

What is a stretchable photovoltaic?

Communications Materials 2, Article number: 7 (2021) Cite this article Stretchable photovoltaics are emerging power sources for collapsible electronics, biomedical devices, and buildings and vehicles with curved surfaces. Development of stretchable photovoltaics are crucial to achieve rapid growth of the future photovoltaic market.

What are flexible and stretchable solar cells?

Flexible and stretchable solar cells have gained a growing attention in the last decade due to their ever-expanding range of applications from foldable electronics and robotics to wearables, transportation, and buildings.

Can a stretchable organic solar cell work?

The Korea Advanced Institute of Science and Technology (KAIST) Engineers have succeeded in implementing a stretchable organic solar cell by applying a newly developed polymer material that demonstrated the world's highest photovoltaic conversion efficiency (19%) while functioning even when stretched for more than 40% of its original state.

Can stretchable photovoltaics be applied to 3D curved surfaces?

Development of stretchable photovoltaics are crucial to achieve rapid growth of the future photovoltaic market. However, owing to their rigidity, existing thin-film solar cells based predominantly on silicon, compound semiconductors, and perovskites are difficult to apply to 3D curved surfaces, which are potential real-world candidates.

Are organic photovoltaics stretchable?

The realization of intrinsically stretchable organic photovoltaics with excellent mechanical robustness remains challenging. Here, the authors redistribute the strain in the active layer to PEDOT:PSS electrodes with simultaneously enhanced stretchability and interfacial adhesion in the device.

What is a stretchable micro-scale concentrator photovoltaic module?

The module is based on a silicone concentrator lens, a thermoplastic polyurethane sheet, and a rigid III-V triple-junction solar cell. A Japanese research team has developed a stretchable micro-scale concentrator photovoltaic (CPV) module that can be installed on arbitrary 3D curved surfaces characterized by sharp curvatures.

DOI: 10.1016/j.apenergy.2022.119559 Corpus ID: 250473256; Reliable Lego-style assembled stretchable photovoltaic module for 3-dimensional curved surface application ...

Researchers make breakthrough in solar technology with "stretchable" panels that act like rubber -- here's why

it's significant ... polymer -- and the research summary ...

Flexible and stretchable solar cells in specific have gained increased attention in recent years due to their capability to widen the range of potential solar energy applications, ...

Stretchable organic photovoltaics (OPVs) have attracted significant attention as promising power sources for wearable electronic systems owing to their superior robustness ...

The newly developed stretchable solar cell can undergo a remarkable 40 percent stretch during operation, showcasing its potential for integration into wearable devices.

The structural safety of solar cells mounted on deployable solar panels in the launch vibration environment is a significant aspect of a successful CubeSat mission. This ...

This Perspective reviews stretchable, elastic materials and devices of use for the conversion of solar energy. Stretchable and extremely flexible photovoltaic and ...

"Stretchable solar cells that can function under strain have received considerable attention as an energy source." An innovative, flexible solar cell being developed in South Korea has passed a ...

The stand-alone photovoltaic-battery (PV/B) hybrid energy system has been widely used in off-grid equipment and spacecraft due to its effective utilization of renewable ...

The increasing demand for photovoltaic (PV) electricity has resulted in wider usage for many applications. Current dominant PV electrical sources use crystalline silicon (c ...

Stretchable organic solar cells have been fabricated directly on pre-stretched PDMS ... Lipomi, D. J. & Bao, Z. Stretchable, elastic materials and devices for solar energy ...

The fluctuating cost of energy, due to multiple reasons including geo-political controls, national or international economic disputes, and the fact that available energy ...

"Stretchable solar cells that can function under strain have received considerable attention as an energy source." Researchers make breakthrough in solar technology with "stretchable" panels ...

KAIST researchers create a breakthrough in solar energy: a stretchable solar cell that converts energy with 19% efficiency, even when stretched up to 40% - ideal for wearable ...

The photovoltaic parameters of stretchable solar cells taking advantage of EGain-Ag particles as the bottom contact ... S. Y. et al. Transparent polymer photovoltaics for ...

This Perspective reviews stretchable, elastic materials and devices of use for the conversion of solar energy. Stretchable and extremely flexible photovoltaic and photoelectrochemical cells would be useful as, for example, power sources for ...

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