

The Leibniz-Institut für Kristallzüchtung (IKZ) is a leading research institution in the area of science & technology as well as service & transfer of crystalline materials. Our goal is to enable solutions for urgent societal challenges (e.g. communication, artificial intelligence, climate protection, health etc.) by modern electronic & photonic technologies. The work covers the full spectrum from basic over applied research up to pre-industrial development and is performed in collaboration with national and international partners from university, academy and industry. The institute is part of Forschungsverbund Berlin (<https://www.fv-berlin.de/>) and a member of the Leibniz Association <https://www.leibniz-gemeinschaft.de>. You can find more details on the institute webpage: <https://www.ikz-berlin.de>.

We are offering two

PhD Student Positions (m/f/d)

for the Marie Skłodowska-Curie Doctoral Network HINA

Hybrid INtegration of Alkaline niobate - tantalate films for advanced photonic and piezoelectric devices

The HINA project proposes to consider the hybrid integration of alkaline niobate-tantalate thin films (materials with the highest known experimentally measured electro-optic, nonlinear, piezoelectric, elasto-optic coefficients) in photonic and acoustic devices for advanced semiconductor photonics platforms. HINA links world-leading research groups at Academia and Industry to give a combined, integrated approach of synthesis/fabrication, characterization, modeling/theory linked to concepts for materials integration in devices and systems.

The MSCA Doctoral Network HINA offers 18 PhD positions; two PhD positions are based at IKZ.

The key responsibilities of the first PhD student (DC 5) will include:

Epitaxial growth of KNN films by CVD with different surface orientations for SAW and electro-optical devices

- (i) Optimization of growth conditions for epitaxially strained, stoichiometric KN-KNN-NN films by MOVPE using commercial or designed MO precursors,
- (ii) Influence of lattice strain, Na/K ratio and off-stoichiometry (alkaline deficiency or niobium deficiency) on piezoelectric properties and domain formation,
- (iii) Variation of film direction by using differently oriented oxide substrates and textured electrodes,
- (iv) Revealing structure-properties relationship with focus on K2 (SAW, BAW) and electro-optic properties.

Supervisor: Dr. Jutta Schwarzkopf

Contact: jutta.schwarzkopf@ikz-berlin.de

The key responsibilities of the second PhD student (DC 7) will include:

Development of sacrificial layers grown on rare-earth scandate substrates for epitaxial KNN/KTN layer transfer

- (v) Epitaxial growth of sacrificial layers by PLD on rare-earth scandate substrates (ReScO₃ with Re= Dy, Tb, Gd,...) of different chemical composition and KNTN crystals,
- (vi) Optimization of KNN epitaxy (MOCVD) on top of the sacrificial layers with regard to domain, interface and defect formation,
- (vii) Release of KNN films by etching the sacrificial layer and transfer the KNN films to Si or sapphire substrates,
- (viii) Determination of piezoelectric, dielectric, electro-optical properties of the free-standing KNN membranes as a function of the orientation and chemical composition.

Supervisor: Dr. Jens Martin
 Contact: jens.martin@ikz-berlin.de

Eligibility

To be eligible the applicant has to fulfil the trans-national mobility criterion, i.e. not have resided or carried out their main activity (work, studies, etc.) in Germany for more than 12 months in the 36 months immediately before the recruitment date – unless as part of a compulsory national service or a procedure for obtaining refugee status under the Geneva Convention. In addition, the applicant has to be – at the date of recruitment – a doctoral candidate (i.e. not already in possession of a doctoral degree). Researchers who have successfully defended their doctoral thesis but who have not yet formally been awarded the doctoral degree will not be considered eligible.

What we offer

This is a full-time position (39 hours per week) with 3 years duration and a tentative start date of 01.11.2024 (or shortly thereafter). For the salary of the Marie Skłodowska-Curie PhDs in Germany the European Commission provides a monthly Living Allowance of 3,342.20 € plus a monthly Mobility Allowance of 600 €. Researchers who have or acquire family obligations during their employment are also awarded a monthly Family Allowance of 660 €. Please note that the combined amounts form the monthly gross employer salary, which is subject to deductions and taxes as per national law. The monthly gross salary varies, depending on the personal circumstances, and amounts to approximately 3,250 €/3,800 € (without family allowance/with family allowance). Family is defined as persons linked to the researcher by (i) marriage, or (ii) a relationship with equivalent status to a marriage recognised by the legislation of the country or region where this relationship was formalised, or (iii) dependent children who are actually being maintained by the researcher. A Special Needs Allowance might be awarded to recruited researchers with disabilities whose long-term physical, mental, intellectual or sensory impairments are certified by a competent national authority and of such nature that their participation in the action would not be possible without the special needs items or services.

We offer the usual social benefits (30 vacation days in a 5-day week, flexible working hours). The IKZ is an equal opportunity employer and actively supports reconciliation of work and family life. There is equality for applicants of all genders. Qualified women are especially encouraged to apply. Among equally qualified applicants, preference will be given to disabled candidates.

Have we sparked your interest?

Then apply with the following documents:

- CV (2 pages).
- Diploma (copy) of Master degree or equivalent degree which formally entitle to embark on a doctorate, including annexes with marks/classifications.
- Diploma (copy) of Bachelor degree or equivalent degree including annexes with marks/classifications.
- Cover letter (1 page).
- Names and contact details of two referees, who agreed to provide recommendation letters.
- List of selected Phd topics in order of preference (see the list of available positions below in additional information).

Applications should be submitted electronically by email to the HINA project coordinator Ausrine BartasYTE, ausrine.bartasYTE@univ-fcomte.fr.

More information can be found at <https://euraxess.ec.europa.eu/jobs/243636>. Applications will be accepted until the positions are filled.

We look forward to receiving your application!