



Graduate School Event

Thesis Defense: Unraveling the Origin and Evolution of Defects to Enable Advanced Thermoelectric Performance

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Host: Jorryt Mathee

Thermoelectric (TE) technology directly converts between heat and electricity, enabling both waste heat harvesting and localized cooling applications. Yet, TE technology remains limited to niche applications, mostly due to high fabrication costs, and lower efficiencies compared to other energy conversion technologies. Solution processing provides a scalable and cheaper route than conventional solid-state methods, potentially enabling the broader adoption of TE technology. Beyond its cost benefits, solution processing uniquely allows the synthesis of well-defined nanocrystal building blocks, translating nanoscale defect control into bulk structures. Such microstructure engineering across length scales allows rational optimization of the TE performance. This thesis explores defect engineering of solution-processed silver selenide (Ag_2Se), with focus on compositional and microstructural control for enhanced TE performance, specifically through thiol-amine based synthesis and post-synthetic treatment using polyanionic CdSe complexes. The material library was extended to lead selenide (PbSe), whose TE performance was optimized through chlorine (Cl) doping from functionalized two-dimensional titanium carbides (MXenes).

Friday, March 20, 2026 02:00pm - 03:00pm

Sunstone Bldg / Ground floor / Big Seminar Room B (I23.EG.102)



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

Please find a schedule of the ISTA Shuttle on our webpage:

<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.