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Black holes and axions: from gravitational waves to axionic beacons

Wednesday 17 February 2021 16:00 (1 hour)

I will discuss how black holes can become nature's laboratories for ultralight axions. When a boson's Compton wavelength is comparable to the horizon size of a black hole, energy and angular momentum from the black hole are converted into exponentially growing clouds of bosons, creating a gravitational atom in the sky. Previously open parameter space of axions can be constrained by observations of rapidly spinning black holes. Such black hole-axion 'gravitational atoms' can also source up to thousands of monochromatic gravitational wave signals visible in LIGO and VIRGO observatories. If the axions interact with one another, instead of gravitational waves, black holes populate the universe with axion waves that may be detectable in laboratory experiments designed for axion dark matter searches.

Zoom link:
https://weizmann.zoom.us/j/97087622747?pwd=YUIySnVRNFEveXQyZzdEeWM4MU8vQT09

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