

Oklahoma Innovations - OCAST's Official Newsletter

August 2014

UCO, OCAST SCHEDULE TECHNOLOGY SHOWCASE AUGUST 28 IN EDMOND

The University of Central Oklahoma and the Oklahoma Center for the Advancement of Science and Technology (OCAST) have joined forces with a lengthy list of sponsors for the third annual Oklahoma Technology Showcase August 28 in Edmond.

Nine advanced technology firms are featured in the showcase. Each is an example of world-class technology developed in Oklahoma in large part due to the state's commitment to funding research and development. The firms also represent collaborations with higher education, state economic development interests, the private sector and foundations.

Featured showcases include Pamlico Biopharma, MaxQ, Charlesson, Noble Foundation, ARL/DNA Solutions, PolySkope, Choctaw Defense, CRTS and Sensulin.

Reservations can be made on line at www.techshowcase14.eventbrite.com until August 24. Cost is \$35.

Sign in begins at 8 a.m. August 28 at the Nigh University Center at UCO, 100 North University Drive, Edmond. The program includes breakfast, lunch and a networking reception. The 2013 Showcase event was held at the Northeastern State University campus in Broken Arrow.

Speakers include UCO President Don Betz; Steve Hendrickson, director of government operations for Boeing; Michael Carolina, OCAST executive director; Phil Parduhn, president of Pelco Products and Scott Hoyte, engineering director of GE.

Three presentations representing college-level students who participated in the OCAST Intern Partnership program will occur throughout the day's program. Interns who will present to the group and also be competing for financial awards at the event include Jordan Flasch, Ryan McCarthy and Martin A. McCurdy.

The Faculty and Student Intern Partnerships improve the state's R&D base by supporting undergraduate student internships and undergraduate teaching faculty internships at Oklahoma R&D facilities and by encouraging the students to prepare for careers at Oklahoma scientific and technical firms. Internships provide undergraduate students and faculty members increased experience with R&D in a workplace environment.

Stephen McKeever, Oklahoma secretary of science and technology, and Senator Clark Jolley of Edmond will be guest presenters at a reception and intern awards presentation at the conclusion of the showcase.

Sponsors include Tactical Electronics of Broken Arrow, Pelco Structural LLC of Claremore, Pelco Products Inc. of Edmond, Greater Oklahoma City Chamber, Amethyst Research Incorporated of Ardmore, Oklahoma State University New Product Development Center, Edmond Economic Development Authority, Oklahoma Manufacturing Alliance, i2E and the University of Oklahoma Office of Technology Development.

INTERN PARTNERSHIPS COMPETE FOR OCAST AWARDS TOTALING \$340,512

Nine Intern Partnership applications chosen from a field of 13 have been approved by the governing board for the Oklahoma Center for the Advancement of Science and Technology. Total funding for the projects is \$340,512. Winning applicants will hire a total of 16 interns.

Private firms and universities are represented in the nine winning applications. Internships are awarded for two years, and the current round of awards represent energy, aerospace, defense, geochemical and specific equipment designs.

Interns are college students or college faculty who have focused on technology subjects, often in hard-to-find areas, and who agree to work with a technology-based company for up to two years. OCAST pays one-half of the cost of an undergraduate internship in a research and development or business setting.

Program goals include developing collaborations among business owners, university professors and undergraduate students. Some of the students become full-time employees with sponsoring companies on completion of their internships.

Recent program awards follow:

Equipment Design

Muskogee

- Advantage Controls (ACI) of Muskogee will work with the University of Tulsa to develop an accurate conductivity-meter. ACI manufactures and designs a complete line of industrial water treatment systems. One student intern will work on a meter with a higher level of accuracy to help determine the proper application of chemicals in water systems. Kaveh Ashenayi is principal investigator for the project. **Award \$21,721**
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- ACME Engineering and Manufacturing Inc. designs, manufactures and installs industrial fans in a varied applications. Customers range from military applications to poultry operators. One intern will assist in development of a Turbulator Fan under the guidance of principal investigator Kaveh Ashenayi. The University of Tulsa will provide faculty oversight. The effort is expected to lead to larger blades and lower noise and improved portable monitoring. **Award \$21,471**

Diagnostic and Therapeutic Health

Tulsa

- Cancer Treatment Centers of America and the University of Tulsa will oversee the work of two interns who will develop and extend the previous work of two prior student interns. The earlier interns investigated deep tissue hyperthermia to treat abdominal and pelvic cancers. They will expand the types of cancer being investigated and improve guidelines and protocols to treat cervical and pancreatic cancers. Robert Sheaff is principal investigator. **Award \$60,000**

Energy

Norman

- SouthWest NanoTechnologies Inc. (SWeNT), principal investigator Yongqiang Tan and three student interns sponsored by OCAST will further research based on SWeNT's development of carbon nanotubes. The team will focus on conductive coating and energy storage. **Award \$60,000**

Oklahoma City

- ATC New Technologies, principal investigator Wayne Jones, a Rose State College faculty member and one student intern will develop a prototype battery pack to improve stored energy performance. The team will use the advanced manufacturing technique of 3D printing to reduce weight and part count. Improved battery structure will increase efficiency. **Award \$28,800**
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- ATC New Technologies, principal investigator John Dyer, and two student interns will develop an individual battery module consisting of a battery and battery management system with wireless data transmission capabilities. The technology is based on the integration of wireless capabilities into battery-powered products. The intent is to develop "smart" batteries capable of balancing themselves and using wireless technology. **Award \$28,800**

Aerospace

Tulsa

- American Airlines, the University of Tulsa, principal investigator Surendra Singh and two student interns will work on the upgrade of a computerized maintenance management system (CMMS) and design and development of a 16 channel scanner. Improvement in maintenance management is expected to make American Airlines more competitive in anticipation of future contracts for new aircraft. **Award \$60,000**

Defense

Broken Arrow

- Tactical Electronics, the University of Tulsa, principal investigator Surendra Singh and one intern will design and develop an explosive ordnance disposal specific multi-meter and manufacturing test fixture for high volume production. The product should be effective as an improvised explosive device (IED) defeat tool. Tactical Electronics will market the device and train for its use creating increased demand for engineers and technicians in Oklahoma. **Award \$36,000**

Geochemical

Alva

- Iofina Resources, Northwestern Oklahoma State University (NWOSU), principal investigator Jason Wickham and two student interns will support and conduct research to determine distribution, quantity and stability of iodine in the brine waters of northwest Oklahoma. Findings will be used to map iodine concentrations leading to increased production and an increase in the volume of iodine produced for a world market. **Award \$23,720**



ENTREPRENEURS ATTEND PROOF-OF-CONCEPT CENTER KICK-OFF MEETING

A kick-off meeting for the first class of entrepreneurs seeking access to the i2E Proof of Concept Center was held August 14 at i2E headquarters, Oklahoma City.

Dr. Elaine Hamm chaired the meeting. She also manages the Oklahoma Proof-of-Concept Center, which is a collaboration with The Oklahoma Center for the Advancement of Science and Technology, the University of Oklahoma's Office of Technology Development, Oklahoma State University's Office of Intellectual Property Management and Licensing and Cowboy Technologies, LLC.

Hamm supports the overall business commercialization efforts at i2E including assisting with market assessments, development of business strategies, evaluation of Business Plans, competitor analysis, preparation of investor presentations and facilitating access to the Angel and Venture Capital Markets.

Prior to joining i2E, Hamm served as the director for the University of Oklahoma's Office of Technology Development, overseeing OU's intellectual property management, economic development and technology-based entrepreneurial activities for the Norman and Tulsa campuses. While at OU, she managed a diverse technology portfolio including but not limited to: oil and gas, weather, biotechnology, medical, alternative energy and telecommunications

engineering and was responsible for the technical evaluation as well as marketing, licensing, and commercialization of patents, copyrights and other intellectual property developed at OU.

THREE PLANT SCIENCE PROJECTS RECEIVE FUNDING OK FROM OCAST GOVERNING BOARD

Plant pollinators, pest management, biofuel crops, plant fertility and plant pathogens are subjects principal investigators will undertake in three plant science research projects approved for funding August 19 by the OCAST governing board. Total awards for the three projects reach \$299,148. Competing projects were considered under the Plant Science Research applications program.

Independent peer reviewers ranked the winning projects from a field of 28 and actually qualified 24 of the applications. Available funds could support only the first three.

Two of the projects came from principal investigators representing the University of Oklahoma and one came from Oklahoma State University.

Oklahoma Plant Science Research is a basic research program designed to:

1. Improve the competitiveness of Oklahoma's plant researchers in securing federal grants and contracts
2. Help researchers gain the expertise and gather research data to support funding opportunities for larger research projects
3. Encourage collaborative efforts to support applied plant research projects
4. Support R&D necessary to move plant science research to commercialization

Plant Science Research targets activities occurring in higher education, nonprofit research institutions and private enterprises. Such projects concern plant productivity, renewable biomass, plant-based environmental applications and chemical platforms, plant-based solutions to improve nutrition, human and/or animal health or performance, process applications and seed management and the development of new products and services that shall form the basis of new, high-technology plant science/agriculture industry for Oklahoma.

Successful applicants include:

Genomics and Genetics

- Marc Libault of the University of Oklahoma. Title: Unraveling the Transcriptional Regulation of Plant Cell Elongation. Plant cell elongation holds keys to determine the relationship with master genes and control of the different steps in plant cell development. Plant root hair cells are characterized by their lateral expansion leading to a significant increase of the surface of interaction between the plant root system and soil. Award: \$99,468

Agrochemicals, Ecology, Energy Crop Production

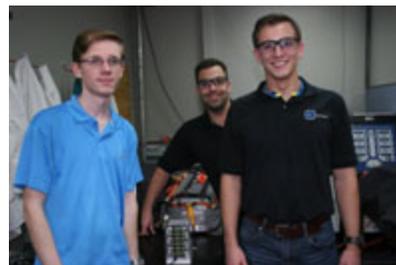
- Kristen Baum of Oklahoma State University. Title: The Interaction of Pollinators and Pest Management Strategies in Increasing Production in a First Generation Biofuel Crop. The project will evaluate the effect of insecticide applications (flonicamid, sulfoxaflor and synthetic pyrethroids) in winter canola fields on the abundance and species richness of native bees, winter canola seed set and field-level production. Results are expected to help develop pest management approaches that consider both the conservation of pollinators and control of insect pests. Award: \$99,944

Molecular Biology

- Sharon Kessler of the University of Oklahoma. Title: Conserved Mechanisms in Plant Fertility and Plant-Pathogen Interactions. Cell-to-cell signaling events are important in the propagation of plants. Such signals determine how cells sense and establish communication to allow beneficial invasions and prevent harmful invasions. This study of new target genes and pathways is designed to make these determinations and improve plant viability through growth and pathogen resistance. Award: \$99,736

INTERNS IMPROVE BATTERY PACKS AT ATC NEW TECHNOLOGIES

Two university students participating in the OCAST Faculty and Student Intern Partnerships program have achieved their goals with employer ATC New Technologies.



Bryan Schultz, battery lab manager at ATC New Technologies, described interns Brandon Carter of Oklahoma City and Andrew Williams of Norman as key to his firm's success in working on improving lithium ion packs to replace NiMH packs from the hybrid Toyota Prius.

The students investigated challenges associated with replacing the High Voltage Nickel Metal Hydride (NiMH). The purpose was to develop in-house technical background to expand in to the heavy duty NiMH hybrid bus market.

Founded in 2011, ATC New Technologies focuses on the life cycle management of advanced alternative powertrain systems and energy storage systems. The firm supports original equipment manufacturers with warranty and aftermarket opportunities for inverters/converters, motors, fuel cell systems and advanced energy storage systems including batteries for electric and hybrid vehicles.

FIFTEEN APPLIED RESEARCH PROJECTS RECEIVE \$3.5 MILLION IN AWARDS FROM OCAST

Fifteen Applied Research applications chosen from a field of 39 were awarded \$3,546,670 August 19 by the governing board of the Oklahoma Center for the Advancement of Science and Technology (OCAST).

Rankings were determined by independent peer review and 28 of the 39 proposals were approved for funding consideration representing a total request from applicants for \$9.5 million. Due to funding limitations, only the first 15 were accepted for contract by OCAST.

Oklahoma research teams will use the funds to conduct research and development for a period up to three years. A typical award is \$300,000 for three years; however, awards can vary in both time and funding amounts.

Proximity to commercialization and good science are the primary standards used to choose the top applicants which represent a long-term effort by the state of Oklahoma to encourage technology-based economic development. OCAST administers funds through the Oklahoma Applied Research Support (OARS) program.

Funded projects include, but are not limited to, supporting diagnostic and therapeutic biotechnology, electronic instrumentation/sensors and control systems, construction materials, energy resources, intelligent controls and sedimentary geology and mineralogy.

Successful applicants include the following:

Oklahoma City

Diagnostic and Therapeutic Biotechnology

- **Robert Broyles**, principal investigator, EpimedX, “A Novel Treatment for Sickle-Cell Disease: Dosing Strategy for Maximum Efficacy” – The Centers for Disease Control and World Health Organization have declared Sickle Cell Disease a public health priority. The goal of this proposal is to test for activation of the gamma-globin gene which can be used as a continual low-dose application for treatment of Sickle Cell Disease. **Match Source: Private Angel investment, a Phase I SBIR proposal to the National Institutes of Health - \$80,935**

Norman

Electronic Instrumentation/Sensors and Control Systems

- **Yan Zhang**, principal investigator, University of Oklahoma, “Multifunctional Airborne Sense and Avoid Radar Development” – A redesigned mission processor is proposed to interface with commercial X-band airborne radar to improve the function of existing

radar technology. The technology will have both military and civilian applications.
Match Source: Garmin International - \$90,000

Stillwater

Building/Construction Materials

- **Saravan Kumar Shanmugavelayudam**, principal investigator, MaxQ Research LLC, “Development of Novel, Compartmentalized Vacuum Insulation Composites for Structural Applications” – MaxQ plans to develop highly insulating, high strength structural materials to be used in both residential and commercial buildings. **Match Source: MaxQ, a Phase I Small Business Innovation Research award from the National Science Foundation, SBIR awards from NCIIA and seed investment from a business accelerator - \$200,000**

Norman

Energy Resources/Petroleum

- **Zhisheng Shi**, principal investigator, University of Oklahoma, “Quantum Dot Solar Cells Fabricated by Industrially Viable Process” – The proposal will attempt to develop a low-cost semiconductor quantum dots solar cell with a newly developed wet-chemical method. **Match Source: Nanolight Inc. - \$90,000**

Stillwater

Intelligent Controls

- **Aravind Seshadri**, principal investigator, Roll-2-Roll Technologies LLC, “Design and Development of Next Generation Lateral Guide for Roll-to-Roll Manufacturing” – The research will attempt development of an electro-mechanical device called a lateral guide that will improve yield in roll-to-roll manufacturing. The product will reduce downtime, setup time and material waste. **Match Source: Roll-to-Roll Technologies LLC from raised investment capital - \$299,966**

Norman

Diagnostic and Therapeutic Biotechnology

- **Sean Bauman**, principal investigator, Immuno-Mycologics Inc., “Phage Display Approach to Develop an Antigen Immunoassay for Diagnosis of Tuberculosis” – According to the World Health Association, 1.4 million people died of tuberculosis in 2011 alone. The goal is to develop a rapid and sensitive diagnostic test that is an improvement from current diagnostics. **Match Source: National Institutes of Health technology transfer grant - \$298,760**

Oklahoma City

- **Richard Kopke**, principal investigator, Hough Ear Institute, “Novel Therapeutic Treatment for Tinnitus, Hyperacusis and Brain Injury” – This project seeks to prove the hypothesis that systemic treatment with a specific pharmaceutical soon after a blast-induced injury can substantially reduce hearing loss and other factors. **Match Source: Hough Ear Institute and Otologic Pharmaceuticals - \$300,000**

Oklahoma City

Energy Resources, Petroleum

- **Christopher Sutton**, principal investigator, SnapLab Technologies, “Autonomous Handling and Analysis of Heterogeneous-Phase Media” – The researcher through SnapLab Technologies will collect, prepare, analyze and record lithology and hydrocarbon content for the oil and gas industries. The effort will support real-time reporting of critical information during the drilling process. **Match Source: SnapLab Technologies LLC - \$300,000**

Ardmore

Sedimentary Geology and Mineralogy

- **Khalid Hossain**, principal investigator, “R&D of a Unique Analytical Facility in Support of Shale Exploration” – The use of ion beam analysis will provide an environmentally friendly and economical way to extract oil and natural gas from shale plays. **Match Source: Amethyst’s pending U.S. Army contract and Cerium Laboratories - \$299,996**

Ardmore

Semiconductors

- **Lucas Phinney**, principal investigator, “Heterostructure Silicon Solar Cells Based on Group IV Colloidal Quantum Dots” – This project is designed to improve the capacity of solar collectors to harness more energy from the sun. **Match Source: Amethyst will use funds from a Phase II SBIR project to match the project - \$299,417**

Stillwater

Other Advanced Materials

- **Nirmal Govindaraju**, principal investigator, Oklahoma State University, “Nanodiamond for Biological Imaging Applications” – Development of an inert, thermally and optically stable material is critical for optical biological imaging. It is estimated the U.S. market

for fluorescent microscopy reagents is \$1 billion. Benefits would be to applications for human and animal cells. **Match Source: Helmerich Research Center - \$90,000**

Oklahoma City

Biotechnology

- **Jay Martin**, principal investigator, Martin Bionics Innovations, “Compliant Force Distribution Modular Socket Interface for Prosthetics and Orthotics” – Martin Bionics Innovations LLC in concert with NASA will integrate a specially designed three-dimensional mesh to develop a line of fabric-based orthotics and prosthetics. Benefits go to more comfortable and functional devices for amputees or orthotics users. **Match Source: Martin Bionics Innovations LLC - \$300,000**

Oklahoma City

Diagnostic and Therapeutic Biotechnology

- **Scott Rollins**, principal investigator, Selexys Pharmaceuticals Corporation, “A Novel Antibody Therapeutic Approach to Treat Multiple Myeloma” – The objective is to advance the preclinical development of a humanized anti-PSGL-1 antibody called SelK2, for treatment of multiple myeloma, a cancer that affects 83,000 individuals in the U.S. **Match Source: Selexys Pharmaceuticals Corporation from a \$25 million Series A financing that closed in 2012 - \$297,599**

Norman

Analytical Instrumentation

- **Shaorong Liu**, principal investigator, MicroChem Solutions, “Polymer Monolith-Based High-Pressure Electro Osmotic Micro Pump” – The project will support miniaturization of biomedical testing machines on hand-held devices. In concert with the University of Oklahoma, the team has developed a pump with a flow rate adequate for most nanoflow HPLC systems. **Match Source: MicroChem Solutions - \$300,000**

Stillwater

Energy Conversion

- **Daryoosh Vashaee**, principal investigator, Oklahoma State University, “Development of High Efficiency Nanostructured Thermoelectric Generators for Industrial Waste Heat Recovery” – The goal is to develop electrical generation through improved thermoelectric materials. **Match Source: ARI and Marlow Industrials - \$299,997**
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CALENDAR

Environmental Protection Agency (EPA) due September 11, 2014. [Click here](#) for the solicitation.

Department of Transportation (DoT) due on September 15, 2014. [Click here](#) for the solicitation.

United States Department of Agriculture (USDA) due October 2, 2014. [Click here](#) for the solicitation.

Governor's STEM Summit – October 7, 2014 - Tower Hotel, Oklahoma City

Department of Energy (DoE) due October 14, 2014. [Click here](#) for the solicitation.

Department of Defense (DoD) due October 22, 2014. [Click here](#) for the solicitation.

National Institutes of Health (NIH) due December 5, 2014. [Click here](#) for the solicitation.

OKLAHOMA INNOVATIONS RADIO PROGRAM

[simpliuniik](#) creates, develops and invents new products for everyday use. Their first product, funded through crowdfunding, is the Seally Cap a versatile kitchen utensil that allows you to reseal items such as canned goods, glasses, canned beverages, fruits, veggies and more.

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The [Oklahoma SBIR Collaborative Resources \(OSCR\)](#) service offers the best resources in the nation to help you successfully compete for SBIR/STTR funding. Each year the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding programs award approximately \$2.5 billion in non-dilutive funding to small, high-tech, innovative businesses. By encouraging small for-profit companies and research institutions in collaboration with industry to pursue risky but potentially rewarding endeavors, the SBIR/STTR program helps the United States remain the world's technology leader.

[Listen to the Radio Show](#)

The [Oklahoma Mothers' Milk Bank](#) provides donor milk to pre-term or very ill babies in Oklahoma and surrounding states when their own mother's milk is not available. OMMB accepts donor human milk from fully screened, healthy, breastfeeding mothers. The milk is pasteurized, tested and frozen until prescribed.

[Listen to the Radio Show](#)

Building on last year's success, the [2014 Oklahoma Technology Showcase](#) will feature nine of the state's innovative high-tech companies. Showcase presenters will give a 10 minute high energy talk that highlights their innovative products or services, life lessons learned as they pursued their ambitions and any needs for collaboration or funding they may have going forward. This year's event will include guest speakers from Oklahoma's leading industries and

provide ample opportunities to network with inventors, manufacturers, researchers and leaders in the innovation economy.

[Listen to the Radio Show](#)

To hear more interviews on *Oklahoma Innovations* visit the [OCAST website](#) or listen weekly on:

Altus - Saturday at 6 a.m. - KOCU 90.1 FM

Ardmore - Saturday at 6 a.m. - KLCU 90.3 FM

Chickasha - Saturday at 6 a.m. - KCCU 100.1 FM

Clinton - Saturday at 6 a.m. - KYCU 89.1 FM

Lawton/Fort Sill - Saturday at 6 a.m. - KCCU 89.3 & 102.9 FM

Oklahoma City - Sunday at 5 p.m. - KTOK AM 1000

Tulsa - Sunday at 8 a.m. - KRMG AM 740/FM 102.3

Wichita Falls, TX - Saturday at 6 a.m. - KMCU 88.7 FM