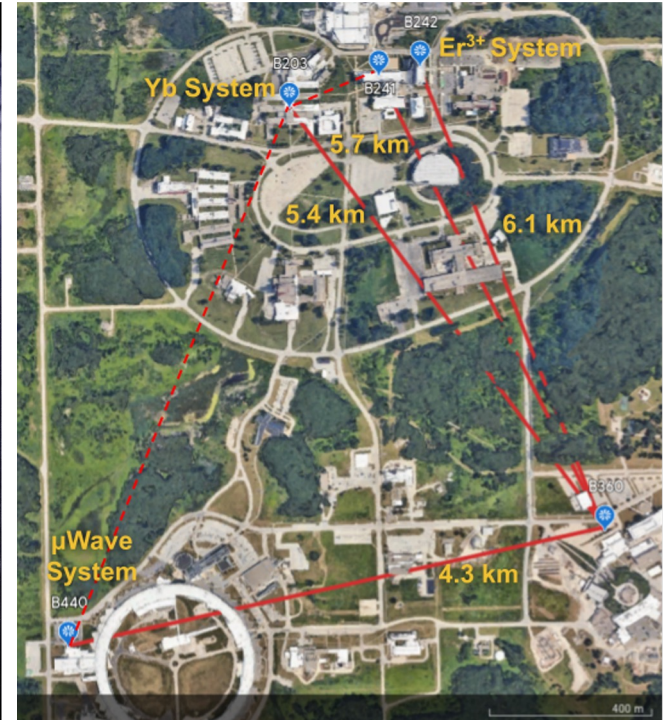# Argonne Quantum Network (ARQNET) Testbed

- Connects 5 buildings in the Argonne campus on a star topology using deployed fiber
- Long distance connections to Fermilab and StarLight using dark fiber
- NuCrypt EPS – cascaded SHG-SPDC
  - |HH> + |VV> Bell state generated in Sagnac Loop
  - 3-wavelength channels
  - Pump @ 1550.1 nm (ITU Ch. 34)
- Polatis 16x16 SDN Switch
  - 16 input and output channels
  - Controlled via REST and NETCONF APIs
- Quantum Opus SNSPD
  - 2 detectors
  - 85% efficiency at 1550 nm

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Team Structure & Project Timeline

Argonne team:

- Ji Liu (co-PI), Md Shariful Islam, ARQNET team

Year1(FNAL, ANL):

- Deployment of ultra-low jitter superconducting nanowire single photon detectors (SNSPDs) in the Fermilab and ANL QNodes.

Year2&3(FNAL, Caltech, ANL):

- Demonstrate long-distance entanglement swapping between Fermilab and ANL.

Year2&3(NU, FNAL, Caltech, ANL):

- Achieve entanglement swapping with classical coexistence.

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