

# The 5th PUBLIC ExU COLLOQUIUM

April 30<sup>th</sup> (Wed.) ONLINE

TALK 17:00 - 18:00 (JST)

April 30<sup>th</sup> (Wed.) 9:00 - 10:00 (BST)

April 30<sup>th</sup> (Wed.) 8:00 - 9:00 (GMT)

ONLINE CHAT TIME  
18:00 - 19:00 (JST)

Registration required (click [HERE](#))



Speaker

Prof. Ángela Capel Cuevas

University of Cambridge

Extreme Universe, JAPAN



MEXT -KAKENHI- Grant-in-Aid for Transformative Research Areas (A)  
The Natural Laws of Extreme Universe

## The Many Faces of Quantum Entropy From Divergence Measures to Conditional Independence

### Abstract

Quantum information theory has given rise to a diverse ecosystem of entropies and divergence measures, each reflecting different operational nuances and mathematical subtleties. While these quantities begin as tools for quantifying distinguishability and uncertainty, they also illuminate deeper features of quantum correlations. In this talk, we will provide an overview on the main entropies and divergences present in the field of quantum information, and we will explore how entropic inequalities and divergence-based characterizations shape our understanding of quantum Markov chains and conditional independence of quantum systems. We will discuss how recovery maps emerge from entropic inequalities, the notion of approximate Markovianity, and the subtle interplay between quantum structure and information flow. Along the way, we will explore structural theorems, approximate recoverability, and the rich geometry underlying quantum correlations.

Extreme  
Universe 2025