



Technology Transfer



Aerospace



Agriculture



Medical



Defense

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Inventions and patents have put Fayetteville State University on the research map. Please click on a research area displayed below to learn more about the advancements the FSU Research & Technology Transfer Office has made in areas of Geospatial Science, Technology Transfer, Agricultural Science, Defense and Homeland Security, and Medical Innovation.

NGA CENTER FOR ACADEMIC EXCELLENCE IN
GEOSPATIAL SCIENCE

Inventions & Patents Put FSU on the Research Map

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GEOSPATIAL SCIENCE

NGA CENTER FOR ACADEMIC EXCELLENCE IN GEOSPATIAL SCIENCE

In June 2015, Fayetteville State University was designated as a "USGS NGA Center for Academic Excellence in Geospatial Science." The National Geospatial-Intelligence Agency (NGA) delivers world-class geospatial intelligence that provides a decisive advantage to policymakers, warfighters, intelligence professionals and first responders. Anyone who sails a US ship, flies a US aircraft, makes national policy decisions, fights wars, locates targets, responds to natural disasters, or even navigates with a cellphone relies on NGA. NGA enables all of these critical actions and shapes decisions that impact our world through the indispensable discipline of geospatial intelligence (GEOINT).

Through its Geospatial Intelligence Certificate Program coordinated by FSU professor, Dr. Rakesh Malhotra, its proximity to Fort Bragg, and the \$443,000 grant previously received from the NGA's Academic Research Program (NARP), Fayetteville State University displayed the right mix of education and skills that would help to strengthen, and cultivate the future of US geospatial sciences. As a designated Center of Academic Excellence in Geospatial Science (CAE GS), FSU will assist the NGA and USGS to develop state-of-the-art geospatial sciences technologies and tradecraft.





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INNOVATION: ELECTRICITY FROM BODY

What if you could charge your phone just by simply holding it? Well now you can! Fayetteville State University is proud to announce that their very own Dr. Daryush Ila has invented a thermoelectric device that can attach to a cell phone and generate electricity just from body heat. The device attaches to the back of the phone. When a person holds the phone, the battery immediately begins to charge.

How does it work? The thermoelectric device has a multi-nanolayer structure, made of alternating insulator and insulator/metal materials, that are irradiated across the layer structure with ionizing radiation. The ionizing radiation produces nanocrystals in the layered structure that increases the electrical conductivity and decreases the thermal conductivity, thereby increasing the thermoelectric figure of merit.

This technology can open the door for even larger applications. Think about the possible use of generating electricity for small vehicles or even households? This breakthrough paves the way for an exciting and progressive future.





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AGRICULTURAL SCIENCE

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AGRICULTURAL SCIENCE

THE INTERNATIONAL AMERICAN MOROCCAN AGRICULTURAL SCIENCES CONFERENCE



Agriculture is a major source of income and the largest industry and employer in the Kingdom of Morocco. Morocco was the first nation to recognize the independence of the United States and for the past two centuries US-Morocco diplomatic and military relations have been excellent at all levels. Thus, it was fitting that the US serve as an organizer for the first International American Moroccan Agricultural Sciences Conference – AMAS Conference.

The establishment of this conference, was spearheaded by Dr. Abdelmajid Kassem, Chair of FSU's Biology department. The conference was produced with the hope that it would lead to greater involvement by the US, not only in Moroccan agriculture, but also in other sectors of the economy. Over 120 experts in Agricultural Sciences, scientists, faculty, and students from the United States, Germany, France, Algeria, Turkey, the Netherlands, United Arab Emirates, Senegal, and India.



The Conference has benefitted both US and Moroccan students and scientists, and will certainly have an impact on the economic transformation of the agriculture sector in Morocco, opening a market with tremendous opportunities for US companies and investors in that country.



AGRICULTURAL SCIENCE

CANABIXMIX

Dr. Shirley Chao has a unique interest in the effect insects have on crops. Insect pests cause substantial damage to stored food products, especially grains and vegetables, throughout the world. Some of the principal pests that cause damage are the adult and larval stages of beetles and the larval stages of moths. All may be problematic by their presence, either alive or dead, in grain that is to be processed for food. Due to the toxicity of current synthetic pesticides to human/animal health, there was a need to develop a safer, more effective insecticide that targets insect pests, specifically without harming non-target animals and humans.

Plants of the Family Cannabaceae have been shown to alter the development of insects. The unique properties of Cannabaceae include its toxicity toward insect pests and, at the same time, its beneficial characteristics toward humans and other vertebrates. The product, called CannabixMix disrupts reproduction and the normal development of insects at the larval stage. Dr. Chao has a provisional patent and is currently preparing a full patent.



AGRICULTURAL SCIENCE

SUSTAINABLE DESERT FARMING

Despite the need for increased food production to address the growing population worldwide, mankind continues to rely on outdated food production methods. The most common method of farming is widespread crop irrigation. However, the amount of water available for farming is decreasing while the size of desert lands is increasing. Logically, a way to convert desert land into farmland would address this problem.



At Fayetteville State University, Dr. Carla Padilla is addressing this problem through the development of agri-tiling methods. Agri-tiles are portable, gel-based, topsoil compositions that lay in a hollow created in the sand, with a layer of sand on top. The topsoil holds the seeds and fertilizer, and allows for water retention throughout the plant growth process. In one method, the plants are watered by conventional means, and in a second method, water is provided through a system of aqueducts placed below the agri-tiles. The density of the agri-tile composition is adaptable to adjust for sand composition and the type of crops to be grown.



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FSU's Center for Defense and Homeland security hosted its 2nd Annual Military Affiliates Cybersecurity Education Symposium and Job Fair. The symposium brought together national and regional cybersecurity experts who engaged military affiliates, industry partners, federal contracting agencies, national laboratory cyber experts, military leaders, legislatures, UNC system faculty and FSU Alumni.

Over 300 attended to gain and share information, as well as to network and collaborate with regard to resources. Attendees included high school and college educators, private industry representatives, scientists, and military personnel.

Panel discussions addressed cyber security-related topics in Employment, Federal Contracting and Entrepreneurship, Research and Technical Training, and the Capabilities of Military Affiliates. As one of the few historically black colleges and universities (HBCUs) with a cybersecurity curriculum, FSU has proudly taken a leadership position in showcasing how HBCUs can play an important role in this expanding industry.

Visit www.cdhs.uncfsu.edu

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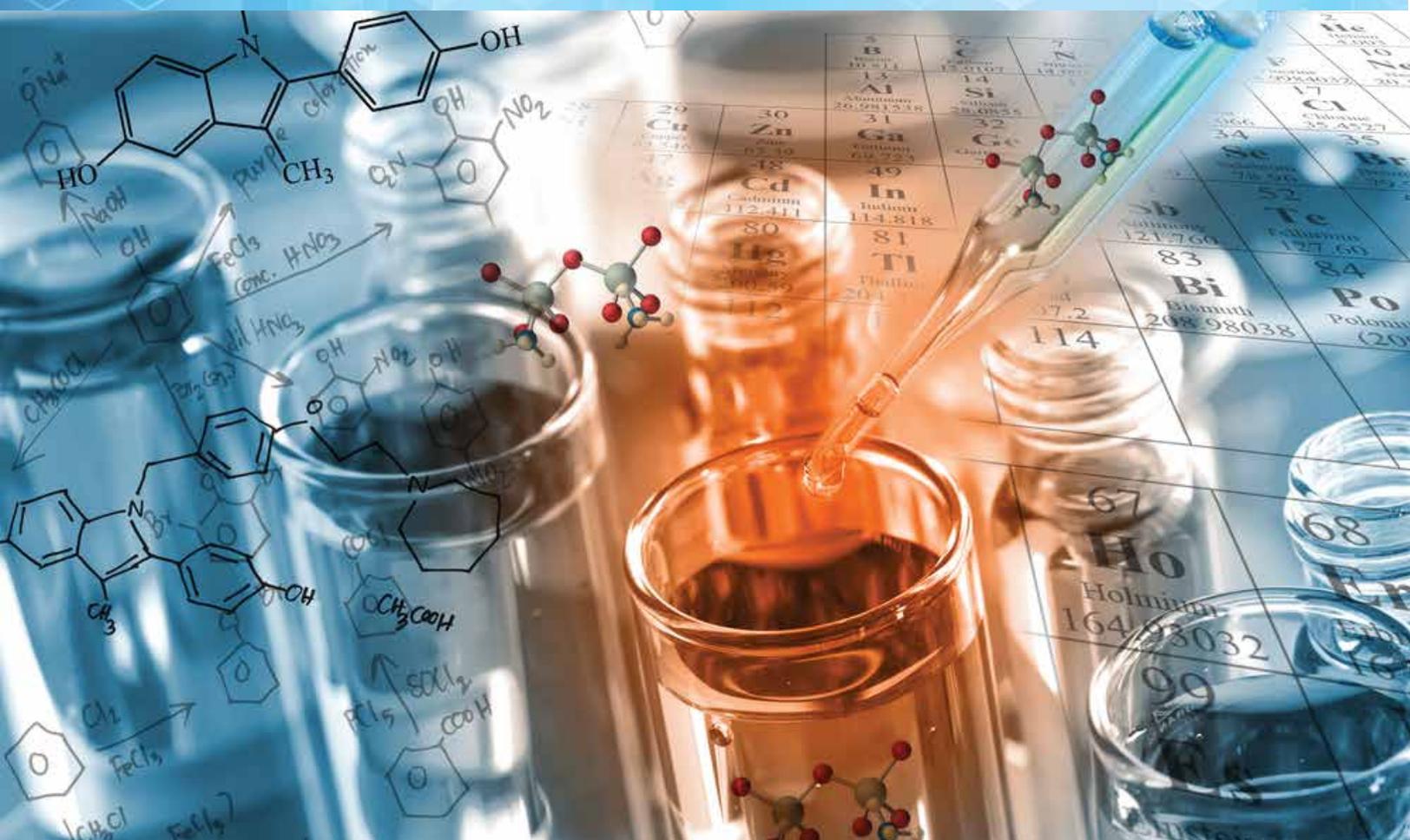
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MEDICAL INNOVATION

VIVEX-CEL ADVANCED WOUND RECOVERY DEVICE

Fayetteville State University (FSU) won third place at the International iMatSci-Innovation in Materials Science Competition at the Materials Research Society (MRS). FSU won for its patented "ViVex-Cel Advanced Wound Recovery Device." Dr. Carla Raineri Padilla of the Research & Technology Transfer Office, inventor of the device, represented FSU at the competition.

iMatSci is designed to demonstrate the newest materials-focused technologies in practical applications. In the two phases to the competition and out of all of the international representative applicants, only 26 finalists were allowed to demonstrate their inventions at the MRS meeting. Finalists included entrants from the United States, Ireland, Korea, Mexico, France and Brazil. First place was awarded to Johns Hopkins University for "Middle-Ear Implant Sensor for Hearing Restoration Applications."



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What does FSU & ORAU Mentor Protege program offer?

Further the development of a mature STEM business model.

Assist in the development of faculty and students toward research and internship opportunities.

Enhance FSU's ability to successfully compete for government contracts.

Expand FSU's diversity of partnerships

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