



## Sonderforschungsbereich TRR 160

Kohärente Manipulation wechselwirkender Spinanregungen  
in maßgeschneiderten Halbleitern

# Seminarankündigung

**Donnerstag 01.12.2022, 12:00 Uhr**  
**P1-02-110**

## **“Photoluminescence of halide perovskite single crystals”**

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### **Abstract:**

The Halide perovskites demonstrate unique combination of soft and cheap synthesis and outstanding optical properties: a lone pair on the valent s-orbital of the central metal atom surrounded by highly symmetrical halogen environment provides a defect tolerant band structure. The strong lowest direct optical transition determines an effective interaction with light, i. e. high optical absorption coefficient and quantum yield. Deep defects lowering the crystal quality have in this case high formation energy and, therefore, a low formation probability.

Halide perovskite composition variety and stable solid solutions in a wide range of concentrations make it possible to obtain materials with a given lattice constant and a bandgap in near infra-red to ultra-violet region. In contrast to traditional covalent semiconductors the ionic nature of the materials is tolerant to a significant lattice mismatch. All of this makes halide perovskites a promising candidate for cheaper and effective optoelectronic devices. I present highlights of optical properties of lead halide perovskite single crystals and prospects for possible perovskite-based semiconductor heterostructures.