Photo courtesy of University Marketing Communications

Dr. Jason Bruck, SFA assistant professor of biology, recently published a study that sheds light on how dolphins use tasks and signature whistles to identify each other. Bruck conducted much of his research at Dolphin Quest in Bermuda, where he spent part of the summer building upon his study.

Biology professor studies dolphin communication

By Renee Fain
Editor-in-Chief

Assistant Professor of Biology Dr. Jason Bruck published a study that dives into bottlenose dolphin communication in May. In his research, Bruck discovered two things: bottlenose dolphins can recognize each other through urine cues, and dolphins have specific whistles for each other, much like humans have names.

"Stephanie King and Vincent Janik showed that dolphins can use each other's whistles to address individuals, and I showed that dolphins can remember these whistles for 20 years or more," said Bruck. "What we didn't know is if dolphins could use whistles the way we use names. For example, if I say your best friend's name, you will picture that individual in your head. Do dolphins do the same thing? If they do that means signature whistles can function as representational labels the way human names do."

To conduct the study, Bruck and his team used audio of dolphin whistles and a long pole to pour in the urine that either matched the dolphin's whistle or did not. They also tested urine of dolphins the subject should have been familiar with versus urine of dolphins the subject would not be familiar with.

"Dolphins keep their mouths open and sample urine longer from familiar individuals than unfamiliar ones," said Bruck. "This is important because dolphins are the first vertebrate ever shown to have social recognition through taste alone, as most other vertebrates have smell capability. This is a new concept in our understanding of gustatory sensory biology and highlights how little we know about this sense broadly."

The next step in the research is to determine what chemical the dolphins are using to identify each other.

"Something we might want to think about as we start to get a handle on urine signaling in dolphins is our use of commercial and industrial chemicals in wild populations," said Bruck. "We may find that oil spills, the chemicals we use to disperse oil, chemical run off and other human effects may impede dolphins' natural ability to chemically signal to one another. This might prevent males from identifying reproductively capable females or diminish dolphins' abilities to recognize individuals through honest signals."

Bruck graduated with his doctoral degree in behavioral biology from the University of Chicago in 2013. He has received numerous grants, authored and coauthored dozens of publications, and served as a faculty advisor/mentee to several graduate and undergraduate students. He formerly served as a visiting assistant professor of zoology and teaching assistant professor of integrative biology at Oklahoma State University and as a former Marie Curie Research Fellow at the University of St. Andrews in Scotland, United Kingdom.

SFA adds mechanical, electrical engineering degrees

By Sandra Carranza
Managing Editor

The Department of Physics, Engineering and Astronomy will begin offering mechanical and electrical engineering degrees this fall.

Previously, the department only offered an engineering physics degree with the option of a mechanical or electrical engineering concentration.

Dr. Hector Ochoa, associate professor in electrical engineering, said the process of getting more engineering degrees at SFA started years ago thanks to Dr. Dan Bruton, professor and planetarium director.

"Bruton continued working hard over the years to build solid arguments to get the degrees approved," Ochoa said. "By leveraging the knowledge acquired from the engineering physics degree and current technological trends in Texas, the department was able to put a solid proposal to add the electrical and mechanical engineering programs."

Dr. Hacer Varol, assistant professor in the department, said the new programs will allow students to take more mechanical or electrical engineering courses to prepare them for the workforce.

"According to the U.S. Bureau of Labor Statistics, the job growth in these two fields is going to be about 7% from today to 2030. One can argue this rate can be higher than what is projected because of high salary earning potential, steady work schedule and prestige," Varol said.

She said SFA has had an increase of engineering students, higher than 7%, and believes having "more marketable and visible degree programs" will attract more students.

The two new engineering degrees have yet to be accredited by the Accreditation Board of Engineering and Technology, which Ochoa said is critical for an engineering degree, as most employers will not hire a graduate from a non-accredited program.

Dr. Rickey McDaniel, department chair, said ABET accreditation means an engineering program has been evaluated and meets "agreed-upon quality standards for the engineering profession." But he said the accreditation process is not easy.

"For example, one of the requirements for applying for ABET accreditation is that a degree must have at least one student that has gone through the entire program and graduated before we can apply for accreditation," McDaniel said. "The purpose of this requirement is that ABET doesn't accredit what you plan to do in the future, but instead they look at what you actually did and how it matches up to their requirements."

However, Ochoa said this doesn't mean the new programs are any less worthwhile, nor should students hesitate to complete the programs.

"The engineering team in the Department of Physics, Engineering and Astronomy is working hard to have everything ready to apply for accreditation once we get our first graduate out the door," Ochoa said. "One good thing about this is ABET provides retroactive accreditation for two years. Once we apply and receive ABET accreditation, if everything works well during the review process, those graduates would be covered."

Professors in the department said they are excited to start offering these programs to students and begin preparing them for electrical and mechanical engineering careers. Students who graduate from the programs will have the possibility to work for top companies like Oncor, Lockheed Martin, GE Aerospace, Boeing, NASA and many others.

Students interested in SFA's engineering programs can email engineering@sfasu.edu or visit the SFA website for more information.

School of Honors students engage in undergraduate research

The SFA School of Honors is celebrating its 30th year of enhancing our students educational experience. The School promotes the intellectual curiosity of the University's most capable students, enabling them to confront complex issues. The program offers small classes specifically designed to develop critical thinking skills, expand the scope of investigation of a topic and explore issues in greater depth than can be done in conventional classes.

"All students in the School of Honors engage in research, which is a major focal point," said Dr. Michael Tkacik, director of the School of Honors. "Research improves resumes, provides opportunities such as internships and conference attendance, and increases engagement in college leading to improved understanding of material in class as well as increased networking with professors and peers."

Many Honors students have presented their work at professional or academic conferences across the nation, as well as at the annual Undergraduate Research Conference at SFA.

The program endeavors to develop students who are prepared to become active and thoughtful members of the University community by involving faculty working together with honors students on challenging topics. The program features small class sections that provide many opportunities for collaboration with professors. A wide variety of intellectually stimulating activities is offered, including Honors study abroad trips.

"While many of our students have directly entered the work world, others have gone on to attend medical school, law school and graduate school at a variety of internationally recognized universities," he said. "Whatever the Honors students' goal, we strive to prepare them for success while sharpening those attributes that make each student an individual."

There are many advantages to School of Honors membership. Honors students are entitled to early registration, have the opportunity to take Honors-only courses and earn the University Scholar diploma. The program has a computer lab, a research center, and other services, including free printing, reserved exclusively for honors students.

"These quiet spaces facilitate good study habits, which is the cornerstone of success in college," Tkacik said. "Not everyone who is in Honors uses the facilities, but those who do also find comradery amongst their peers and support from the office staff that can serve them later in college and after graduation."

For more information about the SFA School of Honors, visit sfasu.edu/honors or call (936) 468-2813.

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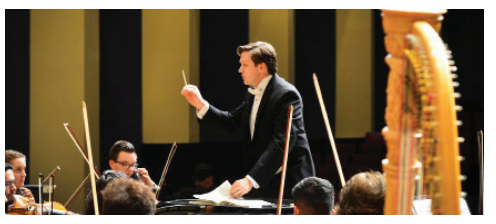

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