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题目: Superconducting quantum micro-electronics using artificial atoms, for future quantum optics, opto-electronics, and quantum information

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报告简介: Atomic physics, quantum optics, nanoscience, condensed matter physics, and quantum information are partly merging as new interdisciplinary areas form to involve all of these traditionally separate subfields. For instance, superconducting circuits based on Josephson junctions can exhibit macroscopic quantum coherence and can behave like artificial atoms. Recent technological advances have made it possible to implement atomic-physics and quantum-optics experiments on a chip using these artificial atoms, as well as performing quantum computing tasks. This talk presents a brief overview of the progress achieved so far in this rapidly advancing field. I will not only discuss phenomena analogous to those in atomic physics and quantum optics with natural atoms, but also highlight those not occurring in natural atoms. In addition, I will summarise its current status and several prospective directions in this emerging interdisciplinary field.

报告人简介: Prof. Franco Nori is a RIKEN Chief Scientist, heading the "Theoretical Quantum Physics Laboratory," and has a concurrent position at the University of Michigan, Ann Arbor, USA. His research is very interdisciplinary, spanning various areas, including quantum optics and quantum information processing. He is a Fellow of the American Physical Society, the Optical Society of America, the UK's Institute of Physics, and the American Association for the Advancement of Science. He is an elected member of the Latin American Academy of Sciences, the European Academy of Arts and Sciences, and the Swedish Royal Society of Arts and Sciences, in Gothenburg, Sweden. He received the 2023 Willis Lamb Medal and the 2024 Charles Townes Medal, both for work in quantum electronics, quantum optics, and quantum information. He is listed as Highly Cited scientist for the past eight consecutive years (totally ~103000, h-index 143 in Google Scholar), and publishes 5 reviews in Rev. Mod. Phys., 142 articles in Phys. Rev. Lett., and 76 articles in Science and Nature journals.