

Taiwan' s Only Private University: Aerospace Engineering Department Launches Lunar Exploration Project

Campus focus

The Department of Aerospace Engineering at Tamkang University has recently relaunched research related to deep space exploration, with lunar exploration set as the initial target. A three-year feasibility study has been initiated, showcasing the department' s strong capabilities and ambition in the space sector. Professor and Department Chair Fu-Yuen Hsiao stated that Tamkang is the only private university in Taiwan engaged in this area of research, and the results will serve as valuable references for the country' s future space programs.

In recent years, many countries have launched lunar exploration missions. Taiwan also made its debut in lunar missions in January 2025, when the Department of Space Science and Engineering at National Central University sent its self-developed Deep Space Radiation Probe (DSRP) aboard Japan' s HAKUTO-R Mission 2 lunar lander, marking a new chapter in Taiwan' s international lunar endeavors. Hsiao emphasized that Taiwan should consider independently deploying a lunar probe beyond international collaborations. Tamkang University is currently the only university in the country capable of planning such a mission.

Hsiao explained that this new research effort builds upon the outcomes of the 2020 project he led for the Taiwan Space Agency (TASA), titled "Simulation and Evaluation of Earth-Moon Transfer Trajectories and Lunar Orbits." That earlier project primarily explored Taiwan's preliminary feasibility of a lunar mission. Still, it did not delve deeply into challenges such as orbital plane changes, lunar capture uncertainties, or scientific operations after reaching the Moon. The new study will conduct a more comprehensive technical and mission feasibility assessment. Assistant Professor Kaiti Wang has joined the team to design scientific payload concepts, aiming to enhance the practicality and realization of the feasibility study.

Hsiao further noted that the 2020 team employed the Phasing Loops method to design the Translunar Injection Trajectory, from which they derived the Lunar Insertion Orbit and Lunar Polar Orbit, laying a theoretical foundation for subsequent lunar mission studies. For orbit design in the new project, the team will continue to use the Phasing Loops method while also exploring the application of low-energy transfer techniques, referencing the lunar mission trajectories recently implemented by Japan and South Korea to improve mission efficiency and cost-effectiveness. Tamkang's Aerospace Department has previously executed TASA research projects and launched 3 sounding rockets successfully. It has also been actively pursuing international collaborations, including space cooperation projects with institutions in Poland, achieving significant milestones. The department also participates in National Cheng Kung University's Taiwan Liliu CubeSat constellation research project, where it is responsible for designing novel orbital control methods. This new venture into deep space exploration further highlights Tamkang University's growing potential and contributions in space technology.



