

# THREE DIMENSIONAL, ADVANCED SOLAR MODULE

My patents for 3d printed/3-dimensional solar energy published in 2018. We filed the International PCT in February 2019.

The American-Made Network could help us execute NREL lab validation with our three-dimensional solar sub panel and eventually full sized 3d solar panel. We validated our design with the owner of Infinity Energy in California. We saw 80% increase in power efficiency when inverting our Isoscell solar triangles at 50 degrees in sub-panel arrangement. The Isoscells were CdTe rated at 11% power efficiency and we reached 18.8% when inverted in 3D. We would like to try higher efficiency thin films with multiple iterations with single junction and tandem to see if we can achieve the same results.

Our Board of Director's Vish Gautam is helping implement our vision to create structured glass with a 10-micron recess that bio-mimics the macro of a fly's eye. You can see the micro fabrication he created in figure 1. It's as advanced as what Stanford is doing in this article and is based off my patent that pre-dates Stanford's Research.

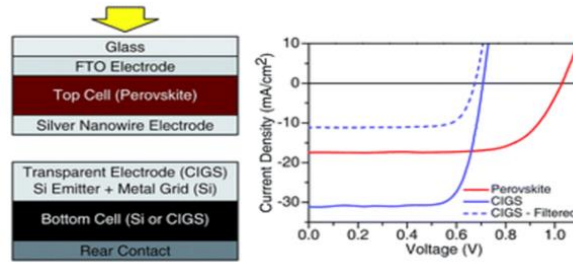
<https://electrek.co/2017/12/04/stanford-researchers-26-percent-solar-cells/>

These sub-cells are 500 microns wide with a 10micron recess as depicted in the photos below. Both iterations, structured glass, and flexible 3d printed scaffolding will protect and encapsulate the perovskite to prevent longevity problems holding this superconducting material back from commercialization.

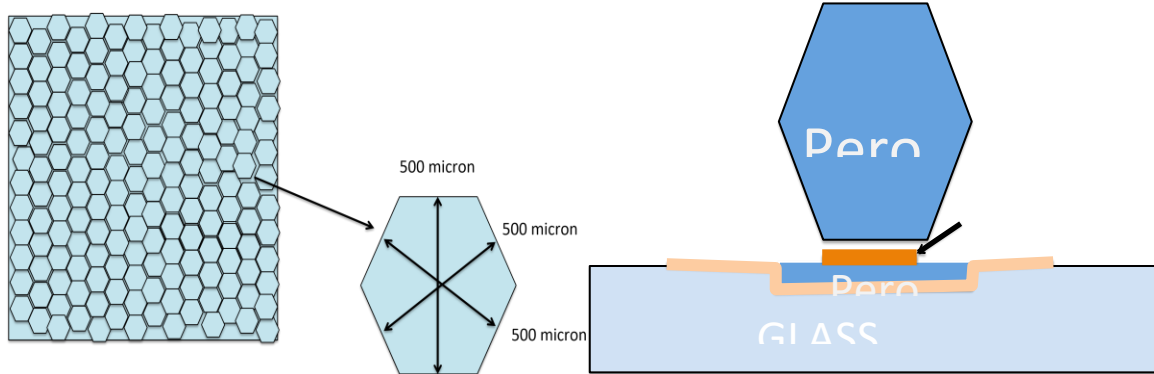
A DOE sponsored Solar Accelerator Powerhouse said they were going to link us up with DSM to help on the polymer side for terrestrial applications to prevent the sunlight from breaking down the acrylate photo polymer. We can Continuous and eventually Volumetric 3d print this scaffolding. If we can get ball rolling with American Made Hero X it will be enough momentum to turn us into real Startup Heroes.

The goal is to manufacture our 3D Isoscell (Solar Triangles) with the help of the National Labs. Then invert the solar triangles at a 50 Degree Angle in a 3d solar sub-panel arrangement for validation testing. With our 3d design, photons that are normally reflected into the atmosphere are instead bounced from one Isoscell to the next increasing light absorption. We would also like to have the labs help with more testing to

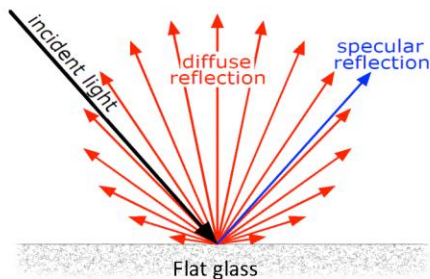
confirm that etching of the fly's eye not only protects perovskite but also increases light



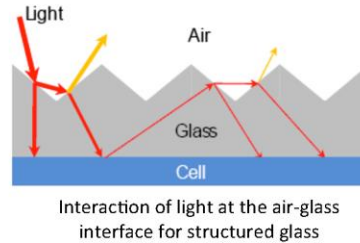
absorption.



### Structured Glass improves solar cell efficiency



Diffuse reflection is the reflection of light or other waves or particles from a surface such that a ray incident on the surface is scattered at many angles rather than at just one angle as in the case of specular reflection.



Interaction of light at the air-glass interface for structured glass



- A CIGS solar cell, different from standard glass / polymer base material fabricated.
- CIGS films processed on 10 micron deep structured glass
- Performance tests in progress

Figure 1

#T3DP <https://www.3dprintingmedia.network/t3dps-new-volumetric-3d-printing-process-may-finally-pave-way-to-3d-printed-solar-cells/>

#T3DP <https://3dprintingindustry.com/news/t3dp-to-use-perovskite-and-volumetric-3d-printing-to-build-solar-cells-150764/>

#AffiliatePartnerDrBag <https://3dprintingindustry.com/news/air-force-research-laboratory-creates-3d-printed-solar-cells-118577/>

#ButterfliesInspire3DSolar <https://www.theengineer.co.uk/butterfly-wings-inspire-efficient-light-absorbing-surface-solar-cells/>

#SolarCellInspiredByFliesEye <https://news.stanford.edu/2017/08/31/new-solar-cell-inspired-insect-eyes/>