



buckeye/engineering

SUMMER 2018 / ISSUE 22

Undisputed national EcoCAR 3 champions

INSIDE/

FIRST BUCKEYE SATELLITE BLASTS OFF

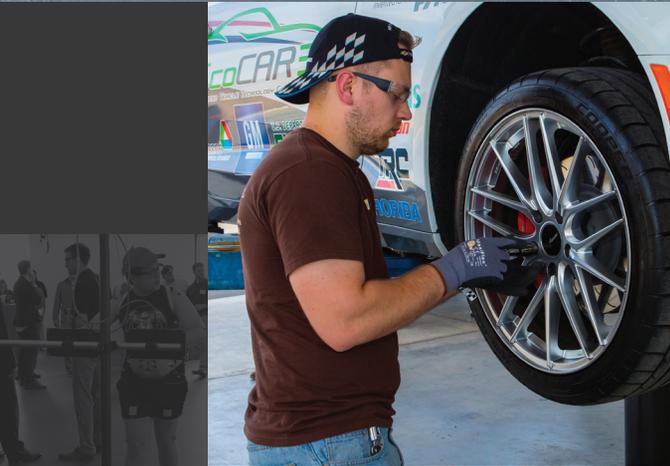
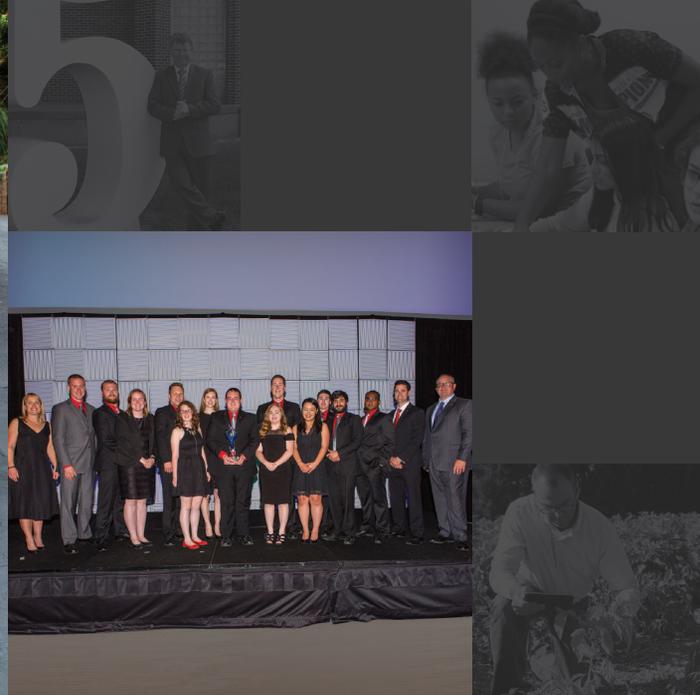
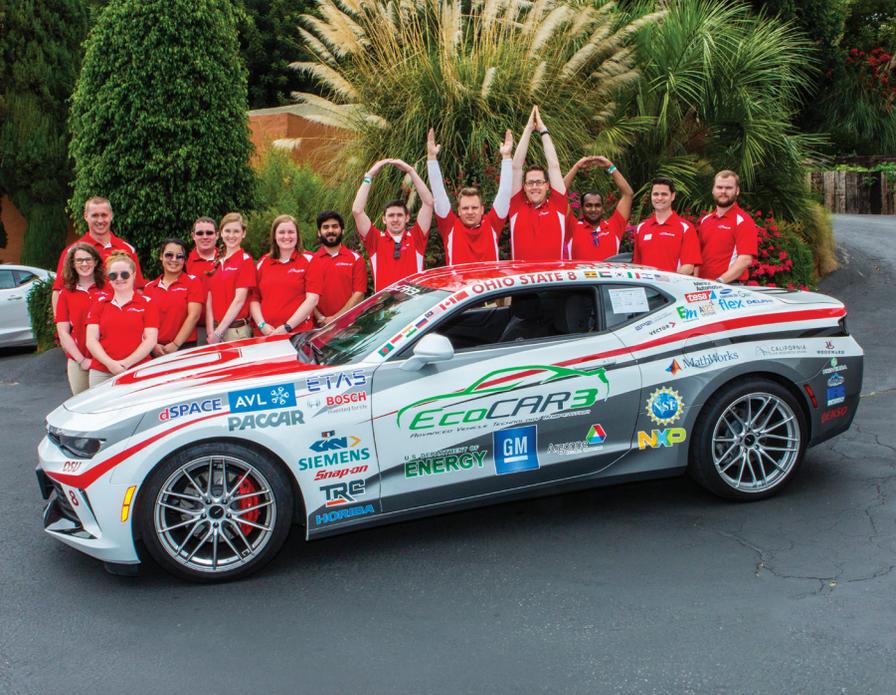
ALUMNA BREAKS BARRIERS

SAVING LIVES ON THE BATTLEFIELD



THE OHIO STATE UNIVERSITY

COLLEGE OF ENGINEERING



Four-peat! Buckeyes sweep EcoCAR 3 competition

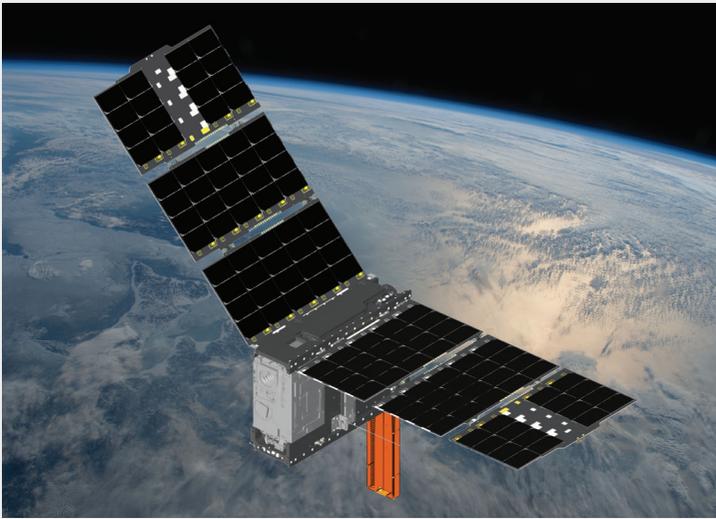
Ohio State students won first place in the final year of EcoCAR 3, an Advanced Vehicle Technology Competition, sponsored by the U.S. Department of Energy and GM. Besting 15 North American universities, the Buckeyes dominated all four years of the collegiate automotive engineering competition that challenged teams to redesign a 2016 Chevrolet Camaro to further reduce its environmental impact while maintaining muscle car performance.

Winning every EcoCAR 3 stage, the Ohio State crew brought home \$33,000 to further support the university's advanced vehicle technology program. They also earned 18 awards, including the NSF Diversity, Inclusion and Equity Award, the NSF Outstanding Advisor Award and the first place NSF Innovation Award.

“Our overall team philosophy focused on building students instead of building a car,” said faculty advisor Shawn Midlam-Mohler. “Our students are able to build a great car, but they’re also able to communicate the thought process, the design, the validation—all of the effort that goes into it.”

Watch and read more: go.osu.edu/4peat





First Ohio State satellite blasts into space

The university's first satellite—the CubeRRT—contains advanced sensors for observing Earth's environment from space. It launched on May 21.

Named after the popular 80s videogame Q*bert, the shoebox-sized CubeSat Radiometer Radio Frequency Interference Technology Validation mission (CubeRRT) contains technology that could solve a major problem for researchers by breaking through radio frequency interference (RFI) that can hinder efforts to detect what's happening on Earth.

RFI is a growing problem for space-based microwave radiometers, instruments important for studying soil moisture, weather, climate and other Earth properties. As the number of RFI-causing devices—like cell phones, radios and televisions—increases, it will be even more difficult for satellite microwave radiometers to collect high-quality data.

“CubeRRT is a microwave radiometer that has a greatly improved processor to get rid of the RFI. The goal is to demonstrate this processor so future satellites can use it,” said project leader Joel Johnson, chair of electrical and computer engineering.

Soon, Johnson added, every Earth observing radiometer may require special processors to separate the RFI signals from the environmental data scientists need.

Read more: go.osu.edu/crrt

Breaking barriers

Growing up in the rural South African village of Kopela, alumna Margaret Mkhosi never imagined that she'd become an engineer—let alone the first female nuclear engineer in her homeland.

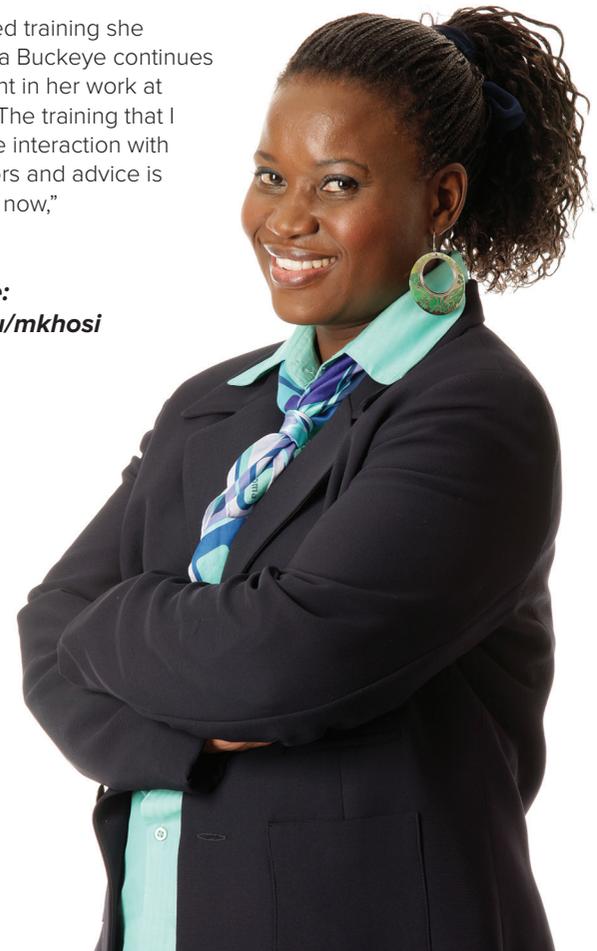
Kopela was so remote, the schools lacked critical resources like computers and labs. But thanks to a supportive family and mentors, Mkhosi later became the third woman to earn a PhD in nuclear engineering at Ohio State.

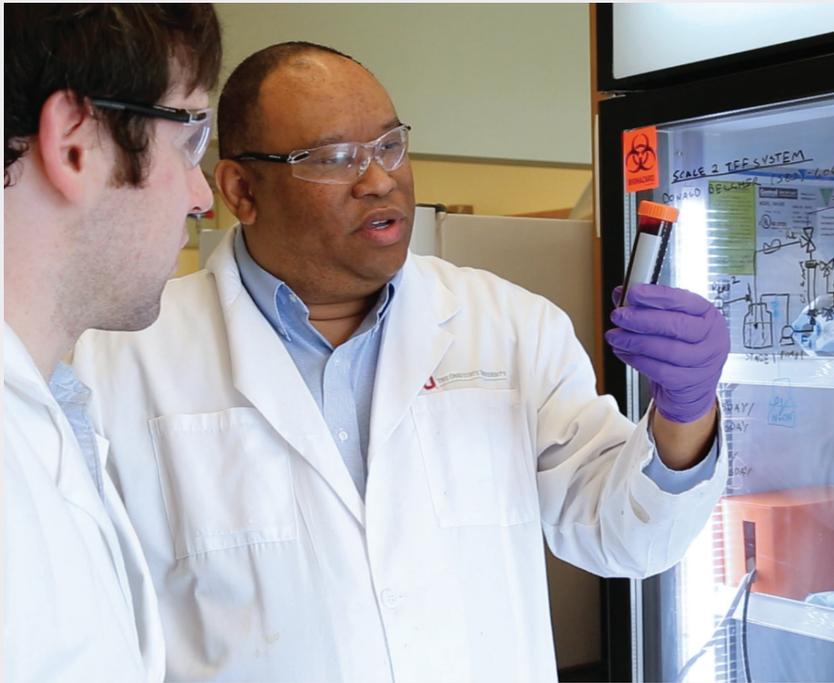
Inspired by the difficulties she overcame, she vowed to help other women also succeed in STEM careers. She mentors women of all ages, including many girls from Kopela. Two of them earned bachelor's degrees in STEM fields this year, with four others currently pursuing undergraduate degrees.

Today as the Center for Nuclear Safety and Security's inaugural director, Mkhosi leads efforts to create a pipeline of trained talent who can support the National Nuclear Regulator and the nuclear sector, as well as overseeing nuclear safety education and training, and R&D.

The advanced training she received as a Buckeye continues to be relevant in her work at the center. “The training that I received, the interaction with the professors and advice is handy, even now,” Mkhosi said.

Read more:
go.osu.edu/mkhosi





Research aims to save wounded soldiers' lives

New research led by Chemical and Biomolecular Engineering Chair Andre Palmer could one day help save the lives of American soldiers who are critically wounded in battle. He received a \$2.4 million U.S. Army Medical Research and Materiel Command grant to develop a resuscitation therapy to treat life-threatening hemorrhage on the battlefield.

Blood transfusion—the only available effective treatment for massive blood loss—is logistically not feasible during field casualty care. Based on years of research, Palmer's lab is working on a novel resuscitation therapy that maintains oxygen delivery to tissues. A form of artificial red blood cell, their polymerized hemoglobin (PolyHb) has shown promise in stabilizing hemorrhage through injection of less than half the volume of lost blood in small animals. The therapy's significantly reduced weight could enable a medic to carry field treatments for more than 10 soldiers, at least doubling current capacity.

While not a permanent replacement for whole blood, PolyHb could sustain wounded soldiers for 24 to 48 hours—enough time to transport them to a medical facility. It also has significant potential for medical preparedness efforts in civilian mass casualty situations, such as transportation accidents, natural disasters or terrorist attacks.

Read more: go.osu.edu/savesol

Gift will help build strong career foundations

Ohio State civil engineering students are gaining hands-on geotechnical experience thanks to a \$200,000 gift from CTL Engineering and its President and CEO C.K. Satyapriya.

The generous gift establishes the CTL Engineering Lab in Hitchcock Hall and supports the reinstatement of the Geotechnical Engineering Laboratory that was discontinued more than 15 years ago due to resource constraints. Complementing a lecture course on the same topic, the lab teaches students how to conduct tests to identify different types of soils, identify their properties and determine if they're suitable as construction materials.

Columbus-based CTL Engineering wanted to support the Department of Civil, Environmental and Geodetic Engineering's geotechnical curriculum because of how critical it is to the civil engineering field, Satyapriya said. The effort is also part of the company's commitment to STEM outreach and education.

"Many companies underestimate the extent of the impact their philanthropy can have on students, who are potential employees and the next generation of engineers," said Michael Hagenberger, associate chair of the department.

Connecting theory and practice, the hands-on learning students receive in the new laboratory is already showing results. Scores on course midterms jumped 10 percent last semester, thanks to the lab experience, said Professor of Practice Daniel Pradel.

Read more: go.osu.edu/strongfoundation





Capping it off

This spring, the college welcomed more than 1,200 new alumni into the Buckeye engineering family. Meet a few members of the class of 2018 who combined their passions with Ohio State's offerings to engineer an extraordinary education.

As a senior aviation major, Yasmine Abu Arab worked to ensure that the Lady Buckeyes Air Race Classic team takes off as an Ohio State tradition. A team co-founder, Abu Arab will be one of three women flying in the nation's oldest and only airplane race for women in June. While the team aims to finish in the top 10, what Abu Arab considers most important is the opportunity to be a role model for future women aviators.

Los Angeles native Wilson Flores first got involved in student organizations to meet people, but it ended up helping him stand out to prospective employers. The aerospace engineer served in leadership roles of several organizations, including Buckeye Space Launch Initiative, which soared to first place in the 2017 Spaceport

America Cup. Now he's launching his career at the National Air and Space Intelligence Center in Dayton, Ohio, where he'll also be a part-time graduate student.



Mechanical engineer Lisa D'lima believes it's important for engineers to build things. She credits her own building experience as part of Ohio State's Underwater Robotics team with helping her land a job as a product design engineer with Amazon's Lab 126.

"I would like to create something that will help people," D'lima said. "I think robots can be used to improve lives. I want to be part of that."

Meet the class of 2018:
go.osu.edu/grads18

briefs:

The evolution from engineer to entrepreneur
go.osu.edu/evolution

AEP Ohio funds research to protect power grids from cyber attacks
go.osu.edu/protectgrids

Class uses drones to improve neighborhoods
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Engineering physics student named Goldwater Scholar
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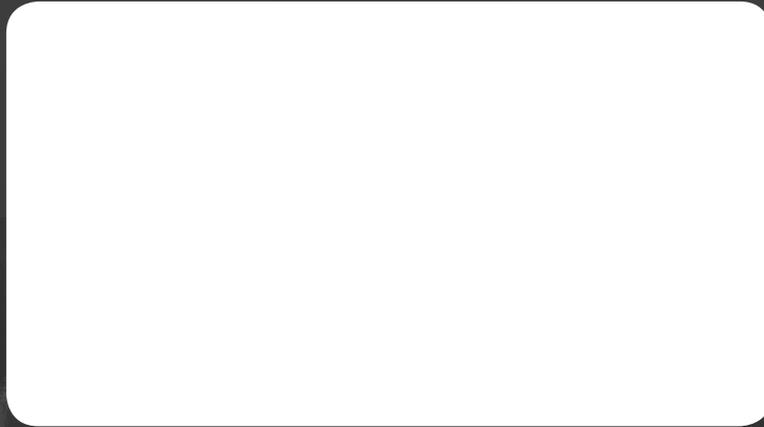
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