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## With new contacting to greater efficiency

Monocrystalline silicon solar cell achieves 25.7 % efficiency

Scientists have been investigating how they can reduce the losses in silicon solar cells. In particular they have focussed on the recombination of charge carriers and the coupling of light. The BINE-Projektinfo brochure entitled “New method comes closer to the ideal solar cell” (13/2017) presents the decisive steps towards more efficient solar cells.

In order to reduce efficiency losses, free charge carriers need to be transferred as loss-free as possible and their recombination avoided. The scientists have achieved this, among other things, by using new, full-area selective and passivating contacting on the back side of the solar cells. This contacting consists of an ultra-thin tunnel oxide and a silicon layer that is only one to two nanometres thick. The new contact transports the charge carriers with virtually no losses and prevents the charge carriers from recombining at the metal contacts.

The greater the proportion of incident solar radiation that the solar cell can convert into electrical energy, the greater the efficiency. Structures on the micro- or nanometre scale help solar cells capture the light and make optimum use of it. The scientists have developed corresponding texture combinations for the front and back side of solar cells that improve the light coupling.

The research work in the “ForTES” project was led by the Fraunhofer Institute for Solar Energy Systems.

The BINE-Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at [www.bine.info](http://www.bine.info) or by calling +49(0)228-92379-0. The brochure cover and additional images can also be downloaded from this web portal in the press section.

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