



Contribution ID: 41 Contribution code: WEYD03

Type: Invited Oral Presentation

Application of Accelerator Technology to Quantum Information Science

Wednesday 13 August 2025 12:00 (30 minutes)

The intersection of accelerator and quantum information science (QIS) offers a unique platform to advance both fields through shared technology and infrastructure. This talk will discuss the synergies which exist between these two vastly different but complementary domains. We demonstrate how we leverage pre-existing infrastructure and knowledge to perform research and development which helps to realize dramatic improvements in both 10 km long accelerators and 10 cm large quantum processors. We will explore niobium superconducting radio-frequency (SRF) cavities, a mature technology that excels in efficiently storing electromagnetic energy, enabling ultra-long photon lifetimes critical for quantum processors and facilitating the characterization of quantum materials with parts-per-billion precision. We will also discuss how advancements in superconducting materials, cryogenic systems, and control techniques help to reduce cost and improve performance for both quantum systems and particle accelerators. Moreover, we will discuss cross-disciplinary applications such as dark-matter searches and demonstrate the convergence of these fields in addressing fundamental scientific questions.

Please consider my poster for contributed oral presentation

No

Would you like to submit this poster in student poster session on Sunday (August 10th)

No

Footnotes

Funding Agency

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I have read and accept the Privacy Policy Statement

Yes

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Session Classification: Applications of Accelerators, Technology Transfer, Industrial Relations, and Outreach (Invited)

Track Classification: MC8 –Applications of Accelerators, Technology Transfer, Industrial Relations, and Outreach