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The Private Plan to Put a Telescope on the Moon

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07.18.13

5:45 PM

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An artist's rendering of the proposed telescope on the Malapert crater on the moon. *Moon Express/ILOA*

Two private companies are teaming up to attempt the first-ever mission to the moon's south pole in order to place a telescope atop a lunar mountain.

This plan is being spearheaded by the [International Lunar Observatory Association](#) (ILOA), a non-profit aiming to build a scientific and commercial base on the moon, with help from the startup [Moon Express](#), which hopes to become a Space Age version of FedEx in the coming decade.

The companies want to put a 2-meter radio antenna along with a smaller optical telescope on a lunar peak, most likely the 5-km-high rim of a crater called Malapert. From this position, both telescopes could view the center of our Milky Way galaxy with unprecedented clarity because they wouldn't be subjected to our atmosphere's hazy interference. The moon would also block them from radio and other electromagnetic noise created by modern civilization. Astronomers have long proposed putting similar telescopes on the moon's far side – which faces permanently

away from our planet – because the pictures could exceed anything produced by the best terrestrial or even space-based instruments.

But far-side telescopes would need to be controlled with costly satellite relays. Located at the lunar south pole, Malapert crater provides the advantage of “a direct line of access to Earth,” said entrepreneur Steve Durst, founder and director of ILOA.

Furthermore, a “day” on the moon is a month-long affair; with two weeks of searing day temperatures rising above 120 degrees Celsius followed by two weeks of night temperatures the plunge below -170 degrees Celsius. Engineering an observatory for such swings would be a challenge. Because of its location at the pole, Malapert gets showered with sunlight for 90 percent of the lunar rotation period and enjoys a relatively stable and balmy temperature averaging around -50 degrees Celsius. The sunny spot would be perfect for solar panels collecting energy, said Durst, averting the need for a nuclear power source.

Because of this, Durst believes the lunar poles are the most obvious locations for eventual human settlement, a future he would like to help get started. “What drives us is the desire to see humanity as a multi-world species,” he said, echoing similar sentiments made by [other private spaceflight entrepreneurs like Elon Musk](#).

The lunar south pole is also a potentially resource-rich area. Moon Express, which is providing the lander, mission architecture, and engineering expertise for ILOA’s telescope, is interested in one day extracting valuable metals, minerals, and water from the moon. The resources could be sold back on Earth while the water could be used by astronauts at an eventual lunar base.

During the mission, Moon Express wants to send a small rover across the lunar surface to do some initial prospecting and see what exists there, said entrepreneur [Bob Richards](#), the company’s CEO.

But pulling off this never-before-done mission, which still has a fair number of unknowns, will require a good deal of work. Though it has [done some initial testing](#), ILOA is looking to land its telescope array on the moon as early as 2016. Though he likes the optimism, Richards thinks that schedule might be a little aggressive. Hitting such a target would require a good deal of money and engineering talent, he said, adding that Moon Express hopes to pull off the mission no later than 2018.

The companies estimate the mission would cost on the order of \$100 million. Durst said he thinks that national space agencies or astronomical centers might be interested in helping foot the bill, though his company hasn’t yet done much fundraising because “we haven’t had a demonstrable need for significant funds.” With the announcement of the ILOA telescope, he hopes to provide a goal to go to investors with in seeking funding.

Still, Moon Express has yet to land a single probe on the lunar surface, hoping to accomplish its first touchdown in 2015 in order to win the \$20 million Google Lunar X-Prize. That initial mission is planning to carry a precursor instrument, [the ILO-X](#), a shoebox-sized telescope to test the ILOA’s software and hardware on the moon. Perhaps once that has been pulled off, both companies will be in a better position to assess the timeframe and costs of their next mission.

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