

Physics Colloquium

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Electrodynamics in an Expanding Universe

ABSTRACT

This presentation explores the impact of cosmic expansion on electrodynamic phenomena using the Friedman-Lematre-Robertson-Walker (FLRW) metric. Modifications to a Coulomblike potential, plane electromagnetic waves, and a hydrogen-like atom governed by the Klein-Gordon equation will be explored. The results demonstrate that the Hubble constant can, in principle, be determined using physical optics rather than the conventional geometrical optics approximation. This approach offers a new perspective on probing cosmic expansion through fundamental electromagnetic theory since the required measurements depend solely on what is recorded locally, thereby eliminating the need to measure velocities distances of far-away galaxies.



3:00-4:00 p.m., Friday, April 11th, 2025 In-person in McLane Hall 162