FLORIDA ATLANTIC UNIVERSITY

Highlighting research, scholarship and creative accomplishments

FAU

2012 DIVISION OF RESEARCH ANNUAL REPORT

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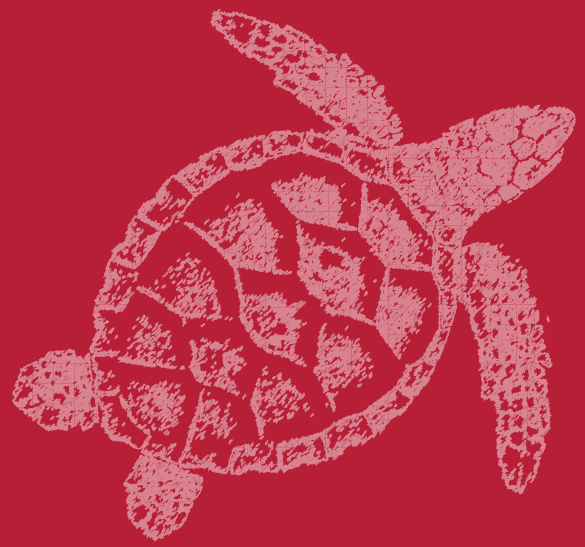


MAKING WAVES IN RESEARCH

What does it mean to be a comprehensive university in today's world? While universities have always been centers of education where existing knowledge is passed on to students, their role in generating new knowledge is moving ahead by quantum leaps. And nowhere is this function – the research function – developing more rapidly than right here in the United States.

Think of any innovation that has improved life for people around the globe and the chances are excellent that it originated in a laboratory at a U.S. university. Examples abound: lasers, MRIs, synthetic insulin, GPS systems, bar codes, FM radio, DNA technology and the algorithm for Google searches are just a few of the myriad advances that have revolutionized the human experience. What is even more impressive is that these remarkable contributions have been made by a relatively small community of about 120 research universities – representing just a fraction of the 4,000-plus universities and colleges that are currently operating in the U.S.

Florida Atlantic University is proud to have earned the designation of "High Research Activity" institution from the Carnegie Foundation for the Advancement of Teaching. Important research and creative activities are taking place throughout the University and involving increasing numbers of students. The Quality Enhancement Plan that has been developed in conjunction with the University's reaccreditation process calls for the expansion of research opportunities available to undergraduates in all majors. FAU truly is a comprehensive university where faculty and students at all levels are contributing to the world's constantly expanding body of knowledge.

South Florida's potential to become the next internationally important center of discovery is well on its way to becoming reality, and FAU is playing a key role in this long-anticipated development. As you will see in the pages of this report, Florida Atlantic University is moving ahead on a host of fronts, and many more exciting accomplishments lie ahead.

Mary Jane Saunders

MARY JANE SAUNDERS, Ph.D.
President
Florida Atlantic University

BUILDING ON SUCCESS

It is critical that research universities continue to search for new and workable solutions to the problems society faces during fiscally challenging times. The award-winning faculty members at Florida Atlantic University are making invaluable contributions to the pool of public knowledge in a host of disciplines in areas that include coastal and marine science, biotechnology and contemporary societal issues.

Our researchers are at the forefront of their fields, whether they are leading student researchers on an archaeological dig in Sicily or discovering an entirely new and distinct species of monkey in Africa. They are making strides in their laboratories, seeking to understand and then change the course of human diseases such as restrictive cardiomyopathy, breast cancer and Huntington's disease. They are working to reduce the occurrence of unnecessary hospitalizations of nursing home residents and thereby reduce Medicare payments by millions of dollars per year. Faculty researchers are developing innovative onboard vehicle technologies that relay traffic conditions to other vehicles on the road with the objective of reducing congestion and collisions. They are studying how babies acquire language skills by reading the lips of people speaking to them, and they are developing sustainable aquaculture systems to address the world's growing demand for seafood.

Such discovery and innovation would not be possible without the significant and growing contribution of FAU students, at both the graduate and undergraduate levels. The importance of student involvement in research is reflected in the University's Quality Enhancement Plan (Distinction Through Discovery), which aims to integrate and expand a culture of undergraduate research, inquiry and creative activity into University programs through a broad range of exciting new initiatives.

This report contains numerous examples of the important endeavors being undertaken by FAU's faculty and students — endeavors that hold the potential to have a tremendous impact on all of South Florida and beyond. As 2013 unfolds, with its many challenges and opportunities, we look forward to answering many of the important questions of the day through the research expertise of our distinguished faculty.

Barry T. Rosson

BARRY T. ROSSON, Ph.D.
Vice President for Research
Dean of the Graduate College

Adult sea turtle tracks from the ocean to the nesting site and back.

Photo by Stephen McCulloch

Shell Game: Researchers Develop Hardy Tracking Device to Stay on Top of Young Sea Turtle Development

They're small, cute and plucky — and they bite. But Jeanette Wyneken, Ph.D., Associate Professor of Biological Science, remains one of their biggest advocates, even as she nurses yet another nipped finger.

"These turtles make a living out of biting," she quipped, prying herself free from the jaws of the tiny loggerhead turtle in her palms.

This young male, and dozens of other sea turtles housed in the FAU research facility at Gumbo Limbo Nature Center in Boca Raton, are part of Wyneken's project to determine the normal sex ratio — males to females — of the loggerhead turtles that nest along the Gold Coast of Florida.

"These animals have environmentally determined gender, which means they have no x or y chromosome. It's set by whatever the environmental conditions are in the nest," she said. "We need to put together about a half generation of sex ratios to get a good feeling for how much it varies from year to year."

The project reflects Wyneken's research interest in how animals interact with their environment. It's only one of many ongoing efforts at her lab, where large tanks serve as temporary homes for young marine turtles.

Working with researchers at Florida International University and the National Oceanic and Atmospheric Administration, Wyneken has developed a noninvasive method of attaching a satellite tracking device to the shells of baby turtles to gain data on their migratory behaviors during their so-called "lost years."

"Prior to our tagging these turtles, all we knew about this part of their life's journey came from one turtle that had been followed for three days," Wyneken said. "From the time they leave our shores, we don't hear about them until they surface in the Canary Islands, which is their early teenage habitat. There's a whole lot that happens across the Atlantic that we knew nothing about."

Thanks to persistence and a little luck, Wyneken and her team came up with a workable way to attach tracking tags to the shells of young turtles without damaging the turtles or infringing on their shell growth pattern. Using a mix of hair extension glue, an acrylic used in manicure salons, old wet suits and aquarium silicone, researchers were initially able to affix the solar-powered tracking devices for up to 60 days without altering the shell underneath.

The outcome has only gotten better over time.

"We have over 200 days of tracking of some loggerheads, with an average of 70-some days," Wyneken noted.

As data streams in from the turtles currently at large — and from those yet to be released, which include green sea turtles and eventually leatherbacks — Wyneken hopes to learn more about the risks these young turtles face, such as natural predation and human factors like accidental capture in commercial fishing nets, loss of habitat and environmental pollution.

Jeanette Wyneken, Ph.D., hopes to improve the ability to track sea turtles during their "lost years."

Human-Powered Sub Makes Waves in the Water and Out

Members of the team prepare to board Talon 1 for a test dive.

As the faculty advisor for the FAU Human Powered Submarine Club, Edgar An, Ph.D., might be expected to have actually gotten into the sub his students have created — especially since that sub has recently won a number of international agility and speed awards.

Not so.

"I've never been inside it," admitted An, Professor of Ocean and Mechanical Engineering. "It's actually pretty challenging to fit even one person inside. There's very little light inside and it can feel claustrophobic."

Fortunately, the student pilots of Talon 1 — a sleek, brightly colored vessel that looks almost like a child's pedal toy — don't share An's misgivings about tight spaces. Piloting Talon 1 means wearing full submarine gear while completely submerged and floating face down, feet clipped into bicycle pedals, pedaling as hard and fast as possible.

But, as evidenced by their wins last summer at the inaugural European International Submarine Race in England, the team is up to the challenge. Competing against six teams from other universities around the world, the 11-person team behind Talon 1 took home top prize for agility in a 175-meter slalom course and had the fastest lap of racing on the second day. The team also received the Overall Runner-Up Award.

It's an impressive run for an already well-decorated sub, which has been taking home honors in the International Submarine Race, held in Bethesda, Maryland, since 2009. It's even more impressive when considering that the vessel is designed and built primarily by students, who also do all of their own fundraising to support the project.

"The fact that they can build such a complex system on their own is pretty amazing," An said. "These students are motivated. They volunteer their time, they don't get credits and they're not getting paid. This is a great way to have them gain some outside-the-classroom experience and to learn about developing technology, how to build something from scratch."

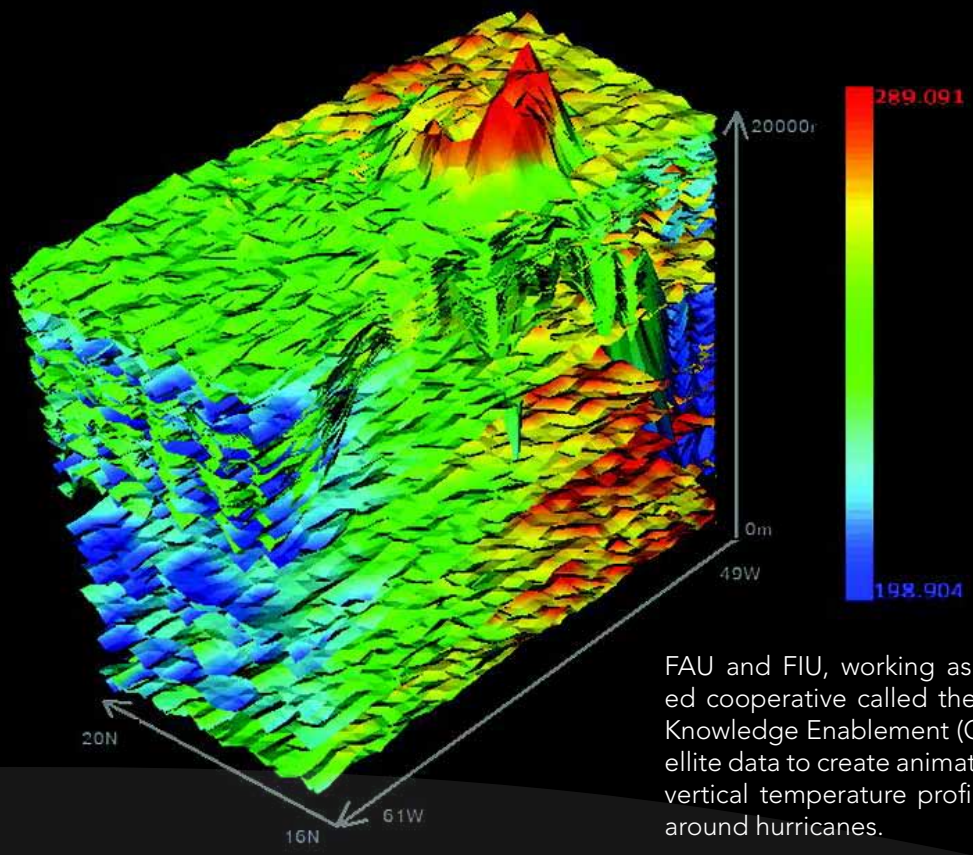
Speaking of building things from scratch, the team currently is working on another ambitious project: building a 16-foot, two-man submarine, one that will incorporate a slate of electronic navigation tools and an innovative hull design using basalt fibers instead of more traditional fiberglass or carbon fibers.

"We're trying to do self-navigation or some sort of navigation system so the pilots don't have to focus on that," said Adrian Desilva, a senior ocean engineering student who has been part of the team his entire college career. "We're considering laser navigation and a few other ideas, based on inertial energy to keep in a straight line."

Desilva and his teammates welcome the challenge of researching technologies and seeing how they can be adapted to fit the needs of their new sub, which is tentatively named the FAUBoat II.

Mike Metzger, project manager and a senior business major, likens the process to building race cars or boats, only with a small twist. "There's really not a market out there for human-powered submarines, so you have to do everything by yourself," he said. "It gives me a chance to do real-life things I'm going to be doing in my career field: working on a big project and seeing it through to the end."

Distributed Cloud Computing: 3-D Visualization Services for Climate on Demand



Hari Kalva, Ph.D., Associate Professor in FAU's Department of Computer and Electrical Engineering and Computer Science, is the first to admit that he's no climate scientist. And yet he, along with his colleague Borko Furht, Ph.D., Professor and Chairman of the Department of Computer and Electrical Engineering and Computer Science, recently completed work on a collaborative project with Florida International University (FIU) and the University of Maryland's Center for Hybrid Multicore Productivity Research (CHMPR) to present decades of climate data in visually meaningful, 3-D renderings. These visual representations of climate data will enable scientists to make more accurate hurricane landfall predictions.

The researchers at FAU and FIU, working as part of an NSF-funded cooperative called the Center for Advanced Knowledge Enablement (CAKE), used NASA satellite data to create animated visualizations of the vertical temperature profiles of the atmosphere around hurricanes.

The hurricane data used in the project came from 2009's Hurricane Bill, which generated a 16-foot storm surge along the northeastern United States and Nova Scotia. Kalva and Furht's lab at FAU looked at a subset of that data to generate slices of imagery that showed the hurricane's internal structure and the range of temperatures within it.

"Our expertise at FAU is using our 3-D technology and expertise to present graphics and data in a way that allows you to easily interpret structure in data," Kalva said.

Borko Furht, Ph.D.

CAKE and CHMPR have implemented a distributed cloud computing web-based service called SOAR that incorporates this visualization capability as a public service available on an advanced IBM-based server cluster. This system gives researchers and students the ability to select regional and temporal periods and automatically transform infrared orbital satellite data into spherical grid arrays of 3-D temperature profiles for viewing the continuously changing thermal structure of the atmosphere.

Hari Kalva, Ph.D.

While this technology will improve both scientific and public understanding of the nature of global and regional climate change, it will have other uses as well.

"Going forward, we see applications for this technology in bioinformatics — for biologists to visualize protein structures, for example. It's important for drug companies to see a molecule's structure, understand how one molecule can dock on another and bind with it. Data visualization allows you to get a better perspective," Kalva said.

Making the Case for Climate Change

The statistics are staggering: more than 250 people dead in seven countries, an estimated $70 billion in damage, thousands of homes destroyed. In the waning days of October 2012, Hurricane Sandy delivered a catastrophic punch to the mid-Atlantic region of the United States — a punch that put the rest of the country on notice.

"I think because the storm went north and hit major urban areas in New York and New Jersey, it showed that this is not just an issue for New Orleans or Florida or the Gulf Coast," said Julie Lambert, Ph.D., Associate Professor of Science Education. "If there's anything positive that has come out of Superstorm Sandy, it's that people are starting to pay attention now."

Lambert, a former earth science teacher and current professor in FAU's environmental education master's degree program, was awarded a three-year NASA Global Climate grant for almost $600,000, which she is using to develop an interactive modular curriculum for middle and high school students called "CSI (Climate Science Investigations): South Florida."

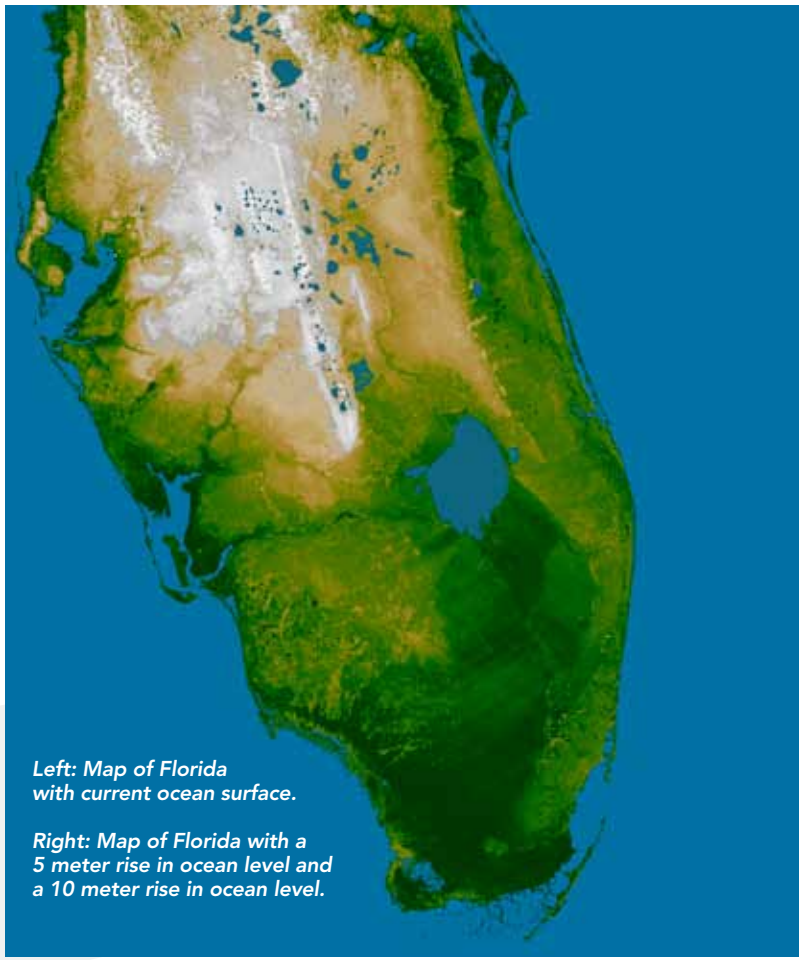
Lambert and a team of researchers, writers and educators are working to create an online textbook that explores key issues in climate science: Weather and Climate; Energy — The Driver of Climate; Temperature Over Time; Causes of Climate Change; Impacts of Climate Change; and What We Can Do. The concluding module tackles argumentation, outlining how students can engage with climate change skeptics through evidence, well-reasoned justification and critical evaluation.

The curriculum is a work-in-progress, says Lambert, who is doing all the writing of the material while Alana Edwards, a geoscience doctoral student and employee of the FAU-based Florida Center for Environmental Studies, is making the interactive charts and graphics that populate the modules. As each section is completed, it is pilot-tested by classroom teachers and their students. Material is also being tried out by undergraduate and graduate students at FAU.

"In 2013, when more of the curriculum is done, we plan to do a lot more professional development," Lambert said. "We hope to reach hundreds of high school students. I'd love to see it used in ninth grade earth science classes — I've always been kind of partial to them, and I feel like that's the year you can get them interested in science."

An ongoing challenge with the curriculum is the dynamic nature of the science itself. The ceaseless stream of new data, the proliferation of extreme weather events and the regular updates on sea level rise necessitate a level of maintenance on the site that will make it challenging to keep the content current.

She pointed to the section titled "Weather and Climate" as an example. A frothy white swirl in the upper right corner of the screen is the infamous Hurricane Katrina from 2005. "See, we already need to put Sandy in there. It's nice that you can update online sites, but you also need the resources to do it."



Left: Map of Florida with current ocean surface.

Right: Map of Florida with a 5 meter rise in ocean level and a 10 meter rise in ocean level.

OCEAN SURFACE

Sea Level Rise Takes Center Stage at Summit Hosted by Center for Environmental Studies

While Associate Professor of Science Education Julie Lambert takes aim at climate change through an innovative online curriculum, Leonard Berry, Ph.D. and his team at the Florida Center for Environmental Studies (CES) are approaching the issue from a slightly different angle.

In June 2012, the Center hosted a two-day Sea Level Rise Summit that drew more than 300 attendees from both private and public agencies. Conversations revolved around coping with the effects of a rising sea, saltwater intrusion into fresh water sources, infrastructure and city planning adaption in light of a changing environment.

"One of the most exciting sessions was about impacts on the built environment, how sea level rise will impact transportation," Berry said.

Berry pulled out some sobering statistics: with Florida's flat and low-lying terrain, even a two-foot rise in sea level puts much of South Florida at risk of flooding. Projections show that sea levels overall will rise three to four feet by the end of the century, which will endanger 50 percent of Miami-Dade County, 20 percent of Broward County and 10 percent of Palm Beach County.

The timing of the event — more than four months before Hurricane Sandy slammed into the east coast — seems eerily prescient, and Berry shares Lambert's assessment that the devastation wrought by Sandy has jolted some policymakers to action. The attitude toward sea level rise, and climate change in general, tends to fluctuate along political lines in Florida, Berry says, although the CES is involved in some grassroots efforts to promote awareness. For instance, the Center helped Monroe, Miami-Dade, Broward and Palm Beach counties coalesce into a Four-County Compact that has become a national exemplar in forging common policies around the problem of sea level rise and climate change.

"The Compact is expanding to include Martin, St. Lucie and Indian River counties," Berry said. "It's exciting to see."

While climate change is a major focus for the CES, it continues to be involved in outreach initiatives, such as the Riverwoods Field Laboratory, where staff hold training programs and conduct research on the effects of restoration efforts on the Kissimmee River. The Center also conducts community outreach and engagement programs at the DuPuis Management Area, a 21,875-acre property owned by the South Florida Water Management District.

Berry, the Center's Director, is frequently asked to speak to media and even before Congress on issues related to climate change. In April 2012, he testified before the U.S. Senate Committee on Energy and Natural Resources about the risks to South Florida posed by sea level rise, saltwater encroachment and flooding in low-lying coastal areas during high tide. Existing flood control mechanisms and water control systems, such as canals and sewer systems, are losing their effectiveness as the sea rises — over the past 50 years, the ocean level has gone up three to five inches, with a projected rise of nine to 24 inches by 2016.

As the nation comes to terms with the new realities facing coastal communities, the spotlight shines brightly on FAU and the research being done here.

"Certainly in South Florida we are the lead institution in looking at this issue, and that makes sense because it's in our own backyard," Berry said.

Indian River Lagoon Observatory Program Established

Mangroves in the Indian River Lagoon.

Scientists at FAU Harbor Branch Oceanographic Institute (HBOI) are hard at work trying to understand phenomena such as unprecedented algal blooms and the resulting loss of more than 40,000 acres of seagrass in the northern Indian River Lagoon (IRL). IRL is an estuary that spans more than 150 miles of Florida's east coast and is designated by the U.S. Environmental Protection Agency as an "estuary of national significance."

Estuaries are coastal bodies of water containing a mix of freshwater and seawater. Although the meeting of these waters produces unique opportunities for rich animal and plant biodiversity, estuaries also are exposed to human activities on land. Population growth, urbanization and residential development result in land-use changes, alteration of watershed drainage patterns and increased stormwater runoff and freshwater discharges that carry urban and agricultural pollutants.

The IRL is an estuary that garners the attention of a variety of research organizations. HBOI, which was founded on the banks of the IRL in 1971, has established the Indian River Lagoon Observatory (IRLO) under the direction of Research Professor Dennis Hanisak, Ph.D. IRLO is a multi-disciplinary, ecosystem-based program that addresses scientific, educational and social questions and issues related to the effects of environmental and human-induced stressors on ecological functions in the IRL. Part of the funding for IRLO comes from sales of the "Save Our Seas" Florida specialty license plates.

One of the first significant steps in galvanizing this collaborative effort was the inaugural Indian River Lagoon Symposium in 2012, which attracted nearly 300 researchers, students, agency and organizational representatives, and interested members of the public for an interactive series of research presentations and discussions about scientific, educational and social issues related to the IRL. While the topic of last year's symposium was restoration, the February 2013 symposium focused on the overall health of the lagoon.

"While the algal blooms in the IRL are not directly toxic, they are linked to hypoxia and anoxia, habitat loss, alteration of biogeochemical cycles and food webs, and potential economic impacts," said Hanisak. "The recent emergence of these blooms signals worsening conditions."

Harbor Branch is also developing the flagship element of the IRLO program: an advanced sensing network that will automatically produce a wealth of real-time environmental data — information that traditionally has been gathered and processed manually — and make it available, in real time, via a website. The backbone of this network will be a number of sophisticated sensor units placed in locations throughout the IRL to monitor environmental conditions, including water quality. Two of these units were recently deployed, and Harbor Branch is working to obtain several more.

The more we know about the dynamics of the IRL and the effects of human activities on its ecosystem, the better we can protect this irreplaceable natural asset, which also serves as an essential engine of Florida's economy.

Participants at the 2012 Indian River Lagoon Symposium view poster presentations.

One Species' Trash is Another One's Treasure

Everyone's talking about debt and deficits these days, and Associate Research Professor Paul Wills, Ph.D., is right there with them — only he's talking about a very specific kind of deficit.

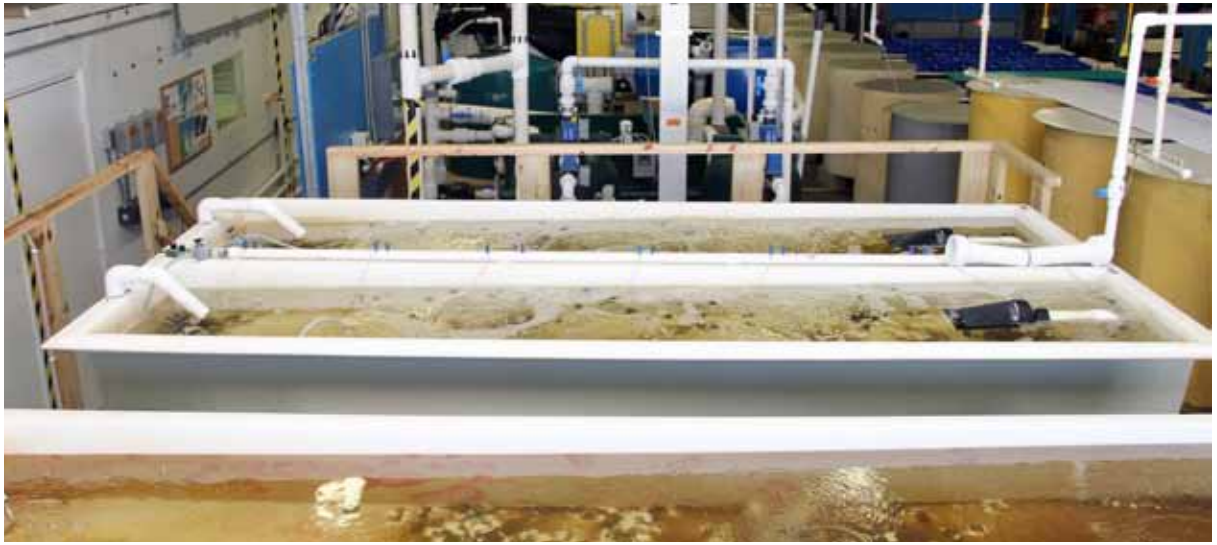
"We import close to 90 percent of our seafood in the United States, a $10 billion trade deficit," said Wills, whose research interests at Harbor Branch center on the development of sustainable aquaculture practices.

Combating this trade deficit isn't the only goal of HBOI's aquaculture research. Worldwide, a burgeoning human population and corresponding decreases in catches from wild fisheries have made it more critical to develop reliable sources of seafood that maximize resources and minimize environmental impacts.

Nearly 30 years of FAU Harbor Branch aquaculture research has resulted in advances such as minimizing water use through recirculation techniques, developing feed formulations that reduce fish protein inputs and designing systems that require less power to operate.

The newest manifestation of this work is an ambitious project, directed by Wills, that produces multiple species simultaneously and is designed according to the premise that one species' trash is another one's treasure. Although the concept is not new — centuries-old Chinese polyculture practices might grow fish, shrimp, ducks and rice in the same system — the approach is pure innovation.

The species in this land-based integrated multi-trophic aquaculture (IMTA) system are fish, shrimp, urchins, oysters and macroalgae, also known as seaweed, and each is grown apart from the others. The individual tanks are connected by a network of filters and piping, through which the water — along with the by-products — is circulated.



The aquaculture tanks are connected by a network of filters and piping through which the water and by-products are circulated.

Circulation occurs via a hub-and-spokes concept in which the hub is a computer-controlled filtration and distribution system and the spokes lead to the different culture areas. In the prototype system at Harbor Branch, all components are indoors with the exception of the macroalgae cultures, which require sunlight.

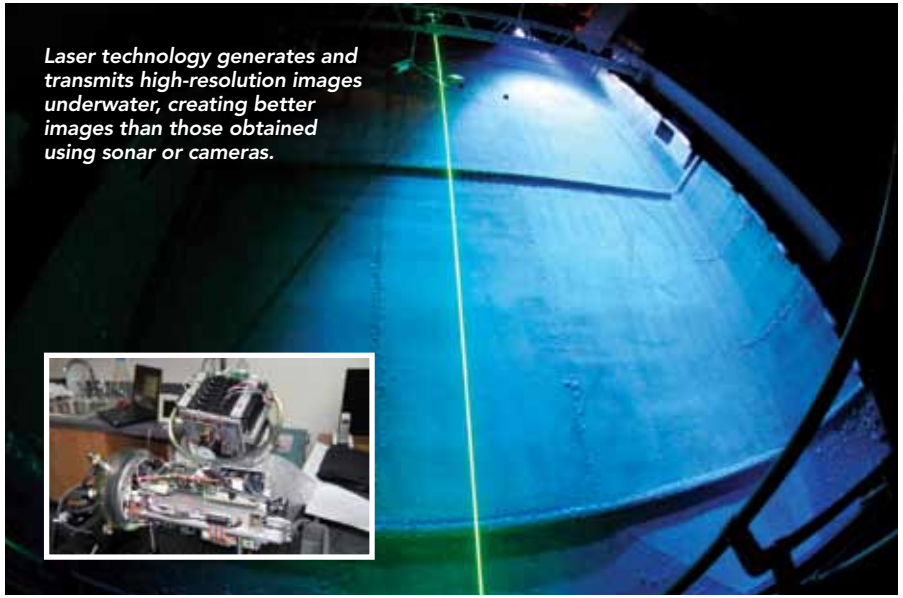
Each species in the system represents a different trophic (or feeding) level in this food web construct, and although the fish and shrimp receive feed from outside the system, each subsequent species feeds on something the others leave behind.

"We filter out the solids and keep the liquid waste, which goes out to the plants," Wills said. "The solid waste, the uneaten food and feces, goes into a bioreactor that converts it into feed for the shrimp and urchins. The other fraction of solids that we can't filter out, the suspended particulates, those go to the oysters and they can filter those out."

Creation of the system was a collaborative project involving Harbor Branch scientists, engineers and aquaculture technicians. The project is funded primarily through sales of Aquaculture Florida specialty license plates.

Wills says the success of this first prototype has generated excitement about the future. "We think that because we're being much more efficient with our feed and energy with this technique, this kind of system should improve the profitability of aquaculture systems in the future," he said. "We're probably 10 to 20 years out from adopting this large-scale."

Laser System Revolutionizing Undersea Imaging



Laser technology generates and transmits high-resolution images underwater, creating better images than those obtained using sonar or cameras.

Fraser Dalgleish, Ph.D., Assistant Research Professor of Ocean Technology and Director of the Harbor Branch Ocean Visibility and Optics Lab (OVOL), has been working with his team to develop an innovative method for seeing underwater. This method, which uses laser technology to generate and transmit high-resolution images, has the potential to supersede the other more traditional methods — sonar and cameras — in both the quality of images and the distance at which images can be obtained in coastal waters.

Cameras must be positioned close to targets and are very limited in murky waters. Sonar, which operates over long distances, typically reveals low-resolution information regarding seabed distance and density.

"There are a lot of suspended particles in the water, either live particles like plankton or inorganic particles like silt or minerals — even tiny things like bacteria or viruses can still scatter light prolifically," Dalgleish said. "Our findings suggest that in coastal conditions, it is possible to acquire millimeter resolution laser imagery through more than 100 meters' distance between the seabed and the surface, and that's quite deep water."

The technology under development at OVOL, which is supported by the Office of Naval Research, allows images to be captured and transmitted at distances up to 10 times what is possible with cameras in coastal waters. System components include a laser transmitter module that uses pulses of light to scan and illuminate target areas and a very sensitive photodetector receiver positioned remotely that captures small levels of diffuse light for image reconstruction.

Recent tests conducted eight miles off Fort Pierce produced crisp images at distances of more than 30 meters, whereas in clearer water off Fort Lauderdale, similar images were produced at more than 80 meters. To capture comparable images with a camera, the lens would need to be within two to three meters of the target.

"Our main motivation is just to get the images to the surface; once we've got them, we can transmit them wirelessly using satellite communications directly to the scientist or to whomever needs them," Dalgleish said.

Perhaps most remarkable is the ability of the system to see "around" an object as if it weren't there. Researchers pointed the photodetector away from the object and were still able to capture and process the scattered light to render high-resolution images.

Combining the system with wireless robotic vehicles is expected to open a new world of undersea opportunity. Potential applications include naval mine detection and characterization, inspection of ship hulls and pipelines, and high-resolution imaging of reefs, wrecks and other man-made or geologic structures.

"With this technology, we can send high bandwidth images or information directly from one submerged robot to another on the surface or above the surface, and vice versa," Dalgleish said. "So here's where we're going with this: you'll be able to network and control resident underwater robots, obtaining real-time feedback of images and data, directly from your office or in fact anywhere in the world with an internet connection."

Beyond further development of the system, OVOL researchers are working with FAU colleagues to create hybrid laser/sonar systems that will enable quality imaging and robust data links over an even wider range of conditions.

Marine Natural Products to Target Malaria and Pancreatic Cancer

Research Professor Peter McCarthy, Ph.D., is a man on a mission. He and a colleague at the University of Central Florida, Professor Debopam Chakrabarti, Ph.D., want to find a cure for malaria, a devastating parasitic disease that kills approximately one million people around the world each year.

An even more sobering statistic, says McCarthy, is the fact that a majority of those dying are children.

"There's a huge need to find a new antimalarial compound, because the drugs we currently have are losing their effectiveness," said McCarthy, a researcher with the HBOI Marine Biomedical and Biotechnology Research Program (MMBR) and member of FAU's Center of Excellence in Biomedical and Marine Biotechnology, which supports multi-disciplinary research projects that explore ocean-based drug discovery. "They've been out there a long time and the disease is becoming increasingly resistant."

The most common element of traditional anti-malarial compounds is quinine, which is derived from rainforest trees. For his research, however, McCarthy is looking elsewhere for inspiration: under the sea.

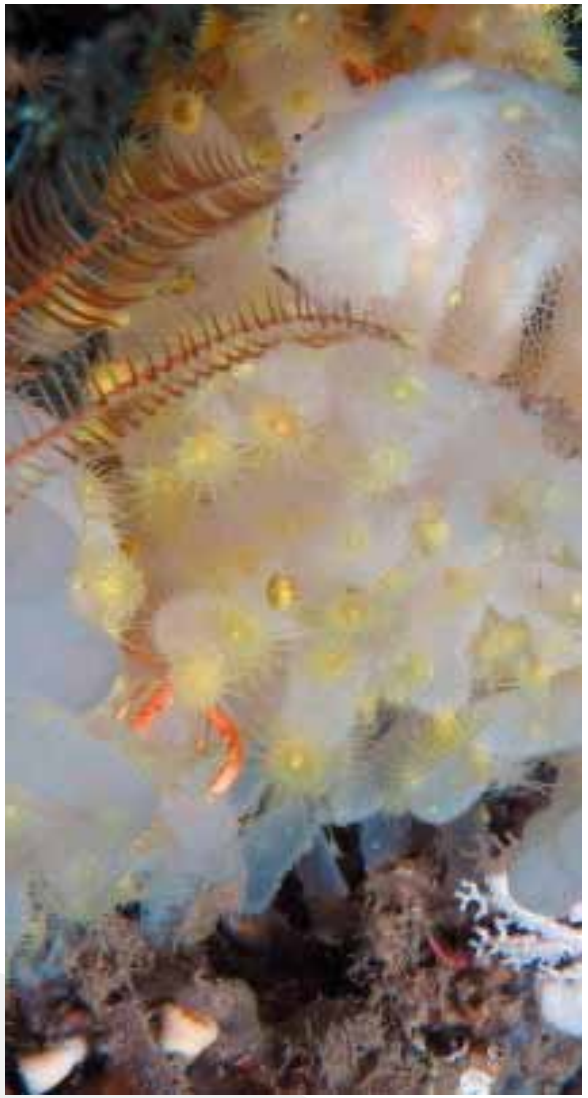
In January 2012, McCarthy and Chakrabarti were awarded a National Institutes of Health grant to identify natural products from marine microorganisms that can be used to combat malaria. The grant builds on previous collaborative research by MBBR and UCF that led to the discovery of compounds that curb or kill malaria parasites. With this new, two-year grant, researchers are expanding their investigation to the realm of marine bacteria and fungi.

This is but one success story from MBBR, which has been dedicated to the discovery of new marine-based drugs for more than 25 years. Another recent success is their work on manzamine A, a compound derived from a sea sponge that was shown to have moderate anti-tumor properties. In recent work at HBOI, manzamine A was shown to have limited toxicity to pancreatic cancer cells on its own, but when added to an agent that can induce programmed cell death (apoptosis), it greatly increased the overall cytotoxicity and susceptibility of the cancer cells to the known apoptosis-inducing agent. This outcome suggests that manzamine A may be very useful in combination therapies.

Researchers also found that manzamine A prevents the migration of pancreatic cancer cells through a membrane, suggesting that it may be able to block tumor metastasis.

Because of these promising findings, researchers obtained a patent in July, which covers the potential use of manzamine A as a treatment in pancreatic cancer. Pancreatic cancer is the fourth leading cause of cancer death in the U.S., with a five-year survival rate of less than 6 percent. Assistant Research Professor (and 2012 FAU Researcher of the Year at the assistant professor level) Esther Guzmán, Ph.D., and Research Professor (and MBBR Director) Amy Wright, Ph.D., (both members of the Center of Excellence in Biomedical and Marine Biotechnology) along with former Postdoctoral Investigator Jacob Johnson, Ph.D., are the inventors on this patent.

With the vast majority of the world's oceans still unexplored, the potential for finding natural marine products to aid in the treatment of human disease is virtually limitless.



Promising therapeutics may be derived from marine organisms such as sponges, or from the microorganisms that they host.

Collaboration between FAU, Boca Raton Regional Hospital Holds Promise for Breast Cancer Research

According to statistics provided by the National Cancer Institute at the National Institutes of Health, there will be roughly 235,000 new cases of breast cancer (male and female) in the United States this year, and almost 40,000 deaths due to this disease.

To Vijaya Iragavarpu-Charyulu, Ph.D., Associate Professor of Biomedical Science in the Charles E. Schmidt College of Medicine, these numbers are simply not acceptable.

"Breast cancer is the most commonly diagnosed cancer in women," she said. "Metastasis is what leads to death, so that's why we're looking at the mechanism of how and why it happens."

Iragavarpu-Charyulu has made it her life's work to understand the behavior of certain key molecules in the formation and propagation of tumor cells, with an eye toward developing therapies that will slow or stop the spread of the disease. Toward that end, her lab has established a joint research initiative with Kathy Shilling, M.D., Medical Director of Boca Raton Regional Hospital's Christine E. Lynn Women's Health and Wellness Institute, to study the role of the immune system in the process of invasive tumor growth.

In one promising area of research, Iragavarpu-Charyulu and Ph.D. student Ramon Garcia-Areas are examining the role of a genetic protein called semaphoring-7-a (SEMA7A), which seems to have an accelerating effect on tumor growth. When the gene is blocked in lab experiments, tumors are shown to grow much more slowly.

"Now that we have an animal model, we're looking to correlate that this is consistent in humans," said Iragavarpu-Charyulu. "We're working with Dr. Schilling and the tissue samples she has provided, so we will have enough numbers statistically to show that this is true and not just a fluke. So far the numbers that we have seen indicate it is holding true."

In addition to the work with SEMA7A, Iragavarpu-Charyulu is studying the effects of another molecule on tumor progression and experimenting with novel compounds in an effort to inhibit that progression. The molecule, chitinase-3-like-1 (CHI3L1), is most commonly seen in crustaceans and is used to break down the chitin in the animals' hard outer shells.

"Humans don't have chitin, but we do express chitinase sometimes when there is inflammation," said Iragavarpu-Charyulu. "When you administer chitin microparticles to tumor cells at the beginning of tumor growth, the expression of CHI3L1 goes down. We saw that the immune response got better and the tumors experienced dramatically reduced growth and a slowed metastasis pattern."

The research is very promising, especially as Iragavarpu-Charyulu's team readies to move into trials with human tissue samples. She theorizes that a therapy based on the results of this research may be available within a decade, but she remains cautious.

"Each individual tumor is different, of course, so we will need to have more of a personalized therapy eventually," she said. "It may not be as simple as 'one molecule cures all.' "

Dr. Iragavarpu-Charyulu with Integrative Biology Ph.D. students Ramon Garcia Areas and Stephania Libreros.

Getting to the Heart of the Matter in Cardiovascular Studies: Researcher Receives NIH Grant to Study Restrictive Cardiomyopathy

The story of a young, physically fit athlete collapsing mid-game with a sudden and fatal heart attack is one we've all seen or heard of too many times. Hypertrophic cardiomyopathy (HCM), in which part or all of the heart is enlarged, takes the lives of nearly a dozen college athletes each year in this country, as estimated by the National Collegiate Athletic Association (NCAA), and it is responsible for approximately 40 percent of sudden cardiac death in young athletes.

While HCM is a major form of heart disease, it is only one of three clinically recognized and described cardiomyopathies. At FAU, renowned medical researcher Xupei Huang, M.D., Ph.D., is making strides against another, lesser known heart disease called restrictive cardiomyopathy (RCM), in which the muscles of the heart are weakened or too rigid to allow the chambers to fill properly, pump fully or both. Typically, hearts with this condition cannot relax normally between beats to allow the blood to return fully from its route through the body.

Statistics indicate that RCM accounts for roughly 5 percent of all cases of primary heart muscle disease.

"Restrictive cardiomyopathy is less common, but the prognosis for this disease is the worst: there's no cure for it right now, unfortunately, except for heart transplantation," said Huang, who is a Professor of Biomedical Sciences in the Charles A. Schmidt College of Medicine. "The mechanism for how the disease happens is not very clear, which is why we can't find the right treatment."

Adding to the sense of urgency is the fact that the greatest percentage of patients who suffer from RCM are children, and the disease progresses quickly in them.

For the past decade, Huang and colleagues in his lab at FAU have been researching the genetic underpinnings of RCM and how a mutation in a single gene creates defective cardiac regulatory proteins that are important to contraction and relaxation in heart muscle. Huang's lab has created a transgenic mouse model to study the mutation and explore mechanisms for blocking the disease.

The National Institutes of Health (NIH) and the American Heart Association have recognized the importance of his contribution to cardiovascular studies with continuous funding, including a recent $433,500 NIH grant to further Huang's study of the defective cardiac protein troponin I.

"We want to understand: why does this one small change in the gene change the sequence for the protein, making the structure different and the function different? This is how a normal cell becomes a diseased cell, how a normal heart becomes diseased," Huang said. "Then maybe we can figure out how to block that process."

Huang is looking into two experimental therapies to slow and/or mitigate the effects of RCM: the use of pacemakers to slow down the heart rate, allowing more time for the muscle to relax and the ventricles to fill more fully with blood; and the use of green tea extract to increase diastolic cardiac functionality.

"We're trying different experimental therapies, giving different medications, to see about reversing the effects of the disease, correcting abnormalities and prolonging patients' lives," he said.

Xupei Huang, Ph.D. (standing) with Pierre-Yves Jean-Charles, Ph.D., a former student.

Researcher Stays Focused on Finding a Cure for Huntington's Disease

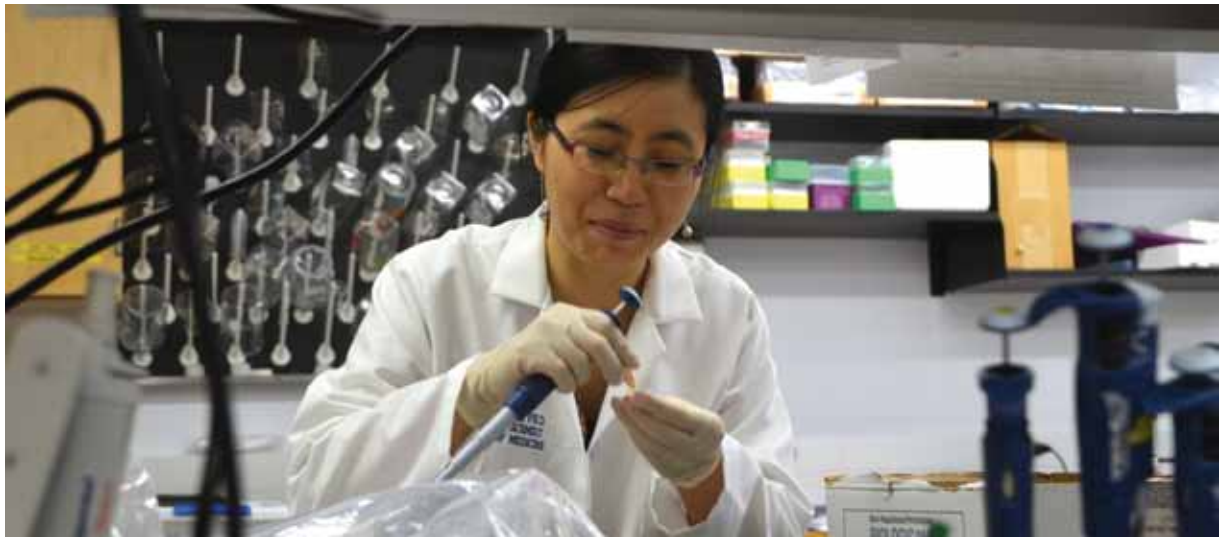
Imagine knowing that within the blueprint of your DNA, you carry the genetic instrument of your death, for which there is no known cure.

That's the precise situation faced by more than 250,000 Americans who have — or are at risk of inheriting — Huntington's Disease (HD), a degenerative neurological disorder that causes gradual deterioration in muscle coordination, cognitive decline and loss of basic motor skills such as walking, speaking, swallowing and talking. The disease is caused by a mutation in the huntingtin gene, which causes the cell to produce dramatically flawed versions of an essential protein — also called huntingtin — that appears to have a toxic impact on neurons. The mutant huntingtin disrupts normal function of the neural cells, causing dysfunction and eventual cell death.

Currently the prognosis for HD sufferers is very grim: everyone with the mutation is going to develop the disease, which cannot be stopped or reversed. The disease tends to manifest itself between the ages of 30 and 50; on average, an individual lives only 10 to 20 years after onset.

"Unlike with other neurological disorders, this one is fatal," said Jianning Wei, Ph.D., Assistant Professor in the Department of Biomedical Sciences. "It's a very severe, devastating disease. We're working hard to understand the pathogenesis of the disease so we can begin to find a cure."

Long interested in the mechanism of neurodegenerative diseases, Wei has received continuous National Institutes of Health funding to study a process of genetic dysfunction called protein misfolding, in which proteins are incorrectly assembled and can end up with modified or even toxic functionality. Most recently, Wei received a grant of almost $430,000 to further her investigation of mutant huntingtin and cell death within the brain, with the goal of identifying the vulnerable neural pathways and eventually developing pharmacological interventions to block those pathways.



Jianning Wei, Ph.D., studies mutant huntingtin and cell death within the brain.

As it stands, there is no treatment for HD save for a drug called Tetrabenazine, licensed in 2008 to help control the involuntary movements associated with the disease. The drug does not do anything to cure the underlying cause of HD nor does it slow the progression of symptoms.

Together with a number of graduate and undergraduate student researchers in her lab, Wei is working to create a transgenic animal model that will allow closer examination of the interplay between mutant huntingtin levels and HD. While she emphasizes that her research is years from producing anything resembling a therapy for HD, she hopes she will begin to understand the mechanism of how — and why — the mutant huntgintin affects the brain.

"We want to have a thorough understanding of the science before we think about developing an inhibitor," she said. "A lot of drugs work perfectly in the animal model but when they go to clinical trials for humans, they don't work."

She gave a bright, determined smile. "I've been working on this for about four years," she said. "It's a long process."

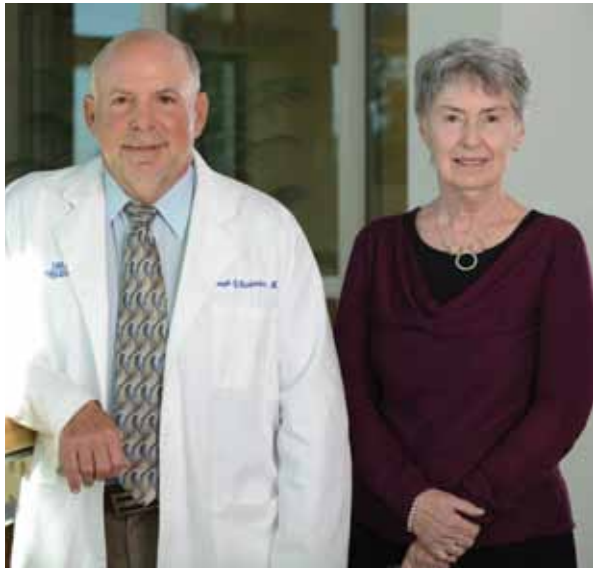
Putting the Brakes on Roundtrips from Hospital to Nursing Home

More than 1.6 million Americans live in nursing homes and too many of them make risky and costly "roundtrips" from the nursing facility to the hospital, then back to the nursing facility — only to be readmitted to the hospital within days or weeks.

It's risky because hospitalization often involves prolonged immobility, diagnostic testing, changes in drug regimens — leading to a higher risk of adverse effects — in addition to inadvertent exposure to infection and the risk of falls. Treatment in a hospital can be dehumanizing and impersonal. It is not rare for an elderly patient's health to decline following a stay in the hospital.

Trips like these cost Medicare, Medicaid and private insurance hundreds of millions of dollars each year. According to the "Revolving Door of Rehospitalization from Skilled Nursing Facilities," a paper published in the January 2010 issue of Health Affairs, 23.5 percent of Medicare beneficiaries discharged from the hospital to a skilled nursing facility were readmitted to the hospital within 30 days at a cost to Medicare of $4.34 billion in 2006.

FAU researchers Joseph Ouslander, M.D., Professor and Senior Associate Dean for Geriatric Programs in the Charles E. Schmidt College of Medicine, and Ruth Tappen, Ed.D., R.N., FAAN, Christine E. Lynn Eminent Scholar and Professor, believe that many of these "roundtrips" are preventable. They plan to greatly reduce the occurrence of unnecessary hospitalizations by rolling out a quality improvement program called Interventions to Reduce Acute Care Transfers (INTERACT) across the country with the support of several grants.



Joseph Ouslander, M.D., and Ruth Tappen, Ed.D, R.N., are using INTERACT to reduce the number of roundtrips from hospitals to skilled nursing facilities for elderly patients.

INTERACT is a set of standardized tools and other resources designed to facilitate early identification, evaluation, documentation and communication of changes in the status of residents in skilled nursing facilities and provide the necessary tools to manage conditions before they become serious enough to necessitate a hospital transfer. The tools help the professional staff at skilled nursing facilities make more informed decisions as they continuously review the data and learn from it to improve care.

"Using the INTERACT program, many residents experiencing an acute event can be treated in the nursing home without complications or the stress of a hospital transfer — saving Medicare upwards of $10,000 or more," said Tappen. "Implementing such care in nursing homes nationwide could improve care, reduce complications from hospitalizations and significantly reduce healthcare costs."

In October 2012, the Centers for Medicare Medicaid Services and some Medicare Advantage plans began implementing severe reimbursement penalties for a 30-day re-hospitalization, beginning with 1 percent of a hospital's entire Medicare billings — climbing to 2 percent in 2013 and 3 percent by 2014.

FAU recently partnered with PointClickCare, the long-term care industry's most widely used electronic health record (EHR) platform, to develop a fully integrated, electronic version of its INTERACT quality improvement program called eINTERACT™.

"We are extremely pleased to be working with PointClickCare to provide ease-of-use and electronic decision support tools based on our INTERACT program," said Ouslander. "Given their market leadership position, along with the breadth and depth of experience in developing and delivering EHR solutions to the long-term care and post-acute care industry, collaborating with PointClickCare is the obvious choice for us for this initiative."

"Reducing hospital readmissions is a major issue facing our member facilities and tops the list of goals of AHCA's Quality Initiative over the next three years," said David Gifford, Senior Vice President for Quality and Regulatory Affairs with the American Health Care Association. "The work Dr. Ouslander's team and PointClickCare are doing with eINTERACT is a significant step forward, and I am encouraged by its potential to deliver real impact to this key issue facing providers today."

Eminent Scholar Elected as Fellow of the Society of Experimental Psychologists

Scott Kelso, Ph.D., is no stranger to accolades. Long considered one of the world's experts on how the brain controls and coordinates movement and learns new skills, the Glenwood and Martha Creech Eminent Scholar in Science is an award-winning Fellow of the American Psychological Association, the Association for Psychological Science and the American Association for the Advancement of Science. Since he came to FAU from Yale University's Haskins Laboratories in 1985, his work has been continuously supported by federal funding agencies such as the National Institutes of Health, the National Science Foundation and the Department of Defense as well as by private sources.

Add to that growing list of honors Kelso's 2012 election as a Fellow of the Society of Experimental Psychologists, one of the oldest and most prestigious honorary societies in the field of psychology. He joins a select group of scientists from across North America, all of whom are elected for life.

Kelso's research uses noninvasive brain imaging techniques in combination with experiments and computational modeling to understand the "neural choreography" of the human brain — how the many parts of the brain are coordinated in space and time to produce ordinary day-to-day functions such as perceiving, attending, decision-making, learning, remembering and controlling movements. According to Kelso, no single focused level of analysis suffices to understand the brain and its disorders. Rather, he views the brain as a complex, dynamic system that is coordinated on multiple scales and levels of description, all the way from cells to cognition and social behavior. As a neuroscientist, Kelso has long been interested in the complexity of human behavior — in other words, the dynamics of "what makes us human."

"My life's work is devoted to understanding coordination in living things, in particular how human beings (and human brains) — individually and together — coordinate behavior," Kelso said in a recent interview with the Washington, D.C.-based Plexus Institute. "At the moment, our research is revealing some of the basic principles and mechanisms of coordination during simple kinds of social interaction. The approach of Coordination Dynamics — a blend of theory, experiment, analysis and modeling — may allow us to narrow the gap between the language of cells and the language of mind."

Kelso pursues this work as founder of the Charles E. Schmidt College of Science's Center for Complex Systems and Brain Sciences along with his dedicated interdisciplinary group, which includes physicists, computer scientists, engineers and neuroscientists in FAU's Human Brain and Behavior Laboratory.

"Dr. Kelso's research and scientific contributions have changed our understanding of brain function," said Gary Perry, Ph.D., Dean of the Charles E. Schmidt College of Science. "His election as a Fellow to this prestigious society is a great honor for him and the University and is well deserved. We are lucky to have him as a part of our scientific community at FAU."

Scott Kelso, Ph.D. is elected as Fellow of the Society of Experimental Psychologists, one of the oldest and most prestigious honorary societies in the field of psychology.

Babies Watch What You Say When Learning to Speak for Themselves

In the first six months of a baby's life, there's a lot of intense developmental growth going on — learning to sit up, grabbing for things he or she wants, and smiling at that cute reflection in the mirror. Recognizable syllables are emerging from the string of a baby's babble.

As these syllables become language, babies learn another skill: lip reading.

Psychology Professor David Lewkowicz, Ph.D., and Ph.D. student Amy Hansen-Tift tested nearly 180 babies at varying ages to measure how long the infants studied a speaker's eyes and mouth. The researchers found that at the age of six months, a baby begins to study a person's mouth more than the eyes, suggesting that lip reading is just as important as listening in learning how to talk.

"Our research found that infants shift their focus of attention to the mouth of the person who is talking when they enter the babbling stage, and they continue to focus on the mouth for several months thereafter until they master the basic speech forms of their native language," said Lewkowicz.

At 12 months of age, the study found, normally developing children shifted their primary attention back to the speaker's eyes — unless the person was using a foreign language, at which point the babies stuck with lip reading a bit longer.

The findings represent a potential breakthrough for early diagnosis of autism or other communication disorders, because one of the hallmarks of these disorders is a marked concentration on the mouth of a speaker rather than on the eyes.

The results of Lewkowicz's research have garnered national and international attention and generated new dialogue on, among other issues, the importance of face-to-face interaction between parents and infants.

Lewkowicz has conducted a number of follow-up studies to determine why infants shift their attention to the lips when they do. Studies have focused on the separate ways that audio-visual synchrony, motion of the lips and the voice itself affect an infant's response to a talking face. And a new collaboration with colleagues in Spain is examining how bilingualism affects an infant's attention to talking faces.

Embracing the Growing Problem of Obesity and Making a Difference

The numbers are grim: according to the American Diabetes Association, 25.8 million children and adults in this country had diabetes in 2011. Each year, almost two million new cases are diagnosed in people 20 and older.

What's even scarier is that an estimated seven million people don't even know they have the disease, which can cause blindness, heart disease, stroke and amputations.

The statistics paint a picture of a national health crisis. And for Eugenia Millender, Ph.D., Clinical Director of FAU's Diabetes Education and Research Center, it's a picture that demands immediate action.

"The numbers show us the need throughout the nation," Millender said. "By 2030, more than 60 percent of the whole United States will be overweight or obese (an adult who has a Body Mass Index between 25 and 29.9 is considered overweight, whereas an adult with a BMI of 30 or higher is considered obese.) And if those numbers are increasing, so are the numbers for diabetes, because they go hand in hand."

It was with that sense of urgency that Millender and the Center applied for (and received) a grant from the Blue Cross Blue Shield of Florida Foundation to launch an outreach effort called "Embracing a Healthy Tomorrow: Empowering Communities to Overcome Childhood Obesity." The two-year, $75,000 grant supports education efforts to more than one thousand students and their parents in Palm Beach County schools, community centers, churches and youth programs.

Originally, Millender says, the plan was to target kids between the ages of nine and 13, but her team soon found that the problem had even deeper roots.

Daryl Bradbury, A.R.N.P., works with Dieuriper Colin, 13, using The OrganWise Guys program.

"We were seeing that kids in elementary schools were already overweight and obese, so we decided to go younger. We found that on average 20 to 30 percent of kids in pre-K were overweight and obese, compared to 50 to 60 percent in elementary school," Millender said. "That data allowed us to identify when we should start prevention education. By high school, their behaviors are already set."

Working with the younger students was rewarding, Millender says, because they were enthusiastic, engaged and eager to learn. In three two-hour sessions, students learned about healthy eating habits, the importance of exercise and the role of mindfulness in maintaining healthy mind-body balance. The educators used an evidence-based curriculum called The OrganWise Guys, which incorporates a mix of songs, videos and hands-on activities. A cast of plush, colorful characters based on the organs of the human body illustrates the connection between healthy behaviors and physical well-being.

One of the most catchy ways the program communicates this message is through the "95210 for Health" campaign, in which basic rules for healthy living are outlined: 9 hours of sleep a night, 5 servings of fruit and vegetables, 2-hour limit of screen time (TV, video games, etc.), 1 hour of exercise and 0 sugary drinks.

"We're not only increasing knowledge and awareness, we're increasing life expectancy, improving lifestyles and hopefully reducing complications related to diabetes and heart problems," Millender said.

Planning for Change in the World of Nursing

The face of nursing is changing — literally — as more than 50 percent of the country's nurses are nearing retirement age. What's even more alarming, according to Rose Sherman, Ed.D., R.N., Director of the Nursing Leadership Institute in the Christine E. Lynn College of Nursing, is that we're going to see a corresponding shortage of experienced nurse leaders as the decade progresses.

"We went out into the community and asked our partner healthcare agencies to profile their current leadership, and they definitely identified that they had a leadership pipeline issue," said Sherman.

To address this impending challenge, Sherman and Assistant Professor Susan Dyess, Ph.D., RN, were awarded a three-year, $827,000 Health Resources and Services Administration grant to pilot an enhanced master's degree program in nursing administration, targeted at developing nurse leaders such as executive nurses, nursing directors and other formal leadership roles.

The Nursing Leadership Institute partnered with a number of hospitals and healthcare organizations, including the Memorial Health Care System in Broward County, St. Lucie Medical Center and Boca Raton Regional Hospital, to identify active nurses to participate in the Nursing Administration Specialty Emerging Leaders program. The first cohort of participants had, on average, fewer than six years of career experience as nurses — most of them had been in active practice for three years or less — and more than half of them were under 30 years of age.

The program combines classroom and online instruction with hands-on practicum experience, "connecting the dots" between classroom and real-world experience. Students are paired with experienced nurse leaders, called preceptors, who share current practice knowledge and mentor the younger nurses.

"We've seen that as students are interfacing with the current nurse leaders and preceptors, those leaders are also changing and growing," said Dyess. "We're finding there's strong mutual growth happening, as the preceptors are exposed to new ideas and embrace learning from the younger generation."

Back row: Susan Dyess, Ph.D., R.N., Angela Prestia and Rose Sherman, Ed.D, R.N. Front row: Manfred Mollica and Daphne Jordan.

Working with these "Generation Y" nurses, as Sherman often calls them, has been eye-opening for her in many ways. For instance, she says she has a better understanding of the role technology plays in how the younger generation approaches communication, tackles problems and interacts with the world around them that is critical for understanding the future of nursing.

Even though the program is only in its second year, feedback from the participants and from the healthcare organizations in which they work has been overwhelmingly positive. More than half of the current cohort of students has already been promoted into leadership roles, and partner organizations are already lining up recruits for the next cohort.

Equally important, for Sherman and Dyess, is the long-term impact their research will have.

"We have a healthcare environment right now that's very chaotic, with lots of change going on," Sherman said. "So a big question for us is, how do we prepare our future leaders for an environment we're not currently living in, but that they will definitely be leading in? What kinds of skill sets do they bring, and what skills will they need to develop, to be effective leaders in that environment?"

New Species of African Primate Discovered

What turned out to be a major scientific discovery started out more like an interesting diversion.

"I was in Tanzania finishing up my Ph.D. when John Hart, a scientist working in the [Democratic Republic of] Congo and Director of the Lukuru Foundation, asked for help with DNA work on a monkey no one could identify," said Kate Detwiler, Ph.D., Assistant Professor of Anthropology at FAU.

"Out of the blue, a brand-new species," she added with a laugh. "I was in the right place at the right time."

However much she downplays her role in the discovery of the lesula monkey (*Cercopithecus lomamiensis*), the fact remains that it is only the second new species of African monkey discovered in the last 28 years. Detwiler and a team of researchers have studied the lesula's diet, social behavior and vocalizations, as well as conducted genetic tests, to determine that it is closely related to the owl-faced monkey (*Cercopithecus hamlyni*).

"We estimate that they separated about two million years ago," Detwiler said. "They're cousins — close cousins."

The genetic intertwining of monkey species is something Detwiler knows quite a bit about, having spent years in the African rainforests studying hybridization and the migration of genes as different species mate over time. In particular, she is interested in how two species in Tanzania's Gombe National Park — the blue monkey (*Cercopithecus mitis*) and the red-tailed monkey (*Cercopithecus ascanius*) — are intermingling to create a spectrum of animals that are increasingly different from their progenitors.

The process of gathering data is a bit less than glamorous. "I look at the movement of genes from fecal samples," Detwiler said.

This indirect method of gathering genetic material allows researchers to obtain samples from the monkeys without having to capture or interfere in any way with their normal habitat.

It's definitely not the job for everyone, but Detwiler says she loves the opportunity to conduct field research and delve into questions that matter.

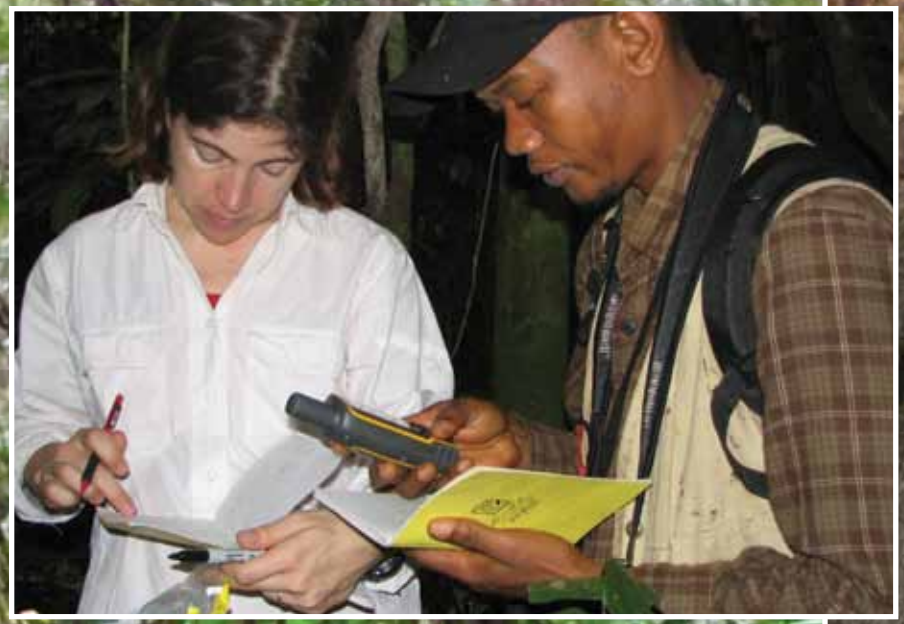
"My career has always been focused on the question of where species come from and the forces in nature that generate diversity," she said.

Thanks to the new molecular anthropology lab she has opened at FAU, these questions are closer than ever to being answered. Using samples from lesula monkeys, as well as from other African monkey populations, Detwiler and a small team of students — both graduate and undergraduate — will study genetic markers and track changes in the genome.

The discovery of the lesula has generated national and international interest, and it has drawn attention to the very real problem of conservation and survival. The aggressive bushmeat trade in the lesula's habitat range — roughly 6,500 square miles in central Congo — threatens to make the species extinct if the hunting is not regulated.

Detwiler is hopeful that plans to develop the Lomami National Park, a conservation area that includes a significant part of the lesula's range, will help protect this rare species from harm. The park will be the first of its kind to be established in Congo through consultation with local communities.

John Hart, Ph.D., and Pablo Ayali of the Lukuru Foundation (with Kate Detwiler, Ph.D.) don FAU tee shirts to acknowledge the collaboration with FAU.



Kate Detwiler, Ph.D., and Pablo Ayali of the Lukuru Foundation collecting sample data at the Losekela research camp.

Broward County Teacher Leaders 'Race to the Top' with a Little Help from FAU, PROPEL

When it comes to preparing teacher leaders to become principals, FAU's Daniel Reyes-Guerra, Ph.D., puts his money where his mouth is.

Or, more precisely, he's putting a $3.5 million Race to the Top grant to work with an innovative, intensive principal preparedness program called Principal Rapid Orientation and Preparation in Educational Leadership Program (PROPEL). Based on the Davie campus, the program trains teacher leaders and pairs them with active school principals in Broward County schools, with the goal of developing a new generation of principals who will improve student achievement and school culture.

Reyes-Guerra, Assistant Professor in the Department of Educational Leadership and Research Methodology, is the principal investigator for the grant, which was awarded in 2011. He says the first cohort of 26 Broward County teachers has successfully completed the first phase, during which time they were essentially interning as assistant principals at their schools. Most of these teachers are moving into the second phase, which will take them to different schools where they will "apprentice" with principals. A second cohort of approximately 30 students is hard on the heels of the first. The goal is to have three cohorts complete the program by June 2014.

PROPEL uses an intensive hands-on approach that aims to bring educational theory and coursework into the real world of a school building, complete with its own complex set of cultural norms, student needs and community expectations.

Members of the second cohort of the Principal Rapid Orientation and Preparation in Educational Leadership Program.

"The only way that what we teach is going to have any significance is if what we're teaching in the classroom is what our students are going to be experiencing in the schools," Reyes-Guerra said. "I think a lot of the criticism that higher education has received is the fact that we tend to be off in the ivory tower doing our own thing and not really reflecting what our students face when they enter the classroom or become leaders in their schools."

The courses that participants in the PROPEL program take are unique in another way, says Reyes-Guerra, in that they are co-constructed with Broward County leaders and FAU faculty. They are also taught by actual school principals, all of whom hold doctorates, which Reyes-Guerra says gives them added credibility.

"We've also incorporated all the Florida Principal Leadership Standards and the new Florida Educational Leadership Exam — which came out at the end of 2011, so they really haven't had time to become a part of the professional development of administrators — into the courses themselves, so they're meeting all the competencies and requirements. That really makes our program cutting edge."

"Success is not just turning around the scores on the FCAT," said Reyes-Guerra. It really means working with your community, working with your students and teachers, figuring out how to distribute leadership across your school. You really need to share leadership for that process to work and turn around the school in the long term. It's complicated, and we're trying to give our students the skills necessary to succeed."

Investing in Teacher Success for Improved Student Learning

Barbara Ridener, Ph.D., aims to provide comprehensive professional development and teacher education projects for teachers in the subject areas of geometry and American history.

It's not "business as usual" for Florida's K-12 teachers, and it hasn't been for quite some time. With the state's gradual implementation of the new Common Core standards, big changes are rolling down the pike, bringing with them even bigger challenges.

Fortunately for Palm Beach County schools, they don't have to face those challenges alone. With the help of two three-year "iTeach Partnership Project" grants from the Florida Department of Education — totaling $1 million — FAU faculty are providing comprehensive professional development and teacher education projects for three groups of teachers in the subject areas of geometry and American history.

"These areas were selected because they are coming up for revision in the state standards. We felt the teachers needed more focus and preparation in these areas," said Barbara Ridener, Ph.D., Chair and Associate Professor in the Department of Teaching and Learning, as well as one of the principal investigators on the grant.

Each teacher selected to participate in the project will receive 125 contact hours of instruction at the graduate level to build content knowledge and develop more effective teaching strategies. Participants come from high-poverty schools as well as from challenging classroom situations that hinder optimal student learning.

"We have everything from instructors with Ph.D.s who have been recognized within the district as top-notch teachers to teachers who are in ESE-based (exceptional student education) classrooms, where they have to teach general math, Algebra I, Algebra II and geometry to all the students in that self-contained room," Ridener said. "Now, that's a teacher with a real challenge: how to address what each student needs, let alone do the curriculum justice AND do the revised curriculum justice?"

So far, the first cohort of 24 teachers has completed their university coursework and the goal is to have them partner with teachers at other schools to support one another with what they're learning. It's a "train the trainer" model, Ridener says, so that the impact of the program is strengthened and extended as relationships grow.

Feedback from teacher participants and from the school district has been positive. Teachers appreciate the fact that most of the activities and work they are asked to do through their university coursework translates directly into resources they can use with their students. For instance, grant funds enabled the purchase of classroom sets of scientific calculators for each math teacher and a range of educational materials for the history teachers.

Obviously, the overarching goal for these iTeach projects is to increase overall student achievement in geometry and history, specifically in the high-stakes, end-of-year subject exams.

"Ultimately that's what we are doing this for: improve student achievement through improved teacher knowledge," Ridener said.

But there's another, equally important benefit to this work. "I am most pleased by the developing collaboration with the Palm Beach County district," Ridener added. "We've always had a good relationship with them but never an academic, research endeavor to this extent. That is exciting to me."

Are You QEP Curious? You Will Be!

As she spoke to a room of more than 100 students, faculty and staff, Donna Chamely-Wiik, Ph.D., Assistant Scientist in the Department of Chemistry and Biochemistry, bubbled with enthusiasm about three little letters…QEP.

At this kick-off event she explained that QEP stands for "Quality Enhancement Plan," and it is a major part of FAU's Southern Association of Colleges and Schools (SACS) reaccreditation process. All SACS-accredited universities are required to have a QEP plan focusing on an area of improvement that the institution considers an integral part of its strategic mission.

Joshua Scholl, Provost Brenda Claiborne, President Mary Jane Saunders, Priscilla Hernandez, Alena Rodriguez and QEP Director Donna Chamely-Wiik, Ph.D., celebrate the kick-off of the Undergraduate Research Journal (URJ). Scholl, Hernandex and Rodriguez are co-editors of the URJ.

In February 2011, Chamely-Wiik, along with colleagues Jerome Haky, Ph.D., and William Louda, Ph.D., submitted a proposal to make undergraduate research the focus of FAU's QEP. Their plan was selected from 15 proposals that were submitted by faculty, staff and students. FAU's QEP is titled "Distinction Through Discovery," and Chamely-Wiik was subsequently appointed its Director. She and the QEP Steering Committee — faculty, staff and students who represent various colleges and programs — are charged with developing and implementing a plan to expand a culture of undergraduate research and inquiry across all disciplines at FAU.

A first-year college student might ask, "Why is undergraduate research so important? I'm just here to be able to get a job when I graduate." Chamely-Wiik would reply, "Exactly!" Regardless of career path, the skills acquired when completing a project-based or research assignment will serve a student well in the future. There is a profound difference between simply memorizing information for a test and actually delving into an issue, exploring it in detail and coming up with insights of one's own.

A group of undergraduate students formed the Council of Scholarship and Inquiry in the fall of 2012 and published the inaugural Florida Atlantic Undergraduate Research Journal. Students and faculty from across the colleges participated in a peer review process of manuscripts submitted by students on projects with titles such as "Olympic Legacy: A Comparison of Barcelona 1992 and Athens 2004," submitted by Emma Nunan, Honors College, and "Population Structure and Burrow Placement of Gopherus polyphemus in a Small, Declining Southeast Florida Conservation Area," submitted by Josh Scholl, Department of Biology.

Projects such as these are potentially career-changing experiences for FAU undergraduates. Marcela Aguilar, an undergraduate scholar in the Dorothy F. Schmidt College of Arts and Letters, is working on a research project dealing with linguistics and Second Language Acquisition. She says, "Learning through interaction with linguists in Second Language Acquisition research at FAU has been a rewarding experience that is shaping my current academic goals and my future professional goals. This research is paramount for understanding how the mind processes language."

Instilling a research-based culture at the undergraduate level will give FAU students more opportunities to grow. The QEP will provide undergraduates with more inquiry-based courses, more funded student projects, additional opportunities to showcase their work, a peer mentoring program, more professional development opportunities and recognition and awards for their work.

FAU Student Edith Nagy Receives Prestigious NSF Graduate Fellowship

As an undergraduate in the Charles E. Schmidt College of Science, Edith Nagy had every intention of eventually going to medical school. She was good at science, especially chemistry, so it seemed a natural path to follow. A stroke of scheduling luck placed her in an Organic Chemistry I class taught by Salvatore Lepore, Ph.D., Professor of Chemistry. It was in this class that Edith began to truly appreciate the subject matter. Lepore knew he had a superstar student on his hands when Edith came to his office to show him that one of the homework solutions was incorrect in the manual. He had assigned that problem before, but no one had ever found the error. And after she achieved the highest score on the American Chemical Society final exam, Lepore didn't hesitate to welcome Edith when she asked to join his lab as part of the Directed Independent Study program.

Ph.D. student Edith Nagy studies an amino acid that is quickly becoming a building block of choice in medicinal therapies.

Edith was paired with mentor and Ph.D. student Pradip Maity on a project relating to ammonium-catalyzed cyclization reactions of non-activated alkynes leading to heterocyclic products (azaprolines). They were able to develop a new way to make a certain type of amino acid that the body does not reject. This advance is allowing it to become a building block of choice in medicinal therapies.

After watching Edith excel in the lab, Lepore encouraged her to apply for the National Science Foundation's prestigious three-year graduate fellowship. While not certain that she would get it, given her undergraduate status and general lack of experience, they both took the application process very seriously. They reasoned that if it didn't succeed, it would be a good test run for a second application to be submitted once Edith had begun her Ph.D. program. But it turned out not to be a test run at all. Edith was thrilled when she received notice that she had, in fact, been selected for the fellowship. She is just the second FAU student ever to receive this fellowship and the first in the last 10 years.

Since winning the fellowship, Edith has been able to take the research even further. While she knew how to make the amino acid, she didn't yet understand why it was happening. Edith's goal was to better understand the mechanism of this unique chemical reaction. After months of late nights in the lab, she recently discovered what Lepore calls "the smoking gun." She plans to publish her findings within the year — another amazing feat for a first-year Ph.D. student.

Edith credits her success to her colleagues in the lab, including her mentor, Maity, (who has since moved on to become a postdoctoral fellow at the University of Texas Southwestern Medical Center) and fellow Ph.D. student Elijah St.Germain, who is working on various aspects of the research with her. But Lepore is quick to give Edith her due, saying, "Edith has a very logical mind. Sorting through this unusual reaction has required mental gymnastics, and she's been able to do this in a very rapid timeframe."

Edith plans to continue working on this research and contribute to the overall goal of Lepore's group: to make non-natural drug variants that are more potent with fewer side effects and to give medicinal chemists the molecular "tools" they need to discover new medicines faster and more cost effectively.

Archaeological Dig Lets Students Get Their Hands Dirty with History

The Italian words roll off Brian McConnell's tongue with a lyrical ease that sounds like poetry: *Rocchicella di Mineo; Parco Archaelogico della Ceramica del Calatino; Assessorato per I Beni Culturati ed Ambientali*.

So what's he actually talking about?

Turns out it's not poetry, but rather an exciting archaeological site called Rocchicella di Mineo (Little Rock of Mineo) on the island of Sicily. Built around a series of "boiling lakes," which are sites of naturally occurring emissions of carbon dioxide, the dig played host last summer to McConnell and a group of FAU students who have been uncovering relics spanning the Paleolithic period through the Middle Ages.

The site, located on the fault line where the tectonic plates of Africa and Europe meet, is an ancient sanctuary known as Paliké, established by an indigenous people called the Sekel. It's proving to be a rich historical treasure trove, with evidence of monumental Greek-style architecture, sacrificial animal remains, grinding stones and even a coin dating from the fifth century B.C.

McConnell, Ph.D., the Interim Chair of FAU's Department of Visual Arts and Art History, directed the 2012 excavation that took 12 FAU students and two other American university students to Sicily for a five-week study-abroad course. The program exposed students to the techniques of archaeological excavation, documentation and restoration.

"On the basis of the work the students did this past summer in an ancient water canal at the base of the site, we're going to concentrate most of our efforts there next summer," McConnell said. "We hadn't realized the importance of this canal in terms of monumentality. It's more than 300 meters long so far."

It's up to the students in the 2013 summer program to find out what else lies under that soil.

McConnell is enthusiastic about the site and its significance in the region, which has long been the stage for various cultural dominations. Greeks, Romans, marauding bands of Hungarian soldiers in the fifth and sixth century A.D. — they have all made their mark and left behind evidence of their presence.

"The layering of history…it's wonderful to see the changes over time," said McConnell, who finds the greatest professional thrill in discerning how things in an archaeological site fit together into a larger, nuanced picture. For instance, the buildings that have been unearthed on the site are as exquisitely designed and put together as any such structures you're likely to find in downtown Athens — a fact that McConnell says underscores the significance of Paliké to the region.

"It gives you the impression that this place was an important location, on the scale of a Delphi or other sites," McConnell said.

"We're fortunate to be able to do this," he added. "Not every institution is able to get into a foreign land and work with the people there and be part of the scene. "

Above: Students Elizabeth D'Antonio and Chris Kaul excavate important artifacts.

Right: Students Jessica Devio and Joe Leonardo carefully unearth a piece from the site.

Partnerships that Pay Off: Real-world Experience Puts Students in Position for Success

After years in "Corporate U.S.A.," Jeanne McConnell, MBA, came to FAU to teach because she wanted to give back and help students prepare for what's ahead. "I have the best job in the world," said McConnell, who has been an Adjunct Instructor in the College of Business for the past five years.

Her efforts have paid off rather grandly: five students in her "Business and Entrepreneurship" class from last spring — a multidisciplinary course that cultivates collaboration and creative thinking — were given the opportunity to work in paid internships at Lockheed Martin's ocean division in Riviera Beach over the summer. These internships revolved around a prototype device the students were modifying, using Android technology, for possible applications in monitoring seaports or other underwater data collection paradigms.

"We started looking at one of those robotic vacuum devices that go around autonomously and clean floors," McConnell said. "The students repurposed it into a remote-controlled robotic device, using a cell phone as the 'brain'."

The prototype was met with great enthusiasm by the program's Lockheed Martin partners, particularly FAU alumnus and senior program manager Tom de Groot. The business and engineering students received high marks for their work, and one student is even being considered for a full-time position at Lockheed Martin.

"We're working very closely with Lockheed Martin to see what we can do next for them," McConnell said. "We've created a very close relationship with this company, which gives them a chance to 'try out' our students and recruit them. It works out well for all of us."

The success of the Business and Entrepreneurship class has led McConnell to seek out additional opportunities for collaboration between students and corporations — and for collaboration among various disciplines within FAU.

She has a new multi-disciplinary course that is open to engineering, business and art students. The course will focus on innovative uses of Android technology. It is a true team project, as each student fulfills a specific role: engineering students work on the technical app development, including backend processing and databases, while the business students are responsible for the marketing plan, how the app will be launched and how it will make money. The art students design the look and feel of the app, the logo and other design elements for marketing. The greatest challenge of all is that the students need to do all of this within the timeframe of one semester.

McConnell is a firm believer that even if cross-disciplinary work is challenging, it is more than worth the investment. "Life is cross-disciplinary, right? It's better that we teach our students how to work with all sorts of people while they're still in school instead of sending them off without the tools they need to succeed. Real-world experience is great for our students because they learn to respect each other's skills."

Students in the "Business and Entrepreneurship" class pose in front of Lockheed Martin, proud of the prototype they created for the company.

Modeling Success in International Business and Marketing

Mike Mullen, Ph.D.

Mike Mullen, Ph.D., Professor of Marketing and International Business, aims to make entering a foreign market much easier and much more profitable for businesses.

Mullen and his team of graduate students have developed a model to predict success in international business. Existing research models, such as Michigan State's Center for International Business Education and Research (CIBER), are not industry specific, meaning they only look at total exports and not at what products are being exported.

Foreign market opportunity analysis is one of the most researched areas of international marketing. Businesses need this data to make strategic decisions about which markets to enter and with which products. The marketing models Mullen and his team, including former Ph.D. students Shirley Ye Sheng and Desi Budeva, developed are extensions of CIBER's basic model. The FAU models study best prospect markets at the industry level and are very relevant to firms seeking profitable international markets.

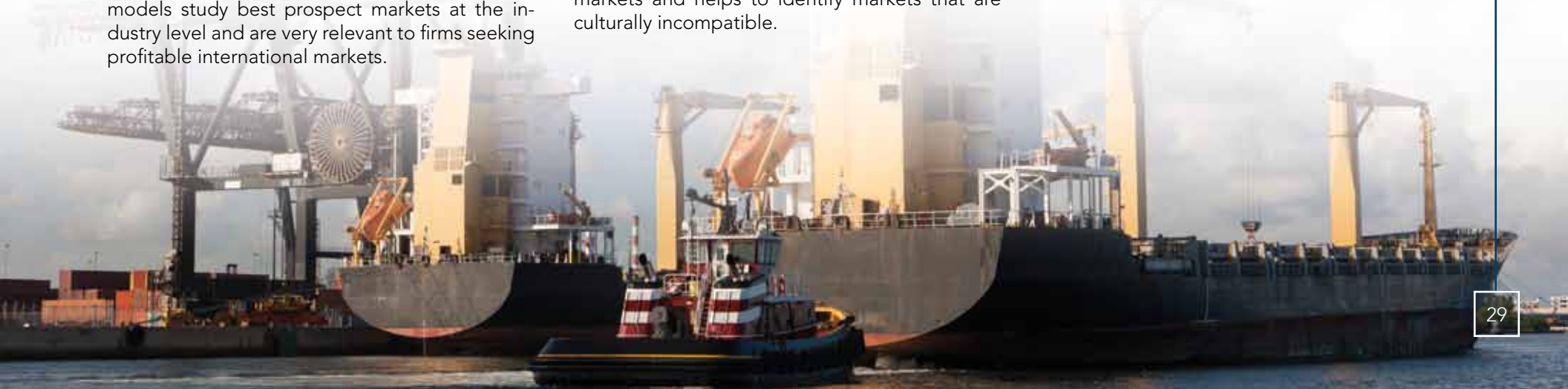
An important contribution from Ye Sheng's dissertation, "A Hybrid Model for Export Market Opportunity Analysis," was recently published in International Marketing Review. This model compares predicted U.S. exports to actual exports of an industry by country basis, offering a gap analysis to identify underserved foreign markets.

Building on Ye Sheng's findings, Budeva carried out the first major study to identify a cultural framework as a significant predictor of U.S. export success at the industry level. Mullen and Budeva found that cultural differences, language and religion can make an impact in determining whether or not a company will have success marketing its products to international markets. They looked at 70 different industries, testing a range of variables to determine how the predictions for success were affected. The model ranks the best prospect foreign markets by industry and groups them into managerially relevant clusters. The clusters are then sub-divided and best prospect countries are ranked. This model has proven to be a valuable method of selecting best prospect markets and helps to identify markets that are culturally incompatible.

The results of this research, Mullen says, will help U.S. businesses make better decisions about entering international markets. "We're helping firms understand how to approach the markets, giving them very detailed analysis of where the sales are in the world, where the gaps are and how they would need to differentiate their marketing approach based on what we see in the numbers."

He credits the South Florida business environment and FAU's College of Business with making such research possible. The region is "an epicenter of international business." With the support and encouragement of the business community, FAU has been able to recruit world-renowned business faculty, including Mark Peterson, Ph.D., Jeff Madura, Ph.D., Patricia Doney, Ph.D., and Tomasz Lenartowicz, Ph.D.

"What FAU brings to the table is outstanding scholars who can train people as a team to be productive scholars in international business and international marketing," Mullen said. "We are on the cutting edge of this applied research on foreign market analysis."



Research Park at Florida Atlantic University Serves as Model for Universities and Research Parks

The Research Park at Florida Atlantic University is quickly becoming the "go to" resource not only for local startups and entrepreneurs working to build their businesses, but for other universities around the country and abroad looking to improve their own business parks and incubators.

The U.S. Department of State awarded Andrew Duffell, President and CEO of the Research Park, a prestigious U.S. Speaker grant to make presentations at several Paraguayan universities. Duffell lectured at the Itaipu Technological Park, the Catholic University Science and Technology Park and the National University to students, professors, journalists and researchers, sharing his expertise on best practices and how research universities in the United States facilitate lab-to-market transfer of technology. He also advised civic leaders how to best organize and run their research parks and incubators, as well as their innovation-based economic development strategies.

"It was an honor to serve as a resource for the U.S. State Department, and I was proud to have the Research Park at Florida Atlantic University serve as a model university-affiliated institution," said Duffell.

The Research Park has been on the international stage since Duffell's visit to Paraguay. Upon his return, he and the Greater Fort Lauderdale Alliance hosted executives from 20 Chilean companies at the Research Park's Deerfield Beach campus.

In October, the Association of University Research Parks selected the Research Park's Boca Raton campus to host its 2014 International Conference. The conference will be attended by more than 250 respected international and domestic leaders from universities, research parks and businesses.

"This is a fantastic opportunity for attendees to learn from one another and for us to showcase South Florida's numerous research endeavors, which support the region's economic development efforts," said Duffell.

This global exposure comes on the heels of major expansion at the Research Park. In response to a growing demand for its services, the Research Park at Florida Atlantic University recently expanded its Technology Business Incubator (TBI). The TBI, a location and knowledge resource for entrepreneurs emerging from FAU — students, recent graduates and faculty — is now home to 22 early stage technology companies in various industries such as pharmaceutical development, software development, logistics management for transportation and medical devices. Three tenants in the TBI are actually student-led companies, focusing primarily on mobile app development technologies.

The Research Park also recently signed a long-term agreement with Florida LambdaRail (FLR) to meet increasing demand for advanced data communications services, becoming the first research park in the state to do so. As a result of this agreement, companies at the Research Park will be able to collaborate on cutting-edge research with other companies throughout Florida, the nation and the world.

Additionally, two of the winners of the 2012 Governor's Innovators in Business Awards were tenants of the Research Park: Flagship Solutions Group was awarded the Governor's Innovation and Entrepreneurship Award (Mega Market) and Modernizing Medicine's CEO, Daniel Crane, was recognized with the Governor's Innovators Under 40 Award.

"The mission of the Research Park includes maximizing academic talent and regional resources in South Florida to accelerate economic development and prosperity," said Duffell. "These two companies represent our finest, both in growing their businesses and providing new benefits to the community in the form of technology and jobs."

Research Park Chair Lonnie Maier and President & CEO Andrew Duffell were joined by Boca Raton Mayor Susan Whelchel, Palm Beach County Commissioner Steven Abrams, FAU Vice President for Research Barry Rosson and other leaders at the ribbon cutting ceremony for the new Technology Business Incubator facility.

FAU Philosopher Furthers Understanding of Somaesthetics

Richard Shusterman, D.Phil., at a conference on somaesthetics in Seoul, South Korea.

With stops in Finland, France, Poland, Germany, South Korea, Norway, Italy and Brussels within the last year, it might sound as if Richard Shusterman is a rock star on tour. But this is just a part of everyday life for Shusterman, D. Phil., Professor of Philosophy and the Dorothy F. Schmidt Eminent Scholar in the Humanities.

In his field — as a philosopher, he considers himself a pragmatist falling somewhere between the neo-classical and neo-analytical currents of thought — Shusterman has reached quasi-rock star status. His pioneering research in a new field of philosophy he calls somaesthetics has earned him a Senior National Endowment of the Humanities Fellowship, a Fulbright Fellowship and other prestigious grants.

Somaesthetics understands the importance of the role of embodiment in perception, performance and even thoughts, especially with respect to aesthetic qualities of balance, order and harmony that structure experience and orient behavior. Shusterman regularly discusses somaesthetics in relation to the arts and also to general issues of cognition, ethics and practices of everyday life such as styles and habits of eating.

He explained that traditional philosophy has looked to the reflective mind to explain everything, when in reality — and when understood from an evolutionary perspective — the body and its perceptions and reactions guide almost everything we do.

"If you are getting chased by a lion, you don't first reflect on the dangers and then decide to run … you just run," he said.

Earlier this year, Shusterman hosted an international conference titled "Body and Technology: Instruments of Somaesthetics" with presenters from all over the world.

Regarding the body as a sentient soma rather than as a merely material machine, the conference examined the complex relationship between body and technology, exploring how the body, as our basic instrument for living, has been reshaped by the technologies we have developed — changing our somatic habits through which we experience and act in the world while also altering the body through various forms of mechanical or chemical enhancement.

"Too often, our society opposes the living body to the tools of technology, forgetting that the body is itself our tool of tools; just as our culture too often contrasts technology and the arts, forgetting that they share a common creative source and etymological history — techne being the Greek word for art," Shusterman said. "We aim to integrate scientific, humanistic and artistic research to promote ways that enrich our somaesthetic understanding and thus improve the quality of our embodied experience."

Pop-Up Books Are Popping Up at the Jaffe Center for Book Arts

Pop-up books such as this Star Wars-themed book are part of the Arthur J. Williams Pop-Up Collection.

Remember being a kid and opening up a wildly colored, creaky-paged pop-up book, full of pictures that leapt off the page with tabs you could pull to make things move and doors you could open and close?

Thanks to the unique and engaging Arthur J. Williams Pop-Up Collection at FAU's Jaffe Center for Book Arts, you can once again experience that tactile joy of immersion in reading. Comprising 425 pop-up and moveable books that Arthur Williams, a Fort Lauderdale resident and retired film editor, has been acquiring since the 1970s, the collection is intended to be both whimsical and inspirational.

"I remember these pop-up books from when I was a kid, and they planted a seed in my head that made me want to make books of my own," said John Cutrone, Director of the Jaffe Center. "So I think they inspire people at a young age."

Indeed, the books inspire people at every age, including the Center's founder and most frequent visitor, Arthur Jaffe. Of the pop-ups collection, he says, "Pop-ups are a very participatory form of book, and that's something unusual. Most books you need to be gentle with when you handle them — if you handle them at all — but pop-ups demand to be handled, pulled, touched."

Students and faculty are encouraged to browse through the books and study the mechanics of pop-ups, such as the intricate tricks of engineering that go into making lobsters unfold from the center of a page or allowing two Star Wars fighters to engage in a light saber battle on the edges of a pair of opposing pages.

While the majority of items in the Williams collection have been commercially produced and sold, visitors can also experience a whole different type of pop-up book, such as the sculptural beauty of a piece by famous book artist Julie Chen. Titled "World Without End," it doubles as a book of poetry that can be physically assembled into a standing globe shape, made of perfectly cut paper festooned with lines of verse.

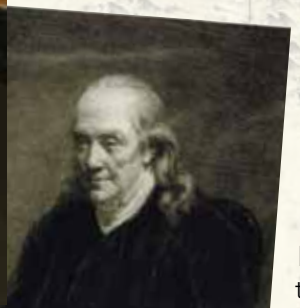
The piece — which Cutrone calls an artist's book — is hard to define and harder to describe, but undeniably riveting.

"Now, see, you can't get a Kindle to do that," Jaffe said with a grin.

Cutrone agreed. "We've seen two or three attempts at artists' ebooks, but they haven't been very good yet, so we don't have any. I'm sure someday we will."

Spirit of America Alive and Well, Thanks to Historic Collection at Wimberly Library

The late Marvin Weiner and his wife, Sybil, pose with a book from their "Spirit of America Collection."



They say that imitation is the sincerest form of flattery. If so, then there was never a more sincere admirer of our Founding Fathers than Marvin Weiner, who spent much of his adult life collecting the books, manuscripts and other items those august men had acquired in their own libraries.

It falls to the staff and faculty of FAU's Wimberly Library to keep that collection going.

Numbering more than 13,000 items, the Marvin and Sybil Weiner "Spirit of America Collection" was donated to the University in 2006 and is an invaluable resource for students of all ages. A new large-scale poster exhibition of selections from the collection stands on first floor of the library. A portion of the fifth floor — where the full collection is housed — now serves as a study hall.

Work is ongoing to catalog and organize the wealth of materials, which include 6,000 books, 3,000 pamphlets and a range of newspapers, broadsides and sundry other items — what University Archivist Victoria Thur calls "ephemera, a fancy archival term for things that aren't usually meant to be kept."

Rita Pellen, Associate Dean of the Library, sees the collection as a major coup for the University. "It's the only collection of its kind in the southeast United States," she said. "We'd love for researchers to know about this and come here to use and work with these materials."

When asked to define why this collection is so significant, neither Pellen nor Thur hesitate, agreeing that it represents the foundations of western thought.

A grand assessment, to be sure, but when you consider the sorts of resources contained in Weiner's collection, it doesn't seem far-fetched at all. Particularly inspired by Benjamin Franklin and Thomas Jefferson, Weiner combed the bibliographies from their personal collections and made diligent efforts to acquire copies of the same volumes in his own.

Publications in his possession span six centuries and include works such as a first edition of John Locke's *Two Treatises on Government*, a first edition of *Uncle Tom's Cabin* and several editions of Thomas Paine's *Common Sense*.

"This collection is literally about the creation of the United States, how this country was built," Thur said, noting that most of the materials date from before 1865.

"Mr. Weiner added his own books from a later period on things he thought were important, but the essence of the collection is on what makes good governance," she added.

Weiner donated his collection to FAU because he knew it would be made available not just to researchers, undergraduate and graduate students, but to middle and high school students as well.

"Two school groups came through, we talked about the American Revolution, and then we brought them up here and showed them all the documents," Thur recalled. "The sixth and seventh graders asked a lot of questions and were sort of shocked that they could actually see and experience the genuine article."

Smarter Cars, Safer Streets: FAU Networking Research to Help Improve Road Safety

You're driving south on I-95, headed toward Miami, when all of a sudden traffic slows to a crawl, then to a stop. There's no indication of an accident that you can see, and there's no traffic report on the radio. The sun shines brightly in the sky, it's a perfect, balmy afternoon — but you're not moving, and the next exit is three miles away.

Sound familiar?

If Imad Mahgoub, Ph.D., has anything to do with it, such a scenario will one day be only a distant memory.

Mahgoub, a Professor of Computer and Electrical Engineering and Computer Science, has received a $330,000 grant from the National Science Foundation — with a matching grant of $142,000 from FAU — to develop new technology whereby cars on the road will be able to "talk" to each other about driving conditions, road hazards and other potential bottlenecks, helping to prevent delay and accidents.

The technology Mahgoub is working on is called VANETs, or Vehicular Ad hoc Networks, a system of vehicle-to-vehicle and vehicle-to-infrastructure communication that will be part of an envisioned Intelligent Transportation System.

"If your vehicle talks to the vehicle next to you and that one talks to the vehicle next to it, and so on, we can propagate information that can help improve roadway safety and improve efficiency of traffic flow," Mahgoub said.

"Do you know how much money is lost because of traffic jams in the U.S. per year?" he asked. "About $114 billion a year, because of lost productivity and money wasted on gas."

The major part of Mahgoub's research concerns how to move past computer software simulations to real-world testing of the technology. He and his team are developing 15 dashboard-mounted devices that will be tested on the University's Boca Raton campus. The device will function like a GPS system — it will, in fact, have GPS functionality built in — and will display pertinent traffic and roadway information that, Mahgoub says, could save a motorist's life.

"Cars have a lot of sensors, for things like ambient temperature, the rpms and speed and acceleration of the engine, traction on the road. The signals from all these sensors can be monitored. If we can tap into all that data and share it, deduce useful things from it — say, information that tells you to speed up or change lanes — well, even a few seconds can save your life," Mahgoub said.

He estimates that there are roughly one billion cars in the world, 240 million in the U.S. alone, which translates to approximately 40,000 fatalities related to motor vehicles per year. Mahgoub predicts that if his VANET technology is widely implemented, almost 80 percent of those deaths could be prevented.

The research he and his lab colleagues are doing puts FAU in the forefront of this area of technological innovation, Mahgoub says, as he knows of no other university in the U.S. that is doing this type of work. The information gathered from this research will enable easier evaluation of complex vehicular networking systems and create a higher standard in vehicular networking research worldwide.

"This is the future," Mahgoub said. "VANET is going to be a significant component of vehicle safety."

Imad Mahgoub, Ph.D., confers with Ph.D. students Monika Rathod and Sajjad Aghdam.

Hope for Haiti: NSF Grant Funds Research into the Invisible Networks that Support a Nation

The beleaguered island of Haiti has suffered more than its share of calamity in the last few years, from a devastating 2008 hurricane season to the 7.0-magnitude earthquake in 2010. The earthquake was followed by a deadly cholera outbreak thought to have originated at a military base operated by the UN; it has so far claimed almost 8,000 lives. Add to that the recent destruction of roughly 70 percent of the country's crops by Hurricane Sandy, and you've got the recipe for disaster on an epic scale.

The challenge of recovery from such a litany of hardship is exacerbated by the fact that media attention is fleeting and the spotlight fades quickly, making it harder to get aid and resources to places that need help.

"The public has historically assumed that people recover quickly," said Ann-Margaret Esnard, Ph.D., Professor of Urban and Regional Planning. "Then Katrina happened and people realized it actually takes years or decades to recover. The question is, how do we insure recovery that's sustainable?"

To study the process of long-term recovery in Haiti, Esnard and Alka Sapat, Ph.D., Associate Professor of Public Administration, received a $300,000 research grant from the National Science Foundation to study the vital role played by communities of Haitians living in the United States and abroad. For this grant, titled "Diaspora Advocacy Coalitions and Networks: A Focus on Haiti's Disasters," the researchers are conducting surveys in communities with large concentrations of Haitian-Americans in South Florida, New York, Boston and Atlanta. Interview questions elicit information about participants' involvement in formal and informal aid organizations and their levels of social and political advocacy.

"The assumption is that these groups exist and that they help, but that turns out to be an understatement," Esnard said. "One of the things we were surprised to find is that there are between 30 and 50 Haitian organizations in South Florida alone! They may not get all the glory, but they play a key role in the long-term recovery and resilience of their family members in Haiti and the U.S."

A real strength of these informal networks, Sapat says, is their ability to mobilize community support quickly and efficiently through the use of social media. She and Esnard are interested in how these networks can serve as advocates for Haiti through interaction with the larger international aid agencies.

One of the goals of the grant is to open pathways of communication and partnership between key members of grassroots organizations for Haiti and the international aid groups that have the greatest ability to help.

"We see this project as a way to make international organizations more knowledgeable about these networks, more able to harness the power of these organizations, so that when the next disaster hits, they will be better able to respond," Sapat said.

"When international organizations can talk to key members of the diaspora here, the message can spread more quickly and effectively."

Ann-Margaret Esnard, Ph.D., and Alka Sapat, Ph.D., are studying the vital role of communities of Haitians living in the U.S. and abroad on the recovery of Haiti.

Research Highlights

Alternative or Mainstream Health Care?

An Ayruvedic medical center in Colombo, Sri Lanka.

Mary Cameron, Ph.D., Professor of Anthropology, spent nearly three months in South Asia on a highly competitive Multi-Country grant from the Council of American Overseas Research Centers (CAORC). While in Kathmandu, Nepal; Dhaka, Bangladesh; and Colombo, Sri Lanka, she compared the use, practice, manufacture, education and politics around an ancient system of health care called Ayurvedic medicine. While Ayurvedic medicine is considered an "alternative" or "complementary" source of healing in the U.S., it is popular in South Asia and is considered entirely mainstream.

In Kathmandu, Cameron organized a workshop called "Health and Nature: Policy Dialogue on Ayurveda, Medicinal Plant Conservation and Markets." Participants included seed geneticists, Ayurvedic doctors, conservation scientists and drug manufacturers from the government and non-government sectors. The workshop was funded by the American Embassy in Nepal. From that workshop — and another she hosted in Bangladesh — Cameron helped form teams of researchers who are studying topics such as Ayurvedic drug quality control, plant genetics, medicinal plant conservation and sustainable trade. Several of the teams plan to seek funding from sources such as the World Health Organization to support this research.

Harnessing the Ocean's Energy

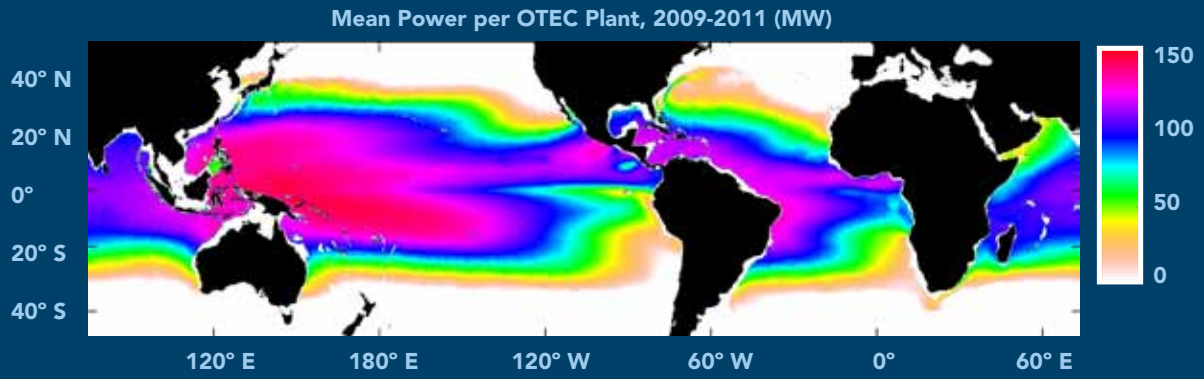
FAU's Southeast National Marine Renewable Energy Center (SNMREC) in the College of Engineering and Computer Science has applied for a lease from the Bureau of Ocean Energy Management (BOEM) to install and operate a small-scale turbine test berth approximately 15 miles off the Fort Lauderdale coast as the next step in making the testing facility a reality.

The purpose of the test berth is to investigate the potential of harnessing the power of ocean currents — such as the Gulf Stream — to generate base-load electricity. If successful, it will provide a unique contribution to a broadly diversified portfolio of renewable energy for the nation's future. BOEM has agreed to move ahead with plans to evaluate the proposal submitted by the SNMREC to lease 17,080 acres for deployment in the ocean.

"The center is taking a systems approach to the implementation of at-sea and in-lab testing capabilities for commercial turbine prototypes," said Sue Skemp, Executive Director of SNMREC. "The release of this environmental assessment by BOEM is an important step forward."

The agency will provide an environmental assessment that considers the effects of issuing a lease for testing equipment for public review and input. This is the first lease application the BOEM has received for testing ocean current equipment and, if approved, would last five years.

The BOEM operates under the U.S. Department of Interior and is responsible for managing the development of the nation's offshore resources in an environmentally and economically responsible way.



FAU Professor Ranked No. 81 in the History of the World by ScienceHeroes.com for Saving More than One Million Lives

Charles H. Hennekens, M.D.

What do Edward Jenner, who developed the smallpox vaccine, Jonas Salk , who developed the polio vaccine, and Henry Heimlich, who invented the Heimlich maneuver have in common with FAU's Dr. Charles H. Hennekens, M.D.

They are all scientists recognized by Science Heroes.com for making discoveries that led directly to saving large numbers of human lives. Hennekens, the first Sir Richard Doll Research Professor in FAU's Charles E. Schmidt College of Medicine, is ranked No. 81 in the history of the world for saving more than one million lives (Heimlich is ranked No. 103, Salk No. 83 and Jenner No. 5). As an epidemiologist or "medical detective," Hennekens has dedicated his life to the prevention of premature death and disability.

Hennekens was the founding principal investigator of the landmark Physicians' Health Study of 22,071 doctors, which determined that aspirin prevents a first heart attack. He was also the first to demonstrate that aspirin prevents heart attacks, strokes and cardiovascular deaths when given to patients within 24 hours after onset of symptoms of a heart attack as well as to a wide variety of patients who have survived an event associated with a blockage in the heart, brain or legs.

"My chief motivation to pursue an academic career in preventive cardiovascular medicine was the premature death of my father from sudden cardiac death," said Hennekens, emphasizing that "death is inevitable, premature death is not."

Hennekens also has done seminal work on the benefits of statins, angiotensin converting enzyme inhibitors, angiotensin receptor blockers as well as beta adrenergic blockers — all of which play major roles in decreasing premature deaths from heart attacks and strokes.

Hennekens advises the general public that all of these cardiovascular drugs with lifesaving benefits should be adjuncts, not alternatives, to therapeutic lifestyle changes. He strongly advocates avoidance or cessation of smoking, avoidance of obesity and taking brisk 20-minute daily walks.

Science Watch ranked Hennekens the third most widely cited medical researcher in the world from 1995-2005, and five of the top 20 researchers listed were his former trainees and/or fellows.

FAU's Digital Library Provides Expanded Online Access to Research Journals

At first there was only one: *The Florida Geographer*, the official publication of the Florida Society of Geographers, was FAU's first open access journal to be published with the Open Journal System. It was hosted by the University's Digital Library, which creates online collections that promote education, scholarship and lifelong learning.

The University began using Open Journal Systems (OJS), a journal management and publishing system developed by the Public Knowledge Project, in 2011 in an effort to expand and improve access to research. OJS provides faculty with digital services that enable the production and open access dissemination of peer-reviewed, scholarly works.

Using OJS helps the Digital Library fulfill its two-fold mission of supporting the teaching and research of FAU faculty and students and showcasing scholarly research produced at Florida Atlantic University.

"We are pleased to be able to mount journals on behalf of our faculty," said William Miller, Ph.D., Dean of University Libraries. "We are using OJS in a variety of ways, such as publishing the *Undergraduate Research Journal* that supports FAU's new Quality Enhancement Plan. OJS represents one way that academia can potentially take back scholarly journal publishing and control the cost of access to scholarly literature."

The process of transitioning traditional print publications to fully accessible online journals fostered campus partnerships between Digital Library staff and faculty in the School of Communications and Multimedia Studies and the Charles E. Schmidt College of Science. Collaboration was also promoted between local groups, such as the Broward County Historical Commission, a division of Broward County Libraries, and the Coastal Education and Research Foundation.

FAU Awards $200,000 in Cash and Prizes at 2012 Business Plan Competition

FAU's Adams Center for Entrepreneurship and the College of Business, along with the Research Park at Florida Atlantic University, hosted the 2012 FAU Business Plan Competition. Twenty-one teams made up of FAU students, members of the business community, alumni and, for the first time, local high school students competed for more than $200,000 in cash and prizes. The high school student track winner's prize also included a full four-year scholarship to FAU.

"The competition inspires FAU students and entrepreneurs in our community, and with only three competitions under our belt, we continue to make progress toward elevating the region with more hopeful entrepreneurs, using the program to vet their ideas," said Kimberly Gramm, Assistant Dean and Director of the Adams Center for Entrepreneurship.

2012 FAU Business Plan Competition finalists Stephen Brynildsen and Gina Brynildsen of OWLFood, a Mobile App for on-campus food delivery service.

More than 300 guests attended the competition, which provided an opportunity for participants to test their business ideas. More than 215 teams registered for the competition, up from 167 last year.

The high school track winner was Austin Tedesco for his prototype, beforeyouturnitin.com, a reliable, accurate and affordable proofreading service for high school students. Tedesco is a junior at Marjory Stoneman Douglas High School in Parkland.

The college student track winner was FAU student Neil Parsont for his prototype Owl Educational Web Services, an online tutor-student matchmaking service. The company's business model allows direct communication between students and tutors.

The entrepreneur track winners were Jose Christiansen, Mark Fredericks and David Fredericks for their prototype SwitchMyBooks.com, a website created to help students save money on their textbooks by creating a listing service where they can buy, sell and exchange their college books.

Participating teams had the opportunity to meet and network with experienced venture capital principals, early-stage angel investors, successful entrepreneurs and senior business leaders.

FAU Developing Innovative Technologies to Address Challenges of Telemedicine and Home Healthcare

Department of Computer and Electrical Engineering and Computer Science Associate Professor Ankur Agarwal, Ph.D., received a one-year National Science Foundation (NSF) grant of $200,000 through the NSF Industry/University Cooperative Research Center (I/UCRC), Center for Advanced Knowledge Enablement (CAKE) to address the challenges of telemedicine and home healthcare. The award was doubled by a matching grant from Soren Technology. This funded research is in response to the rising healthcare costs in the United States associated with hospitalization.

Ankur Agarwal, Ph.D., is addressing the challenges of telemedicine and home healthcare.

"We are very pleased to be a part of this unique interdisciplinary project linking the field of computer science with the field of medicine," said Borko Furht, Ph.D., Professor and Director of the I/UCRC, CAKE FAU site. "This research will help improve patient healthcare options and provide innovative tools to help physicians manage patient care."

The project covers three main areas of research: testing Soren Technology's decision-support system to avoid readmission, developing a protocol for interoperability of healthcare devices and developing a multimedia algorithm to optimize data streams for telemedicine.

The decision-support system work will include testing of patient prognosis system to assess readmission risk based on specific serious health conditions such as pneumonia or heart disease. Once a high-risk patient has been identified, Soren Technology's existing patented software technology will facilitate coordinated care for the patient to avoid readmission.

Current healthcare devices do not typically share data. The research will explore a new protocol compatible with IEEE 11073 Personal Health Data Standards to allow devices to communicate and transfer information through the use of smartphones.

The team, made up of Agarwal, Furht, Ravi Behara, Ph.D., Associate Professor of Information Technology and Operations Management, Hari Kalva, Ph.D., Associate Professor of Computer Science, and Napthali Rishe, Ph.D., Professor of Computer Science at Florida International University, will also enhance Soren Technology's multimedia algorithm to optimize data streams for telemedicine purposes, utilizing voice, video and physiological data. Telemedicine services include specialist referrals, which allow patients to see specialists in live, remote consultations and permit physicians to send diagnostic images and/or video along with patient data to specialists for diagnosis; patient consultations; remote patient monitoring, which can include audio, live or still images; and access to medical and consumer health information using a direct link to a physician's office or over the Web.

FAU's Wilkes Honors College Receives $295,000 Gift to Fund New Social Engagement Program

FAU's Harriet L. Wilkes Honors College received a $295,000 gift from the William R. Kenan, Jr. Charitable Trust to fund the Kenan Social Engagement Program, a three-year pilot program at the John D. MacArthur Campus in Jupiter. The new initiative will bring together best practices in community service learning, public-private partnerships, social entrepreneurship and the use of sound business techniques to address pressing social problems. The goal of the program is to create a series of sustainable projects that will improve the quality of life in southeastern Florida.

FAU's Wilkes Honors College.

"We cherish our ongoing relationship with the Kenan Trust and are honored by their confidence in funding this program, along with two others, at the Wilkes Honors College," said Jeffrey L. Buller, Ph.D., Dean of the Wilkes Honors College. "With service to the region being a central focus of FAU, we believe that the public-private partnership of the Wilkes Honors College and the Kenan Trust will continue to play a significant role in the University's evolving mission."

Richard M. Krasno, the Executive Director of the Kenan Trust, hopes that this initiative will serve as a model for other colleges and universities to develop their own social entrepreneurship programs.

"It's such a creative idea," Krasno said. "We'd love for this to be known as the Wilkes Honors College Model."

Timothy Steigenga, Ph.D., Professor of Political Science and Chair of the Humanities and Social Sciences at the Honors College, and Christopher Strain, Ph.D., Associate Professor of History at the Honors College, are co-directors of the new program.

FAU Receives National Center of Academic Excellence in Information Assurance Research Designation

FAU's Center for Cryptology and Information Security (CCIS) has been designated a National Center of Academic Excellence in Information Assurance Research (CAE-R) for academic years 2012-17 by the National Security Agency and the Department of Homeland Security.

"With this designation, FAU is further recognized as a leader in information assurance and cybersecurity," said Spyros Magliveras, Ph.D., Professor of Mathematical Sciences in FAU's Charles E. Schmidt College of Science and CCIS Director. "After graduating from FAU, our students take on important roles in government, industry and academia, meeting the increasing and urgent need for protection of our critical information infrastructure."

The CAE-R program was started in 2007 to encourage universities and students to pursue research and develop information assurance and cybersecurity programs according to strict government standards. The program addresses the shortage of professionals with these skills and highlights the importance of higher education as a solution to defending America's cyberspace.

FAU's CCIS was established in 2003 with funding provided by the federal government and today draws upon the unique strengths of information assurance specialists in four FAU colleges: the Charles E. Schmidt College of Science, the College of Engineering and Computer Science, the College of Business and the College for Design and Social Inquiry.

INSTITUTES AND CENTERS

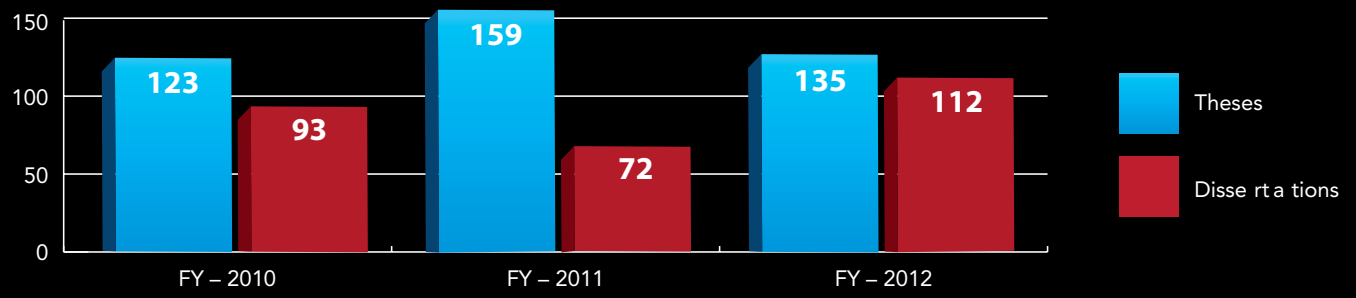
Institutes and centers are established to carry out research, service and instructional activities that supplement and extend programs of instruction and research offered by Florida Atlantic University. FAU's state centers and institutes typically have a state-wide mission, include two or more state universities, have been approved by the Florida Board of Governors and have an advisory board with membership. FAU's University centers and institutes follow the same protocols as state centers but do not necessarily carry out a state-wide mission and are self-supporting.

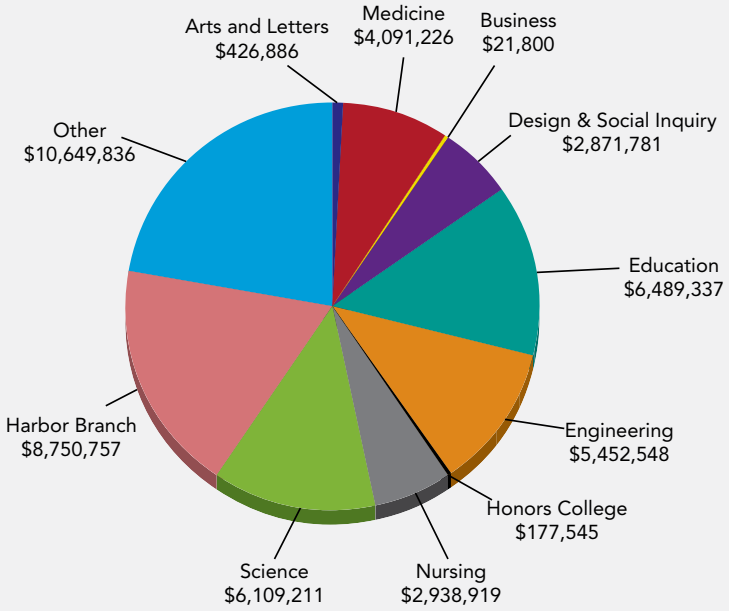
THE FOLLOWING ARE FAU'S STATE AND UNIVERSITY CENTERS AND INSTITUTES:

Adams Center for Entrepreneurship
Carl DeSantis Business and Economics Center
Center of Acoustics and Vibrations
Center for Advancement of Distance Education Technologies
Center for Autism and Related Disabilities
Center for Biological and Materials Physics
Center for Complex Systems and Brain Sciences
Center for Cryptology and Information Security
Center for Economic Education
Center for Holocaust & Human Rights Education
Center for Hydrodynamics and Physical Oceanography
Center for Infrastructure and Constructed Facilities
Center for Intermodal Transportation Safety and Security
Center for Marine Materials
Center for Marine Structures and Geotechniques
Center for Molecular Biology and Biotechnology
Center for Rare and Genetic Neurological Diseases
Center for Services Marketing and Management
Center for the Study of Values and Violence after Auschwitz
Center for Systems Integration
Center for Women, Gender, and Sexuality Studies
Center of Excellence in Biomedical and Marine Biotechnology
Child Welfare Institute
Christine E. Lynn Center for Caring
Community Justice Institute
The Disability Center
Ernest O. Melby Community Education Center
Florida Center for Environmental Studies
Institute for Ocean & Systems Engineering
Intensive English Institute
International Center for the Advancement of Political Communication and Argumentation
Louis and Anne Green Memory and Wellness Center
Pine Jog Environmental Research Center
Public Procurement Research Center
Quantum Foundation Center for Innovation in School and Community Well-being
Southeast National Marine Renewable Energy Center
The Teaching and Leadership Center
Weppner Center for Civic Engagement

BY THE NUMBERS

THESES AND DISSERTATIONS





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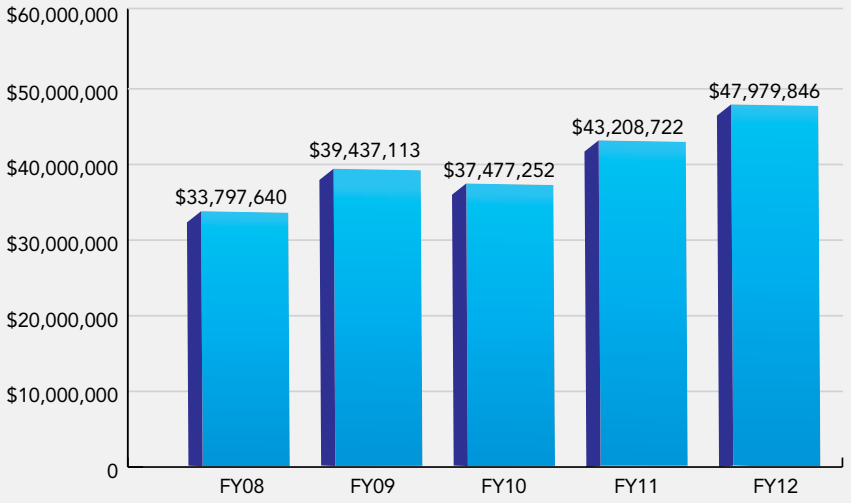

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