

ICFO COLLOQUIUM WOLFGANG KETTERLE 'New Forms of Matter with Ultracold Atoms: Synthetic Gauge Fields and Supersolidity'

WOLFGANG KETTERLE

September 01, 2017

Friday, September 1, 12:00, ICFO Auditorium

WOLFGANG KETTERLE

Prof of Physics, Massachusetts Institute of Technology and director of the Center for Ultracold Atoms at MIT and Harvard$$Wolfgang Ketterle has been the John D. MacArthur Professor of physics at MIT since 1998. He leads a research group exploring new forms of matter of ultracold atoms, in particular novel aspects of superfluidity, coherence, and correlations in many-body systems. His observation of Bose-Einstein condensation in a gas in 1995 and the first realization of an atom laser in 1997 were recognized with the Nobel Prize in Physics in 2001 (together with E.A. Cornell and C.E. Wieman).

His major accomplishments are the development of important tools to manipulate and study Bose-Einstein condensates, and several seminal studies of the properties of Bose-Einstein condensates and quantum degenerate Fermi gases, including superfluidity and vortices. More recently, the focus of his research has shifted towards quantum magnetism of ultracold atoms and synthetic gauge fields.

The properties of ultracold atoms can be profoundly modified with the help of laser beams. They can modify the wavefunction of neutral atoms in such a way that they show behavior of charged particles, e.g. electrons in high magnetic fields. In this way, synthetic magnetic fields and spin-orbit coupling have been realized, and a supersolid phase has been observed. A supersolid is superfluid and breaks translational symmetry, i.e. it has shape.

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