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## Millimeter-wave Superconducting Spectrometers for Next-Generation Cosmology

*Thursday, 9 November 2023 12:15 (15 minutes)*

The most compelling open questions in cosmology – understanding the nature of inflation, dark energy, dark matter, and light relativistic species – require cosmic surveys over extremely large volumes. The emerging technique of millimeter-wave line intensity mapping (LIM) has the potential to measure large-scale structure at distances far greater than the next generation of optical surveys. But while pathfinder instruments are now demonstrating the technique, they lack the sensitivity to constrain cosmology. Next-generation LIM experiments with orders of magnitude more sensitivity will require large-format arrays of on-chip superconducting mm-wave spectrometers. I will discuss the technical advances needed for these detectors to achieve their potential, including novel spectrometer architectures, R&D in superconducting materials, and advanced microwave readout technologies. I will also outline the path towards deploying these detectors at scale in a staged series of LIM experiments, including the SPT-SLIM pathfinder deploying next year and an eventual upgrade to the future SPT-3G+.

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