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# Teachers take flight with Carthage research team

May 2, 2022

Ronda McCarthy, a science teacher at St. Theresa Catholic School in Des Moines, Iowa.
SUBMITTED PHOTO

KENOSHA — A group of teachers from across the country will soon take flight as embedded teachers with the Carthage College Microgravity Team.

A record number of four teachers have been selected to fly their microgravity experiments aboard an aircraft while experiencing periods of weightlessness. The teachers are from Wisconsin, Georgia, Iowa and Texas. The Embedded Teacher

Program is a partnership between the Wisconsin Space Grant Consortium, the National Space Society and the Zero Gravity Corporation (ZERO-G).

The teachers and their experiments will each experience 11 minutes of weightlessness during a series of two-hour flights aboard the ZERO-G G-Force One Aircraft. They will float in free-fall as 30 parabolas are executed during the flights with each parabola lasting about 22 to 24 seconds.

## Meet the teachers

- Lisa Werner is the band director at St. Bruno Parish School in Dousman. She is also the Senior Symphony Orchestra manager at the Milwaukee Youth Symphony Orchestra and Jazz Ensemble director at Kettle Moraine High School in Wales. Werner will execute experiments designed to measure her ability to perform precise manual tasks such as keeping beat and responding to tempo signals in a weightless environment. She will also carry out a demonstration that will allow students to visualize sound waves using the free-float environment of the parabolic flight. Data from the flight will be used by Werner's students to arrange an orchestral piece of music for performance after the flights.


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"I am beyond excited to get to experiment with sound and music in zero gravity, but above all else, I can't wait for my students to take the scientific data from my flight and turn it into a piece of music to perform at our spring concert days after

my return," said Werner.

- Becky Busby, gifted specialist at Frank Long Elementary School in Hinesville, Ga., is flying two experiments designed to study life-saving medical techniques in space and the use of PCR tests for water contamination in spacecraft. Busby has already involved over 700 students in her work on these projects through presentations, direct engagement with the research and outreach.

"I am excited that I get the opportunity to show our students the importance of STEAM and how we can use the scientific process to solve problems and get excited about learning opportunities all around us," said Busby.

- Ronda McCarthy, a science teacher at St. Theresa Catholic School in Des Moines, Iowa, is using her flight to examine the effects of capillary forces in liquids. She will recreate a 2013 demonstration performed by Astronaut Chris Hadfield on the International Space Station. Hadfield's demonstration has long been a student favorite and is used to show how differently liquids behave in space. McCarthy will also perform an experiment by Astronaut Don Pettit in which small droplets of water in the presence of an electrically charged needle execute orbits around the needle, like planets orbiting a star. The demonstration helps students understand the nature of electrical forces in analogy to the force of gravity. More than 600 students are engaged in her flight experience, including 523 students across Iowa who sent in suggestions for experiments or helped design her final experiments.
- Laura Tomlin, a sixth-grade science teacher at Salado Independent School District in Salado, Texas, started her career as a research biologist studying crops and pests of the California and Arizona agricultural systems. Tomlin is flying two primary experiments. One is designed to investigate how water transport in lunar and Martian soils (regolith) is affected by the different gravity levels on these bodies. The second experiment studies whether the microgravity environment suppresses enzyme function in the liver, possibly leading to liver damage during long-term spaceflight.

“The project has required critical thinking, communication, and creativity, giving students a better understanding of the scientific and engineering process,” says Tomlin. “Enthusiasm for this project continues to grow with each accomplishment. A young girl remarked that she ‘did not even know’ she liked science and now wants to work at NASA one day.

The WSGC Embedded Teacher program has flown eight teachers and their experiments over the past seven years. Each teacher works with Carthage Professor Kevin Crosby to develop their experiments for flight, but the ideas for the experiments often come from the hundreds of students involved in each teacher’s project. The teachers will bring the lessons and experiences of the program back to their classrooms to motivate students to pursue their own journeys in STEAM (Science, Technology, Engineering, Arts, and Mathematics).

## About the program

The program invites applications from K-12 teachers in STEAM fields to attend a microgravity workshop on the campus of Carthage College. Workshop participants will be invited to develop their own proposals for flight as part of the Embedded Teacher Project. More information on the workshop is available on the WSGC site **https://spacegrant.carthage.edu**.

### ABOUT WSGC, ZERO-G

**About WSGC:** The Wisconsin Space Grant Consortium (WSGC) is part of a national network of consortia funded by NASA’s National Space Grant College and Fellowship Program. Congress established the program in 1988 to contribute to the nation’s scientific enterprise through research, education and public service projects.

**About ZERO-G:** Zero Gravity Corporation is a privately held space entertainment and tourism company whose mission is to make the excitement and adventure of space accessible to the public. Go to **gozerog.com**.