

PRESS RELEASE

European Union allocates 10 million Euros to thin film solar cell project

European research consortium's German partners to include Berlin's Helmholtz Centre and Free University

In the context of its 7th annual 'Framework Programme for Research and Technological Development,' the European Union has approved funding in excess of 10 million Euros for the thin film solar cell project "Scalenano" through 2015. Thirteen different European research groups will collaborate on co-developing chalcogenide solar cell technology with the common goal of cutting production costs while using nanostructured materials to increase thin film module efficiency. The consortium will include Germany's Helmholtz Centre Berlin (HZB) and the Free University of Berlin.

To date, copper indium gallium diselenide (CIGSe) has proved the most efficient of the chalcogenide materials. Traditionally, a process known as vacuum coating has been used to deposit several layers of CIGSe a few micrometers thick onto a glass or foil surface. In an effort to cut costs, one of this European collaborative's many goals includes development of new, environmentally-friendly production methods that are vacuum-independent.

Using new material and building element concepts including use of nanostructured materials, the goal is to bring about a breakthrough increase in efficiency. Through the electrochemical synthesis of nanocrystalline precursors and using new techniques for printing nano particles - similar to the way ink is used in printing - the researchers hope to tap new methods of production. To ensure its success beyond the laboratory setting (which normally uses only a few, isolated solar cells), the scientists aim to test production concepts for purposes of a potential upscale.

Headed by Dr. Thomas Unold, the HZB team's main focus will be on quality control and process monitoring. Development of innovative analytical tools for solar cell characterization during production is already under way. The scientists are hopeful that they will ultimately be able to use these tools to improve the quality of the chalcogenide absorptive material while ensuring high yield and high performance during the upscale.

The new research strategy will also combine thin film absorptive materials with nanostructured transparent conductive oxides (TCOs). In this area of research, the team led jointly by Professor Martha Lux-Steiner and Dr. Sophie Gledhill of the Free University of Berlin and HZB, respectively, are working on adapting, optimizing, and optically modeling zinc oxide nanoarray coated chalcogenide solar cells.

The Berlin-based researchers are also hard at work on the next-generation chalcogenide thin film materials known as kesterides - materials with properties similar to CIGSe albeit minus the indium component, an element, which occurs only rarely in the Earth's crust.

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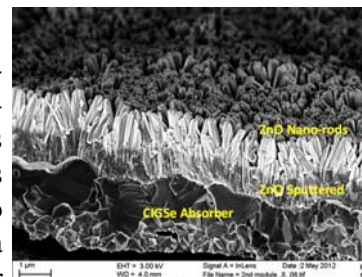
For additional information:

Dr. Sophie Gledhill
Institute for Heterogeneous Material Systems
Ph.: +49 (0)30-8062-43234
sophie.gledhill@helmholtz-berlin.de

Dr. Thomas Unold
Institute for Technology
Ph.: +49 (0)30-8062-42048
unold@helmholtz-berlin.de

Press Office

Dr. Ina Helms
Ph.: +49 (0)30-8062-42034
Fax: +49 (0)30-8062-42998
ina.helms@helmholtz-berlin.de



Zinc oxide nano-rods as anti-reflective coating on a CIGSe solar cell.
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**Scale
nano**

The **Helmholtz-Zentrum Berlin für Materialien und Energie (HZB)** operates and develops large scale facilities for research with photons (synchrotron beams) and neutrons. The experimental facilities, some of which are unique, are used annually by more than 2,500 guest researchers from universities and other research organisations worldwide. Above all, HZB is known for the unique sample environments that can be created (high magnetic fields, low temperatures). HZB conducts materials research on themes that especially benefit from and are suited to large scale facilities. Research topics include magnetic materials and functional materials. In the research focus area of solar energy, the development of thin film solar cells is a priority, whilst chemical fuels from sunlight are also a vital research theme. HZB has approx. 1,100 employees of whom some 800 work on the Lise-Meitner Campus in Wannsee and 300 on the Wilhelm-Conrad-Röntgen Campus in Adlershof.

HZB is a member of the Helmholtz Association of German Research Centres, the largest scientific organisation in Germany.