Graduate School Event

Thesis Defense: Mechanistic Insight into Solution-Processed P-type Tin Chalcogenides as a Basis for Designing their N-type Analogs

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Host: Edouard Hannezo

Thermoelectric materials can directly convert between heat and electricity, offering a route toward sustainable energy generation. However, their use remains limited to niche applications due to high fabrication costs and relatively low efficiencies compared to competing energy technologies. Tin chalcogenides such as SnSe and SnS are promising candidates and, when processed via solution-based routes, provide a scalable and lower-cost alternative to conventional solid-state synthesis, opening pathways toward broader adoption. However, realizing their full potential in polycrystalline form requires a deeper understanding of how defects, dopants, and microstructure govern charge and heat transport.This thesis demonstrates that, in solution-processed materials, dopants including those introduced unintentionally through precursor chemistry, are not just confined to specific lattice sites. Instead, they distribute across the microstructure, partitioning within grain interiors, grain boundaries, and segregated regions, where they govern grain growth, carrier concentration, and charge transport. Through a systematic study of alkali metals and lead halides in SnSe and SnS, this work links synthesis, defect partitioning, microstructure evolution, and thermoelectric performance reshaping how high-performance p- and n-type thermoelectric materials are designed.

Friday, July 17, 2026 11:00am - 12:00pm
Sunstone Bldg / Ground floor / Big Seminar Room B (I23.EG.102) and Zoom

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https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.