



# Mott Lecture 2024: Professor Franco Nori

16 May 2024 5.30pm - 7.00pm To be confirmed

Professor Franco Nori, Chief Scientist at Theoretical Quantum Physics Laboratory, RIKEN, Japan

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

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 can be engineered to exhibit quantum phenomena that are normally associated with atomic systems, and so provide a platform for testing various ideas in atomic physics and quantum optics. And these also can be used to perform quantum analog simulations, quantum computing calculations, and other tasks on quantum information processing. This talk will review the progress made in this field, which has attracted billions of dollars in research and development.

Superconducting circuits based on Josephson junctions 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.

## Contact and booking details

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Cost	Free
Booking required?	Yes
Booking information	To be confirmed

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