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Fundamental Cosmology & Multi-band, Multi-messenger Astrophysics from the Moon

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With the advent of NASA's Artemis program, ESA's European Large Logistic Lander, and China's Chang'e mission, there is a growing impetus across funding agencies and private sectors for scientific payloads on the lunar surface. In this talk, I will review the ongoing efforts for Gravitational-Wave Lunar Observatory for Cosmology (GLOC) - the first concept design in the NASA Artemis era for a gravitational-wave observatory on the Moon. Such lunar-based detectors have a unique access to deci-Hz to 1 Hz frequencies, an astrophysically rich regime that is very challenging for the proposed Earth- and space-based detectors. I will focus on the fundamental cosmology and multi-band, multi-messenger astrophysics goals that are unique to GLOC. In doing so, I will compare the detection landscape of the elusive intermediate-mass black holes between GLOC and other prominent space-based missions, 3G detectors and deci-Hertz concepts.

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Session Classification: Mid-Frequency Gravitational Waves (0.1-10 Hz): Sources and Detection Methods

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