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Ogden College of Science & Engineering Newsletter (Summer 2016)

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Groundbreaking Ceremony Held for Ogden College Hall

A groundbreaking ceremony was held Tuesday, April 5th for the new Ogden College Hall. The building is expected to open at the end of the fall 2017 semester. The construction is projected to cost $32.2 million and will replace the Thompson Complex North Wing with an 80,000 square foot, four story building. Thirty-six new laboratories, Student Success Center, a 300 seat auditorium plus a new dean’s suite for Ogden College of Science and Engineering will be housed in the structure.

University President Gary Ransdell spoke at the groundbreaking and described the Ogden College Hall project as a culmination of many years of planning. Ransdell also stated that roughly $125 million has been invested in improving the science buildings since he came on board in 1997.

The ceremony concluded with a lighting of a WKU logo on the build site.
Alumni Focus:  
Ms. Talia Collins

Talia Collins earned her Bachelor of Science degree in Chemistry from WKU in 1993 and went on to earn a Ph.D. in 1998 from Purdue University in the field of Inorganic Chemistry.

Since January 2006 she has been employed by Michelman, Inc. as a Senior Research Chemist. Michelman is a global developer of water-based barrier and functional coatings for flexible film packaging, paperboard, and corrugated cartons along with water-based surface modifiers, additives, and polymers for numerous industries including wood care, industrial coatings, inks, fibers, composites, and construction products.

Ms. Collins serves on the Ogden College of Science and Engineering Advisory Council. She was the President’s football guest in 2011 and attended an Augenstein Alumni Center donor event in 2013.

Research Highlights

Student Research Conference a Success

The 46th Annual WKU Student Research Conference was a tremendous success this year, thanks to over 370 student participants and to the many faculty and staff who contributed their time and effort by serving as mentors, judges, and Student Research Council representatives.

The conference was held Saturday, April 2nd in the Downing Student Union. Ogden College of Science & Engineering students submitted 164 abstracts. Out of 53 session winners, 29 Ogden students took top honors.

Congratulations to the following faculty who received funding for their KY EPSCor RSP applications. The designated funding supports a summer research student.

- Matthew Shake  
  Psychological Sciences
- Donald Slocum  
  Chemistry
- Farley Norman  
  Psychological Sciences
- Ivan Novikov  
  Physics and Astronomy
- Gordon Smith  
  Engineering
Kentucky Science Olympiad

The state finals for the 2016 Kentucky Science Olympiad were held Saturday, April 23rd on WKU’s campus. Twenty-four middle and high school teams competed in events such as anatomy, dynamic planet, food science, meteorology, helicopters, astronomy, chemistry, computer science, biology, geology, physics, and more.

The overall winners were both from Russell, KY. Russell Independent Middle School Maroon Team won in the middle school division and Russell Independent High School Maroon Team won in the high school division. The winning teams will represent Kentucky at the Science Olympiad National Tournament hosted on May 20-21 by the University of Wisconsin-Stout. Final results from the competition are available on the Kentucky Science Olympiad website at http://www.wku.edu/scienceolympiad/scoring_results.php.

The success of this event is due to the dedication of middle and high school students and teachers. The event would not be possible without the outstanding volunteer work of WKU faculty, staff, and students.

Photos by WKU photographer Bryan Lemon

Ogden Outreach Mission

The outreach mission for WKU’s Ogden College of Science and Engineering is to provide high quality science, technology, engineering and mathematics (STEM) activities and events to regional school districts and the community which promote a greater understanding and appreciation of STEM.

Check out the new Ogden Outreach webpage! Visit www.wku.edu/ogden and click on Ogden Outreach.

Upcoming Events

5/22/16
District 5 4H Horse Show

5/30/16
NSF REU Site: Advancing Psychological Research with Technology

6/20/16
District 6 4H Horse Show

7/21/16
KY Junior Livestock Expo
Right now the WKU farm is preparing to plant what will be its third year of a five year pilot program to study hemp in Kentucky. The Industrial Hemp Pilot program at the farm is run by Agronomy professor Todd Willian. Willian specializes in the study of plants at WKU and helps supervise students and researchers who work with the crops. Growing hemp can aid farmers struggling from the decrease in economic demand for tobacco products.

Josh Hendrix, of Hendrix Hemp, stated, “WKU is so important because their research is public information for farmers in the future and now.” The WKU research centers on stalks and seeds of hemp plants and has yet to research the chemical it contains called CBD which is being tested more and more as a potential new medicine.

What’s Happening at the Farm

At right, Henry County FFA students visit the WKU Farm on April 15th. Students got to bottle feed calves and take a tour of the farm and its facilities.

Pictured above are the 2015-2016 Agriculture Ambassadors at the Spring Banquet. From left to right are Dylan Gipson, Molly Scott, Thomas Poole, Lindsay Ratliff, Thomas Murphy, Mikayla Grider, Tara Watkins, and Emily Smith.
During Spring Break the Habitat for Humanity Campus Chapter paired with the St. Thomas Aquinas Catholic Campus Center to participate in the Collegiate Challenge, an alternative break program in which groups of students work on housing in another community.

The group of eleven students left on March 6 and arrived in Mobile, AL for five days of construction and renovation work. The volunteers put up roofing, windows, and siding as well as building structures like a safe house and soffit.

Also this semester, the Habitat Chapter completed the State Farm Matching Grant this semester. The Campus Chapter raised $2,000, which was matched by State Farm. In total, $4,000 will be donated to the Habitat for Humanity Warren County affiliate.

To mark the occasion, a check was presented to Warren County Habitat by State Farm on Tuesday, May 3rd at a Brush With Kindness build site located at 506 Church Street.

Student Awards Ceremony

The outstanding AMS students were honored at the annual Student Awards Ceremony held Sunday, April 24th in Downing Student Union Auditorium.

at left: Farshid Alavi with Dr. Mark Doggett
at right: Timothy Carroll with Dr. Mark Revels
Dr. Noah Ashley has been awarded a National Science Foundation research grant to study the sleep patterns of artic songbirds in Barrow, Alaska. This grant will not be the first time Ashley has studied the sleep patterns of birds. His post-doctoral research centered on the birds’ circadian rhythm.

The grant began on April 15th and will continue until 2021. Additionally it will provide opportunities for students in a number of ways. Students from the science teacher program will be offered the chance to conduct a weeklong internship in Barrow and teach arctic research at local middle or high schools.

Dr. Jarrett Johnson conducted a field research trip to Ft. Ord reserve in California from April 18th to the 21st (see photos below). Fort Ord Natural Reserve was created from 600 acres of the former army base on the Monterey Peninsula. Fort Ord offers opportunities for students, scientists, and members of the general public to learn about rare species and habitats.

The Biology department honored graduating seniors with a reception on Tuesday, April 19th. Seniors were given food, prizes and had a chance to hang out with Big Red as they celebrated this important milestone.

An online Biology degree from WKU has been ranked as one of the top value colleges. WKU’s affordable M.S. biology degree online offers a “non-thesis” track and was ranked number six. The ranking considered graduation and tuition rates using data that was gathered from the NCES College Navigator Database. In lieu of a thesis paper, students in WKU’s online biology degree program will complete oral exams.
The WKU ChemClub has been working hard this year to help high school students throughout the region get a good sense of what it is like to be a student in the WKU Chemistry program. The students in the club help coordinate tours and work with local high school teachers to plan programs on campus.

The ChemClub involvement began as a way to engage students during campus tours where students have an opportunity to see liquid nitrogen ice cream being made (see photo above). More advanced students tour the teaching and research facilities and get to meet with faculty and student researchers to discuss their scientific interests. Wallace, who served as president this year of the club, stated, “the best thing about our department tours is when students ask thoughtful questions about our research. I think sometimes it surprises them to hear about the impact of work being done so close to home.”

Rui Zhang NSF Grant Renewed

Dr. Rui Zhang (pictured above at right) received a three-year, $300,000 grant from the National Science Foundation to continue support for an interdisciplinary project entitled “Production of Highly Reactive Metal-Oxo Species with Molecular Oxygen and Visible Light for the Selective Oxidative Catalysis.” This award is a grant renewal based largely on the excellent progress made under a similar grant that was first awarded in 2012.

With this award Dr. Rui Zhang and his student research team are designing efficient photocatalysts (catalysts that function with the input of light) that can utilize sunlight to activate oxygen and transfer it to other chemicals, also termed oxidation. The use of sunlight and atmospheric oxygen rather than a chemical reagent in the oxidation processes of bulk chemicals would be more sustainable, generate less chemical waste, and potentially reduce economic costs associated with the process.

The project will continue providing cutting-edge research experiences for the participating STEM students and thereby training future STEM professionals. Over three years, a total of 18 students have been actively engaged in this funded project which has had eight peer-reviewed papers published with ten student coauthors. The students involved have also presented their work at a variety of national, state, and local conferences, and have used their results for six different Honors and MS theses. The department looks forward to seeing an exciting new round of results from this renewal.

Dana Biechele-Speziale of Grayson was awarded a U.S. EPA Greater Research Opportunity Fellowship. Ms. Biechele-Speziale is majoring in Chemistry and Chinese and is a student in both the Honors College and Chinese Flagship programs.

Said Dana, “Being an EPA Fellow is an honor, and I can’t begin to describe how important this award is for my future in academia and professional aspirations.”
Computer Science

Students Creating Autonomous Quadcopter

story excerpted from WKU Herald

Louisville junior Connor Brooks and senior Chris Goulet of Munfordville are currently working on creating a completely autonomous, self-operable drone.

“The goal of the project is to build a quadcopter that can fly autonomously indoors,” Brooks said.

At the Student Research Conference held in April, the pair gave a talk on the latest version of their copter. “Over the past year, we’ve finished building it, updated the hardware, and we reached limited autonomy,” stated Brooks. “We can now fly around and avoid obstacles.”

The spring semester came to an end last week so the two students will be leaving further research to their successors. Brooks said the goal was to set up a platform for future researchers to make the copter completely autonomous.

Ambassadors of Code Teach Classes at the Boys & Girls Club of BG

According to Code.org, 71% of all new jobs in science, technology, engineering, and math are in computing. However, only eight percent of STEM graduates are in the field of Computer Science.

Chase Spraggins, a freshman from Murfreesboro, wanted to help in the nationwide push to teach kids how to code. He got involved with the Ambassadors of Code, an interest group of WKU’s Association of Computing Machinery. The Ambassadors of Code decided to teach a coding class to kids at the Boys and Girls Club of Bowling Green.

The kids were introduced to coding by using Scratch, an interactive online learning environment created by the Massachusetts Institute of Technology. “Scratch gives them click and drag options to give the basics of coding without requiring exactly correct syntax,” stated Spraggins.

The computer programming club that is now a part of the Boys and Girls Club is one of several opportunities for the kids to find new interests that could be useful later in life. Spraggins said plans are in the works to teach the kids to program a version of the popular game Snake. Hopefully these activities will spark an interest within the young students to continue pursuing computer science education.

Below from left to right: students Connor Brooks and Christopher Goulet

Photo by Nick Wagner, WKU Herald

Computer Science student Connor Brooks (at right) has earned a research internship at NASA Langley this summer. He will be researching algorithms for visual object detection and tracking for evasive maneuvering of rotorcraft. This ties in with his Honors Capstone Experience/Thesis he recently defended titled, “Toward Autonomous Multi-rotor Indoor Aerial Vehicles.”
Students Showcase Projects at Annual Engineering Expo

WKU Civil Engineers Win Ohio Valley Regional Conference

WKU civil engineering students finished first overall in the 2016 Ohio Valley Student Conference in Cincinnati, OH. The concrete canoe and steel bridge teams advanced to national competitions.

Civil engineering students from 14 colleges and universities took part in the competition held at the University of Cincinnati and Cincinnati State Technical and Community College.

For the second year in a row WKU finished first overall in the concrete canoe competition (photo below right). The steel bridge team placed third overall (photo below left). The balsa wood bridge team also won their division for the fourth year straight.

Other top three finishes include the surveying team, concrete bat team, and concrete bowling ball team.

Engineering students had the chance to showcase their work at the annual Spring 2016 Engineering Expo held on Wednesday, May 11th in the Engineering and Biological Sciences building. Mechanical and electrical engineering students demonstrated the balsa wood bridges, manual and automatic tennis ball launchers, mini robots, and more that they designed and built as class projects. Attendees took a break from final exams to see these items in action and enjoy a barbeque lunch.
Student Presents Karst Research in China

story excerpted from WKU Herald

Louisville senior Megan Laffoon has been to China four times. During the last visit which wrapped up on April 3, she presented research on karst rocky desertification at Jinan University, Guangdong province. The presentation was part of a conference based on research for hydrogeology comprised of a select group of specialists who were all working on environmental projects.

Karst rocky desertification happens when human land use causes vegetation to deteriorate. As a result, rocky forms and water loss appear in some regions. The occurrences are severe in southwestern China.

Megan’s research is the result of a collaborative effort between Ogden departments. Drs. Albert Meier (Biology) and Chris Groves (Geography & Geology) have been assisting Megan with her research.

Groves said Laffoon’s involvement shows how different disciplines can come together to produce something great. “She’s in the Chinese flagship program, honors and biology,” Groves said. “This just shows wonderful synergy of WKU programs working together.”

Megan hopes to continue her research on solutions to karst rocky desertification. “I was able to speak with some of the top researchers on next steps to take, and that’s awesome in itself.”

Storm Chasers Students Headed to Great Plains

Each year during the May term, Dr. Josh Durkee assembles a group of students for his Field Methods in Weather Analysis and Forecasting course. Together, they forecast, analyze, document, and study severe weather convective storms across the Great Plains.

The course runs for four weeks. Two weeks are spent traveling across the Plains tracking severe storms. The group will also be conducting research in collaboration with the Federal University of Rio grande do Sul in Brazil to study atmospheric circulation with respect to water vapor trajectories in severe environments.

You can follow Dr. Durkee’s storm chase group as they document each day on Twitter and Facebook: twitter.com/wkustormchase or facebook.com/wkumetclimsci

WKU Hosts Geography Bee

The 2016 Kentucky Geography Bee was held on April 1 at WKU’s Knicely Conference Center. Ninety-six students from around the state competed. The event was hosted by WKU’s Department of Geography and Geology whose faculty, staff, and student volunteers judged and moderated the competition. Shyam Ravishankar of Prospect, an eighth grader at Noe Middle School, took top honors. Shyam will represent Kentucky in the national finals on May 25th in Washington, D.C.
Pi Mu Epsilon and Mathematics Department Banquet

Clockwise:

Bruce Kessler, Mark Robinson, and Robin Ayers celebrate 25 years with WKU.

Math Department faculty are dressed in their finest for 2016 commencement.

Dr. Hope Marchionda receives her Ogden College Faculty Award for Teaching from WKU President Gary Ransdell and Ogden Dean Cheryl Stevens.
Planetarium Show Created As Course Project

Students in the spring 2016 Astronomy for Teachers course helped create a new planetarium show titled “Pluto: A Whole New World” as they learned about the exploration of our solar system.

One group of students wrote lyrics related to the New Horizons mission and recorded them being sung to the tune of the song “A Whole New World” from Disney’s animated movie Aladdin. The entire class collaborated to make a video of a walking tour of a scale model of the planets. An interview was arranged with the deputy project scientist for the New Horizons mission, Dr. Cathy Olkin.

The new show opens at Hardin Planetarium on Thursday, May 12 and runs through June 30.

Students Accepted into AAPM Summer Undergraduate Fellowship Program

Stefan Stryker and Andrew McGuffey (at right) are two of only twelve students from across the U.S. and Canada to be accepted to the AAPM Summer Undergraduate Fellowship Program. The two WKU junior physics students volunteer at The Medical Center Cancer Treatment Center.

The AAPM program provides opportunities for undergraduate stu-dents to gain experience in medical physics by performing research in a medical physics laboratory or assisting with clinical service at a clinical facility. Andrew will be going to Johns Hopkins and Stefan will be going to Yale. Both students will receive a $5,000 stipend from AAPM.

“Stefan and Andrew have been very helpful to me in the clinic,” said Sarah Rogers, Physicist with the Cancer Treatment Center. “I have them each working on special projects. Andrew is creating a new lung atlas for us to use in MIM software, and Stefan has been helping me with our 3D printing project. I hope they will want to continue to volunteer when they get back from their summer fellowships!”

“Volunteering at The Medical Center has been a wonderful, eye-opening experience,” said Andrew. “I’m truly grateful for all the clinical experience I’ve gained and look forward to learning new things in the future.”

Stefan agrees. “The 3D-printing project at The Medical Center has been a great opportunity,” he said. “I look forward to the research in medical physics at Yale’s medical school and further opportunities to serve in the medical field.”

Reach Week Student Conference

Dr. Sanju Gupta mentored several students who presented their research at the annual Reach Week Conference held in April. Pictured above left to right are Jared Walden, Bryce Aberg, Dr. Gupta, Sara Carrizosa, Benjamin McDonald, and Gatton Academy senior Rebecca Wood. Benjamin McDonald and Sara Carrizosa won for their poster titled “Nanodiamond Surface Redox Chemistry: Influence of Size and Electrochemical Environment on Electrocatalytic and Biocatalytic Processes.”
Does threatening uncertainty cause self-esteem striving?
Dr. Aaron Wichman (pictured at right) is researching this topic and submitted a small grant to the Society for Personality and Social Psychology.

Dr. Wichman stated the following about his research project, “This project examines whether predicted interchangeability in threat responses exists when people feel threatened with uncertainty - such as possible job layoffs, unplanned pregnancies, or relationship dissolution. The project asks the question of whether threatening uncertainty can cause responses that show self-esteem striving.”

Dr. Brausch was also just awarded an RCAP which begins in May. The grant will fund a graduate student this summer and all of next year to assist with a longitudinal research project that will study how college students with a history of self-injury progress over time to experience thoughts of suicide and suicidal behaviors.

Several students presented their research at the American Association of Suicidology Annual Conference in Chicago, IL, during the month of April. Additionally, students will be working in Dr. Brausch’s lab this summer thanks to a KBRIN grant now in its second year. The students will continue their two year study of self-injury and suicide in middle and high school students. They have collected data from four schools in the state. The study will follow the same students next year to track self-harm behavior and study how it develops and progresses over time during adolescence.

Dr. Farley Norman was awarded a grant from KY NSF EPSCoR to support research in his lab by two undergraduate students this summer. Catherine Dowell and Stevie Hoyng will be working on a project titled “The visual perception of large-scale distance ratios.”

Dr. Amy Brausch and students from the Risk Behaviors and Suicide Prevention Lab have been very active the past month. The students presented research at the American Association of Suicidology Annual Conference in Chicago, IL, during the month of April.

Additionally, students will be working in Dr. Brausch’s lab this summer.