

## PhD Position offer

### DC12: Design and Characterization of Novel Surface Acoustic Wave Devices

At School of Computation, Information and Technology / Technische Universität München  
Munich, Germany, <https://www.cit.tum.de/en/cit/home> & <https://www.tum.de>

**Supervisor:** A. Hagelauer

**Contract duration:** 36 months

**Start date:** no later than October 2025

**Salary:** 3942,2€/month gross (salary+ mobility allowance) + 600€/month (family allowance, if applicable)

#### Context:

The MSCA Doctoral Network HINA project proposes to consider the hybrid integration of alkaline niobate-tantalate thin films,  $(K,Na)(Nb,Ta)O_3$  (KNTN, materials with the highest known experimentally measured electro-optic, nonlinear, piezoelectric, elasto-optic coefficients) in photonic and acoustic devices for advanced semiconductor photonics platforms. The final goal of the project is to develop a thin film technology not only offering the state-of-the-art performances but also with reasonable price and viable for real industrial applications in order to stimulate the transfer of newly developed products and technologies by the industry and to help enterprises to withstand global competitive pressures. This project is coordinated by the University of Marie and Louis Pasteur / Institute FEMTO-ST and funded by the Horizon Europe program under the Marie Skłodowska-Curie Actions. Project website: <https://msca-dn-hina.eu>

#### Research project:

Objectives: Small size and high frequency ( $> 6$  GHz) SAW resonators based on KNTN with high  $K_2$  for acousto-optic transducers and acoustic wave coupling with spin waves: (i) develop design techniques for novel SAW devices (ii) modelling and simulation of SAW resonators based on literature data using COM model or the P-matrix models (iii) building on well-known models from literature and the models will be adapted to the new materials and structures models for SAW resonators and filters with new materials (iv) novel SAW resonators designs based on measured KNTN film properties; (v) FEM modelling and simulation allows a deeper look in the physics of the resonators to optimize them in term of losses (acoustic, electrical) and energy confinement; (vi) innovative designs for guided SAW based resonators with reduced footprint.

#### Eligibility criteria:

- Master degree or equivalent degree which formally entitle to embark on a doctorate;
- **Must not have resided or carried out main activity (work, studies, etc) in the country of host organisation (Germany) for more than 12 months in the last 3 years (short stays for holidays do not count);**
- Have not been awarded a doctoral degree.

#### Skills & Qualifications:

- Master degree or equivalent degree which formally entitle to embark on a doctorate;
- Fluent English (oral and written);
- Excellent IT skills (Microsoft office, image editors...etc.);
- Background and expertise in the field of PhD topic.

#### Personal qualities:

High motivation, excellent interpersonal skills, good time and stress management, excellent written and oral skills.

**Applications** must include a CV (max. 2 pages), Master's and Bachelor's diplomas with transcripts, a one-page cover letter, and the contact details of two referees, and should be submitted via email to [liza.basyrova@femto-st.fr](mailto:liza.basyrova@femto-st.fr)