



uncg research

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Research, Scholarship and Creative Activity

A Molecular
Wonderland

Creating a
better future,
at the
nano level

pg. 10

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UNCG'S ROLE AS A RESEARCH UNIVERSITY, as with other research universities of the 21st century, is complex. We are committed to collaborative scholarship, creative activity, innovation and leadership that enhance the quality of life across the lifespan. But increasingly, we are also expected to address other social, economic and environmental challenges in our communities, whether local, regional, national or global. The articles in this issue clearly reflect the increasing complexity of our role as a research university.

The breadth and depth of our work is no more evident than in this year's honorees as Research Excellence professors — Dr. Michelle Dowd and Dr. Cheryl Lovelady. Dr. Dowd's work covers a wide range of topics from early modern literature, including Tudor and Stuart Drama, Shakespeare, early modern women's writing and research, and extending to feminist theory and gender studies. Dr. Lovelady's research focuses on the complexity of women's health including the broader issues of nutrition, exercise and lactation.

Serving the public good has evolved with the rise of globalization as well, creating new mandates for knowledge creation and application for the 21st century research university. The work by Consumer, Apparel and Retail Studies faculty reflects how UNCG is meeting this challenge. With their second grant from the U.S. Department of Agriculture, faculty are training students in international business practices, working collaboratively with several other major universities to develop curriculum components that can be widely used to train students to be competent and competitive in a global industry.

The public research university is now expected to be an economic driver as well. Whether it is the work of Dr. Rick Bunch with the e-NC Authority, bringing broadband access to the state through mobile and fixed wireless propagation modeling, or the policy work of Drs. Holland and Heutel on economics and energy, UNCG is fulfilling this role. This is also reflected in the Joint School of Nanoscience and Nanoengineering (JSNN). JSNN provides a hub for cutting-edge technology and interdisciplinary collaborations with NC A&T State University and with industry. Researchers there are finding a variety of uses for the smallest of particles - from creating a better way to detect mild brain trauma and concussions to creating new materials and new businesses.

Whether it's research that addresses the challenges of working mothers, or identifies best teaching practices to support the development of science identities, or increases self-determination in individuals with intellectual disabilities, UNCG is the research institution of the 21st century, bringing both inspiration and change.

TERRI SHELTON, PHD

Vice Chancellor for Research and Economic Development



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On EAM, or **Exercise as Medicine**

“It’s not really focusing on trying to make better athletes; it’s focused on making healthier people. We think it’s important for society to understand this.” Dr. Joseph Starnes

Dr. Joseph Starnes isn’t on a quest to discover a new drug or net a patent. But his research on heart health for UNCG’s Department of Kinesiology could have wide-reaching implications.

Starnes, who heads the department, recently concluded a study with lab rats involving the interactions of exercise and statin drugs on the heart. Statins, which lower cholesterol, are currently the most widely sold class of drug in the world.

“But they are fairly new,” he said, “and there’s still a lot not known about them.”

Funded by a \$154,000 grant from the American Heart Association, the study found that statins protect the heart by one mechanism and that exercise protects the heart by another.

“Essentially we found that the heart is better protected by doing both, rather than doing just one or the other,” Starnes explained.

One concern about statin drugs is that they lower Coenzyme Q or CoQ, a critical molecule involved in energy production. Consequently, many patients who take statins feel compelled to take a CoQ supplement. “There are a lot of hypotheses that say that if CoQ is down, you are going to get some dysfunction and damage to the heart. But we found that wasn’t the case.”

Although the study found a depletion of CoQ in the rats, the amount was not sufficient to cause any problems to the heart or, importantly, to impair the ability to exercise. “That’s great news. This proves the unfounded notion that you need to supplement your diet with CoQ if you are taking statins.”

Next up for Starnes is another study he hopes will be funded by the AHA, this one looking more extensively at a protein important for heart protection. Called the sodium-hydrogen exchanger (NHE1), it induces damage to the heart when elevated and protects the heart when decreased. Even though it’s such an important protein, Starnes said, no one has studied whether exercise affects its levels.

In a preliminary investigation, Starnes hypothesized that exercise would increase the protein level in rats, but it went down a whopping 38 percent.

“That’s a really great thing,” he explained. “It’s such a large change in such an important protein, we decided it needs to be researched, particularly since it’s an unexplored area in exercise-induced cardio-protection.”

Collaborators on this project are kinesiology doctoral candidate Bryan Feger and biology associate professor Dr. Dennis LaJeunesse.

At age 61, Starnes jogs every other day because he knows it helps protect his heart from cardiovascular disease, the biggest killer in the world.

And ultimately, Starnes hopes his work will have wider implications.

“Exercise is known to help prevent some cardiovascular disease. How it does that is still not totally understood,” he said. “If we could find out what the specific changes are in the heart resulting from exercise, then it could be a very innovative way to greatly decrease health care costs and lead to better therapeutic approaches than just using drugs.”

Taking pride, staying safe

DR. ROBIN BARTLETT hopes to one day develop a community-based intervention program that will help teenage girls avoid the kind of risky sexual behavior that can lead to HIV infection.

Bartlett, an associate professor in UNCG’s School of Nursing, is overseeing her second pilot feasibility intervention study on the topic, this one involving Hispanic middle-school girls and their mothers. Her first pilot involved African-American adolescents and their mothers. The TRIAD Center for Health Disparities funded the studies.

Blacks and Hispanics contract HIV in disproportionately high numbers, and young women most often contract it through risky sex.

The 12-week intervention is designed to decrease risk factors for HIV by educating the girls and their mothers about the disease and providing a service-learning opportunity that encourages the girls to use both the assertiveness and communication skills they have learned, while enhancing their cultural pride.

“What I believe, and what the literature sug-

gests, is that pride in one’s culture may be protective against some negative outcomes, like risky sex,” Bartlett says.

Bartlett’s current study incorporates literature written by Hispanic authors and DVDs that feature Latinas. A Hispanic nurse implements the program. Dr. Terri Shelton, vice chancellor for research and economic development, is co-investigator on the project.

For six weeks the girls meet with the nurse to talk about healthy relationships, good commu-

Protecting their turf

The turf and pasture grass market is far from sleepy. It's a multi-billion dollar industry.

Biology professor Stanley Faeth and chemistry professor Nadja Cech hope their research on so-called "sleepy grass" will further awaken that market. And eventually lead to more effective natural medicines for people.

Their research, which includes studies of native grass sam-



SLEEPY GRASS *Achnatherum robustum* plants, a native grass known for its toxic effects on livestock, shown here in the Lincoln National Forest near Cloudcroft, N.M.

ALL PHOTOS BY DR. STAN FAETH

ples from New Mexico and Arizona, could lead to tremendous benefits for farmers, ranchers and grass suppliers. As a result, the National Science Foundation is funding the project with \$652,000 in federal stimulus money.

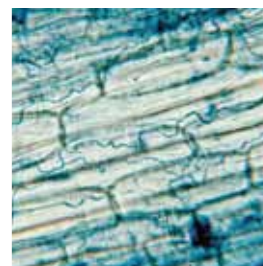
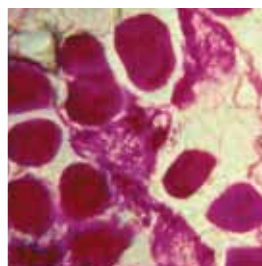
The legendary "sleepy grass" — rumored to freeze livestock in their tracks — is grass infected with certain poisonous fungal endophytes that produce ergot alkaloids, says Faeth. Fungal endophytes are found in all plants; some of these in grasses make alkaloids to protect their hosts from insects and disease. But, as is the case with sleepy grass, these alkaloids also can be poisonous to livestock — and also humans.

Faeth says he and Cech are experimenting with manipulating the plant endophytes to optimize grasses and herbal medicines for different uses. For instance, a pasture would require an absence of toxic endophytes to keep livestock safe, while a golf course would not.

Fungus and plants enjoy a reciprocal relationship, Faeth says. Endophytes generally protect plants from bugs and help plants thrive. Because the fungus is dependent on plant seeds to reproduce, anything that increases plant survival and reproduction also does likewise for the endophyte.

"What benefits the plant benefits the fungus," Faeth says.

Faeth, Cech and chemistry professor Nicholas Oberlies are applying for a separate grant from the N.C. Biotechnology Center to expand their study to medicinal plants like *Echinacea*. What if, they wonder, medicinal plants can be bioengineered to be even more beneficial to human health?



LEFT, a microscopic view of the hyphae, or long, thread-like filaments, in the *Neotyphodium* endophytic fungus growing in the leaf tissue of Arizona fescue, a native grass from Arizona. **RIGHT**, another microscopic view of the hyphae of *Neotyphodium* endophytic fungus — this time growing in the seed tissue of Arizona fescue.

nication and assertiveness. They learn what puts them at risk for HIV, such as engaging in sex with multiple partners or without using a condom.

"We also talk to the girls about how they can self-protect. We talk about abstinence, the only way to really protect oneself from HIV, but then, if you are going to have sex, we talk about safe sex."

Concurrently, the nurse meets with each mother to talk about the challenges their daughters are facing, the factors that put the girls at risk for HIV and how to be a role model for them.

"We talk to the moms about sharing with the girls aspects of their culture that have been really helpful to them," Bartlett explains. "A lot of our intervention encourages open communication with the moms and the girls. Culture is a very important piece."

A second, six-week phase involves a service-learning opportunity that helps the girls put their communication and assertiveness skills into practice. The Hispanic girls are working two hours each week at Head Start. During their sessions,

they might be asked to read a story to a child, lead a group of children in activity or talk to the staff about their jobs.

Bartlett surveys the girls' behavior, their knowledge of HIV and their communication with their moms directly before and after the program and then three months later. Thus far, she's been pleased with the progress of the intervention.

Bartlett's next step is to seek funding for a larger study examining how well the intervention works.

World-wide appeal

Working in apparel requires more than an understanding of fabric and fashion. These days, it means knowing your customer — whether in the U.S. or across the world.

Dr. Nancy Hodges, an associate professor in the Consumer, Apparel, and Retail Studies Program, knows that her students must understand other cultures in order to succeed in the global apparel industry.

In 2007, Hodges, along with CARS assistant professor Dr. Kittichai Watchravesringkan and CARS department chair Dr. Gwendolyn O'Neal, received a three-year, \$327,000 grant from the U.S. Department of Agriculture to develop students' global awareness and cultural competencies. Working with researchers at Iowa State University and South Dakota State University, as well as with industry and government officials in Russia, Thailand and Australia, they produced a series of learning modules, which are available online to any academic institution at no cost.

As researchers talked with government and apparel industry representatives, Hodges said, they kept hearing a common theme: small business is critical to the global apparel industry.

"What we realized is that many of the U.S. companies, even manufacturing companies in apparel and textiles, are classified as small businesses," Hodges said. "The other thing

that we learned is that a lot of these U.S. companies deal with small business all the time in other countries."

In September, Hodges, Watchravesringkan and CARS assistant professor Dr. Jennifer Yurchisin received a three-year, \$466,052 grant from the U.S. Department of Agriculture to build on their earlier work. This project is aimed at developing ways to foster students' entrepreneurial and small business skills from a global perspective. They will work with the same team of researchers at Iowa State and South Dakota State, faculty at Colorado State University, as well as with industry in the U.S., India, South Africa, Russia and Thailand.

"Problems come up all the time in the global supply chain," said Hodges, who directs the project and is a principal investigator. Students may never visit China or India, she said, but they need to learn how to be comfortable picking up the phone and calling a supplier in another country.

"We're trying to marry the global competency piece with being able to be innovative and think creatively to solve problems," she said.

Though the work is just getting under way, Hodges said the research team plans to develop a series of learning modules similar to the one they created for the first USDA-funded project.

The economics of energy

PAINFUL AS IT CAN BE TO THE POCKETBOOK, the availability of affordable and clean energy continues to be one of the most important challenges facing us today. As energy prices creep higher, people are experiencing the law of supply and demand as it plays out every day at the gas pumps or in their heating or air conditioning bills.

Among its researchers, the Bryan School has a pair of economists — **Dr. Stephen Holland** and **Dr. Garth Heutel** — whose work is squarely in the middle of this field.

Heutel has recently completed a study that examines a person's reluctance to pay for something upfront that will have long-term benefits, such as saving for retirement or buying a hybrid car.

"People don't put enough weight on future benefits," Heutel said. "Can we design policy so that we can make people make the right choices?"

His research says policy can be crafted to influence behavior. To encourage people to purchase fuel-efficient hybrid car, the government either could raise the gas tax or set a tax based on the fuel economy of the car.

Holland recently has looked at the effects of the Waxman-Markey Bill, which is also known as the American Clean Energy and Security Act. The bill proposed a cap and trade system, meaning

the government could set a limit on the total amount of greenhouse gases (carbon dioxide) emitted. Companies could then buy or sell permits to emit these gases.

His study, called "Some Inconvenient Truths About Climate Change," calculated how each county would benefit and then looked to see if their congressman's vote correlated to the benefit. It did.

"The Waxman-Markey Bill wouldn't have been as beneficial to ethanol producers as current regulations," Holland said. "Our calculations predict that the bill would have received 47 votes on average in the Senate and would almost never get the 60 votes required to break a filibuster."

Holland was a staffer at the Federal Trade Commission and then a visiting researcher at the University of California Energy Institute before coming to UNCG in 2003. His current research interests include the RECLAIM emissions trading program in southern California and co-firing biomass in coal-fired power plants.

Heutel has been at UNCG since 2009, coming from the Harvard University Center for the Environment, where he was a Kernan Brothers Environmental Fellow. His primary research is in the environmental and natural resources economics and public economics. Other areas include labor, economics of education and economics of nonprofit organizations.



Moving Beyond Academics

Four years ago, the idea of sending students with intellectual disabilities to college seemed hard to imagine. How would it work? Who would pay for it? Where would the students live? How would these students be given the support they needed while teaching them how to live on their own?

This year, the first group of Beyond Academics students graduates from UNCG.

Beyond Academics, which launched in 2007, is giving students with intellectual disabilities the college experience and the skills to live on their own.

The need for such a program is great, says Joan Johnson, executive director of Beyond Academics. The Individuals with Disabilities Act (IDEA) ensures children with disabilities have access to a public education alongside their non-disabled peers. However, the entitlement to services ends at age 21.

"These young adults want to be employed and they want to live independently," Johnson says. "It's a stark reality for the students and families who have invested many years in preparing for a future to seemingly reach a dead end."

Students who are accepted into the Beyond Academics (BA) program go through a substantial application process. Those who are accepted have mild to moderate disabilities such as Down syndrome, cerebral palsy or autism.

The ultimate goal is to leave the program able to live a more independent, fulfilling life. Students in the program typically begin by living in nearby student apartments with other college students.

BA students pursue an Integrative Community Studies certificate. The courses — which include nutrition, budgeting, home management and career development, among others — start simply and grow more complex as they progress. Students are graded based on participation, attendance and progress with goals. To graduate, students must have a 2.0 GPA and 120 credit hours.

For now, 30 students are enrolled in the Integrative Community Studies certificate program.

Similar programs have popped up in South Carolina, Iowa,

Beyond Academics sophomore Jeff Piegari walks through the grocery store with instructor Steffanie Lewis. She lets him make choices and decisions but is ready to offer guidance, if needed.

Florida and New Jersey. However, Beyond Academics is one of only a few public-private partnerships using Medicaid waivers.

"Our model is fairly unique," Johnson says. "The partnership of a nonprofit with a state university to provide equal emphasis on academics and the application to daily lives is pioneering territory."

Administrators are backing up the model with research. They are tracking students' progress in growth and functionality, friendships and a host of other areas as they make their way through this pilot program.

They want to know how BA students are doing in the community and on campus. They want to know what hasn't worked so well and how to change it.

"The outcomes will be key," Johnson says. Administrators hope they will have a model that others will want to replicate.

For now, they can report a number of successes: All students are managing financial affairs with minimal supports; all students are volunteering for, or are members of, community organizations; all are living in apartments, shared homes or student housing with minimal support services; social connections have increased; one student is employed; two have internships with prospective employers; and one student was accepted into an associate degree program at a community college with concurrent enrollment with UNCG.

In the long run, Beyond Academics saves money. When BA students begin their journey, they need about \$50,000 in Medicaid assistance per year, says Dr. Terri Shelton, vice chancellor for research and economic development. When they leave, because of the skills they have acquired, they only need about \$15,000 in assistance.

"And it isn't so much about the money," Shelton says. "It's what that represents."

Johnson agrees. "It's a wise business decision, but what I really care about is the human element," she says. "Every single human being is worth the investment. Everyone wants this to succeed."

“ They also say: ‘My life is proof that Hitler didn't win.’ ”
 Dr. Roy Schwartzman

The testimony of Holocaust survivors and witnesses has been well documented. But because scholars have focused on gathering a definitive record of survivors’ wartime experience, relatively little attention has been paid to how that experience shaped the rest of their lives.

Dr. Roy Schwartzman, professor of communication studies, wants to change that.

"We have very little idea of how these people were crafting their lives as a result of living through the Holocaust," Schwartzman said. "I'm not trying to look inside their heads, but instead I'm seeing what they're offering in their communication that tells us what resources they bring to bear as survivors, as witnesses."

Through his AfterWords Project, he is collecting and analyzing oral histories from North Carolinians who lived through the Holocaust, as well as analyzing testimony collected in archives elsewhere.

His previous academic work on the Holocaust focused on analyzing Nazi propaganda. But a few years ago, Schwartzman asked himself, "OK, what about the other side of this?"

"The world is different after monumental events like the Holocaust," he said. "What do we do with that? And that's where this whole research begins."

Since starting the field work in 2007, he's interviewed more than a dozen North Carolinians, whose experiences range from surviving concentration camps or forced-labor camps to living in hiding or helping others escape the Nazis. He begins every interview with the

same broad question: "Starting with liberation (or the end of your Holocaust experience) how did you get from there to here and now talking to me?"

"And often that's all I need to do," he said.

Schwartzman then looks for common themes and metaphors in the stories that emerge from those interviews. One theme, he says, is that of a "public and passionate patriotism." His interview subjects see being an American as "a way of controlling your own destiny," Schwartzman said.

Through AfterWords, Schwartzman is also developing teacher education materials and a web site. The North Carolina Holocaust Education Research and Outreach, or NCHERO, project will provide multimedia resources that profile survivors and witnesses who settled in the state. It will also have a section devoted to refuting Holocaust denial. In a later phase, it will also include a place where Holocaust educators and others can blog and share information. The project has received grants from the N.C. Council on the Holocaust, and it is also receives support from the N.C. Center for the Advancement of Teaching. UNCG also provides undergraduate research assistants, who transcribe the interviews and prepare field notes of archived testimonies.

"The deadline we're facing here is one of us entering the twilight of that generation," Schwartzman said. "(This) may be one of the last opportunities to gather testimony or update testimony that's already been given and to find testimony that has not been collected thus far."



Finding factors in adolescent suicide

For more than 15 years, Dr. Stephanie Daniel followed the lives of a group of adolescents who were psychiatrically hospitalized following a suicide attempt.

Daniel was a graduate student in clinical psychology at UNCG when she and Dr. David Goldston, now a researcher at Duke University, began this 15+ year longitudinal study. They wanted to understand the factors associated with increased risk for adolescent suicidal behavior.

Of the 180 youths they began following in 1991, 153 remained enrolled in the study until it was completed last year. Most of the participants are now in their mid 20s and early 30s, and some of them now have children of their own. Initially, the researchers met with these adolescents and their parents every six months to conduct clinical interviews and assessments.

"Using longitudinal research methods really allows you to piece together over time an individual story, and to see if there are group differences between the stories," said Daniel, who is now a research professor with the Center for Youth, Family, and Community Partnerships.

"Some of the individuals enrolled in our study did really well over time, so not everybody who came into the study with a history of a suicide attempt remained suicidal," she said.

"That's an important message. For some people, the difficulties they experienced were time-limited."

The adolescents, ages 12 to 17, came into the study with a variety of psychiatric diagnoses, including affective disorders, anxiety disorders, conduct or

oppositional disorders, or substance abuse disorders.

"From our data, we learned that there are a lot of differences in the paths and patterns associated with increased risk," Daniel said. The most common risk factor for suicide is depression. "We've also learned that decreasing someone's immediate distress is not enough to decrease risk over time for suicide attempts," Daniel said.

Their data also indicated that adolescents are at highest risk for another suicide attempt in the first six months after discharge from inpatient psychiatric care. Those who do well over time are those who get effective treatment for their depression and other mental health issues. "They're the individuals who stay with treatment and adhere to treatment," Daniel said.

Using the lessons they learned in the longitudinal study, which was funded by the National Institute of Mental Health, the researchers developed an intervention program for adolescents diagnosed with depression, substance abuse and suicidal behavior. The intervention focuses on strategies for increasing hope and reasons for living, including survival and coping beliefs. It also addresses the immediate stress and crisis and focuses on decreasing depression and substance abuse problems because those increase risk for future suicide attempts, Daniel said.

"Many of the lessons we've learned from our longitudinal research can be applied in a clinical setting for suicidal adolescents," Daniel said.

The work is important because there are few research-based suicide interventions tailored specifically for adolescents, she noted.

OPPOSITE, these woodcarvings and the sculpture used as the visual identity for the project were created by Greensboro resident Paul Gould. Gould, a participant in the AfterWords project, is a forced labor camp survivor.



Powerful prose

Junior Research Excellence Award winner Dr. Michelle Dowd is passionate about British Renaissance literature and what it can tell us about the issues and changing values of early modern society. Her first book, "Women's Work in Early Modern English Literature and Culture," delves into the working roles of women from a variety of sources – from Shakespeare to advice books written by mothers. Her next project will look at inheritance. Dowd joined the faculty in 2004 and is an associate professor in the Department of English.

OUTSIDE THE HISTORY BOOKS What I'm interested in thinking about is not how real women lived, because that's a historian's project, but thinking about what fictional narratives can tell us about what people were thinking, what ideas people were concerned about, what maybe was scaring people, what solutions were being proposed. These texts I think are rich for those kinds of questions. They might not map on to what really happened. But they tell us something really important about a separate issue, which is that women were participating actively in discourse and there was a lively debate about women's roles as workers in this period. And that debate was not always one-sided, certainly, and we see that through these texts.

WOMEN WRITERS In my first book I looked at a lot of women writers who we might consider or call extra-literary, meaning they're not necessarily poets or playwrights. I was interested in looking at things like diaries, prose texts. There were advice books women wrote to their children, for example. What I was interested in in that book was the way in which certain narratives about women's work appear throughout a range of texts, whether it be a play by Shakespeare or a woman's diary. It was striking to me that you see similar narratives reappear in very different kinds of texts, similar stories getting told about women's housework, for example.

WHAT'S NEXT My current project is more about the stage — the way in which the stage represented changes in inheritance patterns which were happening in the same period, the turn of the 17th century. There were a lot of historical transformations in this period in terms of England's expansion within a global economy and the ways in which inheritance was thought about in terms of land and property. ... You have debates about long-standing traditions such as primogeniture, the legal system in which the oldest son inherits everything. There were some really heated controversies about such questions as: What if the older son is a bad son? What if he wastes his inheritance? What about that younger son? What about women?

TAKING IT TO THE STAGE Again, what I think is interesting is that the drama is a multivocal medium. You have multiple voices and personalities. You have debate. Conflict and debate is the focal point of drama. So that provided a forum in which to air these different concerns. Not all texts, of course, came down on the same side of each issue. ... I do find it interesting to think about how these fictions, these popular forms of entertainment, were actively participating in this process of struggle, change, debate, and what that can tell us about what was possible to be imagined in the period, even if some of those changes didn't end up occurring until much later.

A YOUNG INTEREST I'm an odd person in a way because I've been interested in this for a very long time — since I was in grade school. Essentially, it comes through theater. I did amateur theater, through my childhood and in high school. So I was always fascinated with theater and with drama. But specifically, I saw a televised play that was a production of "The Taming of the Shrew" and I saw it in maybe 6th or 7th grade. I was absolutely entranced by it. I mean, it was a fantastic production itself but I had never really seen Shakespeare before. Seeing it performed — rather than reading it — for the first time, I do think makes a huge difference, because you see it as embodied and lively and funny and active rather than perhaps just text on a page.

MORE THAN WORDS Fictions are powerful. I really believe that. It's not "just" a fiction (or "only" literature or "only" a fantasy), but fictions can be extremely powerful. They don't just reflect what goes on and tell what goes on but they create it, they mold it, they shape it. It's sometimes not obvious how that happens and that's what my research is aiming to do.

Reshaping motherhood

When it comes to women's health, especially mothers' health, Senior Research Excellence Professor Dr. Cheryl Lovelady has just about done it all. In 2000, her research made headlines when the New England Journal of Medicine published her findings that breastfeeding moms, starting as early as four weeks postpartum, could exercise and lose weight without any negative impact on their breast milk. She has expanded her research to include studies on exercise and bone density as well as a study on combating childhood obesity by educating mothers. She has been at UNCG for 18 years.

THE LANDMARK STUDY We determined how many calories moms would need for their weight, their age, their height and the fact that they were exclusively breastfeeding. Then we subtracted 500 calories per day to get an average weight loss of one pound per week. Nobody had done this before. Doctors were saying, "Don't diet if you're breastfeeding." We showed the moms in the weight loss group lost 10 pounds in 10 weeks on average. Moms in the control group only lost two pounds. Babies grew the same in both groups.

FOLLOWING THE EVIDENCE The New England Journal of Medicine said they chose it as the lead article because we did something that was against medical dogma. A lot of medical recommendations aren't evidence-based. It's getting better. But a lot of it, especially when it comes to pregnancy and breastfeeding, it's kind of old wives' tale. People are afraid to do anything.

STARTING EARLY Some people say, why don't you just let mothers start dieting when they quit breastfeeding? Nowadays, two-thirds of women in childbearing years are overweight or obese. So, two-thirds of the population are entering pregnancy that way. And we want them to breastfeed for a year postpartum. So if they don't do something in that year, it really concerns me. We have to say, you can't eat for two in the breastfeeding period. You do have to watch what you eat.

A STUDY OF GOOD BONES During lactation, the calcium from your bones is metabolized to put calcium into the breast milk for the baby. So you have a very high turnover rate during lactation and your bone density in those early months actually decreases. When you wean your baby your bone density comes back up to where it was before. I hypothesized, if we have moms do resistance training, could we slow that bone loss? ... Their strength improved tremendously and their bone density — they lost it on average but significantly less than the control group. We were shocked to see, even with a small sample, that we helped preserve that.

EVEN MORE GOOD NEWS FOR WEIGHT LOSS We wanted to make sure our dieting intervention (with resistance training) didn't promote more bone loss than before. We found, thank goodness, the moms in the weight loss group lost significantly more weight and their bone density loss was the same as the moms' in the control group. Again, you can lose that pound a week and not only will it not affect your baby's growth and your milk composition, it won't affect your bone density.

A KAN-DO ATTITUDE The next study we did — and we were funded by NIH again — it's called KAN-DO — Kids & Adults Now: Defeat Obesity. It was for postpartum moms who were overweight or obese, and this time they had to have a preschooler and a new baby. It was a child obesity grant, but we went after it as far as what can we do for parenting styles. Mom being the gatekeeper. That KAN-DO intervention, instead of having moms come to class, it was all mailed.

REALISTIC EXPECTATIONS From some of the preliminary data, I don't think (the mailing) works. ... I really strongly feel we need to acknowledge people need help initially and usually afterwards. You do have to recognize that diet's got to be a part of it. For you to exercise alone and burn the calories, you've got to exercise for about an hour a day. Even then, it's going to come off slowly and most people get discouraged. But the benefit of exercise is it makes you feel better. Restricting your calories doesn't.

TAKE-AWAY MESSAGE Mothers need to take care of themselves. A healthy mom is going to be a better mother. 🗣️

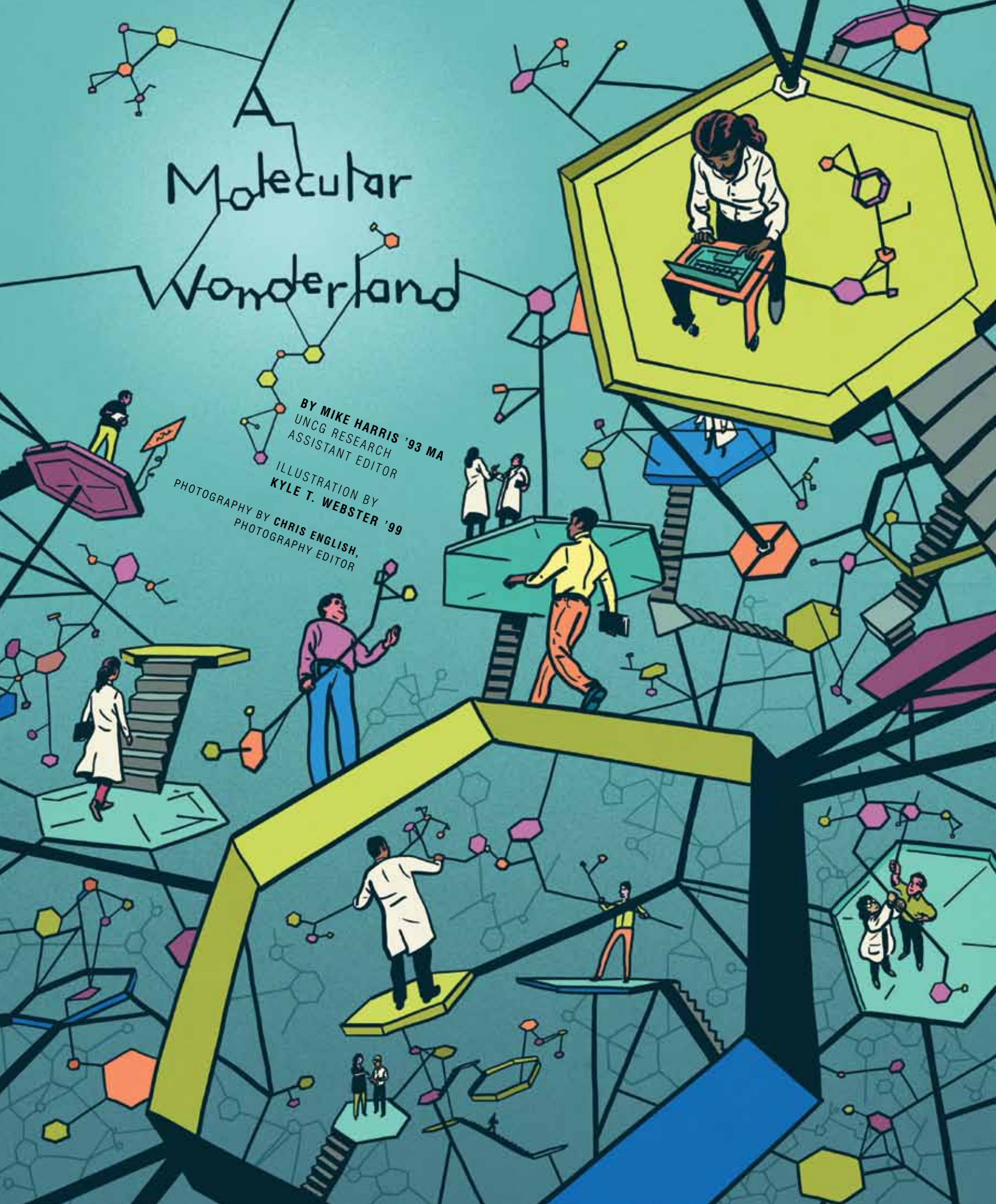


A Molecular Wonderland

BY MIKE HARRIS '93 MA
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ILLUSTRATION BY
KYLE T. WEBSTER '99

PHOTOGRAPHY BY CHRIS ENGLISH,
PHOTOGRAPHY EDITOR



Creating a better future,

Thinking big means thinking small.

How tiny can microchips be? ...can drug delivery tools be? ...can the fibers of strong materials be? Slice this thin page you're reading in ten thinner slices. Do that again. Do that again. Only at this point are you dealing with nanoscale: less than 1/1,000th a page's edge. Many products contain nano manufactured materials, from paints to makeup to cell phones. The field is booming. Around the world, investment dollars are being poured into research and applications. It's uncharted territory. The Joint School of Nanoscience and Nanoengineering is in uncharted territory as well, the first joint nano school in the country. A partnership between UNCG and NC A&T, its possibilities seem endless.

For millennia, humankind has wanted to build bigger, taller. The sky was the limit. Nano provides engineering of a more impressive sort. The microscopes in JSNN peer into the spaces within cells, even within molecules, to a frontier of quantum physics and molecular engineering the science fiction of Star Trek could never have known.



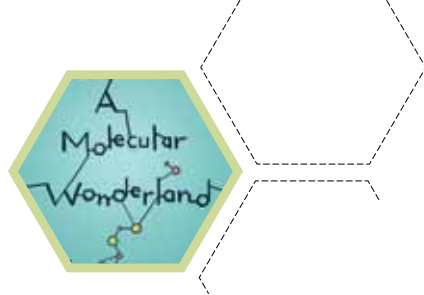
Late each Friday afternoon, when most individuals are thinking about plans for the weekend, students, faculty and the dean of JSNN, Jim Ryan, are looking much further ahead.

How certain students and professors — there are different ones each week — can take their ideas, their research, to the next level. "A time for interesting ideas," Ryan says. How to get from point B to point C — or how to overcome those final hurdles, getting from point Q to point Z.

4 p.m., Friday, Jan. 21. Dean Jim Ryan enters the conference room and pulls the shades, so the sun setting across Lee Street and the new Gateway Gardens won't be a distraction. Last week, a JSNN professor talked with others about patent strategies for his work. One student brought in a problem in the area of the nano-chemistry of food science. "We're looking for problems," Ryan says.

He motions to some of the students at the table. "We're taking some of these students' inventions, and seeing how far we can push

at the nano level



them. We have a couple we think could survive all the tests." But at this point with the students, what is more important than the end result is the process. Learn that and success will follow.

This time is a combination bull session, collaboration and brainstorm. Exciting ideas are brought to the table. Obstacles are opportunities. Dean Ryan and others note potential hurdles and what is missing for it to be patented, to attract investors, to ultimately be marketed.

Why aren't they more secretive in these meetings — why so open and collaborative with each other?

They all discussed this issue early on. "We decided we wouldn't stab anybody in the back," says doctoral student Adam Bozeman, who got his BS in Applied Math from UNCG. He came today to listen, and make contributions if possible.

The student beside him, Kyle Nowlin, says: "The teamwork is very important. You will have a hard time doing this by yourself. If you look at the large companies like Google, Yahoo, that was not a single person that did that. ... It's very hard for a single person to make it huge, on their own."

TRYING TO MAKE IT HUGE IN THE TINIEST WAYS

What's possible with nanoscience and nanotechnology? The possibilities appear limited only by imagination, tools and funding.

Nowlin talks a bit about harnessing piezoelectricity, resulting from mechanical pressure. He devours pop science shows — a hot topic is taking any or all human motions, even heartbeats perhaps, and harnessing that energy. The potential is staggering. He talks of some specifics, but notes that creating a product that is patentable takes a lot of detail, a lot of steps.

Nowlin got his BS in physics from UNCG. He was leaning toward getting his MS in medical physics at Duke, but learned of JSNN opening, what he calls "a perfect circumstance."

His goal is to start his own company, to be an entrepreneur. That's Bozeman's goal as well.

Dimitri Balabanov, sitting in a different part of the room, is drawn to entrepreneurship, but has loved teaching. He enjoys all the sciences. "When I found out about JSNN, and since nanoscience is sort of a collaborative venture between chemistry, physics, biology and math, it was kind of a perfect match. A no-brainer."

Now a doctoral student, Balabanov says the boundaries — where two individuals' disciplinary areas overlap — are where innovations spring up.

Those convergent areas, where imagination commingles with expertise.

Those are the "sweet spot for innovation," Ryan says.

INSPIRATION ON DISPLAY

A gaggle of middle school students pass by. Jacqueline Oates, in the office next door, leads JSNN's outreach for area kids.

Walk into her office, and you'll be struck by the Legos —



DEAN'S VISION Dr. Jim Ryan, right, seen with Mike Tarrant of UNCG's Office of Government Relations. UNCG and NC A&T leaders and leaders from the greater community have collaborated to bring JSNN to fruition. Ryan praises the level of cooperative planning and collaborative spirit.

young students enter events where they construct scale models of molecules. The first Lego state championship was held at NC A&T in January.

The other thing you might notice is a big, orange Dr. Suess book: "Horton Hears a Who!"

"No one believes there's a universe in a dust speck," Oates says, explaining the plotline of the book she often shares with pre-schoolers to explain nanoscience. "Horton knows there is."

Leading kids' imaginations into tiny spaces can even lead into outer space.

Groups of Guilford County middle schoolers and teachers entered a competition this year to have an experiment on April's space shuttle mission. They'd be allowed 1/8 inch³ of space. JSNN reached out to them, with faculty and students teaching them about nanoscience and providing technical assistance to the students. The local group that won? Their experiment involves tiny shrimp in zero gravity. These are the scientists of tomorrow.

Oates' eyes light up when contemplating the thought of leading tours in the new building. The building's design will help facilitate school-age tours, with large windows onto the labs. "I can't wait till that first fourth-grade class goes through and sees scientists in their habitat."

THE RIGHT TOOLS

Patty Elkins was one of the first to arrive for the 4 p.m. session. Of all the students, she is the microscope guru, and she is teaching other students some ins and outs. She is currently one of the few with the expertise to run the Orion helium ion microscope, as others learn. It is the only such microscope in the Southeast. The manufacturer, Carl Zeiss SMT, has a specialist there at JSNN as well.

Elkins loves teaching and research, and as a microscope expert, she likes working with the different types of researchers.

"You get different insights from each group," she says. "A biologist may explain in one way, and me being in physics I'll explain it another way. You learn a different way to look at things."

Different backgrounds involve more than just science disciplines. Life experiences and ways of communicating help in that creativity and innovation as well.

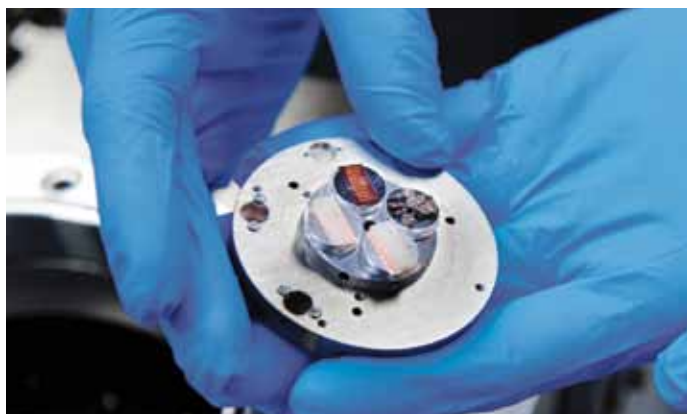
Elkins had once been a police officer, before returning to pursue science at Appalachian State. A&T graduate Steven Coleman worked in product creation and animation for years. Richard Vestal was a restaurant manager with a love of science, before going to community college then Duke. While he studied at Duke, his father died of a brain tumor. Vestal hopes to work on using nanotechnology to cure cancerous tumors.

"They all came into my office with an idea," Ryan says of the students, as the school was getting off the ground. "'This is what I want to do.' Or 'I have an invention and I want to start a company.' Or 'This is where I want to do research,'" Ryan says. "This student population is different than any I've seen, in that way."

Bozeman says, "It's pretty neat, the closeness. It takes you by surprise." At how many schools can you so regularly chat with the dean?

Elkins recalls the earliest days, before the rooms were furnished. Ryan let the students use part of his office, while he worked in the other part. "How many deans would let you do that?"

Tom Ross, the new UNC system president, toured JSNN the day before this meeting, and commented on the stream of busi-



nesses coming to the school to learn about the technologies and considering locating on the campus. He said the joint school is an example of why he's passionate about the role of the public university and the powerful engine it can be for the state's economy.

During that visit, Ryan and Ross talked about curriculum. The first-year curriculum is meant to expose the students to the breadth of nanoscience, so the students take mathematics, nanochemistry, nanobiology and nanophysics rather than just the areas in which they had majored as undergrads.

"In order to step out of your comfort zone, you have to learn a lot," Ryan explains.

Talk about collaboration, Ryan continues. The students doing

Mighty microscopes

At present, JSNN's microscopes include:

ORION HELIUM ION MICROSCOPE, one of only six in the United States, excellent for not only imaging but also milling/fabrication at nano-scale, in a vacuum

ATOMIC FORCE MICROSCOPE, allowing researchers to collect 3D topographical images at nano-scale

OPTICAL MICROSCOPES for cellular and subcellular analysis

The new JSNN building will house additional cutting edge microscopes, including:

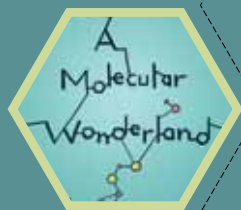
EVO ENVIRONMENTAL SCANNING ELECTRON MICROSCOPE, allowing examination of "wet tissue" biological samples without having to coat them or place them in a vacuum

LIBRA 120 ENERGY-FILTERED TRANSMISSION ELECTRON MICROSCOPE for high resolution study of nanostructures – view cell slices at atomic scale – plus chemical analysis capability using Electron Energy Loss Spectroscopy (EELS)

AURIGA CROSSBEAM FOCUSED ION BEAM/ SCANNING ELECTRON MICROSCOPE workstation, which will allow high resolution examination of samples as well as in-situ sample preparation



PEERING INTO THE TINIEST SPACES The Orion Helium Ion Microscope allows for not only imaging but also fabrication in a vacuum, at a nano-scale level. It is the only such microscope in the Southeast. Above, Patty Elkins and Richard Vestal use this microscope. Left, Vestal readies a microscope sample.



Joint School of Nanoscience and Nanoengineering

The JSNN's new research facility will be the second of 12 buildings on Gateway University Research Park's South Campus. JSNN and Gateway are developing partnerships with numerous companies, in nano, life and biomedical science as well as engineering.

The Joint School:

Is expected to create more than 30 jobs in 2010-11, including 11 faculty members (with three more to be hired before June)

Has more than 50 affiliated UNCG and NC A&T faculty members

Has helped attract Nano conferences to the Triad including:

NC Nanotechnology Commercialization Conference
(Greensboro, April 2010)

International MANCEF COMS Conference
(High Point, September 2011)

International Nanocon 2012
(at JSNN building)



COLLABORATIVE SPIRIT UNCG Chancellor Linda P. Brady joined NC A&T Chancellor Harold Martin as they discussed the joint school in a question and answer session at the fall 2010 UNCG Business Summit. The area business community learned the latest news about the school as well as some nano businesses and technologies. The new JSNN building, right, will open later this year.

The new JSNN building

In addition to offices, classrooms and collaborative spaces, and an auditorium, the building will include:

A nanoelectronics cleanroom and a biocleanroom

A nanoparticle synthesis facility for the production of nanomaterials

Shared characterization suite, housing electron microscopes and the helium ion microscope, analytical and characterization instruments, and a spectroscopy lab

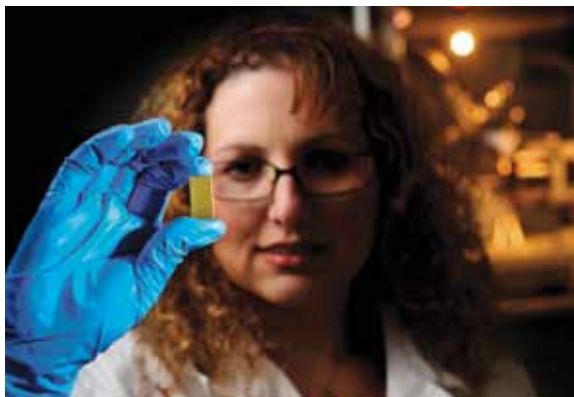
General research laboratories, capable of housing laser and optics research and capable of functioning as wet lab space



LAB RESULTS Opposite page, left, Dr. Marinella Sandros, a biomedical chemist, holds a prism coated with gold, used for detecting a biomarker. Far right, she looks on as graduate student Steven Coleman explains the features of particular lab equipment to U.S. Congressman Brad Miller.

research with professors. The biologists working with the physicists. The universities cooperating. JSNN and Gateway University Research Park in lock step. Professors working side by side. The business partners that have begun to work at the school. Collaboration is the theme — openness, innovation and collaboration.

At the fall 2010 UNCG Business Summit, UNCG Chancellor Linda P. Brady and NC A&T State Chancellor Harold Martin sat side by side with microphones, speaking with the Triad business



community about the joint school, a source of unity for each of those groups.

Ryan cites a recent ranking. "I think the state was ranked eighth as a Nano state," Ryan says.

Other people had a jumpstart on this, Ryan says. "Silicon Valley. The area around Houston. Boston. New York has plowed a lot of money into nanotechnology, and other states have as well." But one thing that sets North Carolina apart is its collaborative spirit.

"I came from New York," Ryan says. He was associate vice president of technology and professor of nanoscience at the University of Albany's College of Nanoscale Science and Engineering. Before that he had an engineering career at IBM, and holds 47 patents. "It was refreshing when I came down here and realized the community was working with the two universities and the universities were working together — and all three went to Raleigh together to ask for the same thing. That kind of collaboration is pretty remarkable, at least where I come from."

HEALTH INNOVATIONS AND HELPING OTHERS

Two doors down, Dr. Marinella Sandros has a suspicion of why Ryan placed her and Dr. Shyam Aravamudhan in the same small office. Aravamudhan is an engineer. Sandros is a biomedical chemist. She says Ryan must have thought, "If I get these scientists and these engineers together, something good will happen."

On one ongoing project, a number have been involved. Dr. Vince Henrich, director of UNCG's Center for Biotechnology, Genomics and Health Research. Dr. Kristine Lundgren in Communication Sciences & Disorders. Dr. Ashraf Sawafta, a molecular biologist. Dr. Ghassan Qabaja, an organic chemist. And two graduate students. Their project to develop a way to quickly detect concussions has gotten lots of press coverage — from ESPN Magazine to CBS Sports.com — though a prototype is many months away.

Currently, detecting mild brain trauma and concussions is an

inexact science. For example, on a football field, a coach might ask a player a few questions or hold up a few fingers. They are working on a way to use a quick blood test to instantly detect a molecular biomarker signaling brain trauma. Sports trainers, military medics and EMTs would find it advantageous. And the technology, using biomarkers, might extend to other medical uses.

Their message to the students, Sandros says: "Come up with an idea. We're here to help you." The dean acts as catalyst. "It's exciting." She cites A&T professor Ajit Kelkar as one inspiration to



the junior faculty and the students. He teaches and also created the technology behind the A&T spin-off company Advaero. Its carbon composite prototypes, such as surprisingly strong and light materials, are a hit with schoolkid tours, as well as visitors from the military and aerospace industries.

Dr. Yousef Haik, whose office will move from UNCG to the new building when it opens, also teaches while helping create start-up businesses using nanotechnology. TherミアCure's technology, which he developed, will monitor and perform treatment on cancerous tumors, using nano-particles. Haik is the editor of the new "International Journal of Nanoscience and Engineering."

The Friday afternoon session breaks up. Outside, it's even colder. Dusk is descending. The only sounds are the US and NC flags in the wind. The construction lifts and grading equipment now get a break as darkness falls.

In the coming weeks, one brainstorming session will involve a professor's research proposal. Another will involve a student's assignment from a professional development class that Ryan offers to prepare the students for their careers. The east end of the new building will be nearly completed and additional glass panels will be installed on the new building, set to open at the end of 2011.

The UNC Board of Governors approved the NC A&T Master of Science in Nanoengineering degree program. Its first students will join the UNCG students in the current master's and doctoral nanoscience programs in the fall.

And the ideas will keep flowing, destined to be new possibilities for the Triad economy. For students wanting to engage in the brand new field. For businesses wanting to take products to a new nanoscale level. **●**



FAMILY

Researchers are studying how mothers' part-time work and non-traditional working hours impact families

BY BETSI ROBINSON

PHOTOGRAPHY BY CHRIS ENGLISH,
PHOTOGRAPHY EDITOR
AND DAVID WILSON,
ASSISTANT PHOTOGRAPHY EDITOR



BUSINESS

Decades ago, researchers who studied working mothers focused on a few simple questions: Did a mother work or didn't she? And was that good or bad for her family?

The year: 1968. More than half of the children born in the United States lived in families with a father who pulled in the paycheck and a mom who stayed at home.

Times have changed for families and for the researchers in UNCG's Department of Human Development and Family Studies who seek to understand the challenges facing them.

Today, fewer than 20 percent of mothers stay at home with their children. And of the more than 80 percent of mothers in the work force, many have schedules outside of the traditional 9 to 5 workday, either in part-time jobs or ones that requires nonstandard hours.

"Initially, a couple of decades ago, the key question was, 'is it harmful or not for moms of young children to go back to work,'" said Assistant Professor Danielle Crosby. "But, that is really the norm today. It's just a different reality."

Professor Cheryl Buehler calls it the “new normative.” Not only do more mothers have to work to make ends meet than in years past, some prefer working to staying at home. In other words, it’s a choice, not just an economic need.

“It’s gone beyond that,” Buehler said. “We are really starting to see some ideological shifts in our beliefs about families.”

So, how are these monumental shifts affecting families? That’s what HDFS researchers hope to find out.

WHY IT MATTERS

“I think it’s important because people are making decisions and choices about their lives ... sometimes without the benefits of knowing what some of the ramifications of those decisions might be,” Professor Marion O’Brien said.

Case in point: families who do the “hand-off” in the parking lot, with one parent passing a child to the other as one is coming to work and the other is leaving. In these families, spouses or partners choose to work jobs with different shifts to avoid having to use child care because of concerns about its effects on kids.

“The guiding principal for some parents is, ‘I don’t want to have to use child care,’” O’Brien explained. “And we have not found anywhere in any of the research that says using child care is a bad thing. It has to do with the quality of child care and how much time children spend in care. ... In many cases people are making choices and not always for the best reasons.”

The researchers hope their work may one day help families, employers and policymakers alike make more informed decisions about modern-day maternal employment and the supports that families need to be successful.

PART-TIME WORKING MOTHERS

Buehler and O’Brien are working on a study involving mothers and part-time work. They set out to answer one broad question: Under what conditions does mothers’ part-time employment help the family and under what conditions does it hurt?

The study found that only 11 percent of participants worked full time across four developmental periods of their children’s lives: infancy, toddler, preschool and middle childhood. And only 3 percent were not employed at every stage.

Thus, the great majority of mothers moved in and out of full-time and part-time jobs during their children’s early years. Men, on the other hand, rarely work part time.

“The guiding principal for some parents is, ‘I don’t want to have to use child care.’ And we have not found anywhere in any of the research that says using child care is a bad thing.

In many cases people are making choices and not always for the best reasons.”



The researchers considered not only the effects on the development of children — how they fare in school or how they behave, for example — but also looked at maternal physical and mental health, parenting skills, involvement in their child’s school and the like. And lastly, they looked at marital quality and the sharing of household chores and child care.

The study compared mothers who worked part time with those who worked full time or not at all, controlling for such variables as the mother’s level of education and ethnicity as well as the gender of the child. The researchers used an existing data set from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development, which involved 1,364 children and their mothers from 10 sites across the country.

The preliminary findings thus far?

“For the most part, if there are any differences, it favors part time over not employed and over full time,” Buehler said.

For example, mothers who worked part-time jobs had fewer issues with depression than those who did not work at all. What little differences the researchers found in parenting skills also favored part-time work to full-time work or not being employed.

Across all developmental stages, mothers employed part time perceived less conflict between work and family than those with full-time jobs.

And yet, Buehler added, “The important news is that work-family conflict isn’t generalizing into things like depressive symptoms or physical health problems. Mothers are very skillful with compartmentalizing.”

Universally, the researchers are finding that mothers do more — about 70 percent — than fathers when it comes to child care and housework.

O’Brien believes that studying part-time work is especially important today because, while so many mothers are choosing it, employers generally don’t invest in them.

“Part-time work often comes with no benefits, no obvious stability. Employers ... don’t train them, they don’t look at them for promotions, so part-time jobs have some problems for people who really want to achieve and have careers.”

On the other hand, O’Brien noted, the early research suggests that part-time work can benefit families and children.

“So, from a child and family perspective, having someone in the family working part time is probably a good thing. From a policy and employment standpoint, we are not investing in that. There’s a disconnect here.”

NONSTANDARD EMPLOYMENT

Associate Professor Esther Leerkes has worked on a pilot study of nonstandard employment, a type of employment that is increasingly common among mothers of young children.

The research, conducted in collaboration with Dr. Stephanie Daniel, a research professor at UNCG's Center for Youth, Family and Community Partnerships, and Dr. Joseph G. Grzywacz at Wake Forest University School of Medicine, explores whether the children of mothers who work nonstandard hours experience increased behavior and emotional problems. Nonstandard work is defined as any job outside the typical 8-5, Monday-Friday schedule, and frequently requires working night or rotating shifts.

"What we found was that the mothers who were employed in a nonstandard schedule during their children's first year of life engaged in lower maternal sensitivity, and that effect got stronger over the first three years," Leerkes explained.

"This general idea that something that happened in the first year was predicting their parenting two years later was very interesting. We want to understand why that is."

It could be that parenting gets harder as children get older, she said, or that a stressful job makes parenting less fun.

Regardless of the reason, preliminary evidence suggests that mothers who work a nonstandard schedule are at risk when it comes to parenting.

And so are the children.

"We did find that, at age 2 and 3, those kids ... were a bit more aggressive and acting out more than children of mothers who were in a job with a standard schedule."

The researchers wondered what it is about maternal work and a nonstandard schedule that may threaten a child's well-being.

A new, collaborative study between Wake Forest's Grzywacz and UNCG's Center for Youth, Family and Community Partnerships seeks to find out. Two center research faculty members, Daniel and Dr. Chris Payne, are collaborating with Leerkes on the \$2.9 million National Institutes of Health grant titled "Nonstandard Maternal Work Schedules and Child Health in Impoverished Families."

The study will involve 400 low-income women working in either standard or nonstandard jobs. The women are recruited shortly after the birth of their children, who will be followed from 3 months to 30 months old.

"We are trying to measure more of those things that might explain how or for which women nonstandard work may have a negative effect," Leerkes said.

The researchers also identify factors they think help women and families cope when a mom works nonstandard hours.

"We think that's really important, since this is a growing portion of the job sector, to think about how you create support systems to help families do well in those circumstances," Leerkes said.

Payne, director of the center, said that families just above the poverty line often don't receive benefits such as Medicaid insurance for their children or subsidized child care, which poorer families can access. And professional families tend to have a level of work flexibility and resources to invest in their children that low-income parents do not.

"They sort of fall through the cracks," Payne said. "Are there ways that we can change workplace policies or practice, or things

that we can offer to these families in order to help them raise their children in ways that will be successful? That is the ultimate goal."

Dr. Danielle Crosby's primary research interest involves how parents' employment and income affect children younger than age 5. When families have access to child-care subsidies, health insurance and a wage above the poverty level, children tend to have better outcomes, both academically and behaviorally, she said. The research shows those outcomes were tied to the additional supports provided to working parents.

Currently Crosby is working with colleagues at Cornell and the University of Chicago on a study of the work schedules of low-income mothers. They've found that as many as 55 percent work nonstandard schedules. And that when mothers work more than 35 hours a week, they and their children tend to get less than the recommended amount of sleep (7 hours per night for adults and 10 hours for children).

"Our next steps are to say, what impact does amount of sleep have on how kids are doing, their physical health and cognitive development?" she said. "And is night work different from evening work? We have some indications already that night shifts may be particularly difficult for families to manage."

INFORMING GOOD DECISIONS

All of the researchers are mothers themselves. And they believe their work is important to women who struggle to make good decisions about work and family just as they have.

"And they are important decisions that we aren't able to provide people with very much guidance about. What difference does it make if you go back to work at this time with these hours, or work this much or that much?" O'Brien asked.

"I think as women with children and families and working, these are questions that we find very meaningful."


And for some women, Leerkes is quick to point out, it's not a choice.

"Even women who do have some choice don't get a lot of information," she said. "They may have the idea that working a job with a nonstandard schedule would be better because maybe they wouldn't need to have child care; the mother and father can share child care. But is that good or bad? And what's the impact on their relationship? We really don't know the answers to these questions."

Crosby said employers and policy-makers could benefit from this kind of research as well. After all, evidence suggests that employers benefit when their employees are healthy and have stability in their personal lives.

"Certainly policy can play a role in terms of how work life is structured in the U.S., but it can also influence the types of benefits available to workers such as health insurance or child care assistance. Supports that help parents balance work and family demands can actually lead to more employment stability, job growth and better economic outcomes," she said.

O'Brien believes that part-time work should be viewed as a valid and important work status, from both an economic and personal viewpoint.

"It shouldn't just be considered a way of cutting an employer's costs," she said, "but a really viable strategy for our country to have a better balance between employment and support of families." 

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Making connections everywhere you go

BY BRIAN CLAREY

PHOTOGRAPHY BY DAVID WILSON,
ASSISTANT PHOTOGRAPHY EDITOR

Technology, by its very nature, solves problems. The automobile effectively shrank the distance between one geographical point and another, allowing people greater mobility from home. But technology creates problems, too. After the popularization of the car, we needed to create roads and parking lots, an entire infrastructure to accommodate this new device.

In the same way that our system of highways and roads grew into a web that connects us geographically, broadband internet access has flourished in the population centers of our country. But it has been slow to come to rural areas because there are often not enough potential subscribers to make it worthwhile for media companies to expand their networks out into the sticks.

"The problem is that building and extending network capacity is costly, and the limited number of potential subscribers in rural areas makes it difficult to justify this expense," says Dr. Rick Bunch, director of the Department of Geography's Center for Geographic Information Science.

For many rural areas in North Carolina, a wireless signal is the only way to achieve broadband access.

A broadband wireless signal originates from a physical backbone created by cable, fiber-optics or a DSL signal that travels through telephone lines. Relay towers at the end of the line transmit the broadband signal as radio waves, which are subject to all manner of physical interference, both natural and man-made.

Rural North Carolina teems with interference, from mountains and tree cover to textured landscapes and large buildings that can block or obscure the signal. So Bunch and his team, using Geographic Information Systems (GIS), mathematical models and field research, spent all of 2010 mapping the state's existing wireless cloud, documenting its reach into rural areas and noting the corners of the state without broadband access of any kind.

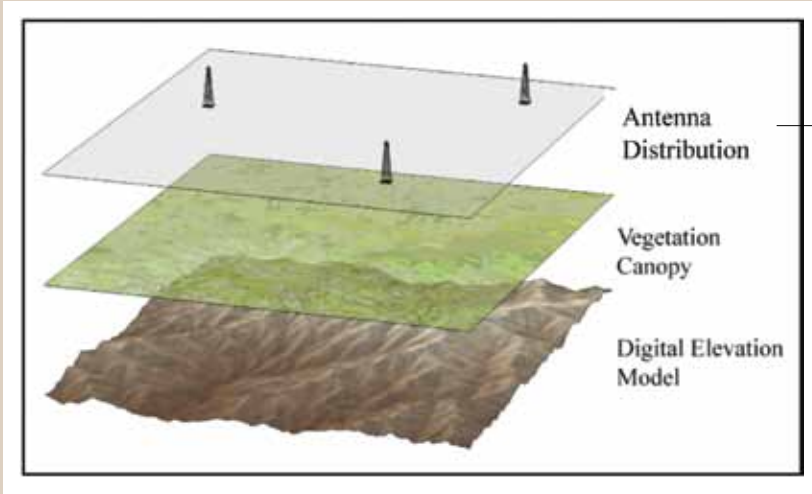
And, he says, it's about much more than issuing tweets and updating Facebook pages.

"The region that lacks [broadband internet] access is at an economic disadvantage," Bunch says, and the situation goes far beyond the information-rich vs. the information-poor paradigm. Modern businesses can no more function without speedy internet access than without a supply line, and big companies looking to relocate or expand will not consider regions that do not have it.

Living apart from the broadband signal also stunts access to long-distance learning, Bunch

FIGURES 1 & 2:

Several factors are considered before creating a model. Bunch captured the impacts of terrain, vegetation, man-made features and the behavior of radio waves in space by using a unique blend of high spatial resolution datasets and formulas.

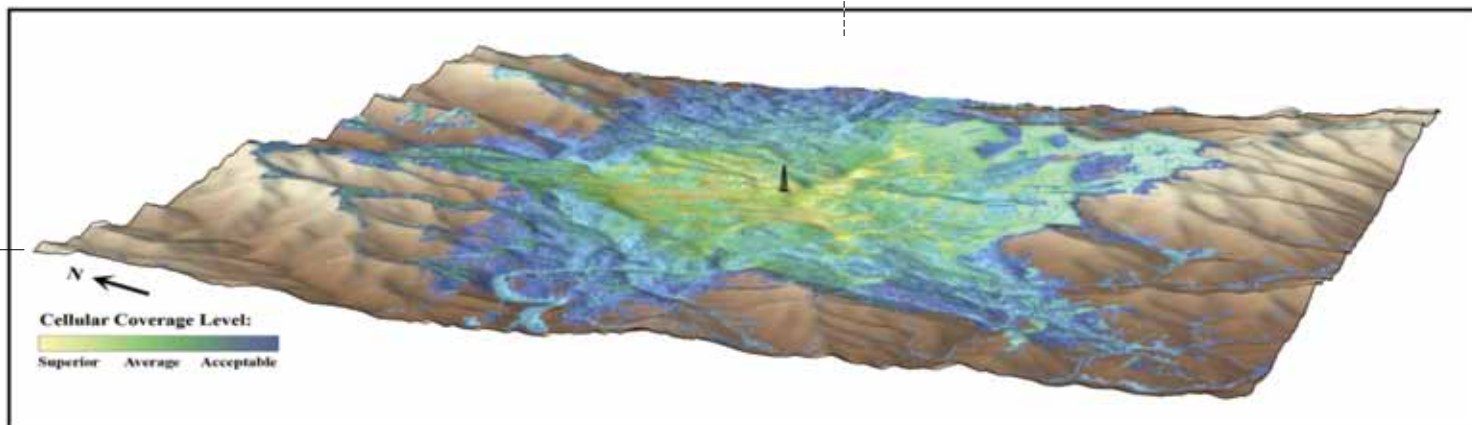


says, affecting schools and online degree seekers. It prevents healthcare treatment via teleconferencing, an increasingly common practice. And forget about streaming Netflix. Broadband access in rural areas can be akin to fire stolen from the gods.

And it's important enough that the federal government allocated a portion of the 2009 American Recovery and Re-Investment Act to expand broadband internet access to rural areas, which

FIGURE 3:

The map below shows the received signal strength indicator levels. In this simulated rugged terrain (near Bryson City, NC), the yellow indicates superior reception, whereas the blue represents only acceptable reception. His work with mapping broadband was much like creating this surface model for cellular signal strength.



internet service providers have been slow to include in their land-based networks.

In North Carolina, the funding is received by the e-NC Authority, which according to its web site, "finds and advocates for solutions to ensure that all North Carolina citizens and businesses increase broadband adoption and usage and have equal access to affordable, high-speed broadband." Bunch's funding comes through the e-NC Authority.

The state has been involved in this aspect of information technology since 2000, with the enactment of SB 1343, which created the Rural Internet Access Authority. It recognized, among other things, the importance of affordable high-speed internet access for our citizens.

"Unequal access to computer technology and internet connectivity by income, educational level and/or geography could deepen and reinforce the divisions that exist in our society," it states. "The intent of the Rural Internet Access Authority is to close this digital divide for the citizens of North Carolina."

As part of their broader project, the e-NC Authority tapped Bunch and his team, who has previously mapped cell-phone coverage to determine the best locations for new antenna locations. Using GIS to map out the topography of the area and mathematical models similar to the ones used in the cell-phone study, Bunch and his team set out to create a snapshot of wireless broadband coverage from Murphy to Manteo.

"In physics, we know the attenuation of a wave in a vacuum,"

BUNCH AND HIS TEAM, LEFT, went into various areas of North Carolina to collect signal strength and see how well their theories matched up with reality. The team: Anna Tapp, associate director of the Center for Geographic Information Sciences; Dr. Rick Bunch; Alex Sinykin, GIS technician; and Matt Catanzarite, GIS specialist.

Bunch says. "Free space.' When you start to add mountains, things get complicated. Buildings. And vegetation. Vegetation totally blows up a radio wave. It's no longer free space. The human and natural environment — we had to replicate that.

"If I spray a hose in two different trees," Bunch explains, "even though they're the same kind of tree, the water is going to drop down differently."

Armed with data from the maps and math, Bunch and his team then went out into the wilds of North Carolina to collect signal strengths and see how well the theoretical results matched up with the real world.

The resulting wireless propagation model, laid out at e-NC Authority's web site, shows significant coverage in the city's population centers as expected, and reveals swaths of isolation in the western mountains and the northwest and northeast corners of the state, as well as smaller pockets in the more thinly populated areas.

Now Bunch studies the map in the power cubicle of the GIS office on the third floor of the McIver Building at UNCG, the overlaid signals color-coded by type and strength. His study helps provide an initial approach for assessing equitable wireless broadband. But the wireless cloud, Bunch says, is like an organism: expanding, shrinking and shifting as more relay towers are erected and more interference created through construction and population density changes. Even the seasons, he says, affect the signal.

"It changes every day," he says.

So the work now is about updating the existing database as wireless access creeps into the far corners of the state. Bunch says there have been no significant changes to the map ... yet. But additional funding from e-NC Authority, made available this year, will ensure that Bunch keeps the map current, and that North Carolina remains at the fore of this rapidly expanding technology.

"The entire nation is still trying to map the wire lines," he says. "I don't know of any other state that has done the wireless mapping." ●

Scientific Americans

How do teachers motivate students to become competent, confident and interested in science? Dr. Heidi Carlone has spent the last five years researching that very question — and her findings will surprise you.

BY MARY BEST '84, '89 MA

PHOTOGRAPHY BY CHRIS ENGLISH,
PHOTOGRAPHY EDITOR

Only 34 percent of U.S. fourth-graders perform at or above the proficient level in science. 34 percent. That's according to results from the 2009 National Assessment of Education Progress released in January. Also called the Nation's Report Card, the standardized test is the nation's leading indicator of U.S. educational achievement.

Many blame this deficiency in science on No Child Left Behind, the 2002 federal law that requires students be tested annually in reading and math but not science, shoving the once-core elementary-school subject to the classroom sidelines. Others point to the lack of resources, inadequate professional development and a shortage of well-qualified teachers.

But what makes a student "good" in science? How do students come to see themselves as smart science students? If students claim to love science, what science do they love? Do students think science is a meaningful way to make sense of the world? How do teachers foster

RIGHT, the bulletin board in one school where Dr. Heidi Carlone has researched excellent science teachers shows the faces of students and the collages they created to explain their view of science.





an interest in scientific knowledge? How do they encourage students to perform confidently, competently and in ways that others recognize as scientific?

Dr. Heidi Carlone, an associate professor of science education in the Department of Teacher Education and Higher Education, has been considering these questions of “science identity” for more than five years. Her mammoth research project has been funded by a \$597,009 grant from the prestigious National Science Foundation’s Faculty Early Career Development Program. Carlone is the study’s principal investigator and a leading authority on science identity. She joined the UNCG faculty in 2000.

The study sought to determine the effects of various teaching practices on science identities and to pinpoint teaching strategies that bolster a student’s proficiency and interest in science. Also, an underlying motivation for Carlone’s research was to understand how to be more responsive to diversity and equity issues in science classrooms. “I’m interested in the gamut,” she says.

Ultimately, Carlone hopes her research will become a tool for teachers to broaden and heighten instruction to make science more appealing and accessible to a diverse range of students.

“If we truly care about a science for all, we need new ways to study and understand science learning that move beyond static outcomes of simply measuring achievements and knowledge. We have to look at who these students are becoming in the process —

the value they are attaching to science and how they affiliate with what it means to be smart in science,” she says.

With such an exhaustive blueprint, Carlone relied on observation and interviews to construct an “analytic lens” through which to study the culture of outstanding fourth- and fifth-grade science classrooms, the effects of excellent teaching over a few years and teaching practices that cultivate scientific identities for a wide range of students. (See sidebar for details of the study.)

Not surprising, the four years Carlone spent in classrooms was intensive, the findings powerful. Now, as the study draws to a close, she has amassed “a lot of good, meaty data. There are so many stories I am ready to tell,” she says.

THE SOCIAL AND THE SCIENTIFIC

Early on, Carlone realized learning experiences should integrate who students are socially with what it means to be “scientific.” For example, a student may be creative but not a good problem solver. Another might be logical but doesn’t work well with others. Another might be inquisitive but easily frustrated when they don’t get the right answer quickly. Creativity, logical thinking and an inquisitive nature are invaluable characteristics for a scientist, and teachers should nurture them in students. Appreciating different ways of being smart means scientific knowledge is not owned by one student but shared by everyone.

If “scientific” is narrowly defined as a body of knowledge, “a smart science student is the kid with the one right answer,” says

Carlone. But broadening the definition and including more areas of competency will help enable us to “produce the scientific workforce or the scientifically literate population we are hoping for,” she says.

“We pay lip service to that now,” she says. “We want students to think critically and be problem solvers and work well in groups, but we assess them on the knowledge they have at the end of the course.”

The students in two similar fourth-grade classrooms all claimed to like science, but when asked if they were smart in science, if they could identify the three smartest science students and describe characteristics they shared with the smart students, the results were surprising. In “Ms. Wolfe’s” class, the students noted themselves as one of the three smartest science students or shared characteristics with the smart students. In “Ms. Sparrow’s” class, however, girls of color, in particular, felt disassociated from smart science students. When asked who the three smartest science students were, they named and described them but didn’t identify themselves as one of them — “They’re the smart ones, we aren’t.” One of the girls had one of the highest scores in the class on the traditional assessment tests.

Why the disparity? Carlone honed in on sharing. In Ms. Sparrow’s class, sharing in groups meant taking turns; students owned their own ideas and knowledge. As a whole class, the teacher elicited students’ ideas, but ultimately one student received credit for the one correct answer, even though other students helped lead them to the right idea.

In Ms. Wolfe’s class, however, sharing did not mean turn taking. While students took turns, they were responsible for knowing the ideas of other group members. In the entire class, sharing meant building on one another’s ideas. Students were held accountable for understanding one another’s ideas. “This classroom used the language of ‘we’; the other one used the language of ‘me,’” Carlone says.

“You would think sharing would be sharing, but when you look at the nature of sharing that can make a huge difference for students’ affiliation,” she notes. “If one person owns the knowledge and you aren’t the person who can articulate it in a way that’s recognizable to a mainstream teacher, then your ideas aren’t recognized, valued or celebrated.”

NOT AN EXACT SCIENCE

To promote a more equitable science, Carlone suggests that scientific competence be considered a “socially constructed trait.” In other words, rather than scientific learning being an individual exercise of piling one immutable fact on top of another, it means

OPPOSITE, TOP Carlone prepares her camera. She will film interactions in the classroom. **Right**, Carlone hands the teacher a microphone so the video will pick up all that he's saying while teaching. **BELOW** Carlone speaks to one of the students in the hallway after the middle schoolers completed an exercise in interviewing one another.



Evaluating Excellence

So how did Dr. Heidi Carlone actually conduct such extensive studies of excellent fourth- and fifth-grade classrooms? She and a number of graduate students, undergraduates and colleagues from around the country:

EXAMINED excellent fourth- and fifth-grade science teachers from 70 schools from seven school districts within an hour or so of UNCG. The selection of teachers was based on nominations, classroom observations and interviews. In addition, the teacher's instruction needed to align with the instruction recommended by the National Science Education Standards. The selection process lasted one year.

COMPLETED ethnographies — or studies of classroom cultures — of five outstanding classrooms based on 20 to 35 hours of observation per classroom.

TRACKED 27 students who were recipients of this excellent teaching across three to four years to see how scientific competence, interest and affiliation changed over time. Students were also chosen based on diversity — race, gender, ethnicity, historically marginalized, economically challenged, privileged, etc.

INTERVIEWED teachers twice a year and conducted multiple informal interviews.

INTERVIEWED all the students in each classroom twice per year individually and at least once per year in focus groups.

challenging students to share scientific knowledge, broadening the definition of a “scientific student,” and fostering inquiry and social interaction, especially in scientific investigations. It’s a tall order, but this view redefines the meaning of “smart” and opens up the possibility to everyone.

And it requires vigilance. Students may be competent one year and not the next, “even though we know what they are capable of,” Carlone says.


“It’s been a little shocking how high the standards were in fourth grade for speaking up and thinking critically, for being good observers, for being good thinkers, for questioning and how little of that is left in what’s expected in sixth and seventh grade.”

A fourth-grade Latina student who had emigrated from Mexico earned the highest score possible on her end-of-the-year test after being in the United States for a year. Three years later she is “flirting with her science teacher and acting helpless and clueless, and he’s not holding her accountable to be scientific, to think scientifically, to see the world scientifically,” says Carlone.

GREAT EXPECTATIONS

Finally, Carlone argues students should be held accountable to become scientific and perform scientifically. The norms for what it means to be “scientific” need to be explicit, believable, achievable, accessible and compelling for a wide range of students, she says. They need encouragement and consistent opportunities to meet those expectations. Teachers should be “diligent and vigilant” and remind students of “processes and expected outcomes. It’s hard to do. It’s a tall order, but it’s doable. We saw it,” she says.

“Ms. Carpenter’s” fourth-grade class is wildly unconventional — her desk is chaotic, students’ backpacks are scattered everywhere and there seems to be no rhyme or reason to what and how she’s teaching. But students are gathered around a table, leaning forward and hanging on her every word. All students, in end-of-year interviews, said they were either one of the three smartest kids in the class or shared characteristics with the smartest students.

The class is composed primarily of students of poverty who are either African American or Latino, but Carpenter minimized the gap between traditionally smart and struggling students. She raised the bar for their vocabulary and taught them “what it means to be scientific, how to talk scientifically and how to conduct themselves in an academic setting,” says Carlone. “It was unacceptable to be anything less than an outstanding member of the class.” 



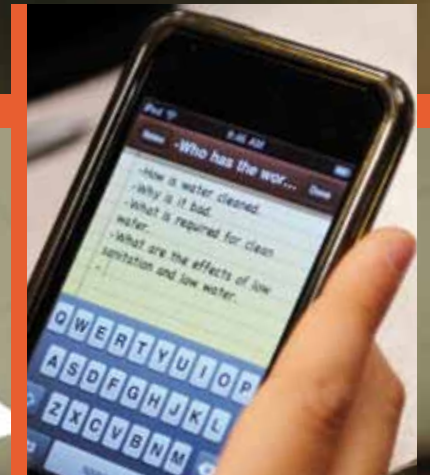
AT THIS SCHOOL, each student has an iTouch for taking notes and entering information into a shared file. At top right, the view from Carlone’s camera. Below, one student shares her questions with the group.

Married ... with Tenure

Even in her office in Curry Building, Heidi Carlone is close — really close — to family.

Carlone’s husband, David, is an associate professor in UNCG’s Department of Communication Studies. Their two children attended the university’s Early Childcare Education Program. And her mother, Dr. Sarah Burke Berenson, is the Yopp Distinguished Professor of Mathematics Education, also in the Department of Teacher Education and Higher Education. “Even though we have distinct research interests, my mom’s my biggest mentor,” she says. “She’s an easy mom to have as a colleague.”

Having three generations of her family on campus “has been a real gift,” Carlone says. “It’s been a huge factor in my professional success.”



“Eloquent, original and exhilarating.”
Archbishop of Canterbury Rowan Williams
in the Scottish Journal of Theology

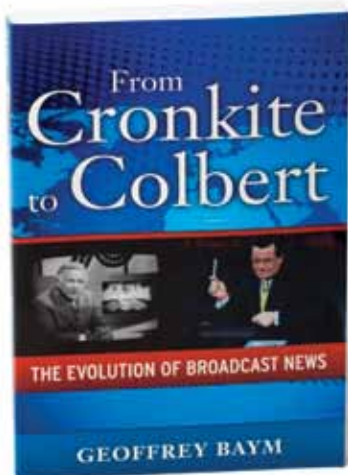
Dr. Eugene Rogers, professor of religious studies, published his groundbreaking “Sexuality and the Christian Body: Their Way into the Triune God” in 1999. Now the journal *Christian Century* has named it an essential read among theology books published in the last 25 years.

“Not only those interested in Christian disputes but anyone interested in same- and opposite-sex couples may learn much about what those relationships can mean,” Rogers said of his book.

“Sexuality and the Christian Body” considers how

Christians argue among themselves about same-sex relationships: how conservatives hear liberals, and how liberals hear conservatives. It proposes that they might find common ground in their accounts of how God binds people together to bring them to himself.

According to *Christian Century*, “Rogers offered one of the most important critical readings of [Protestant and Catholic] views on gender and one of the most sophisticated treatments of a number of crucial theological issues in relation to the body.”



**From Cronkite to Colbert:
The Evolution of Broadcast News**

Dr. Geoffrey Baym
Paradigm Publishers (197 pp.)

Years ago, Geoffrey Baym paused his late-night channel surfing to listen to an in-depth conversation with Sen. John McCain about campaign finance reform. CNN? CSPAN? Nope, Comedy Central.

It turns out that Baym, an associate professor of media studies, was watching “The Daily Show with Jon Stewart.” A former television journalist, Baym was fascinated by the forum as much as by the reasonable discussion itself.

He explores this “serious comedy” and more in his book “From Cronkite to Colbert: The Evolution of Broadcast News,” winner of the 2010 Book Award from the National Communication Association’s Political Communication Division.

In the book, Baym guides readers through the metamorphosis of broadcast news from the stately Walter Cronkite to the often sarcastic approaches of Jon Stewart and Stephen Colbert.

Baym argues that, as mainstream news has changed, broadcasts have morphed into echo chambers for political propaganda, worked to appease corporate and political forces and fulfilled the public’s fancy for infotainment news rather than perform its fundamental mission: to give citizens the information they need to be free and self governing.

In his evaluation, Baym finds an example of media best practices in the most unlikely of places: Comedy Central. Personalities like Stewart and Colbert are reinventing network television and doing in-depth reporting with their hybrid comedy news shows, finding ways to communicate about current events that are relevant to today’s audiences, he said.

The comedians don’t refer to themselves as journalists, giving themselves more latitude and freedom to be subjective, yet fair, in their reporting, he added.

“They are doing the heavy lifting of the Fourth Estate. ... They hold the powerful accountable and ask the questions that the regular people can’t ask.”

**Bring Your ‘A’ Game:
A Young Athlete’s Guide
to Mental Toughness**

Dr. Jennifer Etnier
The University of North Carolina Press (232 pp.)

The need was obvious.

Dr. Jennifer Etnier saw young athletes hanging their heads, losing their tempers with referees and yelling at teammates. Coaches at the sports psychology seminars she led for the United States Soccer Federation were hungry for more information to share with their players.

So Etnier, an associate professor in the Department of Kinesiology, wrote “Bring Your ‘A’



Game,” a guide to help young people develop the mental toughness they need to reach their potential in sport. The book, written primarily for teenage athletes, explains how mental training is just as important as physical training, and how, like physical training, it can be learned and honed through diligent practice.

“Mental toughness enables a person to consistently perform at a high level,” Etnier says. “To be able to do that, you have to be able to consistently practice at a high level. You have to be able to perform well under pressure.”

Techniques detailed in the book include mental imagery, goal setting, energy management, pre-performance routines and confidence building. Through exercises at the end of each chapter, athletes are encouraged to apply these skills in daily life and practice sessions so that they become second nature during competition.

Although all these skills can enhance performance, the use of mental imagery can be particularly beneficial. “If you ask elite athletes if they’ve ever used mental imagery, they’re all going to tell you yes,” she says. “We have a lot of empirical evidence that tells us that if you mentally practice a skill, you can improve that skill. If you combine mental practice with physical practice, you can improve even more.”

A school of their own

Anna Will, above center, a senior interior architecture major, came home from a Habitat for Humanity trip with a mission. She wanted to design a school for the Kyekyewere village she had visited in Ghana, Africa.

Anna had seen the thirst for learning in the Kyekyewere children, who had to walk several miles to school in neighboring villages.

“It was upsetting to hear children explain that they probably wouldn’t have the opportunity to see the future they dreamed of just because they didn’t think they were capable of making it to university,” she says. “Witnessing this determination to learn made me realize how important it was to bridge the gap between reality and dreams to better the futures of these children.”

The children’s dreams are fast becoming reality. Assistant professor Hannah Rose Mendoza, above left, and Anna’s fellow design students quickly embraced Anna’s idea. The project represented the same community-engaged social activism that interior architecture has invested in earlier projects like Our Sister Susan’s House, a home for single teen moms and their children.

Anna and other students worked under Mendoza, adopting the school design project as part of their coursework. Final designs were chosen, and several of the students traveled to Ghana in January to help build the school.

“The world is much smaller than we realize; students at UNCG need to understand the importance of global involvement and thinking beyond our school, state and country,” Anna says. “We spend so much of our time focused locally that we turn a blind eye to the lives of those in greater need. If children of rural villages, such as Kyekyewere, can understand and idolize the opportunity in our ‘American’ way of life, it is only fair that we invest efforts in giving them the same.”

In designing a school for Kyekyewere — where there is no phone service, no electricity, no plumbing, no air conditioning and no means to replace broken glass — Mendoza’s students faced unique challenges.

“They are having to step outside of their own experience of what a school is,” she says.

Mendoza looks on the Ghana project as a pilot for future global design projects.

“I want to build 15 schools before I retire,” she says. “There’s a transformative process in making something you’ve envisioned come to life. It’s a lifestyle. And we want to show people that you don’t have to wait for a millionaire or a government program; they can go grassroots.”

Jumping, no jive

IT'S A FIRST FOR DR. JOHN SALMON.

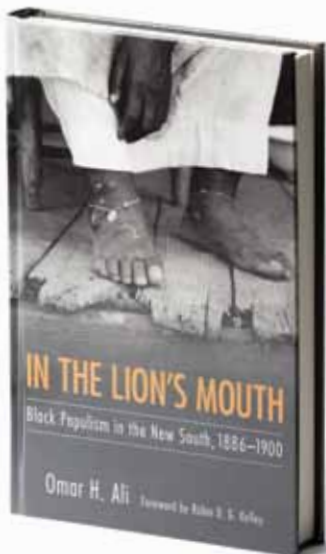
Salmon, professor of piano, has made several recordings through the years. Now he's put out the first recording of his own compositions.

The CD, titled "Salmon Is A Jumpin'," was released on Albany records on Nov. 1. It features jazz piano compositions, recorded in the Music Building Organ Hall in the fall of 2009.

"They reflect my background in both jazz and classical music," he said.

The recording was funded by grants in 2009 from the North Carolina Arts Council (\$10,000) and the United Arts Council of Greater Greensboro (\$1,500), and the project was also made possible by a research leave in the 2009 fall semester.

The style of the compositions could be classified as "third stream," a term describing jazz influenced by classical music.



In the Lion's Mouth: Black Populism in the New South, 1886-1900

Dr. Omar Ali

University Press of Mississippi (228 pp.)

The collapse of Reconstruction was not the end of African-American political activism in the South during the late 19th century as it is often portrayed — far from it, argues Dr. Omar Ali in his book "In the Lion's Mouth: Black Populism in the New South, 1886-1900."

Black populism, an independent political movement of African-American farmers, sharecroppers and agrarian workers distinct from the white populist movement of the same period, was the largest black movement in the South until the rise of the modern civil rights movement, says the historian and associate professor in the UNCG African American Studies Program.

"After Reconstruction ended in 1877, African Americans in the South regrouped," says Ali. "Black populists formed alliances with white populists and challenged the Democratic Party, a party of wealthy interests and white supremacy. They failed, but many of their demands would be enacted within a generation by the New Deal — so in some ways they were laying the groundwork for changes that came to pass."

"In the Lion's Mouth" describes how the independent movement grew out of established networks of black churches and fraternal organizations in the region. From 1886 to 1900 African Americans established farming cooperatives, raised money for schools, published newspapers, lobbied for legislation, protested the convict lease system and helped to launch the People's Party.

"Ali correctly resists the common tendency to either see black populists as an offshoot of the white populist movement, or a failed effort at interracial organizing," writes Dr. Robin D. G. Kelley in the book's foreword. "Rather, he paints a compelling portrait of an independent movement. ... Ali flips the script, if you will, and compels us to rethink the entire history of late 19th century Southern politics."

In North Carolina, black and white populists formed an alliance that won control of the state legislature in 1894 and the governor's office in 1896. The bloody Wilmington Riot of 1898 was a response by the Democratic Party to retake state control. The incident would signal the demise of black populism in North Carolina, and soon across the region.

A frequent commentator in the national media, with political analysis offered on CNN and NPR, among other networks, Ali sees similarities between the Democratic Party's virtual monopoly in the South during the late 19th century and the dominance of the Democratic and Republican parties in the nation today. In both cases, entrenched parties have blocked important reforms, he says.

"It's been the outsiders, the independents, who have been at the forefront of critical changes in American history, from the abolition of slavery to labor rights, from women's right to vote to civil rights. All of these things came from outside forces, independents and third parties, until they were co-opted by the parties in power.

"What independents, black and white, are doing now is challenging the political control of the two major parties on the electoral process. In that way, they share a history with the populists of a century ago."

Like a lot of people, Dr. Cerise Glenn is fascinated with pop culture. But her interests lie more with what people take away from movies and television.

This semester Glenn is teaching “Popular Culture and Media,” which allows her to talk with students about how pop culture is more than entertainment. It often sends subtle messages about defining who you are.

Understanding the creation of that sense of self is at the heart of Glenn’s research. As a communication studies professor, she looks at how the intersection of race, class, gender, age and nationality come together in a potent mix and influences everything from picking a profession to defining success.

“Sometimes there’s the fear that if you’re financially successful you’ll lose the cultural elements of who you are. As I interview students, I see that’s a real fear they have.”

Women — particularly those who have family who didn’t go to college — struggle to put those two identities together.

It’s a push-pull in a lot of ways. Young African-American women worry that if they become too educated, they won’t be able to get married. At the same time, a sense of empowerment and pride comes with that success and achievement.

Families play into that as well. They hold up the successful family member as a role model while at the same time giving off the perception they aren’t “one of us” anymore.

Glenn also looks at fit and belonging within organizations. “How do I present myself in this situation? How do I learn to show I belong?”

She has gotten involved with Rites of Passage, a series of workshops for African-American male students to help them succeed at UNCG. Glenn talks with them about finding faculty mentors.

Students tend to seek out mentors who look like them. “They use that as cues sometimes more so than skill sets. (I tell them) you can get socialization of skill sets with someone who doesn’t look like you.”

For her dissertation, she began a study with African-American women who were interested in becoming professors. This semester, she will interview them again and see how they are adjusting in their new roles and learning the ropes.

Most recently, she’s completed a study on African-American women who became tenure-track faculty in the sciences, technology, engineering or mathematics (STEM) disciplines. Glenn looked at how these newcomers to universities are socialized and taught job-related expectations in traditionally male-dominated fields. She found they faced challenges such as the demands of additional roles, finding mentors, being excluded from social networks and resources, and others questioning their competence and “belonging.”

She’s also looking at why some people are better at negotiating all the different hats they wear than others.

The questions about constructing identity continue to fascinate Glenn. And she encourages her students to find what fascinates them as well.

“Research doesn’t have to be dry and boring,” she said. “You can connect and find yourself in your work.”



I found people would talk about these characters as if they were real people. I thought, ‘Why are you taking a cue of who you’re supposed to be from a movie?’”

Dr. Cerise Glenn





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IN FOCUS One middle school student interviews another in a class observed by Dr. Heidi Carlone, who has spent more than five years studying what makes students identify themselves as "good" in science. Her work has uncovered the teaching practices that make a difference in how students develop strong science identities. *Read more about this research on page 24.*

