

NITheCS Colloquium

Monday, 11 April 2022, 16h00 – 17h00 SAST

Dr R. Srikanth (Poornaprajna Institute of Scientific Research (PPISR), Bengaluru, India)

'Counterfactual security of quantum key distribution'



ABSTRACT

Counterfactual cryptography involves the use of interaction-free measurement to enable two players (Alice and Bob) to share a secret key. Here the key bits are generated counterfactually, i.e., in situations where Bob's action to block Alice's transmitted photon doesn't lead to a detection on his end. Here, we show how the key rate can be enhanced by including non-counterfactual bits, i.e., cases where Bob's blocking actions lead to a detection. This approach in a sense introduces a twist to the quantum counterfactual theme in terms of what we may call 'counterfactual security', whereby non-counterfactual key bits are rendered secure by counterfactual detections.

BIOGRAPHY

After obtaining his PhD at the Indian Institute of Science (India), and postdoctoral stints at the Indian Institute of Astrophysics and Raman Research Institute, Dr R. Srikanth joined as a faculty member with Poornaprajna Institute of Scientific Research (PPISR), Bengaluru. Here, he is currently an Associate Professor in the Theoretical Sciences Department.

His main research interests are in the areas of the foundations of quantum mechanics, quantum information theory, solar physics and philosophy (consciousness, free will and causality). He is the founding coordinator of the Center for Foundational Study within PPISR, which aims to explore ways to bridge science and philosophy.

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