Ninth episode of the science podcast "exzellent erklärt" now online

Start Time: Monday, March 21, 2022

End Time:

Michael Köhl and Sebastian Diehl investigate the fundamentals of quantum mechanical phenomena. At the Cluster of Excellence ML4Q, they bring together their expertise in experimental and theoretical physics to create network architectures for quantum computers. There are many problems to be solved - for example, the question of how quantum computers can be networked together, even though the quantum states they need to function are difficult to be kept stable.

Prof. Michael Köhl heads the Experimental Quantum Physics group at the University of Bonn. His research focuses on the study of ultracold atoms and trapped ions for the purpose of quantum information processing and quantum simulation. Köhl worked in the research groups of Nobel Prize winners Wolfgang Ketterle (MIT) and Theodor Hänsch (MPI Garching) during his diploma and doctoral theses. After research stays in Switzerland (ETH Zurich) and Great Britain (University of Cambridge), he returned to Germany as Alexander von Humboldt Professor at the University of Bonn, where he has been developing an outstanding research focus at the interface of quantum optics and condensed matter since 2013.

Prof. Sebastian Diehl heads his research group at the Institute for Theoretical Physics at the University of Cologne. As part of the Excellence Initiative, Diehl was appointed to the University of Cologne in 2015 to conduct research at the interface between quantum optics and many-

body physics. An important goal of his research is to uncover new macroscopic phenomena that reflect quantum mechanical many-body systems. To this end, he is developing theoretical tools to efficiently describe such quantum systems. At the same time, his research group is working on identifying experimental platforms in which the theoretical predictions can be tested.

ML4Q stands for Matter and Light for Quantum Information and combines the unique expertise of the participating partners in three key disciplines of physics - solid state research, quantum optics and quantum information - to create the best hardware platform for quantum information technology and blueprints for a functional quantum information network. Quantum computers promise computing power beyond that of all classical computers, e.g. for materials research, pharmaceuticals or artificial intelligence. The goal of ML4Q is to create new computer and network architectures based on the principles of quantum mechanics.

The German science podcast on current science topics reflects the research diversity of Germany's leading research institutions and Clusters of Excellence: from Africa Studies to Quantum Physics. In each episode, listeners can expect insights into the interdisciplinary work of one research network. The researchers of the clusters of excellence, funded by DFG talk to podcaster Larissa Vassilian about how they want to find scientifically based answers to relevant topics of our time – for the society of tomorrow. Listen in and follow us: https://exzellent-erklaert.podigee.io/