

### ***All-optical confinement of a Bose-Einstein condensate***

Magnetic confinement of Bose-Einstein condensates is incompatible with many precision measurements and applications in atom optics. Therefore, we realized an optical trap for a Bose-Einstein condensate [1]. It uses a single, focused infrared laser beam of only a few milliwatts of laser power, which is sufficient due to the very low energy of Bose condensates. In this trap, we have observed high atomic densities which were unprecedented both for Bose condensates and for optically trapped atoms. Furthermore, the trap works at arbitrary magnetic fields and for atoms in all hyperfine states. This has led to the observation of Feshbach resonances and spinor condensates. The optical trap may also serve as an “optical tweezers” to move condensates, and for example, place them close to surfaces and in optical and microwave cavities.

1. D.M. Stamper-Kurn, M.R. Andrews, A.P. Chikkatur, S. Inouye, H.-J. Miesner, J. Stenger, and W. Ketterle, Phys. Rev. Lett. **80**, 2027 (1998).