1139-68-345 **Ashley Montanaro*** (ashley.montanaro@bristol.ac.uk). *Quantum states cannot be transmitted efficiently classically.*

In this talk I will show that any classical communication protocol that can approximately simulate the result of applying an arbitrary measurement (held by one party) to a quantum state of n qubits (held by another) must transmit at least 2^n bits, up to constant factors. The argument is based on a lower bound on the classical communication complexity of a distributed variant of the Fourier sampling problem. Two optimal quantum-classical separations follow as corollaries. First, a sampling problem which can be solved with one quantum query to the input, but which requires order-N classical queries for an input of size N. Second, a nonlocal task which can be solved using n Bell pairs, but for which any approximate classical solution must communicate 2^n bits, up to constant factors.

The talk will be based on the paper arXiv:1612.06546. (Received February 16, 2018)