

Quantum Gas in a Box

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For the past two decades harmonically trapped ultracold atomic gases have been used with great success to study fundamental many-body physics in a flexible experimental setting. Recently, we have achieved the first atomic Bose-Einstein condensate in an essentially uniform potential of an optical-box trap¹, which has opened new possibilities for closer connections with other many-body systems and the theories that rely on the translational symmetry of the system. I will present some of our recent experiments on this new system, including the study of the (Kibble-Zurek) dynamics of spontaneous symmetry breaking in a quenched homogeneous gas².

¹ A. L. Gaunt, T. F. Schmidutz, I. Gotlibovych, R. P. Smith, and Z. Hadzibabic, “Bose-Einstein Condensation of Atoms in a Uniform Potential”, *Phys. Rev. Lett.* **110**, 200406 (2013).

² N. Navon, A. L. Gaunt, R. P. Smith, and Z. Hadzibabic, “Critical Dynamics of Spontaneous Symmetry Breaking in a Homogeneous Bose Gas”. *Science* **347**, 167 (2015)