Berliner Physikalisches Kolloquium

im Magnus-Haus, Am Kupfergraben 7, 10117 Berlin

Eine gemeinsame Veranstaltung der Physikalischen Gesellschaft zu Berlin e.V.,
der Freien Universität Berlin, der Humboldt-Universität zu Berlin,
der Technischen Universität Berlin und der Universität Potsdam

– gefördert durch die Wilhelm und Else Heraeus-Stiftung –

Am Donnerstag, dem **7. Januar 2021, um 18:30 Uhr**

spricht

Prof. Dr. Giovanna Morigi
Theoretische Physik, Fachrichtung Physik,
Universität des Saarlandes

über das Thema

„Quantum crystals of photons and atoms“

Moderation: Christiane Koch, Freie Universität Berlin

The formation of patterns in nature is often determined by the interplay of noise and interactions of different range. Numberless examples are encountered in everyday life and can be described classically. In the nano-world, where the laws of quantum physics are dominant, our understanding is still in its infancy. The dynamics of a quantum many-body system subject to interactions, dissipation and driving forces poses severe theoretical challenges. Understanding the quantum dynamics of these pattern formation processes is an important question of fundamental research and a crucial issue for quantum technological applications, where one aims at robust quantum coherent dynamics in systems of mesoscopic size. A promising and flourishing approach to tackle these questions is offered by the study of ultracold ensembles of atoms coupled to the light fields of high-finesse optical cavities. In these systems quantum structures of photons and atoms emerge from a quantum nonlinear interaction between scattering particles in the presence of noise and dissipation. The inter-atomic interactions are here mediated by multiple scattering of cavity photons and have a long-range character, which makes these systems a unique platform for shedding light into dynamics predicted in other fields of physics, ranging from nuclear physics, nonlinear dynamics, and astrophysics. In this talk I will discuss the basic physical mechanisms leading to crystalline structures of photons and atoms and will review insights gained by theoretical and experimental studies of these systems.

Auch zu lesen im Internet: http://www.pgzb.tu-berlin.de/