APPROACH

Broad-spectrum photovoltaics for enhanced solar energy conversion

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euproject-approach.eu/

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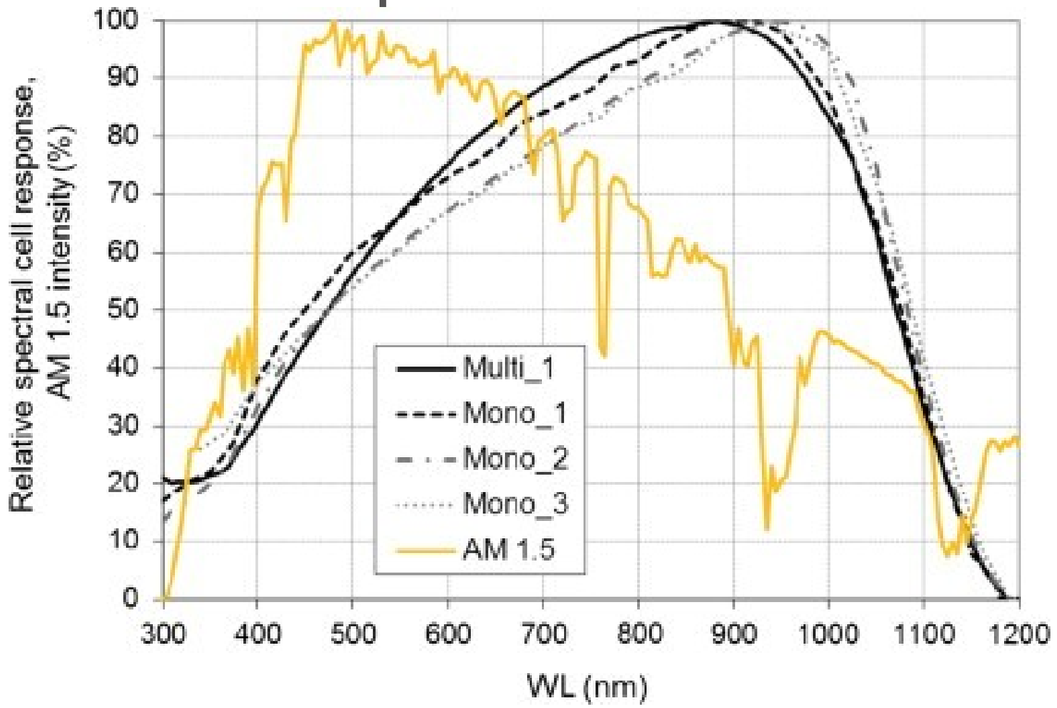
OUTLINE

- The Problem & Opportunity: Current PV Limitations
- The Solution – Research Innovation: Ultra-Broad Spectrum Material
- Impact
- Call to Action

The Problem & Opportunity: Current PV Limitations

The Solar Spectrum Bottleneck



- Silicon is, by far, the most common semiconductor material used in solar cells, but they miss a lot of the light.

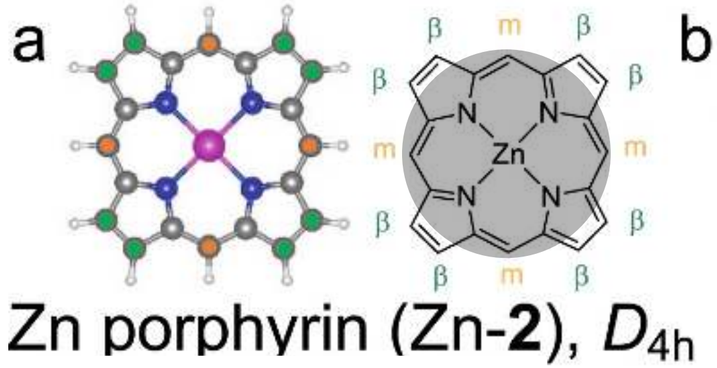
Wirth, H. (2013). Chapter Three - Crystalline Silicon PV Module Technology. Semiconductors and Semimetals. G. P. Willeke and E. R. Weber, Elsevier. 89: 135-197.

- PV cells are not 100% efficient as they are unable to respond to the entire spectrum of solar radiation.

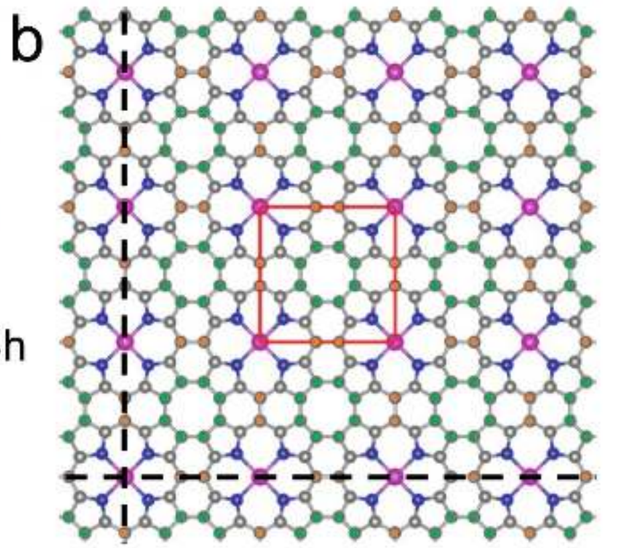
Hasan, A., et al. (2018). "Concentrated photovoltaic: A review of thermal aspects, challenges and opportunities." Renewable and Sustainable Energy Reviews **94**: 835-852.

The Solution – Research Innovation

Introducing PORPHENE: Ultra-Broad Spectrum Material

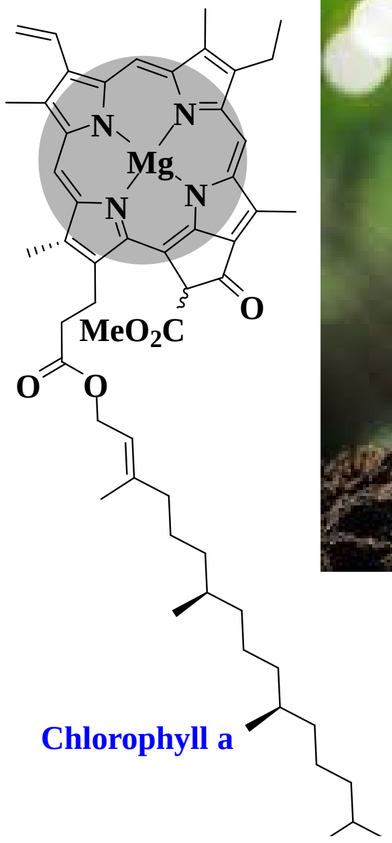


Zn porphyrin (Zn-**2**), D_{4h}



Zn porphene (Zn-**1**)

increased stability!



Chlorophyll a

J. Am. Chem. Soc. **2024, 146, 6, 3992-4000**
Nat Commun **14, 6308 (2023). https://doi.org/10.1038/s41467-023-41461-w**

Impact

A Bright Future for PVs

- **Scientific Impact**: This research is expected to result in publications in high-ranking journals.
- **Industrial Impact**: There is a huge market potential since the global solar capacity doubled in 3 years from 2018. (SolarPower Europe)

  Our technology targets towards a significant competitive advantage: higher efficiency at lower cost.
- **Sustainability Impact**: These technologies are in absolute alignment with EU green goals for reduced CO_2 emissions and renewable energy advancements.

  Potential implementation: Utility-scale solar farms, residential rooftops, portable electronics and more.

Call to Action & Next Steps

- Seeking funding for basic research in this field to bring this idea to life: 300k€ for 2 years of basic research
- Looking for strategic partners to accelerate scaling up production.
- Why now? Porphene was produced for the first time in 2023.
- Why us? Our team has the expertise to lab scale synthesis and characterisation.

Join us in powering a brighter future with porphene solar cells!

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THANK YOU

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