# MATHEMATICS COLLOQUIUM

### *Quantum Information Processing under Spacetime Constraints*

THURSDAY

## APRIL

# 4

4:30 - 5:30PM
LECONTE COLLEGE
ROOM 103

Quantum position verification (QPV) is a cryptographic task in which the spatial location of an untrusted agent is certified using the principles of quantum mechanics and special relativity. The problem of QPV fits under a more general framework of information processing with spacetime constraints. In this talk, I will describe this framework after providing an accessible introduction to qubits (quantum bits) and quantum communication. I will then turn to our recent theoretical work analyzing the structure of QPV protocols in which the distribution of product states is used to certify a spatial location, and an honest prover must perform a joint measurement on the signals. This particular class of QPV protocols reveals separations in security based on whether the adversaries are restricted to classical versus quantum communication. No prior knowledge of quantum physics is needed to enjoy this talk.

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