# New roadmap to better performing solar energy cells

September 27 2021

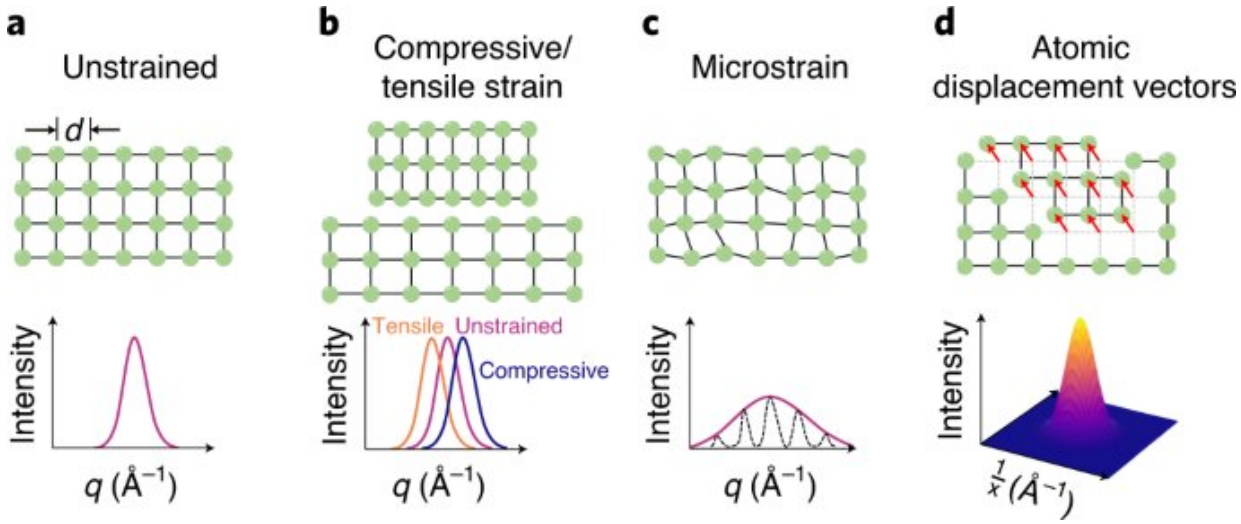


Fig. 1: Definition and measurement of strain in halide perovskites. Credit: DOI: 10.1038/s41563-021-01097-x

Perovskite solar cells are in many ways already as efficient as conventional crystalline silicon-based solar cells; perovskite has the added benefit of being much more cost-effective than its silicon counterpart. Perovskites are also being introduced in various devices such as light-emitting diodes, lasers, memory devices and much more.

In a paper published by *Nature Materials*, researchers from the University of Surrey, University of Cambridge and University of

Toronto, Canada, explain the origin, characterisation, pitfalls and opportunities for strain in perovskite materials. The team also explain their vision of how the research community can use strain to unleash the full potential of perovskite materials.

Dr. Wei Zhang, a corresponding author and Senior Lecturer from the University of Surrey, said: "Many in the photovoltaic research community are rightly excited about the potential of perovskite materials, not only when it comes to green technologies such as solar cells but other electronic devices. In this study, we look at factors that influence the efficiency and stability of devices—and explore the role strain may play on perovskites. A comprehensive understanding of strain in perovskites will lead to perovskite materials with remarkable optoelectronic novelty."

Dr. Sam Stranks, a corresponding author and University Lecturer from the University of Cambridge, said: "Strain appears to play an important role in perovskite solar cells, yet the phenomenon in these materials is not well understood. We hope this work will challenge existing assumptions and encourage new efforts to understand and ultimately harness these effects—to deliver high-efficiency solar cells as well as new devices with new functionality."

**More information:** Dongtao Liu et al, Strain analysis and engineering in halide perovskite photovoltaics, *Nature Materials* (2021). DOI: 10.1038/s41563-021-01097-x

Provided by University of Surrey