2nd Announcement of the 13th FLUXONICS Digital Superconducting Electronics workshop

Engineering single-flux-quantum microelectronics

The workshop is directed to those who want to get familiar with aspects of design and simulation of superconductive electronic circuits and the development of emerging applications

Technische Universität Ilmenau – Germany

The 13th FLUXONICS Workshop on Design of Superconductive Flux-Quantum-based microelectronic circuits will take place from **June 23-25, 2025** at its traditional location in **Ilmenau / Germany**.

Digital superconducting electronics has been a relevant and promising option for creating ultra-low power and at the same time ultra-fast monolithically integrated circuits.
Besides existing demonstration in the read-out of quantum sensors and detectors, with the recent rapid increase of interest in quantum technologies, these principles will be developed towards peripheral electronics for quantum-based information processing.

FLUXONICS e.V. is a society with the aim of fostering the development by clustering the efforts of international researchers and providing an ecosystem from fundamental research via design up to implementation and chip fabrication.

The purpose of the workshop is to introduce essential aspects of this circuit technique to those who are not yet familiar with it, however being interested.

This aim is to be achieved in a two-fold manner:

- Experienced researchers will provide lectures on the basics of contemporary superconductive electronics.
- Researchers, being active in this field, will report on recent achievements and exchange experience in putting such circuits into action.

Therefore, it is a unique chance to get an overview within a short time, and also to get in contact with experts in this field.
Topics will cover:

- Basic principles of superconducting sensors and circuits
- Circuits for flux-quantum based information processing
- Fabrication technology
- Design approaches
- System integration

- Quantum sensors and sensor systems
- From chip design to hardware
- Applications
- Requirements for application in digital quantum computing
- Neuromorphic circuits and other advanced architectures

The workshop is part of FLUXONICS' activities of spreading the knowledge about superconducting sensors and electronics circuits, thus contributing to the utilization of this technology.
There are no fees for participation. Also, beverages and lunch throughout the lectures as well as a barbeque evening on one of the evenings are provided.

Travel and accommodation as well as other meals are with the participants.

Registration

Registration - best before May 15 - via e-mail is preferred and encouraged.
Applications and all other correspondence concerning the workshop should be addressed to:

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Preliminary Agenda.

22. 06. 2025 | Sunday

- Arrival / check-in

23. 06. 2025 | Monday

- Superconductive Electronics (SE) lectures, introduction to the single flux quantum digital electronics, circuit design, and testing
- This first part is devoted to teaching the nature of RSFQ technique and how to design superconducting devices

24. 06. 2025 | Tuesday

- Oral presentations related to several technical issues and scientific aspects of SE design, such as: signal sensing, high throughput interfacing, new circuit concepts, system integration topics
- This day is to discuss recent developments and future activities in the field of Digital superconducting electronics design with particular emphasis on the translation of scientific knowledge into industrial needs

25. 06. 2025 | Wednesday

- Calculation of inductances in complex integrated structures, best practices, live demonstrations, specialized software usage, Q&A and more– provided by Dr. Lieze Schindler, Prof. Coenrad Fourie and Dr. Kyle Jackman, SUN Magnetics and Stellenbosch University / South Africa.

Travel Information.

Ilmenau is a small German town located 200 km east of Frankfurt and 300 km south of Berlin and in close vicinity to Erfurt. The workshop will take place on the University Campus in Ilmenau.

Arrival by plane / via Frankfurt, Berlin or Leipzig:
Take a fast train to Erfurt and one of the hourly connecting trains to Ilmenau main station (Hauptbahnhof/Hbf.).
Train time tables: http://www.bahn.de

The hotels and the campus are within a 10-15 min walking distance from the train station.
Hotels (examples): https://www.hotel-tanne-thueringen.de
https://www.mara-hotel.de
https://ilm-hotel.de
https://www.jugendherberge.de/en/youth-hostels/ilmenau-163/portrait/

More information concerning the particular lecture halls including a campus map will be provided after the registration process.