

Abstract Submitted
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Molecular matter waves – tools and applications THOMAS JUFFMANN, MICHELE SCLAFANI, CHRISTIAN KNOBLOCH, Univ. of Vienna, ORICHESHNOVSKY, Tel Aviv University, MARKUS ARNDT, Univ. of Vienna — Fluorescence microscopy allows us to visualize the gradual emergence of a deterministic far-field matter-wave diffraction pattern from stochastically arriving single molecules [1]. We create a slow beam of phthalocyanine molecules via laser desorption from a glass window. The small source size provides the transverse coherence required to observe an interference pattern in the far-field behind an ultra-thin nanomachined grating. There the molecules are deposited onto a quartz window and can be imaged in situ and in real time with single molecule sensitivity. This new setup not only allows for a textbook demonstration of quantum interference, but also enables quantitative explorations of the van der Waals interaction between molecules and material gratings.

[1] Juffmann et al., Nature Nanotechnology, 7, 297-300, (2012).

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