

SemiQonTM

www.semiqon.tech

Quantum Computers

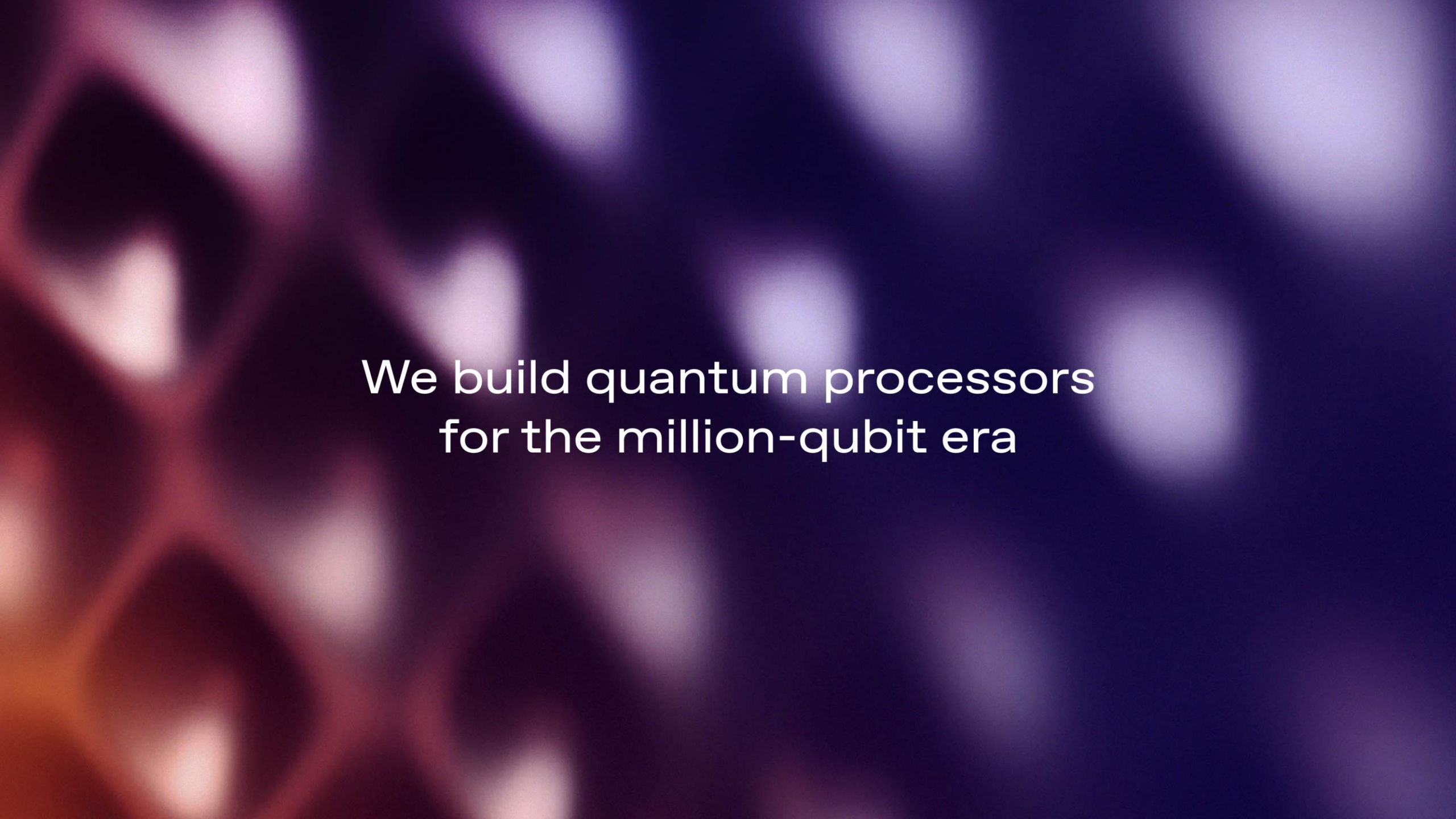


XX years from now



?

XX years further



We build quantum processors
for the million-qubit era

Scalable and affordable
quantum computers

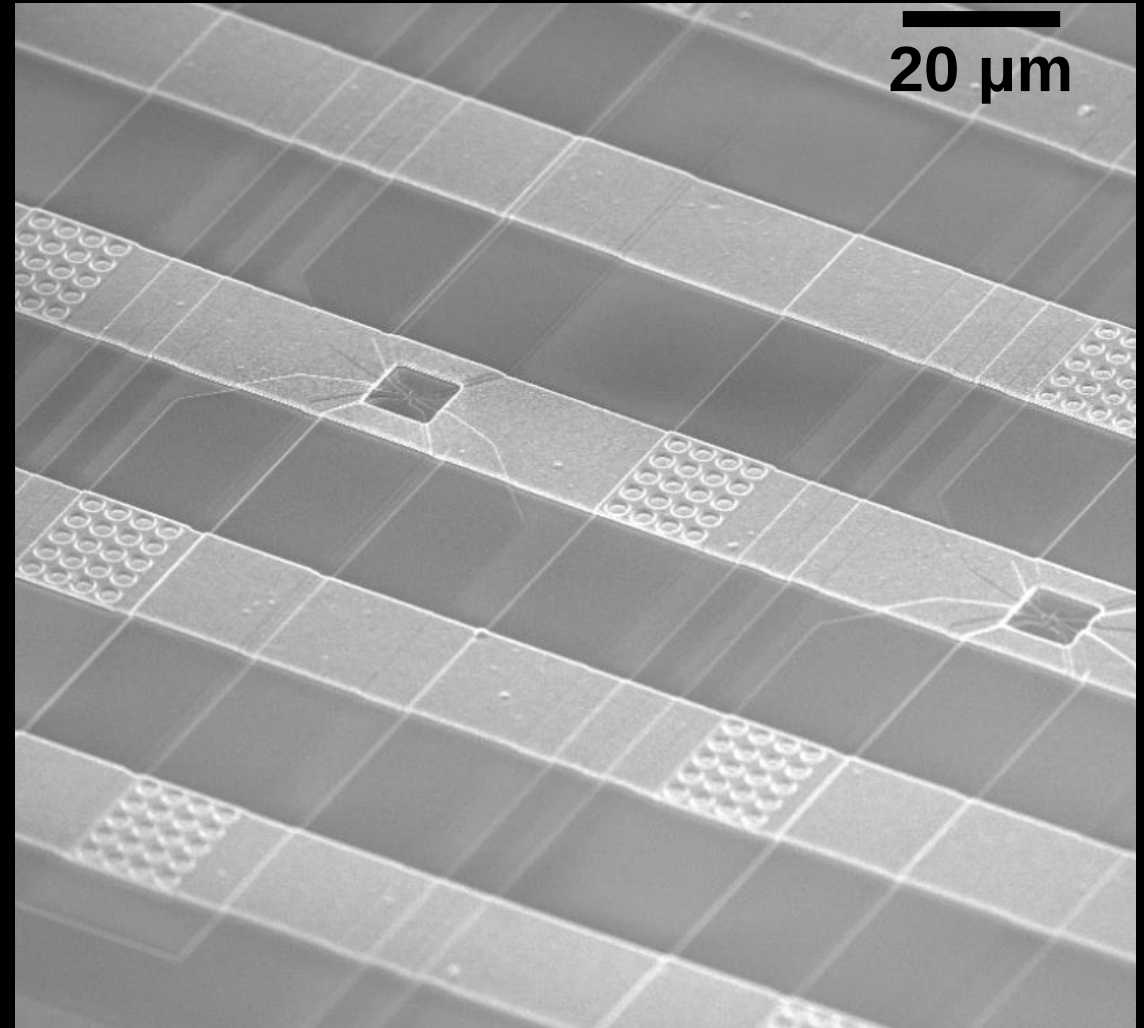
100 times more densely packed processors
operated at 100 times higher temperature,
manufactured using affordable standard
semiconductor manufacturing methods.

Company Facts

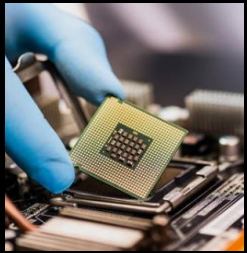
- A spin-out from VTT's Launchpad Incubator.
- Started operations in 2023 in Espoo, Finland and operates at the Micronova Center pilot line and own lab in MIKES metrology centre.
- Secured EUR 2 million in funding by February 2023. Lead investor Helsinki-based deep tech investor Voima Ventures.
- Founders Himadri Majumdar, PhD (CEO), Janne Lehtinen, PhD (CSO), Mika Prunnila, PhD (CRO), and Markku Kainlauri (Lead, Fabrication) have all previously worked at VTT and have combined experience of over 60 years in microelectronics and quantum technologies.
- 8 member team (October 2023)
- 1.2M€ Business Finland deep-tech grant funding
- 2.5M€ European Innovation Council grant funding

What is our approach?

- We utilise customised CMOS fabrication process
- We do monolithic quantum and classical circuit integration
- We have capability for fast design and material iterations



Why this approach?



Established (but unique!) manufacturing technology



Typical semiconductor manufacturing at scale



Scale



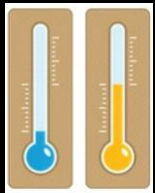
Qubit size



Qubit area about $\sim 0.000001x$ compared to superconducting qubits



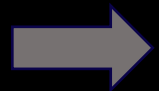
Scale



Operational temperature



100x higher operational temperature compared to superconducting qubits



Cost
Scale



Control integration



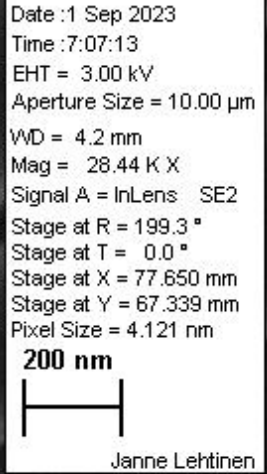
Full system integration – quantum IC!



Cost

First fabrication run

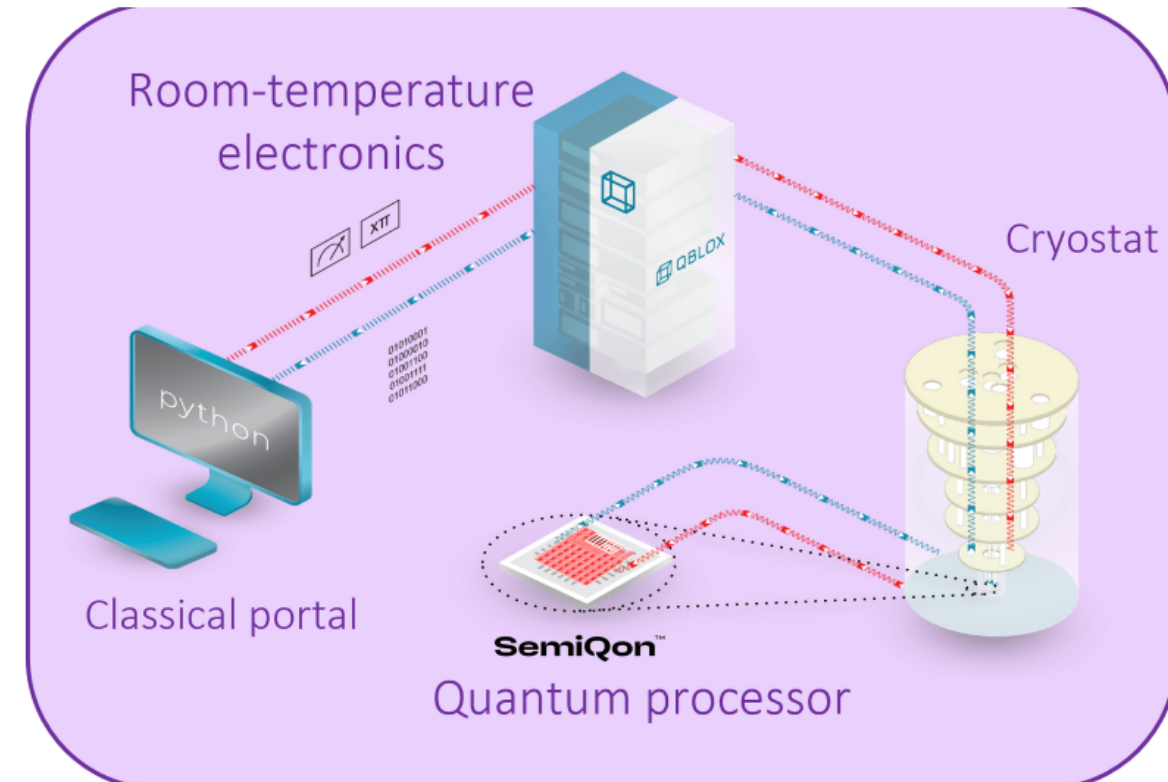
- Up to 12 quantum dots (spin-qubit) designs
 - First run complete.
 - Second run ready in Oct.
- Run completion time about 3 months
 - First runs ~5 months
- Both quantum dot devices and cryogenic CMOS circuits



- SemiQon develops QPUs
- Qblox does the system integration

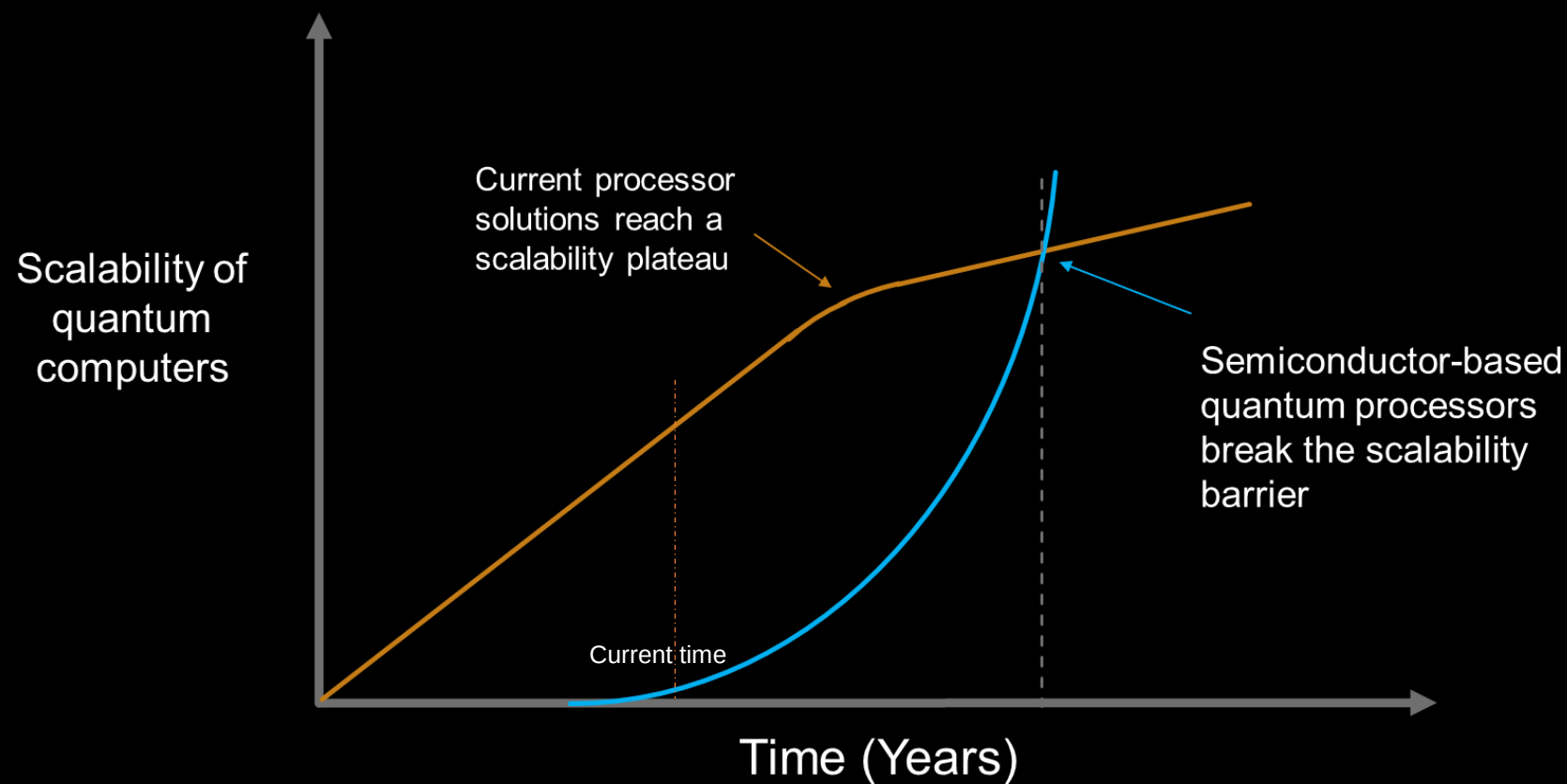
SemiQon and Qblox secure €2.5 million EIC Transition funding

News



The European Innovation Council has approved a €2.5 million grant funding to SemiQon, a leading developer of silicon-based quantum processors and Qblox, a leading provider of scalable and modular qubit control stacks. The goal of the project is to build high quality silicon-based spin-qubits and the tools to control and operate them sustainably, using a scalable quantum computing control stack. The project will be coordinated by SemiQon.

Hypothetical scenario



SemiQonTM

Fulfilling the promise of quantum computing with scalable quantum processors

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