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## Multi-messenger Probes of Primordial Black Holes and Axion-Like Particles

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Superradiance provides a unique opportunity for investigating dark sectors as well as primordial black holes (PBHs), which themselves are candidates for dark matter (DM) over a wide mass range. Using axion-like particles (ALPs) as an example, we show that line signals emerging from a superradiated ALP cloud combined with Hawking radiation from PBHs, along with microlensing observations lead to complementary constraints on parameter space combinations including the ALP-photon coupling, ALP mass, PBH mass, and PBH DM fraction. For the asteroid mass range  $\sim 10^{16} - 10^{22}$  *textnormalg*, where PBHs can provide the totality of DM, we demonstrate that ongoing and upcoming observations such as SXI, JWST, and AMEGO-X will be sensitive to possible line and continuum signals, respectively, providing probes of previously inaccessible parameter space.

### Mini Symposia (Invited Talks Only)

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