Another overnight sonic boom possible from SpaceX launch of moon-bound lander

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Another commercial company is trying to become the first to land on the moon with a planned overnight launch atop a SpaceX rocket that could bring another sonic boom to Central Florida.

A Falcon 9 is slated to lift off from Kennedy Space Center's Launch Pad 39-A at 12:57 a.m. Eastern time Wednesday on the IM-1 mission for Houston-based Intuitive Machines, which is flying its first of three contracted missions so far under NASA's Commercial Lunar Payload Services, or CLPS, program.

The first-stage booster for the mission is making its 18th flight, and will attempt a recovery touchdown at nearby Cape Canaveral Space Force Station's Landing Zone 1 about eight minutes after liftoff. SpaceX warned that one or more sonic booms could be heard in the wee hours by residents in Brevard, Orange, Osceola, Indian River, Seminole, Volusia, Polk, St. Lucie and Okeechobee counties.

SpaceX has a second launch lined up for Wednesday as well. The USSF-124 mission for the Space Force is slated to lift off on a Falcon 9 rocket from Canaveral's Space Launch Complex 40 during a four-hour window the Space Force reports as running from 5:30–9:30 p.m. Eastern. Space Launch Delta 45's weather squadron forecasts a better than 95% chance for good conditions. The two launches would be the ninth and 10th from the Space Coast in 2024.

It's been a loud and shaky week in Central Florida. A SpaceX launch on a NASA mission on Feb. 8 at 1:33 a.m. had reports of that returning booster's boom rattling windows as far south as Vero Beach, and that was just hours after a 4.0 earthquake in the Atlantic was felt by some in Central Florida. Later in the week, a returning SpaceX Crew Dragon spacecraft dropped sonic booms as it crossed the state on Thursday morning for a splashdown off Daytona Beach.

Weather for the IM-1 launch is looking clear, with Space Launch Delta 45's weather squadron forecasting a 95% chance for good conditions. A delay to early Thursday would see chances drop to 90%, and drop further to 80% if delayed until Friday, the last chance for this mission to

fly before having to wait until March.

No matter when it launches over this three-day window, the company's Nova-C lander named Odysseus carrying six out of 12 payloads for NASA will aim for a Feb. 22 touchdown near the south pole of the moon.

The CLPS program was first announced in 2019 but fell victim to pandemic-related delays. It seeks to pay private companies a fixed amount of money so that they can go out and build a lunar lander, find themselves a ride to space and take care of the logistics such as communications after launch, all while carrying whatever NASA science payloads have been assigned.

The endeavor is part of an effort by NASA to stoke the fires of what it hopes will be a robust lunar economy under which NASA can simply become a customer for science and cargo missions to the moon, allowing it to focus on its human missions under the Artemis program.

"We're glad to get to this point; it's been a while getting here," said NASA's CLPS program manager Chris Culbert. "We've got our fingers crossed. We hope that they're successful, but we know it's very, very hard to land on the moon."

It's the second of what is still scheduled to be five CLPS launches in 2024. The first, in January, saw Pittsburgh-based Astrobotic Technology's Peregrine lander launched on the first-ever flight of United Launch Alliance's Vulcan Centaur. While it made it to space and flew nearly half a million miles, a propellant leak took any chance of a soft moon landing off the board, and the company eventually steered it back to Earth to burn up on reentry.

Efforts by Russia and a private Japanese company, ispace, also both met

with failure in 2023.

"Knock on wood, we won't have to see one of those types of situations again," Culbert said.

That lays the groundwork for Intuitive Machines to try and achieve what no private company, or nation for that matter, has ever done, which is make a successful moon landing on its first try.

Culbert said success "demonstrates that commercial entities with relatively little direct help from NASA can do this without having to follow the government process, without NASA watching over their shoulder every step of the way."

He added that even at five years since the program was announced, that's "still pretty fast by NASA mission standards, and the prices are ludicrously cheap by NASA standards."

NASA paid Intuitive Machines $118 million for this mission, which was originally targeting a landing in the moon's mid-latitudes, but was shifted to the lunar impact crater Malaport A, about 10 degrees from the south pole.

NASA's payloads include tools to measure the moon-dust plume created by the landing, how space weather affects the lunar surface, precision landing technology, cryogenic fuel use on landing and a GPS-like beacon to assist future lunar spacecraft missions. Their value is just under $12 million.

"We know there's a lot of risk in the early missions, so we were building payloads that if we lost it, it wasn't a big deal," Culbert said. "We could re-create them fairly quickly and cheaply if we needed to."

As a commercial endeavor, Intuitive Machines is also bringing six more payloads to help offset the cost. One of those, though, is getting a free ride—a 360-degree camera built by Daytona Beach's Embry-Riddle Aeronautical University students that will be ejected just before touchdown to try and get a photo of the lander on its final descent, and also measure the dust plume.

"Understanding how when you land, you're blasting the surface with a rocket engine, right? So understanding where that dust goes and what it does is important," Culbert said pointing out that nobody knows, for instance, just how close you might be able to have human habitation nearby. "Are you sandblasting them? … Those are important pieces of things to know about future missions."

Intuitive Machines also partnered with Columbia Sportswear to use its insulation technology to protect the lander's avionics. Other payloads include an art project from sculptor Jeff Koons, a data repository from Lonestar Data Holdings and a camera for the International Lunar Observatory Association that aims to take images of the center of the Milky Way from the moon for the first time.

"We've done so much with the few federal dollars that have funded our first mission," said Intuitive Machines CEO Steve Altemus. "We built an entire lunar program, and we've had to innovate and invent technologies to get there. At that price point those technologies didn't exist before. We had to take this on and figure out a way to do things differently to lower the cost of access to the moon."

To date NASA has awarded 10 CLPS contracts worth $750 million out of a $2.6 billion budget, although one of those was to a company that has since declared bankruptcy. Intuitive Machines, though, has won three of those—all using the Nova-C lander—and has bid out for a fourth that could be announced as early as March.

"They built three of essentially the same lander," Culbert said. "I'm not sure how much that helps on the first one, but it will definitely help them on our second and third try."

Astrobotic still has another launch scheduled for late this year, with its larger Griffin lander launching on a SpaceX Falcon Heavy, along with Intuitive Machines' second mission, flying again on a Falcon 9, and potentially the first from Texas-based Firefly Aerospace, flying its Blue Ghost lander on a yet-to-be-announced launch service provider.

"They can do some things that allow us to get more bang for our buck, if you will, particularly in the science alone, the uncrewed portion of the missions," Culbert said. "The demonstration that commercial companies can do this without a lot of NASA help, that can be worth a lot."