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# ”Yueshan” (MoonFlash): A Hong Kong-Led Circumlunar Mission for Dedicated Lunar Impact Flash Observation

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As humanity prepares for a sustained presence on the Moon, understanding the dynamic hazards of the lunar environment has become a critical priority. Among these hazards, micrometeoroid impacts pose a significant threat to future lunar infrastructure and astronaut safety. This paper presents “Yueshan” (MoonFlash), the first dedicated lunar mission led by Hong Kong, designed to observe and characterize transient optical phenomena—known as “lunar flashes”—resulting from hypervelocity impacts on the lunar surface.

Spearheaded by the Laboratory for Space Research (LSR) at the University of Hong Kong, the MoonFlash mission addresses a vital gap in current planetary defense and lunar science: the lack of dedicated, circumlunar platforms for continuous impact monitoring. By deploying a specialized wide-field optical telescope into lunar orbit, the mission aims to systematically record the frequency, intensity, and distribution of impact flashes. These observations will provide unprecedented data on the flux of centimeter-to-meter-sized meteoroids in the Earth-Moon system, refining impact flux models that are essential for the engineering safety standards of future International Lunar Research Station (ILRS) assets.

This presentation will detail the mission’s scientific objectives, the design of the Hong Kong-developed optical payload, and the strategic collaboration with Mainland aerospace partners for launch and platform integration. MoonFlash not only represents a milestone in Hong Kong’s emergence as a key player in deep-space exploration but also serves as a pathfinder for international collaboration in space situational awareness. We will discuss the anticipated data products and their broader implications for lunar geology, exosphere dynamics, and the sustainable development of the cislunar economy.

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