

SPACE DAILY

your portal to space

Subscribe free to our newsletters via your Email Address SPACE DAILY SPACE WAR

MICROSAT BLITZ

NASA funding is helping students build cubesats

by Emily Dieckman
Tucson AZ (SPX) Jul 18, 2019

University of Arizona researchers will use \$3 million in NASA funding over three years to research the low-gravity surface environments of asteroids, and to provide students from underrepresented backgrounds the opportunity to design, build and operate CubeSats, or miniature satellites at the UA.

The project was selected through NASA's Minority University Research and Education Project Institutional Research Opportunity, or MIRO, program. The UA, which was designated a Hispanic-Serving Institution in 2018, is one of eight institutions to receive a share of more than \$8.2 million in cooperative agreements awarded through the MIRO program.

"This project will help us understand asteroid surface geophysics in a way that no one has done before," said Erik Asphaug, deputy principal investigator for the project and a professor in the UA Lunar and Planetary Laboratory. "And the students get to participate in a low-cost endeavor that has huge implications for how we work with asteroids in near-Earth space."

There are many reasons to study asteroids, from the way they affect humans when their orbits cross paths with Earth, to their potential as sources of spacecraft fuel, to the clues they may hold about the origins of planets and life.

But it's difficult and expensive to send missions to asteroids, and it's impossible to simulate their low-gravity environments - where a human would weigh as much as a mouse - on Earth for long durations.

The answer is to build a lab in space, according to Jekan Thanga, principal investigator of the MIRO project, head of the UA SpaceTReX Laboratory and assistant professor in the Department of Aerospace and Mechanical Engineering.

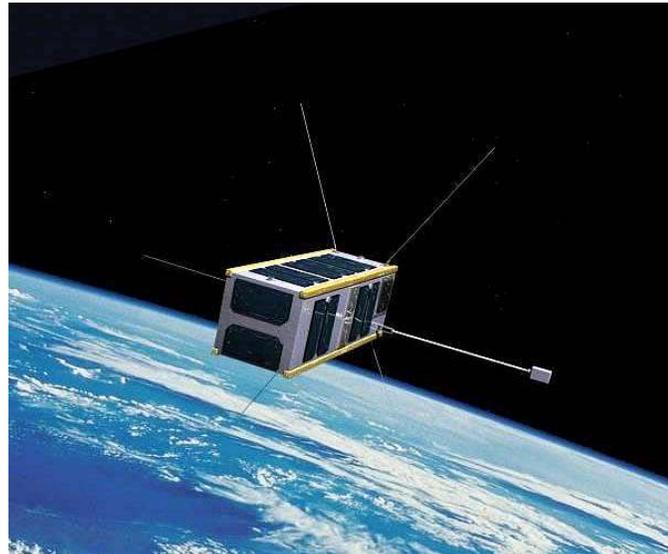
The project will recreate the surface environments of asteroids by placing asteroid origins satellites, or AOSATs, small laboratories containing asteroid material that came to the Earth in the form of meteorites, into low-Earth orbit.

Rotating at about the speed of the second hand on a clock, each AOSAT will generate a centrifugal force equivalent to an asteroid's extremely low surface gravity. Scientists can't recreate asteroid gravity in this manner onboard the International Space Station because it is too subtle of a force - smaller than the vibrations from the pumps and fans that keep the astronauts alive.

Because it's much cheaper and easier to operate a laboratory-spacecraft in low-Earth orbit than it is to spend hundreds of millions of dollars going all the way to an asteroid, AOSATs will offer repeated opportunities for basic science and act as a testbed for asteroid-bound hardware.

"We are coming up with an asteroid proving ground without having to go to an asteroid," Thanga said. "This is a whole different way of doing science."

Students from the UA, Pima Community College and the University of Puerto Rico will have the opportunity to build three AOSATs, each about the size of a loaf of bread. Then, they will operate them in low-Earth orbit, conducting basic research on their simulated "patch of asteroid."



file image

SpaceExces
The marketplace for
space and aerospace
www.spaceexces.com

COMMERCIAL
UAV EXPOSURE
AMERICAS
Vertically focused
Market driven

**Tempur-Pe
Mattress C
& Memory
Mattress R**



Research areas will include how to extract water for conversion into rocket fuel, testing robotic devices capable of digging and planting sensors on an asteroid, and sending bursts of gas and firing small projectiles into a low-gravity asteroid surface.

"This is a unique project which will provide students the opportunity to study different aspects of asteroid science," said Desiree Cotto-Figueroa, project co-investigator and assistant professor at the University of Puerto Rico at Humacao. "The continuous discovery of unknown near-Earth asteroids, as well as gaining an understanding of their origin and evolution, is very important."

Ultimately, the researchers envision AOSAT as pathway toward a significantly larger centrifugal spacecraft that could act as a semipermanent proving ground in low-Earth orbit. This accessible facility would allow researchers to realistically test how an entire lander or an astronaut might interact with an asteroid surface - what Asphaug calls a "persistent link" between distant asteroid environments and the Earth.

Such a facility could even be used to recreate a "patch of the moon" where astronauts could train and adapt to the low-gravity lunar conditions humans first experienced in the Apollo missions 50 years ago.

"Our decades-spanning experience in planetary exploration makes the UA an ideal institution to lead this STEM education and research project," said UA President Robert C. Robbins. "Underrepresented students from both our local community and international partners will have an opportunity to learn about asteroid science and space systems engineering through a project that will actually launch into space. This is the kind of incredible opportunity we are proud to offer students for them to have the tools and experience to succeed."

In the near term, "we would like to build a pipeline of students working with professors to conceptualize, design, build and fly CubeSats at the University of Arizona," Thanga said. "We're looking to the day in the future where sending a CubeSat to space might be as easy as sending a payload up on a balloon flight to do an experiment in high altitude."

Roberto Furfaro, professor of systems and industrial engineering and head of the Space Situational Awareness Initiative under which SpaceTReX operates, said that with the help of the College of Engineering; the provost; and the Office of Research, Discovery and Innovation, he recruited Thanga specifically to be "University of Arizona" between CubeSat research and space situational awareness, or SSA, which is the ability to monitor, understand and predict the behavior of objects orbiting Earth.

"He represents what we call space-based SSA," Furfaro said. "He could potentially build a CubeSat that can not only view the Earth or other planetary bodies, but can observe other spacecraft or debris to learn more about the characteristics and behavior of objects in space, for example."

Related Links

[University of Arizona](#)
[Microsat News and Nanosat News at SpaceMart.com](#)

4 people recommend this. Be the first of your friends.

Thanks for being here;

We need your help. The SpaceDaily news network continues to grow but revenues have never been harder to maintain.

With the rise of Ad Blockers, and Facebook - our traditional revenue sources via quality network advertising continues to decline. And unlike so many other news sites, we don't have a paywall - with those annoying usernames and passwords.

Our news coverage takes time and effort to publish 365 days a year.

If you find our news sites informative and useful then please consider becoming a regular supporter or for now make a one off contribution.

SpaceDaily Contributor \$5 Billed Once



credit card or paypal

SpaceDaily Monthly Supporter \$5 Billed Monthly



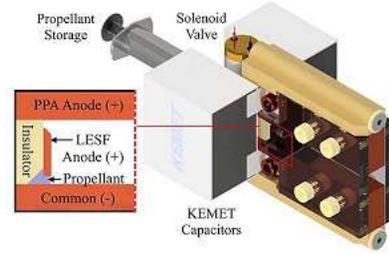
paypal only

MICROSAT BLITZ

New safer, inexpensive way to propel small satellites

West Lafayette IN (SPX) Jul 17, 2019

Finding inexpensive solutions for propelling CubeSats is one of the most critical components of the rapidly growing industry of commercial launches of satellites the size of a loaf of bread. The small size and relatively low cost have made CubeSats popular choices for commercial launches in recent years. The first CubeSat was launched in 1999. Since then, more than 1,000 have been launched. The rapid development and application of nanosatellite technology has vastly accelerated mission complexity ... read more



Comment using your Disqus, Facebook, Google or Twitter login.

0 Comments spacedaily 1 Login

Recommend Tweet Share Sort by Best

Start the discussion...

LOG IN WITH

OR SIGN UP WITH DISQUS ?

Name

Be the first to comment.

ALSO ON SPACEDAILY

Share this article via these popular social media networks



SPACE TRAVEL

Russia May Send Saudi Astronaut to Space - Intergovernmental Commission

US to Launch Its First Own Spacecraft to ISS After NASA Certification in May 2020 - Source

Lithuania introduces e-residency to boost foreign investment

Major shuffle at NASA in rush to meet Trump's moon deadline

ROCKET SCIENCE

SpaceX Dragon capsule explosion blamed on titanium valve failure

Fuel leak halted blastoff for Indian rocket: reports

India's heavy rocket Bahubali gearing up for Moon

Vega rocket fails after takeoff in French Guiana

MARS DAILY

A material way to make Mars habitable

Aerogel could be a key building material for Mars

Sustaining Life on Long-Term Crewed Missions Will Require Planetary Resources

InSight Uncovers the 'Mole' on Mars

DRAGON SPACE

From Moon to Mars, Chinese space engineers rise to new challenges

China plans to deploy almost 200 AU-controlled satellites into orbit

Luokung and Land Space to develop control system for space and ground assets

Yaogan-33 launch fails in north China, Possible debris recovered in Laos

SPACE MART

Maintaining large-scale satellite constellations using logistics approach

Maxar begins production on Legion-class satellite for Ovzon

Maintaining large-scale satellite constellations using logistics approach

To be a rising star in the space economy, Australia should also look to the East

TECH SPACE

Raytheon nets \$40.2M for variants of Navy's AN/SPY-6 radar

Stonehenge construction may have been aided by lots of pig fat

Radiation levels at Marshall Islands test sites 10 times greater than Chernobyl

Perseverance is key to NASA's advancement of alloys for bearings and gears

EXTRA SOLAR

Scientists deepen understanding of magnetic fields surrounding Earth and other planets

Astronomers expand cosmic "cheat sheet" in hunt for life

Ejected moons could help solve several astronomical puzzles

A desert portal to other worlds

OUTER PLANETS

Jupiter's auroras powered by alternating current

Kuiper Belt Binary Orientations Support Streaming Instability Hypothesis

Study Shows How Icy Outer Solar System Satellites May Have Formed

Astronomers See "Warm" Glow of Uranus's Rings



Memory Foam Mattress Review

[SPACE MEDIA NETWORK PROMOTIONS](#)
[Solar Energy Solutions](#)
[Tempur-Pedic Mattress Comparison ...](#)

Newsletters :: SpaceDaily :: SpaceWar :: TerraDaily :: Energy Daily
 XML Feeds :: Space News :: Earth News :: War News :: Solar Energy News

The content herein, unless otherwise known to be public domain, are Copyright 1995-2019 - Space Media Network. All websites are published in Australia and are solely subject to Australian law and governed by Fair Use principals for news reporting and research purp
AFP, UPI and IANS news wire stories are copyright Agence France-Presse, United Press International and Indo-Asia News Service. ESA news reports are copyright European Space Agency. All NASA sourced material is public domain. Additional copyrights may apply
whole or part to other bona fide parties. All articles labeled "by Staff Writers" include reports supplied to Space Media Network by industry news wires, PR agencies, corporate press officers and the like. Such articles are individually curated and edited by Space Media
Network staff on the basis of the report's information value to our industry and professional readership. Advertising does not imply endorsement, agreement or approval of any opinions, statements or information provided by Space Media Network on any Web page publ
or hosted by Space Media Network. **General Data Protection Regulation (GDPR) Statement** Our advertisers use various cookies and the like to deliver the best ad banner available at one time. All network advertising suppliers have GDPR policies (Legitimate Interes
conform with EU regulations for data collection. By using our websites you consent to cookie based advertising. If you do not agree with this then you must stop using the websites from May 25, 2018. [Privacy Statement](#)