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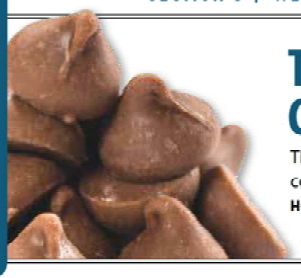

TALKING CHOCOLATE

Tips and tricks for cooking with chocolate

HOMESTYLE | PAGE C3

Names of MSU's 2018 graduates heading to outer space in research satellite

By MARSHALL SWEARINGEN
MSU News Service

The Montana State University graduating class of 2018 is out of this world — literally.

Around the time when the roughly 2,000 graduates toss their caps in the air at MSU's May 5 commencement ceremony, a rocket will carry their names into outer space as part of a university research project to test a radiation-tolerant computer technology.

The tiny names are printed on eight paper-thin sheets of aluminum enclosed in a satellite that will test the innovative computer prototype. A rocket carrying food and other supplies will bring the satellite to the International Space Station, where astronauts will use a spring-loaded launcher to send the satellite into orbit around Earth.

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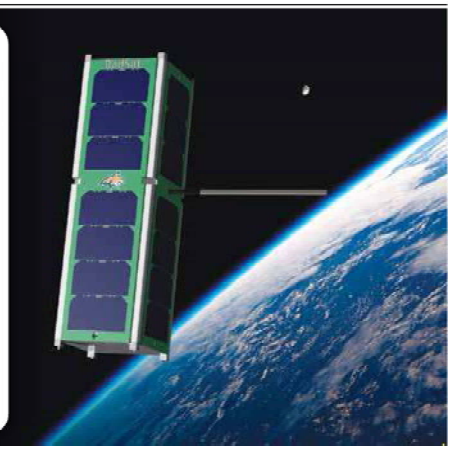

COURTESY OF BROCK LAMERES

In addition to testing an innovative computer prototype, a bread loaf-sized satellite called RadSat, shown in this rendering, will carry the names of Montana Sate University's 2018 graduating class as a fun tribute to the university's 125th anniversary.

Satellite/ from C1

"We were trying to think of a cool way to celebrate the 125th (anniversary of MSU), and realized that the launch would be close to commencement," said Brock LaMeres, professor in the Department of Electrical and Computer Engineering.

In March, LaMeres and his team delivered the completed satellite to Houston, where it will be prepared for its May launch.

Despite being engineered to be extremely compact and lightweight, the bread loaf-sized satellite had a small amount of empty space not taken up by the computer prototype, the solar panels and batteries that power it, and the radio transmitter that allows it to communicate with the MSU team, LaMeres said.

He worked with MSU's Office of the Registrar and a local manufacturer to gather the names and have them printed on the sticky note-sized metal plates.

It's a fun flourish to a project that has spanned more than a decade and received more than $1.5 million in NASA funding while supporting hands-on research for more than 50 MSU students, mostly undergraduates, LaMeres said.

"We're really close to the end in terms of verifying this technology," LaMeres said.

The computer technology, called RadPC, takes a new approach to handling the intense radiation of outer space, which can interfere with the operation of computers on satellites and other spacecraft. Traditionally, space computers have used oversized circuitry to fortify against the radiation particles emitted by the sun and other celestial bodies, which are blocked from the Earth's surface by the planet's magnetic field.

The MSU team's RadPC instead uses multiple inexpensive processors like those found in personal computers. The processors are programmed to operate in parallel, so that when a radiation particle disrupts one, the others recognize the fault, continue the computation and re-program any damaged computer memory.

The latest test of the technology, which is currently being completed, has taken place inside the space station. The upcoming trial is the first time the technology will operate in a stand-alone satellite, in this case called RadSat. The RadSat is the largest of the nine satellites that MSU's Space Science and Engineering Laboratory has designed, manufactured and sent to outer space.