Deutsche Forschungsgemeinschaft
Faculty of Physics, Lomonosov Moscow State University
Russian Science Foundation

Invitation to the DFG Leibniz Lecture

Professor Dr Wolfgang Ertmer
Institute of Quantum Optics
Leibniz Universität Hannover
Vice President of the DFG

COLD ATOM BASED QUANTUM METROLOGY

21 February 2017, 5.00 pm

Faculty of Physics, Lomonosov Moscow State University
Leninskie Gory, bldg 1, str. 2, Moscow, 119991

Online registration is obligatory until 20 February 2017:
https://lomonosov-msu.ru/rus/event/4130/

The lecture will be followed by a reception by the Deutsche Forschungsgemeinschaft (DFG).

About the lecture

Highly sensitive quantum sensors based on ultra-cold atomic ensembles open new horizons in quantum sensing and quantum metrology. For instance, inertial sensing by atom interferometry or optical atomic clocks benefit strongly from new methods of quantum engineering of the atomic ensembles.

Entanglement, one of the most intriguing features of quantum mechanics, is nowadays a valuable resource for the improved sensitivity of quantum metrology beyond the standard quantum noise limit. Most prominently, quadrature-squeezed and spin-squeezed states are and will be new techniques propelling atom interferometry and atomic clocks to sub-shot-noise performance. Eventually, this will pave the way towards “interaction-free” quantum measurements.

This lecture treats – besides introductory examples – innovative applications and research directions based on these developments and recent breakthroughs. This will include relativistic geodesy, pan-European clock comparisons, fundamental tests in weightlessness and on ground.

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