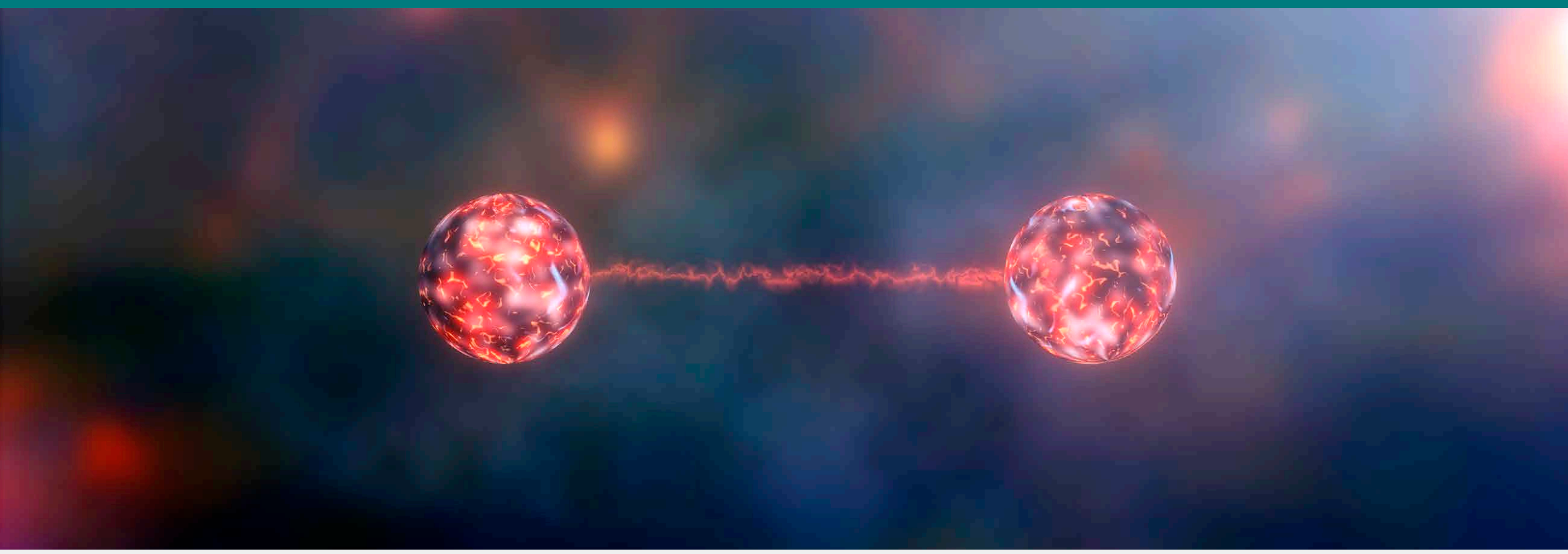

פרופסור סנדו פופסקו

מרכז בריסטול לננו-מדע ולאינפורמציה קוונטית
בית הספר לפיזיקה, אוניברסיטת בריסטול, בריטניה

Professor Sandu Popescu

The Bristol Centre for Nanoscience and Quantum Information
School of Physics, University of Bristol, UK

Colloquium | קולוקוויום

QUANTUM NON-LOCALITY AND BEYOND

Abstract:

Long considered to be a fringe aspect of quantum mechanics, non-locality is now understood to be one of the main aspects of nature – and the experimental proof of its existence via the so-called Bell inequality violations has been rewarded with the Nobel Prize 2022. In my talk I will explain, in elementary terms, what non-locality is. I will then focus on an even more exciting issue. That nonlocality can exist at all, given the constraints imposed by relativistic causality, is an extraordinary fact. Surprisingly, it was found that even stronger nonlocal correlations are possible in principle, without contradicting relativity. Whether or not such correlations exist in nature is an open experimental question. If they exist, quantum mechanics is wrong and has to be replaced. If they do not exist - why not? What is the fundamental physical principle that forbids them? Could quantum mechanics be derived not from the study of spectra of atoms and such but from taking the existence of non-locality and these new principles as basic axioms? Here, I will describe some of the recent directions in the intensive effort to answer this question.

The colloquium will be held on Sunday
27 November 2022, at 14:00
Room 104, Shenkar Physics Building
Tel Aviv University, Ramat-Aviv

הקולוקוויום יתקיים ביום ראשון
27 בנובמבר 2022, בשעה 14:00
חדר 104, בנין שנקר לפיזיקה
אוניברסיטת תל-אביב, רמת-אביב

Light refreshments will be served before the Colloquium | כיבוד קל יוגש לפני הקולוקוויום