

Press Release

SemiQonTM

MARCH 14, 2023

SemiQon, a spinout from VTT, to develop more affordable and scalable quantum computers with new semiconductor qubit technology

Voima Ventures backs the development of an alternative to conventional quantum computer chips, making future computers more affordable, scalable, and sustainable. With this milestone, SemiQon advances towards making quantum computers more capable of solving some of the world's greatest challenges.

ESPOO, Finland (March 14, 2023) Today, [VTT Technical Research Centre of Finland](#) announced the launch of its quantum computing spinout [SemiQon](#). The company builds a new type of quantum processor chip made from silicon semiconductors, as opposed to current approaches that are based on non-standard materials.

The new semiconductor quantum processor chips are scalable and easier to manufacture. They can also function at warmer temperatures, making them more operable and sustainable. This could ultimately enable the building of quantum processors that will require millions of qubits for fault-tolerant operation.

Due to scalability issues, there are currently less than 100 quantum computers in the world, and they can cost EUR 10,000,000 or more to build. Quantum physicists and engineers are now trying to discover how to scale up quantum computers. SemiQon's approach of using relatively inexpensive and easy-to-replicate silicon quantum dot-based technology answers that challenge.

"Our solution responds to three major challenges currently slowing down the development of quantum computers globally – their scalability, price, and sustainability. Our technology allows us to fabricate quantum processors in a way that supports scaling up manufacturing efficiently while also lowering costs.

The chips we manufacture also enable the quantum computer to operate at warmer temperatures – thus requiring only a fraction of the energy needed for alternative solutions," says **Himadri Majumdar**, CEO of SemiQon.

Current quantum computers excel at optimization tasks, like solving complex logistical issues. For example, quantum computers could one day accurately model viruses and drugs, or come up with climate solutions. However, due to the hardware and scalability limitations of currently available solutions, tackling such complex problems is not yet possible.

For quantum computers to become truly useful in this sense, they would need to operate with millions of qubits instead of hundreds – which is what exists today. The amount of qubits is currently limited due to a number of factors, and that is why a more scalable option like SemiQon's semiconductor-based processors are necessary for bringing the field to its future potential.

“We need to solve the scaling problem to bring exponentially more processing power to quantum computers before we can start tackling some of the world's great challenges. SemiQon's silicon semiconductor qubit technology is an elegant solution for this,”
Tauno Vähä-Heikkilä, Vice President, Microelectronics and Quantum Technology at VTT.

Large-scale manufacturing processes and facilities already exist for silicon because it is used to manufacture microchips that are used in regular computers and other electronics. This manufacturing capability has been crucial for the increase of computing power in classical computers, as demonstrated by Moore's law over many decades. SemiQon currently operates in such a pilot manufacturing facility in Finland.

“Globally, the vast majority of quantum investments have addressed superconducting and other qubit technologies. However, silicon semiconductor qubit technology is still underfunded – despite not being burdened with the scalability challenges that many other technologies face. SemiQon has the perfect team to harness the opportunities in the field of quantum computing,” says **Jussi Sainiemi**, Partner at Voima Ventures.

“The SemiQon team consists of leading experts within the field of silicon semiconductors. As a VTT spinout, the team has worked closely with one of the globally leading research organisations in the field of silicon semiconductor qubit technology, and has the experience and expertise necessary to bring their innovation to market. Their technology has the potential to impact the quantum computing field drastically, paving the way to a truly scalable and sustainable quantum chip,” he continues.

SemiQon started operations in February 2023.

For additional information:

[Media kit with pictures](#)

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VTT Technical Research Centre of Finland

VTT is a visionary research, development and innovation partner. We drive sustainable growth and tackle the biggest global challenges of our time, and turn them into growth opportunities. We go beyond the obvious to help the society and companies to grow through technological innovations. We have almost 80 years of experience of top-level research and science-based results. VTT is at the sweet spot where innovation and business come together.

VTT – beyond the obvious

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SemiQon™

SemiQon

SemiQon builds silicon-based quantum processors for the million-qubit era. SemiQon's mission is to realize the promise of quantum computing by delivering scalability through powerful, resilient, and cost-effective quantum processors. SemiQon's technology builds upon decades of development and know-how from the semiconductor industry, making its silicon processors commercially competitive and well-suited for mass-manufacturing.

Founded in 2023 by **Himadri Majumdar** (CEO), **Janne Lehtinen** (CSO), **Mika Prunnila** (CRO), and **Markku Kainlauri** (Lead, Fabrication) SemiQon's core team brings together decades of research expertise in quantum and microelectronics and a strong knowledge of the European and global quantum industry.

SemiQon is a spin-off from VTT Launchpad incubator programme, and it operates at the Micronova Center for Applied Micro and Nanotechnology in Espoo, Finland. For more information, follow SemiQon's journey on [LinkedIn](https://linkedin.com/company/semi-qon) and online at semi-qon.tech.

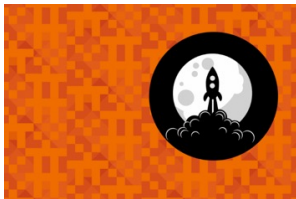


Voima Ventures

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Voima Ventures is a deep tech fund that invests purely in startups with a background in deep tech and science. Voima Ventures' mission is to solve major global problems by combining science, entrepreneurship, and capital. Voima Ventures' industry domains include bio and new materials, medical technologies and life sciences, imaging and optics, IoT and electronics, robotics, software & ICT and AI. In addition, Voima Ventures is managing a portfolio of VTT Ventures with 20 prominent deep tech companies including Solar Foods, Paptic, and Dispelix. Cornerstone investors include VTT Technical Research Centre of Finland and European Investment Fund (EIF), backed by Finnish private and institutional investors.

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About VTT Launchpad

VTT LaunchPad is a science-based spin-off incubator, where we bring VTT researchers and technology together with the best business minds and investors out there to renew industries. VTT LaunchPad supports incubator teams to develop VTT owned IPR into fundable spin-off companies.