

# Out of this world: NASA picks ASU to lead moon-orbiter mission

[Anne Ryman, The Republic | azcentral.com](#) Published 3:53 p.m. MT Aug. 25, 2015 | Updated 10:01 a.m. MT Aug. 26, 2015

*The shoe box-size satellite will orbit the moon, targeting water on the South Pole.*



(Photo: Arizona State University)

It's been one of the best-kept secrets for days at Arizona State University.

Now it's official.

For the first time in school history, the university will lead a NASA planetary-science mission with ASU designing, building and operating a satellite that will orbit the moon.

"Bingo!" yelled an ASU researcher as the announcement was made over the Web this week to a group of planetary scientists in Baltimore.

Cheers echoed across the Tempe conference room where five members of the ASU team gathered to hear the announcement on Monday.

The shoebox-size satellite is part of a new generation of miniature, lower-cost spacecraft called "CubeSat"

missions.

The unmanned spacecraft will target the lunar South Pole and map water present there. A launch date has not been set yet.

The 30-pound spacecraft will be designed and built in a special lab at ASU's Tempe campus.

This week's announcement marks a milestone for the university and its School of Earth and Space Exploration.

ASU has a long history of partnering with NASA, including missions to the moon and Mars. But this is the first time university researchers will be in charge of a space mission, directing and operating the science instruments aboard the spacecraft. They'll also analyze the data collected by the instruments.

"It's a big win for ASU," said Craig Hardgrove, a 33-year-old planetary geologist who is the mission's principal investigator.

The spacecraft -- called the Lunar Polar Hydrogen Mapper, or LunaH-MAP -- will catch a ride into space aboard a powerful NASA rocket. After a day or two's journey, the satellite will eject from the rocket and gradually enter lunar orbit over two months.

The satellite is expected to make about 140 orbits of the moon over 60 days. A neutron detector in the belly of the craft will take readings for water as it passes over the shadowed regions of the moon's South Pole. Scientists know from previous space missions that there is water in this region. But they don't know how much, or where.

The data could help solve the mystery of whether water originated on the moon or was deposited there by comets or asteroids, Hardgrove said. Knowing the location of water could also help planning for future manned missions to the moon.

"There's a lot of questions we want to answer with this mission," Hardgrove said.

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Cube satellites, like the one that will be built at ASU, are increasingly being used in space exploration. NASA has a CubeSat Launch Initiative that provides opportunities to get small research satellites into space. The small satellites are less expensive than traditional, big-budget space missions that can run into the hundreds of millions of dollars. The mini satellites range from the size of a coffee mug to as large as a shoebox.

ASU scientists compare their craft to the size of an “NBA- or NFL-size shoe box.” Solar panels, designed to help propel the craft, will pop out once the spacecraft deploys.

Despite its size, the satellites have sophisticated control systems, said ASU assistant professor Jekan Thanga, who will oversee the engineering of the moon satellite.

The ASU team could begin building as early as October.

“How much good science can we do with these small missions? We don’t know the answer, but we will be one of the first groups to try to answer the question,” said Jim Bell, an ASU professor and the mission’s deputy principal investigator, in a statement.

The satellite won’t be able to return to Earth. It will likely end its journey by crashing into one of the shadowed craters near the South Pole of the moon — but not before, scientists hope, sending large amounts of data that can shed more light on our knowledge of the moon.

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