

Engineering Projects

Invitation to Wind Tunnel Dedication

When recent graduate **Dylan Grove** visited NASA's Langley Research Center as a sophomore, he saw the wind tunnels and heard that EMU was planning to purchase such a machine. He proposed that one could be built instead, and proceeded to do just that for his senior capstone project! Dylan's wind tunnel is now being used by current engineering students at EMU.

The engineering program will host a dedication and demonstration event on Wednesday, February 26, from 4 to 5 pm in the lower level (west end) of the Suter Science Center. At 4:15, Dylan will give a presentation describing the design process, followed by a demonstration of the machine's functions. Students in the Fluid Mechanics class will also demonstrate ways they are using the machine in their studies.

Alumni are invited to drop in any time during the hour to share refreshments and meet the wind tunnel's creator, professors, and students. (Parking permits can be picked up at the Facilities Management office at 994 Parkwood Drive, 9:00 am-noon and 1:00 pm-4:00 pm.)

Successful Weather Balloon Launch

On the morning of November 25, a small crowd gathered on the hill behind EMU to witness the launch of a weather balloon with a payload designed by EMU's Engineering Design III class. Designers were **Aaron Zimmerman, Blake Sargent, Douglas Nester, Ethan Beiler, Josh Schlabach, and Karissa Sauder**, under the guidance of **Professor Stefano Colafranceschi**.

The purpose of the project was to implement a payload for a high-altitude balloon with the ability to take atmospheric measurements, and to send GPS coordinates that could be tracked by team members on the ground. The balloon was designed to ascend to a high altitude, where it would pop, and a parachute would bring the payload safely back to earth.

The weather was perfect on the day of the launch. Onlookers eagerly gazed after the balloon as it dwindled to a white dot in the blue sky, then disappeared. Several hours later, we learned the payload had safely landed in a field in the Eastern Shore of Maryland, having traveled a distance of about 165 miles, in the opposite direction from where it was predicted to go!

The team had lost contact with the balloon during part of its flight, likely due to extreme cold temperatures, but regained contact before it landed. It was safely retrieved by the state police, and returned to EMU, where the students were able to retrieve photographs, as well as the temperature, humidity, and ozone readings the payload had recorded.

Faculty News

Sabbatical Provides Space for Study

Professor Owen Byer is on Sabbatical for the 2019-2020 academic year. His main project is completing a Master's degree (online) in Applied Statistics at Penn State University (supplementing the Masters and Doctoral degrees in Mathematics that he already holds). In addition, he is revising his textbook *Methods for Euclidean Geometry* for publication with Dover Press. The first edition was published by the Mathematical Association of America in 2010. Coauthors: Deirdre L. Smeltzer (former EMU math professor) and Felix Lazebnik (Owen's PhD advisor).



Photo courtesy of Rachel Holdeman

Department News

Codebreakers Excel Once Again

In April 2019, EMU again fielded a team for the Kryptos code-breaking competition. 149 students formed 62 teams representing colleges and universities from around the world. Students **Daniel Harder, Cameron Byer, and Hannah Leaman** performed admirably, placing second among all teams in the competition. They solved all three problems in under five hours – much less time than it took in 2018, when Byer, Harder and senior Ben Stutzman placed first after nearly 20 hours of work. Congratulations, EMU!

Students Contemplate Graduate Study

Professor Owen Byer took a group of seven students to visit the University of Virginia in November. The students met with faculty and graduate students in both the Mathematics and Computer Science graduate programs. We have several students who plan to attend graduate school in mathematics, computer science, and engineering in the next couple of years.

Problem Corner

Congratulations to the following people for solving the Sudoku knockoff in our last Problem Corner: **Sam Beachy, Sarah Diener Beachy (2002), Jesse and Tyler Blosser, Hannah Daley (2017), Don Hooley (1977), John Horst (1960), Sam Kauffman (2012), Haleigh (Walcott) Kelley (2011), Larry Lehman (1979), Joe Mast, Helen (Kraybill) Miller (1966), and Denton Yoder (1985).**

New Problem:

How many positive integers contain only digits that are in strictly decreasing order? For example, 9310, 7, and 9876543210 all count, but 5331 and 7654328 do not.

Since Owen Byer is on Sabbatical, please send your response to daniel.showalter@emu.edu. Let us know your graduation year, too!

Do you know a prospective student who is interested in studying math at EMU?

Contact Owen Byer at byer@emu.edu for information about applying for the Brenneman-Longacher Endowed Math Scholarship.

Recipients receive \$1,250 per year for four academic years, as long as they continue in the math major.



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Mathematical Sciences Department
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www.emu.edu/math Winter 2020

Engineering Student Projects are Impressive and Meaningful



Dylan Grove displays the wind tunnel he built.

From Introduction to Engineering & Design, to senior capstone projects, engineering students at EMU engage in hands-on learning, applying their skills to master real-world challenges in group or individual projects. The results are typically impressive and often practical. EMU reaps benefits from such projects as a solar-powered golf cart or solar-powered concession stand, created by students for use on campus. Keep reading to learn more about two recent projects with real “Wow!” impact.