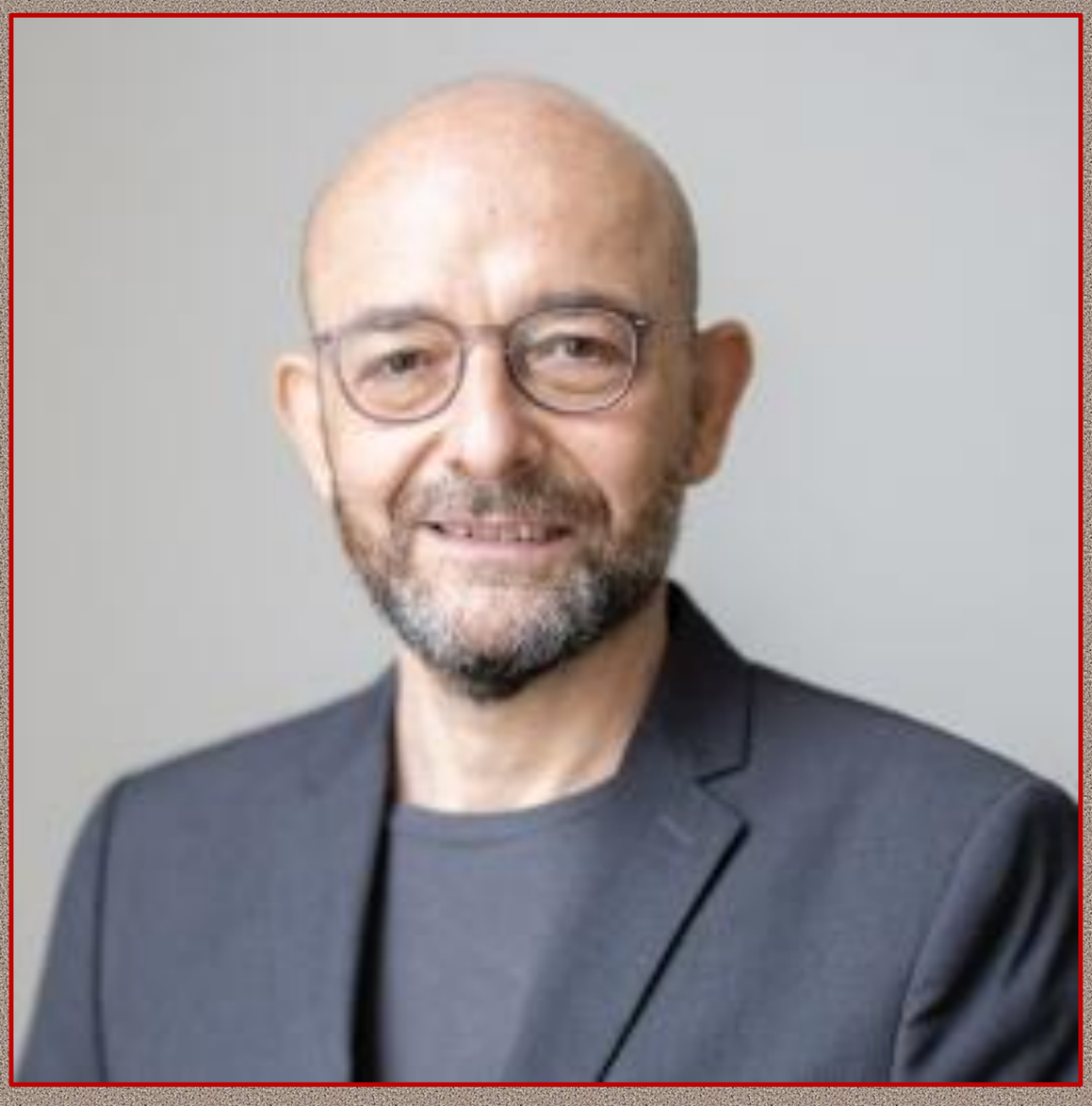
International Year of Quantum Science and Technology (IYQ)-2025, at TCG CREST (Kolkata, India)



Prof. Caslav Brukner

University of Vienna, and Institute for Quantum Optics and Quantum Information (IQOQI), Austria.

Date & Time:

13th November, 2025 @ 3:00 PM IST

Venue:

Classroom-4, TCG CREST

Join Zoom Meeting:

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Title – What is an observable in quantum reference frames?

Abstract

An invariant observable is defined as a measurable quantity whose statistics are unchanged under the symmetry group describing transformations between classical reference frames. I extend this notion to quantum reference frames (QRFs), where reference frames are physical systems that can exist in superposition and become entangled with the systems they describe. I model changes of QRF as quantum-controlled reference-frame transformations and define invariant observables as those unchanged under this enlarged group. In this setting, standard notions such as coherence and entanglement—while invariant under classical frame changes—fail to be invariant under QRF transformations. However, I show that suitable combinations of coherence and entanglement do remain invariant under QRFs.

Organized by:

CQuERE (Centre for Quantum Engineering, Research and Education), TCG CREST, Kolkata, INDIA

For more details, please visit the website: http://www.tcgcrest.org/iyq2025

For any queries, feel free to contact us through the email: iyq.2025@tcgcrest.org