



Novel Semiconductor Nanowire Photovoltaics (NWIREs)

Duration: 01.01.2015-31.12.2017 (3 years)

Partners: Aalto University (Finland) and IIT Delhi (India)

Funding: Academy of Finland & DST, India

Researchers: Finnish PI: Prof. Harri Lipsanen (harri.lipsanen@aalto.fi)

Postdoc: Dr. Veer Dhaka (veer.dhaka@aalto.fi)

Doctoral candidates: Tuomas Haggren & Joona-Pekko Kakko

Abstract

Solar energy is inherently clean and renewable but cost-efficient solar-to-electrical energy harvesting of currently available thin film based solar cells is a major concern for their large-scale commercialization. This joint Finland-India (Aalto University-IIT Delhi) proposal targets research on new kind of efficient solar cell materials based on III-V and II-VI semiconductor nanowires. The project focuses on the use of cheap and abundant materials, inexpensive scalable fabrication methods and employs unique light trapping core-shell radial p-n junction geometry to fabricate novel low-cost and energy efficient next generation solar cells. Specifically, GaAs and InP nanowires based solar cells will be fabricated on Si substrates using MOCVD epitaxial growth technique, while the ZnO nanowire based II-VI core shell radial p-n junctions solar cells will be fabricated on TCO coated glass substrates using the solution based electrochemical deposition method. The project is expected to establish a common joint platform between Aalto University and IIT Delhi that would produce new information and knowhow in the form of new and novel low-cost PV demonstrators.