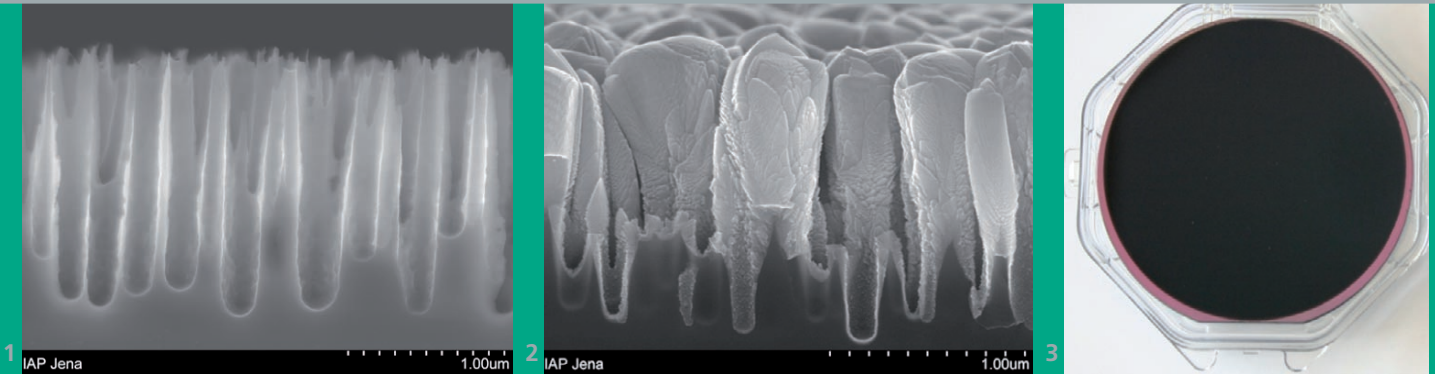




- 1 SEM micrograph of a structured silicon surface.
- 2 SEM micrograph of a Nano-SIS solar cell.
- 3 Nano-SIS solar cell.

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NANOSTRUCTURED SIS SOLAR CELLS

Motivation and objective

The photovoltaic industry faces the challenge of providing a significant share of future energy demands. To achieve the high national and international goals, it is necessary to develop efficient cell concepts with low-cost production processes.

Nanostructured silicon

A requirement highly efficient solar cells have to meet is for the incident radiation to be efficiently coupled into the absorbing material. Nanostructured silicon surfaces are a well-known solution for the generation of broadband antireflection properties as well as direct photon management.

Nano-SIS solar cells

To implement a semiconductor-insulator-semiconductor system, a thin film of an insulating material is deposited on silicon, followed by overcoating with a transparent conductive oxide (TCO), for which indium tin oxide or aluminum-doped zinc oxide can be used.

The combination of nanostructured silicon interfaces and low-cost SIS systems creates an innovative solar cell concept with the potential of high efficiency at low production costs.

Thanks are due to the BMBF for financial support of this work within the project PHIOBE (FKZ 13N9669).

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