

Abstract Submitted
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Direct observation of superfluidity in an ultracold two-dimensional Fermi gas LENNART SOBIREY, University of Hamburg, MARKUS BOHLEN, LKB-ENS Paris, NICLAS LUICK, HAUKE BISS, HENNING MORITZ, THOMAS LOMPE, University of Hamburg — Understanding the mechanism for superfluidity in low dimensional systems with strong correlations is one of the major unsolved problems of condensed matter physics. Ultracold two-dimensional Fermi gases model these systems in a clean and controllable way, but so far, superfluidity has not been directly observed. Here, we present direct evidence of superfluidity in a strongly interacting 2D Fermi gas. We drag an optical lattice through a homogeneous 2D Fermi gas and observe no dissipation below a critical velocity and temperature, in excellent agreement with the Landau criterion. We find evidence for superfluidity across a wide range of interaction strengths in the BEC-BCS crossover.

Lennart Sobirey
University of Hamburg

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