

# LEXMARK E-DAY 2017

## EXHIBITORS

### **AFTER THE STORM**

What happens to the rain after a storm? Learn about storm water, rain gardens, and more.

[www.uky.edu/bae/bae-student-branch](http://www.uky.edu/bae/bae-student-branch)

### **ALTEC - REACHING HIGHER**

Explore the ins and outs of a telecommunications vehicle and take over the controls to reach the bucket to the highest limits.

[www.altec.com](http://www.altec.com)

### **AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS**

Interested in aerospace? Come stop by and talk to UK AIAA Student Chapter about what we've been up to this year, our ongoing project, and what are plans for the future are!

<http://aiaa.engineering.uky.edu/>

### **AUGMENTED REALITY SANDBOX**

A topographical sandbox "map" that colors contours according to height and updates in real-time.

[www.uksmestore.com](http://www.uksmestore.com)

### **BALLOON GIVEAWAY**

Complimentary balloon giveaway to kids 12 and under

[www.engr.uky.edu/eday](http://www.engr.uky.edu/eday)

### **BALLOONS! BALLOONS!**

Ever wonder what goes into a balloon to make it float? Learn all about helium and grab a balloon at the same time!

<https://www.uky.edu/bae/bae-student-branch>

### **BIOMATERIALS FOR MUSCULOSKELETAL REGENERATION**

A selection of some common orthopedic and cardiovascular implants are presented to demonstrate some of the various applications synthetic materials have in human tissue regeneration. Also present is sampling of polymers produced in our lab available for an example of how simple reagents can become useful resources in medical practice.

### **BIOMEDICAL IMPLANTS**

An exhibit of implants developed by biomedical engineers to augment, replace, and restore function to different body parts.

### **BIOMEDICAL OPTICAL IMAGING**

An exhibit of research conducted by the Biomedical Optical Imaging lab in Department of Biomedical Engineering

<http://bioptics.engineering.uky.edu/lab-introduction/>

### **BIOSYSTEMS ENGINEERING INFORMATION**

Biosystems and Agriculture Engineering students will be giving general information about what Biosystems engineers do!

<https://www.uky.edu/bae/bae-student-branch>

### **BLASTER'S ROUNDUP VIDEO**

Video compilation of mining production blasts ranging in many sizes and materials. same as previous entry

### **BUILDING SIMPLE CIRCUITS**

Learn about electric circuits from the IEEE Student Group

### **BURNING!!!**

Want to burn things? Come!!

### **CARDIAC RHYTHM**

This exhibit shows how pacemakers are used and implanted into the body; a brief description about mouse action potentials, VAD's and other assisted devices

<http://www.uky.edu/Centers/CBME/CRL/>

### **CENTER FOR NANOSCALE SCIENCE & ENGINEERING TOUR**

See the labs for the CeNSE research group

### **CHEMICAL & MATERIALS ENGINEERING PROGRAM INFORMATION**

Brochures & pamphlets related to the Chemical & Materials Engineering curricula.

### **COME TO SEE MAGICIAN WITH SMART MATERIALS**

Wind turbine toy made with smart materials (nitinol wires), Magic wand/springs, UK logo made with smart polymer will be displayed. Small objectives (sugar, insects, food texture) also will be displayed under high resolution Optical Microscope, to see the real world that your naked eyes cannot do.

### **COMPUTATIONAL ELECTROMAGNETICS**

Learn about how things like radio waves and antennas are analyzed.

### **COMPUTERS MAKING THINGS**

Learn about how computers are used to manufacture parts including 3-D printing

### **COMPUTING INSIDE**

Learn about what is inside computers and how they work

### **CROSSTOWN KIDS**

Learn the physics of some everyday things through fun hands-on activities.

## **DETECTING BACTERIA IN WATER WITH UV LIGHT**

Detecting Bacteria in Water with UV Light

## **DIGITAL DESIGN LABORATORY**

Learn about the circuits that are used to make computers

## **DREAM BIG - BUILDING LEGO INFRASTRUCTURE**

Civil Engineers create infrastructure to help our world work better every day, but it all starts with an idea. DREAM BIG as you play the role of a Civil Engineer, using Legos to design and build a dam to hold back water or a tower to withstand an earthquake.

[www.bluegrassbranchasce.com](http://www.bluegrassbranchasce.com)

## **DRIVING, DIVING AND RAPPELLING...ENGINEERS DO THAT?!**

Designing roads, inspecting bridges underwater and dangling from a bridge 886 feet over the Colorado River. Come check out how the coolest engineers do their jobs and test drive the Double Crossover Diamond simulator.

[www.stantec.com](http://www.stantec.com)

## **ECE SENIOR DESIGN PROJECTS**

Explore current projects for senior Electrical and Computer Engineering students

## **EDIBLE CAR CONTEST**

Build a car entirely out of food and see how far it can travel!

<http://uky.swe.org/>

## **EGG DROP CHALLENGE**

Rules: <http://www.engr.uky.edu/eday/2017-Egg-Drop-Guidelines.pdf>

Registration Form: <http://www.engr.uky.edu/eday/2017-Egg-Drop-Contest-Form.pdf>

<http://asce.engineering.uky.edu/>

## **ELECTRICAL, ELECTRONIC, AND COMPUTER SCIENCE EXHIBIT**

Magnetism

## **ELECTROMAGNETIC LAUNCHER**

Launch things with an electric energy source

## **ENGINEER A POLLINATOR**

Mother Nature is a great engineer. Learn about pollinators while designing and building your own hand pollinator.

<https://www.uky.edu/bae/bae-student-branch>

## **ENGINEERING GEOLOGY ACTIVITIES AT THE KENTUCKY GEOLOGICAL SURVEY**

Engineering geology exhibit showing applications related to earthquakes, landslides, energy, and general geology that improves the success of the built environment.

<http://www.uky.edu/KGS/>

### **ETA KAPPA NU-SCAVENGER HACK**

The Electrical and Computer Engineering Honor Society is recruiting agents to solve circuit and programming puzzles. Each agent will be given a unique ID to scan when they've completed a challenge. Look for clues and solve all the puzzles to get a prize!

### **FLASH FREEZE**

In pharmaceutical sciences, liquid nitrogen is often used for purposes such as cell preservation for research or in drug dosage form processing. It is also used in the food industry to create ice-cream. We will be demonstrating how liquid nitrogen flash-freezes various objects.

<http://uky-aaps.org/>

### **FIRST LEGO LEAGUE ROBOTICS EXHIBITION**

Teams from the Dec. 3rd First LEGO League Robotics Competition are invited to give a fun, exhibit-version of this contest for the public.

### **FORCES IN THE HUMAN LOWER BACK**

A demonstration of how forces in the lower back change under different physical activities.

<http://hmb1.engineering.uky.edu/>

### **FUN WITH DAMS!**

Roll up your sleeves because this exhibit is sure to be fun! Kids (and their parents!) have the opportunity to see how a dam works with a model built by UK students. Test different gates to see how the water holds, as well as how downstream communities could be affected. This exhibit is a favorite each year, so come and join the fun!

[www.damsafety.org](http://www.damsafety.org)

### **FUN WITH MULTIMEDIA**

Learn about advances and applications of multimedia

### **FUN WITH SPEECH AND SOUND**

Learn about audible signals and sound

### **GROUND VIBRATIONS EXPERIMENT DEMO**

A demonstration model that shows how vibrations are measured and how they affect structures

### **GUMDROP TOWER FREE BUILD**

You can build gumdrop creations out of spaghetti and gumdrops!

<http://asce.engineering.uky.edu/>

### **HARVESTING HEMP**

Weather permitting, a hemp flower harvester will be on display in the courtyard!

<https://www.uky.edu/bae/bae-student-branch>

### **HIGH SPEED IMAGING DEMONSTRATION**

The Optical Diagnostics Laboratory uses high speed cameras to see fast processes. This demonstration will show two examples: how liquids break up into small droplets and how fires can oscillate because of gravity.

### **HOW ALUMINUM PRODUCTS ARE MADE**

See aluminum products samples and videos of how they are made.

### **HOW IS COTTON CANDY MADE?**

Biosystems engineering students will describe how cotton candy is made! Samples of this scientific treat will be given out.

[www.uky.edu/bae/bae-student-branch](http://www.uky.edu/bae/bae-student-branch)

### **HUMAN GYRO TRAINER**

Come ride Newton's Attic's three axis human gyro training device. Once you get strapped into the seat you will spin, flip and roll head over heels in an unpredictable manner.

[www.newtonsattic.org](http://www.newtonsattic.org)

### **INFRARED CAMERA IMAGING IN MACHINING**

While touring the machining lab, visitors will be able to stand in front of an infrared camera to view their body heat.

<https://www.engr.uky.edu/ism/>

### **INNOVATION IN CHEMICAL ENGINEERING**

Stop by to learn about exciting topics in Chemical Engineering!

### **ISPE: INTERNATIONAL SOCIETY FOR PHARMACEUTICAL ENGINEERING**

Play a game (and earn candy!) while learning about how medicines travel from the research lab to the store shelves!

### **KENTUCKY ENGINEERING EXPOSURE NETWORK**

KEEN is an educational outreach associated with the Kentucky Transportation Cabinet. It is a program dedicated to teaching Kentucky's kids about engineering. We will have a Spaghetti and Marshmallow Bridge Building Contest, Foam Block Arch Building Activity, EnviroScape Demo, Highway Planning/Design/Construction Information, and Scholarship Applications.

<http://transportation.ky.gov>

### **KENTUCKY GIRLS STEM COLLABORATIVE**

Science is FUN! Fun for boys & girls!

[www.kgsc.org](http://www.kgsc.org)

### **LEARN ABOUT ELECTRICAL AND COMPUTER ENGINEERING**

Visit at least 7 ECE exhibits to be entered in a drawing for an Arduino or Snap Circuit Junior!

### **LEGO® CAR RACES**

On your mark, get set, go! Use LEGO® Bricks to design, build and race your own car! What design is better/faster/most creative?

[www.bricks4kidz.com/lexingtonky](http://www.bricks4kidz.com/lexingtonky)

### **LEXMARK**

[www.lexmark.com/careers](http://www.lexmark.com/careers)

## **LOCKHEED MARTIN ENGINEERING & AVIATION**

[www.lockheedmartin.com](http://www.lockheedmartin.com)

### **MAIL-IN PRINGLE COMPETITION**

When you think of a Pringle potato chip, I'm sure the last thing you think about is its strength. This competition lets you find out just how strong this chip actually is. In order to compete in this competition, all you have to do is send a single Pringle chip through the US Postal Service without it breaking or falling apart. The catch is the winner of this competition will be the contestant who is able to construct the lightest by weight package to ship the Pringle in. The package must be durable enough to protect the Pringle, but also as lightweight as possible if you want a chance to win! All packages can be made out of any material you desire, but it must be hand-made. All packages must have one Pringle chip contained inside and should be mailed to the following address: 430 Park Avenue, Lexington KY, 40502.

<http://kspe.engineering.uky.edu/>

### **MAKE YOUR OWN SCRATCH AND SNIFF CARD!**

Learn how common scented food products may be manipulated through a process to break down and recreate agents to make your very own scratch and sniff card to take home with you!

<https://www.uky.edu/bae/bae-student-branch>

### **MAKING BIODIESEL**

Learn how to make biodiesel from waste cooking oil!

[www.uky.edu/bae/bae-student-branch](http://www.uky.edu/bae/bae-student-branch)

### **MAKING ICE CREAM!**

Come learn about scientific concepts used in making ice cream. You can make your own ice cream here and enjoy your sweet treat!

### **MASON & HANGER - ARCHITECTURAL & ENGINEERING SERVICES**

Mason & Hanger, oldest engineering & construction company in the United States, provide full discipline architectural and engineering services worldwide.

[www.masonandhanger.com](http://www.masonandhanger.com)

### **MATERIALS SCIENCE GALORE!**

Polymers and metals that bounce back into their original shape when heated (shape memory materials). A tile that can protect you from an acetylene torch. Stable/unstable glass droplets (Prince Rupert's drops). Three-dimensional printing. Levitating superconductors.

<http://ukymaterialadvantage.wixsite.com/home>

### **MATH-OFF AT THE MATHNASIUM**

Come work out your math skills at the Mathnasium (like a gymnasium for math) and see who will walk away the champion. Do you have the Number Sense? Can you defeat our Math Games? Prizes will be awarded.

[www.mathnasium.com/westlexington](http://www.mathnasium.com/westlexington)

### **MAZE BOT**

Race a remote-controlled robot around a maze against the clock!

<http://ieee.engineering.uky.edu>

## **MECHANICAL ENGINEERING SENIOR DESIGN POSTERS**

Poster presentations of Senior Design projects by students in the course.

## **MINE RESCUE TEAM**

A look at the equipment used by real mine rescue teams in underground mining disasters as taught by the UK Collegiate Mine Rescue Team.

## **MINERALS PROCESSING SEPARATION DEMO**

Interactive exhibit of different minerals separation techniques including magnetic and density separation.

## **MOLECULAR ENGINEERING**

Molecular Engineering, also called molecular dynamics, is a technique for computer simulation of complex systems such as proteins. This exhibit will demonstrate how molecular dynamics is used to model the physics of protein atoms in space; participants will play the interactive puzzle-solving video game Foldit.

## **NANOSCALE 3D PRINTING**

Nanoscale materials exhibit

## **NASA KENTUCKY**

Learn about Kentucky's aerospace and NASA-related educational, research and workforce development programs at the NASA Kentucky office open house.

<http://nasa.engr.uky.edu/>

## **NEURAL ENGINEERING: "MIND GAMES"**

Non-invasive Brain-Computer Interface system in regards of "Mind Games".

<http://www.uky.edu/~ssu223/>

## **NEWSPAPER BRIDGE CONTEST**

ITE is hosting a bridge building competition where students will attempt to build the strongest bridge out of 1 pound of newspaper and masking tape. The bridges will be loaded with weight, and the designer whose bridge holds the most will win a prize.

[http://www.engr.uky.edu/~ite/index\\_.htm](http://www.engr.uky.edu/~ite/index_.htm)

## **PEIK RENEWABLE ENERGY LAB**

Learn about alternative electrical energy sources

## **PIPE CLEANER TOWER CONTEST**

Build as freestanding tower as tall as possible with pipe cleaners

<http://ewb.engineering.uky.edu/>

## **PLASMA GENERATION AND DIAGNOSTICS**

Generating high temperature plasmas with radio frequency and microwave excitation and high voltages

<https://www.engr.uky.edu/research/researchers/michael-winter/>

### **POPCORN!**

Learn about what makes popcorn pop from Biosystems engineering students! Bags of this delectable snack will be given out!

[www.uky.edu/bae/bae-student-branch](http://www.uky.edu/bae/bae-student-branch)

### **POWER PROTECTION AND ADVANCED SOFTWARE LABORATORY**

See how analysis of the power grid is performed

### **QUICKSAND TANK: DEMONSTRATING EARTHQUAKE SOIL LIQUEFACTION**

A tank of saturated sand will demonstrate the effects of seismic vibration on soil

### **REALLY VERY VERY VERY FAST!!!**

Amazing things you wouldn't be able to see without a high-speed camera.

### **ROBOT MAZE**

Race a Lego robot against the clock.

### **RUBE GOLDBERG EXHIBITION MATCH**

We are partnering with Big A\$\$ Solutions here in town to host the Rube Goldberg exhibition. This event will be a preview of the actual contest happening in April at Big A\$\$ Solutions.

### **SEE THE SUN - FOR FREE!**

We observe the Sun, only in the light of hot hydrogen. The image is much more detailed than a white-light image. The telescope is computer driven to follow the Sun. We expect to see prominences and sunspots.

<https://pa.as.uky.edu/observatory>

### **SNAP CIRCUITS**

Have fun learning about electronics! Build your own circuits and complete a variety of interesting projects!

<http://ieee.engineering.uky.edu>

### **SPACE AGE MATERIAL FOR STRUCTURAL REPAIR**

Composite and high performance material used for the construction and structural repair of bridges are presented. These include pultruded hybrid CFRP-GFRP I-beams, CFRP and GFRP rebar and prestressing tendons, carbon fabric and laminates and composite deck sections. Several field projects carried out in Kentucky will also be highlighted.

<http://www.ktc.uky.edu/structures/>

### **SPACE SYSTEMS LABORATORY GROUP TOURS**

Learn about UK's Space Systems Lab and their projects including satellite design

### **STEAM STUDENT SHOWCASE**

Student-run exhibit showcasing the engineering work we do at FCPS's STEAM Academy

<http://steam.fcps.net>

### **STREAM RESTORATION**

Streams need doctors too. Learn what make a stream healthy and help us construct a new one.

[www.uky.edu/bae/bae-student-branch](http://www.uky.edu/bae/bae-student-branch)

### **SUPERCOMPUTERS R US**

Massive parallel computing systems

### **TEST YOUR CRITICAL THINKING SKILLS!**

We will have Critical Thinking Puzzles that incorporate Math skills for ages 4 and above.  
[www.eyelevellexingtonwest.com](http://www.eyelevellexingtonwest.com)

### **THE POWER OF CUMMINS: EVERYTHING ENGINES**

From compression ignition to what engines power, come and learn the basics of modern combustion engines.  
[www.cummins.com](http://www.cummins.com)

### **THE WONDERS OF MEDICAL PHYSICS**

A display of the technology, methods and problems addressed by medical physics involved in diagnosing and treating cancer.

### **THIS SHOULD BE THE SAME AS LEXMARK'S TITLE**

Hands-on STEM Activities  
[www.kentuckyshpe.org](http://www.kentuckyshpe.org)

### **TRAFFIC AND SAFETY QUIZ BOWL**

Students will participate in a Jeopardy style quiz competition, answering transportation safety questions to win prizes. There will also be videos and information provided showcasing how crashes are combatted in the state among other interesting transportation related projects.  
<http://www.ktc.uky.edu/traffic-safety/>

### **TRAFFIC ENGINEERING - WHY'S MY LIGHT STILL RED?**

Exhibit will show different devices used to move and control traffic safely. Signs, reflectors, traffic signal, controller cabinet, video cameras, simulation models, etc.  
[www.lexingtonky.gov](http://www.lexingtonky.gov)

### **TRANE / ASHRAE**

HVAC Engineering

### **TWO TOWERS CHALLENGE**

Using clothes pins and craft sticks to see who can build the highest tower in a set time.

### **UAS AND REMOTE SENSING IN AGRICULTURE**

Learn how drones and sensors are used to assess fields!  
<https://www.uky.edu/bae/bae-student-branch>

### **UK AIR FORCE ROTC**

A program dedicated to producing officers for the United States Air Force, Air Force ROTC is a unique opportunity to take your career dreams to the next level and be a leader for our nation's military. Have a normal college experience while attending military leadership development classes on the side to graduate college as a Second Lieutenant. The Air Force has a career field equivalent for just about any civilian job.  
<https://afrotc.as.uky.edu/>

### **UK ARMY ROTC**

The U.S. Army Reserve Officers' Training Corps is one of the best leadership courses in the world. Here at the University of Kentucky we create agile, adaptive, creative and critically-thinking leaders of character for the nation. Army ROTC develops men and women who thrive in chaos and excel in complex environments, serving and leading by example in the Army uniform as commissioned officers.

<https://armyrotc.as.uky.edu>

### **UK COLLEGE OF ENGINEERING INFORMATION SESSION AND CAMPUS TOUR**

Learn about UK Engineering admissions, scholarships, housing, internships, and more! The 60-minute information session (9 am and 1 pm) will be followed by a 60-minute campus tour (10 am and 2 pm).

<https://www.engr.uky.edu/>

### **UK SOLAR CAR**

Solar powered cars are closer to reality than you think! Come and visit the UK Solar Car Team to see Gato Del Sol V, the team's fifth solar car. The UK Solar Car Team designs, builds, and races solar powered cars. Visit the team to learn about how they built their solar car and to see videos of them racing on a formula one track!

[www.uksolarcar.com](http://www.uksolarcar.com)

### **UK'S UNMANNED AERIAL VEHICLE LAB**

Explore the exciting world of unmanned aerial vehicles (UAVs) with UK's Unmanned Aerial Vehicle Lab. Children can test their skills as UAV pilots with our mini drones! Learn about past and present projects taking place in the lab.

<http://usrc.engineering.uky.edu/>

### **VEX ROBOTICS COMPETITION**

VEX Robotics Competition Skills Event. Link to details/registration:

<https://www.robotevents.com/robot-competitions/vex-robotics-competition/RE-VRC-16-1785.html>

<http://www.pltwky.org>

### **VIBRO-ACOUSTIC LABORATORY**

Anechoic chamber and associated noise demonstrations

[www.engr.uky.edu/vac](http://www.engr.uky.edu/vac)

### **VOLCANO CONTEST**

Many different variables affect the disastrous potential of a volcanic eruption. Some of these variables are height, shaft dimensions, amount of material, and slope. Ironically, these are some of the same variables that engineers encounter in their daily work practices. To emphasize the power of small parameter changes, we have designed the Volcano Contest competition. This is your chance to play Mother Nature and build your own volcano.

Rules & Registration Form: <http://www.engr.uky.edu/eday/2017-AIChE-Volcano-Contest.pdf>

<http://ukaiche.engineering.uky.edu/>

### **WATER TREATMENT PROCESS**

Check out how Kentucky American Water brings you quality drinking water, from the river to the tap.

[www.kentuckyamwater.com](http://www.kentuckyamwater.com)

### **WATERSHED: EVERYONE LIVES IN ONE!**

Interactive ability to make it rain, see run off, simulate farms, factories, and neighborhoods and where your drinking water comes from originally.

[www.uky.edu/WaterResources](http://www.uky.edu/WaterResources)

### **WEIGHT AND DISTANCE: HOW DO THEY WORK TOGETHER?**

We are going to build cars or have premade cars with add-ons and put different weight in the car to see what difference it makes to distance. We have a ramp that will be used to start the cars all at the same speed and they will mark how far it went and we will track all the cars for the day.

[www.toyota.com](http://www.toyota.com) and [www.visittoyotaky.com](http://www.visittoyotaky.com)

### **WHAT CAN'T BE GROWN MUST BE MINED**

A game of matching everyday items with the minerals from which they are produced.