

FALL/WINTER 2015

EXCHANGE

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HERITAGE OR HATE?

Scholars Add Context in Wake of Charleston Massacre



UNC CHARLOTTE
College of Liberal Arts & Sciences

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The College of Liberal Arts & Sciences

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About the Cover:

Emanuel AME Church has served for centuries as a symbol of faith and perseverance in the face of racist acts. Image courtesy of Glenn Roberson.

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Dear Alumni & Friends,

This morning, UNC Charlotte celebrated the 288th anniversary of Constitution Day, commemorating the creation and signing of the U.S. Constitution. A panel of experts discussed the use of deadly force, with Charlotte Police Chief Kerr Putney (Criminal Justice, 1992), prominent on the panel.

This past summer, I met Meredith Sharp, senior director of public affairs with Janssen Pharmaceutical Companies, a subsidiary of Johnson and Johnson. Prior to her current position, she had served in U.S. Senator Elizabeth Dole's office, the second Bush White House, and the U.S. Department of Commerce (Political Science, 2002).

Also this summer, I touched base with Mark Fiechtner, who has had a career in the computer industry and who with Pamela Fiechtner has endowed a scholarship for students in computer science and mathematics. (Mathematics, 1984).

These are just three of the tens of thousands of UNC Charlotte alumni who have graduated from the College of Liberal Arts & Sciences and who have assumed leadership positions in their fields. In my conversations with them, I hear a consistent set of themes (paraphrased below):

- "Ongoing education is critical for continuing success in my career."
- "The breadth of my education was as important to me as my major."
- "I would not have been as successful if I had not been helped by the faculty at UNC Charlotte (and in several cases, by alumni, who provided mentoring.)"
- "I am so glad to see you. I have wanted to tell my story to someone at UNC Charlotte for years!"

In my position as dean of the College of Liberal Arts & Sciences, I advocate for the value of liberal learning every time I speak with a student, a parent, a community member, my own colleagues, and a host of others. If you do not believe me, all you have to do is reread these introductory "Letters from the Dean" in each issue of Exchange since its first issue in 2006!

However, the most effective advocacy are the stories of our students and alumni. Liberal learning is not an end in itself; rather, liberal learning is a collaborative effort, between students and faculty, as both work towards the development of the student as a fully engaged human being who is exhilarated by the lifelong journey of a self-examined life, and embraces the privileges and responsibilities of citizenship and the challenges of social justice. The three alumni I have cited above are exemplars of this effort. Not only have they all been successful in their careers, but all are quick to talk about the people at UNC Charlotte who gave them their starts. It is thrilling to know that our efforts have made a difference in the lives of these exceptional people. And, as their comments make clear – as well as the commitment to public service in the lives of Chief Putney and Ms. Sharpe – they, too, are generous with their time and resources.

It may seem an abrupt transition from celebrating our alumni to talking about this issue's cover story. The common theme of "human connecting," however, links both these topics. The CLAS professors who are being called on to interpret various aspects of the Charleston killings and the aftermath would be the first to say that they do not have answers that would explain the tragedy. However, they unhesitatingly responded to media queries, related to their expertise, as the country tries to understand the complexities of culture, human psychology, and human suffering. Their example, and the examples of other faculty in the past, helped to shape the exemplary alumni I cite above.

One of my goals over the next year is to engage more frequently with alumni, especially those alumni who have not been connected with the college or university for a while. The stories of alumni Putney, Sharp, and Fiechtner augur the existence of many other such stories. I would love to hear the story about your time in the college and to tell it to others. My email is ngutierr@uncc.edu; do not hesitate to write. ✉



Nancy A. Gutierrez

DEAN NANCY A. GUTIERREZ
COLLEGE OF LIBERAL ARTS & SCIENCES

News Briefs

“Excellent professors motivate students to harness their own creativity and resourcefulness so that they are able to seek answers to important questions.”

– Provost Joan Lorden

1 Communication Studies Researcher Receives Bonnie E. Cone Early-Career Professorship

UNC Charlotte researcher Margaret Quinlan was awarded the Bonnie E. Cone Early-Career Professorship for Teaching during the 2015-2016 University Convocation.

“For Dr. Quinlan, sustained excellence in teaching is about employing communication knowledge and skills effectively so that she and her students become co-constructors of shared meaning,” Provost Joan Lorden said, when presenting the award to Quinlan, an associate professor in the Department of Communication Studies and a core faculty member of the Health Psychology Ph.D. program.

“Her teaching philosophy and practices are informed by the theoretical concepts that also influence her research agenda,” Lorden said. “In her research, she creates opportunities where scholars can hear and acknowledge voices of individuals often marginalized or silenced, and be responsive to salient concerns of community members. This same philosophy guides her teaching—she wants her classroom to be a place where diverse voices can be heard and students can connect the coursework to their lives as citizens.”

A three-year appointment, the professorship recognizes a recently-tenured professor who embodies Bonnie Cone’s tenacious commitment to providing UNC Charlotte undergraduate and graduate students with enriching, high quality educational experiences.



2

UNC Charlotte Center Director to Build, Explore New South Connections

As the new director for UNC Charlotte’s Center for the Study of the New South, Ashli Quesinberry Stokes is drawing upon her research expertise and knowledge, along with her leadership and community engagement experiences, to lead the Center in its work.

The Center promotes discourse and dialogue on a rich and diverse constellation of topics and ideas relating to the New South. Known as the period of regional history from the end of the Civil War to the modern era, the New South offers a bold tapestry of history, culture, social movements, and political issues ripe for reflection and study.

Stokes, an associate professor and director of the communication studies honors program in the Department of Communication Studies, fills a role previously held by Jeffrey Leak. Leak, a professor of English, has assumed the role of president of the Faculty Council at UNC Charlotte. Stokes teaches a variety of public relations courses at the undergraduate and graduate level. In the summer of 2015, she led the 13th year of the department’s public relations study abroad program in the United Kingdom. Stokes’ research focuses on public relations and communication, specializing in rhetorical approaches to analyzing public relations controversies.

3

Biological Sciences Professor Receives UNC Charlotte's Top Teaching Award



Professor of Biological Sciences Stanley Schneider is the 2015 recipient of the Bank America Award for Teaching Excellence, one of UNC Charlotte's most prestigious honors.

He received the award during a special ceremony Friday, Sept. 18, at Bank of America's Founders Hall. Schneider and the other four award finalists were recognized for their sustained commitment to teaching excellence.

Schneider ensures students can conduct research, as he views this as the primary means by which students learn how new information is

generated and synthesized into an existing body of knowledge. Since joining the UNC Charlotte faculty in 1985, Schneider has worked with approximately 140 graduate and undergraduate students through individualized instruction, many of whom have gone on to become productive biologists, teachers, researchers and entrepreneurs.

"In a university, teaching and research are inextricably interlinked," he said. "Lectures give people the background information necessary to train them to start applying it. Research trains them to generate that knowledge themselves. So, you can't separate the two. The interaction of those two is what moves education forward and what moves human understanding forward."

Beth Whitaker, associate professor of political science and public administration in the College of Liberal Arts & Sciences, was named a finalist for the award.

"Teaching excellence requires a strong sense of direction, but it also requires one to have the courage to risk getting lost in the wilderness every once in a while," Provost Joan Lorden said. "Excellent professors motivate students to harness their own creativity and resourcefulness so that they are able to seek answers to important questions, view the world differently and change lives for the better."

The UNC Charlotte Bank of America Award for Teaching Excellence was first presented in 1968 to recognize outstanding faculty members at the University.

4

Sociology Department Honored With Teaching Award

The Department of Sociology in the College of Liberal Arts & Sciences is the 2015 recipient of the Provost's Award for Excellence in Teaching.

This honor is presented annually to an academic department, office, or program in recognition of the collective responsibility of faculty members for maintaining high-quality teaching, and to acknowledge efforts that improve student learning and outcomes.

The department has over the past decade taken innovative approaches to provide an engaging and well-rounded curriculum for students, said Provost Joan Lorden. The department has focused on new student engagement, written communication, honors education, and international experiences, such as building a Habitat house in El Salvador, she said.

Funds from the UNC Board of Governors support the award to the department.



5

Botanical Gardens New Director Seeks to Engage People With Gardens, Nature



As the new director of the UNC Charlotte Botanical Gardens, Jeff Gillman sees his mission as engaging the public with the gardens and with nature.

"My goal is to bring the gardens to the public," Gillman said. "The gardens have had a wonderful base over the years, and I hope we can bring it to a wider

audience and help more people to experience not only the gardens, but also plants in general. That is something I've worked on for my whole career – public engagement and getting people to appreciate plants and the environment."

Gillman assumed his role on August 1, following in the footsteps of Larry Mellichamp, who retired at the end of 2014 after almost four decades with the Botanical Gardens and with UNC Charlotte. Gillman most recently was an instructor for the Department of Horticulture Technology at Central Piedmont Community College. Prior to that, he was an associate professor in the Department of Horticulture Science at the University of Minnesota. His work focused on urban and consumer horticulture, particularly sharing research information with the public.

He has written five books, including *The Truth About Garden Remedies*; *How the Government Got in Your Backyard*, with co-author UNC Charlotte professor Eric Heberlig; *Decoding Gardening Advice*; *The Truth About Organic Gardening*; and *How Trees Die*.

Gillman has taught public certificate programs including the Extension Master Gardener programs in Minnesota, and programs on plant propagation and pruning and organic pest control since moving to North Carolina. He has written a training book for practitioners titled *Pruning Young Elms*; chapters in two books; and 22 papers in refereed journals. He earned his master's degree in entomology and his doctorate in horticulture, both from the University of Georgia.



BATH

Bath salts, K2 and other so-called “designer drugs” pop up like mushrooms after a storm, as word among users spreads.

Yet, a drug’s popularity can crest before legal, medical and police forces can marshal an effective response. As the legal and medical communities catch up, users often have moved on to other drugs, meaning the response may be too much, too late.

UNC Charlotte criminologist John Stogner conducts his research at this critical point of intersection, seeking a way to predict and calibrate society’s response to emerging drugs.

“We haven’t obtained reliable statistics on designer drug use in the past until after the substance was heavily used,” says Stogner, a faculty member in the Department of Criminal Justice and Criminology. “If you think about the two most discussed examples in the last decade, synthetic cannabinoids like K2 or Spice, and bath salts, our national centers for monitoring drug use didn’t pay attention until as late as 2012 when use had already rapidly increased.”

Despite the countless novel psychoactive substances that have attracted attention – even hype – over the last 15 years, Stogner has found that most fail to become a substantial threat.

“What I am trying to do is develop a forecast model so that policymakers, healthcare providers, and law enforcement officers alike can preemptively determine which substances to focus on,” Stogner says. By revisiting drug use trends of the 1980s through the 2000s, Stogner is

analyzing whether the information known at that time could have predicted the next big drug or new compound, had it been better understood.

“Without a forecasting model, the problem we have is that whenever something emerges, our society has this gut reaction that we have to do something,” he says. “We think, ‘It’s bad, it’s prevalent, everybody’s using, it’s the crisis of the decade, it’s a blight on America,’ when that characterization may not be entirely true.”

In the case of bath salts, these synthetic cathinones – which are not the same as bath salts used in spas and homes – have been sold legally in the United States. As they gained media attention, policymakers responded with laws to ban the substance. Yet, little was known about its prevalence or users, and Stogner’s research suggests that the use among college-aged youth was extremely rare.

“We suggest that the media attention focusing on synthetic cathinone use as a growing epidemic may be largely misplaced,” he says. “We need to take a step back and think, ‘Are we likely to see this substance become prevalent? Is this where we need to spend our dollars? Is this where we need to educate youth? Is this where we need to focus our training for law enforcement officers and EMTs?’ ”

Stogner’s article “Predictions instead of panics: The framework and utility of systematic forecasting of novel psychoactive drug trends,” published in the *American Journal of Drug and Alcohol Abuse*, takes a step toward answering these questions.



TIME

Researcher Considers Intersecting Issues with Emerging Drugs

The article reviews past experiences with novel, or newly emerging, drugs and constructs a five-step forecasting model. The model relies on availability, costs, the subjective experience, the substance's dependence potential, and ease of acquisition.

Although predictions might give a better idea for determining which drugs to regulate, Stogner points out that knowing what drugs to regulate still might not decrease drug production.

"When you ban mephedrone, you get pentedrone," he says. "When you ban that, you get something else. And we don't know where that next jump is, which creates a challenge for those who do medical and toxicology research to keep up with the proper treatment for each one."

Stogner includes his students in the research process.

"Sometimes I have students participate in studies assessing these drug-related panics, and we typically see more drug-related panics for things that are new, than for substances that have been around for a while," Stogner said. "We have far more problems in society with tobacco and alcohol than any other substances, but we don't panic about those because they're known."

Amber Sanders worked with Stogner as a student for four years. Currently pursuing her doctoral degree in criminology at Pennsylvania State University, Sanders began as an undergraduate student coding data for a research project on substance use and risky behaviors among college students.

"I have participated in many projects related to that coding data, such as examining novel drug use and 'doctor shopping' among college students," Sanders says. "The most interesting part of Dr. Stogner's substance use research is how relevant it is and how fast it can change. New substances pop up seemingly overnight, but then it takes time for researchers to understand its effects, use, and legality."

Adam Duso is a graduate student who works with Stogner on a project assessing legal issues related to maternal alcohol use. Duso credits his understanding of the criminal justice system to his involvement in research.

"I greatly encourage any student with a strong interest in advancing the knowledge of a given discipline, coupled with a capacity for self-motivation, to look into research," Duso says. "Even as an undergraduate, there are outstanding opportunities available with a number of faculty for advancing our understanding of many different research questions."

In Stogner's case, his research and teaching continue to evolve, focusing on substance use, criminological theory and biosocial criminology. He continues to explore the concept that if society paid more attention to forecasting instead of turning to sensationalized reports, the result would be a more effective, targeted response to novel drugs. [&](#)



BEST FACE FORWARD

Research Explores Dynamics of Relationships



The phrase “putting your best face forward” takes on significance in the work of UNC Charlotte researcher Amy Canevello.

Canevello, an assistant professor of psychology, studies the dynamics of relationships, including what motivates people in relationships and how those motivations affect the “faces” people show.

“When people want you to see them as smart or interesting, they’re going to do certain things to make sure you see them that way,” Canevello says. “We do it in our romantic relationships; we do it with our friends; we do it with others,” she says.

“Our research suggests that having those impression management goals only works early on in a relationship.”

Later, those facades can break down, damaging or even tearing apart relationships, she and her research colleagues have found.

From a broad perspective, Canevello’s studies build on the concept that people are motivated by either a focus on self or on giving equal attention to one’s own and others’ needs. These two systems – called the egosystem and the ecosystem – affect people’s psychological well-being and their relationships.

“Think of an egosystem as if you are standing in a dark parking lot under a bright light,” she says. “You can’t see what’s beyond the light, only what’s within it. You do things only for yourself, making yourself feel better, making sure that you’re O.K.”

An ecosystem motivation would broaden out that streetlight’s beam to chase away the shadows and allow an equal focus on others and the self. “Think of an ecosystem in a biological sense,” she says. “Everything depends on everything else. Everyone’s needs are important.”

Ironically, the harder that people with a self-focused motivation work for others to recognize and acknowledge them, the worse they feel and the worse their relationships are, the research suggests. In contrast, people with ecosystem motivation feel more connection and belonging.

“When people have impression management goals in their relationships, they become more depressed, more anxious and more stressed,” she says. “On the other hand, when people have the goal to give in their relationships, they become less depressed, less anxious and less stressed. They have higher self-esteem, and people like them more.”

The two systems work in tandem, and people shift back and forth between them. Canevello is particularly interested in determining ways for people to consciously move from one system to the other and uncovering what affects people’s abilities to do so.

She has found that an orientation toward giving may influence this phenomenon.

“Compassionate goals, and the goals to give and to be supportive of one another, are a sign that the ecosystem is functioning,” she says.

The researchers caution that the compassionate and self-image goals refer to intentions toward interactions – not specific behaviors. They use the example of philanthropists who can be motivated to give either by the ecocentric goal of helping others or the egocentric goal of validating their generosity.

Canevello’s work includes three book chapters this year. Two are in press and the third was published in the *APA Handbook of Personality and Social Psychology, Volume 3, Interpersonal Relations*, with Jennifer Crocker of The Ohio State University. In their chapter, “Relationships and the Self: Egosystem and Ecosystem,” they identified a need for greater understanding of the conditions that affect the system from which people approach others.

“Identifying the conditions under which relationship behaviors are driven by one motivational system or another, the consequences of these systems for relationships and the people in them, and whether people can choose to shift from one system to another are urgent priorities for future research,” they wrote.

Canevello’s research initially focused on college students and the impact of their attempts to manage their roommates’ impressions of them. She extended the concept to other types of relationships and had similar findings across various types of relationships.

“My research has been evolving over time because these ideas can be generalized across different relationships and types of interactions,” she says. “I can question other things and think about new avenues. I can always give more insight. I want to start looking at race relations and work domains and see if there is the same correlation that we have found with other relationships.”

A major area of emphasis for Canevello is relating her research to the lessons she teaches in her classes.

“I try to share with students the data from my research, because there’s so much data supporting all the ideas I’ve told them about,” she says. “You know the teachers that are just there to teach versus the ones that are really passionate about it and really want you to get something out of it?” Canevello – likely motivated from the ecosystem – strives to be the latter. &

JOURNEY OF JOURNALS



Editors Enrich Knowledge, Provide Context

Political changes in Peru. Human rights conditions in Colombia. Immigration concerns across Latin America. The issues might occur half a world away, but for Gregory Weeks' students, they snap into sharp focus with the help of research from around the globe featured in an academic journal Weeks edits, *The Latin Americanist*.

The journal is the oldest continuously published Latin American studies journal and is one of dozens of academic journals edited by College of Liberal Arts & Sciences faculty. This work brings global attention to UNC Charlotte and enriches the education that students here and elsewhere experience. The journals also help establish context for significant topics in the natural sciences, social sciences and humanities.

In one case, the thought of World War I summons the familiar images of trenches, "doughboy" uniforms, and poppies. This narrow view inspired a group of scholars to launch *First World War Studies*, the international publication of record for the field.

"It was so difficult to find scholarship beyond the very typical stereotypes of this war," says Heather Perry, associate professor of history and associate editor of the journal. Now, she said, the journal's articles – which cover everything from the underground press in occupied Belgium to British POW memoirs to U.S. food relief programs – are expanding the international understanding of World War I and the way it set the stage for both modern life and World War II. That's an understanding researchers – and the public – are hungry for. Readers of this journal come from every continent.

"Our articles were downloaded over 10,000 times last year," Perry says. "People want to know about this war. The journal is known

worldwide as the primary place you go to find out brand-new scholarship related to discoveries and developments in the history of the war, but also society, culture, music, art, film and medicine."

For Paula Eckard, director of American Studies, serving as editor in chief of *The Thomas Wolfe Review* is a way to not only preserve

the legacy of North Carolina's most famous literary son, but also to grow UNC Charlotte as a magnet for scholars and writers pursuing a deeper understanding of Wolfe's writings. When she stands in front of her American literature class, she can share new information about works such as *Look Homeward, Angel* and the world in which Wolfe lived.

"I teach Wolfe in both graduate and undergraduate courses; he's an important writer for North Carolina students to know about," Eckard says. "Many of my students have studied Wolfe in-depth, and at least two of them have published articles in

the Wolfe Review over the years. Others have presented papers at conferences and received awards." Her role with the journal, she says, opens up avenues for students to become scholars.

Offering up such avenues requires time and effort. Weeks, the chair of Political Science and Public Administration, once received an article about the long-reaching effects of a cooking show. He had to hunt for reviewers with an expertise in Argentinian political and cultural thought of that era who were willing to give unpaid time for the work. "It showed how this Julia Child of Argentina created this nationalism in midcentury Argentina," he says.

In a double blind process in which the reviewers and author are not made known to each other, reviewers have six weeks to provide

"The journal is known worldwide as the primary place you go to find out brand-new scholarship related to discoveries and developments..."

— Heather Perry



a detailed analysis of the article and the soundness of its research. Weeks and other editors at times go through a dozen people before finding qualified and interested reviewers. They negotiate a delicate diplomacy between the parties until an article that is accepted is revised multiple times by the writer and is polished for publication. The entire process can take as much as a year. Long before one issue is put to bed, the next is already in the works.

All of that work – Eckard calls her efforts “a labor of love” – pays off in the enrichment it provides students and in the benefits to the college, the university, and the wider community.

English Department Chair Mark West last year helped launch *RISE: A Children's Literacy Journal*, which he edits. The journal is aimed at teachers, librarians and parents concerned about children's reading. Recent issues have covered everything from the role of literary fiction in the new Common Core standards to the enduring appeal of fairy tales.

“It fills an important gap in the field,” West says. “We educate by teaching our classes but we educate in other ways too. We share our insights with a broader audience...with people in our community. Our community engagement is sharing our expertise with a larger audience.”

The Journal of Chemical Education, which publishes scholarly papers about teaching chemistry in K-12 and university settings, likewise is geared toward the broader community. It particularly reaches teachers eager for new ways to engage students in the field of chemistry. Edited

by biochemistry professor John Risley, the journal provides practical help for the classroom, featuring games that help students learn organic chemistry molecule names and including environmentally friendly laboratory experiments that synthesize organic molecules.

“Students need to understand chemistry to participate actively in political and economic decisions that affect all of us,” Risley says. “We need to teach students the importance of chemistry, and to provide them with a basic knowledge to participate as citizens in our democracy. The information in the journal helps instructors at all levels to convey the concepts of chemistry to all students.”

The academic and intellectual resources UNC Charlotte has to offer become more widely known with each journal edited by college faculty, the editors say.

“It's significant for UNC Charlotte to be home base for this journal,” Perry says. “Most scholarly journals are at the Ivy League universities and big state schools. It's a real honor when I go to these editorial meetings and I go to the conferences, and I can represent *First World War Studies* as a journal that finds its home in the history department of UNC Charlotte.” &

Words: **Amber Veverka**



BUILDING

Language Translation Helps People Cross Chasms

Language helps us cross the chasms that can exist between cultures, people and time. UNC Charlotte researcher Anabel Aliaga-Buchenau forges these connections through her work in translation.

“Translation is the most important thing to be able to build a bridge between people who speak two different languages,” Aliaga-Buchenau says. “It is crucial in this world to connect people who otherwise don’t have an opportunity to connect.”

Aliaga-Buchenau is an associate professor of German in the Department of Languages and Culture Studies. Through her translation work, she links diverse cultures and languages to give people an understanding of texts and times that they would otherwise find out of reach. She is one of a number of faculty members in this department who conduct research, write and teach in the area of translation.

In her most recent work, Aliaga-Buchenau has translated “Máximo Castillo y la revolución en Chihuahua” by Jesús Vargas Valdés. She turned to her language skills and married them with her research background in comparative literature. Through her translation of the autobiography of this Mexican general from the Mexican Revolution, she explored the culture and rich language of

his time, and delved into details of his family to more fully understand the historical figure.

Aliaga-Buchenau collaborated with Latin American Studies colleagues to gain additional insights for her work. This collaboration illustrates how research focus can change over time, in her case expanding from her early research into 19th century German immigrants to encompass a different culture and region.

A German native, Aliaga-Buchenau brings deep knowledge of the German language and heritage to UNC Charlotte and the broader community. She studied English and French when attending a German university, is fluent in Spanish and is comfortable with all four languages.

“When I was in Germany, part of learning another language at a German university was you had to take a translation course,” she says. “The theory is that translation is one of the great tools of improving your language ability, and it’s true. I was at a German university and I had to translate into English and into French. You really have to be flawless in these languages and that takes a long time.”

She seeks to show her students that being a translator holds an array of career and research paths. Translation involves much more than translating words in one language to words in a second language, she says.

“Research is crucial, and knowledge about another culture is essential,” she says. “If you don’t understand a culture, then you can’t translate, and at the same time the more

you translate the more you learn from the interaction between these two cultures.” She teaches her students to comprehensively read a text first to make sure that they understand it fully. By becoming familiar with the text, they can better translate into the target language.

While an increase in technology gives students and other translators an opportunity to use computer databases, which can make the process easier and quicker, people are still essential.

“People often say we are rationalizing ourselves away, and that computers will be able to do it all,” Aliaga-Buchenau says. “That isn’t true because the cultural connotations are so difficult that I don’t think a computer is capable. It’s great that the computer remembers, but you can’t replace a human being.”

Bringing that human touch to bear on translation adds beauty and meaning for Aliaga-Buchenau, who advises students, “Go learn another language. Go communicate with people. Become that bridge.” &





BRIDGES

Profession Faces Profound Changes, Research Finds

Today's fast-paced, technology-driven world has left language translators grappling with issues that can affect their work behavior and job satisfaction – factors that perhaps are even redefining an entire profession, UNC Charlotte researcher Mónica Rodríguez-Castro has found.

In an article in *The International Journal for Translation & Interpreting Research*, Rodríguez-Castro considers the impact on people working in the language industry of Internet-based technologies, outsourcing, compressed deadlines and new organizational structures, among other changes.

“Translation used to be thought of as an art and a craft, but with globalization, the translator needs to have a more sophisticated skill set to remain competitive,” Rodríguez-Castro says. “The process used to be where we could enjoy the beauty of the craft and we had the time to craft the language.”

Digital technology and globalization trends have accelerated outsourcing through subcontracting to language services providers an array of services including translation, post-editing and localization, she finds. The providers then subcontract the work to a network of translation professionals who work in virtual teams.

Meanwhile, translators now are asked to provide pricing quotes and to perform sales, marketing and related tasks, in addition to using their language skills. “Thus, the overall

complexity of the job has increased in a short span of time, and the same job now requires a wider number of competencies with a highly-technical skill set,” she writes in the article.

Previous translation studies have overlooked the dynamic of translator satisfaction and the resulting impact on the profession, Rodríguez-Castro says. Her research seeks to understand satisfaction in the industry and to develop an instrument to measure task and job satisfaction. She considers the development of the detailed instrument a major output of the study.

Rodríguez-Castro is one of several researchers in the Department of Languages and Culture Studies who are considering contemporary issues' impact on translations. She collaborates with colleague Jeffrey Killman on the intricacies of machine translation versus human translation, in one related area of research.

“It is now more important than ever to clearly delimit the division of translation labor between humans and machines,” Killman says. “We should divide labor so that we can take full advantage of how people have greater ability to understand content and how computers can process large amounts of data more quickly.”

Using a UNC Charlotte faculty research grant, the researchers conducted a machine translation experiment with legal texts, 30 participants, and professional translation graders. They plan to apply for an external grant in the hopes of having more participants and refining the data.

Killman also explores the difficulty in finding the equivalence between two languages without losing something through translation. It is essential for translators to transfer the same meanings, tones, and the same feelings the original text gave the reader. To do this, they must plan a course of action.

“Indeed, it is a translator's duty to research what they do not understand before they may begin translating,” he says. “It is often said that translators cannot translate what they do not understand.”

Killman is researching the impact of machine translation on the quality and speed of translators and developing a model to help answer why translation in the legal domain is considered a highly demanding area. “I am arguing that difficulty often arises from a particularly heavy burden of context which legal translators have to shoulder,” he says.

As he works with students, Killman urges them to consciously choose when to turn to technology to help with their translations. He wants them to slow down and experience the inherent beauty of language, he says. “Due to insecurities, beginners tend to develop an excessive dependence on technologies, which is why I always encourage my students to think first,” he says. &

Words: **Maggie Upton**



HN

ON

Scholars A

HERITAGE

HATE?

Added Context in Wake of Charleston Massacre

As the oldest AME church in the American South, Emanuel African Methodist Episcopal Church has served for centuries as a symbol of faith and perseverance in the face of often brutal racist acts.

In June, a white gunman murdered nine black people attending prayer at the church – which is known as Mother Emanuel in recognition of its age and significance. The act has sparked national conversation surrounding the complex, intersecting issues of heritage and hate. College of Liberal Arts & Sciences' faculty have drawn from their research and writing to add significant insights in the discussions.

"I have always been mindful of the effects of Confederate memory on southern culture, and its negative impact on race relations in the South, but this tragedy exposed it to a far broader spectrum of people both in and out of the region," says Karen L. Cox, professor of history.

"The assailant was acting on a racist philosophy that has been around for several

decades and goes back to the immediate post-Civil War era when freedmen were accused of being a 'threat' to white women and potential 'rapists,'" Cox says. "In other words, this kind of racial terror does not occur in a vacuum."

Cox has spoken with international and national media on the topic of the Confederate flag and Confederate monuments. Dylann Roof, who faces federal hate crime charges in addition to state charges of murder, has been shown in photographs with the Confederate Flag. In an article published in *Huffington Post*, Cox details the history of these monuments and their connection to the United Daughters of the Confederacy, which erected monuments to honor and vindicate the Confederate generation.

"Historians play an important role in bringing historical context and providing facts that can help people move to a better understanding of how we got where we are and where we go from here," Cox says. "We must remember that the victims in this

tragedy were victims of racial terror, and African Americans have been victims of it for centuries. This is not simply a 'southern' problem. It may have occurred in the South, but racism — structural racism — is an American problem."

Julia Robinson, religious studies professor and ordained minister, researches the history of the relationship between race and religion in the United States, and has brought insights from that work to the tragedy.

"Most of my perspectives on the Charleston shooting stem from my research and teaching in African American religion and history," Robinson says. "My course, *Race, Religion, and Murder*, for example, was created to help me better understand how race, religion, and acts of violence intersect with each other, often formulating the very foundation of terrorist identities and supremacist culture."

Robinson describes the church as a symbolic structure of what is understood as sacred, and notes that the targeting of this

Continued from page 13.

historic church has been felt as a violation.

“Scholars in religious studies have a unique perspective on racially motivated acts of violence and terrorism by offering a lens to the religious foundations of racism and act of violence,” Robinson says.

“Historians also offer a crucial lens as they provide the social-historical contexts, which shaped and reified white supremacist culture in America,” she says. “Together, both historians and scholars in religious studies can present a broader framework of analysis by which racism and acts of violence can be understood, deconstructed, and eventually eradicated from American society.”

Christopher Cameron, history professor, has played a major role in the creation of #CharlestonSyllabus, which is an educational resource gleaned from thousands of Tweets beginning on June 21. Individuals from around the world, including Cameron and Cox, suggested titles of books, articles, films, short stories, and other sources that shed light on the history of slavery, race, and religion in not only South Carolina, but also throughout the United States and African Diaspora.

“Historians and other academics are increasingly realizing the critical importance of their work in speaking to contemporary political issues,” Cameron says. “Social media and outlets like blogs and podcasts provide more opportunities than ever for scholars to address public issues, and they are certainly taking advantage of this.”

Gaining an understanding of how racism works and how specific governmental policies at the state and federal level can bolster racism can help citizens take meaningful action to address the issue, he says.

“Historians dating back to the mid-19th century have seen it as their duty to provide the knowledge and context that can assist in social movements, ranging from abolitionism to suffrage to civil rights,” he says. “We are seeing this now, as historians have been

some of the leading voices calling for removal of the Confederate flag from government property. The creation of crowd sourced syllabi such as the #CharlestonSyllabus has also let to greater cooperation between historians, archivists, and librarians from around the world.”

David Goldfield, Robert Lee Bailey Professor of History, has written, done interviews and spoken on the issue of the Confederate Battle flag flying on capitol grounds in South Carolina and its historical symbolism, among other topics. The issue has spurred discussions in his classroom about the interaction between memory and fact, Goldfield says.

“We study history not merely to understand the past, but also to make a better future,” he says. “We can see that a better understanding of the past can lead to reconciliation in the present.”

A positive to come out of this tragedy is the debate over the Confederate battle flag, Goldfield says. “Is the flag heritage or hate?” he says. “The historical record is emphatic that the flag was and is a symbol of first, slavery, then of white supremacy, and, ultimately of resistance to racial equality. Which is why this controversy is less about history — the historical record is settled — than about the advances African Americans have made and the decline of both the law and symbols of white supremacy, with precious few of those symbols remaining. The symbols must remain part of our heritage — but in a museum.”

Words: **Tyler Harris and Skye Allan** | Images: **Glenn Roberson**



TITAN TRIUMPH

Botanical Gardens Pollinates Rare Titan Arum



The Titan Arum thrived in the misty environment of the McMillan Greenhouse's tropical area.

In a significant botanical accomplishment, UNC Charlotte Botanical Gardens staff this summer successfully pollinated a Titan Arum, using pollen from another Titan Arum at Daniel Stowe Botanical Gardens.

“To have a Titan Arum bloom at all is a testament to the expertise of our greenhouse gardeners,” said Paula Gross, UNC Charlotte Botanical Gardens assistant director. “To have gone further by achieving successful pollination represents an opportunity for the UNC Charlotte Botanical Gardens to contribute globally to the propagation of this rare plant.”

This is the second Titan Arum to bloom at the UNC Charlotte Botanical Gardens, with the first plant – named Bella – blooming in 2007 and 2010. The second plant was named Odoardo or “Odie” in honor of Italian naturalist Odoardo Beccari, who discovered the Titan Arum in Sumatra in 1878.

Titan Arums need pollen from a second plant to reproduce. On their native Indonesian island of Sumatra, carrion beetles move pollen from one plant to another, attracted by the plant’s stench as the bloom opens. In captivity, however, Titan Arums are

few and far between. Not only are there no carrion beetles to carry pollen, there usually is no second bloom to receive the pollen.

The blooming of two of these tropical giants within five days and 30 miles of each other offered an unusual opportunity to attempt pollination.

UNC Charlotte’s Titan Arum bloomed on July 17, unfurling its massive bloom throughout the evening and filling the greenhouse with its characteristic odor of dead animal mixed with burnt sugar. As midnight approached and plant enthusiasts watched via

a live camera feed, greenhouse manager John Denti attempted pollination.

Earlier in the week, Denti and other UNC Charlotte Botanical Gardens staff had collected pollen from the bloom at Daniel Stowe Botanical Gardens in Belmont, with the permission of staff there.

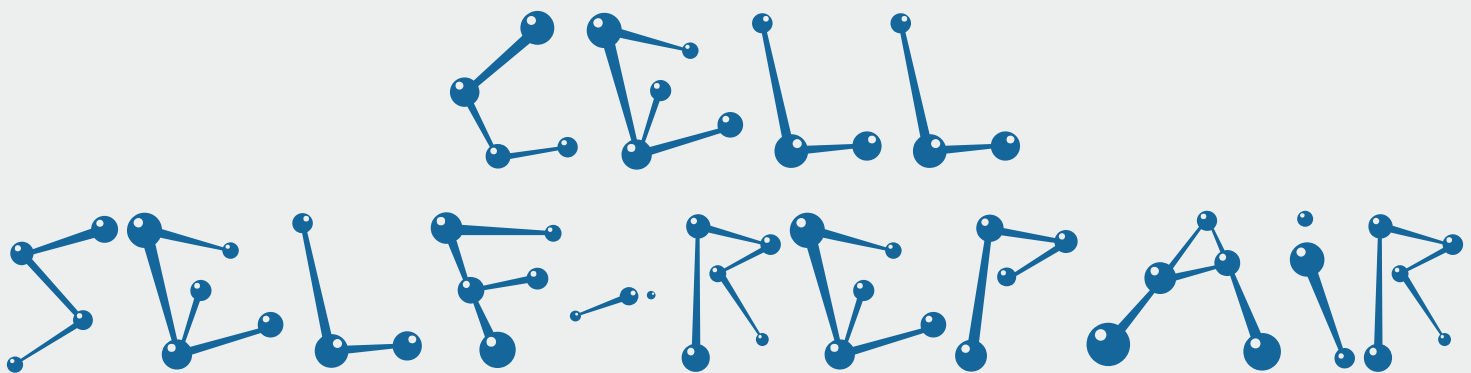
On August 5, greenhouse staff determined that the pollination succeeded, based on the persistence and growth of the flowering stalk and the swelling and coloring of ovaries. Now comes a long wait, as it can take up to six months for the berries – each containing two to three seeds – to ripen. If ripe seeds are produced, Odie will die off but the staff will plant and germinate the seeds, with hopes of blooms in eight to 12 years.

“The pollination of the Titan Arum is very significant for UNC Charlotte Botanical Gardens,” Gross said. “We were the first to bloom this rare plant in the Carolinas, and now we are the first in North America to have achieved pollination with fresh, or unfrozen, pollen.” &

Words: **Brittany Algieri** | Images: **Lynn Roberson**



It can take up to six months for the berries to ripen.



Researcher Uncovers Clues to Cancer, Neurodegenerative Disorders

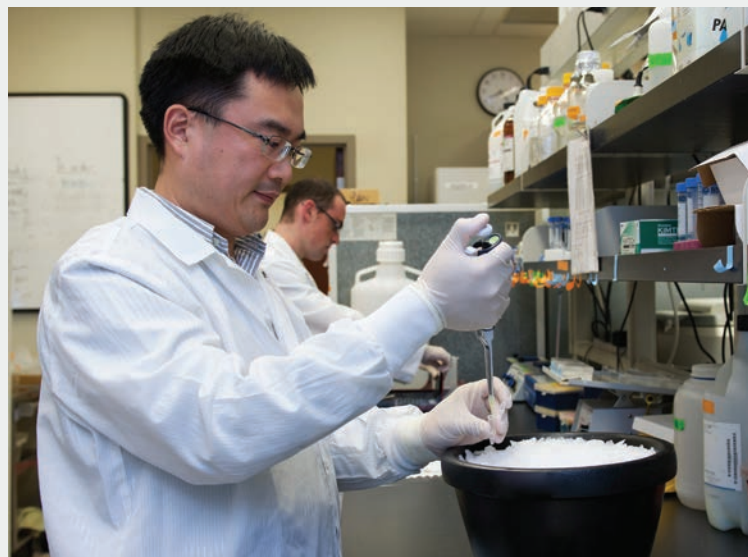
Frogs and their tiny eggs are helping a UNC Charlotte researcher unlock the mysteries of genomic instability, with implications for cancer and neurodegenerative disorders such as Alzheimer's and Parkinson's Disease.

Biological sciences assistant professor Shan Yan researches DNA damage that human cells sustain from thousands of internal and environmental assaults each day. Researchers know that the body's cells have a complex set of processes that constantly assess the damage and make repairs to fragile genetic material.

Yet, the vital biochemical processes by which this constant DNA repair takes place are still only partially understood because of their complexity, speed, and the difficulty of studying complex interactions within living cells. Moreover, it remains unknown how cells sense the oxidatively damaged DNA in the first place.

"The main question we try to answer is how genomic integrity is maintained," Yan says. "All living organisms have a genome, which must maintain its integrity in response to damaging agents, such as oxidative stress or chemotherapy drugs. The process is not well studied and there are many unanswered questions, which is why we are interested."

For organisms to maintain their integrity, an elaborate network called DNA damage response detects abnormal DNA structures through a process called checkpoint signaling and coordinates the repair and activation. This DNA damage response has been



Biological Sciences Researcher Shan Yan and master's student Steven Cupello work in the lab.

demonstrated as a biological barrier to the formation of tumors.

In an article published in the *Proceedings of the National Academy of Sciences* (PNAS) in 2013, Yan's lab first announced the discovery of a previously unknown surveillance mechanism.

Two biochemical pathways, known as ATM-Chk2 and ATR-Chk1, govern the cell's response and repair of double-strand DNA breaks and other types of DNA damage or replication stress respectively. The molecular mechanisms underlying the

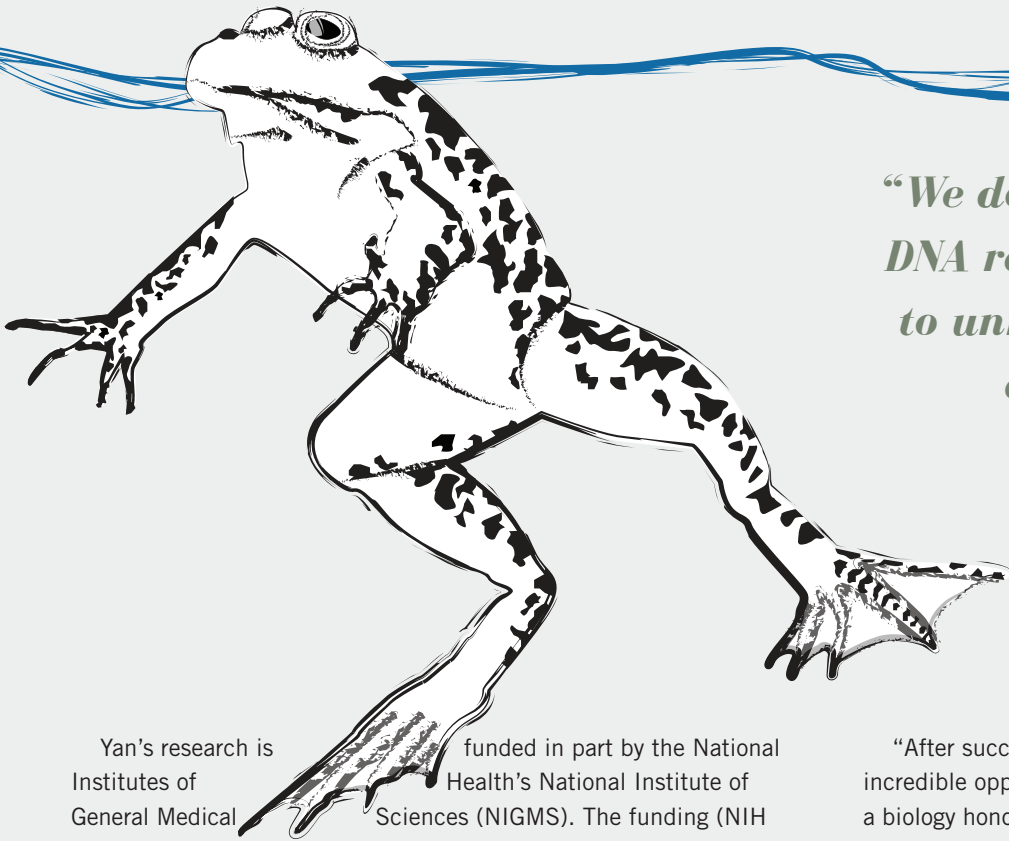
ATR-Chk1 checkpoint activation include the uncoupling of DNA

helicase and polymerase activities and DNA end resection of double-strand breaks.

The UNC Charlotte researchers found a third, previously unknown trigger for ATR-Chk1 checkpoint pathway, and this novel mechanism was discovered in the context of oxidative stress.

A base excision repair protein known as APE2 plays unexpected roles in the checkpoint response: single-strand DNA generation and Chk1 association. The protein was previously known to be involved in the DNA repair of oxidative damage, but not to the extent revealed in the study's findings.

"Better understanding of these processes can give us new clues or avenues for therapies for human diseases," Yan says. "We have discovered that many of the target proteins we're working with in *Xenopus* are correlated with those found in cancer patients."



“We don’t just get to uncover that DNA repair happens, but also try to unravel the nuanced mystery of exactly how it happens.”

– Student Steven Cupello

Yan’s research is funded in part by the National Institutes of Health’s National Institute of General Medical Sciences (NIGMS). The funding (NIH R15GM101571) has allowed Yan to support his lab, train students, and publish eight papers in a three-year period, often with students.

The most recent research papers were published in *Biochemical and Biophysical Research Communications* and *Cellular Signalling*. Yan also summarized the current understanding of oxidative stress response and discussed applications of these findings from basic research to cancer and neurodegenerative diseases in two comprehensive review articles in *Cellular and Molecular Life Sciences* and *International Journal of Molecular Sciences*.

In March, the NIH awarded him additional funding of over \$360,000 (NIH R15 GM114713). He also has received funding from UNC Charlotte.

“The whole research program is growing, and we are grateful for the funding support,” Yan says. “This is a very encouraging and emerging area, and our cutting-edge research projects will help to better understand genome stability and cancer development.”

Yan works closely with students and fellows, including postdoctoral fellows and graduate, undergraduate and high school students.

“We’re passionate about this line of research because we want to know how it works at the core,” says Steven Cupello, who is pursuing a doctoral degree in biology. “We don’t just get to uncover that DNA repair happens, but also try to unravel the nuanced mystery of exactly how it happens.”

Another student who works with Yan, Jude Raj, was chosen for a 10-week intensive Research Experience for Undergraduates (REU) program funded by the National Science Foundation. This Biology and Biotechnology REU program allowed him to develop lab research skills, continue independent projects, and present the results at various research symposiums.

“After successful months of training, Dr. Yan offered me the incredible opportunity to pursue an independent project,” says Raj, a biology honors student. “I’ve become deeply passionate about molecular biology and fascinated about the invisible, microscopic reactions taking place in living organisms.”

Raj has gained insights not only into the subject but also into research practices. His research presentation was awarded first place in Biological Sciences at the University’s Undergraduate Research Conference in April.

“I think the biggest life lesson I have learned from my research experience is to never quit and keep moving forward, no matter how much you fail,” he says. “Research has had such a great impact on me by increasing my problem-solving skills, and even making my classes more interesting. My ultimate dream would be working alongside other scientists to eradicate disease.”

Yan’s students have created a video and a written resource for the *Journal of Visualized Experiments*, describing how the lab uses *Xenopus* egg extracts to study pathways of DNA damage response. Yan’s lab also shares its research by giving tours of the lab during the UNC Charlotte Science and Technology Expo each spring.

To expand access among a larger group of students beyond his lab, Yan integrates his research in the classroom. By sharing real-world examples of cell biology research outside the textbook, he hopes to inspire his students.

“Science is always the driving force for the overall human being,” he says. “It’s not always easy to move forward, but every new discovery through basic research could open unidentified and unexpected new avenues.” &

RESEARCH



Henry Tigri (right) meets with mentor Michael Turner.

Undergraduates Work Alongside Professors

As first author of a research paper in the prestigious academic journal *PLOS ONE*, biology undergraduate and Charlotte Research Scholar Jenna Brown picked up an impressive honor – and a new nickname.

“Becoming a published author as an undergraduate student still feels surreal to me,” says Brown, who co-authored the paper with mentor Dennis Livesay, bioinformatics and genomics professor. “It was fun being able to share the news with my family and friends, who now refer to me as “Scientifically Suitable” after hearing about reviewers’ comments.”

Brown is one of hundreds of UNC Charlotte undergraduates who have participated in

the Charlotte Research Scholars initiative at UNC Charlotte. Each summer, students apply for the 10-week program. Those chosen receive a scholarship to work closely with faculty mentors conducting research. They also participate in professional development sessions to better prepare them for graduate school and careers.

Brown is embracing the serious side of her nickname, using these early research opportunities as fuel for her passion. “The paper was never meant to be the end point for me, though it was certainly a goal,” she says. “The most exciting part of this for me is that it isn’t over.”

The work has made progress in the search

for a weak spot in the architecture of a group of enzymes that are essential to antibiotic resistance in a number of bacteria, using a complex modeling program that helps analyze the physical dynamics of large, structurally complex protein molecules.

“This work was the first research experience I had, and for me it involved a learning curve,” Brown says. “I have gained confidence in my ability to function as a part of a professional academic team, become more comfortable with computers, developed into a seasoned public speaker, and gained a better understanding of what I hope to do post-graduation.”

A senior, she is currently applying to pharmacy schools, marrying her love of chemistry and biology with her interest in a medical career.

Another Charlotte Research Scholar, Henry Tigri, worked with mentor Michael Turner, a professor in the Criminal Justice and Criminology Department, to research the relationship between gang membership and firearms and bully victimization and firearms.

“Dr. Turner became a great mentor, in research specifically, criminology broadly and in life in general,” says Tigri, who graduated with degrees in criminal justice and psychology. “My role included selecting our research topic, discussing how we might get answers to our research questions, collecting data, and analyzing that data. Dr. Turner gave me the reins, but worked with me to explain the processes, including how to work with the statistical software.”

Tigri published two papers, one with fellow student Jennifer Devinney, in the *American Journal of Criminal Justice* and the

READINESS

International Journal of Offender Therapy and Comparative Criminology. His research experiences stood out when he applied to graduate school, he says, and he currently is pursuing his master's degree in accounting at Florida State University.

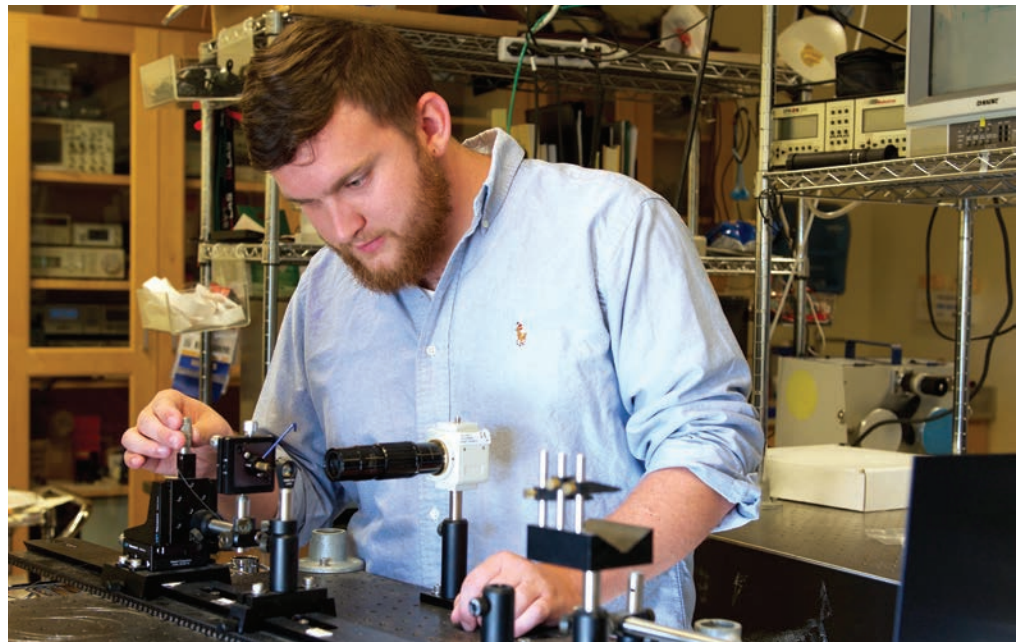
"Research teaches analytical and critical thinking, problem solving, troubleshooting, attention to detail and other skills," he says. "I would go so far as to say that my research experience has taught me more usable skills that are applicable in the real world and the working world than the rest of my undergraduate education as a whole."

Like Tigri and Brown, physics student Luke Hardy has worked closely with his mentor, physics and optical science professor Nathaniel Fried, researching the thulium fiber laser as an alternative to conventional lasers. Their work has resulted in papers in major journals and conference presentations.

"Carrying out research is not just sitting in a lab and doing experiments," says Hardy, who now is pursuing his doctoral degree in optical science and engineering at UNC Charlotte. "A big part is explaining what you do, why it is important, and how you are able to do it. Being faced with multiple situations where I had to explain what I was doing in front of audiences has helped me overcome my fear of public speaking."

Fried meets with students each day to discuss individual projects, which keeps the pace moving, Hardy says.

"All research has its dead ends and hard decisions; it wouldn't be research if it didn't," he says. "Because Dr. Fried talks with us frequently, it helps us decide on the best path possible with our research. The hands-



Luke Hardy works in the lab of mentor Nathaniel Fried.

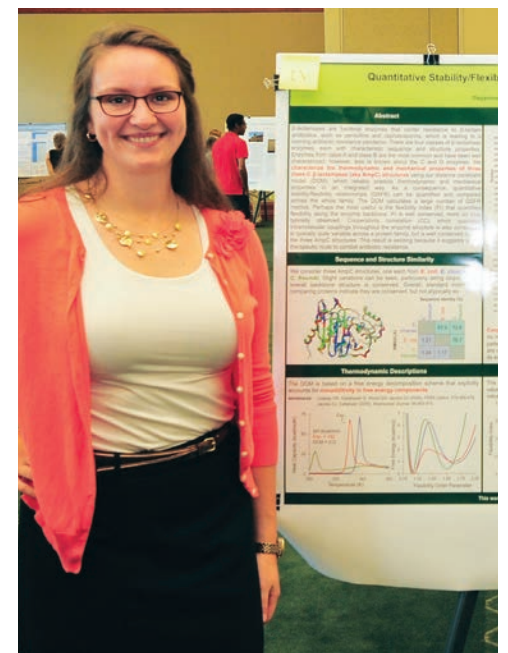
on aspect of the lab helps you visualize and attack problems in the classroom a lot easier."

Hardy knew he wanted to use his knowledge and interest in engineering and science to help others.

"My father had a serious issue from a urinary stone blocking his urinary tract," he says. "He was in the hospital for a while and needed surgery to remove the stone. I thought that if there was an easier way to destroy stones inside of the body, then I would love to help make that possible." &

Words: **Brittany Algieri** | Images: **Lynn Roberson and Aaron Cress**

Jenna Brown presents research conducted with mentor Dennis Livesay.





They are born all over the planet, some 3.5 million of them a year, beginning life as tiny flickers in the grass. They grow fast; feeding on forests, devouring ground, turning landscapes into ash.

As these fires burn, Brian Magi is watching, scanning maps to see the places the flames have touched, and charting the changes in the way humans are using fire to both form and destroy the land.

Magi, assistant professor of atmospheric sciences in the Department of Geography & Earth Sciences, is researching the connections between fire, land, atmosphere and climate – and the role humans play in that mix. This is research that has gained new urgency as the world's changing climate has sparked an increase in wildfires – an increase that could hold significant consequences for Earth's largest remaining forests.

The smell of smoke, the crackle of flames – even in the most urban of people, these can raise a primal prickle of fear. Yet, fire is both a creative force and a key component in the carbon cycle, Magi said. “When fire burns, it converts carbon stored in trees and grasses into carbon that largely gets into the atmosphere,” he said. “In the global view, fire is a natural part of our ecosystem.”

California's wildfires have ignited during the worst drought in the state's recorded history, and have left behind them a wake of devastation. With shrinking snowpack and drier summers, “the perception that the West is burning more each year is pretty much correct,” Magi said. “But elsewhere in the world, humans use fire to manage landscape on a vastly different scale. Satellites can count fires from space. When you look at those maps, you can see clearly that even with the West burning as it is, the fires are contributing a very small fraction of the total number of fires each year.”

Magi's research highlights the hotspots where most of the Earth's fires occur: sub-Saharan Africa, southern Africa, and South America. “Africa is the king of fire in the world,” he said. “Those two continents account

BURNING

*Climate Research
Fuels Insights
Into Human-Fire
Dynamic*

ISSUE

for roughly 70-75% of all fires every year. The fires mostly occur outside of the rain forests. Rain forests only burn when very intentional human deforestation is unleashed.”

Fire is the easiest way to manage a cultivated landscape, he said. “When you burn residue from the present year’s crops, that releases the nutrients from the biomass back into the soil,” he said. “You are taking phosphorus and nitrogen back into the soil, faster than through decomposition. It’s very effective. Within days, you’ll have new growth of fresh grass over the savanna.”

Meanwhile, the boreal forest is susceptible to lightning-triggered wildfires. This vast stretch of dense, wilderness forest in the northern reaches of the planet have almost zero human settlement, yet research suggests a connection between the fires and people.

“Wildfires in the boreal forests of Canada and Alaska are on the rise as a result of human-driven climate change,” Magi said. “Russia has boreal forests too, and likely these are burning more too, but data is not as solid as it is for North America.”

Part of what Magi hopes to gain by looking back at fire’s behavior over time is an understanding of future fires, including ones in those forested areas. If, for instance, a changing climate forces farmers to seek more productive pasturelands, lands that they’ll manage through fire, they will inch ever closer to wild areas, Magi said. That means instead of burning savanna as they have in the past, they will burn trees.

“People might move...more deeply into this biomass-heavy region, burning all along the way,” he said. “That’s already happening in the Amazon.”

A National Science Foundation Geography and Spatial Sciences program grant is helping to fund Magi’s research into the ways

environment and human activity have influenced fires over time. Magi is working with colleagues from Yale University and the University of Oregon on the project, which uses satellite-based reconstructions of fire activity, modern-day simulations and a treasure trove of data collected from around the world on the incidence of fire.

“The research we’re trying to do will inform how fire will behave in Earth’s system in the future,” Magi said. “The climate will be changing. If climate and the land are changing, will humans change in a way that changes how fire behaves?”

— *Brian Magi*

Magi is using the diverse fire data to advance methods used in global fire simulations, which themselves are a part of the international effort to model future climate. He and a doctoral student funded by the grant will use climate model output and fire data to simulate past fire activity.

He and his colleagues also organized a fall workshop to bring together dozens of experts on fire, fire data, and fire modeling to learn from each other’s research, and he joined other researchers in Germany for an intensive fire modeling workshop. As he and other researchers delve into the impact of the spread of fire into heavily forested regions, Magi remains optimistic about the answers science could provide.

“All of the solutions are there,” he said. “We just have to figure out how to better balance ourselves with the environment. The fact that we know these things gives me great hope.” &

LIFE, DEATH, AND REALITY

Researcher Confronts Death To Give Life New Meaning

Christine Davis reads aloud the evocative narrative of her father's death. She scans the audience and spots her husband Jerry, tears streaming down his face. Fighting to keep her composure and to detach herself from the subject, Davis scours the somber audience, looking for an unemotional face. There are few.

"This type of writing that I do is called narrative auto-ethnography," Davis says. "It's the study of your own culture written as an evocative narrative. I write about emotional experiences, especially in my work about my mother's and father's deaths, though I am usually able to maintain an academic distance from the experiences while I am writing."

On this night, as she gave a talk on her research, the distance grew close. Her ability to draw from her personal experiences and blend them with her research adds depth to her specialty of health communication, with an emphasis on mental health, disability, and end-of-life communication.

A professor in the Department of Communication Studies at UNC Charlotte, Davis teaches research methods in addition to health communication. Her end-of-life research involves analyzing subjects such as end-of-life dialogue and funeral liturgies.

"I'm interested in end-of-life communication because when a loved one is dying, it calls into question your personal and relational family identity," Davis says. "It's not like when someone gets a broken leg that will heal. As we age, we move along a continuum from life to death, from ability to disability. I'm interested in the liminal spaces of aging and dying, and the communication that occurs as a result."

Davis first became captivated by end-of-life communication following the death of her father from prostate cancer, which she documents in her book, *Death: The Beginning of a Relationship* (2012).

"As he fell ill, I made a point of going by and seeing him on my way to work every day, and we got closer over time," Davis says. "It was bittersweet, where we developed a relationship while I was losing him."



“We’re all going to die one day, so don’t be afraid to live life. A tragic life is one where someone never truly lived.”

— *Christine Davis*

After he died, I had a real spiritual, personal, and relational crisis. I didn’t know anything could hurt this badly.”

The experiences with her father pushed Davis to return to graduate school, where she took Buddy Goodall’s narrative ethnography class and wrote the story of her father’s death. This story eventually became the book. The class changed her life, showing Davis she could do this type of research for a living.

One important piece of Davis’ research is studying how language constructs reality.

In 1990, a woman named Terri Schiavo experienced a heart attack that left her in a persistent vegetative state, kept alive by machines. Schiavo became the center of a legal battle, with the two sides trying to convince the judge that she was either ‘more alive than dead’ or ‘more dead than alive’.

“A social construct is an individual’s or society’s concept of reality,” Davis says.

“Although we might agree a person’s

biological death is real, the concept of when one is defined as dead, clinically or otherwise, is certainly a social and legal construct. Words either kept Schiavo alive for 12 years, or prolonged her death for 12 years, resulting in a very real experience for her, her family, and many of the rest of us.”

Collaboration with professors in other research areas broadens Davis’ own research. One of her current projects is a book co-authored with Jonathan Crane, titled *Crossing Over: Media and Mortality in the Dead Zone*. Crane, associate professor of Communication Studies, researches media, film, and popular culture.

“We are looking at where film, popular culture, books, and songs intersect with death, and how that reflects, or doesn’t reflect, real life.” Davis says. “We’re combining cultural studies with narrative ethnography, which is not done a lot. We’re adding to the methodological conversation where we’re merging methods in a really interesting way.”

Davis is currently also working on several other book projects discussing communication at end of life, and is co-authoring a third edition of a communication research methods textbook.

Davis hopes that her research encourages people to take more consideration of their own health. She wants to teach medical professionals how to communicate better with patients and families, and vice versa.

“Students leave my health communication class knowing how to be better healthcare consumers, how to be more empowered, and how to have those difficult conversations with families,” she says. “We’re all going to die one day, so don’t be afraid to live life. A tragic life is one where someone never truly lived.” &

Words: **Tyler Harris** | Image: **Lynn Roberson**



BACK TO BASICS

Scientist Connects Future of Imaging, Metamaterials With Fundamentals

Dust motes drift in a shaft of sunshine, tumbling through the air in a seemingly aimless way. Yet, these apparently insignificant specks hold fundamental meaning for UNC Charlotte optical scientist Michael Fiddy.

Fiddy conducts complex research in super-resolution imaging – or optical imaging beyond the diffraction limit of light, and in metamaterial design – or the precise design of composite materials with properties not found in nature.

Even a small speck of dust might be composed of different materials and have a shape that makes it an interesting resonant scattering object over some part of the electromagnetic spectrum. Resonant electromagnetic responses are the key to engineering new materials with unusual optical properties. As Fiddy works to advance these revolutionary fields, he finds himself reconnecting with the basics.

“I can’t look at a speck of dust without thinking about it being an electrical circuit,” says Fiddy, a professor of physics and optical science and of electrical and mechanical engineering.

“It’s a resonant circuit at some frequency, as even a speck of dust will have some distinct electromagnetic scattering properties,” he says. “Now, how do I shape and organize properties like these to make better or fundamentally new materials that I need for next generation applications? More importantly, how do I design and fabricate

these small structures to have exactly the properties I want?”

The engineered metamaterials with which Fiddy works show extraordinary optical or acoustical properties, including negative index of refraction, ability to harvesting or trap light, reciprocal properties and anomalous transmission.

The possible applications make up a list that seems unending – including flat lenses, efficient energy devices, high-performance sensors, medical imaging devices, new components for communications technology, and camouflaging structures.

“There’s a pretty large cohort of scientists globally now in this space recognizing that by digging a bit deeper into the fundamentals, we can understand light-matter interactions more profoundly and in a more useful way that will enable us to design new generations of man-made materials for future technology development that will have a major impact,” Fiddy says.

Fiddy’s research at UNC Charlotte initially centered on the imaging side, aligned with his service as the founding director of UNC Charlotte’s Center for Optoelectronics and Optical Communications from 2002 to 2010.

He and colleagues developed algorithms they found had implications for metamaterial research. “One of the projects we focused a lot of attention on was developing new materials to help you image things with higher resolution, such as a superlens that allows

imaging with greater precision,” he says. “That’s what led to me getting involved in these artificial or engineered materials.”

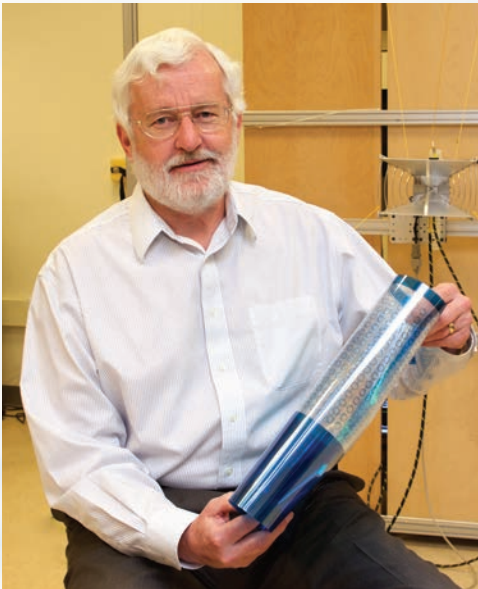
The ongoing theme of most of the work now centers on understanding how to better code information onto light waves and then decode it using these engineered materials, to see objects or transform how they appear, he says.

“We’ve worked on modeling how microwaves or light interact with structures to try to determine what those structures are,” he says. “Some of the work has led to us realizing that if we can make measurements from some object that let us figure out what that object was, then we can design objects that lead to certain scattering measurements, that lead to certain observations that we want.”

As they engineer the materials, the researchers determine how the material behaves when they illuminate it. They use that data to refine the engineering design process to further modify the material’s properties.

“We’re continually going through this loop of modeling how light interacts with and propagates through engineered structures and then figuring out from how it responds and how to engineer or make something better that does what I want it to more effectively,” Fiddy says.

With the metamaterial design process, scientists can create artificial materials that at optical frequencies rather than lower frequency microwaves necessarily includes engineering structures with features on the nanoscale.



“As you make these structures smaller and smaller, that automatically gets you into nanotechnology,” Fiddy says. “It’s an exciting area where electrical, optical, and mechanical properties become hard to distinguish, and where there’s a whole lot that’s unknown, because these seemingly unrelated phenomena all connected.”

In August, Fiddy received \$542,662 in funding from the DOD DA Army Research Office for a Nanoscribe 3D printer for the fabrication of nano structures, especially those designed as metamaterials for use in the Infrared range. This fabrication tool will assist with developing inverse methods for improved metamaterial designs and will also be used to

experiment with low refractive index polymers as the printing medium.

In his four decades of research, Fiddy has published two books, 14 book chapters, over 150 articles and 360 conference papers. He has been editor-in-chief of the journal *Waves in Random and Complex Media* since Jan 1996 (Taylor and Francis Publisher). He is a Fellow of the OSA, IOP and SPIE and Deputy Editor of OSA’s *Photonics Research Journal*, and is on the OSA’s Board of Directors. He also has been awarded millions in research dollars.

As his research interests broadened, Fiddy stepped down as director of the Center for Optoelectronics and Optical Communications and since 2011 has been site director for the National Science Foundation-funded Industry/University Center for Metamaterials. This center also includes the City University of New York, Clarkson University and industry and government partners who work together on projects of common interest.

The center, and Fiddy’s lab, involve a range of students in the work. He also brings insights from his research into the classroom.

“Professor Fiddy’s work is a synthesis of advanced theoretical concepts and practical fabrication of three-dimensional structures and represents the cutting edge of the field of metamaterials,” says Glenn Boreman, chair of the Department of Physics and Optical Science. “A very significant aspect of his research is that it energizes his

classroom teaching, continually bringing in fresh examples to motivate and illustrate the concepts presented.”

While Fiddy sees that some people feel unsettled by the creation of materials that do not occur in the natural world, he feels no such discomfort.

“We are at a point where we certainly are going to continue to develop increasingly impressive technology,” he says. “We’re going to be able to do more and more. For example, if I want a kind of Star Trek handheld viewer that I can wave over me, and that allows me to see inside my body, I can imagine a way to do that with these wave imaging algorithms and these new materials.”

One lesson Fiddy seeks to impart to students and colleagues is to be unafraid of the future – and also to be confident in re-examining the past and framing the previous research within a constantly emerging new understanding.

“We are rethinking the most basic concepts and the most fundamental concepts we learned as students. By revisiting them and understanding them in a more profound way, we gain new insights.” he says. “When you get down into this region of light-matter interactions with features that are at the nanoscale, there is a lot we don’t yet understand. It’s very exciting.” &

Words and Images: **Lynn Roberson**



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TITAN ARUM

In a significant botanical accomplishment, UNC Charlotte Botanical Gardens staff this summer successfully pollinated a Titan Arum, using pollen from another Titan Arum at Daniel Stowe Botanical Gardens. Now comes a long wait, as it can take up to six months for the berries - each containing two to three seeds - to ripen. If ripe seeds are produced, the Titan Arum will die off, while the seeds are planted and germinated, with hopes of blooms in eight to 12 years. Learn more: gardens.uncc.edu.