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沖縄科学技術大学院大学

VISITING PROGRAM

TSVP TALK

How To Trust a Quantum Box: Bell's Theorem for Quantum Engineers

2025
THU. **Nov. 13**

15:00–16:00

HYBRID L5D23, ZOOM



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How can we be sure that a quantum device really performs as intended? As quantum technologies promise secure communication, certified randomness, and unprecedented computational power, verifying their behavior becomes both essential and surprisingly challenging. One of the deepest results of 20th-century physics, Bell's theorem, has become a practical tool: it allows us to test quantum behavior by treating devices as black boxes and observing only their input–output statistics. In this talk, I'll introduce the central ideas behind this approach, known as device-independent quantum information, and show how fundamental physics offers new ways to build and trust quantum technologies.

Université libre de Bruxelles

Stefano Pironio

Stefano Pironio works on quantum information theory, exploring how the counterintuitive features of quantum physics, such as entanglement and nonlocality, can be used for information processing and security. He is a F.R.S.–FNRS Research Director at the Université libre de Bruxelles (ULB). He obtained his PhD from ULB in 2004 and held postdoctoral positions at Caltech, ICFO–The Institute of Photonic Sciences, and the University of Geneva. His work has been recognized with the QIPC Young Investigator Award, the De Donder Prize of the Belgian Academy of Sciences, and the Prix La Recherche.



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