

Abstract Submitted  
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**Electron Interferometry with Nanogratings**<sup>1</sup> BEN MCMORRAN, ALEX CRONIN, University of Arizona — We present an electron interferometer based on near-field diffraction from two nanostructure gratings. Lau fringes are observed with an imaging detector, and revivals in the fringe visibility occur as the separation between gratings is increased from 0.2 to 2.7 mm. The oscillations in visibility depend predictably on the wavelength of incident electrons. This verifies that 5 keV electrons diffracted by nanostructures remain coherent after propagating farther than the Talbot length, and proves that a Talbot-Lau interferometer for electrons can be built with nanostructure gratings. Distorted fringes due to a phase object are used to demonstrate an application for this new type of electron interferometer.

<sup>1</sup>A. Cronin and B. McMorran, Phys. Rev. A 74, 061602(R) (2006)

Ben McMorran  
University of Arizona

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