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The Detection Challenge of the Cosmic Neutrino Background and Other Relics

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The cosmic microwave background—the relic light from the Big Bang—has transformed cosmology into a precision science. Its lesser-known counterpart, the cosmic neutrino background, is another remnant from the early universe, dating back to when the cosmos was just a fraction of a second old. Although a direct laboratory detection remains beyond our current reach, discovering this background would mark a milestone of profound significance. In this talk, I will argue that building a relic neutrino telescope is, at its core, a challenge in quantum metrology. I will explore how tackling this problem may open new avenues for detecting other cosmic relics, including dark matter.

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