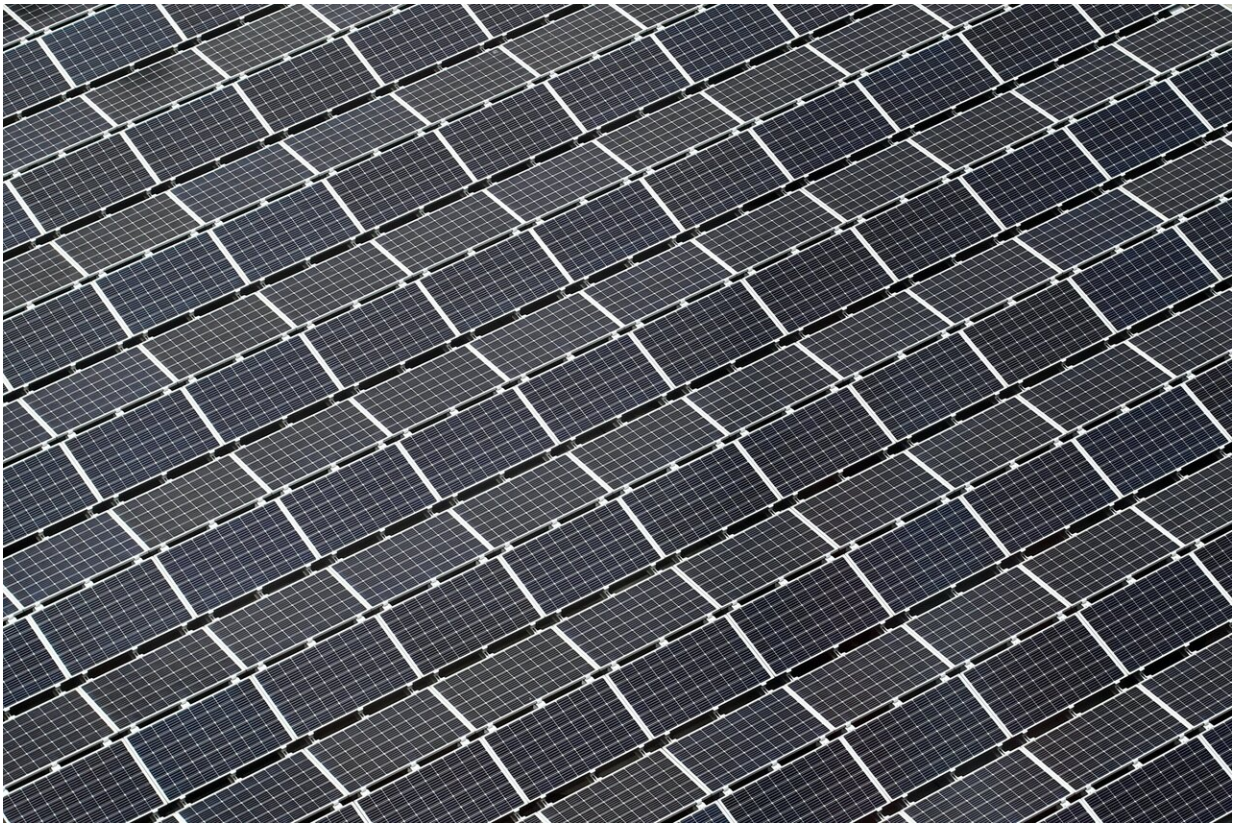


Researchers leading the way in perovskite tandem solar cells

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Scientists from the University of Surrey have revealed the significant improvements they are making in perovskite-based solar cells.

Perovskite solar cells have shown significant potential in reaching the efficiency limit of the widely used solar cells currently on the market by absorbing light in a broader range of wavelengths. Industry has also been paying close attention to the development of perovskite-based cells thanks to their low-cost and simple fabrication, and their efficient combination with other types of solar cells to produce tandems.

Perovskite solar cells have emerged as the heir apparent to silicon-based solar cells because of their high-power energy conversion efficiency, low development cost, and ability to be ultra-lightweight. Named after a naturally occurring mineral that shares a structurally similar chemical formula, perovskites are synthetic composites that have three-dimensional lattice crystal structures.

In a front-cover paper published by the top American Chemical Society journal *Chemical Reviews*, the team from Surrey's Advanced Technology Institute (ATI) summarize the recent progress in improving perovskite tandem solar cells power conversion efficiencies, including thickness adjustment of perovskite, improving the transparency of [perovskite solar cells](#), more effective protective layers and much more. The team also highlight measurement techniques, large-scale fabrication, commercialization development and lead-related environmental issues.

In the paper, the team offer a roadmap for further progress, including strategies for the enhancement of the power conversion efficiencies, stability and reliability assessments, and potential applications.

Dr. Wei Zhang, the corresponding author and Senior Lecturer in Energy Technology at ATI, said, "Perovskite tandem solar cells are at the forefront of next-generation photovoltaic technologies. Our timely review summarizes the fundamentals of this exciting research field and future applications, which are expected to accelerate the commercialization of this low-cost and high-efficiency photovoltaic

product as a major competitor to the traditional crystalline silicon solar [cells](#) in the next few years."

Professor Hui Li, first-author and Visiting Professor and Advanced Newton Fellow at ATI, said: "We are excited to offer this review that is showing great potential for moving our planet towards green energy."

Professor Ravi Silva, Director of ATI at the University of Surrey, said: "We are happy to see this wonderful research finally being used for real-world applications and we look forward to continuing our collaboration on [perovskite](#) tandem [solar cells](#), which is a research priority area at ATI."

More information: Hui Li et al, Perovskite Tandem Solar Cells: From Fundamentals to Commercial Deployment, *Chemical Reviews* (2020). [DOI: 10.1021/acs.chemrev.9b00780](https://doi.org/10.1021/acs.chemrev.9b00780)

Provided by University of Surrey

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