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also featured
‘JANE CROW’
IMPACT OF BLACK WOMEN WRITERS

THE RETURN
HELPING FORMER INMATES WITH NEW START

DRUM ROLL, PLEASE
PROFILE OF A PERCUSSIONIST
EARLY INTERVENTION
Biomedical engineering graduate student LaDonya Jackson works on a new test to help prevent health problems in people with Type 1 diabetes

ELECTRONIC ARCHITECT
Avinash Kodi harnesses the power of optics to boost the multitasking abilities of computers

REVEALING “JANE CROW”
A new book by scholar Ayesha Hardison examines the black female writers of the mid-20th century

WIDE CANVAS
Mateo Galvano mixes photography, drawing, sculpture, sound, and poetry in his vast installations

COMING HOME
Former inmates start a new life in Southeast Ohio with the help of a network of social services

VARIATIONS ON A RHYTHM
From the boombakini to the rock drum kit, percussionist Roger Braun uses multiple tools to make music—from world beats to Latin jazz

AFRICA: DEEP IN TIME
Discoveries from the Rukwa Rift Basin help Ohio University paleontologists piece together the development of Africa’s unique landscape and its inhabitants

UP FRONT :: From the Office of Research l Supporting Innovative Bobcats

OF NOTE :: Infant health discoveries l Highway impact on wildlife l Cell phones and agricultural innovations l Disaster relief agencies l Art therapy on film

CLASS ACT :: Polar Puzzle: Meteorology students move from forecasting to studying Antarctic climate change
Roger Braun, center, has been leading Ohio University’s percussion program for 15 years. See story, page 32.
Supporting Innovative Bobcats

A student’s passion for science might have its roots in a childhood fascination with the stars in the night sky. That interest may be kindled in an astronomy course at Ohio University, which then leads to an opportunity to conduct research with a faculty member who is an expert on the cosmos.

An artist’s early experiments with watercolors may lead to the discovery of other creative media in the studios of Ohio University’s Seigfred Hall, and later, to the exhibit space of Trisolini Gallery. To pursue a career unlocking the mysteries of our universe or exploring our world through artistic expression, students need enriching professional opportunities. The chance to present study findings at a conference of peers, display work in a national competition, or interact with scholars in other disciplines to make new knowledge connections is invaluable for academic and professional development. Support from alumni and friends helps make these opportunities possible.

Ohio University offers several special programs to nurture the careers of our student researchers, scholars, and artists. The Student Expo welcomes more than 750 undergraduate, graduate, and medical students to present the results of their original work for a panel of faculty judges and to a general audience that includes middle school and high school students from Southeast Ohio. The Undergraduate Travel Fund supports students attending professional conferences, exhibits, or performances to present their research, scholarship, or creative work. This program allows us to send student ambassadors to national venues where they can make the connections necessary to launch their careers.

Student demand for these programs grows each year. To help our younger Bobcats realize their dreams of pursuing careers in research, scholarship, and creative work, we launched a Student Research Fund through The Ohio University Foundation (www.ohio.edu/give). Your support of this fund will provide new opportunities for our students to innovate and make a positive impact on our world.
Revealing the virus behind intellectual disabilities in infants

The National Institutes of Health has awarded $445,500 to Bonita Biegelke, associate professor of virology with the Ohio University Heritage College of Osteopathic Medicine, to study a virus considered to be the main viral cause of intellectual disabilities in infants.

Human cytomegalovirus (HCMV) is present in 80 percent of the population but is usually dormant in healthy individuals. However, HCMV can be deadly for patients with HIV, organ transplant recipients, and those who have weakened immune systems. It can also be passed from a pregnant woman to her fetus, causing deafness and intellectual impairments in infants. Currently, there is no cure for HCMV. The Institute of Medicine, an independent agency of the National Academy of Science, has ranked the development of an HCMV vaccine as a high priority.

Biegelke has been researching HCMV since 1991. About 10 years ago, her research team identified the protein UL34 as an essential player in the replication of the virus.

The three-year grant from the National Institute of Allergy and Infectious Diseases will help Biegelke’s lab learn more about the unique characteristics and conditions that make the virus go dormant or replicate and cause harm. A better understanding of how to control and regulate the UL34 protein may help scientists build a more effective and safer arsenal of antiviral compounds, which could be used to treat HCMV infections, limiting the associated diseases and birth defects.

story by :: LISA FORSTER
Engineers, environmental researchers to study impact of highway bypass on wildlife

When the Ohio Department of Transportation (ODOT) needed to bisect the Wayne National Forest with five miles of the new U.S. Route 33 Nelsonville Bypass, it invested $10 million to safeguard the forest’s natural habitat and threatened species. The state project included building wildlife crossings and fencing, installing special lighting, and creating a 7.5-acre wetland.

It’s a conservation strategy typically found only in the western United States for large mammal preservation, notes transportation engineer Deb McAvoy, chair of the Department of Civil Engineering in the Russ College of Engineering and Technology.

“This project is the first of its kind in Ohio,” she says.

How well is the strategy working? ODOT has awarded $600,000 to McAvoy and researchers in the Ohio University Voinovich School of Leadership and Public Affairs and College of Arts and Sciences over the next three years to monitor traffic safety and the effectiveness of the wildlife preservation efforts. The Ohio University engineers and scientists will work with ODOT, Wayne National Forest, and private industry partners.

McAvoy’s team will study traffic flow, road-kill rates, and the effectiveness of exit areas for deer.

“The key is to reduce deer crashes in order to maintain traffic flow along the roadway while reducing the impact to individual motorists associated with such crashes,” she says.

Willem Roosenburg, professor of biological sciences, and his team will study amphibians and reptiles, including how the bypass impacts population size.

Scientists—using photography and animal tags with radio transceivers—will map where the animals live, document how they are using new structures, and observe wildlife behavior.

The Voinovich School will contribute the expertise of field ecologists and GIS specialists who can evaluate which pieces of the protective and mitigation efforts are working most effectively, according to Scott Miller, director of the school’s energy and environmental programs.

story by :: COLLEEN CAROW + SAMANTHA PEKO
Connecting farmers with information about agricultural innovations

With the support of the John Cady Fellowship, Ohio University graduate student Juneann Garnett has examined how the growing popularity of cell phones in her native Guyana could help inform farmers about agricultural innovations.

Garnett is mapping how information spreads, using hydroponic farming methods as a baseline example. In Guyana, farmers are losing crops due to flooding. By using hydroponic farming, crops can be raised above ground and grown in materials such as rice husk, sand, and sea shells. This method makes better use of available space and earns a faster rate of return on cash crops in the region.

Farmers can receive information about this farming method in a variety of ways. They can text or call hotlines to reach extension officers or automated messages that give them tips on topics such as when to plant, when and how to apply fertilizer, what kind of soil mixtures different crops need, and other vital information. Despite the costs of the technology, the demand is out there, says Garnett, a graduate student pursuing a master’s degree in Latin American studies with a certificate in development practice.

“A lot of times these things could incur an expense,” she says. “I asked farmers if they’d be willing to pay for information. A lot of them have indicated that this is the case. ... The kind of information they would want, marketing and production information and that kind of thing, is very valuable to them.”

Garnett hopes that her research can be extrapolated to more Latin American and Caribbean countries where farmers need better access to information.

“I’m very passionate about using information for development, and streamlining that information for it to get where it really needs to go for farmers to make the right decisions,” Garnett says.

story by :: JACOB ZUCKERMAN
How faith-based organizations repair homes and lives

Brenda Phillips, a sociology professor and associate dean at Ohio University-Chillicothe, is the author of the recent book Mennonite Disaster Service: Building a Therapeutic Community after the Gulf Coast Storms (Lexington Books). The book chronicles the experiences of both volunteers and homeowners who were impacted on the Gulf Coast after hurricanes Katrina, Rita, and Ike.

Phillips spent a year in 2010, the fifth anniversary of Hurricane Katrina, conducting research that included “participatory observation,” working alongside members of the Mennonite Disaster Service (MDS) on the Gulf Coast of Louisiana, Mississippi, and Alabama. The experience allowed her to gain an inside understanding of the group, their efforts, and those they impact. She and her research team interviewed 162 people, mostly low-income individuals whose homes had been badly damaged or destroyed by storms, as well as local community leaders.

“I wanted to know the organization from the ground up, so I spent a year on the research and working as a volunteer. MDS has a reputation as being the best at what they do, and I wanted to learn what they are doing right that makes them so effective,” she said. “MDS is known for going to the ends of the earth and focusing their efforts on people who are least like to recover from a disaster, such as the elderly, people with disabilities, and low-income families.”

Originally, Phillips set out to evaluate the organization and help them understand how they can better perform their duties. But the project soon became about the meaning of volunteer service and what the recipients and the volunteers get out of it, she says.

“I learned that they work really hard at relationships. Homeowners who were helped by MDS talked mostly about the kind of people who came to build and repair their houses rather than the projects themselves,” Phillips said. “The most common word they used to describe the volunteers was ‘family.’ Part of the Mennonite theology and belief system is that you help your neighbor, and the MDS approach certainly personifies that.”

Phillips is continuing to explore how faith-based disaster service organizations get their start. She’s examining how religious values and beliefs translate not only into service, but into organizational structures, and what the relationship is between faith and sustaining an organization over time.

story by :: JACK JEFFERY
The new documentary *A Beautiful Remedy* reveals how the Arts and Medicine Program at the University of Texas MD Anderson Children’s Cancer Hospital encourages young patients to embrace their creativity.

The film was produced and directed by Lynn Harter, a professor in the School of Communication Studies, and WOUB’s Chief Editor/Videographer Evan Shaw. Through firsthand interviews, Harter and Shaw showcase how the program, led by artist Ian Cion, allows children to create their own art, learn new techniques, and work collaboratively with other kids as a way to overcome their hardships.

“Sometimes there is no fixing the circumstances; there can only be a shift in the environment,” Harter says. “Instead of giving these children pity about their situation they are able to create meaningful work everyone can be proud of.”

*A Beautiful Remedy* is the first of three documentaries in a series called “The Courage of Creativity” on the power of art programming to help individuals and organizations. The goal of the series is to start the conversation of what creativity can do for illness and self-identity for those suffering. An excerpt from the series already has garnered the documentary team an Emmy Award.

The documentary will appear on PBS and be available nationally for purchase. The program was funded with support from the Barbara Geralds Schoonover and Joe Berman Professorships.

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*Documentary explores the power of the arts on illness*

*(Above) This dragon is part of a traveling art exhibit collaboratively constructed by more than 1,300 children and families served by the Arts in Medicine Program at the University of Texas MD Anderson Children’s Cancer Hospital.*
By the time she was a college sophomore, LaDonya Jackson already was cloning horses in a lab at Utah State University. She thought her interest in this research stemmed from her childhood dream of becoming a veterinarian, but she quickly realized that’s not what excited her about the work.
“If the destruction of beta cells can be halted before major damage is done, patients will have the possibility to live natural lives without the worry of insulin injections and blood glucose problems.”

LaDonya Jackson

“I thought I was interested in the animal aspect of animal cloning. I found out it was the technology and engineering applications to medicine that I was interested in; that’s when I began working in that field,” she recalls.

Jackson, now a second-year graduate student in biomedical engineering at Ohio University, has turned her laboratory skills to developing a diagnostic assay (a test used to diagnose different biological states) that can detect the early onset of Type 1 diabetes.

She is working with two mentors from the Heritage College of Osteopathic Medicine, Kelly McCall, an associate professor of endocrinology, and Frank Schwartz, a professor of specialty medicine, to create a test that can detect the disease before it causes irreparable damage to the pancreas.

Early detection of the disease will allow patients to begin treatment regimens earlier, ideally resulting in better clinical outcomes for the patients, McCall says.

PREVENTING CELL LOSS

Type 1 diabetes is characterized by a loss of pancreatic beta cells, Jackson says. They are responsible for producing insulin, which the body needs to utilize the glucose obtained through food. Current diagnostic tests for Type 1 diabetes can detect the disease only after 50-70 percent of the pancreatic beta cells have been destroyed.

“The diagnostic assay we’re hoping for will be able to detect diabetes early on before the major loss of the beta cells in the pancreas,” Jackson notes.

Early detection and medical intervention could result in preserving the body’s natural ability to produce insulin, meaning less overall medical treatment for the patient.

“If the destruction of beta cells can be halted before major damage is done, patients will have the possibility to live natural lives without the worry of insulin injections and blood glucose problems,” she says.

Jackson began designing the diagnostic test in June 2013. By the end of the summer, she was testing the assay using cell cultures. The results were promising; the cell cultures have shown a high sensitivity and high specificity, indicating a good probability that the assay can detect early onset Type 1 diabetes. These results prompted the move to animal trials in spring 2014.

Jackson concluded a 24-week study in November of 48 mice with a genetic predisposition to spontaneously develop Type 1 diabetes. Though still analyzing her data, she is hopeful the results will show that the assay detected which mice were developing diabetes early in the study.

MERGING MEDICINE WITH ENGINEERING

Jackson decided to pursue her graduate education at Ohio University because of the integrated nature of the biomedical engineering program, which is housed in the Russ College of Engineering and Technology but has synergies with several other academic colleges and institutes on campus, including the Heritage College of Osteopathic Medicine.

“If you are creating a diagnostic assay, you have to use both medical and engineering applications. It has the possibility for direct application to impact the lives of patients,” she says.

After she graduates from Ohio University, Jackson will pursue a dual doctoral degree in medicine and philosophy. She plans to become a reproductive endocrinologist and pursue research on in vitro fertilization, embryonic stem cells, and epigenetics, the study of heritable changes that are not caused by changes in the DNA sequence.

As for her current research, Jackson will continue working with her mentors to study the effectiveness of her assay in the hope that it will one day be available to the public.

“LaDonya’s research is important because it may not only lead to a better understanding of how Type 1 diabetes develops,” McCall says, “but may also provide a novel and much improved method for diagnosing this disease earlier, which may help to prevent the progression of the disease and/or delay its onset.”

(Opposite page) Jackson works with Heritage College of Osteopathic Medicine endocrinologist Kelly McCall to test the effectiveness of their diagnostic tool. Current tests can detect the disease only after 50 to 70 percent of the beta cells in the pancreas have been destroyed.
AVINASH KODI HARNESSES THE POWER OF OPTICS TO BOOST THE MULTITASKING ABILITIES OF COMPUTERS

by ANDREA GIBSON
Vinash Kodi considers himself an architect, but you won’t see his creations punctuating a city skyline. His design work is intended to sit deep within our computers, driving them to be faster, more efficient, and less expensive.

Kodi is constructing a new generation of processors for our electronic devices that merge computer science engineering with photonics. In other words, he asks, how do you get the fiber optic cable technologies that wire us to the internet inside our computers?

It’s a “hot field” in computer technology, with major research institutions such as MIT and Cornell and industry leaders Intel, Oracle, and IBM all working to solve the problem with support from funders such as the National Science Foundation and Defense Advanced Research Projects Agency (DARPA), Kodi says.

Kodi, an associate professor of computer science in Ohio University’s Russ College of Engineering and Technology, has been exploring the convergence of optics and high performance computers since his days as a doctoral student at the University of Arizona. During his seven years at Ohio University, he’s landed two National Science Foundation grants to advance his research on multicore computer processors for our electronic devices that boast processing and computer chip communications.

Commercial computer processors may be built with between four and 72 cores to ensure the system so that it could work at 1,000 cores. Those mega multicore processors would eat up a lot of power, however, and they must be able to communicate with the efficiency of their smaller counterparts, Kodi notes. It’s a classic scaling problem, he explains.

That’s where photonics comes in. The concept uses laser light as a conduit for communication between the individual cores. Kodi and other researchers specifically are looking at building photonic components on silicon substrates to make the process work.

“Silicon is the material used for electrical circuits or what we use in today’s computers. If the material is the same (for metal and photonics), then manufacturing and fabricating would become simpler,” Kodi explains. He adds that “there is a push to make silicon photonics a reality, as industry will easily adopt it.”

So far, he’s simulated the idea for 64 to 256 cores.

“The idea could work for four to eight wavelengths of light transmitted between the source and destination—basically a very, very small scale idea,” he explains, noting that nothing has been fabricated in the lab or by industry yet.

Kodi’s lab has integrated multiple layers of photonics in a processor, which reduced power consumption. Now he’s exploring how to scale up the system so that it could work at 1,000 cores.

“These are emerging technologies—there are no clear-cut tools to use,” he notes.

With Ohio University engineer Savas Kaya, Kodi also is investigating how to integrate wireless communication technologies on multicore computer processors. This function would work in conjunction with the silicon photonics, he says.

Although Kodi and others in the field of silicon photonics are making progress on the technologies, some hurdles remain. “The devices are thermally unstable,” he says. “If the temperature increases, they do not behave how you expect them to behave.”

That’s because the detectors in the technologies are programmed to a particular wavelength or color of light. Temperature increases can prompt a color change, which can lead the detector to misread the data, Kodi explains.

Researchers also are searching for more efficient lasers to use in the system. Right now the efficiency is less than 10 percent, as much of the light disperses into air instead of the waveguide before it can be used, he explains.

Kodi’s goal is to create a small prototype of a multicore processor that uses silicon photonics in the next few years. He’ll tap the expertise of Kaya, a specialist on nanoscale structures in computer science, and work with a team of undergraduate and graduate students.

The researcher notes that studying emerging technologies means being comfortable with a high level of uncertainty, but it’s a good creative and intellectual challenge for his students.

“They are exposed to a variety of areas—circuits, optics, computer architecture,” he says. “They wind up with a breadth of knowledge, not just a depth of knowledge.”

It’s paid off for his alumni, who have gone off to work for state and national tech companies, including Intel.

As for Kodi, he hopes to explore how photonics could play a role in improving our smart phones and tablets. And he has his sights on even bigger processors, such as the 100,000 multicore processors that could run massive computations.

“Think of Facebook or Google servers where everyone is tapping in — updating their profiles, posting photos and searching,” he says. “It requires significant computation and communication between cores and memory.”
In Writing through Jane Crow: Race and Gender Politics in African American Literature, Ohio University scholar Ayesha Hardison sheds light on mid-century writers—particularly women—and how portrayals of black women in literature of the time reflected the real-life racism and sexism those writers faced.

A lifelong reader, Hardison first became interested in race and gender issues in literature in her late teens. “That is when I was exposed to the work of Toni Morrison, who had achieved a kind of popular, commercial success in addition to her critical stature, and I was introduced to earlier black women writers like Zora Neale Hurston,” says Hardison, an associate professor of English.

Her book is an expansion of research she did for her dissertation. With fellowships from the Ford Foundation and the Black Metropolis Research Consortium, Hardison scoured archives in Chicago and at Yale, Harvard, Radcliffe, Princeton, and Rutgers universities, diving into everything from African American newspapers and magazines, films, and music to biographies and etiquette guides to put the literature in context.

“I traced various threads—figures, events, and places—to see where they might lead me,” she says. “Everything I read did not make it into the book, but I weaved together those threads in order to discover new insights about the period and add new layers to our appreciation of it.”

Hardison’s interest in mid-century African American literature is unusual. More scholars traditionally have studied the Harlem Renaissance, and, since the 1990s, the Black Arts Movement. Hardison attributes this focus to the ease with which authors can be pegged to a place (Harlem) or a particular belief (the Black Power Movement).

“A good example is Richard Wright’s seminal Native Son, which breaks with the positive message advocated by the Harlem Renaissance but doesn’t go all the way to a call for revolt.”

But the work of mid-century African American writers is worth studying for what it tells us about that time, Hardison says—even if some of that work can be a little more difficult for scholars to unpack.

“Black writers that complicate our understanding of mid-20th century African American literature, due to their aesthetic conventions, gender subject matter, or lukewarm critical reception, need to be recovered,” she says. “They offer a unique perspective and make a valuable contribution to black cultural production.”

Hardison showcases a number of these lesser-known black writers, including Era Bell Thompson, foreign correspondent and editor of Ebony magazine, is one of several writers featured in Hardison’s recent book.
Thompson, longtime foreign correspondent and editor of Ebony; Jackie Ormes, the first African American woman cartoonist; and Pauli Murray, poet and groundbreaking civil and women’s rights activist.

Male writers get their due, too. One chapter discusses Third Ward Newark, a 1946 novel by Curtis Lucas about the tragic consequences for two young black girls abducted by white men with intentions to rape. One girl is beaten to death; the other escapes, but never fully recovers from the ordeal.

Violence—particularly sexual violence—is a common theme in many of the works. “The sexual violence targeting black women has not been documented to the same extent as the lynching of black men, but mid-20th century black writing exposes the threat of sexual violence, which differentiates the oppressive experiences of black men and black women,” Hardison says. “The literature of this period highlights white men’s sexual assault of black women, which did not warrant legal restitution, such as in Third Ward Newark, as well as black men’s complicity in patriarchy and black women’s sexual and economic exploitation, as in Ann Petry’s novel The Street.”

Hardison plans to do further work on Ormes and Thompson, both of whom are understudied, she says. “Despite their obvious cultural influence in their historical moments, and the importance of their legacies, I knew very little—if anything—about these extraordinary women before my research for the book,” she notes.

Hardison acknowledges that discussion of race and gender can be difficult, but she says that makes it even more important to talk about them.

“We encounter racial and gendered representations in our lives daily—on television, in magazines, in films, on the news, and on the billboards we encounter while driving,” she says. “Race and gender shape the cultural media we consume as well as how we interact socially and politically in the world. Confronting these topics lessens our discomfort and increases our skill in discursively managing such subject matter. This is how we continue to learn and develop intellectually.”

“Black writers that complicate our understanding of mid-20th century African American literature, due to their aesthetic conventions, gender subject matter, or lukewarm critical reception, need to be recovered. They offer a unique perspective and make a valuable contribution to black cultural production.”

AYESHA HARDISON
MATEO GALVANO MIXES PHOTOGRAPHY, DRAWING, SCULPTURE, SOUND, AND POETRY IN HIS VAST INSTALLATIONS

Skeins of white silk gauze and translucent paper flow elegantly from the ceiling to the finely polished concrete floor, which is filled with swirling white designs formed by hundreds of hands and leaves, suggesting seashells or bones, created from cast plaster.

story by ANGELITA FALLER
The walls are filled with dozens of images portraying key moments in the circle of life, ranging from a newborn fawn nestled in the grass to a dead fox decomposing in the forest. This exhibit, titled “Book of the Dead,” is one of four full-room installations created by artist Mateo Galvano for his thesis exhibition, which was displayed at Majestic Galleries in Nelsonville in April 2014 and funded by an Ohio University Student Enhancement Award. While his MFA degree emphasis is on painting and drawing, Galvano works with a variety of other media, including collage, photography, sculpture, 3-D installations, poetry, and sound composition. His work often encompasses elements of the supernatural, emphasizing the themes of damage, memory, time, and loss.
Galvano believes the advantage of coming to an academic setting later in life is that he was challenged to approach new ideas and practice expanded forms of art.

**COMMANDING THE GALLERY**

In addition to “Book of the Dead” and “Inheritance,” Catch and Release” featured two more exhibits.

“Empathies” featured a dozen abstract drawings of tendrils meant to represent different ways of connecting or disconnecting with other people on an emotional level.

The final exhibit, “Dialect Series,” served as a showcase for Galvano’s experimental pieces involving hybrid paintings and photographs exploring the breakdown of the written word and language.

Galvano’s thesis exhibition is quite large in comparison to other final projects in his MFA program. Very few students fill an entire gallery for a three-week exhibition, says Julie Dummermuth, an associate professor of painting and drawing at Ohio University and Galvano’s adviser.

“He transformed that space into one of invitation, where meaning and its disintegration presented itself through a lens of gratitude and humility and where a life-affirming spirit portrayed a simultaneous sense of inner life and afterlife,” Dummermuth says.
“I like there to be ambiguity in the work. It doesn’t say: This is what you’re supposed to think. It filters through a person’s psyche, and they can have their own experience.”

INHERITANCE

Installation view of sculptural installation with original sound composition by the artist.
Photo:Mateo Galvano
A CAREER IN FINE ART

Galvano has worn many different hats in his artistic career. Prior to attending Ohio University, he worked as a waiter and bookstore manager before opening his own art gallery, all while working as a professional artist in Santa Fe, New Mexico.

Since 1988, his work has been shown at many venues, including Northeastern University in Boston, Ward-Nasse Gallery in New York City, and Chiaroscuro Contemporary Art in Santa Fe.

Galvano relocated to Athens in 2005 to be with his partner, C. David Russell, an assistant professor of production design and technology in scenic design. He joined Ohio University in 2006, earning his bachelor of fine arts degree in 2009, his MFA in 2014, and a certificate in museum studies in May 2015.

Galvano now teaches art courses at the Ohio University Lancaster campus, and this autumn will take on a part-time instructor position at the School of Art + Design at Athens as well.

Since completing his MFA, Galvano has displayed his work in solo exhibitions at the Hilton Columbus Downtown and the Holzer Clinic in Athens, as well as in several recent group exhibitions around the country (see sidebar). He is in the midst of several new projects, including a series of abstract paintings involving wildflowers, a book of prose poems and landscape photography, and editing sound compositions of vocal experiments.

When asked about the overall meaning of his work, Galvano says he does not want people to take home a specific message. Instead, he wants his work to serve as an outlet for people to experience personal truth.

“I like there to be ambiguity in the work. It doesn’t say: This is what you’re supposed to think. It filters through a person’s psyche, and they can have their own experience,” he says. “That’s why I don’t necessarily want to make things too clear in the work.”

RECENT SOLO EXHIBITIONS

2015  Remedy, Holzer Clinic, Athens, Ohio
2014  Sanctum, Hilton Columbus Downtown, Columbus, Ohio
2014  Catch & Release, MFA Thesis Exhibition, Majestic Gallery, Nelsonville, Ohio

RECENT GROUP EXHIBITIONS

2015  Athens Voices, Dairy Barn Arts Center, Athens, Ohio
2015  Athens Voices, Arthur Butcher Gallery, Concord University, Athens, West Virginia
2015  Athens Voices, Alabama Center for the Arts, Athens, Alabama
2014  Expansion, Shawnee State University, Portsmouth, Ohio
2014  Athens on Paper, Dairy Barn Arts Center, Athens, Ohio
2014  Athens Paints, Dairy Barn Arts Center, Athens, Ohio
Former inmates start a new life in Southeast Ohio with the help of a network of social services

In jail, you have big plans for what you'll do when you get back out, Brandy Morris recalls. But reentering society after finishing a stint in prison can be more difficult than you think. “It’s very hard and challenging, especially if you don’t have support or money. And employment—there’s so many things you don’t have,” Morris says. The Ohio Department of Rehabilitation and Correction has a strong track record of spearheading help for former inmates such as Morris who reenter the community. But those programs had been more successful in urban areas than rural ones such as Southeast Ohio, notes Lesli Johnson, an associate professor in the Ohio University Voinovich School of Leadership and Public Affairs.
The project case managers conducted a second assessment with the individuals to determine what they perceived to be the clients’ highest needs. Those reentering society face many obstacles. In rural areas with little or no public transportation or services within walking distance, transportation becomes a major problem—even if the person has access to a vehicle.

“You often lose your driver’s license when you go into prison, either right off the bat or because you’ve been in there so long and you can’t renew,” Spjeldnes says. “But because of the fines, fees, and court costs, many of these people have thousands of dollars they have to pay back to the system before they can get their licenses back.”

Because a driver’s license is used as a basic form of identification, it’s hard to get other services without it, Johnson adds. In the trial project, the case manager helped the reentering client obtain a state identification card, Social Security card, birth certificate, or driver’s license to help land jobs or access programs such as Medicaid. The researchers found that individuals who obtained a driver’s license within the first 30 days of release were much more likely to be employed by the end of the study, Johnson notes.

Among those case managers was Morris, who worked for Alvis House in Chillicothe, Ohio, part of the Ross County hub.

“I had immediately believed in what they were doing for the simple fact that I know what it’s like to transition back into society,” she says.

The Ohio Rural Recidivism Reduction Project boasted a 7 percent recidivism rate among the 400 individuals who participated over an 18-month period.

Rather than duplicate existing programs with a new one, the project aimed to form a coalition of community programs—such as halfway houses, adult parole authority boards, and sheriff’s departments—in each of the 10 counties under study, where the recidivism rate was approximately 37 percent.

In counties with populations too small to sustain their own coalitions, a hub was created to serve multiple counties.

The linchpin of the project’s success, however, was more personal. “What became clear in our research was that it was important to have a community-based case manager to connect people coming out of prison with services and acting as a communication conduit,” Johnson says.

One of the case managers’ most important roles was a personal assessment of needs. Each exiting inmate already receives an individualized service plan from the Ohio Department of Rehabilitation and Correction that is designed to mitigate recidivism. (It also evaluates recidivism risk; each of the 400 individuals enrolled in the Ohio Rural Recidivism Reduction Project were classified as moderate-to-high risk, Johnson says.) The project case managers conducted a second assessment with the individuals to determine what they perceived to be the clients’ highest needs.

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“I had immediately believed in what they were doing for the simple fact that I know what it’s like to transition back into society,” she says.

The Ohio Rural Recidivism Reduction Project boasted a 7 percent recidivism rate among the 400 individuals who participated over an 18-month period.
providers to work more collectively and cooperatively to address the needs of the reentry population.

“I saw a lot of relationship building and a fair number of folks who took a step back to figure out how to tweak or alter our service delivery model,” Graves says. “It was really great to see people do that.”

The project has not only been successful for the former offenders and the service providers who help them, but for the community as well, adds Morris, who is now working as the operations manager for the Alvis House/Terry Collins Reentry Center.

“Anything that can lower the crime rates in your community, to make productive citizens who are paying taxes—that’s a win-win for everyone,” she says.

Although the project’s funding and trial run is complete, its impact will continue. Some of its successful elements—such as new collaborative efforts among existing service providers—can be sustained without any additional money, Graves notes. However, some of the counties are choosing to hire reentry case managers at the local level, he says, because of their effectiveness.

The project team hopes to leverage additional grant funding to study how to expand and enhance the case management initiatives from the original project. Graves has submitted a new proposal for Second Chance Act funding; if funded, Spjeldnes and Johnson will lead the research and evaluation team.

The project’s lessons can extend beyond Southeast Ohio, Graves notes. The model can be applied to other rural areas of the United States, as the project resulted in an operations and resource manual that can be shared with other communities.

For Johnson and Spjeldnes, the Ohio Rural Recidivism Reduction Project is an important step toward improving the nation’s criminal justice system. Comprehensive and individualized incarceration strategies to improve public safety must be followed by services for those who reenter society to ensure that they do not become more damaged or likely to commit crimes, Spjeldnes says.

“This is an effort to increase public safety, improve families, the economy, and the strength of our society,” she says.

It’s also cost-effective to focus on reentry, Spjeldnes notes. One study showed that for every dollar spent on reentry programs, an estimated $6 is saved on court and prosecution costs, as well as other damages that result from crime.

“For me personally, this is the social justice issue of our time,” she says. “We can’t continue with mass incarceration—we need to find ways to change our criminal justice system. We need to treat people decently, provide them with basic services that suit their particular circumstances. This has been shown to lower our costs and will influence generations to come.”
AFRICA:
DEEP
IN TIME

PHOTO: DREAMSTIME.COM
NANCY STEVENS AND PATRICK O’CONNOR RETURN FROM THEIR SUMMER RESEARCH WITH FOSSILS OF ANCIENT PRIMATES, DINOSAURS, AND OTHER SPECIES NEW TO SCIENCE.

The paleontologists journey to Tanzania each year to pursue their long-running investigation into the evolution of life in central Africa.

Before the Ohio University scientists established a field site in the Rukwa Rift Basin in 2002, little evidence of ancient mammals, reptiles, dinosaurs, or other living creatures had been captured from this part of the world. With help from fellow paleontologists and geologists based in the United States, Tanzania, and Australia, Stevens and O’Connor set out to find the missing pieces of the evolutionary puzzle.

The rift—a deep opening in the Earth’s crust—has revealed a trove of fossils from two geological time periods: the Cretaceous Period (144 million to 65 million years ago), when dinosaurs ruled and modern mammals and birds first emerged, and the Paleogene Period (65 million to 23 million years ago), a time when mammals rose to dominance after the fall of the dinosaurs.

In the following pages, we offer a glimpse into the scientific process from field to laboratory and some of the project’s notable finds from the rift.

TEAM LEADERS | Nancy Stevens and Patrick O’Connor, Ohio University Heritage College of Osteopathic Medicine; Eric Roberts, James Cook University (Australia).

FUNDING SOURCES | National Science Foundation, National Geographic Society, Leakey Foundation.
In 2008, the paleontologists discovered a skull with teeth that caught them by surprise. The jaw featured a row of squat, ridged teeth that were more like the molars of a mammal than the sharp, conical dagger-style teeth of today’s crocodiles.

The mysterious mouth, the small size of the animal, and the fact that the body didn’t have heavily armored plates led O’Connor to deduce that this Cretaceous crocodile was more like a cat than its lumbering, scaly modern counterparts.

“If you only looked at the teeth, you wouldn’t think this was a crocodile. You would wonder what kind of strange mammal or mammal-like reptile it is,” he says.

But the cat-like croc Pakasuchus (Paka is the Ki-Swahili name for cat and souchos is Greek for crocodile), was not an anomaly. The team has found fossils from seven different individual reptiles like this one in the Rukwa Rift study areas. The lack of armor allowed these crocodiles to be quick and agile hunters. They most likely moved about on land, not in the water. Pakasuchus may have used its unusual molars to slice through prey—insects and small mammals—in a shearing-like motion.

These mammal-like species are not the ancestors of modern crocodiles. Between 110 million and 80 million years ago, they exploited an ecological niche in a landscape of dinosaurs, turtles, fish, and small mammals. As climate changed and continents shifted, that niche disappeared—and so did these ancient crocs.

Based on other fossils discovered as part of the Rukwa Rift Basin Project, Pakasuchus lived alongside large, plant-eating sauropod and predatory theropod dinosaurs, other types of crocodiles, turtles, and various kinds of fishes.
his giant, plant-eating dinosaur weighed as much as several elephants. *Rukwatitan bisepultus* was a titanosaurian, a type of sauropod dinosaur known for iconic large body sizes, long necks, and wide stances. It lived more than 100 million years ago.

Paleontologists have found dozens of titanosaurians around the globe, but only a few have been found in Africa. "Much of what we know regarding titanosaurian evolutionary history stems from numerous discoveries in South America—a continent that underwent a steady separation from Africa during the first half of the Cretaceous Period," says Eric Gorscak, a doctoral student in biological sciences at Ohio University who served as lead author on the *Journal of Vertebrate Paleontology* paper that announced the discovery.

With the help of professional excavators and local coal miners, the Rukwa Rift Basin Project team unearthed the vertebrae, ribs, limbs, and pelvic bones of *Rukwatitan* from a steep, vertical cliff during the 2007 and 2008 field seasons.

CT scans of the fossils, combined with detailed comparisons with other sauropods, revealed unique features that suggested an animal that was different from previous finds, Gorscak says.

Not only did *Rukwatitan* differ from the sauropods found in northern Africa, but it was also distinct from the only other titanosaurian found in sub-Saharan Africa, a dinosaur from Malawi.

"There may have been certain environmental features such as deserts, large waterways and/or mountain ranges that would have limited the movements of animals and promoted the evolution of regionally distinct faunas," Patrick O’Connor says.
Artist Mauricio Antón’s reconstruction of the newly discovered fossil primates, *Rukwapithecus fleaglei* (front) and *Nsungwepithecus gunnelli* (right). Both fossils were collected from a site in the Rukwa Rift Basin of Tanzania.
When Ohio University graduate students Eric Gorscak and Ryan Felice unearthed two specimens in a different pocket of the Rukwa Rift, they not only had discovered two primates new to science, but also documented an important interval in primate evolution.

The specimens are the oldest fossils found to document the split between two major groups of primates: the group that today includes apes and humans (hominoids) and the group that includes Old World monkeys such as baboons and macaques (cercopithecoids).

*Nsungwepithecus gunnelli* represents the earliest member of the evolutionary branch containing cercopithecoids, and *Rukwapisithecus fleaglei* is interpreted as the oldest member on the branch including hominoids.

Geological analyses of the Rukwa Rift site revealed that these specimens are 25 million years old, which is several million years older than fossils previously documented for either of the two groups.

Not only are they the first primate discoveries from this particular fossil locality, but they are two of only a handful of known primate species from the entire late Oligocene (28 million to 23 million years ago), globally.

The Ohio University team’s finds also suggest that these two primate lineages had split into separate groups earlier than paleontologists had previously documented. Nancy Stevens notes that there has been a longstanding uncertainty on when the groups diverged, with estimates based on analyses of DNA sequences of living primates consistently suggesting an earlier divergence time than was evidenced by the fossil record. These finds represent the first paleontological evidence old enough to reconcile with the DNA information.
“The fossils suggest a fundamental shift toward more active and potentially venomous snakes that could exert very different pressures on the local fauna.”

NANCY STEVENS

As the research team began finding fossil snake vertebrae in paleontological localities dating to 25 million years ago, they suspected that they had found the fossils of booid snakes (related to modern boas and pythons). The environment at that time was expected to be lush and green, with plenty of foliage for this “hide and ambush” type of reptile to thrive.

The scientists did, indeed, discover a new species of booid snake, *Rukwanyoka holmani*, documenting the oldest African boine snake on record. The team was surprised, however, to find even more fossils from a very different snake group, says Jacob McCartney, an Ohio University postdoctoral researcher who published a paper on the findings in the journal *PLoS ONE* in early 2014.

The colubroids—which include modern cobras—are active foragers that use a variety of methods, including venom, to capture and kill prey. Although colubroids have been recorded from Africa as early as 50 million years ago, the group was not expected to constitute such a large portion of the African snake fauna as early as 25 million years ago.

This higher than expected number of colubroid snakes suggests that the local environment became more open and seasonally dry—and, in turn, more hospitable to these active foraging types of snakes that don’t require cover to hide and ambush prey—at an earlier time in Africa than in most other parts of the world.
**UNDERSTANDING THE EPOCH PUZZLE**

**THE PROCESS**

1. **EXPLORATION + EXCAVATION**  |  Rukwa Rift Basin Project teams have discovered dozens of fossil localities in this important segment of the East African Rift System. Once a fossil locality has been identified, the team intensively collects geological and paleontological samples.

2. **FIELD PREPARATION**  |  Fossils collected from the Rukwa Rift are prepared for transport to the laboratory. Smaller specimens are wrapped carefully and placed in impact-resistant containers. Larger, more delicate specimens are encased in plaster jackets until they can be extracted from the rock matrix under controlled laboratory conditions.

3. **LABORATORY PREPARATION**  |  Expanding the team effort into the laboratory setting, technicians and students in the National Science Foundation-funded Ohio University Paleobiology Specimen Preparation Facility use a variety of techniques to remove fossils from the encasing rock matrix.

4. **RECONSTRUCTION**  |  Scientists scan the specimens in Ohio University’s MicroCT scanner, allowing them to create detailed 3D reconstructions of the ancient specimens that can be used for comparisons with other fossils.

5. **MOLDING + CASTING**  |  Physical copies of the fossils are made for distribution to museums and colleagues worldwide. MicroCT scan data can also be sent to 3D printers, offering additional mechanisms for generating physical replicas of important fossil specimens.

Photos: Nancy Stevens, Ohio University, and Karie Whitman
“My favorite thing is to play collaborative music—I like the synergies that happen. It has a lot to do with the individuals I want to work with and what they bring as musicians.”
Variations on a Rhythm

A BOOMBAKINI, A VIBRAPHONE, A ROCK ‘N’ ROLL DRUM KIT. ROGER BRAUN IS A VERSATILE PERCUSSIONIST WHO HAS TRAVELED THE GLOBE.
This toilet paper tube—as silly as it is—has a pitch-bending effect,” the Ohio University percussionist notes, explaining that the clothespins dampen the sound produced when he strikes the instrument with yarn mallets.

Braun’s compositional companion for the evening, Andre Gribou, has hidden a few surprises in his neighboring grand piano. The piano wires are punctuated with silver screws and strips of blue painter’s tape. These tiny objects will play a big role in the reverberations emanating from what the two music professors call “prepared instruments.”

The duo begins the performance, the vibraphone and the piano in sonic dialogue. The music surges and subsides; the students’ eyes are fixed on hands that move expertly across the keyboard and bars. It’s clear that Braun and Gribou have a strong musical rapport; for years they’ve played live as a duo and as part of the Latin jazz group Los Viejos Blanquitos.

“My favorite thing is to play collaborative music—I like the synergies that happen,” Braun explains during a quiet moment in his office and teaching space on the top floor of Glidden Hall, where he’s directed Ohio University’s percussion program for 15 years. “It has a lot to do with the individuals I want to work with and what they bring as musicians.”

Braun has spent his career collaborating with a wide variety of musicians in performance groups that have toured the globe. In addition to his endeavors with Gribou, a fellow School of Music faculty member, Braun has played with Biakuye, an American-African world percussion troupe that included musicians from Ghana and Senegal, as well as Galaxy Percussion, which toured Japan and Korea. He’s gigged at the world’s biggest jazz music festivals, played with the industry’s top marimba and xylophone instrumentalists, recorded at Montreux, and jammed with Lyle Mays, a frequent collaborator with Pat Metheny.

These projects have allowed Braun to immerse himself in different musical forms—from African and Asian world music to Latin jazz and contemporary instrumental music.

“I can be a lot of different people musically, which is a lot more interesting for me than doing the same gig over and over,” he says. “A lot of people have said, ‘You can’t do it all.’ But I smile and say, ‘I try.’”

These days, Braun is focusing on improv performances with
Gribou and creating new compositions under the name Ohio Percussion. He's collaborating with former students and taking advantage of the ease of do-it-yourself music publishing by getting his work directly to fans via iTunes and other online sites.

When he does compose, he has what looks like the world's treasure trove of percussion instruments at his fingertips.

In addition to the large xylophone, marimba, and vibraphone in his office and teaching space, Braun shows off a rare “boombakini,” a gift custom made by Dominican Republic musician Felle Vega. There are probably only 50 of these wooden, curved percussion instruments in the world, Braun says, and he has number 36.

Tucked between these impressive, beautiful instruments is a classic drum kit. Braun notes that he got his start with percussion like a lot of American teens do—providing the back beat for the local rock band. He played all over his hometown of Westport, Connecticut, and made his first recording at age 14, early musical experiences that pushed him to enroll in the nation's top percussion programs at the University of Michigan and the Eastman School of Music.

“I’m very much a strong drum set player at heart—it’s kind of like coming home for me,” he says.

Braun is no longer playing rock music, but the drum kit can have a featured role in his performances. Videos of Biakuye show the percussionist moving easily from hand-slapping the boombakini to teasing out shimmering tones on the vibraphone to wielding a pair of drum sticks on a kit's snare and rack toms—all in the service of the group's vibrant world music.

Although a lot of percussionists specialize in only one instrument—such as the marimba—Braun relishes working across a wide collection of musical tools.

At his classroom performance with Gribou, for example, Braun has stocked a table of small percussion instruments, such as piccolo wood blocks and Chinese jing cymbals. A series of larger cymbals surround them. At various points in the piece, Braun strokes a violin bow across the edge of the cymbal to create a haunting sound.

When the room goes silent, the students pepper the duo with questions about the art of improvisation, and offer their own insights about how performing with others requires some vulnerability, personal chemistry, and trust.

Braun notes that he and Gribou have an easy rapport—which translates to a fruitful creative partnership.

“We just connect really well musically,” Braun notes later in Glidden Hall. “We have a wide understanding of different musical styles—we're not limited in what we can play—and we uniquely do it without written music in front of us.”

The two both came out of a rock ‘n’ roll background but spent time at conservatories, so have a “shared vocabulary” in classical, jazz, and rock music and a similar artistic point of view, says Gribou, professor of piano/composition/general studies.

“When I throw something out, Roger will be there in two seconds,” he says of their improv performances. “It’s so incredibly cool to be able to do that onstage with somebody.”

While Braun continues to compose his own work, he notes that improvisation has become the focus of his performances with Gribou, as it allows him to draw on his wide range of musical instruments and music styles that he's played throughout his career.

Can he pick a favorite style? Braun has a passion for all of it.

“I enjoy continuing to learn,” he says, “and continuing to explore.”
Like many of the students he now teaches, Ryan Fogt entered meteorology expecting a career in forecasting. “But I was the worst in my class!” Fogt says. “My professor said he couldn’t write me a good letter of recommendation if I wanted to be a forecaster.”

Instead, Fogt turned to research. As director of the Scalia Laboratory for Atmospheric Analysis at Ohio University, he’s now helping more undergraduates do the same.

In May 2014, backed with a $250,000 grant from the National Science Foundation, Fogt recruited three undergraduates and a graduate student to help him undertake an ambitious three-year project. The team will look at how atmospheric pressure over Antarctica has changed over the last century (especially in the last 30 years), what causes those changes, and how those changes have affected other areas of the globe.

First, the research team had to reconstruct historic pressure records between 1905—when such records begin for most other locations in the Southern Hemisphere—and 1957, when record-keeping began for Antarctica.

To do that, undergraduates Megan Jones, Chad Goergens, and Grant Witte

(Above) Glaciated mountains and ice cliffs surround Paradise Bay in Antarctica. (Left) Undergraduate meteorology students Chad Goergens, Grant Witte, and Megan Jones (back row, left to right) work with faculty member Ryan Fogt (center) on a National Science Foundation-funded project that seeks to recreate historic weather records for Antarctica.
pulled existing data from weather stations in locations nearest Antarctica, such as Australia and the tip of South America. Using a program Fogt wrote, they correlated pressure patterns for those stations and Antarctica between 1957 and now.

“The mass of the atmosphere is constrained: If it's low in one place, it's balanced by high pressure somewhere else,” Fogt says.

With actual historical pressure figures in place, the students created a series of data sets—drawing on different numbers of weather stations, or from different locations—to determine which set's predictions most accurately mirrored the existing data. Armed with estimated pressure data for individual stations in Antarctica, they could then map pressure across the entire continent.

In addition to expanding the base of knowledge about the world's driest and coldest continent, Fogt says the project may help to shed light on wider climate trends. “A lot of studies show a connection between Antarctica and the tropics,” says Fogt, whose doctoral dissertation explored the interplay between polar weather changes and formation of El Niño patterns in the central Pacific Ocean. In a previous NSF-funded project, Fogt and his students studied a persistent low-pressure Antarctic system to see if it had a role in the continent's uneven climate changes.

Sitting in front of a computer screen on the top floor of Clippinger Laboratories all summer may not be everybody's idea of a great time, but Fogt's students embraced the work. “It was kind of fun in a way,” Jones says.

Unencumbered by classes and studying, they were able to focus entirely on the project. “This work is more rewarding when you're not doing 100 other things,” Goergens says.

It also was another opportunity to spend time with friends who share common interests. Most meteorology majors are at least acquainted with one another; in a program with approximately 70 majors at any given time, it's hard not to know everyone. Between having the same classes and participating in the same activities (more than half the program's majors belong to the Ohio University student chapter of the American Meteorological Society), meteorology students tend to be a tight-knit bunch.

“It's so helpful to have a lot of the same people in the upper-level classes, so we can all help each other out and bond during late night studying,” Jones says. None of the three had expected to do research as undergraduates. “I always assumed it was something reserved only for graduate students,” Witte says.

Now both he and Goergens are not only doing research, but also presenting it: Both were presenters at the January 2015 student meeting of the American Meteorological Society.

“Not many undergraduates get the opportunity to present their own research on a platform such as this, so I hope to make the most of it,” Witte says.

Witte, a senior, hasn't decided what to do after graduation. Jones, a junior, and Goergens, a senior, are considering pursuing careers in climatology. It's especially a switch for Goergens, who also had an internship with the National Weather Service in Wilmington, Ohio, last summer.

“My internship was great, but I concluded that forecasting might not be my cup of tea,” he says. “I gained a lot more interest in climatology by working for Ryan, and this research position has opened up many new opportunities that I never knew existed.” That's exactly what Fogt had in mind when he added research to the Scalia Lab agenda back in 2010.

“In forecasting, people read it every day and it goes away,” he says. “With this work, we're creating meaning.”
AT A Glance

:: Diabetes intervention
Using engineering technology to tackle a medical problem

:: Computer booster
How optics can drive the next generation of electronic devices

:: Artistic vision
Installations explore themes of damage, memory, time, and loss

PHOTOS: (TOP LEFT) BEN SIEGEL; (BOTTOM LEFT) PORTRAIT, BEN SIEGEL; DIGITAL ILLUSTRATION, ALIX NORTHRUP; (TOP RIGHT) MATEO GALVANO