

SemiQonTM

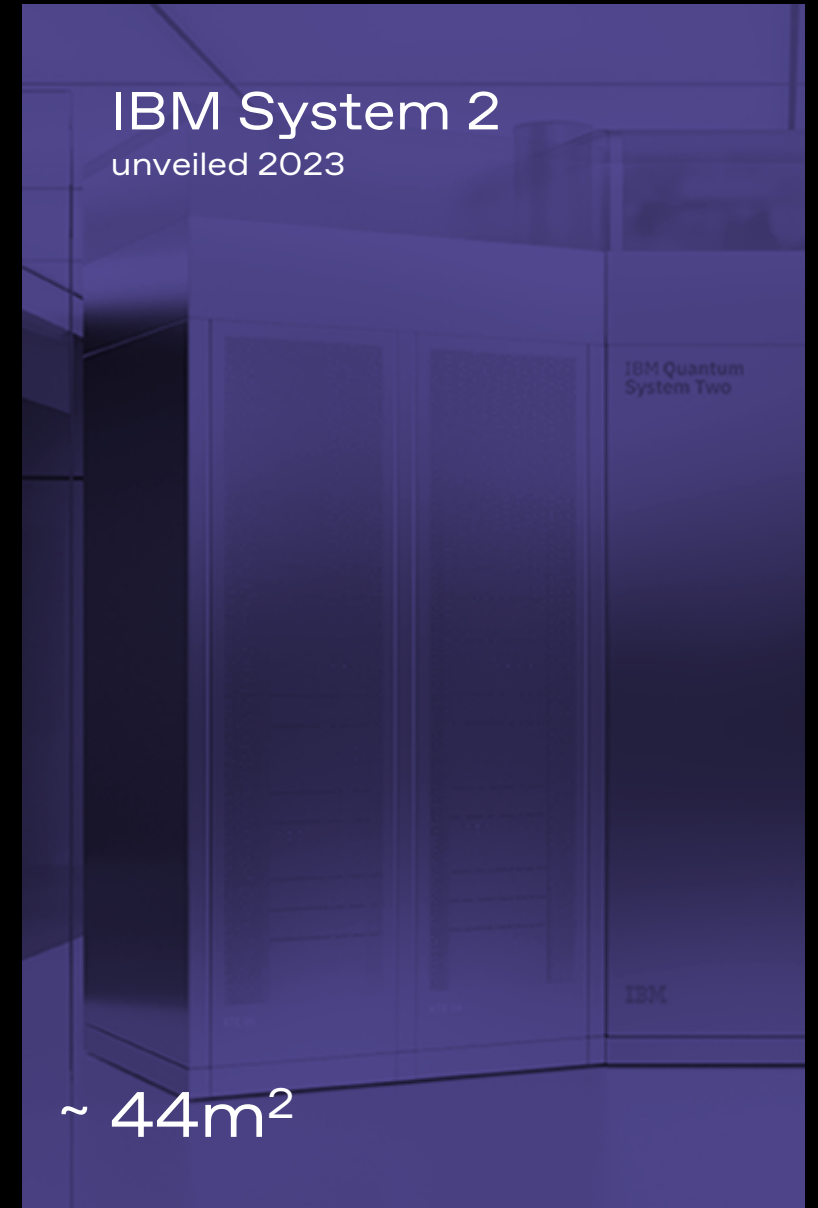


We power quantum
computers for the
million-qubit era.

THE PROBLEM

Quantum computers keep getting bigger as they get better

The complexity of control electronics, wiring, and cooling becomes the dominant scaling bottleneck.

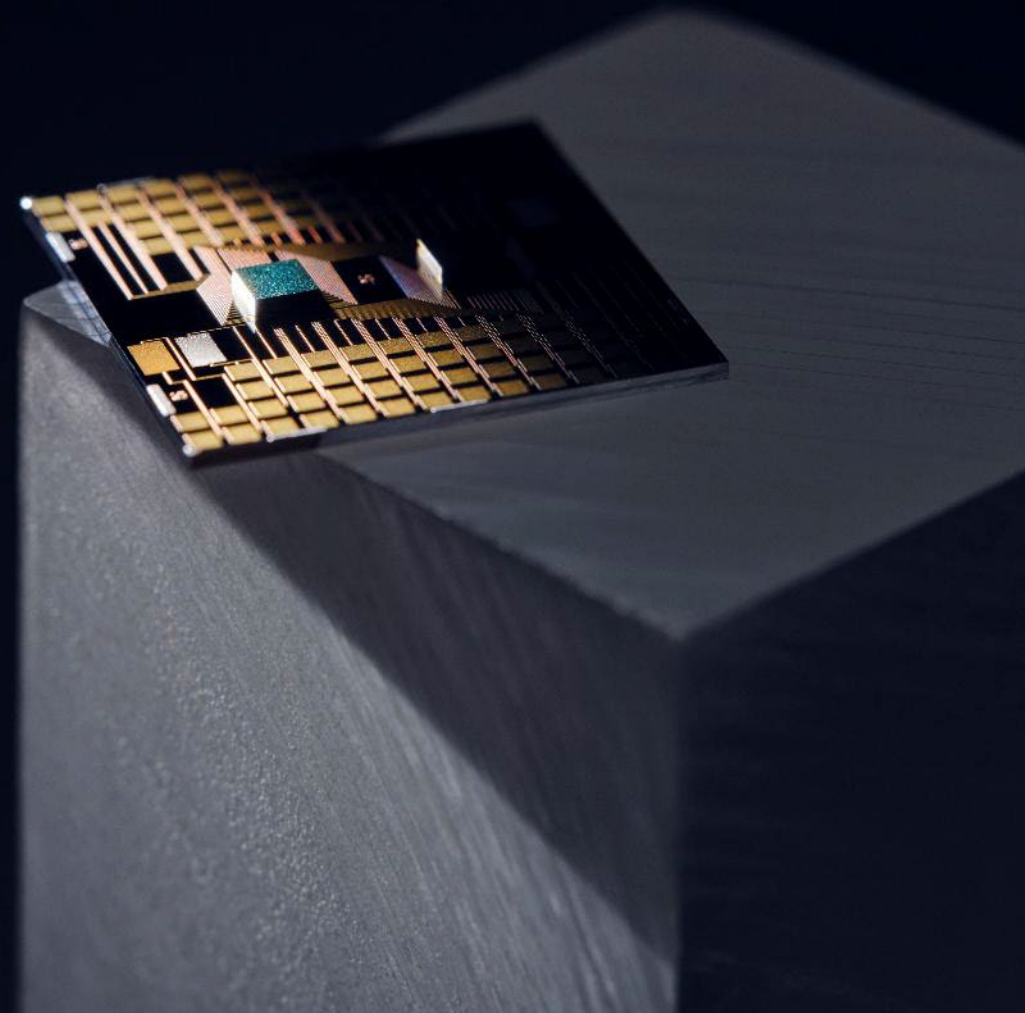


THE SOLUTION

Quantum electronics on a fingertip

Cryo-optimized CMOS solutions to
scale up quantum computing across
qubit modalities

- Control electronics converted to a chip inside the cryostat, eliminating bulky room-temperature wiring
- Built on proven CMOS technology, optimized to run reliably at sub-kelvin to millikelvin temperatures
- Designed as a modality-agnostic platform compatible with all major qubit technologies



Company overview

SemiQon in numbers

2023

Founded

Finland

Headquarters

40+

Employees

30

Engineers & PhDs

2026

First customer
shipment

>15M€

Fundings

10+

Customers

+10

Patent families ignited

SemiQon team

Executive and founding team



Dr. Himadri Majumdar
CEO, Board Member



Dr. Janne Lehtinen
Chief Technology Officer, Board Member



Prof. Mika Prunnila
Chief Research Officer



Markku Kainlauri
Chief Operations Officer

Board



Dr. Antti Vasara
Chair of the Board



Jussi Sainiemi
Director

Advisory



Prof. Prineha Narang
UCLA, USA



Prof. Juha Muhonen
Jyväskylä University, Finland

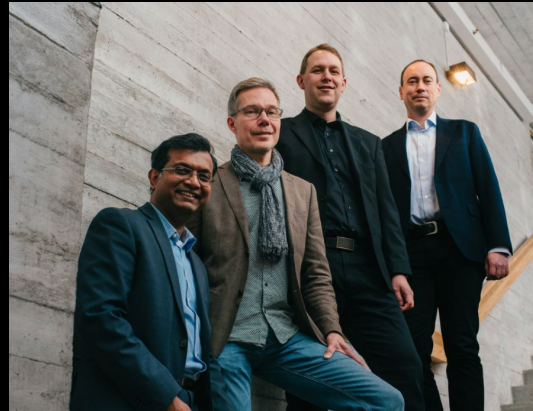
Our technology & capabilities

Milestones to date



Peter Sarlin-led
PostScriptum invests
in quantum hardware
developer SemiQon

JULY 2026



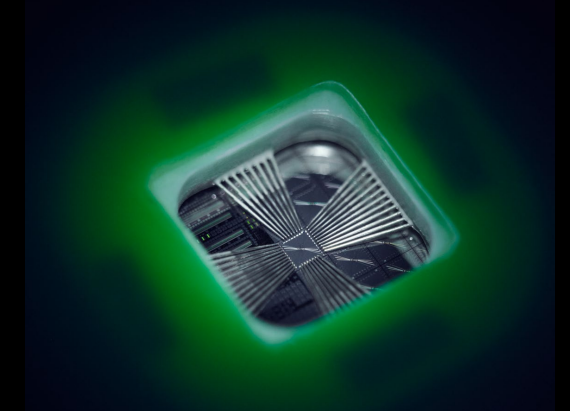
SemiQon celebrates
three years and enters
new growth phase

FEB 2026



SemiQon wins EARTO
first prize for cryo-
CMOS chip innovation

OCT 2025



SemiQon develops
the world's first
CMOS transistor
optimized for
cryogenic
temperatures

NOV 2024

OUR TECHNOLOGY & CAPABILITIES

What sets us apart

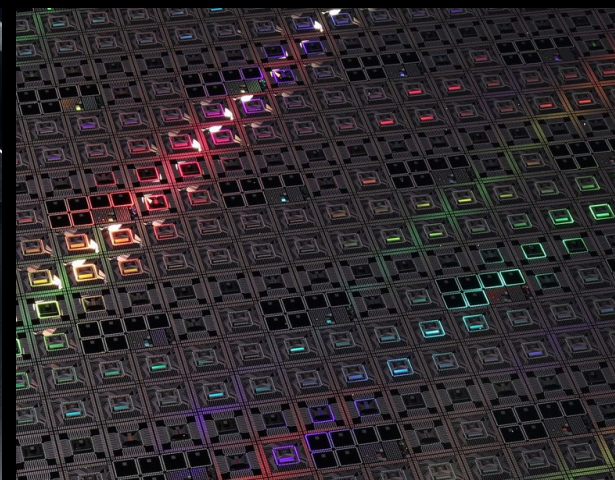
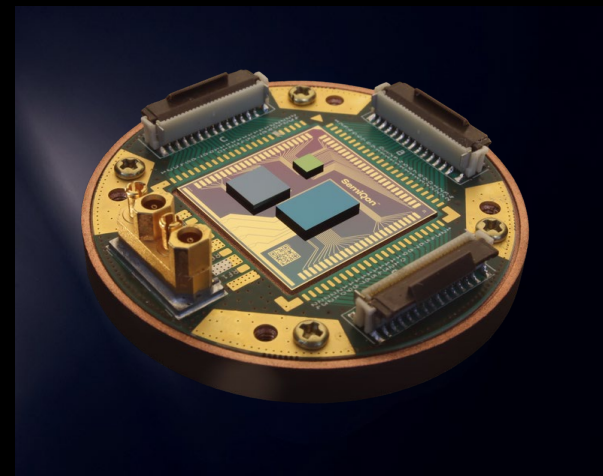
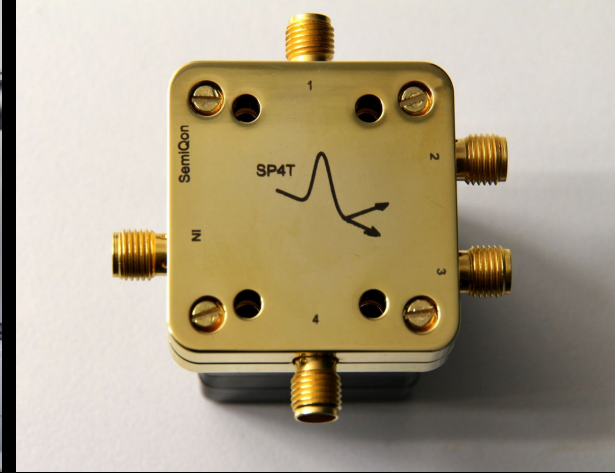
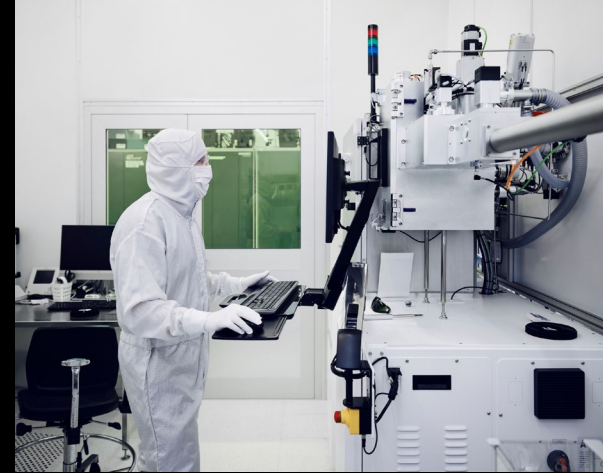
Vertically integrated operation

- We **design, manufacture, test and package** our products in-house, with full ownership of the IP.
- This enables tape-outs **3-4x** faster and development cycle costs **4-5x** lower than larger foundries.
- We collaborate closely with early adopters, running fast tape-outs **tailored to each partner's needs**.

Fully optimized for cryogenic operation

- World's first cryogenic CMOS transistor operating reliably at millikelvin temperatures
- Power consumption and heat load **1,000x** lower than conventional electronics at cryogenic conditions
- Proprietary on-chip qubit control, designed for the cryogenic environment
- **Modality-agnostic**: compatible with all major qubit modalities

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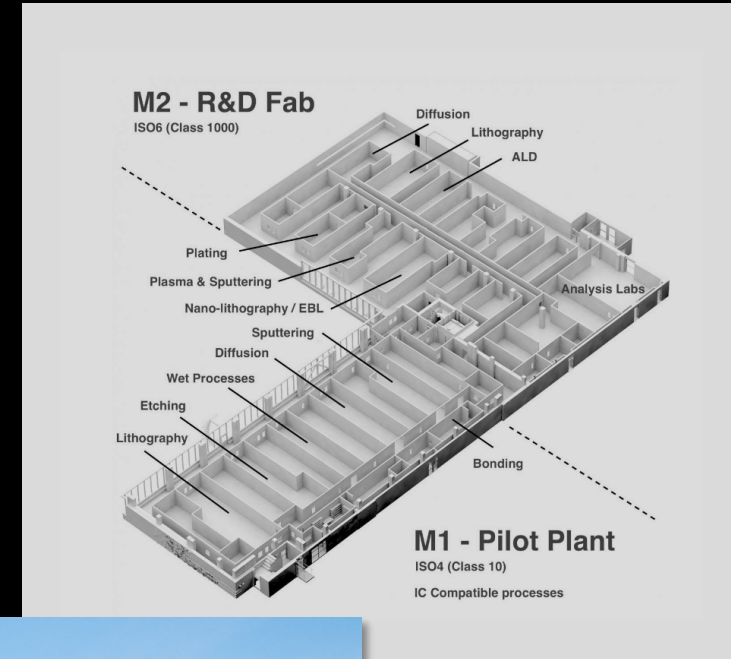


Fabrication facility

Based in Espoo, Finland, SemiQon benefits from direct access to advanced design and fabrication infrastructure, enabling rapid development and strong quality control.

Micronova in Espoo Finland

- Largest R&D cleanroom in the Nordic countries.
- Total CR area 2600 m²
- Hosted by VTT & Aalto University
- Wafer size upgrade from 200 mm to 300 mm (2028)
- Further 3x expansion of manufacturing capability through €0.5B investment at the new [Kvanttinova](#) facility from 2028



OUR TECHNOLOGY & CAPABILITIES

Measurement infrastructure

Measurement lab in the premises of Finland's national metrology institute

MIKES metrology building — purpose-built metrology facility

Locates in Otaniemi close to Micronova

SemiQon 25m² dedicated lab space in shielded room

- Possess two cryostats
- MPI wafer level automated room temperature probe station
- High-end measurement electronics

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Available products

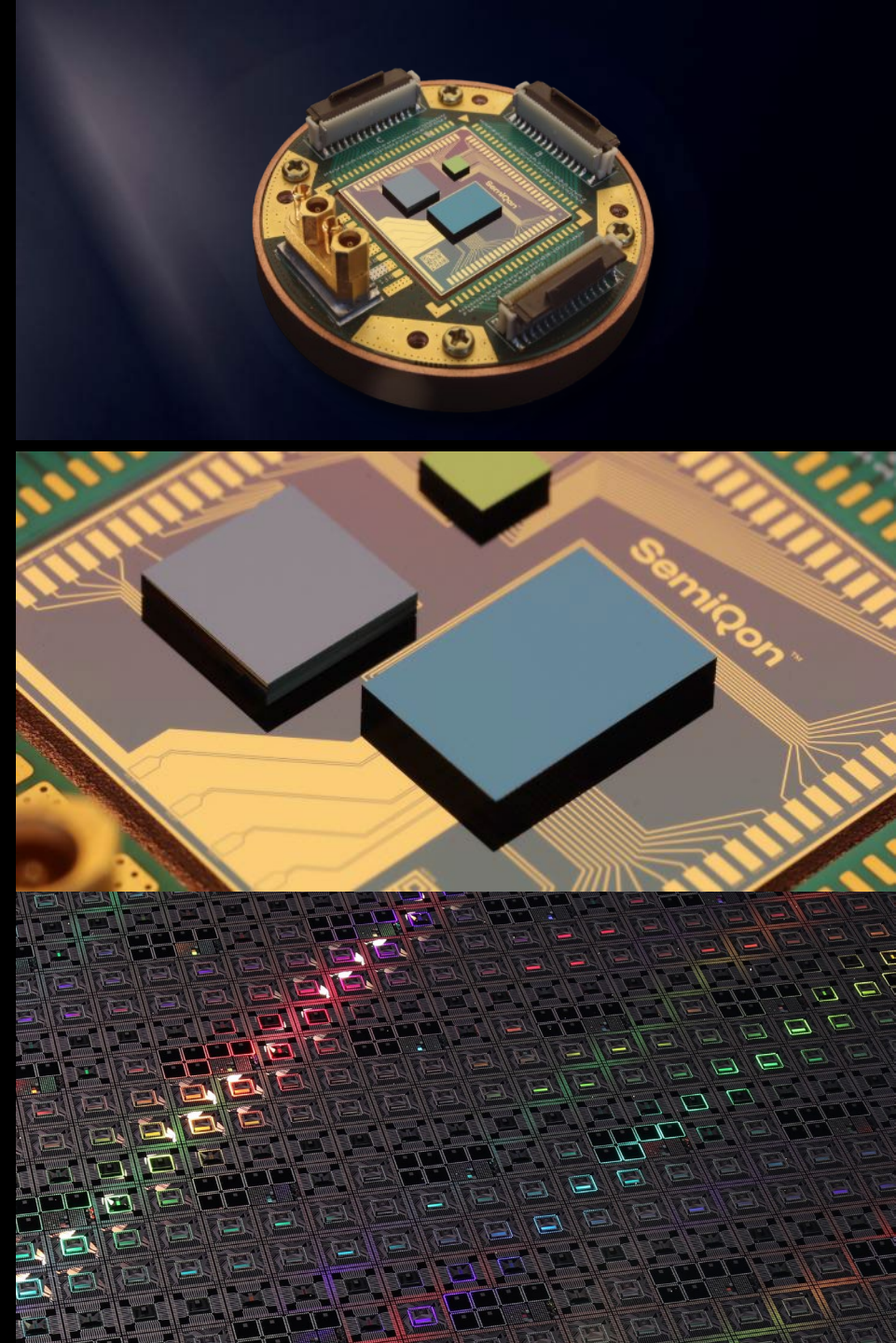
TECHNOLOGY PLATFORM

Cryo-optimized CMOS solutions to scale up quantum computing

Ultra-low-power cryo-optimized CMOS technology that moves qubit control inside the cryostat.

- 1,000× lower power consumption than conventional control electronics
- 30% lower infrastructure costs for quantum hardware manufacturers
- Cryogenic-ready 2.5D/3D packaging for seamless cold integration
- Components and sub-systems in development: multiplexer/de-multiplexer, amplifier and memory elements

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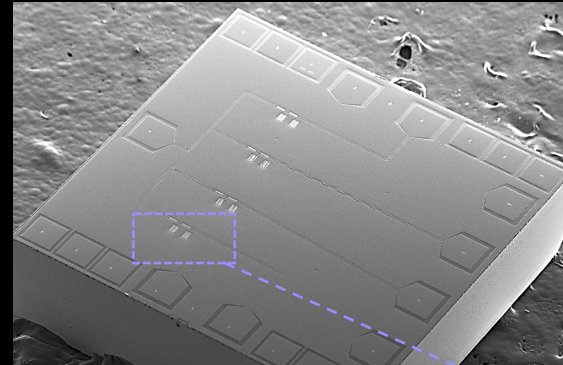
AVAILABLE PRODUCTS

Cryo-optimized CMOS RF switches

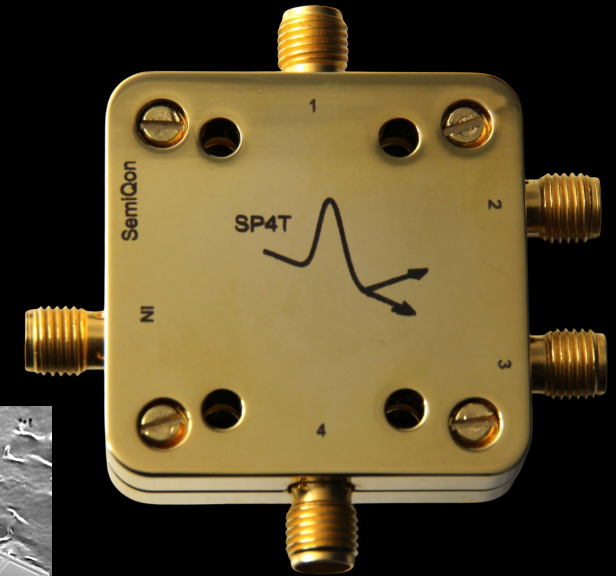
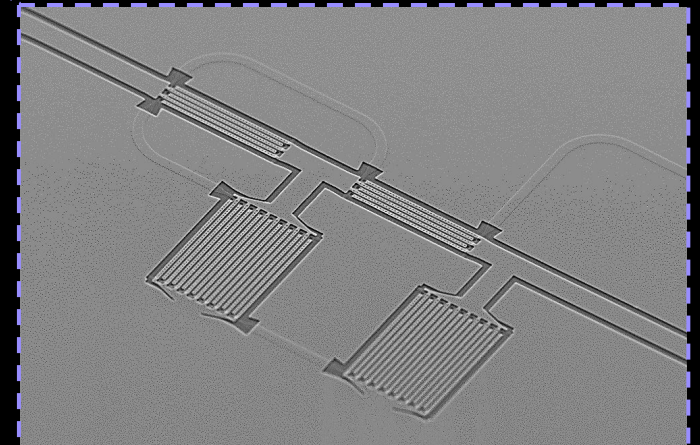
SemiQon cryo-optimized CMOS RF switches bring signal routing inside the cryostat.

Operating at the millikelvin stage next to the qubits, they route control, readout, and bias signals on-chip, so a single line from room temperature can address many qubits through a multiplexer tree.

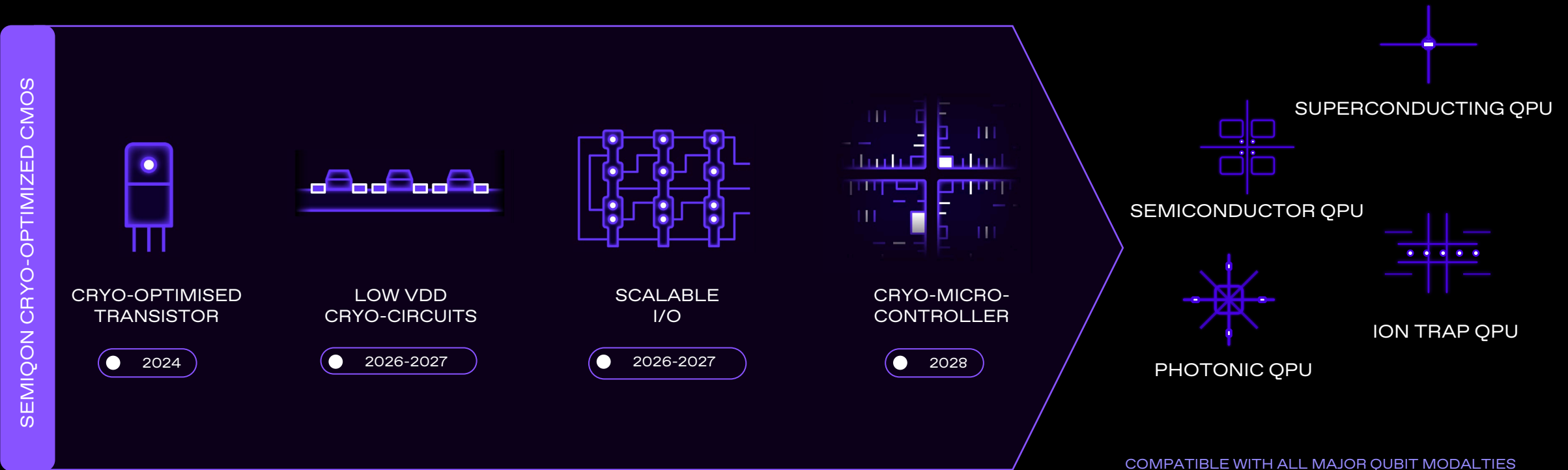
- Variants are available across qubit modalities, including superconducting, semiconductor, and ion trap systems.
- The result: fewer cables, lower heat load, and a clear path to scale.



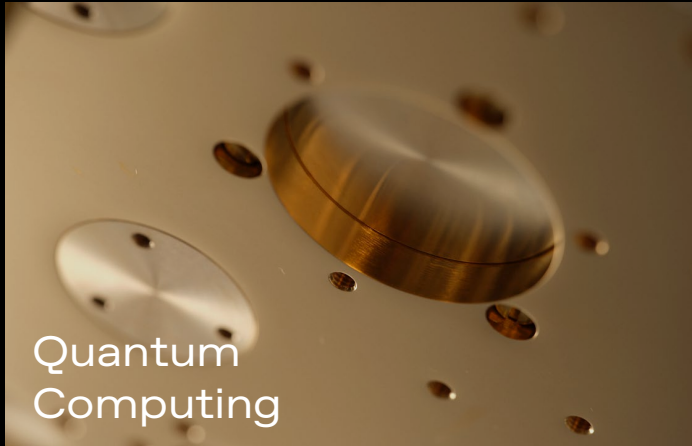
Die size: 2.5 mm × 2.5 mm



Roadmap



Application in multiple domains



Quantum
Computing

Quantum integrated circuits and cryogenic peripherals for major qubit technologies:

- Control electronics
- Readout electronics
- Cryogenic memory
- Cryogenic signal and data processing
- Packaged quantum-dot R&D kits



Space
Electronics

Cryogenic CMOS electronics for:

- Telescopes (bolometer, infra-red, x-ray)
- Lunar and Mars exploration
- SNSPD

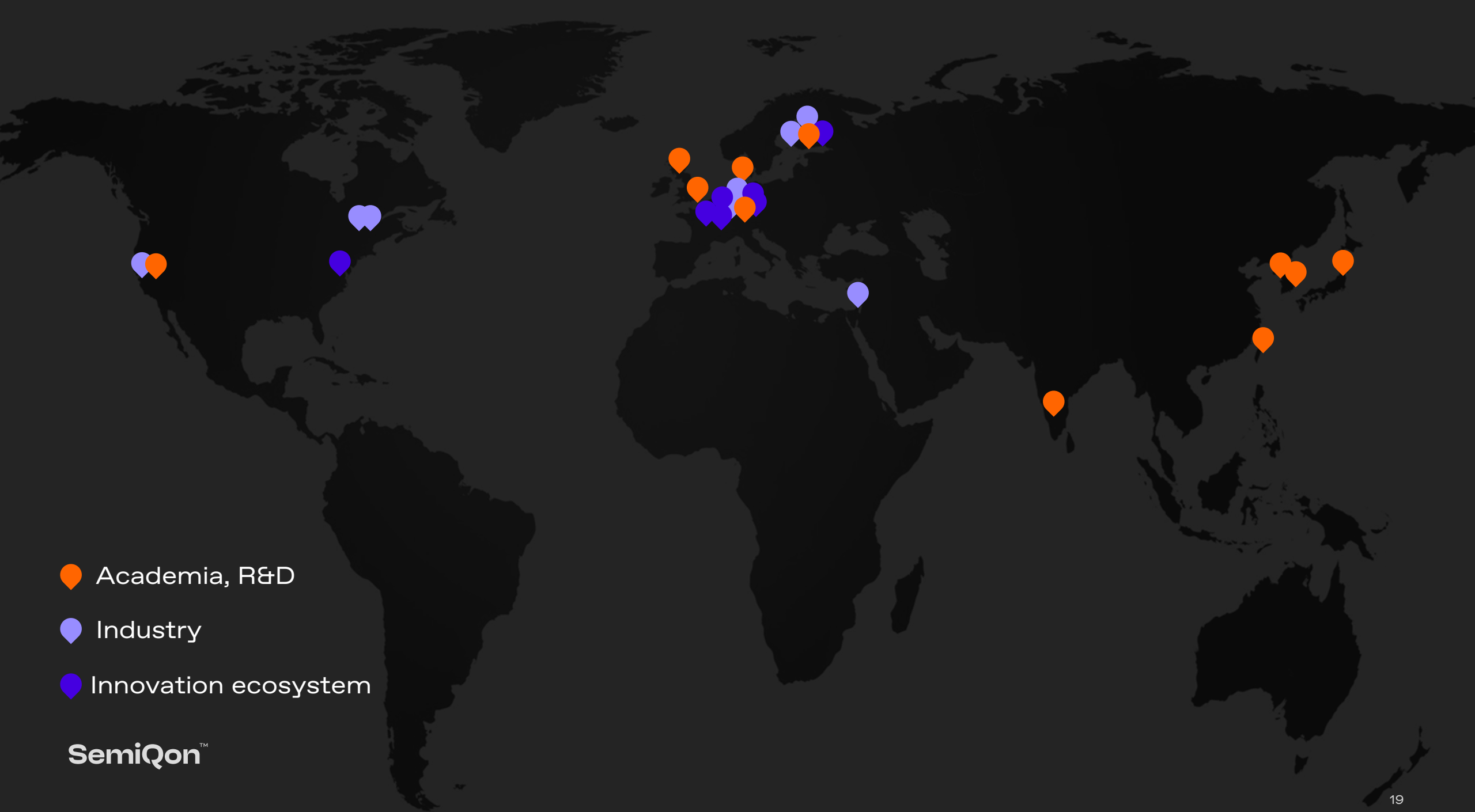


High-performance
Computing

Cryo-CMOS PDK under development for integration into CPU/GPU/QPU:

- Supercomputers
- Data centre
- AI Servers

Global network



- Academia, R&D
- Industry
- Innovation ecosystem

SemiQon's international project portfolio

COOL-CHIPS (EIC)

Focuses on commercializing SemiQon's disruptive cryogenic CMOS chips as control and readout hardware for quantum computers, with further applications in space electronics and high-performance computing.



SCALLOP (EIC)

A collaboration between SemiQon and Qblox to develop and validate core hardware for scalable quantum computers.



EQUSPACE (EIC)

Aims to develop a new type of silicon-based quantum platform and advance breakthrough quantum technologies in collaboration with six partners.



ARCTIC (CHIPS JU)

Develops scalable cryogenic ICT microsystems and control technology for quantum processors, bridging the gap between qubit research and the control electronics needed for large-scale quantum systems.



SPINS (CHIPS JU)

One of six pilot lines established under the EU Chips Act, bringing together 25 leading European partners to advance semiconductor-based quantum technologies. SemiQon leads the development of ultra-low-power cryo-CMOS technology.



QLSI² (Horizon Europe)

Brings together 23 partners from 9 countries with the ambition to demonstrate a cloud-accessible 200-qubit semiconductor-based quantum computer by the end of 2027.



EUREKA GLOBALSTARS

Combines SemiQon and ScalinQ's expertise in quantum devices and electronics with the semiconductor know-how of National Taiwan University and Hon Young Semiconductor Corporation. Together, the partners accelerate progress at the intersection of semiconductors and quantum technologies.



The background of the image is a dark, deep blue to purple gradient. It features a series of bright, diagonal, wavy lines that create a sense of motion and depth, resembling light reflecting off a liquid surface or a high-speed camera shot of a flag. The lines are more prominent in the upper left and fade towards the bottom right.

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