



Tech Insider Stories 6 January 2023

Story 1: Five Pacific Northwest companies are working to commercialize fusion as a power source

Source: GeekWire

Story by Lisa Stiffler

Link: <https://www.geekwire.com/2022/historic-fusion-energy-achievement-will-boost-pacific-northwests-burgeoning-startups/>



The target chamber of LLNL's National Ignition Facility, where 192 laser beams delivered more than 2 million joules of ultraviolet energy to a tiny fuel capsule to create fusion ignition on Dec. 5, 2022. (NIF Photo)

- First, a quick reminder – Fusion is the same process that powers the sun and creates huge amounts of energy, with the potential to provide unlimited carbon-free power.
- Last month the blockbuster news was all about how researchers at the Lawrence Livermore National Laboratory in California used 192 laser beams to produce a fusion reaction that generated more energy than required to create the reaction.

- For decades, until this breakthrough, experiments generating fusion required more power to create a fusion reaction than the energy it produced.
- It's a great achievement, but the laser beam approach is not the only way to create a fusion reaction.
- There are five Pacific Northwest companies working to commercialize fusion as a power source, each using different strategies for generating fusion.
- The group includes Washington state's:
 - Avalanche,
 - Helion Energy,
 - Zap Energy,
 - and CTFusion,
 - and up in British Columbia there's an outfit called General Fusion.
- Some of these companies are using technologies developed by the University of Washington and the Pacific Northwest National Laboratory.
- One of the five companies I find interesting is Helion Energy, based in Everett, Washington.
- WARNING...what I'm about to say IS VERY GEEKY...They have an experimental prototype plasma accelerator fusion device that raises fusion fuel to about 180 million degrees Fahrenheit which directly extracts electricity using a high efficiency pulsed approach.
 - And Helion Energy hopes to launch their system as early as 2024
- So, Mark, who knows, maybe we'll start seeing the benefits of fusion in the not-too-distant future!

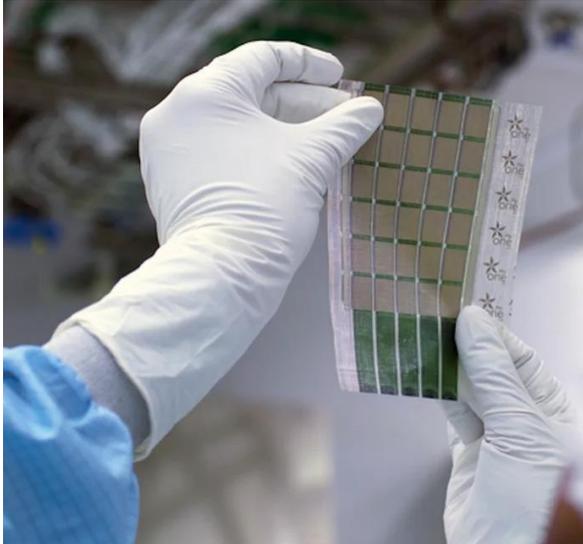


Story 2: Scientists create powerful, light-weight solar panels as thin as a human hair

Source: Popular Science

Story by Andrew Paul

Link: <https://www.popsci.com/technology/solar-panel-fabric/>



The new solar cells could turn almost any surface into a power generator. MELANIE GONICK, MIT

- Recently, the Massachusetts Institute of Technology revealed a new, ultra-thin solar cell material that is one-hundredth the weight of conventional solar panels, while also potentially generating 18 times more power-per-kilogram.
- Here's the problem -- Today's typical solar panels require heavy thick glass and aluminum encasements to protect fragile conventional solar cells.
- To eliminate that bulk the MIT team used semiconducting inks printed onto material thinner than a single strand of human hair to create their ultra-thin and flexible solar panels.
- They then glued them on top of a layer of a lightweight composite fabric weighing only 13 grams-per-square meter [that's a little under half an ounce!]
- The resultant microns-thin and flexible solar sheets can be laminated onto a variety of surfaces and materials opening the door for an endless range of possible applications!

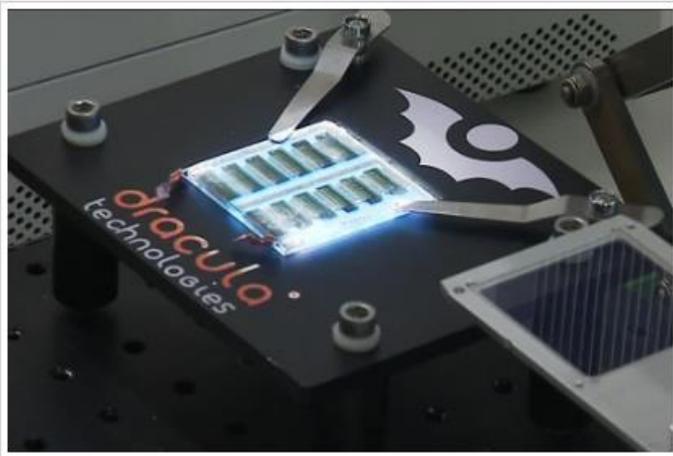


Story 3: New technology can harvest indoor light to power a future generation of smart gadgets in our homes

Source: ElectronicsWeekly.com

Story by David Manners

Link: <https://www.electronicsworld.com/news/business/811456-2022-12/>



- What if the next generation of small smart home gadgets did not need to be plugged in or powered by non-rechargeable, single use batteries?
- That's the goal of a French company with the funny name of Dracula Technologies.
- They've developed a photovoltaic technology that can harvest energy from indoor light [even in low light conditions].
- The device they created looks like the tiny solar panels you see on small solar powered outdoor garden lights.
- The special materials the company uses can harvest both natural and artificial light.
- Dracula Technologies' flexible photovoltaic modules are now being provided to manufacturers to incorporate them into a new generation of small, eco-friendly products in a variety of shapes and sizes.



Story 4: New Experimental 'Cellular Glue' Could Heal Wounds and Regrow Nerves

Source: CNET

Story by Monisha Ravisetti

Link: <https://www.cnet.com/science/biology/new-cellular-glue-concept-could-heal-wounds-regrow-nerves/#ftag=CAD-09-10aai5b>



The team's new "cellular glue" molecules helped these cells assemble into a structure.
UCSF

- Recently researchers at the University of California, San Francisco announced a "cellular glue" they say could one day open doors to exciting medical achievements, such as building organs in a lab for transplantation and reconstructing nerves deemed damaged beyond surgical repair.
- First, some background - In our bodies we have adhesive molecules found in and around cells that automatically dictate the way our tissues, nerves and organs are structured and anchored together.
- Basically, the UC San Francisco team engineered a set of synthetic molecules that do the same function but can be manipulated by doctors to selectively cause target cells within the human body to bond with one another.
- Together, these synthetic molecules constitute a kind of "cellular glue" to control the organization of cells, which is key to being able to synthesize tissues with the properties needed for specific goals, such as:
 - Mending a patients' wounds,
 - regrowing nerves otherwise considered destroyed
 - and potentially even working toward regenerating diseased lungs, livers, and other vital organs.