

# Wave and Particle in Molecular Interference Lithography

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The wave-particle duality of massive objects is a cornerstone of quantum physics and a key property of many modern tools such as electron microscopy, neutron diffraction or atom interferometry. Here we report on the first experimental demonstration of quantum interference lithography with complex molecules. Molecular matter-wave interference patterns are deposited onto a reconstructed Si(111) 7x7 surface and imaged using scanning tunneling microscopy. Thereby both the particle and the quantum wave character of the molecules can be visualized in one and the same image. This new approach to nanolithography therefore also represents a sensitive new detection scheme for quantum interference experiments.

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