

Advancing science, technology, engineering, and mathematics education for people of all ages.



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Students Become Engineers for a Day at SSOE

SSOE Group, a global project delivery firm for architecture, engineering, and construction management with global headquarters in Toledo, hosted 35 students from local area high schools in February as part of "Engineers Week". Focused on promoting entry into the engineering profession, Engineers Week annually takes place during February in locations across the U.S. "Engineers Week" is a way to increasing the understanding of and interest in engineering and technology career and helps address the shortage of talent in STEM careers by increasing public dialogue about the need for engineers and other STEM professionals.

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Visiting students from Bedford, Eastwood, Ida, Port Clinton, and Saline received hands-on experience from a team of engineers and technical experts when they spent part of their day at SSOE's world headquarters during the "Engineer for a Day" program. Students attended a luncheon at The University of Toledo College of Engineering before meeting at SSOE. While at SSOE, they had the opportunity to participate in team building activities, gain insight into the different engineering disciplines, and learn what it takes to become an engineer-and potentially a future employee of SSOE.

The program began with Mary Jo Szczublewski, PE, Structural Engineer, leading an activity titled "Paper Column Challenge", which involved students collaborating in teams to construct columns out of paper. The columns were tested to see how much vertical weight each structure can hold-measuring the students' creativity with various design options in a team environment. Next, John Colley, PE, Senior Electrical Engineer, led a demonstration on electrical engineering titled "Let's Build a Motor", which exposed students to motor effect and electromagnetism. The day concluded with an overview of Virtual Design and Construction (VDC), and the important role of technology, presented by Lauren Collier, Department Manager, VDC Global Initiatives. After the overview, students participated in a LEGO exercise to learn the value of VDC. The activity simulated traditional building in a 2D model and then was repeated in a 3D model, using virtual reality as a tool. This helped the students visualize the project more accurately, resulting in reduced errors and time savings.

During the program, students also learned about SSOE's Student Co-op / Internship Program. This program provides college students with resume building experience, a competitive wage, and college credits. In the past 3 years, SSOE has hired more than 175 students in their Student Co-op / Internship Program for full-time positions at more than twenty SSOE offices. In addition, SSOE has been named a "Great Workplace" by independent analysts for 3 consecutive years.

SSOE is committed to preparing students for successful careers by generating interest and improving skills in STEM fields. For the last 4 years, the firm has helped to sponsor "STEM in the Park", a family friendly event at BGSU that engages participants in the STEM fields through hands-on, inquiry based STEM activities.

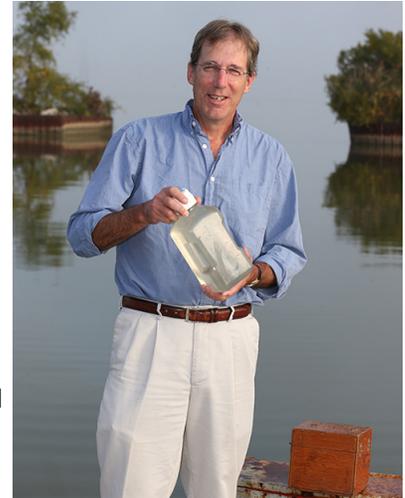
Community STEM in the NEWS

George Bullerjahn Named Distinguished Research Professor

This is a re-post, with permission from BGSU

Dr. George Bullerjahn, Bowling Green State University professor of research excellence in [biological sciences](#), has been a pioneer in exploring the causes of toxic algal blooms in Lake Erie and beyond. In recognition of his stature as a scientist and as a faculty member, the BGSU Board of Trustees awarded him the title of Distinguished Research Professor at the Feb. 22 meeting.

Bullerjahn, who midway through his 30-year career transitioned from microbial biology to aquatic biology, applies his considerable expertise and collaborative skills to addressing the international water quality crisis. He recently became the director of the new [Lake Erie Center for Fresh Waters and Human Health](#), a \$5.2 million project funded by the National Science Foundation and the National Institutes of Health. Working with colleagues from nine other universities, Bullerjahn is leading the effort to discover the causes of and methods for predicting and deterring dangerous cyanobacterial algae outbreaks.



He has advised various government agencies on how to lessen the effects of human-caused sources of that pollution, wrote Dr. Verner Bingman, Distinguished Research Professor of psychology, in his letter of support.

Bullerjahn is "not a cloistered scientist that sits secluded in his lab. He is a high-profile researcher who actively engages governments and communities in an active discussion on how to fix Lake Erie," Bingman said. "As an example, he and his colleague Dr. Robert M. McKay assisted Rep. Bob Latta (R-OH) in drafting H.R. 212, The Drinking Water Protection Act, signed into law by President Obama in 2016."

He has demonstrated a long commitment to basic and applied research that is directly in the public interest, including studies on Grand Lake Saint Marys and working with a multi-university team to detect, map and warn of harmful algal blooms in Sandusky Bay.

Since joining BGSU in 1988, Bullerjahn has garnered more than \$8 million in external grant funding for his research, including 15 NSF grants, and has a distinguished record of more than 90 refereed publications, which are frequently cited by his peers. Those include research on physiology, ecology, food web, cyanobacterial blooms, biogeochemical impacts and potential management of problematic organisms.

"His publications on these topics have . . . had a marked impact on the direction and application of research in the broader field of harmful algal bloom dynamics," Dr. Hans Paerl, Kenan Professor of Marine and Environmental Sciences at the University of North Carolina at Chapel Hill, wrote.

Undergraduate and graduate students at BGSU and other universities have benefited from Bullerjahn's mentorship, noted his supporters, as he helps train the next generation of scientists. He serves as an NSF Research Experience for Undergraduates mentor, and each year students list meeting him as one of the most influential parts of their research experience; a number have gone on to become graduate students, said Dr. Steven Wilhelm, the Kenneth and Blaire Mossman Professor of microbiology at the University of Tennessee at Knoxville.

"To summarize his impact at BGSU, Dr. Bullerjahn is an excellent collaborator and mentor for his graduate students," Dr. Raymond Craig, dean of the College of Arts and Sciences, said. "He approaches his work with a

great deal of humility, but also with a great deal of passion."

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STEM Opportunities

Student Drone and Robotic Challenge

Celebrating the 50th Anniversary of Apollo 11 Landing on the Moon

July 20, 2019 will mark the 50th Anniversary of the landing of Neil Armstrong and Buzz Aldrin on the Moon in Apollo 11. NASA's [Northwest Earth and Space Sciences Pipeline](#) (NESSP) will hold a 5th-12th grade student drone and robotic challenge to celebrate!



Dr. Kevin Czajkowski from the University of Toledo, Toledo, OH and Jeff Demaray from Monroe Community College, Monroe, MI are hosting the **Apollo Next Giant Leap Student Challenge (ANGLeS)** at **Monroe Community College** on Saturday, **July 20, 2019**. Kevin and Jeff will host a regional hub for Michigan and Ohio teams.

The Challenge

1. Register a team and design and submit a mission patch to NESSP
2. Design and build an Apollo Lunar Lander. Fly it to a destination with a drone and land it as close to where Buzz and Neil landed.
3. Develop a pre-programmed robotic system to represent an astronaut who will explore the lunar surface and complete challenges to score points!

Please see: <https://nwessp.org/apollo50/registration/>

Kids Tech University @ BGSU

Kids' Tech University (KTU) is a science outreach program now in its 8th season at BGSU that provides a true university experience for children by introducing them to a scientist and providing hands-on activities that let kids explore scientific concepts. The morning sessions feature a talk and extended question period with the invited speaker. Afternoon sessions will include a series of hands-on activities relevant to the session topic that the children can participate in with their parents. Topics covered in this year's program will include the importance of human factors in the design of new technologies, the science behind our sense of taste, climate records in the earth's crust, and plant interactions with insects. To participate, children must be 9-12 years old as of Sept. 30, 2019. There is a \$100 registration fee to participate. However, scholarships support for registration fees is also available.



Please contact the KTU Program Director, Dr. Paul Morris, at: pmoris@BGSU.edu for more information.

Leveraging the TI-84 Plus CE Graphing Calculator for ACT[®] Test Success

This workshop is designed for **mathematics educators** who want to learn to leverage TI-84 Plus CE technology skills to drive student success on the ACT[®] test by exploring released test items. Educators will cover the main elements of the ACT[®] test, discuss strategies for helping students to better understand key topics, and emphasize techniques for teaching with TI-84 Plus CE technology.



By the end of the workshop, participants should feel comfortable with:

- Leveraging the TI-84 Plus CE graphing calculator for exam questions in key categories such as Number & Quantity, Algebra, Functions, Geometry, and Statistics & Probability
- Highlighting the key content areas on the ACT[®] test and adjusting mathematics instruction accordingly
- Implementing test preparation strategies in the mathematics classroom and using pre-made activities that reinforce technology skills and deepen student understanding of key topics

Location: NWO: Northwest Ohio Center for Excellence in STEM Education at BGSU (room location TBD)

Date: June 4-June 5, 2019

Time: 8:00am -3:00pm

Host: Jenna Pollock, jpolloc@bgsu.edu

Cost:

\$350 with technology included, \$300 without technology

Register: <https://education.ti.com/en/professional-development/teachers-and-teams/summer-workshops/leverage-ti-84-act-bowling-green>

NBC News Learn "Discovering You" Video Series (NBC Universal)

In celebration of National Engineers Week, NBC News Learn has launched "Discovering You," an original video series celebrating the careers of engineers who are inspiring the next generation. NBC News Learn, the education brand of NBC News, produced the series in partnership with Chevron, the American Society for Engineering Education (ASEE), and the National Science Foundation (NSF).

<https://www.nbclearn.com/engineering>

Toledo Zoo Teacher Open House

The Toledo Zoo Education Department is offering a **FREE** Teacher Open House to help teachers prepare for field trips and learn more about how the Zoo can support their classrooms. We would appreciate it if you would be able to share the following information with teachers:



Toledo Zoo Teacher Open House

March 19

3:30 pm - 6:00 pm

Join us at the Toledo Zoo to learn more about how we can help meet your educational needs. Meet with staff members and sample some of our program activities. We will feature examples of on-grounds, off-grounds, and virtual learning opportunities and more.

Program is free, but registration is required.

Register at <https://connect.toledozoo.org/education/res/teachers>

Camp Invention

A High-Energy, Hands-on STEM Camp

Secure Your Spot Today and save \$25 with promo code **INNOVATE25** (offer expires March 22nd)



Camp Invention®

Who: Students in grades K - 6.

Location: Grove Patterson Academy, 3020 Marvin Ave., Toledo, OH

Date & Time: June 3 - 7, 2019 from 9:00 am - 3:00pm

Price: \$230 (before discount)

Register at invent.org/camp or call 800-968-4332!

Questions contact Hemeika Johnson at hjohnson@tps.org

For more information, visit: <https://www.invent.org/programs/camp-invention>

INFOhio Open Space Webinar

Learn how Open Space, INFOhio's newest Open Educational Resource (OER) platform, supports educator collaboration and OER content creation. Open Space, developed in partnership with the Institute for the Study of Knowledge Management in Education is built on the OER Commons platform. This site provides a place for Ohio educators to work, collaborate, curate and develop resources and lessons that easily integrate into Google Classroom and a variety of learning management systems in K-12 curriculum. To join the webinar:



To join the webinar, go to <https://zoom.us/j/138730916>

<https://www.eventbrite.com/e/create-lessons-and-collaborate-with-peers-use-infohios-open-space-registration-57634595627>

MakerX, Ohio Expo Center

MakerX, The Columbus Maker Expo, is a festival of creating with technology. It is suitable for all ages and will take place on Saturday, April 6, 2019 in the Buckeye Building of the Ohio Expo Center (aka State Fairgrounds) in Columbus, Ohio.



Tickets are available at the link below. Tickets are \$5 for ages 5 and over when ordered online (or \$8 at the door). The Expo Center also charges \$5 cash preferred for each vehicle entry for parking. The entire event will be indoor and food will be available for purchase on site.

For more information: https://epay.capital.edu/C20501_ustores/web/classic/store_main.jsp?STOREID=103&SINGLESTORE=true

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NWO STEM Activity

Earth System in a Bottle

This month's activity is from GLOBE.gov can be found at https://www.globe.gov/documents/348830/350113/ElementaryGLOBE_EarthSystemsActivity1_en.pdf

Purpose

- To acquaint students with the hydrosphere, geosphere, atmosphere, and biosphere more closely.
- To have students use microcosms to study natural phenomena.
- To introduce students to the concept of a "fair test" in a scientific investigation.

Overview

In pairs, students will create experimental conditions in terrariums in order to study what plants need to live. Variables to study include the presence or absence of soil, water, and sunlight. Students will record the growth of radish plants as well as observations of "the water cycle" in their terrariums. At the conclusion of their experiments, students will share their results with the class and discuss how water, Earth materials, and air are all necessary to support living things.



Student Outcomes

After completing this activity, students will know about the importance of the hydrosphere, geosphere, and atmosphere in supporting the biosphere. They will learn how to set up "fair tests," record detailed observations, use drawings as scientific records, make sense of experimental results, and share them publicly.

Science Content Standard A: Science as Inquiry

- * Abilities necessary to do scientific inquiry

Science Content Standard C: Life Science

- * The characteristics of organisms

* Organisms and environments

Science Content Standard D: Earth and Space Science

* Properties of earth materials

[Click here](#) to view the complete activity on the GLOBE website!

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Share Your Story!

Thank you for your support of NWO, our programs, our activities, and our partners. Please send us updates, press releases, and news of STEM happenings at your school, district, or organization. Please submit to nwo@bgsu.edu. We are always looking for great STEM education stories to feature in upcoming newsletters.

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