



Contribution ID: 90

Type: **Talk**

Scalable silicon quantum photonics

Friday, 10 May 2024 12:00 (30 minutes)

Over the past two decades, quantum photonic devices have exploded in scale and complexity, with application to every corner of quantum information science. However, the writing is on the wall: to make scalable photonic quantum technology, we must do away with postselection and its exponentially poor scaling. This means building dynamic quantum circuits, featuring measurement and feedforward, and closing the loop on detection and modulation within our photons' lifetime. The challenge is extensive—ultra-low-loss circuitry and high-speed modulation must be packaged together with low-latency logic, likely in a cryogenic environment. Furthermore, all of these elements must be co-packaged in a holistic design, with each domain (electronic, photonic, cryogenic) placing strict requirements on the others. In this talk, I will discuss our efforts to build scalable quantum photonic systems in the Big Photon Lab at the University of Bristol, featuring 2-micron-band silicon photonics, DC-Kerr modulation, space/frequency filters, detector readout ASICs, and tools for the co-design of photonic, electronic and quantum systems.

Presenter: C. ADCOCK, Jeremy (University of Bristol / Qontrol Systems)

Session Classification: Talks