

# MEET THE POWER PLAYERS

*Organic polymer solar cells are set to revolutionize photovoltaic technology. Five of the world's leaders in the field are at the same institution*

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## THE HOTSPOT

The Institute of Polymer Optoelectronic Materials and Devices at South China University of Technology in Guangzhou leads the world in research and development of organic polymer solar cells. This next-generation photovoltaic technology is low-cost, lightweight and flexible enough to be used in solar electric vehicles and for portable charging

devices, or to be wall-mounted for power generation. The lab's research contributed to the design of polymer solar cells that achieved 12% sunlight to energy conversion, the highest efficiency achieved for this type of solar cell to date. The research was published in *Nature Photonics* in 2016.

These five researchers are also listed on the Web of Science's most highly-cited in materials science.

## THE PLAYERS



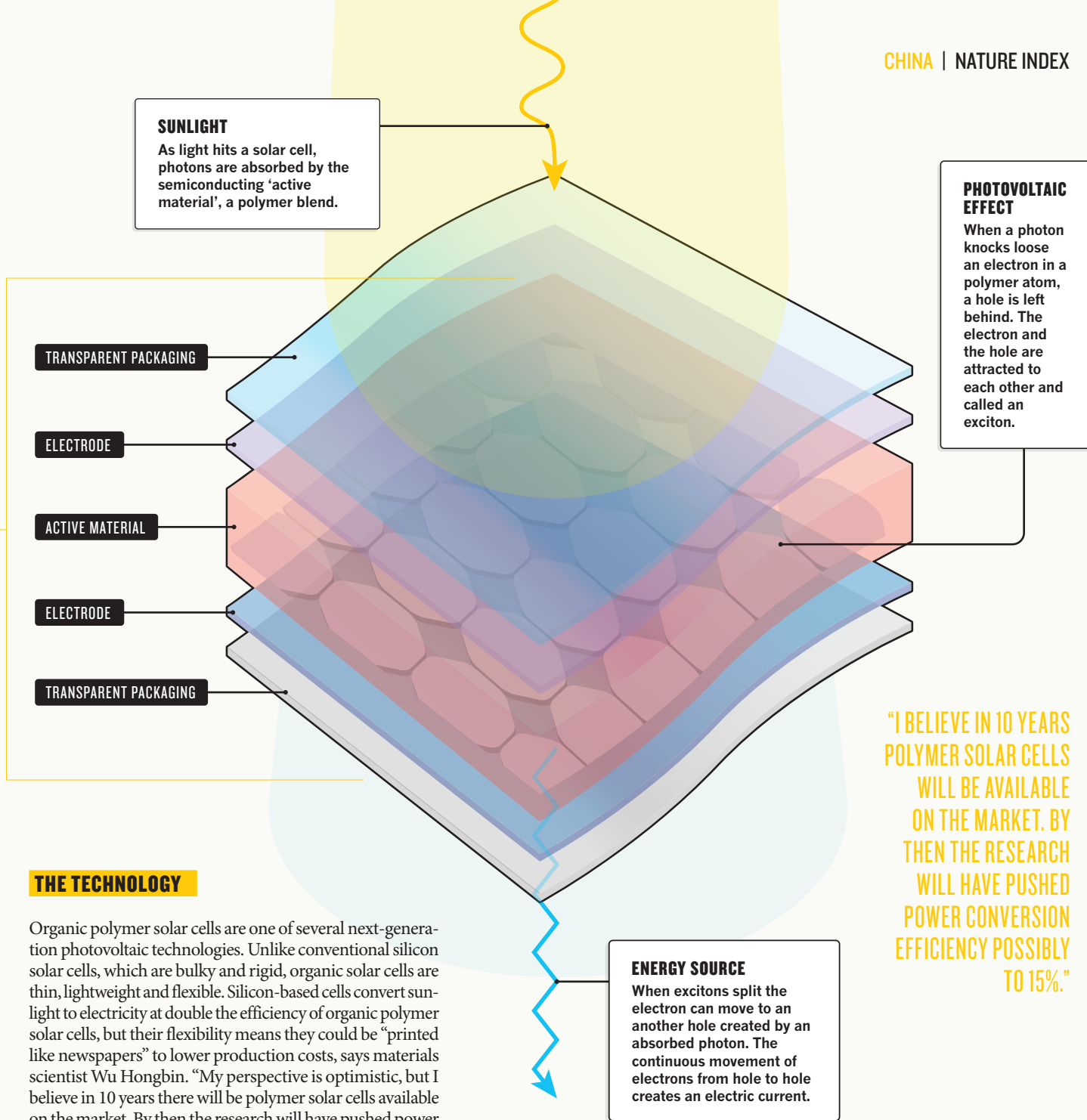
### CAO YONG

Cao has been researching polymers since the 1970s, creating highly efficient light-emitting materials. His is co-inventor of more than 20 US patents in conducting polymers and optoelectronic polymers and devices. In 2001 he was elected as an academican of the Chinese Academy of Sciences.



### MA DONGGE

Ma worked as a research fellow abroad and in Hong Kong before being recruited back to the mainland under the Chinese Academy of Sciences' Hundred Talents programme in 2001. After a stint at the State Key Laboratory of Polymer Physics and Chemistry in Changchun, he joined the South China University of Technology in 2015. He develops small molecules to create more efficient light emitting devices.



**"I BELIEVE IN 10 YEARS POLYMER SOLAR CELLS WILL BE AVAILABLE ON THE MARKET. BY THEN THE RESEARCH WILL HAVE PUSHED POWER CONVERSION EFFICIENCY POSSIBLY TO 15%."**

**THE TECHNOLOGY**

Organic polymer solar cells are one of several next-generation photovoltaic technologies. Unlike conventional silicon solar cells, which are bulky and rigid, organic solar cells are thin, lightweight and flexible. Silicon-based cells convert sunlight to electricity at double the efficiency of organic polymer solar cells, but their flexibility means they could be "printed like newspapers" to lower production costs, says materials scientist Wu Hongbin. "My perspective is optimistic, but I believe in 10 years there will be polymer solar cells available on the market. By then the research will have pushed power conversion efficiency possibly to 15%," he says.



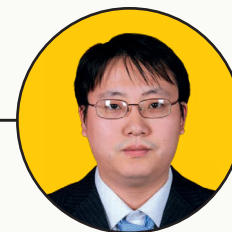
**WU HONGBIN**

Wu was one of the first students to join the institute, completing his PhD in materials physics under the supervision of Cao. He leads a team developing organic optoelectronics, electronic devices that source, detect and control light.



**YIP HIN-LAP**

Yip joined the laboratory in 2013. He worked with Cao Yong on the design of an organic solar cell that converts light to electrical power with an efficiency greater than 12%, the highest certified efficiency achieved in an organic polymer solar cell to date.



**HUANG FEI**

Huang also joined the laboratory as a PhD student and is now deputy director of the State Key Laboratory of Luminescent Materials and Devices. His focus is on developing new organic polymers. In 2012, he was a finalist in the Innovation Cultivation Plan, part of Ministry of Science and Technology's plan to promote innovative talents.