1171-97-220 **Dunbar Birnie**, **Christopher Cheng** and **Emina Soljanin*** (emina.soljanin@rutgers.edu).
Codes for Reconciling Jitters.

In time entanglement-based quantum key distribution (QKD), Alice and Bob extract the raw key bits from the (identical) arrival times of entangled photon pairs. If they could measure the photon arrival times with unlimited precision, they would generate an unlimited number of key bits. Instead, Alice and Bob extract their raw key bits by time-binning as follows. Each of them individually discretizes time into bins and groups the bins into frames. Then, they use the position of the occupied bin within a frame to generate random key bits. Because of entanglement, their photon arrival times and thus their keys should be identical. However, practical photon detectors suffer from time jitter errors. These errors cause discrepancies between Alice's and Bob's keys. For fixed frame size, the smaller the bin, the more information it carries. However, the smaller the bin, the larger the probability of Alice's and Bob's disagreement. This talk explains time binning, jitter errors, and implications on non-binary (LDPC) codes that Alice and Bob could/should use to reconcile their raw keys. Time entanglement QKD promises to increase the key rate and distribution distances compared to other entanglement-based QKD implementations. Can it live up to its promise? (Received August 15, 2021)