

**PHYSIKALISCHES KOLLOQUIUM
EINLADUNG**

21.4.2011/Wh

Am Montag, dem 2.5.2011, 16.15 Uhr in W2-1-148

spricht

Prof. Dr. Bernd Rech
Institute Silicon Photovoltaics
Helmholtz-Zentrum Berlin für Materialien und Energie

über

**“Challenges and perspectives of micro- and nanostructures for silicon
based thin-film photovoltaics”**

Thin-film silicon based technologies bare the potential to significantly reduce production costs for PV modules, and thus, huge investments were made world-wide into a multiplicity of new production plants during the past years. These approaches rely on PECVD (plasma enhanced chemical vapour deposition) equipment which was developed and scaled-up for flat panel display applications. However, inherent material properties of a Si:H and $\mu\text{c-Si:H}$ and the rather high costs of the PECVD processes may limit the cost reduction potential of this technology on the long term. Large grained poly-crystalline Si thin film solar cells bare the potential to overcome limits of the Si thin-film solar cell technology existing today. On the longer term Si based nanostructures may open-up new device structures providing perfect light trapping or even novel component cells for tandem devices utilizing quantum size effects to tune the bandgap of silicon.

This talk reviews latest results achieved in our lab comprising high-rate electron-beam evaporation and adapted crystallization techniques, perfectly controlled a-Si:H/crystalline-Si interfaces, temperature stable high mobility ZnO, and large-grained poly-Si films prepared by electron beam crystallization. Based on these results we discuss perspectives and challenges of micro- and nanostructures for Si based thin film solar cells towards large scale application.

Einladender: Prof. Dr. Carsten Agert