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NTU makes breakthrough solar technology

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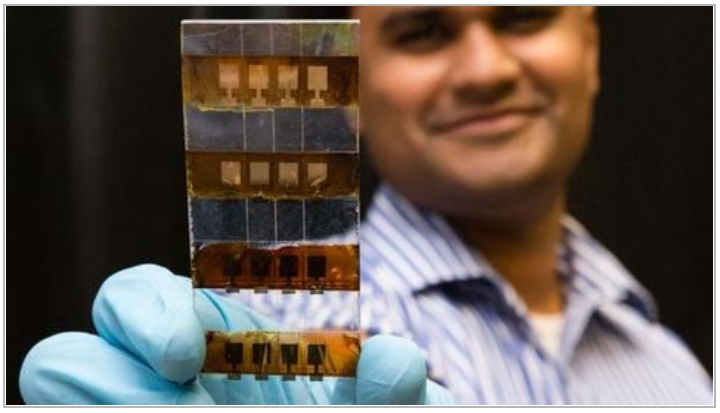

SINGAPORE: A group of researchers in Nanyang Technological University (NTU) has uncovered the working of perovskite, a material that may be the answer to cheaper and more efficient solar energy panels.

Perovskite has been described as a remarkable solar cell material as it can convert up to 15 per cent of sunlight into electricity, coming close to the efficiency of nearly 20 per cent of solar cells in the market.

However, scientists have not explained the workings of the substance till an NTU interdisciplinary research team did so in a paper published on October 18 in the academic journal Science.

Assistant Professor Sum Tze Chien said, "We discovered that in these perovskite materials, the electrons generated in the material by sunlight can travel quite far. This will allow us to make thicker solar cells which absorb more light and in turn generate more electricity."

"In our work, we utilise ultrafast lasers to study the perovskite materials. We tracked how fast these materials react to light in quadrillionths of a second (roughly 100 billion times faster than a camera flash)," added the photophysics expert in an NTU statement issued on Monday.

Dr Sum had collaborated with Dr Nripan Mathews, a senior scientist with ERI@N, an energy research institute in the university.

"Now that we know exactly how perovskite materials behave and work, we will be able to tweak the performance of the new solar cells and improve its efficiency, hopefully reaching or even exceeding the performance of today's silicon solar cells," said Dr Mathews.

Solar cells made from organic-inorganic hybrid perovskite materials are said to be about five times cheaper than current silicon-based solar cells, due to a simpler manufacturing process.

ERI@N is working with Australian clean-tech firm Dyesol Limited to develop a commercial prototype of the perovskite solar cell, said the statement.

Dr Sum, Dr Mathews and their team have worked closely with Professor Michael Grätzel of the Swiss Federal Institute of Technology in Lausanne (EPFL).

Prof Grätzel, a winner of multiple awards for his invention of dye-sensitised solar cells, also co-authored the paper.

The work of the team was funded by NTU and Singapore's National Research Foundation.

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