



# 2<sup>nd</sup> Announcement of the 12<sup>th</sup> 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 development of emerging applications.

## Technische Universität Ilmenau – Germany

The 12<sup>th</sup> FLUXONICS Workshop on Design of Superconductive Flux-Quantum-based microelectronic circuits will take place from **September 11-13, 2023** 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 demonstrations 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.

**The workshop will offer a unique opportunity to get in its short duration a comprehensive overview as well as direct contact with experts in this research field.**

The following topics will be covered:

- Basic principles of superconducting sensors and circuits,
- Circuits for flux-quantum based information processing,
- Fabrication technology,
- Design approaches,
- System integration,
  
- Quantum sensors and sensor system,
- From chip design to hardware,
- Applications and their specific requirements (e.g. in digital quantum computation),
- Advanced circuit 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 Wednesday are provided.

Travel and accommodation costs as well as other expenditures (e.g. meals) are with the participants.

## Registration / Contributions

Registration via [this link](#) / email ([tet@tu-ilmenau.de](mailto:tet@tu-ilmenau.de)) is preferred and encouraged **UNTIL 21<sup>st</sup> of July 2023**. Contributions are welcome. Please provide title, authors' list, acknowledgement and if possible a short abstract (max. 200 words – just for arranging the programme) also **UNTIL 21<sup>st</sup> of July 2023**. No specific format / template is required.

Applications and all other correspondence concerning the workshop should be addressed to:



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## Preliminary Agenda

### 10. 09. 2023 | Sunday

- Arrival / check-in

### 11. 09. 2023 | Monday

- Superconductive Electronics (SCE) 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

### 12. 09. 2023 | Tuesday

- Oral presentations related to technical issues and scientific aspects of SCE 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 SCE design with particular emphasis on the translation of scientific knowledge into industrial needs

### 13. 09. 2023 | Wednesday

- Presentations of early-stage researchers / PhD candidates
- Emerging topics and architectures in digital SCE
- This day is to discuss upcoming trends and cross-disciplinary aspects as, e.g. neuromorphic principles or analogue building blocks in the field of digital SCE

## Travel Information

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

### Arrival by plane - via Frankfurt, Berlin or Leipzig airport:

Take a fast train to Erfurt/Hbf. and from there 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-thuringen.de>  
<https://www.mara-hotel.de>

**new:** <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.**