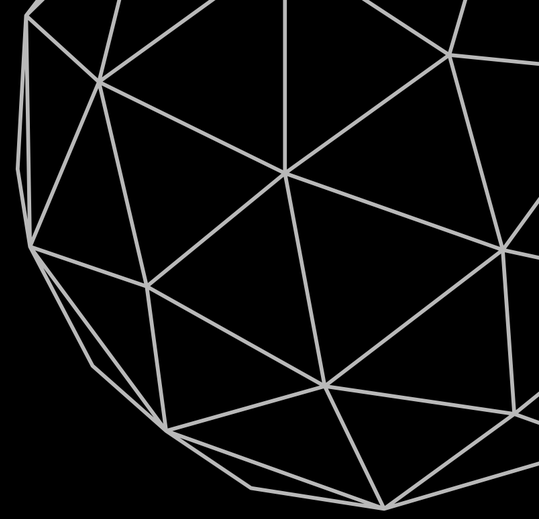
Australian Research Council Centre of Excellence in exciton science

CSIRO



LIGHT IDEAS 22
DESIGN COMPETITION

THE UNIVERSITY OF MELBOURNE

MONASH University

RMIT UNIVERSITY

THE UNIVERSITY OF SYDNEY

UNSW THE UNIVERSITY OF NEW SOUTH WALES

CALL FOR DESIGNS

To achieve a renewable energy future, we aim to explore how novel solar materials and photovoltaic technologies can be integrated into new products, devices and objects.

Printable solar cells

The technology that entrants are challenged to creatively integrate into their designs are printable solar cells. Using photovoltaic inks, these solar cells are printed onto sheets of plastic meaning they are just as lightweight, flexible with some transparency. Unlike conventional, roof-mounted solar panels, these have the potential to be more closely integrated into portable products. The energy collected could then be used to power at least some of the product's functions.

Competition purpose

The Exciton Science Light Ideas Design Competition will direct and encourage the next generation of industrial designers to prepare for a future in which this type of technology is widely available. Additionally, their perspective may help guide the scientific development direction of these materials further by proposing innovative uses of this emerging technology.

EXCITON SCIENCE

What we do

The ARC Centre of Excellence in Exciton Science is a collaborative research centre focused on innovative research to improve solar energy technology, lighting and security systems. The Centre is based across five Australian universities: The University of Melbourne, Monash University, RMIT, UNSW and The University of Sydney. Researchers also work closely with industry partners including the Reserve Bank of Australia, the Defence Science & Technology Group and CSIRO—who the Centre works with on improving printable solar cells.

A core part of our research and the first of our three themes involves building the ultimate lightharvesting systems by efficient conversion and transport of excitons. Excitons are formed when an atom's electron becomes energised and elevated to higher energy levels but is still atomically bound. The formation of excitons can be thought of as the intermediary state of a material when converting energy between light and electrical forms or vice versa.

This research involves spectral and spatial manipulation of the solar spectrum and aims to deliver new, light-harvesting concepts and novel, full-spectrum materials for next-generation, lowcost, high-efficiency excitonic light-harvesting devices.

YOUR BRIEF

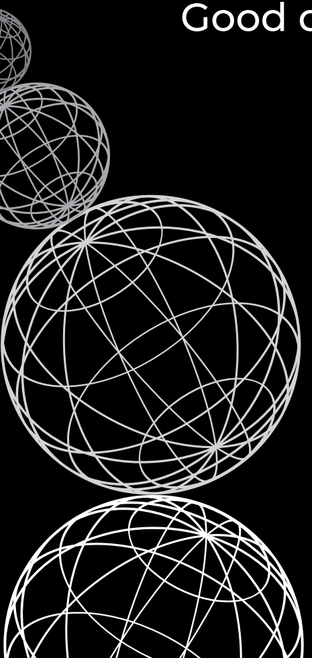
Exciton Science's Light Ideas Design Competition challenges industrial designers to creatively and innovatively integrate printable solar cells into design forms for products.

Your design may resemble an already existing product or imagine something completely new. Regardless, printable solar cells should be incorporated and its unique properties showcased.

Design concepts should be ambitious and surprising, yet feasible.

Please note this is an ideas competition and will not result in the winning designs necessarily being realised.

Good designs will:



- Consider the technology's properties, in particular its portability
- Be innovative and aesthetically pleasing
- Explore how the material can be used in a way that maximises solar harvesting
- Have the ability to be feasibly created and mass produced

COMPETITION DETAILS

Entrants

This competition is open for students and early career graduates (graduated in 2018 or later) in industrial design related disciplines. Entrants may submit proposals as individuals or in a small team of three or less individuals.

Round 1

Entrants will be required to submit a design proposal in the provided template, which will include the following elements:

- a description of how you have considered printable solar cells are a material
- maximum 5 pages of drawings, sketches, renders or diagrams, describing the design intention, function and form of the intervention, including images speculating on its use

Round 2

The best entries will be awarded $500 and showcased on the Exciton Science website. These shortlisted teams will then receive feedback from our expert panel of judges and have two weeks to incorporate this advice into their designs. After teams resubmit, our judges will award the most impressive design with the $5000 grand prize. There will also be a People’s Choice Award.

KEY DATES
UPDATED AND EXTENDED

<u>Key Dates</u>

- Round 1 of competition closes – Sunday 18 September
- Feedback sessions (online) for shortlisted entries – Monday 3 October to Sunday 9 October
- Round 2 closes for shortlisted teams to resubmit – Sunday 23 October
- Winner announced early November

MATERIAL BRIEF

Printable solar cells are created by printing photovoltaic inks onto thin plastic rolls. While they aren't as efficient as rooftop solar they can be used in many places that traditional rooftop solar can't be used and are easier to produce. Some uses include:

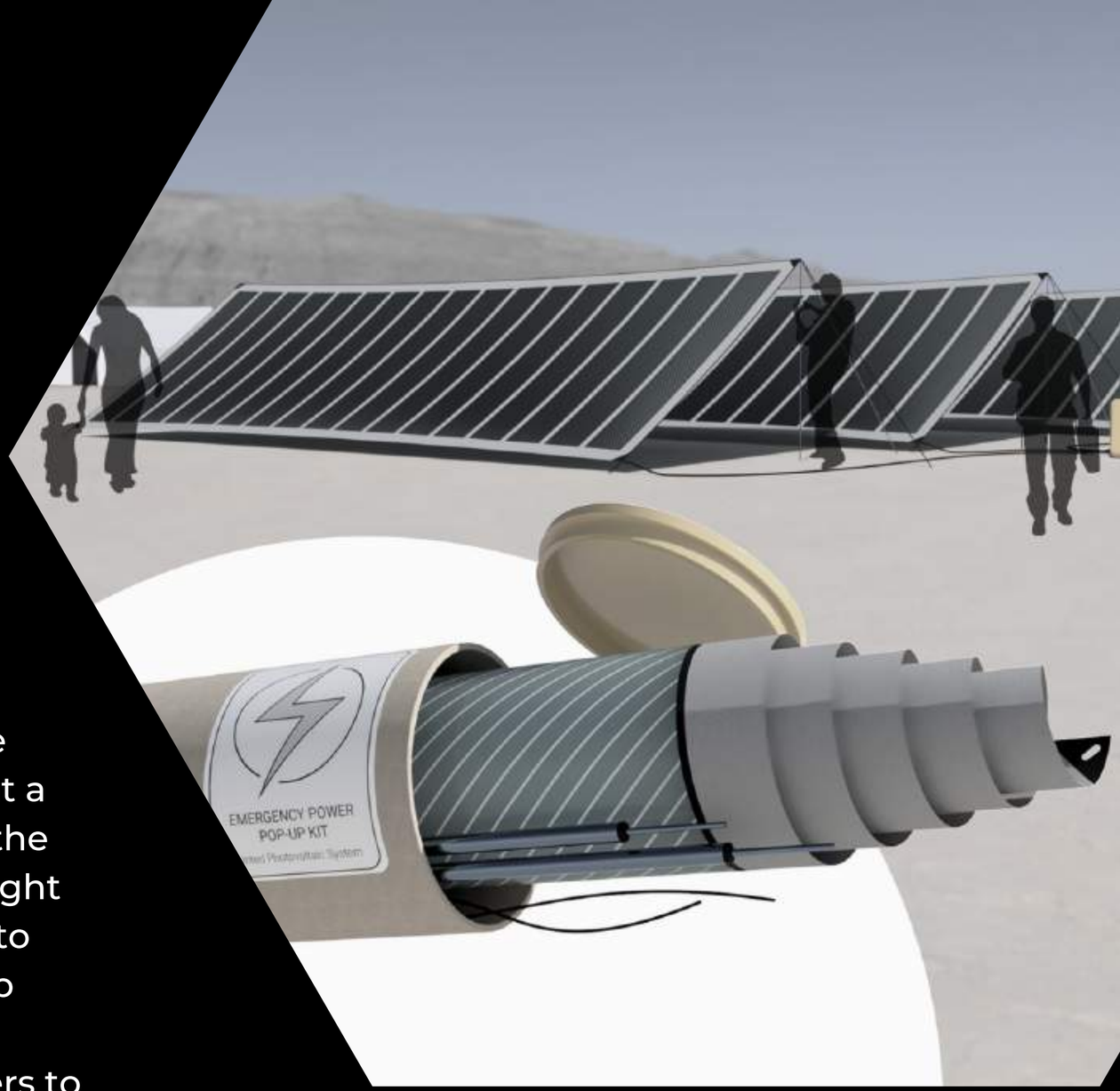
- Wearable devices
- Disaster relief
- Recreational camping
- Packaging
- Window furnishings

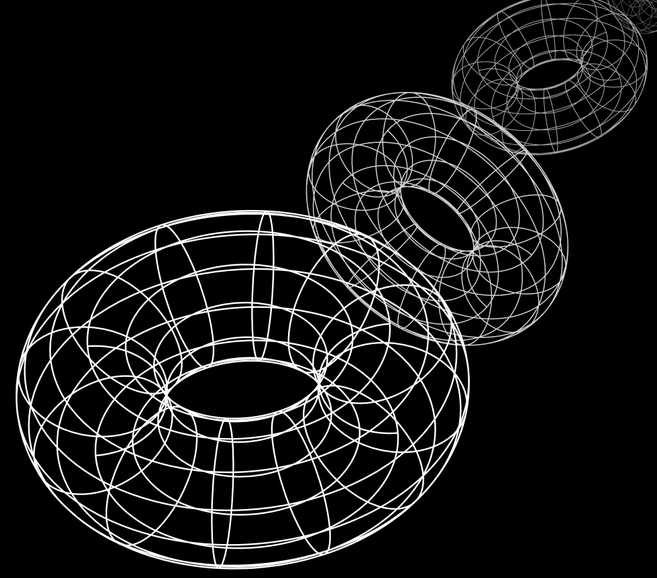
Further reading

- Printable solar cells for lightweight energy
- Low temperature nanoparticle ink: Printing a new chapter in solar energy

PHYSICAL PROPERTIES

For the purposes of this competition, printable solar cells should be treated as one would treat a thin sheet of plastic. Due to this thinness and the plastic they are printed onto, they are lightweight and flexible. Some bend easily but are unable to roll up whereas thinner sheets can be rolled up tightly. Rolls can be cut to different sizes and shapes, from long lengths that are many meters to short strips. They have some level of transparency and can come in different colours.





WE LOOK FORWARD TO RECEIVING YOUR ENTRY FOR THE LIGHT IDEAS DESIGN COMPETITION!

THE TEMPLATE, T&CS AND SUBMISSION DETAILS FOR THIS COMPETITION CAN BE FOUND ON OUR WEBSITE AT HTTPS://EXCITONSCIENCE.COM/LIGHTIDEAS

Please don't hesitate to contact Joshua Ezackial at outreach@excitonscience.com *with any questions.*

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