

Development and Advanced Characterisation of Sb-chalcogenide Based Next Generation Solar Cells

Summary

The PhD candidate will join a team to develop next generation solar cells technology. We investigate Sb-compounds as thin film optical absorbers and its immediate interface layers for charge extraction. The aim is to introduce technological advances and to demonstrate improved photovoltaic performance. Current projects are as follows: PRG627, TAR16016EK, and H2020 ERA Chair of Emerging Next Generation Photovoltaics (Additional information: www.etis.ee). Work will be carried out in TalTech, external EU collaborations are possible.

Research field:	Chemical, materials and energy technology
Supervisors:	Erki Kärber Merike Kriisa
Availability:	This position is available.
Offered by:	School of Engineering Department of Materials and Environmental Technology
Application deadline:	Applications are accepted between June 01, 2020 00:00 and July 03, 2020 23:59 (Europe/Zurich)

Description

Description, responsibilities and tasks

The PhD-candidate will survey relevant literature, plan and execute the experimental work and disseminate the results. In detail as follows:

- Deposition of thin solid state semiconductor films in a modern wet-chemistry lab. Requires the use of essential lab ware, chemical processing equipment and high precision analytical equipment.
- Characterization of semiconductor thin films. Requires using a range of techniques (microscopies, spectroscopies, diffractometry, profiling and mapping) and understanding their benefits and limitations.
- Characterization of solar cells. Requires using a range of techniques (current-voltage scans, spectral sensitivity, thermal dependence of direct current and capacitive response), knowledge of standard testing conditions.
- Presentation of the results, verbally and graphically. Requires the ability to analyze and summarize the results and disseminate for a target audience, and impeccable formal communication skills.
- Publishing of the findings. Requires the development of the knowledge of academic peer-review system and academic writing skills.

Qualifications:

- Master degree in the field of Chemistry, Chemical Technology, Materials Technology, Physics, and related.
- First-hand experience in materials research, i.e. preparation of thin films and/or use of related characterization methods and analysis.
- Excellent understanding of semiconductor and photovoltaics technology and research is favored.
- Strong analytical thinking, fluent in English (both written and oral).
- Competence in using data analysis and graphing software such as Microsoft Office (Word, Excel and PowerPoint), Origin.



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