

Press release

Lunar Navigation Challenge Winners Announced

Freelancer.com announces winning solutions for a set of innovation challenges developed on behalf of NASA

SAN FRANCISCO, California - 12 FEBRUARY 2025 – [Freelancer.com](https://www.freelancer.com) (ASX: FLN) (OTCQX: FLNCF), the world's largest freelancing and crowdsourcing marketplace by number of users and jobs posted, today announced the winners of the [Find Me On The Moon: NASA Lunar Navigation Challenge](#).

Announced in September 2024, the set of innovation challenges aimed to create low-tech orienteering tools for astronauts and devise methods to survey and map the bottom of the Shackleton Crater. Shackleton Crater is an impact crater that lies at the lunar South Pole, measuring 13 miles (21 km) in diameter and 2.6 miles (4.2 km) deep. The crater has steep sides, and continuous shadows cause temperatures at the floor of the crater to reach below 90 K, potentially resulting in water ice trapped beneath the surface.

"By opening complex space problems to freelancers worldwide, NASA received 23 award-winning breakthroughs for astronauts navigating the moon's south pole to find water. Innovation challenges are growing the space ecosystem by bringing novel ideas and practical tools from the global community," said **Trisha Epp, Program Manager for the NASA Open Innovation Services contract at Freelancer.com**.

The challenge, managed by Freelancer.com, awarded US\$50,000 in prize money to the most promising solutions in two focus areas, as independent competitions: Challenge 1 – Low-Tech Orienteering Device; and Challenge 2 – Navigating and Mapping the Interior of the Shackleton Crater.

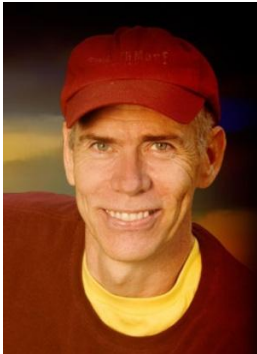
For Challenge 1, NASA sought out orienteering aids that will help the astronauts navigate on traverses away from the lunar lander and return back. While there were similar devices available to the Apollo astronauts, NASA was looking for new and unique solutions.

For Challenge 2, NASA was looking for solutions to getting to and mapping the bottom of Shackleton Crater. The solutions for this challenge must have worked in the extreme conditions of the lunar south pole and Shackleton Crater, map the crater, characterize and quantify what is in the crater, and send the data back to be used for future Artemis missions.

Challenge Winners

The challenge received a total of 83 eligible entries, with 23 entries winning a share of the \$50,000 prize pool. The top winners in each category include:

Challenge 1: Low-Tech Orienteering Device



First Place: \$5,000 | Physical Triangulation Tool

Team Lead: [Daniel Barry](#) from the United States

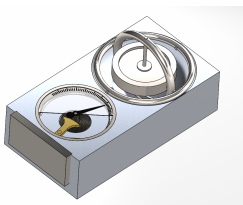
This submission introduces an ultra-lightweight (<100g), low-cost (<\$10) navigational aid that provides both heading and location without requiring power or communications. By combining a clear sleeve, blunt pegs, simple sticks, and a printed page, astronauts can orient themselves accurately on the lunar surface. Its minimal parts are straightforward to fabricate or repair on-site, and terrestrial tests using heavy mittens demonstrated 5-minute training to achieve mission-required precision.



Second Place: \$2,500 | Lunar Position Angle Ruler

Team Lead: [Jonathan Layman](#) from the United States

The Lunar Angle Ruler is a purely analog device that leverages circumpolar celestial bodies visible from the Moon's south pole, as well as a known waypoint, to determine heading. Designed to operate under low-light conditions without electronics, this method provides continuous feedback of the user's position relative to a fixed reference point. By integrating a clear mechanical interface and dust protection, the tool aims to offer a reliable, power-free solution for lunar explorers.



Third Place: \$2,500 | Lunar Orienteering Suite

Team Lead: [Neil Shah](#), Kandarp Vadia, Mahatma Kollu, Om Patel from the United States

This submission features a four-part system—a gyroscope, solar compass, gas thermometer, and stopwatch—to establish and maintain heading in lunar conditions. Initial measurements of the Sun's position are recorded with the solar compass, then the gyroscope preserves heading through dark or shadowed regions. The device's purely mechanical design negates the need for electric power, offering a resilient navigational approach adaptable to variable lunar lighting and temperature extremes.

Fourth Place | Star Analog Navigation Device (SAND), *Harry Espiloy, Quill Starling, Ian Graham, Edmy Cruz Reyes, Justin Bailey, Paula Drozdowska from the United States*

Fifth Place | Wheelie, *Mathias Ionescu-Tira, Jürgen Hartmaier from Germany*

Sixth Place | Lunar Home Finder, *Joshua Sorell from Canada*

Seventh Place | Monocular Absolute Positioning (M.A.P.), *Adam Weston from United States*

Eights Place | Lunar Manual Orientation And Positioning System (LMOAPS), *Jeffrey Morse, Steven Wu from United States*

Ninth Place | Sync View, *Nazarii Vareshchuk from Ukraine*

Tenth Place | Shadow Compass Orienteering Device, *Dennis Ragsdale from the United States*

Honorable Mention | Trig Point, *Andrew Pullin from Australia*

Honorable Mention | Polar Eyes, *Kent Nebergall from the United States*

Challenge 2: Navigating and Mapping the Interior of the Shackleton Crater

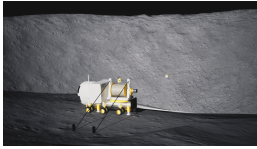


First Place: \$20,000 | Lunar Halo

Team Lead: [Kent Nebergall](#) from the United States

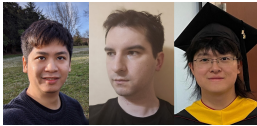


This submission introduces a modular rover system engineered specifically for extreme conditions in Shackleton Crater and other cold lunar regions. By exploiting low temperatures and reduced lighting, Lunar Halo employs unique design features that treat the environment as an advantage rather than an obstacle. The rover addresses lunar dust contamination through grinding and expulsion mechanisms, while an optional “roll cage” attachment—referenced by the “Halo” name—adds further resilience during exploration.



Second Place: \$7,500 | Navigating and Mapping the Interior of Shackleton Crater

Team Lead: [Po-Jen Wang](#), Aleksandr Kalmykov, Mingyan Zhou from the United States



This concept proposes two heavy-duty Lunar Terrain Vehicles (LTVs) to stretch a fiberglass cable across Shackleton Crater's rim. A specialized sensing module, equipped with a camera, LiDAR, IMU, and light source, traverses this cable to perform Simultaneous Localization and Mapping (SLAM). The system's suspended approach avoids hazardous terrain and delivers a comprehensive interior map of the crater through controlled, linear motion between the two LTVs.



Third Place: \$2,500 | Nyx Autonomous Lunar Hopper

Team Lead: [Ryan Manley](#), Joshua King from the United States



Nyx is an autonomous hopper designed to survey and map steep, shadowed regions within Shackleton Crater. Running on hydrolox propulsion, it can land precisely in predefined safe zones, collect high-resolution multispectral topographic data, and detect potential water ice deposits. After each sortie into the crater, Nyx returns to the rim for refueling, data transmission, and maintenance, providing a repeatable solution for long-term exploration under harsh lunar conditions.

Honorable Mention | POSEID-N, *Liam Murray, Dylan Stephens, Alex Schaar from the United States*

Honorable Mention | SPIDER (Survey Platform for Intelligent Deployment, Exploration, and Reconnaissance), *Dmitri Garin from the United States*

Honorable Mention | Wheel-Legged Robot Utilizing SLAM and Multimodal Sensors for Mapping and Resource Identification, *Nathan Hung, Tommy Kaufmann from the United States*

Honorable Mention | Mapping Shackleton Crater with Falling Beacons and AI, *Alexander Poplavsky from Poland*

Honorable Mention | Near Exploraon and Reconnaissance Flyer, *Scott Mende, Alexander Mende from United States*

Honorable Mention | Selena Buzzard (SB), *Nishma Bhatt from Canada*

Honorable Mention | LunarLENS, *Andrea Chau, Zeyu Wang, Hongming Li, Alice Li from the United*



States

Honorable Mention | *Selene, Alaf Do Nascimento Santos, Bruno Fernandes Egger, Daniel Goulart Miranda, Erika Harumi Akashi, Giovanna Bueno Marcondes, Guilherme Bertoldo Guerra, Luan Gabriel dos Santos Ayres, Rafael Peluzio from France.*

More information about the challenge and the winning solutions are available on the Freelancer website here:

<https://www.freelancer.com/contest2442541>

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