That enabled me to take a second major in applied math."

Belding worked closely with Lois Hawkes — then a professor of computer science, now the senior associate dean in the College of Arts and Sciences — on her undergraduate honors thesis, which discussed barriers to women in the sciences. She remembers Hawkes fondly as "a very supportive and encouraging adviser."

"By introducing the topic of women and the STEM (science, technology, engineering and mathematics) fields, and the obstacles that have to be overcome, she set up a lifelong passion for me of trying to create opportunities for other women," Belding said.

"It was through talking with Lois and researching the issue that I realized there was more to it than I had thought; the issue was more complicated than the fact that there wasn't a 50-50 distribution of females and males in my computer science classes. This was actually a national phenomenon and a very complex problem with causes that typically begin in grade school. I learned a lot about gender biases through the research I did with her."

A new American Association of University Women review of more than 380 studies from academic journals, corporations and government sources highlights the issue, showing a lingering gender gap in the computing field. In 2013, only 26 percent of computing professionals were female — down considerably from 35 percent in 1990 and virtually the same as in 1960.

The issue of women and STEM has been a major focus of Belding's own career as an educator.

"I've done a lot of work at the graduate level to try to create a really supportive and welcoming climate (for women) through actual activities and through policy changes," she said.

Hawkes recalls Belding as particularly memorable among her classmates.

"Elizabeth was an incredibly focused, dedicated and driven undergraduate student," she said. "While we try to interact to some extent with all students in our classes, some just naturally stand out more in our memories. Elizabeth is one of those students. She knew what it was she wanted to pursue, and did so. I could not be more pleased that she has succeeded so very impressively. She is truly a role model in her discipline for all students, but especially young women."

Belding graduated summa cum laude, with honors, from Florida State in 1996 with bachelor's degrees in computer science and applied mathematics. Soon to follow was a master's degree in electrical and computer engineering from the University of California, Santa Barbara, in 1997, followed by a Ph.D. in the same discipline from UCSB in 2000. Later that year, she was hired by that university's computer science department as an assistant professor, and has since climbed the ranks to full professor.

As a researcher, Belding concentrates on wireless networking, particularly for developing regions.

"In the last six or so years I've focused the majority of my work on the field of ICTD, which stands for 'information and communication technologies for development.' The development component is thinking about how to improve Internet access for people in remote, rural areas or people in developing communities," she said. "My research group pays particular attention to studying wireless-network performance where it exists already, examining how rural communities are connected, and then assessing how well the



Internet is serving users in those communities. The users are typically connected through a very slow access link. We investigate answers to questions such as: Does the local network perform well enough to enable residents to use the applications that they want on the Internet? What applications do they want to use? What websites do they want to visit? How well does the local network perform? Typically we find that there are issues in performance and in supporting the local users. We then build research projects around trying to improve the experience for those people."

She's done extensive research in Zambia, is currently working on a project in South Africa with one of her former Ph.D. students, and is exploring the idea of networking within refugee camps.

"Two of my Ph.D. students went to the Za'atari refugee camp in Jordan and studied cellular coverage, whether or not residents had Internet access, whether or not they would be allowed to have Internet access, these kinds of things," Belding said.

Closer to home, she has a partnership with an American Indian community in eastern San Diego County.

"We're very involved in studying their network and trying to develop recommendations and build research projects around services that they might find useful," she said.

Her hard work has earned Belding several professional accolades that she is particularly proud of. In 2014, she was elected a fellow of the Institute of Electrical and Electronics Engineers, the world's largest professional association for the advancement of technology, for her contributions to mobile and wireless networking and communication protocols. In 2012, she was awarded UCSB's Outstanding Graduate Mentor Award, and this year she received the National Center for Women and Information Technology's (NCWIT) Harrold and Notkin Research and Graduate Mentoring Award. Both of these awards are given in recognition of the contributions of faculty who offer exemplary mentoring of their graduate students, which is a vital component of the mission of a research university. The NCWIT award in particular focuses on mentorship of female graduate students.

"I have put a substantial amount of my time into graduate mentorship and my university's computer-science graduate program," Belding


said. "I served as the department's vice chair for the past six years, and my primary responsibility has been overseeing the graduate program. I'm very proud of the mentorship awards. I've put a lot of effort into trying to fine-tune the graduate program and make improvements."

Unfortunately, teaching full time and working on her various research projects doesn't allow Belding many opportunities to come back to visit Florida State. However, she did return in November 2014 as a guest of the Department of Computer Science, which proclaimed her a Grad Made Good during the department's CS Expo. She also came back in previous years to speak to students within the Honors Program and to take part in a computer science colloquium. But the changes that have taken place on and around the FSU campus over the past few years still come as a surprise to her.

"The amount of growth that I saw this last time was stunning in terms of campus buildings and areas for undergraduates to live — the modern apartment buildings with the shops underneath. The feel of the campus and local community has really changed quite drastically," she said."



**"I could not be more pleased that she has succeeded so very impressively," said Lois Hawkes, who worked closely with Belding during her undergraduate years at FSU. "She is truly a role model in her discipline for all students, but especially young women."**



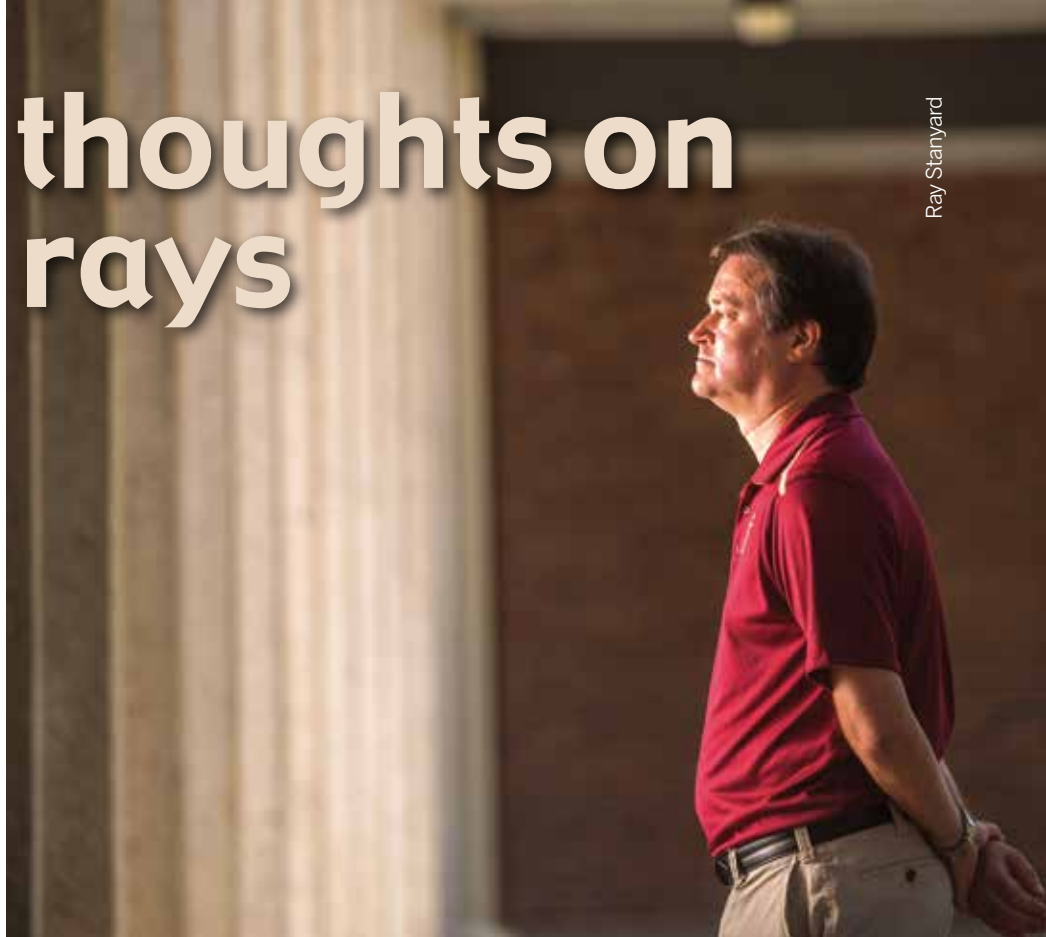
Belding in her lab with two of her doctoral students, Paul Schmitt (standing) and Daniel Iland.

# Deep thoughts on gamma rays

Ray Stanyard

Mark Riley may be a world-renowned physicist, but he's also pretty quick with a joke

By Kathleen Haughney



Riley, his collaborators and his students are studying the basic properties of atomic nuclei and the dramatic changes in structure that occur when nuclei are pushed to new extremes.

**T**he physics professor stands at the front of the classroom on the first day of class and lays out the syllabus for his physics class at Florida State.

“We don’t have exams or tests in here,” he tells the puzzled students. “Instead we have opportunities. Don’t miss your ‘opportunity’ to show me how brilliant you are.”

You remember physics class, right? It’s where you learned Newton’s laws of motion. That’s the one that says a body continues in its state of constant velocity unless acted upon by an external force.

Or you might have learned about gamma rays. That’s electromagnetic radiation of an extremely high frequency.

Those are just a few of the things you might discuss if you visit Professor Mark Riley’s office or classes on a given day.

But to meet Riley at first, you won’t hear about physics or his specialty in gamma rays.

The first thing you notice when you stop by his

office is that it’s a bit chaotic. He’s moved a few times, so boxes and posters are taking over his space in the Keen Building on the west side of the FSU campus. Giant framed posters of the Beatles, Monty Python, Manchester United and Einstein take up a good deal of real estate among the books, student papers and journals littering the office.

The next thing you notice is that he knows a lot of people.

A walk from one building to the next involves stopping to talk to two people. The first is Graham Farmelo, a British author visiting campus to discuss his book on the late Nobel Prize winner and Florida State physics Professor Paul Dirac. The second is a student running a video lab.

Simon Capstick, professor of physics, said that’s normal for his colleague of more than 20 years.

“In the classroom, he’s got this unique charisma,” Capstick said. “He’s funny and engaging. Students identify with him, and he builds a rapport with them pretty quickly.”

But the jovial scientist also has a more serious

side. In fact, he’s a world-renowned nuclear physicist engaged in research at the highest level.

And to put it mildly, he’s been on a bit of a roll lately.

Riley has just finished eight months of intensive work in charge of coordinating the field of low-energy nuclear physics in the United States to produce a white paper outlining the future goals and needs of the national community in the coming decade. He was also recently invited to contribute a chapter to the Encyclopedia of Nuclear Physics and Its Applications.

He’s working on a committee — and has been for the last 17 years— to create the next-generation gamma-ray facility, GRETA, which will be the most powerful gamma-ray detector ever created. He previously helped develop the world’s current most powerful one, Gammasphere, which is housed in the Argonne National Laboratory in Illinois and featured in the 2003 blockbuster movie “The Hulk.”

He was recently named Robert O. Lawton Distinguished Professor, the highest honor the faculty at Florida State confer on one of its own.



On top of that, just last year, the lab that houses Riley, who formerly chaired the Department of Physics, and four other nuclear scientists at Florida State brought in a \$4.5 million grant from the National Science Foundation to study nuclear physics and nuclear astrophysics. That lab, the John D. Fox Superconducting Linear Accelerator Laboratory, has been funded by the NSF since 1970 and is a key part of the university's research in both nuclear physics and nuclear astrophysics.

"I've been very fortunate to be part of the world-renowned nuclear physics group here at FSU," he said. "The group has been funded by the NSF continuously for the last five decades, and I have benefited greatly from all the help my colleagues have given me since I joined this fabulous group in 1991, and of course from the fact that the physics department is a very special place indeed."

Riley, his collaborators and his students are studying the basic properties of atomic nuclei and the dramatic changes in structure that occur when nuclei are pushed to new extremes of excitation energy, deformation and angular momentum. Such studies provide fundamental insight into the unique quantum world of the atomic nucleus and help drive the development of new radiation detection technology forward.

These advances impact areas such as medical imaging systems, homeland security, space exploration and environmental monitoring, and many of Riley's former students are now working in these important fields.

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Riley and a colleague, Professor Sam Tabor, designed and built their own "mini-Gammasphere," seen here. Pictured with Riley are some of his students: from left, Kalisa Valifana, Scott Miller and Jonathan Baron.

Riley and Professor Samuel Tabor, who is also a member of the lab, designed and built their own "mini-Gammasphere" (which has just undergone a major upgrade), for studies here at FSU that allow their students to obtain superb data and valuable hands on experience.

But despite his deep involvement in the physics world, Riley initially had no intention of studying physics.

Riley said he had a change of heart after studying and taking the entrance exams to go to the University of Liverpool. Up to that point, he said he could do the calculations and work required for physics, but it didn't really make sense to him.

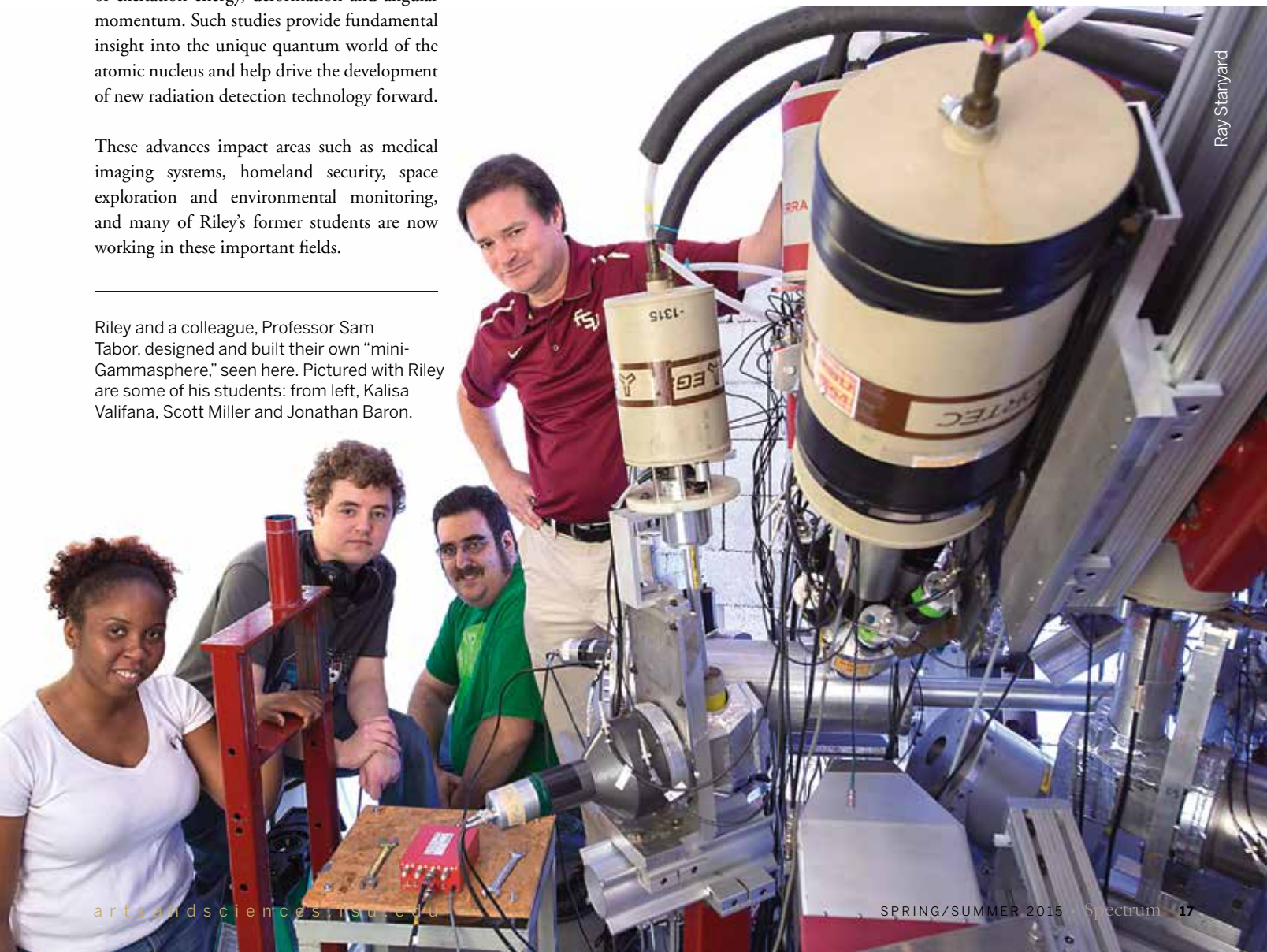
Then all of a sudden, he understood it.

"I saw how beautiful and coherent physics was and everything clicked," Riley said.

The university allowed him to switch his course of study — an unusual decision at that time — and set him on an entirely different course. He stayed on at Liverpool for graduate school and worked under John Sharpey-Schafer, a professor who was leading a revolution in nuclear physics via gamma-ray studies.

He also met his wife and soulmate, Alison, now an associate professor of accounting and business at Thomas University in Thomasville, Georgia, at the University of Liverpool. They had their wedding reception at the Niels Bohr Institute in Denmark, 30 years ago this August.

After earning his doctorate in physics in 1985 at Liverpool, he worked at the Niels Bohr Institute, Oak Ridge National Laboratory and the University of Tennessee before returning to a special tenure track position at the University of Liverpool. Finally, in 1991, he moved to Florida State University.



Ray Stanyard





Since then, Riley has supervised 13 doctoral students, three postdoctoral researchers and three master's degree candidates. He's taught dozens of classes, served on countless national committees and authored nearly 150 papers.

U.S. Naval Academy Professor Daryl J. Hartley, who earned his doctorate under Riley's supervision, wrote a letter supporting Riley's nomination for the Lawton professorship last year.

"Now that I know almost all of the major research professors in the field of nuclear structure, if I could choose any professor at any school, I would not hesitate to choose Mark Riley as my adviser again," Hartley wrote.

On top of that, he and Alison have raised two sons, Daniel and Jonathan. And Daniel and his wife, Stephanie, who are both FSU grads, recently made the Rileys grandparents with a grandson named Ben — a sneaky reference to

the Spider-man character Ben Reilly. (Riley is a fan of the comic.)

He also learned just how special gamma rays were because of Alison.

In 2001, his wife, who was then finishing her doctorate at Florida State, was diagnosed with a brain tumor, and the initial surgery failed.

Surgeons at Shands then opted to try a unique procedure in which gamma rays zapped the tumor. This time the surgery was successful.

"Gamma rays to the rescue," Riley joked.

In a 2003 radio interview at FSU, he took on a more serious tone, noting that gamma rays truly had "saved her."

"And they saved me, because I do not know what I would do without her," he added.

Riley sat with his mentor, chemistry and physics Professor Emeritus Raymond Sheline, in 2011. In fact, Riley holds the title of Raymond K. Sheline Professor of Physics. Sheline served on the Florida State faculty from 1951 to 1998.



Riley rarely misses an opportunity to pull out his Albert Einstein costume. Here, he entertains a child during a recent "Flying Circus of Physics" educational outreach event.

Photo courtesy Mark Riley



# Getting her kicks

By Kristen Coyne

**Kirsten van de Ven has excelled on soccer fields from FSU to Europe**

**K**irsten van de Ven couldn't wait to play soccer. At age 3, she was already eager to start kicking the ball around on the field. In her native Holland, however, children had to be 6 before joining a soccer program. Undeterred, the wee van de Ven, one of four siblings, swiped an older sister's uniform and pulled on the oversized shorts and jersey. Soccer might not be ready for her, but little Kirsten, dressed for the part, was ready for soccer.

Her sister dropped soccer for rugby, eventually playing for the Dutch national team. The younger van de Ven, however, never wavered from her first sport love. Inspired by her idol Mia Hamm, the athletic towhead grew into a promising player and dreamed of competing in the United States one day. The more she worked and improved, the more doors were opened for her, leading to Florida State University, then to professional teams and to the Dutch national team, which will compete in the Women's World Cup for the first time this summer. The sport has knocked her down, lifted her up, and in large

part shaped her into the person she is today. She wouldn't have it any other way.

"I just love to go out there every day, every training, every game," said van de Ven, from her home in Malmö, Sweden.

Van de Ven was considered the top young player coming out of the Netherlands when FSU women's soccer coach Mark Krikorian, preparing for his first season in 2005, began eyeing the 5-foot, 6-inch midfielder. A freshman at Quinnipiac University in Connecticut, she had been named the North East Conference's Rookie of the Year and Player of the Year.

"It was clear to me that she had a very positive, outgoing personality and she would come right in and make an immediate, positive impact, both as a player and a person," said Krikorian.

For van de Ven, eager to compete at a higher level, the decision to join the Seminoles was a no-brainer.

Photo courtesy Mark Riley



"I just love to go out there every day, every training, every game," says van de Ven, who lives in Malmö, Sweden.

Photo credit: Mirko Kappes

“I knew directly that’s where I should be,” she said. “(Krikorian) sounded very ambitious, and I knew they had very good players. It felt right.”

At Florida State, van de Ven found a highly competitive, talented and international squad that included players from half a dozen countries. Playing beside teammates such as Hermann Trophy winner Mami Yamaguchi of Japan, van de Ven learned a little international relations along with new soccer tactics.

“Your points of view get challenged all the time, in a fun way,” said van de Ven. “You think it’s very normal to think one way, but it might not be in Japan, you know?”

The eclectic mix certainly worked on the field: The team advanced to the College Cup each of van de Ven’s three years on the team, making it all the way to the finals in her senior year, 2007. Although van de Ven suffered a torn ACL her first year on the team, enduring two surgeries and months of physical therapy, she remained tough and upbeat throughout, her coach said.

“She was a very imposing, physically strong and competitive player,” said Krikorian. “She was a winner. She had the mentality for competing and fighting.”

Van de Ven brought that mental toughness to the classroom. A psychology major whose parents had always stressed academics, she chalked up a 4.0 grade average several semesters and was named to the 2006 All-ACC Academic Team.

“We hope when we’re recruiting young women to come here and represent the university on the soccer field that they will do the same in the classroom,” said Krikorian. “And she was just an outstanding student and an outstanding player.”

After graduation, van de Ven returned to Europe to compete on the Dutch national team and to play professionally, at first in the Netherlands. She later moved to Sweden, where competitive teams attract top players, including former Seminoles Yamaguchi, Katrin Schmidt, Becky Edwards and Sanna Talonen. Van de Ven quickly learned Swedish, adapting to yet another home-away-from-home.

“I think the country itself has a very nice culture,” said van de Ven in March, just hours after her team, FC Rosengård, won the Swedish Women’s Super Cup, a face-off between the

country’s two top professional teams. “Women’s football is very appreciated, so that’s always nice.”

Back home, she said, more fans are also embracing women’s soccer. “It starts to grow in Holland — we have a lot of people at the home games,” she said. Fans recognize her on the street, and girls contact her on Facebook to ask for tips. Her advice: Enjoy yourself.

“I think the kids get already put on so much, they shouldn’t forget to have fun,” said van de Ven. “If you like it, you’ll train a lot anyway.”

Her fans will be watching closely this summer as van de Ven and her Dutch teammates head to Canada for their Women’s World Cup debut. Van de Ven attended the event in 2011; she hopes she and other players will showcase the same level of soccer she saw then.

“A lot of games were of really high quality, which is important, I think, to promote women’s soccer in the world,” she said.

Visibility and respect for women’s soccer have always been important to van de Ven. When one day she decides to hang up her cleats, she will remain active in the sport: Not as a coach, she predicted, but behind the scenes, perhaps running soccer camps for girls.

“In the U.S. it’s very common to have camps just for girls, but it’s not like that in Holland,” explained van de Ven, who turned 30 this year (in May). “It would be great if I could organize those camps, so girls actually have a place where they are the No. 1 players.”

Some athletes transitioning to new careers have been known to falter, unprepared for life after sports. But van de Ven has been working at more than just soccer since she left FSU: She earned a master’s degree in work psychology in the Netherlands, and has taken an online class in entrepreneurship. Of the road ahead she says, “I’ve got plenty left to learn.”

Her former coach, for one, is confident she’ll bring the same commitment to a new career that she always showed on the soccer field.

“She is really a well-rounded young woman,” said Krikorian. “She’s the kind of young person that, wherever she ends up, her bosses are going to be thrilled with her and she’s going to be doing a great job.”



Van de Ven (highlighted at left) celebrates with her FSU teammates after Florida State defeated the University of Connecticut 3-2 in double overtime in the 2007 NCAA Tournament Elite Eight to advance to the College Cup. FSU went on to finish as the national runner-up.



Photo credit: Florida State University Athletics

# Statistically speaking

Department of Statistics researchers are collaborating with faculty in areas including psychology and medicine

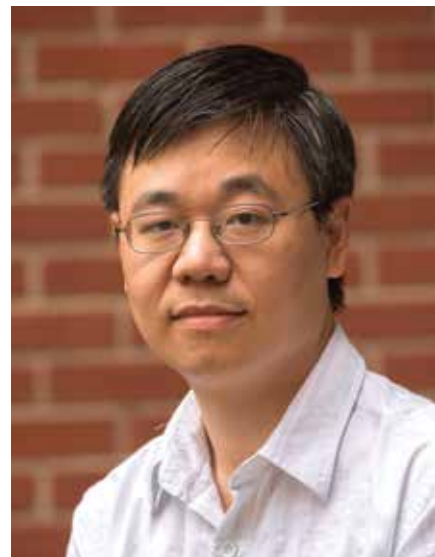
By Kathleen Haughney



Elizabeth Slate, the Duncan McLean and Pearl Levine Fairweather Professor of Statistics



Professor Xu-Feng Niu, chair of the Department of Statistics



Associate Professor Wei Wu

Ray Stanyard

**E**lizabeth Slate probably isn't the first person you'd imagine when you say the words "oral health researcher."

She's not a dentist, doctor or biologist.

She's not involved in public health initiatives.

In fact, Slate is a statistician.

"With statistics, I like to think it has always been motivated by real data application," Slate said. "In the past, there might have been a focus on agriculture data for farmers or population data for census takers. I'm focused on health."

Slate, who came to Florida State University in 2011 as the Duncan McLean and Pearl Levine Fairweather Professor of Statistics, is just one example of a professor who wound up studying the application of statistics to health issues instead of pure mathematical theory.

Previously, she worked at the Medical University

of South Carolina, where she made her first forays into oral health, collaborating broadly with clinical and basic science researchers.

In particular, she works with a group of researchers, many still at MUSC, who were studying the Gullah population in South Carolina. The Gullah are descendants of African slaves in coastal South Carolina and Georgia who have been able to preserve much of their African linguistic and cultural heritage. Researchers also consider them an ideal population for genetic research because they have been able to maintain racial purity to a greater degree than other populations.

Researchers were interested in studying a number of different health concerns, but the one Slate and colleagues focused on is the link between type 2 diabetes and periodontal disease.

"Other researchers have shown that if you have diabetes, you're more susceptible to periodontal disease," she said.

The research team at MUSC performed full oral examinations on African-American Gullah with diabetes. These exams yield 168 periodontal measurements for each study participant.

"To accurately reflect the uncertainty in our findings, it is important that the statistical analyses account for this data structure," she said. Her analyses showed a higher rate of periodontal disease than has been seen in other African-American populations.

She and her MUSC colleagues have also looked at severity of the disease and disease progression, among other issues.

And it's all by looking at the numbers.

"In biostatistics, collaboration is important," Slate noted. "You bring different backgrounds to solving certain problems. And you get to learn a lot about many different areas."

That's true indeed for Slate. In addition to her collaborations with colleagues at MUSC, she



is also working with FSU College of Medicine Distinguished Research Professor Amy Wetherby on a project to screen infants using smart technology to test for autism.

Slate is not the only one in the Department of Statistics who is moving toward medical research and other areas in which statistical reasoning is in high demand. In fact, the majority of the department's faculty members frequently collaborate with researchers in other fields including psychology, medicine, geography and education.

Slate calls it a "beautiful mix."

"Collaboration between statistics faculty and researchers in other fields is essential for the development of statistics science, which will be beneficial to both sides," said Xu-Feng Niu, chair of the Department of Statistics. "For this reason, my department strongly encourages faculty to participate in interdisciplinary collaborative research with scientists in other fields, such as economics, computer science, chemistry, psychology, biology, oceanography, meteorology, geography, mathematics, medicine and engineering."

Niu, for example, examines environmental data, helps the state analyze water quality data, performs statistical analysis of Florida highway fatality and injury data, and designs statistical algorithms for predicting resource needs and establishing individual budgets for individuals served by the Florida Agency for Persons with Disabilities.

In contrast, Associate Professor Wei Wu collaborates with neuroscientists and psychologists to examine how the brain codes things and how we can decode neural signals to fix internal or external behaviors. And Professor Anuj Srivastava is interested in how statistics can help build better image recognition software that could apply to medical diagnosis, video surveillance, terrain mapping and satellite analysis.

Associate Professor Jinfeng Zhang was always interested in doing statistical work that could help people.

For the past few years, Zhang has been looking at cancer cells, their genetic markers and their responses to different cancer treatments.

In some cases, Zhang found that patients were receiving too much chemotherapy, which was causing added health problems. Zhang is designing a statistical method so that doctors can personalize chemotherapy treatments based on those genetic markers.

"Only with proper statistical analysis can the big data, now occupying all the disk spaces in the world, be converted to knowledge in people's minds," he said.

Zhang also recently collaborated with Department of Biological Science researchers on some of their genetic work, including a paper by recent doctoral student Daniel Vera and Associate Professor Hank Bass.

A paper published last November shed light on how chromatin (the complex of DNA and proteins) is organized in a cell and how plants regulate genetic material, so that some genes are turned on and others are turned off. Researchers hope that may give them a better idea in the future about how plants adapt to adverse situations such as floods and drought, information that would be crucial for the agriculture industry.

The paper produced a wealth of data to sort through.

With an overwhelming amount of data now facing researchers, statisticians are now finding themselves quite in demand.

"Data is so readily available now that everybody is forced to confront it," Slate said. "So it's prompted people in other disciplines to talk to some statisticians."

CareerCast, a national online job board, ranked mathematicians as one of the best jobs in 2014. In 2013, the Bureau of Labor Statistics released numbers that showed it predicted 27 percent job growth by 2022 as more businesses and government agencies grow reliant on big data to make their decisions.

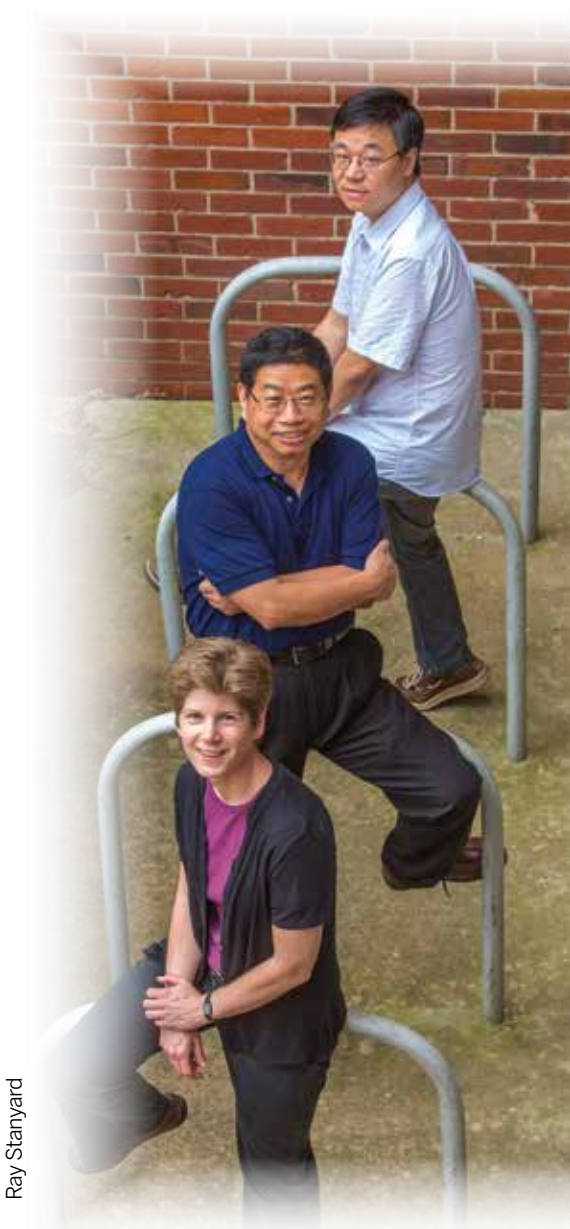
The BLS also noted that a large amount of data is generated from Internet searching, social media, smart phones and other mobile devices, so businesses will increasingly need statisticians to organize and analyze that data for commercial purposes.

Predictably, FSU's Department of Statistics is growing.

The number of faculty in the department has grown from 12 to 19 over the past 10 years, and the number of graduate students has grown from 39 to 136. The number of undergraduate students has increased from 13 to 75.

That number will also likely continue to grow.

As part of that continued growth, Slate and Professor Dan McGee, who also studies disease occurrence in certain populations, have designed a new Statistical Data Science program to debut in fall 2015.



Ray Stanyard

# Duly Noted

## News and notes from around the College of Arts and Sciences



### Charness named director of Institute for Successful Longevity

With an aging boomer population that is facing a number of issues ranging from financial security to long-term health, Florida State University's

Institute for Successful Longevity ([www.isl.fsu.edu](http://www.isl.fsu.edu)) is focusing its research on how to help a key segment of the U.S. population.

"We have an aging population with a huge number of baby boomers," said Neil Charness, FSU's William G. Chase Professor of Psychology. "And that raises a whole host of questions. For example, how do we manage an aging work force and keep them productive? How might we support them to work a little longer if they prefer to do so? And what training do they need in order to do that?"

The university named Charness as the institute's first director in February.

Charness is a leading scholar in the field of aging and longevity with a focus on understanding the aging process and its implications for technology use and work performance.

Charness said that with the aging baby boomer population, a focus on living longer, healthier lives is key. The institute will examine a range of issues that affect successful longevity, from financial issues facing older adults to health concerns including cognition, as well as transportation and employment issues.

Florida State University formed the Institute for Successful Longevity as part of its overall commitment to studying and promoting a healthy, active life for people at and past retirement age.

Read more at <http://fla.st/19fuozN>.



### Marincola named president of principal society for classical studies in North America

John Marincola, FSU's Leon Golden Professor of Classics, has been named president of the

3,000-member Society for Classical Studies, the principal society for classical studies in North America. He took office during the organization's annual meeting in January.

Classics, according to Marincola, is a term used in the academic community to describe the study of the ancient civilizations of Greece and Rome, primarily starting with the Roman Bronze Age in about the 13th century BCE (Before the Common Era) and continuing to the advent of Christianity and the death of the first Christian emperor, Constantine, in 337 CE (the Common Era). During that span of about 15 centuries, the societies of Greece and Rome became great innovators in literature, art, architecture, philosophy, science and critical thinking that greatly informed the later Enlightenment—and our modern society as well.

"These are important societies for the ways we look at the world," Marincola said. "As an example, see Plato's treatise on the place of the individual in society. There were also questions of war that might apply today: Does might make right? When is war acceptable? These are the sorts of questions that we're still asking."

Read more at <http://fla.st/1EWRW5C>.



### FSU, MagLab mourn passing of physicist Jim Brooks

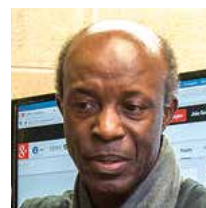
Professor James S. "Jim" Brooks, chair of the Florida State University Department of Physics, director of the National High Magnetic Field

Laboratory's Condensed Matter Science Experimental Program, and a much-beloved teacher, mentor and friend, passed away on Sept. 27, 2014.

"His affiliation with the MagLab and role as a physicist were key components to collaboration and interaction between FSU's main and southwest campuses," said Sam Huckaba, dean of the College of Arts and Sciences. "Jim was a bright, personable, well-rounded scholar with an infectious sense of humor."

Brooks worked in experimental low-temperature and high-magnetic-field physics for decades. A fellow of the American Physical Society, he pioneered the use of dilution refrigerators in high-field resistive magnets and held the record for doing an experiment in the largest steady-state magnetic field (47.8 tesla). He was particularly devoted to educational outreach.

He also championed the creation and development of the interdisciplinary graduate-level Materials Science and Engineering program at FSU. Because of that, the Dr. James S. "Jim" Brooks Graduate Student Award in Materials Science and Engineering was recently established in his honor. To make a gift toward this fundraising effort, visit <http://fla.st/1FDmAm9>.



### Physics professor one of two FSU faculty members elected to prestigious AAAS

A professor in Florida State's Department of Physics is one of two FSU faculty members recently named

to receive a top scientific honor. Harrison B. Prosper, the Kirby Kemper Professor of Physics, has been elected as a fellow of the American Association for the Advancement of Science (AAAS).

Election to fellow is an honor bestowed upon AAAS members by their peers. Prosper is among 401 members to receive the honor this year for their scientifically or socially distinguished efforts to advance science or its applications.

A high-energy physics experimentalist, Prosper is among the U.S. scientists who played a significant role in the search for and 2012 discovery of the Higgs boson, the particle that proves the existence of the Higgs field, which gives mass to elementary particles. His research interests include high-energy physics, cosmology, advanced analysis methods and Bayesian statistics.

Joining Prosper in receiving the AAAS honor from Florida State is David C. Larbalestier, the Francis Eppes Professor of Superconducting Materials in the Department of Mechanical Engineering.

Read more at <http://fla.st/1Bq6Xze>.



### De Grummond receives teaching award from Archaeological Institute of America

FSU classics Professor Nancy de Grummond, one of the nation's leading scholars of Etruscan studies,

has been named this year's recipient of the Archaeological Institute of America's Excellence in Undergraduate Teaching Award for the invaluable service she has given to the archaeological community as an educator.

De Grummond, the M. Lynette Thompson Professor of Classics and a Distinguished Research Professor at Florida State, received the award during the annual meeting of the Archaeological Institute of America in New Orleans on Jan. 9.

The award, which is the only teaching award given in the field of classical archaeology, is the latest recognition in de Grummond's distinguished career, according to Daniel J. Pullen, professor and chairman of Florida State's Department of Classics.

Read more at <http://fla.st/1Bq6Nb1>.

# Moving the college forward

## The College of Arts and Sciences shares its fundraising goals

By Barry Ray

**F**lorida State University recently announced the official launch of the most ambitious fundraising effort in its history with “Raise the Torch: The Campaign for Florida State,” a \$1 billion fundraising effort that will help the university improve the educational experience for students, hire and retain talented faculty, and serve as an economic engine for the state through research and job creation. (Read more about the campaign at <http://fla.st/1DO15BE>.)

As part of “Raise the Torch,” FSU’s College of Arts and Sciences has its own fundraising goal of \$80 million. Sam Huckaba, dean of the college, has established a set of campaign priorities designed to help donors find a way to merge their own philanthropic goals with the needs of the institution.

“As FSU continues to climb to the top 25 of U.S. public universities, the College of Arts and Sciences will be a major engine that drives productivity, complements existing areas of excellence, and expands in innovative ways,” Huckaba said. “But we can’t do it alone. For us to be successful, private support is critical.”

Huckaba gave some examples of areas where philanthropy would be put to best use within the college.

“Roughly 50 percent of our needs arise in the areas of student and faculty support,” he said. “For students, scholarship funds can make an impact in so many different ways, including recruitment of students in targeted areas, enrichment of the undergraduate experience, improvement in the area of retention, and enhancement of career preparation.”

Examples of endowments that would support student needs, Huckaba added, include the following:

- Merit-based scholarships at all levels
- Study-abroad scholarships
- Funds to support undergraduate and graduate recruiting in the sciences
- General support for student internships
- Support for undergraduate research
- Graduate fellowships

Meanwhile, for faculty members, endowed chairs and professorships provide support for high-end faculty members whose presence in a department can be transformational. They can also provide a means to help with faculty retention.

“More than once we have lost faculty members to outside recruitment into an endowed chair at another university,” Huckaba said. “This is an essential component of moving FSU forward and making it boldly competitive at attracting, and retaining, the best faculty.”

Another top priority for Huckaba is the Dean’s Discretionary Fund, which enables donors to support the areas of greatest need within the College of Arts and Sciences.



“Very often,” he said, “we are able to use the discretionary fund to assist a department when it needs help in such areas as supplementing a graduate fellowship; allowing a talented student to attend a professional conference or conduct important research; contributing to establishing an endowed fund for a lecture series or graduate lectureship; or help funding an endowed professorship to assist in recruiting and retaining an exceptional faculty member, among other possibilities.”

Finally, Huckaba emphasized the importance of private donations that would enable the college to pursue new or “fresh” initiatives. One such initiative is a new College of Arts and Sciences Post-Doctoral Fellows Program that will make it possible to hire talented young researchers and scholars who might otherwise be lured away by other institutions.

To learn more about the college’s “Raise the Torch” campaign priorities or other philanthropic opportunities within the College of Arts and Sciences, contact Assistant Dean for Development and Alumni Affairs Nancy Smilowitz at (850) 294-1034 or [nsmilowitz@fsu.edu](mailto:nsmilowitz@fsu.edu).

Members of the FSU Marching Chiefs help kick off the festivities during the launch of the public phase of “Raise the Torch: The Campaign for Florida State” on Oct. 17, 2014.



Photo credit: FSU Foundation



## Nancy Smilowitz



### Assistant Dean

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Assistant Dean for Development Nancy Smilowitz loves working with people who have a thirst for knowledge and a desire to enhance higher education. May 2015 marks 17 years that Nancy has been in the Office of Development at Florida State University's College of Arts and Sciences. She began at FSU as an associate director of development, became senior director in 2002 and assistant dean in 2008. In her 17 years as a liaison between the college and the FSU Foundation, Nancy has raised nearly \$40 million through outright and deferred gifts.

Nancy earned her bachelor's degree in sociology from Penn State University, where she also worked part time raising funds in the phone center. Between her time at Penn State and her arrival at FSU, Nancy served as the assistant director of annual giving at Ball State University in Muncie, Ind.

## Jeff Ereckson



### Director of Development

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Jeff Ereckson was born and raised in the Florida Panhandle, growing up in Panama City, and graduated from high school in Pensacola in 1980. He earned his bachelor's degree in finance from FSU in 1985 and enjoyed a 17-year career as a financial consultant in Atlanta before returning to Tallahassee in 2005 to become Director of Planned Giving at the FSU Foundation. He also helped raise funds and gifts-in-kind to build the new FSU President's House, which was completed in 2007. In 2009, Jeff joined the College of Arts and Sciences as Director of Development; became the PA announcer for the FSU baseball team in 2015; and continues to serve FSU in both roles today.

While in college, Jeff was a student senator and member of the Renegade Team, and was Chief Osceola in 1983 and 1984. As an alumnus, he was an active member of the Atlanta Seminole Club and served on the FSU Alumni Board and the College of Arts and Sciences Leadership Council for eight years. He and his wife, Renee, live in Tallahassee and have two grown sons.

## John Trombetta



### Senior Development Officer

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John Trombetta joined the foundation in July of 2012. John came to FSU from Valdosta State University where he served as the Director of Alumni Relations. Prior to his work in Higher Education, John worked for 10 years in financial services. A native of Tallahassee, he is happy to be back in his hometown and to have the opportunity to work at FSU. It energizes John to see the talent and passion that faculty have for their subject and the university.

John is a graduate of Valdosta State University (B.A. Political Science). While there he was Comptroller of the Student Government Association, a member of the Georgia Board of Regents Student Advisory Council where he served as Chair of the Academic Affairs Committee and received the Student Advisory Council Tom McDonald Award for Career Achievement. Currently, John is pursuing his doctoral degree in Educational Leadership also at Valdosta State.

## Brett Lee



### Development Officer

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Brett is a native of Crestview, Fla. In 2011, he earned a Bachelor of Science degree in marketing from Florida State. After graduation, he immediately accepted a position in Data Management with the FSU Foundation and worked most recently in the Department of Gift Processing before moving over to the College of Arts and Sciences.

For fun, Brett plays on the FSU Foundation flag football team and enjoys hiking and kayaking. In his new role as a development officer, he will be advancing the many initiatives of the college and working with faculty, staff and students throughout the university to raise interest and awareness among current and prospective donors.

## Torri Miller



### Development Coordinator

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Torri Miller, born and raised in Miami, graduated from FSU in 2006 with a bachelor's degree in residential science. The first time she visited Tallahassee and toured the campus, she realized that FSU was the place for her. Torri met her husband, Blake Miller, while a student, and they were married shortly after her graduation. From 2002-2008, she worked at the Tallahassee Leon County Civic Center, where she learned all about catering events and the restaurant industry, and from 2007-2010, she worked at the Tallahassee Builders Association as their marketing coordinator. In April 2010, Torri joined the College of Arts and Sciences, where she is happy to be working at the university where she experienced some of the best moments of her life.

Torri and her husband, Blake — also an FSU grad — are the proud parents of two young boys.

## Barry Ray



### Media & Communications Officer

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Born and raised in Jacksonville, Fla., Barry Ray graduated from FSU in 1988 with a bachelor's degree in English literature. He credits his college studies with helping him to hone the skills needed to become a successful writer, editor, and communications professional. He has held communications positions in state government and with a statewide association, and has worked extensively as a freelance writer and editor. In 2005, Barry returned to FSU, working with University Communications to focus national and international media attention on the groundbreaking research and accomplishments of Florida State faculty.

Barry moved to the College of Arts and Sciences in 2013 and is excited about this new opportunity to promote the college. He and his wife, Susan (a 1987 FSU grad), whom he met while he was working his first job at a daily newspaper in Tallahassee, have two children.

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Ray Stanyard

Florida State alumni Stan and Paula Warmath have found creative ways to give back to the Department of Psychology, which they feel has enriched their lives in numerous ways. "You don't have to come up with a large sum," says Stan Warmath. "Everything helps if there is something people want to do, if they want to make a difference. We wanted to make a difference." Read more about how and why they choose to support the department on page 8.