

SUMMER 2015

EXCHANGE



PUBLIC HISTORY

Alumni Help Research, Interpret the Past



UNC CHARLOTTE
College of Liberal Arts & Sciences

TABLE OF CONTENTS



The College of Liberal Arts & Sciences
UNC Charlotte
9201 University City Blvd.
Charlotte, N.C. 28223
clas.uncc.edu | exchange.uncc.edu

Editor Lynn Roberson, assisted by Taryn Walls.

Designer Irina Bakalenko, assisted by Seul "Misty" Lee.

Additional Assistance: Skye Allan.

Send comments or story ideas to lynnroberson@uncc.edu.

5,000 copies of this public document were printed at a cost of \$1.26 per piece, for a total cost of \$6,289.

About the Cover:

People nationwide are researching and preserving the early 20th century Rosenwald Schools, including these in Stanly County. Images courtesy of Julie Hawks, from the Fisk University collection.

1	Dean's Letter
2	News Briefs
4	Producing Childhood Anthropologist's Research Uncovers Ideological Differences
6	Seniors in Crisis Helping Those Who Are Raising Grandchildren
7	Global Perspective Student Makes Connections In Germany
8	Bearing Witness Students Learn Lessons From the Holocaust
10	Venturing into the Unknown Ugandan Trip Takes Student Outside Comfort Zone
11	A Moral Imperative Research Explores Educational Opportunity
12	Public History Alumni Help Research, Interpret the Past
15	American Possessions Fighting Demons in the Contemporary United States
16	A Knotty Problem Unlocking DNA Secrets to Combat Deadly Diseases
17	Tiny Scale, Big Impact Harnessing Energy With Quantum Dots
18	Inspired by Nature Energy Research Seeks to Emulate Natural Process
20	Immersive Experience Alumna Researches Ecuadorian Health Issues
22	A Culture of Writers University Writing Project Inspires Collaboration
24	Torture and Terrorists Research Assesses Governments' Terrorism Response

Dear Alumni & Friends,

“There is nothing either good or bad but thinking makes it so.”

— *Hamlet*, II, ii, 249-50

Last Saturday, I attended the Spring 2015 commencement ceremony at UNC Charlotte, my 20th since my arrival at the University in July 2005. As at all commencements, solemn ritual was interrupted by occasional irreverence, students were both giddy and terrified, and faculty were alternately bored with the familiar event and overcome with pride at their students’ achievements. It was a glorious May day.

My role, as always, was that of institutional “congratulator,” the Chancellor’s designee to shake every student’s hand as she or he crosses the stage. I am gradually becoming used to the selfie phenomenon, resigned to the fact that I will be part of many students’ video-captured memories of the day. But, in spite of my discomfort with this kind of remembrance system, I feel honored to play this small part in the transition of our students’ lives, as they take their education in liberal learning into the world, an education that has well-prepared them for their future.

The public misunderstanding of the power of a degree in the liberal arts and sciences befuddles many of us in the College because we see the changes it causes in our students. We understand that immersion into our fields helps to develop individuals who are attuned to cultural difference, who can understand and exploit different rhetorical situations, who welcome challenges, who delight in the process for solving a problem. To be successful in our inconstant world requires resilience and flexibility of mind. It also requires courage and risk-taking, people skills and good humor. Our goal is, as always, to have provided a foundation for these intellectual, ethical, and empathic characteristics for the students who graduated on Saturday. Thinking matters.

Thinking matters—and human connection matters. In my letter for the last issue of *Exchange*, I highlighted the contributions an alumnus and a current student were making on the international stage—an alumnus in Ebola-ridden Liberia and a student in the conflict-torn city of Jerusalem (one of Saturday’s graduates!). Both individuals brought stories back to us about the people they met during these perilous upheavals, reminding us that we all belong to one single human family.

This issue of *Exchange* continues our focus on peoples beyond our borders, as faculty, alumni and students report back from the distant sites of the Marshall Islands, Uganda, Ecuador and Germany. At the same time, local obligations command our attention, in Professor Mickelson’s impassioned account of the need for educational opportunity for all our children, in Professor Brannon’s legacy of developing writing communities in the public schools, in Professor Montoro-Rodriguez’s and Professor Smith-Ruiz’s concern for the “crisis” in grandparent caregiving. Our science and mathematics faculty study and manipulate physical phenomena, sometimes at the most infinitesimal level, in the service of both protecting and improving people’s lives. All of these stories challenge us to leave our comfort zones so that we can better understand ourselves and others.

As a Shakespearean scholar, I need to note that I have taken the epigraph for this letter totally out of context. In Act 2, scene 2, Hamlet, the undergraduate student on leave from Wittenberg University, one of the great universities of Renaissance times, toys with his so-called friends, Rosencrantz and Guildenstern, whose intellects are no match with that of their brilliant colleague. But my intent in de-contextualizing this quote is to call attention to the fundamental principle invoked by the witty prince—the power of thinking in creating reality, in creating a world, in molding the future.

At this point, it is difficult to foresee whether or not the selfie phenomenon will perpetuate. That graduates from the College of Liberal Arts & Sciences understand that thinking matters is a surer bet. &



Nancy A. Gutierrez

DEAN NANCY A. GUTIERREZ
COLLEGE OF LIBERAL ARTS & SCIENCES

News Briefs

“These faculty help students understand that their capacity for success is constrained only by obstacles of their own invention. This is the power of a liberal arts education.”

– Dean Nancy A. Gutierrez

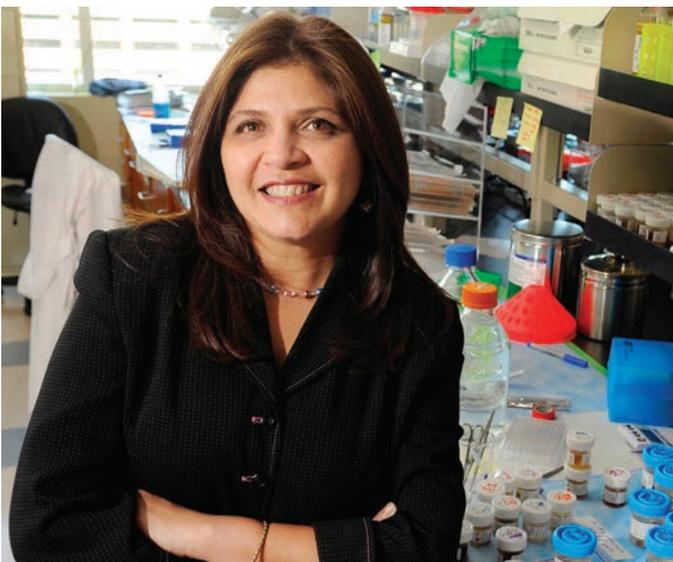
1

Researcher Named National Humanities Center Fellow

UNC Charlotte researcher Akin Ogundiran has been named a Fellow at the National Humanities Center for the upcoming academic year, in one of the most competitive fellowship programs in the country. He will join 36 other distinguished scholars from 32 institutions across the United States and eight foreign countries working on a wide array of projects.

With his fellowship, Ogundiran will pursue a project focused on Cultural History of the Atlantic Experience in the Yoruba Hinterland (West Africa), ca. 1550–1830. He is the second member of the UNC Charlotte faculty to be selected as a Fellow at the National Humanities Center.

Ogundiran serves as chair of the Africana Studies Department, and as Professor of Africana Studies, Anthropology and History. As a cultural historian, ethnographer and archaeologist, his scholarly interests and publications focus broadly on emergent societies in Atlantic Africa and the African Diaspora over the past 700 years. These include the topics of community formation, landscape history, materiality, rituals, sacred grove and empire. He has also written on historiography, black intellectual thoughts and cultural heritage issues.



2

Cancer Researcher Mukherjee Honored With Board of Governors’ Highest Faculty Award

Distinguished cancer researcher Pinku Mukherjee was honored with the O. Max Gardner Award – the highest faculty accolade given by the Board of Governors of the University of North Carolina. She was presented the honor formally on Friday, April 10.

The award, established by a provision in the will of Gov. O. Max Gardner, recognizes UNC system faculty members who have “made the greatest contribution to the welfare of the human race.” It is the only award for which all faculty members on the 17 UNC campuses are eligible. The honor, given annually since 1949, carries a \$20,000 cash prize.

As the Irwin Belk Endowed Professor of Cancer Research at UNC Charlotte, Mukherjee is transforming the ways in which cancer is diagnosed and treated. She has designed innovative approaches to more accurately detect breast cancer early and is developing targeted therapy and imaging for pancreatic, ovarian and colon cancers. Her appointment is in the Department of Biological Sciences in the College of Liberal Arts & Sciences.

3 College Honors Faculty with 2015 Teaching Awards

Janna Shedd, Tonya Bates and Robin James have received the College of Liberal Arts & Sciences' 2015 Teaching Awards for their dedication, teaching and research contributions and lasting impact on students.

"These faculty members help students understand that taking risks is part of intellectual and emotional growth," said Dean Nancy A. Gutierrez. "They help students understand that their capacity for success is constrained only by obstacles of their own invention. This is the power of a liberal arts education."

Shedd of Religious Studies received the College's Award for Outstanding Teaching by a Part-Time Faculty Member. Bates of Biological Sciences received the College's Award for Outstanding Teaching by a Full-Time Lecturer. James of Philosophy received the College's Integration of Undergraduate Teaching and Research Award. The College also honored finalists for each award.

The two finalists for the Outstanding Teaching by a Part-Time Faculty Member Award are Allison Hutchcraft of English and Lawrence Blydenburgh of Criminal Justice and Criminology. The two finalists for the Outstanding Teaching by a Full-Time Lecturer Award are John Taylor of Mathematics and Statistics and Sue Hodge of Criminal Justice and Criminology. The two finalists for the Integration of Undergraduate Teaching and Research Award are Joe Kuhns of Criminal Justice and Criminology and Paula Connolly of English.



4 College Home to Two of UNC Charlotte's Three NSF Graduate Research Fellows

Physics major Jennifer Kassel and computer science and mathematics major Jonathan Knighten have received two of the three National Science Foundation Graduate Research Fellowships awarded to UNC Charlotte students for 2015.

These highly prestigious awards recognize and support outstanding graduate students who are pursuing research-based master's and doctoral programs. The research fellows receive a \$32,000 annual stipend for three years within a five-year fellowship period. They also receive a \$12,000 cost-of-education allowance and professional development opportunities.

During their time as undergraduates at UNC Charlotte, Kassel and Knighten have found opportunities to conduct hands-on research while also helping others through volunteerism focused on science and technology.



5 College Faculty Named Fulbright Scholars

UNC Charlotte professors David A. Johnson and Alan Freitag have been named Fulbright Scholars, extending the College's focus on global research.

Johnson will conduct research in London, examining the 20th century effects of British cemeteries and memorials in India. He will complete a book tentatively titled *Death at the End of Empire in India*. Johnson will also teach classes at Regent's University, focusing on colonial and transnational history. This will fulfill a Fulbright mission of broadening cultural awareness by placing fellows in teaching, learning and creative positions.

Freitag will travel to Poland; this is his second Fulbright award. He will be based at the Poznan University of Economics, where he will teach public relations courses, conduct research and give lectures at other universities in Poland. With his 2012 Fulbright, Freitag and colleagues researched Polish businesses and organizations and created focus groups and surveys, the purpose being to connect the effective internal communication of employees with productivity, profitability, and success of the organization.

UNC Charlotte is one of the top producers of Fulbright Scholars, according to an article in *The Chronicle of Higher Education*. This is a significant achievement, ranking UNC Charlotte alongside other such institutions as the University of California Berkeley, the University of Georgia and the University of Michigan. The Fulbright Scholar Program is sponsored by the U.S. Department of State and administered by the Council for International Exchange of Scholars.



PRODUCING CHILDHOOD

ANTHROPOLOGIST'S RESEARCH
UNCOVERS *IDEOLOGICAL DIFFERENCES*

"I want others to realize that people are both amazingly the same and amazingly different. We live in such a multicultural world, and we have to come to understand that people are different and not judge them for that."

-- Elise Berman



Living on a remote outer atoll in the Marshall Islands for a total of 26 months has given UNC Charlotte anthropologist Elise Berman the up-close and personal perspective she needs to conduct her ethnographic work.

“I work on the relationship between language, age and exchange with a focus on comparing children and adults,” Berman said. “When I was in graduate school, I knew I wanted to work with children. I also knew that to understand how culture is produced, you have to look at children because they are the people who learn culture.”

Berman decided that to truly grasp how childhood is produced in the Marshall Islands, she should spend extensive time with the children and their families. For extended periods in 2009–2010 and in 2012 she lived among the 250 islanders in a village she calls Jajikon.

A linguistic, cultural and psychological anthropologist, Berman has uncovered important differences between Western and Marshallese ideologies of childhood and language. Her research has resulted in two papers published in 2014 in *The Journal of Linguistic Anthropology* and *American Anthropologist*. She is also working on a manuscript for a book, provisionally titled *Producing Age: Children, Deception, and Avoiding Giving in the Marshall Islands*.

The National Science Foundation, the Society for Psychological Anthropology, the Notre Dame Institute for Advanced Study, UNC Charlotte and the University of Chicago have supported her work. She has received a highly competitive Hunt Postdoctoral Fellowship from the Wenner-Gren Foundation for Anthropological Research for 2015-2016; this is her second grant from this foundation.

While in the Marshall Islands, Berman interviewed and observed adults and children. She also recorded them and analyzed their naturally occurring conversations. She regularly videotaped eight children between the ages of 8 and 12 years, often using a novel method that she calls Passive First-Person Recording. In this method children wore cameras on their heads and recorded what they saw and heard. She observed adult-child interactions as well as interactions between peers.

She originally planned to focus on “deception among children” in the Marshall Islands, meaning “what deception is, how it differs from that of people in the U.S., and why people spoke differently,” she said. “Then, when I got there, I realized that most of the things that people lie about – and their definition of a lie is different

from that of many English speakers – concern giving, when they don’t want to give or have things that they are trying to conceal from other people.”

She realized that age is central to economic functioning in the Marshall Islands.

“Children are allowed to do certain things that adults are not,” she said. “Adults there have to give to everyone; this means that they cannot carry anything around the village because if they did they would have to give it away. Since children are immature social actors they are not subject to these responsibilities. They are not seen as responsible for what they are carrying or what they are saying. They can carry things around the village. They can say things that adults cannot, they can refuse to give, and they can lie.”

She argues that these child-specific ways of interacting are socially produced and that children are socialized into immaturity. This serves as a central mechanism of socialization. Seemingly paradoxically, by doing things that adults should not, children eventually learn more mature ways of speaking and giving. Her research challenges and modifies theories of exchange, deception and socialization as they relate to economic and linguistic anthropology and the anthropology of childhood.

People in the West tend to assume that children are naturally direct, her research suggests. Similarly, the Marshallese say that children do not hide.

“I argue, in contrast, that Marshallese children are taught to be direct,” she said. “That directness is learned rather than instinctive, cultural rather than a natural part of childhood. I studied directness because of my interest in deception; through looking at deception I started thinking about directness and indirectness.”

She infuses lessons from her Marshall Islands experience into the classroom. “I want to make the strange intelligible to my students and show that their way of doing things is not the only way,” she said. “The best way to get students to understand is to tell stories. When I tell stories I can see that people start to listen and get what I’m trying to teach them.”

While anthropologists and students rank high among those she hopes to reach with her work, she also seeks a broader audience.

“I’m trying to write my book in a narrative form so that every chapter tells a story so it will be accessible to a wider audience,” she said. “For example, Chapter One follows the story of Pinla, a young first-time mother, whose grandfather asked to adopt her child. I use this story to talk about the culture of giving and exchange in the Marshall Islands and get readers to understand how people are expected to share everything, including their children.

“People generally find the fact that Marshallese parents are obligated to give their children away shocking, even though such practices of child circulation are common in many places throughout the world and reflect a different understanding of kinship and ownership. Ultimately, I want others to realize that people are both amazingly the same and amazingly different. We live in such a multicultural world, and we have to come to understand that people are different and not judge them for that.” &

SENIORS *in* CRISIS

Helping Those Who Are Raising Grandchildren

In the sunset of their lives, many grandparents, especially grandmothers, find themselves raising their grandchildren. Meanwhile, the children's parents struggle with poverty, mental illness, incarceration, physical illness, neglect and abuse, addiction, death and other problems. UNC Charlotte researchers, including Julian Montoro-Rodriguez and Dorothy Smith-Ruiz, seek to help these seniors deal with these mounting issues.



"I realized that grandmothers have this component of multiple problems where they don't have the support of their own family and may feel bad about the whole situation because their own children aren't able to take care of their grandchildren," said Montoro-Rodriguez, director of the University's Gerontology Program.

Montoro-Rodriguez began his research and programs to assist custodial grandmothers while at California State University, San Bernardino. With his move to UNC Charlotte late last year, he is building on his previous work. Montoro-Rodriguez has published on the issue of intervention programs to improve the parenting skills of custodial grandmothers and has a forthcoming publication on the impact that coping resources have on the custodial grandmothers and grandchildren.

"If we could train grandmothers to increase their informal support and have an action plan for them to sit down with someone and plan out activities, would they build the skills and knowledge needed to find and request help?" Montoro-Rodriguez said.

Studies show grandmothers who are custodial caregivers experience higher levels of stress compared to grandmothers who are not raising their grandchildren.

"It is a stressful situation for the whole family," Montoro-Rodriguez said. "Grandmothers are so overwhelmed because they have competing demands, with their children, grandchildren and their own personal needs. The temptation for them is to give up."

He has developed programs that alleviate stress for grandmothers. The programs focus on refreshing parenting skills, while implementing planning and self-management skills. These programs bring the seniors up-to-date with methods of communicating with grandchildren and professionals.

"We have this framework that uses selection, optimization and compensation," he said. "This model allows grandmothers to select some of their priorities and optimize the best way to get them accomplished. This is tailored to the needs of the person and it gives them a skill that they can implement themselves."

UNC Charlotte researcher and Africana Studies professor Smith-Ruiz is also researching the issue of grandmothers as custodial caregivers. Her broad research focuses on attributes of African American family life and the effect of structural issues on families over time.



This particular aspect of her research focuses primarily on how caring for grandchildren full-time affects the daily lives of grandmothers. Her research areas include depression, physical health, social support, incarceration, religious views, needs assessment and family values. Recently, she completed a study on needs assessment of grandmothers in Charlotte in collaboration with the Department of Health and Human Services. The results will be used

advise Social Services when developing programs to assist grandparents.

"African American grandmothers have played a major role in the socialization of children and the stabilization of families," Smith-Ruiz said. "The strength and resilience of African American grandmotherhood is embedded in her ability to withstand economic and social challenges, her ability to perform multiple roles, her unconditional love of family, and her strong religious beliefs."

Despite the unique circumstances of caregiving, financial hardships, health problems, and lack of social support, African American grandmothers have been a steady and supportive connecting link for their grandchildren, she said.

"Although the majority of grandparents take pleasure in caring for their grandchildren, some reported being overwhelmed by the burdens of childcare responsibilities and did not enjoy the experience," she said. "In spite of their mixed feelings about caregiving, grandmothers generally assumed care of their grandchildren because of a deeply felt sense of obligation, the need to keep their grandchildren out of the system, the need to control proper upbringing, and the need to care for others."

She is particularly concerned about the impact of incarceration on families headed by grandmothers. The drastic increase in incarceration among black people since the 1970s has caused researchers and scholars to question how this pattern is affecting families and the wellbeing of children.

A forthcoming book by Smith-Ruiz will analyze how the recent recession has changed the structure of African American families; many of these are headed by grandparents. The book will be published by Greenwood/Praeger (Connecticut), 2016.

The need for society to better understanding the positive impact grandparents have on their families and the broader community – often with great cost to their own finances and mental and physical health – drives these researchers to continue to seek solutions and understanding. &

Words: **Michael Eccles** | Images: **Courtesy of Julian Montoro-Rodriguez and Lynn Roberson**



GLOBAL PERSPECTIVE

Student Makes Connections In Germany

Dozens of UNC Charlotte students have studied in Germany and built relationships with the German community, through a strong partnership between the German program in the Department of Languages and Culture Studies and the German community. One of these students, Kyle McLain, shares thoughts about his experiences.

Q: Why did you choose German language, history and culture to study?

A: During my undergraduate studies, I was a member of UNC Charlotte's Air Force ROTC program and by my junior year held a contract with the United States Air Force. I knew the ability to speak German could be useful. While I did not go through with my military service, I still maintained a profound interest in German history and culture, especially that of the 20th century.

Q: How did the faculty and staff of the German program prepare you?

A: Without the financial support of the German program at UNC Charlotte and the German Language and Culture Foundation, I would have never been able to study abroad. My mentor and professor, Anabel Aliaga-Buchenau, guided me through research in archives in Vienna, helped organize

my timeline, offered me insight into my ignorance of foreign culture and the logistics of traveling, and even had relatives generous and kind enough to host my stay in Germany.

Q: How are you using German in your everyday life?

A: Currently, I am a student in UNC Charlotte's graduate history program with a concentration in German history. This summer I will serve as a graduate research assistant working for the International Tracing Service at the United States Holocaust Memorial Museum. When I am not working, I plan to comb through the Museum's Archive Branch to find source material related to my master's thesis concerning the international hunt for Nazi fugitives from the aftermath of the Holocaust to the present day. Given that a large majority of the documents are in German, I will need to rely heavily on my German skills. In my daily life, I listen to German music, keep up with German news and enjoy German art, enterprise, architecture and culture.

Q: How has studying abroad changed your perspective on life and other cultures?

A: My experiences and those of friends who also have studied abroad made me reconsider

my cultural perspectives, as I gained a glimpse from different viewpoints. Now I live my life with a greater appreciation for what makes us all human, no matter from what point on the globe we come.

Q: What advice would you give students who want to study abroad?

A: Stay open to and seek out opportunities even if they look like they are overwhelming. Once one door opened for me, dozens more opened as a result. Now I get to tell my friends about how I rode in a BMW at 120 km/h on the Autobahn and how I hitchhiked with a friend from Cologne to Hanover. I describe how on my first day in Germany, I witnessed a man who had just received his Ph.D. climb a 20-foot statue and kiss it dressed in a full tuxedo and top hat, while giving out champagne and flowers. I tell people about the awe that I felt standing inside the massive cathedrals that I toured throughout Europe, and the exhilaration and nervousness that I felt leaving the European Union at the Serb-Hungarian border and visiting the Valle de los Caidos on the periphery of Madrid. I remember standing over Francisco Franco's gravesite in an unbelievably large monastery residing within a mountain. Most importantly, I tell them about the friendships that I formed and how I never again will feel ignorant or isolated from the rest of the world. &

Words: Kyle McLain, with Darien Talley | Images: Courtesy of Kyle McLain



BEARING

Students Learn Lessons From the Holocaust

Atrocities can start with seemingly insignificant acts.

UNC Charlotte students have learned this painful, yet powerful lesson through their in-depth study of the Holocaust. As scholars in the course "Bearing Witness to the Past: A Journey to Auschwitz," they have traveled to the death camps of Auschwitz and Krakow. They have studied the photographs of the dead and read their names. They have seen the mute mountains of surrendered belongings – the shoes, the battered suitcases, the eyeglasses.

"We can't fathom that six million Jews, plus several million others, were tortured, shot, starved, gassed," said student Liz Roberts. Yet, these students have gained a deeper understanding of what the raw numbers mean through the trip conceived, organized and led by Judy LaPietra, a part-time faculty member in the Department of Global, International & Area Studies (GIAS).

These rails lead to Auschwitz-Birkenau.

WITNESS



UNC Charlotte students view photographs of Holocaust victims.

Personal connections breathe life into the statistics found in the research materials, as the course focuses not only on the history of the Holocaust but also on the history of the Jewish people and their oppressors.

“I believe that it is imperative that other cultures be studied, because education and knowledge are two of the best tools to combat genocide and human rights abuses,” Roberts said.

To prepare for the trip, students received access to a website created by the Shoah Foundation, which hosts thousands of testimonies from survivors of the Holocaust. Students were asked to complete projects on individual survivors.

“The students learn about the individual lives of people who had loved ones, had homes and jobs and hobbies and dreams,” said John Cox, an associate professor in GIAS, which organizes the Auschwitz course and trip. Cox specializes in holocaust, genocide and human rights issues and administers a minor in those topics.

For Roberts, the research material provided an important first step towards understanding, although incomparable to traveling to the death camps. “The testimonies and video

projects were amazing,” she said. “But they were only a tiny window into what I would see and how I would feel once I got there. I don’t think any activity, assignment or course material can prepare you for the emotional impact of the camps.”

Cox and LaPietra accompanied the students on the spring 2013 and 2014 study abroad trips; LaPietra led the most recent trip in March 2015. Throughout the trips, the professors reminded the students of the loss of individual lives and of the devastating impact on civilizations and cultures.

“We should feel indignation and compassion and avoid being academically removed,” Cox said. “At the same time, we need to go beyond the utterance of platitudes, such as ‘Never again,’ and ineffectual hand-wringing.”

In past trips, students have visited the Plaszów concentration camp, which was established in 1942 as a forced labor camp for Jews and where thousands perished. From there, students traveled to the town of Oświęcim, the site of Auschwitz, the largest concentration camp and the site of the murder of over 1 million people. Students toured the sites and attended workshops and presentations, one of which included a Holocaust survivor.

Sarai Olivar Garcia, a UNC Charlotte international student from Madrid, Spain, traveled on the 2013 trip. For her, hearing witness testimony drove home an important lesson.

“The whole point is to make others understand that the Nazis were human beings just like us,” she said. “We learned that you and I could have been the German woman who refused to host a Jewish family in her house and abandon the victims to their fate.”

The students process what they have learned by writing papers, creating photographic essays and a book of their images and by making presentations in the community, including to Jewish organizations.

As she has considered the impact of the research and the trip abroad, Roberts has found herself more attentive to the meaning of actions around her.

“Genocide and human-rights abuses can start small, so be watchful, pay attention,” she said. “Don’t believe something about another person or group of people just because it seems like everyone around you does. Do your own research, question things—be aware. Don’t always listen to the news and media. Speak out for those who seem to have lost their own voice and for those who still have one. When something is wrong, say it’s wrong. Don’t be a bystander.” &

Words: **Amory Drew Quentyn** | Images: **Courtesy of John Cox**

*Autumn
Anderton
and her host
Rebecca
Abitimo
Odongkara,
or Mama, in
Mama's home
country.*



VENTURING *into* *the* UNKNOWN Ugandan Trip Takes Student Outside Comfort Zone

Some people are afraid to travel to African countries because they fear the dangers of traveling there and the differences they will find. Yet, I have never felt safer, nor more welcomed, than I did during my study abroad trip last summer to Uganda and Rwanda.

While there certainly can be danger in Africa, a possibility of danger exists everywhere in this world. That should not stop anyone from experiencing spectacular cities like Kigali or meeting amazing people like those I met in my travels, especially Rebecca Abitimo Odongkara.

Mama, as Mrs. Odongkara is known, is one of the most amazing and exceptional women I have ever met; she is a grandmother, a teacher and now a dear friend. I stayed with her family in Uganda. She welcomed me into her home with the same generosity she shows her community.

During the reign of dictator Idi Amin in the 1970s, Mama was exiled to the United States, where she raised a family. She later decided to go back to Uganda to help others. She returned to Gulu, her hometown, during a time when her community was torn apart by a war between the infamous Lord's Resistance Army (LRA) and the Ugandan government.

After witnessing children pretending to fight in the war, she knew she must take action. She decided to stop the cycle of violence and teach these children, many of whom had been orphaned. She set up a school under a tree, using the dirt around its trunk to draw

and teach the children through the drawings. When she could, she moved the school to an abandoned railway station. After the war ended, she began fundraising for the school, which was legitimized, and the Upper Nile Institute for Appropriate Technology (UNIFAT) was born.

Mama still works at the school, and mentors, fundraises and pays school fees for families who cannot. She recently came to the United States to share her school's story, and I visited with her when she gave a talk at UNC Charlotte.

While I found that Mama and her household are extraordinary, I also learned that many aspects of their daily lives parallel Americans' lifestyles. The children wake up and go to school. They come home and help with the chores – often reluctantly – play games, visit with friends and watch television.

I never would have known of these similarities without traveling to Mama's home country. How can we learn what we share with others, if we never venture outside of what we know? Differences can be scary, but they can be wonderful as well. For example, I learned that I love passion fruit. More seriously, I also learned that the stereotypes we see in the media about countries like Uganda can be wrong.

Mama and I are unlikely friends; she is much older than me, and she lives in a completely different place in our world. However, she loves her community and her



family, and she cares for others, which is something I respect.

We must be courageous and travel outside our comfort zones and into new communities, whether down the road or around the world. We must meet amazing new friends. We must give ourselves the opportunity to learn what we share with others, and we must engage with new ideas. There is no better way to learn about ourselves than spending time somewhere unfamiliar. &

Words: **Autumn Anderton** | Images: **Autumn Anderton (top); Lynn Roberson (bottom)**

Autumn Anderton graduated in May with a bachelor's degree in International Studies with an African concentration. She studied abroad with the School for International Training.

A Moral Imperative



RESEARCH EXPLORES EDUCATIONAL OPPORTUNITY



As a high school social studies teacher in southern California decades ago, Roslyn Mickelson questioned why so many of her African American students did more poorly in her classes than she knew they could.

“I found that adolescents’ achievement in high school is linked to their perceptions of the future opportunity for people like themselves,” said Mickelson, a sociologist of education. “Students who see their family

members receiving a just return to educational investments are likely to do well in school.”

Yet, when her students looked around, they saw little to inspire them. Instead, they witnessed the adults in their lives facing significant barriers to career and income advancement. As a result, they grew cynical about how doing well in school could help them in their futures.

These early observations have driven Mickelson’s life’s work. She has spent the past 30 years critically examining educational organizations and how their policies and practices either perpetuate – or help to overcome – the social and educational inequality associated with race, ethnicity, gender and social class background.

Mickelson’s work has influenced major policy and theoretical debates in the sociology of education. In 2011, she was invited to share her findings with U.S. Education Secretary Arne Duncan.

In 2014, UNC Charlotte named her its second Chancellor’s Professor, an honor that recognizes scholars of international and national distinction who also have accomplished significant achievements within the UNC Charlotte community.

When Mickelson came to UNC Charlotte in 1985, she began her research into the implementation of the U.S. Supreme Court’s desegregation order in *Swann v. Charlotte-Mecklenburg* (1971), under which Charlotte-Mecklenburg Schools operated until 2002.

“Charlotte turned out to be an excellent site for examining school desegregation, urban school reform and educational policy,” she said. “I followed how the school system’s desegregation policies responded to the political demands of the local community, the federal court’s mandates, and the imperatives of changing demographics.”

In 1997, she collected data on students’ school-to-work attitudes and labor force preparation. She also gathered attitudinal data, family background, achievement and educational histories with racially isolated and desegregated schools and classrooms.

“The results of that investigation showed that as CMS desegregated at the school level, it intensified segregation via racially-correlated tracking within schools,” she said. “Importantly, I demonstrated that both segregated schools and racially isolated classrooms had negative effects on academic achievement for black and white students.”

Mickelson has continued to research these inter-related issues, most recently resulting in a book she co-edited with Stephen Smith of Winthrop University and Amy Hawn Nelson, her former graduate student. Harvard Education Press in 2015 published *Yesterday, Today and Tomorrow: School Desegregation and Resegregation in Charlotte*.

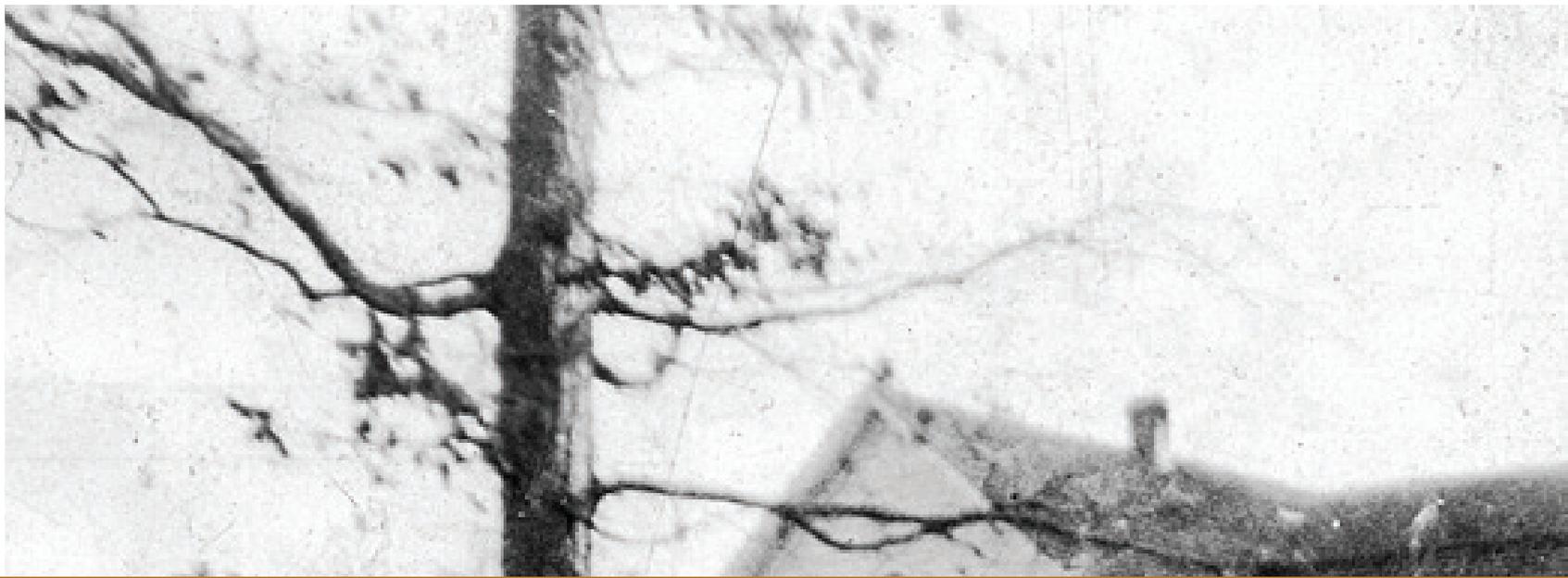
The book examines public education, political economy, race, class and opportunity in Charlotte-Mecklenburg over four decades, a time period that saw segregation, court-ordered desegregation and resegregation of one of the nation’s largest school systems. The book illustrates how past decisions by leaders can create structures in which future decisions and actions occur.

“This book about the Charlotte-Mecklenburg school system’s experiences is relevant to many other localities’ efforts to deal with the complexities of economic development, school reform, improvement, and governance,” Mickelson said. “More importantly, the book also addresses the relationship between educational opportunity and race, ethnicity and social class.”

Mickelson has continued to produce groundbreaking tools and knowledge to help researchers and communities confront important issues of equity. She and UNC Charlotte colleagues Elizabeth Stearns, Stephanie Moller and Martha Bottia are researching the effects of school organizational characteristics on science and math achievement by students, particularly female and minority students in the UNC system.

She also has created the Spivack Archive (Spivack.org), a searchable digital database with almost 600 detailed synopses of social science research. Students, journalists, attorneys, scholars, policymakers and citizens have used the resource, which allows them to consider the issues for themselves, Mickelson said.

“I believe that the moral imperative of U.S. public schooling is to contribute to the creation of a fair and humane society by expanding educational opportunity, especially to those from historically underserved populations,” she said. “The arc of my research during the past three decades has contributed to this end.” &



ALUMNI HELP RESEARCH,
INTERPRET THE PAST



“You can hear the clanging of metal. You can touch the tools they used. With living history, it’s right in front of you.”

-- Nicole Moore

Memories can prove fleeting, particularly in the case of public memory. This is especially critical for African American history, with the loss of historic black businesses, churches, schools and records.

UNC Charlotte alumni who work in the field of public history are helping communities to research and commemorate their collective past, before the memories are lost forever.

Jason Harpe, executive director of the Lincoln County Historical Association, has worked with the community on an African American history initiative, partnering with community leader Robert Hamilton.

“We created the Lincoln County Voices project because we felt strongly that the best way to begin collecting the history of Lincoln County’s African American community was through oral history,” Harpe said. “A relatively large number of elder members of

this community have amazing stories to tell about their cultural experience in Lincoln County. This community has lost so many of the buildings with which it was associated historically, such as houses, community buildings and schools, so it is imperative that we collect this community’s spoken word as one of the only resources available to document their history.”

As Harpe’s colleague in the endeavor, Hamilton has made annual trips to Tucker’s Grove Campground in Iron Station to record people’s stories during camp meetings when thousands of people from neighboring churches gather for two weeks to share in fellowship and worship.

Harpe also has been involved with two Rosenwald Schools in his county, the Mount Vernon school and the Oaklawn school. People nationwide are working to research and preserve these early 20th century African American schools.

From weekends as a teenager working the desk at the Charlotte Museum of History in the early 1990s, Harpe’s interest in public history grew. He earned his bachelor’s degree in history from UNC Charlotte and enrolled in museum studies, a minor then offered in the anthropology department. Harpe also obtained his master’s degree in public history, attending classes part-time.

The ability to explore a diverse range of projects while impacting the community appeals to Harpe. “Most folks care at least a little bit about history,” he said. “We have tons of examples to show that we are actually an asset. We increase tourism. We provide

Images of Rosenwald Schools in Stanly County courtesy of Julie Hawks, from the Fisk University Collection.



An Apple a Day: Nicole Moore and Ryan York interpret a scene.

programming for schools. It's not like we're just a museum that has artifacts on display. We produce things."

Like Harpe, Julie Hawks, manager of the Stanly County Library and Museum in Albemarle, has seen the impact of researching African American history. She studied rural Stanly County's Rosenwald Schools and created an exhibit as one of her first initiatives at the museum. She also has showcased Native American history.

Hawks has found herself translating academic research so that it resonates and connects with a more diverse audience.

"When you're doing straight academic history, you're presenting for a very specific audience who already knows a lot about what you're studying," she said. "For public history, you still have to do that level of research, but present it in ways that relate to the public."

Hawks earned her master's degree in religious studies from UNC Charlotte in 2013 and is currently pursuing her master's degree in public history.

"Public history wasn't even on my radar," she said. "Everything that I read for my own pleasure was philosophy of the mystics or eastern philosophy. But then I took a course on religious studies theory and had to apply a case study on how Americans remember and think about Hiroshima. That led me to public history."

The flexibility of studying two different liberal arts disciplines led her to see connections she might not have before, she said.

"Frankly, the religious studies program changed the way I viewed the world," Hawks said. "What I do in public history doesn't necessarily deal with traumatic memories, but it's still about how we get at a history that doesn't have defined conclusions. Part of this is trying to raise questions about the history and not just say, 'This is the narrative; this is the history.'"

For Nicole Moore, the preservation of history takes a very personal approach. She is one of a small but growing group of slavery interpreters at historic sites throughout the

American South. Now based at the History Museums of Virginia Beach, Moore has traveled to plantation homes and museums to help these institutions find ways to incorporate a painful but vital chapter of American history into their programming.

Moore recalls a day when she and another living history interpreter at Historic Brattonsville finished their depiction of two former slaves reuniting at the end of the Civil War. A woman approached in tears, talking about her relationships with her sisters.

"I realized that she had really understood what we were trying to do and had started to apply the freedoms that she had to the past," Moore said. "We created a moment of empathy."

As a psychology major a decade ago, Moore took a course in digital history. A course project led her to consider how historical sites talked about slavery or avoided the topic almost entirely.

"It was the first time I really started to look at how the historical sites around me were talking about slavery," Moore said. "When you're talking about southern plantation museums, these same visitors who are oooing and awing at the architecture of the place, they aren't thinking about the enslaved man who did the woodwork."

After completing her undergraduate studies, Moore completed her master's degree in public history at UNC Charlotte. Much of her work today focuses on translating the findings of academic historians and making them relatable to a wider audience.

"For most people, there has to be some kind of activity that engages them and engages their senses," Moore said. "You can hear the clanging of metal. You can touch the tools they used. With living history, it's right in front of you." &

Words: **Chuck McShane** | Images: **Courtesy of Julie Hawks and Nicole Moore. (Rosenwald Schools images are from the Fisk University collection. Moore photo taken by Windy Cole.)**

AMERICAN FIGHTING DEMONS IN THE CONTEMPORARY UNITED STATES POSSESSIONS

Shopping malls, self-help books and demons have more in common than people might think, in connections explored through research by Sean McCloud, a professor and director of graduate studies in UNC Charlotte's Religious Studies Department.

McCloud's new book, *American Possessions: Fighting Demons in the Contemporary United States* (Oxford University Press), examines Third Wave spiritual warfare, a movement of evangelicals focused on banishing demons from human bodies, material objects, geographical regions and political parties.

With his research for the book, McCloud studied spiritual warfare handbooks, conducted interviews and reviewed digital resources. He examined Third Wave practices such as the form of exorcism called deliverance rituals, spiritual housekeeping to remove demons from everyday objects, and spiritual mapping, which is looking for the demonic in specific places, such as houses, cities and nation-states.

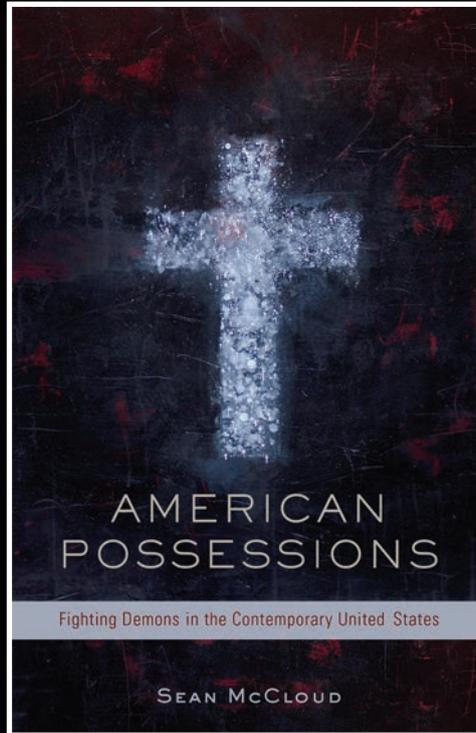
After moving to Charlotte in 2003, McCloud started hearing the language of spiritual warfare more often. Nearly 52 percent of southerners are evangelicals, compared to 27-29 percent of all Americans. While Third Wave beliefs may feel far removed from what some Americans consider "mainstream" religious practice, McCloud's research and recent public opinion polls have found these beliefs to exist more pervasively than some assume.

"Side conversations brought home to me just how common these beliefs are," McCloud said. "It struck me that it cut across variables of class, race, gender and region. Ted Haggard used the language of spiritual warfare. Pat Robertson uses the language when he talks about demons. Sarah Palin used it when she was on the campaign trail."

McCloud's interest in the subject began in the early 2000s after an early morning meeting with a student at Central Michigan University.

"He told me he was tired because he had been up all night; I assumed he had been at a party," McCloud said. "But it turned out he had been on an all-night prayer walk, trying to pray demons out of various places on campus."

McCloud started reading spiritual warfare handbooks and interviewing spiritual warfare practitioners. While he found many different types of spiritual warfare, he grew interested primarily in the



Third Wave evangelicalism style that emerged out of international missionary work in the 1980s.

The researcher identifies three themes in spiritual warfare theology: the focus on demons and hauntings, uneasiness toward consumer objects, and a therapeutic language of "deliverance" that sometimes mirrors that found in self-help books such as *The Secret*.

In contrast to Catholic notions of possession and exorcism, Third Wave evangelicals believe that demons cannot fully control human bodies. Spiritual warfare "intercessors" use "deliverance prayers" to remove the demons from objects and humans.

The objects that evangelicals believe contain demons hold implications for American politics and reflect an attempt to reconcile neo-liberalism with evangelical Christian principles, McCloud's research argues.

"The Third Wave evangelicals write books in support of neo-liberal forms of economics and capitalism," McCloud said. "And they also benefit from it because a lot of their mission work follows transatlantic free trade agreements. But, at the same time that they embrace and benefit from it, there's this ambivalence. The ambivalence comes in the form of demons and how demons are thought to torment humans through generational curses, happenstance encounters and material objects. When a missionary goes somewhere in Southeast Asia, they run up against demons all the time in objects or statues they have brought home. It really shows this ambivalence towards a certain type of international consumerism."

The idea of possessed objects has a powerful and long lasting sway on evangelical followers, he said.

"I interviewed a college graduate here in Charlotte," he said. "His parents were the main deliverance pastors at his church. They prayed over his toys so that they would be delivered from demons. He eventually came to think that demons don't exist in everything. But still to this day, as he walks into a Target past the horror movies, he gets that heightened sense of fear. Mentally, he doesn't believe that there are demons in the DVDs, but he still gets sweaty palms and his heart starts racing." &

A KNOTTY PROBLEM

UNLOCKING DNA SECRETS TO COMBAT DEADLY DISEASES

Sleeping sickness, Chagas disease and other devastating illnesses threaten the lives of millions of people and livestock worldwide, particularly in developing Latin American and African countries. While tsetse fly and other insect bites spread the diseases, the true culprits are parasites that so far have defied efforts to combat them.

One reason for the difficulty in dealing with these trypanosomatid parasites is their unique mitochondrial DNA structure, known as kinetoplast DNA. UNC Charlotte mathematician Yuanan Diao is working with researchers across the country to unlock the secrets of the organisms' DNA.

"When we talk about treating a disease, one approach is to attack its replication process and interrupt it so it cannot reproduce," said Diao, chair of UNC Charlotte's Department of Mathematics and Statistics. His research interests include Knot Theory and Geometrical Topology.

"If you understand the DNA of an organism well enough, then you could develop a drug that actually interrupts this process," he said. "Unfortunately in this case, we still do not understand exactly how this DNA works and how it is replicated. Therefore, we have no idea how to attack it. If there is any hope, understanding it will be the first step. Without understanding, there is no hope."

The DNA in these organisms is organized into a unique network containing several thousand interlocked short circular DNA chains (called minicircles) and a handful of longer circular DNA chains (called maxicircles). The kDNA is confined within a cylinder, called the kinetoplast disk. In that disk, the DNA concentration is comparable to that of the bacterial nucleoid. While scientists have been able to gain some knowledge about the networks, their function and origin are still largely unknown.

Biologists have questioned whether the interlocking circles connect for a reason, or randomly, and the mathematical models Diao has developed help researchers to study this question.

"The numerical evidence we have obtained indicates that, when you have a lot of the minicircles crowded in a confined space like the kDNA disk, it is natural for them to form a complicated network through linking between adjacent minicircles," Diao said. "So, the kDNA probably doesn't really need any other special mechanism for the minicircles to form a complicated network as having been observed by us."

When these results are interpreted in the context of the mitochondrial DNA of the trypanosome, they suggest that confinement plays a key role in the formation of the linked network, that is, the mere fact that there are too many minicircles crowded in a small space would lead to the formation of a complicated network.

Diao has drawn upon work he did 20 years ago, which he published in an academic paper at that time. That paper considered from a pure mathematical perspective how circles contained in a tight space would interact with each other through topological linking. A colleague, Javier Arsuaga of the University of California at Davis, realized the potential connection of that paper and the minicircle network problem in kDNA and approached Diao about collaborating.

"Understanding the kDNA network structure is a huge deal," Diao said. "From a purely mathematical point of view, our research does not produce very deep theorems. However, we are making progress in understanding the kDNA, and our work can have a significant impact." 

Words: **Lynn Roberson**

TINY SCALE -

BIG IMPACT

Harnessing Energy With Quantum Dots

In less than one hour, the Earth's atmosphere, oceans and land masses absorb the same amount of solar energy as the total amount of energy humans use in one year. UNC Charlotte researcher Marcus Jones' lab, the Nanoscale Dynamics Group, is finding ways to efficiently harness this vast source of energy through nanoscience.

"Our research is with a class of materials that are called quantum dots, which are nanoparticles made out of semiconducting materials," Jones said. "This field of nanoscience is all about understanding the physics and chemistry of objects on this size scale."

While the scale is tiny – quantum dots can be about 10,000 times narrower than the width of a human hair – the opportunity they present is enormous. This opportunity relates to one very important property – changing their size changes their color. Therefore, they can be adapted for a wide range of improved devices such as transistors, lasers and LEDs, in addition to solar cells.

The Nanoscale Dynamics Group is taking the understanding of quantum dots and this property a step further.

"When you make a solar cell, you want to make it as thin as you possibly can to reduce losses in the device," Jones said. "When it absorbs light, you want to generate electrons. And those electrons have to find their way through the active layer in your device, so they can go into the rest of the circuit and do electrical work. You want the path the electrons take to be as short as possible, so they don't get lost."



Yet, thinner layers absorb less light. “What we’re trying to do is find a way of pushing more light into our quantum dots,” Jones said. “In other words, making them absorb more light than they otherwise would so that we can use them in thinner devices. To do this, we are using metal nanoparticles.”

In particular, the lab is using gold to fine-tune the electronic properties of the quantum dots.

“When you put a little gold nanoparticle next to something you want to absorb light, like a quantum dot, the gold particle acts like an antenna, directing the energy and increasing the amount of light the quantum dot can absorb,” he said.

The team, including graduate and undergraduate students, measures how metal particles and quantum dots interact with each other in the presence of light. “In particular, we want to understand how the excited states of metals and quantum dots can interact with each other to either enhance the amount of light being channeled into the quantum dot – which is good for a solar cell – or enhance the amount of light being emitted from the quantum dot – which is good for an LED or a laser,” he said.

If they are close enough, energy flows between metal nanoparticles and quantum dots when they absorb or emit light. It is

important to understand this ebb and flow and to figure out the factors that help control it.

“The interactions are complex and depend strongly on particle-particle distance as well as their individual size and shape,” Jones said. “We want to find out what’s the optimal configuration of metal nanoparticle and quantum dot so that we get as big a gain in absorption or emission as possible.”

To do this, the research lab uses laser spectroscopy, in which samples are illuminated by millions of extremely short pulses of light every second. “The laser causes the quantum dots to fluoresce, and we observe how this light emission decays over a certain period of time,” he said. “It is like watching the afterglow after you’ve hit the particle with a little burst of light. What we are measuring happens on nanosecond timescales, or billionths of a second.”

They repeat the spectroscopy experiments hundreds of times on a range of different sample configurations, to better understand and document distance and material dependence and other fine details.

After all, no detail is too tiny to ignore when researching these powerful quantum dots. &



Marcus Jones is an assistant professor in the Department of Chemistry and a faculty member with the Nanoscale Science Ph.D. Program. He earned his doctoral degree at Cambridge University. To fuel his work, Jones received a highly competitive National Science Foundation Faculty Early Career Development (CAREER) award in the summer of 2014. These most prestigious awards support junior faculty who exemplify the role of teacher-scholar.

Words: **Tyler Harris** | Images: **Lynn Roberson (Marcus Jones) and Jon Merkert (Laser)**



INSPIRED
by **NATURE**

Energy Research Seeks to Emulate Natural Process

Plants soak up the sun's light, converting its energy to the fuel they need through a clean and efficient process.

UNC Charlotte chemist and nanoscale science researcher Michael Walter is seeking ways to replicate in his lab what plants do naturally.

"We take our inspiration from nature because nature has developed molecular systems that are really good at absorbing light and transferring that energy from one place to another to do useful work," Walter said. "It's all about light absorption and transport."

Nature accomplishes the task of solar energy conversion by using molecular systems to direct photoinduced reactions that ultimately store solar energy in the form of chemical bonds.

"We try to mimic these processes by designing materials that absorb solar photons and efficiently convert them into electricity or fuels such as hydrogen," Walter said.

The ultimate goal is to design an environmentally friendly and sustainable artificial photosynthetic system that uses inexpensive molecular semiconductors and catalysts to convert sunlight and water into clean, usable fuels.

The key to moving the work forward rests on discovering new organic semiconductors and understanding how they work. One process Walter's lab is developing uses molecules called porphyrins in organic solar cells, or third generation photovoltaics. Porphyrins and chlorophyll have a very similar molecular structure and show compelling optoelectronic properties. The porphyrin molecules absorb light and convert the light into energy.

"What we're researching now is how these porphyrin molecules interact with each other," Walter said. "How do they relate to one another; do they stack up in a column, or are they randomly oriented in a device? And most importantly, how do these interactions affect their photochemical properties? We don't know that yet."

The lab is examining how far and how fast excited states – called excitons – move in a thin film of porphyrin molecules before relaxing and losing energy.

To test this, the group synthesizes new porphyrin materials in the lab, and then creates a thin film (20 nm) of purified porphyrin. The thin film is created by dropping a solution of the material on a glass slide that is spinning very fast. Following this the film is enclosed by a glass slide and sealed to prevent oxygen from entering. For the final step, a short pulse of light is directed at the organic thin film to survey how long the excitons hop around.

"To understand the exciton movement, we started adding another set of molecules that quenches the excited state – very, very tiny amounts of quenchers," Walter said.

By simulating the decay with a computational model, the group discovered they were able to change how far the excitons move by changing the molecular structure of the porphyrins.

"It's the first time that this kind of model has been used for the porphyrin systems, and these particular molecules have not been measured before," he said. "It's never been really looked at in this kind

of detail in terms of exciton diffusion." Exciton diffusion occurs during an energy transfer process.

Since his days as an undergraduate at the University of Dayton, Walter has found porphyrins compelling. While his experience as a graduate student at Portland State University supplied him with the foundation for his current research, his post-doctoral scholar experience at California Institute of Technology exposed him to silicon-based materials research.

Between porphyrins and silicon, the latter remains more efficient. However, the efficiencies of porphyrins are also improving, as research teams such as the Walter group explore the dynamics of porphyrin molecules.

"Porphyrins are exciting because of their similarities to chlorophyll and the unlimited number of porphyrin molecular structures yet to be investigated," he said.

The work by Walter's group has yielded several papers, including one in the Royal Society of Chemistry's *Journal of Materials Chemistry C* in December and one in *Polymer International* in April.

Walter also collaborates with chemistry and nanoscale science colleague Marcus Jones, who works with the tiny nanoparticles called quantum dots. "We're trying to put them together into systems where quantum dots will actually sensitize the porphyrin and help to increase its absorption and overall efficiency," Walter said.

In another ongoing initiative, the lab has worked with faculty and students from the UNC Charlotte School of Architecture to transform one of the most popular features in most structures — windows — into environmentally responsive, energy producing surfaces.

The interdisciplinary team working on this design, led by Walter and architecture faculty member Mona Azarbayjani, received an honorable mention award in April in the People, Prosperity, and Planet Student Design Competition for Sustainability sponsored by the U.S. Environmental Protection Agency.

With the design, the windows feature thin silicon microwires wrapped in a temperature-sensitive polymer, which causes the microwires to move when the outer polymer layer heats up and expands.

As day breaks and the sun starts to rise, the wires are lying straight, letting in more natural light and allowing people inside a building to see through the windows. As the sun rises and the windows heat up, the outer polymer layer absorbs the heat and causes the silicon microwires to bend. The windows become slightly tinted to provide shade, while the excess solar energy converts to electricity and helps meet the building's energy needs.

"The most obvious impact this work can have, if implemented, is to drive down our CO2 emissions and fossil-fuel usage," said Jennifer Kassel, a team member who earned her bachelor's degree in physics in May 2015. "In the science world, it will open up new avenues of research characterizing such a system and finding ways to optimize it. More subtly, I think it has amazing potential to push the borders of novel approaches to more efficient generation of energy."

The novelty may be in its pointing energy production to a more natural way of thinking. &



"We take our inspiration from nature..."

--Michael Walter

IMMERSIVE EXPERIENCE

Alumna Researches Ecuadorian Health Issues

UNC Charlotte alumna Celia Karp holds a passion for population, family, and reproductive health issues. Karp received a federal Fulbright grant her senior year at UNC Charlotte, which has allowed her to conduct research in Ecuador on the maternal health practices of indigenous Andean populations.

With bachelor's degrees in public health and communication studies, her multidisciplinary undergraduate experience prepared her to take on the challenge of global health equity. During her time at UNC Charlotte, she furthered her knowledge and understanding of these fields through internships with government agencies, including CDC and USAID; private companies; and non-profit organizations.

After graduating as a member of UNC Charlotte's inaugural class of Levine Scholars, she worked at USAID, where she contributed to HIV/AIDS programs in Africa and helped develop and implement communication strategies. As she moves forward in her career, she calls upon her diverse background to support organizations that work to improve population health and well-being in communities around the world. Here, she shares an update on her research.

Q. How is your research progressing?

Since September 2014, the research I have done has taught me so much about maternal health in the Andes Mountains and how the research process works from start to finish. I have become involved in two investigations revolving around maternal and child health.

The first one, which I have helped carry from project idea to implementation, is about spontaneous abortions (miscarriages) that occur within communities living at high altitudes. Our research team is analyzing the relationships among five different factors that could affect miscarriage rates to determine viable solutions to this issue.

The second study, which I have supported just throughout its implementation, is about infant nutrition and the modification of infants' diets to prevent child malnutrition.

Although they are very different, both projects have strengthened my understanding of how to conduct primary, hands-on research and foster relationships throughout diverse, underserved communities.

Q. How are you using your science, public health and humanities skills and knowledge in your work abroad?

I apply the skills I acquired in my public health and communication studies coursework every day during this experience abroad. Whether it is the evaluation of public health issues to understand potential causes of disease and illness or the development of communication strategies in Spanish to publicize our research within participating communities, the analytical, interpersonal, and teamwork skills I developed through UNC Charlotte's BSPH and BA programs effectively prepared me for this work. My Spanish courses and semester abroad in Spain also have enabled me to thrive in this fully immersive experience working and living in Ecuador.

Q. How have you found yourself changed as a result of what you are doing?

As a result of my research in Ecuador, I have developed a stronger interest in indigenous and reproductive health issues. These two dimensions of public health are central to our miscarriages project and have become a focal area for my studies. Additionally, the challenges I have faced throughout our research efforts and the societal struggles I have witnessed during this journey have instilled in me a greater passion for helping establish health equity worldwide through





increased cross-cultural efficiency and effectiveness in the public health field.

Q. What have been some of your most memorable experiences?

My most memorable experiences throughout my research have occurred in the communities where we work. Thinking back to my first interaction with the indigenous community leaders in October, I am reminded of the excitement I felt, and continue to feel, during visits to these remote populations. I am not sure if it is the sincere kindness and generosity of the people, the happiness and beautiful smiles of the children, or my keen interest in learning about this culture, which is so different from my own, that enlivens me the most.

I have begun learning Quechua, the language of the indigenous people in Ecuador's Andes Mountains, which has connected me to these people in ways I never anticipated. Their enthusiasm for my first attempts speaking their language, instead of relying on Spanish-Quechua translators, was a shared excitement that I will never forget.

Another unique moment, which has truly characterized my experience here, was the day the midwives and community health workers provided me with a detailed

demonstration of birthing practices. It was this day, in the midst of feigned vertical births and prenatal crises, that I realized just how diverse maternal and child health issues are around the world.

Q. What do your days entail?

Every day of this Fulbright experience has been different. Some days I am out in the field, venturing with the research teams to communities high up in the Andes Mountains where we collect data for our projects. Other days I am at the Universidad San Francisco de Quito, my affiliate organization here, developing research tools, such as surveys and questionnaires, and strategizing for project implementation and preventive problem solving. My days vary depending on the status of each project and where most support is needed. I have loved the flexibility and versatility of my role and have learned so much along the way. &

Words: **Celia Karp, with Lynn Roberson** |
Images: **Courtesy of Celia Karp**

From left to right:

Celia Karp stands in front of Quilatoa Lake, which fills the crater of an inactive Andean volcano.

A view of the Guápulo neighborhood and Cayambe volcano from where Karp lives in Ecuador.

Karp stands with one of the children from the Guangaje village in which she works.

A C U L T U R E O F W R I T E R S

UNC CHARLOTTE WRITING PROJECT INSPIRES COLLABORATION

To convey a story of sustainability, students in Steve Fulton's Kannapolis Middle School classroom constructed a cardboard city complete with buildings, roads, fences and cardboard people.

Beyond the sustainability story, the carefully crafted city illustrates how teachers and students are breaking down symbolic walls. "Much of what gets taught in school we confine to artificial disciplines, but just about all learning in the real world, academic or otherwise, blurs these lines," said Fulton, a UNC Charlotte Writing Project teacher consultant.

For over 35 years, the UNC Charlotte Writing Project has focused on this type of learning – learning that takes place collaboratively and creatively rather than in isolation. It has been widely acclaimed as an effective professional development program since its inception at UNC Charlotte in 1979. Although it operates independently, it is part of a network of more than 100 sites across the country.

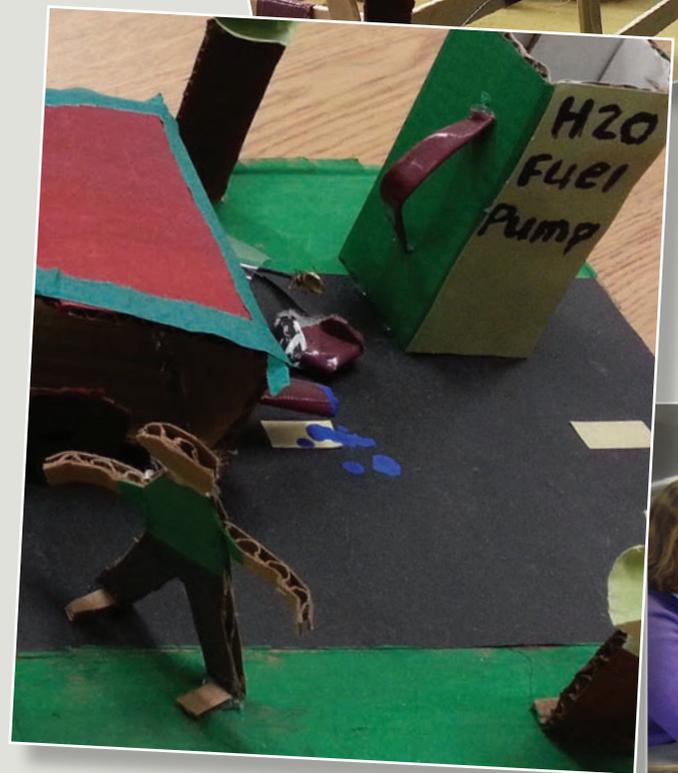
"What the Writing Project does is create a culture of writers," said its Director, Lil Brannon, a UNC Charlotte professor of English and Education.

"It works with students' imaginations, uses their energy, and uses their thoughts and experiences as a kind of foundation," Brannon said. "We help them begin to imagine their writing doing work, not just in the classroom, but in larger communities towards issues of social justice."

When the emphasis in education shifts from a singular focus on testing to one more centered on self-initiated and connected learning, teachers become more engaged and committed, Brannon said.

"Stability in education is very important, for morale of the staff, and for developing a high quality of teachers who are good at working with youth," she said. "Often teachers leave either for more money, or for better working conditions, and it's very difficult to sustain teachers in urban schools."

Teachers who become students in the Writing Project's institutes hone their teaching methods and their own writing, said Lacy Manship, a teacher consultant based at ALC Mosaic and a UNC Charlotte student pursuing a doctoral degree. "Through writing together we not only work through pedagogical issues, but we also actively engage as writers ourselves in the way we ask our students to engage," Manship said.



Students and teachers collaborate in the UNC Charlotte Writing Project, creating products and considering strategies.



Those involved also highly regard children's potential, she said. Teacher consultants are "honoring their ideas, interests, experiences and voices not as cute, not as just in the frame of child development, but as humans making important contributions to an active body of knowledge," she said.

Recently, the National Writing Project and the Association of Science-Technology Centers have founded Intersections to integrate the strong literacy practices with science, technology, engineering, art and mathematics education. UNC Charlotte is partnering with Discovery Place in this innovative effort.

"The project is all about the intersection between literacy and the Make Movement in science," said Robert Corbin, vice president of education with Discovery Place. "It's really about imagination, creativity and wonder."

Intersections seeks to create a network of partnerships that will receive two years of support to explore, design, pilot and refine new initiatives exploring the relationship of literacy and science. The work will take place in formal and informal settings.

Corbin has seen participants realize that the traditional method of teaching subjects as separate, discrete topics is not the only way. "It doesn't need to be for this 60 minutes we're going to teach science, and for this 60 minutes we're going to teach literacy, and for this 60 minutes it's going to be practical "make." It's all those things simultaneously," he said.

"What does teaching need to look like?" Corbin said. "What does what students will do need to look like? What does how I converse and assess my students look like? So, this idea of writing before making, writing during making, writing after making is just fantastic. It's caused both teachers and students and all of us to

be really reflective. We're all learning together, and it's been extraordinary and amazing."

For Fulton and his colleagues at Kannapolis Middle School, Intersections has brought an emphasis on research into their classrooms. For example, Fulton's students document and reflect on their learning through notes and photographs in process logs and daybooks as they write and make things.

"Being a teacher leader isn't about presenting oneself as an expert," he said. "It's about valuing the expertise and desire to learn and grow ... and engaging them in experiences that draw upon the collective to build new knowledge and community."

As the world changes rapidly, and the skills and knowledge needed to navigate the world change, critical thinking has grown more essential, said Gábor Zsuppán, director of school experiences at Discovery Place.

"The world around us is pushing us to think in a more integrated fashion," Zsuppán said. "You have to be willing to ask questions. You have to be willing to be critical. You have to question systems. You have to think about your role in the world and how it works." &

"WHAT THE WRITING PROJECT DOES IS CREATE A CULTURE OF WRITERS. IT WORKS WITH STUDENTS' IMAGINATIONS, USES THEIR ENERGY, AND USES THEIR THOUGHTS AND EXPERIENCES AS A KIND OF FOUNDATION."
-- LIL BRANNON

"THE WORLD AROUND US IS PUSHING US TO THINK IN A MORE INTEGRATED FASHION. YOU HAVE TO BE WILLING TO ASK QUESTIONS. YOU HAVE TO BE WILLING TO BE CRITICAL. YOU HAVE TO QUESTION SYSTEMS. YOU HAVE TO THINK ABOUT YOUR ROLE IN THE WORLD AND HOW IT WORKS." -- GÁBOR ZSUPPÁN



TORTURE *and*
TERRORISTS

Research Assesses
Governments'
Terrorism Response

“There is a great deal of complexity, and if we want to make policy better, we need to understand that complexity.” -- James Igoe Walsh

Allegations of brutal torture and abuse of suspected terrorists by the CIA and the U.S. military have heightened the debate about the effectiveness, morality and frequency of torture in the face of terrorist threats. Research centered at UNC Charlotte offers important insight into the agencies that engage in torture and the conditions under which they do.

The U.S. Senate Select Committee on Intelligence and the U.N. Committee Against Torture have reported an increase in the use of torture since September 11, 2001, when 3,000 people died in terrorist attacks in New York City and Washington, D.C. Yet, their reports leave questions about the conditions under which government agencies view torture as an effective and acceptable response to the threat of terrorist attacks.

In their research, UNC Charlotte political scientists Justin Conrad and James Igoe Walsh and colleagues Courtenay R. Conrad and James A. Piazza address these questions, and find little evidence that governments routinely and pervasively respond to terrorism with torture.

“Human rights are certainly not violated across the board in response to terrorism and external threats,” Conrad said. “Knowing this is key to better identifying the circumstances under which human rights violations occur, and it opens up possible policy solutions to mitigate the amount of torture in which governments engage.”

The researchers have disaggregated massive amounts of data to consider how terrorist attacks affect countries’ human rights conditions. An article detailing their findings, “Who Tortures the Terrorists? Transnational Terrorism and Military Torture,” was published in *Foreign Policy Analysis* in late 2014 and detailed in *The Washington Post* and other media.

One source of data was the “III-Treatment and Torture Data Collection Project,” documenting which agencies in countries worldwide engaged in greater degrees of torture from 1995 through 2005.

“We did the study because we noticed a big contradiction,” Conrad said. “There was plenty of unreliable evidence suggesting governments have tortured as a response to terrorism. However, empirical studies on this found no evidence of widespread torture.”

The researchers contend that the incentives to violate human rights vary across government agencies, and that the type of terrorist attack affects the use of torture.

“We see that the spike of torture is present only in the military,” Walsh said. “Police and prison officials, in contrast, are less likely to view responding to transnational threats as central to their organizational missions, and thus do not respond by increasing the degree to which they torture.”

They also found that this heightened level of torture by the military does not occur with domestic terrorist activity. This is because military forces historically have planned for and defended against external attacks, such as those found in wars, the researchers argue.

“...torture offers an inexpensive, familiar tactic that militaries can quickly implement to gain intelligence necessary for preventing future terrorist attacks,” the researchers state.

The researchers also found that democracies are more likely than autocracies to increase military torture following increases in transnational attack. Evidence suggests that citizens of democracies may be less likely to object to torturing suspected terrorists who are members of “out-groups,” such as foreign nationals.

“Public opinion surveys that had been taken within the United States found that a majority actually opposed torture,” Walsh said. “However, if you link the torture to a threat, the threat aspect increases support for torture, especially when the threat is a foreign threat.”

Countries may take advantage of this by increasing repression at home towards a certain group of people. Indiscriminate repression, directed at the general population, is unlikely to control dissent or reduce terrorist attacks, the study argues.

Lack of oversight is found to be one reason for the government’s engagement in torture. Oversight of military institutions “...may be less robust during times of threat from a foreign source,” providing additional incentives for militaries to use torture when faced with terrorist activities, the study suggests.

The use of torture by U.S. government and intelligence agencies can undermine counterterrorism policies, the researchers contend.

“History has shown that the use of torture can severely cripple counterterrorism and counterinsurgency efforts because it can turn populations against you,” Conrad said. “Reducing the amount of torture, and more importantly, the incentives for agencies to use torture, could ultimately strengthen counterterrorism efforts.”

The researchers plan to continue exploring what the data can reveal about nations’ actions and the potential policy implications.

“Our study is among the first to provide evidence about how torture is used in response to transnational threats,” Walsh said. “There is a great deal of complexity, and if we want to make policy better, we need to understand that complexity.” &

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





College of Liberal Arts & Sciences
UNC CHARLOTTE

9201 University City Blvd
Charlotte, NC 28223-0001

Nonprofit org.
US Postage Paid
Permit No. 949
Charlotte, NC



NATIVE TERRACE GARDEN

UNC Charlotte Botanical Gardens has opened the Mellichamp Native Terrace Garden, a first of its kind in the Southeast. It showcases diverse flora of the region in a home-landscaping style and will serve as a practical example of how gardeners can creatively use a wide variety of native plants in traditional, contemporary or natural landscapes. The garden will serve as a testing ground for new selections of native plants as well as a source of inspiration and education. Learn more: gardens.uncc.edu.

Image: **Larry Mellichamp**