



Call for Papers

Area 5: Amorphous, Nano and Film Si Technologies

Chair: Arno Smets, Delft University of Technology, the Netherlands

Co-Chair: Hiroyuki Fujiwara, Gifu University, Japan

Co-Chair: Aad Gordijn, Forschungszentrum Jülich, Germany

Sub-area 5.1: Fundamental Properties of Thin Silicon Films

Sub-area 5.2: Processing Issues for Thin Silicon Films and Devices

Sub-area 5.3: Novel Concepts for Thin Silicon Solar Cell Devices

Sub-area 5.4: Amorphous, Nano/Microcrystalline and Silicon Film Devices and Modules

Dear Colleagues,

On behalf of the technical program committee it is our pleasure to invite you to submit papers for **Area 5: “Amorphous, Nano and Film Si Technologies”** of the 37th IEEE Photovoltaic Specialists Conference, which will be held in Seattle, Washington, the week of June 19-24 2011. The IEEE PVSC meeting is the established international platform for presenting PV related research of high scientific level.

In an era with an increasing demand for PV, many companies have invested in the mass production of thin silicon-film PV technology, driven by the availability of turn-key production lines, the former shortage in the crystalline silicon supply and the low manufacturing costs of thin silicon-film PV technology. The field of thin-film photovoltaics based on amorphous, nano/microcrystalline and polycrystalline silicon on non Si-substrates has matured through three decades of advances in the design and processing of high-quality materials, solar cells and modules. Despite these great advances, many fundamental and technological issues of great importance still remain in order to achieve further progress, like the highly necessary further increase of the conversion efficiencies of thin silicon film based solar cells. We would like to devote Area 5 to these important hot topics, which have been categorized in four subareas as presented below. We encourage people to submit papers **on detailed scientific research studies, on realistic promises how to achieve further progress and visionary papers** addressing the full range of these fundamental issues and technological challenges in the field, including:

**Subarea 5.1: Fundamental properties of thin silicon films***Chairs:* David Bobela, NREL, USA

Nikolas Podraza, Penn State University, USA

Due to the wide variety of process technologies, thin-film silicon possesses a diverse range of microstructures and material phases, from fully amorphous to fully polycrystalline, as well as mixed-phase, such as nano- and microcrystalline silicon with amorphous silicon. In subarea 5.1 we would like to address the progress in the fundamental understanding of these materials by studies on the properties of the diverse phases of silicon, like its microstructure, opto-electronic (meta)-stability and mechanisms involved, SiGe, SiC, SiO and other Si based PV alloys, novel doped layers and prevention of possible oxidation of polycrystalline and mixed-phase materials.

Subarea 5.2: Processing issues for thin silicon films and devices*Chairs:* David Young, NREL, USA

Nicolas Wyrsh, EPFL Neuchatel, Switzerland

An important issue is the progress in and the development of novel processing technologies to further reduce the cost/price of thin silicon film PV products. In subarea 5.2, important processing issues concerning high throughput of thin amorphous and nano/microcrystalline silicon, such as homogenous deposition over large areas, high deposition rates, deposition on flexible substrates, novel precursor gasses, processing routes for polycrystalline silicon on non-silicon substrates, c-Si seed layers on glass, laser-crystallization of a-Si, approaches for equipment cleaning, laser scribing of monolithic interconnections, encapsulation of devices and sustainable clean processing technologies. Furthermore, sub Area 5.2 will cover approaches for processing and surface passivation of silicon nanocrystals for PV applications.

Subarea 5.3: Novel concepts for thin silicon solar cell devices*Chairs:* Ruud Schropp, Utrecht University, the Netherlands

Porponth Sichanugrist, Tokyo Institute of Technology

A further increase in the efficiency of thin silicon film based PV products is badly needed to enhance its competitiveness in the PV market. In subarea 5.3, novel concepts to increase the light trapping, currents, voltages and the utilization efficiency of the solar spectrum in thin silicon film solar cells will be addressed, like enhanced light trapping using, texturing of interfaces, multi-layers, intermediate reflective layer between junctions or integrated in doped layers, plasmonic enhancement, photonic structures, "3d" structures (nanowires, nanorods), advanced transparent conductive oxide layers and films with new functionalities like spectral up- or downconversion, quantum dots, etc.

37th IEEE Photovoltaic Specialists Conference

June 19-24, 2011

Washington State Convention Center, Seattle, Washington



Subarea 5.4: Amorphous, nano/microcrystalline and silicon film devices and modules

Chairs: Per Widenborg, Solar Energy Research Center, Singapore
Rutger Schlatmann, Helmholtz Institute Berlin, Germany.

In subarea 5.4 all topics related to state-of-the art amorphous/microcrystalline and silicon film solar cells and modules, such as the various types of multijunction structures, characterization of performance and long-term reliability, will be addressed.

Please check our website for the 37th IEEE PVSC at www.ieee-pvsc.org. Please, submit your extended abstract of three pages in length before the deadline of **February, 21, 2011** using the conference website.

Looking forward to seeing you all in Seattle.

Sincerely,

Arno Smets, Delft University of Technology, the Netherlands
Area 5 Chair

Hiroyuki Fujiwara, Gifu University, Japan
Aad Gordijn, Forschungszentrum Jülich, Germany
Area 5 Co-Chairs