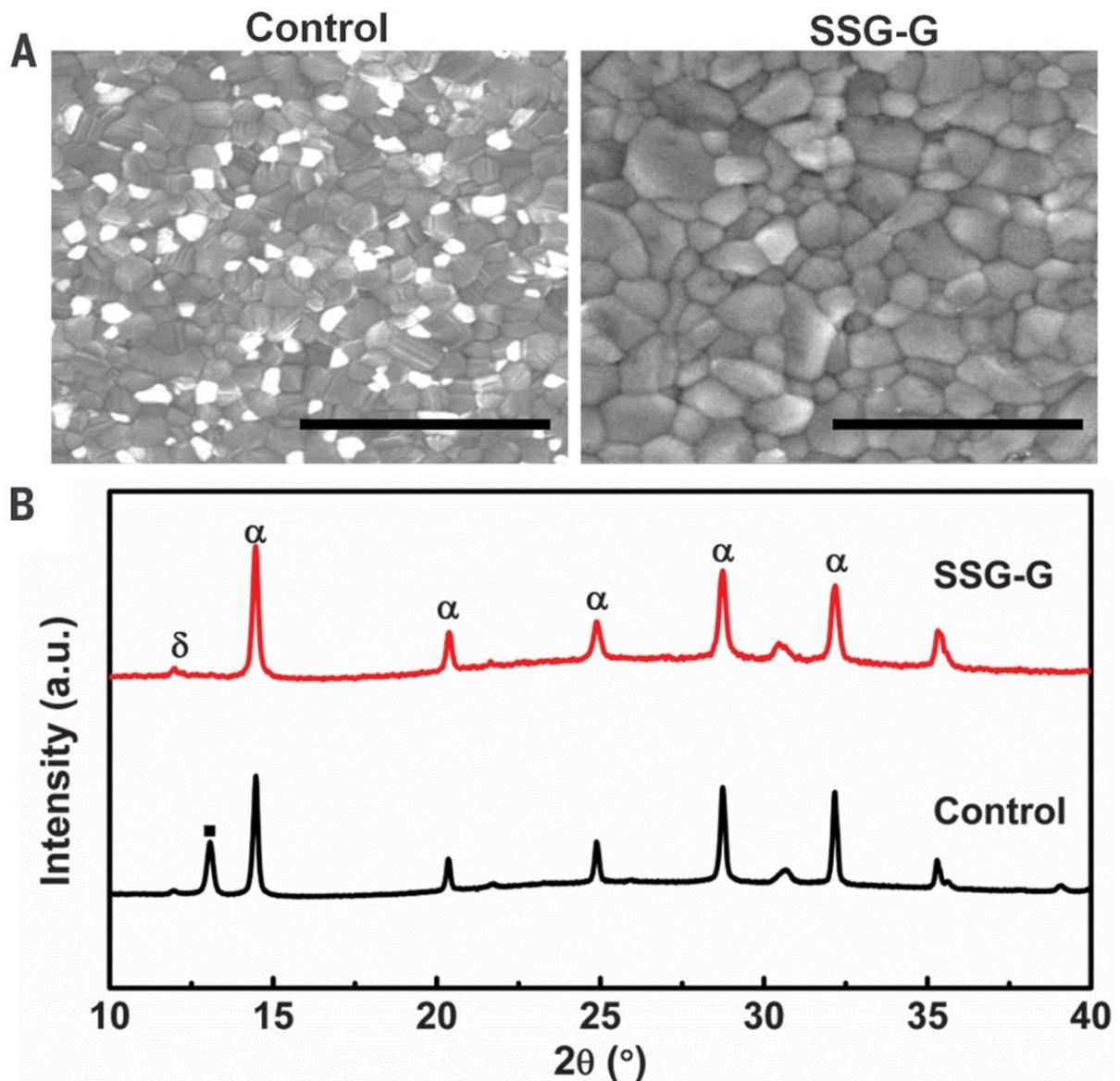


Team makes breakthrough in perovskite solar cell technology

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Improved morphologies and crystal structures. (A) Top-view SEM images of the control and SSG-G films. Scale bar, 2 μm . (B) XRD patterns (α , δ , and the black square denote the identified diffraction peaks corresponding to the black perovskite phase, the nonperovskite phase, and $\text{PbI}_{1.50}\text{Br}_{0.50}$, respectively). a.u., arbitrary units. Credit: *Science* (2018). DOI: 10.1126/science.aap9282

The University of Surrey has helped to create a technique that has produced the highest performing inverted perovskite solar cell ever recorded.

Perovskite based cells are widely viewed as the next generation of solar cells, offering similar [power conversion efficiency](#) (PCE) performance, but at a much lower cost than the market dominant crystalline silicon based solar cells.

In a study published by *Science*, a team of researchers from Peking University and the Universities of Surrey, Oxford and Cambridge detail a new way to reduce an unwanted process called non-radiative recombination, where energy and efficiency is lost in [perovskite](#) solar cells.

The team created a technique called Solution-Process Secondary growth (SSG) which increased the voltage of inverted perovskite solar cells by 100 millivolts, reaching a high of 1.21 volts without compromising the quality of the solar cell or the electrical current flowing through a device. They tested the technique on a device which recorded a PCE of 20.9 per cent, the highest certified PCE for inverted perovskite solar cells ever recorded.

Dr. Wei Zhang from the University of Surrey's Advanced Technology Institute, said: "The need for clean and sustainable energy that helps us

to stop damaging our planet is what drives us at the Advanced Technology Institute. Our new [technique](#) confirms that there is a lot of promise with perovskite solar [cells](#) and we aim to explore this new and exciting area more in the future."

Professor Ravi Silva, Director of the Advanced Technology Institute at the University of Surrey, said: "It is pleasing to see the Advanced Technology Institute join in this global project that could provide a solution to the need for a truly sustainable, cheap and clean energy resource. This was a monumental effort from leading laboratories, researchers and institutions from across the world, all working together for the common good."

More information: Deying Luo et al, Enhanced photovoltage for inverted planar heterojunction perovskite solar cells, *Science* (2018). [DOI: 10.1126/science.aap9282](https://doi.org/10.1126/science.aap9282)

Provided by University of Surrey

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