Driving decarbonization and digitalization. Together.

Doctoral Thesis with Innsbruck University: Trapped-Ion Quantum Processor Development (f/m/div)

Job description

Get the best of both worlds with an industrial doctorate at Infineon: Pursue a doctoral degree at a university and gain professional experience simultaneously - an ideal start for your career. Advance your research with us and profit from our vast network of doctoral candidates and the expertise of a university. Mentorship is handled by both professors and dedicated Infineon experts.

We are offering a doctoral thesis in the field of trapped-ion quantum computing. As part of our growing ion trap systems team, you will develop trapped-ion quantum processing units. In particular, your technology development work will focus on ion traps on structured glass substrate, which is a preferred material for academic research groups due to its ease of use in their experiments. However, glass substrates are a non-standard substrate material in CMOS fabs and therefore require adaptations to process routes and fabrication process parameters.

You will design your ion traps specifically for the quantum information experiments at Innsbruck University, then initiate and support ion trap fabrication at our industrial fabrication facilities in Villach. Our project partner Joanneum Research will provide essential glass-structuring expertise to enable new topologies for quantum information processing with academic chip traps.

After successful chip fabrication, you will employ your devices for quantum information processing experiments at the world-leading quantum optics laboratory at Innsbruck University. Your thesis will accelerate technology development of scalable trapped-ion quantum processors and therefore provide a substantial boost towards useful applications with economic impact.

The thesis will be written in cooperation with our academic partner at Innsbruck University and you will spend a total of 3 semesters in Innsbruck for lectures, trainings and trapped-ion experiments with your own quantum processors.

In the course of the thesis you will:

- **Develop scaling elements for ion traps on structured glass substrate**, like optical access, shuttling elements, junctions and islands electrodes
- **Conduct ion trap fabrication** by defining a fabrication route, find solutions to process restrictions and implement measures to improve fabrication yield
- **Investigate strategies to mitigate scaling blockers** like RF-capacity, dielectric losses, cross-talk or ohmic losses
- **Test your ion traps** at the Infineon quantum lab

At a glance

Location:	**Villach (Austria)**
Job ID:	**HRC0835087**
Start date:	**Jul 01, 2024**
Entry level:	**0-1 year**
Type:	**Full time**
Contract:	**Temporary**

Apply to this position online by following the URL and entering the Job ID in our job search. Alternatively, you can also scan the QR code with your smartphone:

Job ID: HRC0835087
www.infineon.com/jobs

Contact

Melanie Happerger, MSc
Recruiter

- **Conduct research at our academic partner Innsbruck University**, with ca. 3 semesters dedicated on-site in Innsbruck
- **Support the quality and reliability of Infineon ion traps** by defining control concepts for inline process control, device screening and component verification

Start: 01.07.2024 (or later)
Full-time employment: 38.5 hrs/week
Duration: 3 years

Profile

A doctoral student is a research enthusiast,

- whose interests are scientific research combined with the passion for Infineon's innovative products and applications
- who enjoys working in an industrial environment in combination with an Infineon partner university
- who appreciates open communication and the contribution of an international environment
- and is thus an excellent candidate for a further academic or industrial career after completion of their thesis

As the ideal candidate you:

- are a **highly motivated** individual who wants quantum computing to become a reality
- have a **master's degree in physics, quantum engineering** or similar
- have gained **first experience in semiconductor manufacturing or ion trap fabrication**
- are **fluent in English and German**

Please attach the following documents to your application:

- Your CV
- Motivation letter
- Copy of your master degree certificate if already available
- Otherwise: copy of your latest study transcript

This position is subject to the collective agreement for workers and employees in the electrical and electronics industry. The salary for this position is EUR 3.525,00 gross p. m. (full-time basis).

Benefits

- **Villach:** Coaching, mentoring networking possibilities; Wide range of training offers & planning of career development; International assignments; Different career paths: Project Management, Technical Ladder, Management & Individual Contributor; Flexible working conditions; Home office options; Part-time work possible (also during parental leave); Sabbatical; Child care in Villach & Klagenfurt; On-site social counselling and works doctor; Health promotion programs; On-site canteen; Private insurance offers; Wage payment in case of sick leave; Corporate pension benefits; Flexible transition into retirement; Performance bonus; Accessibility, access for wheelchairs

Why Us

Driving decarbonization and digitalization. Together.

Infineon designs, develops, manufactures, and markets a broad range of semiconductors and semiconductor-based solutions, focusing on key markets in the automotive, industrial, and consumer sectors. Its products range from standard components to special components for digital, analog, and mixed-signal applications to customer-specific solutions together with the appropriate software.

–Power & Sensor Systems (PSS) drives leading-edge power management, sensing, and data transfer capabilities –

The **PSS division** powers decarbonization and digitalization with a wide range of energy-efficient and digital solutions. PSS semiconductors help avoid carbon emissions, use resources sustainably, manage power effectively and intelligently, give 'things' smart senses, and process data quickly and reliably. The portfolio includes power, connectivity, RF, and sensor system technologies to develop smaller, lighter, smarter, and more efficient solutions for consumer devices, smart home/building applications, robotics, computing and data centers, charging devices, power tools, and much more.

The next generation of silicon and wide-bandgap (SiC and GaN) solutions provides unparalleled performance and reliability for 5G, big data, and renewable energy applications. These materials are paving the way for further energy and carbon savings. Highly precise XENSIV sensor solutions are enabling IoT devices to react intuitively to their surroundings for seamless user interactions while audio amplifiers bring exceptional sound experiences to smart speakers and other audio use cases.

Click here for more information about working at PSS with interesting employee and management insights and an overview with more #PSSDreamJobs.

At **Infineon in Villach** you shape the technologies of tomorrow and work in an international environment with more than 4.700 colleagues from over 70 nations. Your personal contribution will be valued and appreciated as the cornerstones of our success. And all that in beautiful surroundings which guarantee a high quality of life.

The **City of Villach** is located in the center of Carinthia, Austria's southernmost province, in close proximity to the Italian and Slovenian border. Due to its particular geographic location and the outstanding natural beauty of the region, Villach and the whole province of Carinthia have for generations been popular holiday destinations for people from all over the world. Living in Austria also has many social, health-care-related and economic perks. The country's social and health care system is among the best in the world and for decades numerous international surveys have singled out Austria as a particularly safe and wealthy country with a high quality of life. Villach benefits from its status as a "small town", offering everyday living at affordable prices in an outstanding setting.

Find out what you like most about Villach and join us:
https://www.welcome2villach.at/

We are on a journey to create the best Infineon for everyone.
This means we embrace diversity and inclusion and welcome everyone for who they are. At Infineon, we offer a working environment characterized by trust, openness, respect and tolerance and are committed to give all applicants and employees equal opportunities. We base our recruiting decisions on the applicant´s experience and skills.
We look forward to receiving your resume, even if you do not entirely meet all the requirements of the job posting.
Please let your recruiter know if they need to pay special attention to something in order to enable your participation in the interview process.
Click here for more information about Diversity & Inclusion at Infineon.