

## **Project 4.6 Rocksalt (MgZn)O alloys and (MgZn)O/MgO quantum structure and their application in deep-ultraviolet light-emitters (experimental)**

**Supervisor:** Henryk Teisseyre

**Institute:** IF PAN

**Unit:** ON 4

### **Background:**

ZnO-based materials have important potential industrial and medical applications due to their biocompatibility and biodegradability properties. The main goal of the project is to perform a systematic study of the  $\text{Mg}_x\text{Zn}_{1-x}\text{O}$  alloys and quantum structures in RS phase: this study will include their epitaxial growth, the experimental determination of their fundamental physical properties (bandgap nature, energy bandgaps, bandgap offsets, etc.), which will be supported by theoretical simulations of their electronic and optical properties. In a second stage, we will exploit the grown quantum structures for demonstrating oxide-based emitters at wavelengths smaller than 300nm. The main outcome of the project will be a set of new oxide materials, enabling the fabrication of deep-UV emitting devices, and a proof-of-principle working device.

### **Aim:**

Fabrication of deep-UV emitting devices.

### **Requirements:**

- Master's degree in physics (or an equivalent that qualifies one for PhD studies in physics in the country of issue),
- to be employed, the candidate must be accepted into the PhD school in which the Institute of Physics participates. Applications for the position are through recruitment to the School, online at [warsaw4phd.eu](http://warsaw4phd.eu).
- main research field: Physics
- sub Research Field: Physics of semiconductors
- career Stage: Early stage researcher
- research Profile (details): First Stage Researcher (R1)
- type of Contract: Fixed term (48 months)
- status: Full-time

### **Funding:**

Scholarship: grant funding of 5000 PLN per month, before subtracting obligatory employer and employee social security contributions (~15%), for 30 months. Afterwards, standard Polish PhD scholarship (about 3240 PLN/month net in months 31-48).

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