Grenoble INP
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TALLINN UNIVERSITY OF TECHNOLOGY

SEMINAIRE EXCEPTIONNEL

(de 10h30 à 11h30, Salle Belledonne, IMEP-LaHC, Bât. BCAi, Minatec, ouvert à tous : enseignants, étudiants, chercheurs, administratifs, techniciens)

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"Challenging kesterite materials for photovoltaic applications"

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Abstract: Kesterite absorber materials (Cu_2ZnSnS_4, $Cu_2ZnSnSe_4$, $Cu_2ZnGeSe_4$ etc.) have been considered as promising low-cost and non-toxic materials for solar cells. However, the intensive research conducted by many research groups over the last decade have come to a deadlock and in the last few years there is no efficiency improvement anymore, the highest solar cell efficiency so far is 12.6 % (CZTSSe), reported by IBM research group [1]. In Tallinn University of Technology we implement monograin layer solar cell concept and we have reached efficiencies of 9.3 % (CZTS). What are the main obstacles on the way to further efficiency improvement and what could be the solutions?

[1] W. Wang, M.T. Winkler, O. Gunawan, T. Gokmen, T.K. Todorov, Y. Zhu, D.B. Mitzi, Device characteristics of CZTSSe Thin-Film Solar Cells With 12.6% Efficiency, Adv. Energy Mater. 4 (2013) 1301465.

[2] M. Kauk-Kuusik, K. Timmo, M. Danilson, M. Altosaar, M. Grossberg, K. Ernits. p–n junction improvements of Cu_2ZnSnS_4/CdS monograin layer solar cells. Applied Surface Science 357 (2015) 795–798.

Dr. Maarja Grossberg *is experienced researcher in the field of optical and electrical characterization of materials and devices for solar energetics. She is specialized in luminescence, advanced Raman scattering, modulation and capacitance spectroscopy methods. The main effort has been put into the research of chalcopyrite and kesterite based solar cells.*

She is a principal investigator of several national research projects and has been and is a participant in several international projects (FP7 and INTAS projects) in the field of research of solar energy materials and solar cells. She is an author/co-author of 59 WOS publications. Her detailed CV with the list of publications can be found at: https://etis.ee/Portal/Persons/Display/0137df39-498b-4d3f-82d0-a73a420d88b3?tabId=CV_ENG.