Bandgap engineering for high-efficiency solar cell design

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ZnSnP2, an absorber material for solar cells, transitions from an ordered to a disordered structure at high temperatures. Researchers from University College London and the University of Bath have proposed taking advantage of this structural change to design high-efficiency solar absorbers.

The team used theoretical calculations to investigate the electronic structure of both phases, and predicted a significant difference in the bandgap between the ordered and fully disordered materials.

Experimental measurements of the bandgap of ZnSnP2 are consistent with predictions from partially disordered phases.

In a paper accepted for publication in the American Institute of Physics' journal Applied Physics Letters, the researchers propose that a family of ZnSnP2 materials with different structural phases could provide a graded solar cell system that absorbs light across a wide swath of the spectrum.

More information: "Bandgap engineering of ZnSnP2 for high-efficiency solar cells", *Applied Physics Letters*.

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