Optical Fiber-Based Solar Cells (#4520)

A hybrid solar and mechanical power generator

Georgia Tech inventors have created a hybrid solar and mechanical power generator that includes a solar power generating portion and a piezoelectric nanowire vibrational power generating portion. The solar power generating portion is electrically coupled to a first electrode. The piezoelectric nanowire vibrational power generating portion includes an electrical contact structure electrically coupled to and extending downwardly from the first electrode and disposed adjacent to the solar power generating portion. The three dimensional solar cell allows light to have multiple interactions with the dye molecules without increasing the electron transport distance.

Benefits/Advantages

- Remote function
- Greater mobility
- Can be hidden and located off the surface where sunlight is unavailable
- Smaller size
- Robust design and flexible shape
- Lower production costs

Potential Commercial Applications

- Collecting solar cell energy
- Energy harvesting devices
- Green energy source

Background/Context for This Invention

There are generally three different sources for scavenging energy from the environment: solar energy, thermal energy and mechanical energy (such as wind energy). Solar cells are typically used to collect solar energy and transform it into electrical energy. However, solar cells cannot produce electricity at times when there is insufficient ambient light, such as in the evening. Mechanical energy, from large-scale winds to micro-scale vibration, is almost always available. Thus, a system for converting mechanical energy to electricity would be able to produce electricity almost anywhere at almost any time.

Dr. Zhong Lin Wang
Former Hightower Chair, Regents' Professor - Georgia Tech School of Materials Science and Engineering; Distinguished Professor - Georgia Tech College of Engineering

Benjamin Weintraub
Researcher - Georgia Tech School of Materials Science and Engineering

More Information

U.S. Patent Issued - 8,664,523

Publications

For more information about this technology, please visit:
https://licensing.research.gatech.edu/technology/optical-fiber-based-solar-cells

Images:

The automated sequential delivery of multiple fluids. A varying number of delay gates imprinted in the branches are shown in the figure.

COVID-19 and flu saliva test on paper: (A) The automatic sequential delivery of multiple reagents required for virus test; (B) Water pouring into the device triggers the virus assay, allowing the presence of SARS-CoV-2 and influenza A & B viruses to be visually identified by the color changes in the corresponding detection spot