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Laser interferometric searches for gravitational waves and ultralight dark matter

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Since the first detection of gravitational waves a decade ago, more than 300 events have been reported. The Observing Run 4 (O4) concluded in November 2025, and LIGO, Virgo, and KAGRA have since begun upgrades aimed at further improving their sensitivities. These upgrades are expected to improve sky localization, which will aid multi-messenger observations. Moreover, laser interferometric gravitational-wave detectors offer excellent sensitivity to ultralight dark matter. In this talk, I will discuss the current status of gravitational wave observations as well as direct searches for axion and gauge boson dark matter using KAGRA.

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