MAX PLANCK INSTITUTE
OF QUANTUM OPTICS

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Press Release

Professor Dan Stamper-Kurn is elected "MPQ Distinguished Scholar"

Professor Dan Stamper-Kurn from Berkeley University is visiting scientist at the Max Planck Institute of Quantum Optics.

The Board of Directors of the Max Planck Institute of Quantum Optics has honoured Professor Dan Stamper-Kurn from the University of California Berkeley (USA) an "MPQ Distinguished Scholar", in appreciation of his groundbreaking contributions to the field of Ultracold Quantum Gases and Quantum Optics.

The MPQ Distinguished Scholar program aims to promote cooperation with eminent scientists worldwide by inviting them to work in one of the scientific divisions. Professor Stamper-Kurn was nominated by Professor Immanuel Bloch, Director at MPQ and head of the Quantum Many-Body Systems Division. Having started his visit on 22 January this year, Stamper-Kurn will work in Professor Bloch's Division until the end of July. The certificate of honour was presented to him by MPQ Division Director Professor Rempe upon Stamper-Kurn's delivery of an MPQ Colloquium on 24 April, 2018.

Photo: From left to right: Prof. Gerhard Rempe and Prof. Dan Stamper-Kurn with the certificate (Photo: MPQ)

Professor Stamper-Kurn is a highly recognized scientist in the field of ultracold atomic matter, many-body quantum physics, quantum optics and condensed matter physics. In his current position as Professor of Physics at the University of California, Berkeley, Stamper-Kurn leads experiments that use ultracold atomic gases to investigate a variety of fundamental topics in quantum science.

One strong focus of his research is magnetism in quantum gases. He has been a pioneer in the study of spinor Bose-Einstein gases, which become low-temperature superfluids that also display magnetic ordering similar to solid-state ferromagnets. By developing numerous microscopy techniques, Stamper-Kurn has brought to light the intricate dynamics that such fluids undergo when they are suddenly induced to become magnetically ordered. His work sheds new light on quantum systems that are driven strongly out of equilibrium, and on the quantum nature of dynamics that accompany the spontaneous breaking of symmetry.

His work on magnetism also extends to the nature of gases that are trapped in optical lattices, in which the effects of interactions between atoms become amplified. His group was the first to create a kagome-geometry optical lattice, one that is strongly affected by geometric frustration and that provides a connection to research on solid-state quantum magnets.

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A second focus of Stamper-Kurn's work is the study of the implications and applications of quantum measurement. This work centers on the dynamics of atomic motion and spin that occurs when atoms are trapped inside a high-finesse optical resonator. This resonator simplifies and amplifies light-matter interaction, as described by the theory of cavity quantum electrodynamics. Stamper-Kurn has pioneered a new approach to studying cavity opto-mechanics, i.e. the quantum-level interaction between light and moving objects. Recent work shows also how light can be used to cause disparate quantum objects to interact with one another, as discussed at his April 24 Colloquium to the MPQ.

Information on the person:

Professor Stamper-Kurn began his graduate studies at the Massachusetts Institute of Technology (MIT, Cambridge) from where he obtained his PhD degree with a thesis on Bose Einstein condensates in 2000. From 1999 to 2001 he worked as a postdoctoral scientist at the California Institute of Technology (Caltech, Pasadena). In 2001, he joined the faculty of the Physics Department at the University of California, Berkeley, where he now remains as a full Professor. He also holds a joint appointment as a Faculty Scientist in the Materials Sciences Division of the Lawrence Berkeley National Laboratory.

Professor Stamper-Kurn is the recipient of the 2000 APS Division of Atomic, Optical and Molecular Physics Outstanding Thesis award, the Alfred P. Sloan Fellowship (2001 – 2003), the David and Lucile Packard Fellowship in Science and Engineering (2002 – 2007), and the Presidential Young Investigator Award in Science and Engineering (2002). He holds the Class of 1936 Second Chair in the College of Letters and Sciences (2007 – 2012), and is a Fellow of the American Physical Society and of the Optical Society of America. Most recently, Stamper-Kurn was elected to receive the Carl Friedrich von Siemens Research Prize of the Alexander von Humboldt Foundation.

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