Project SIQCI: Scalable Architecture for Ion-Trap Quantum Computing Integration

Alpine Quantum Technologies GmbH, Quantinuum GmbH, Warsaw University of Technology

- Developing technology stack for ion-based quantum computing
- Building blocks for scalable devices with multiple processing zones and physical qubit operations
- Device-aware compilation and performance benchmarking

**MICRO-STRUCTURED CHIP TRAPS**

- www.aqt.eu/qc-modules/

**LOW-NOISE REAL-TIME CONTROL**

- sinara-hw.github.io

**EFFICIENT COMPILATION FOR SCALABLE ION TRAPS**

- https://github.com/CQCL/tket

- Development and production of a monolithic, three-dimensional ion trap with segmented electrode structure.
- Enabling of ion shuttling between several processor zones.

- Development of an FPGA subsystem for driving an in-vacuum cryogenic electronics stack that is tailored for operation of segmented ion traps.

- Integration of the physical transport operations into tket™.
- Compiler pass optimizing taking into account trap topology and of operations fidelities.