How to capture synthetic biology's full bioenergy potential?

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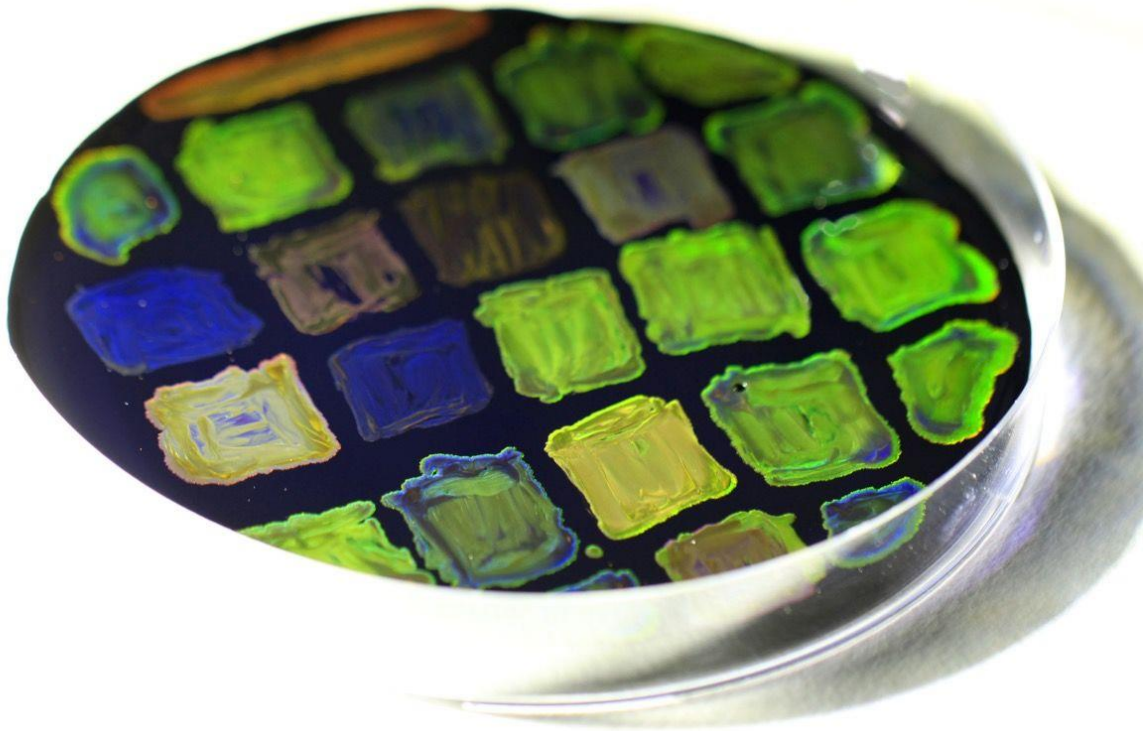

Biology leads the way on CO_2 capture and utilization

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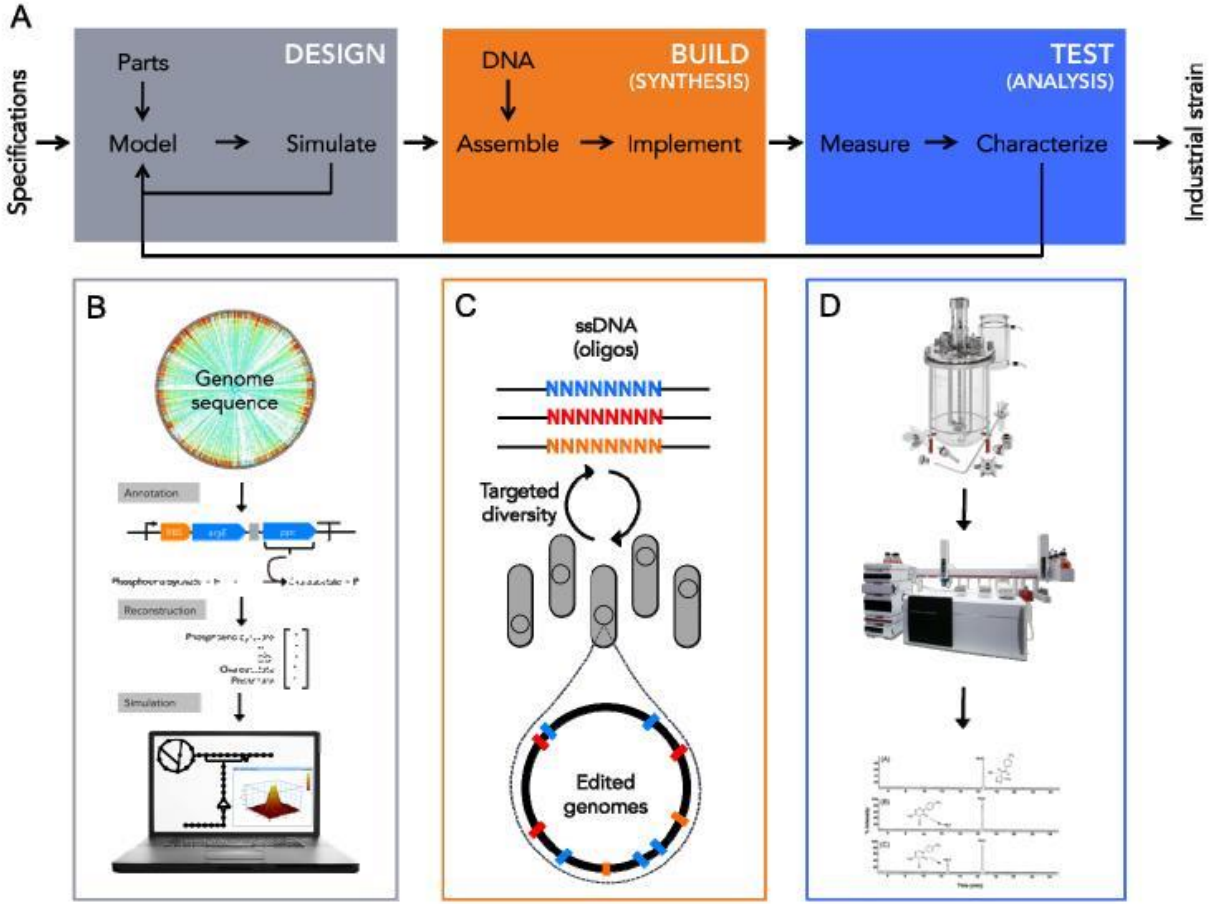
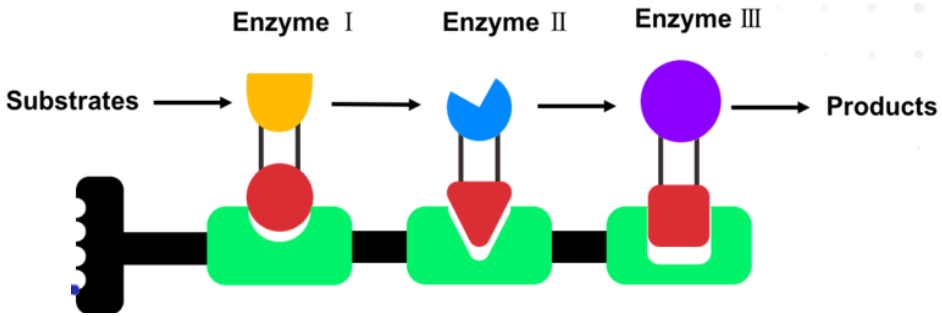
- Much of that **carbon** is **stored as carbohydrates.**
- **Carbohydrates** can be **converted** via **fermentation** to beverages**, chemicals, and fuels.**

Synthetic biology enables new products and better biocatalysts

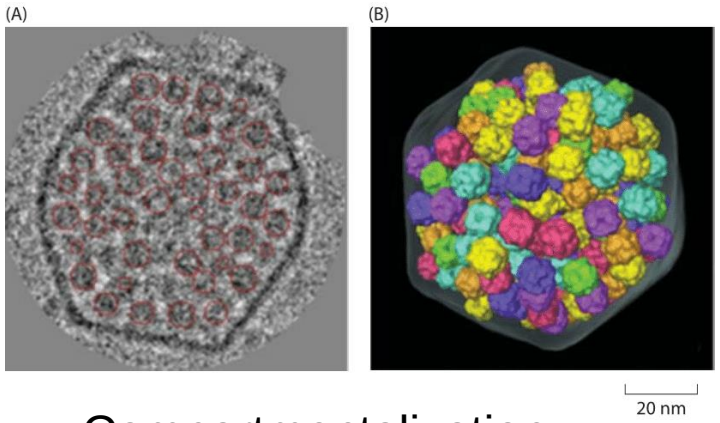
By designing more efficient pathways…



…but also spatial organization



Scaffolding



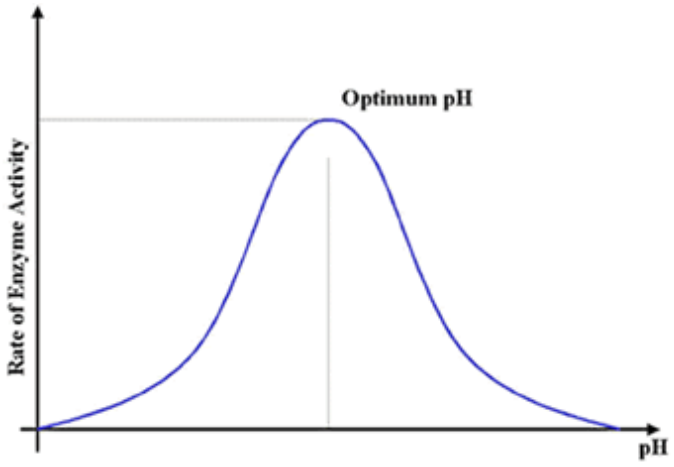
Compartmentalization

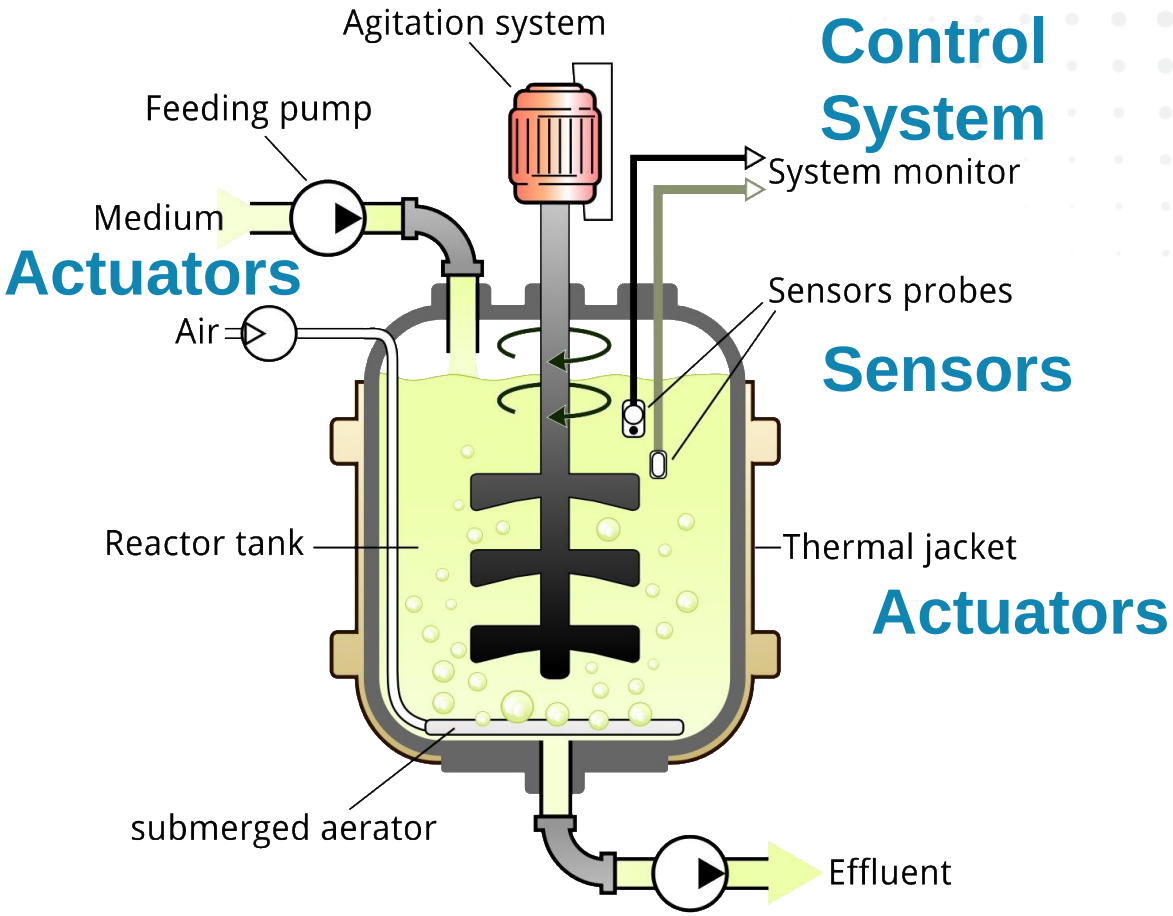
Images: G H McArthur et al. (2015), http://book.bionumbers.org/how-many-photons-does-it-take-to-make-a-cyanobacterium/)

…but then, we still stick them in the same old tanks

Bioreactors are designed to keep biocatalysts happy

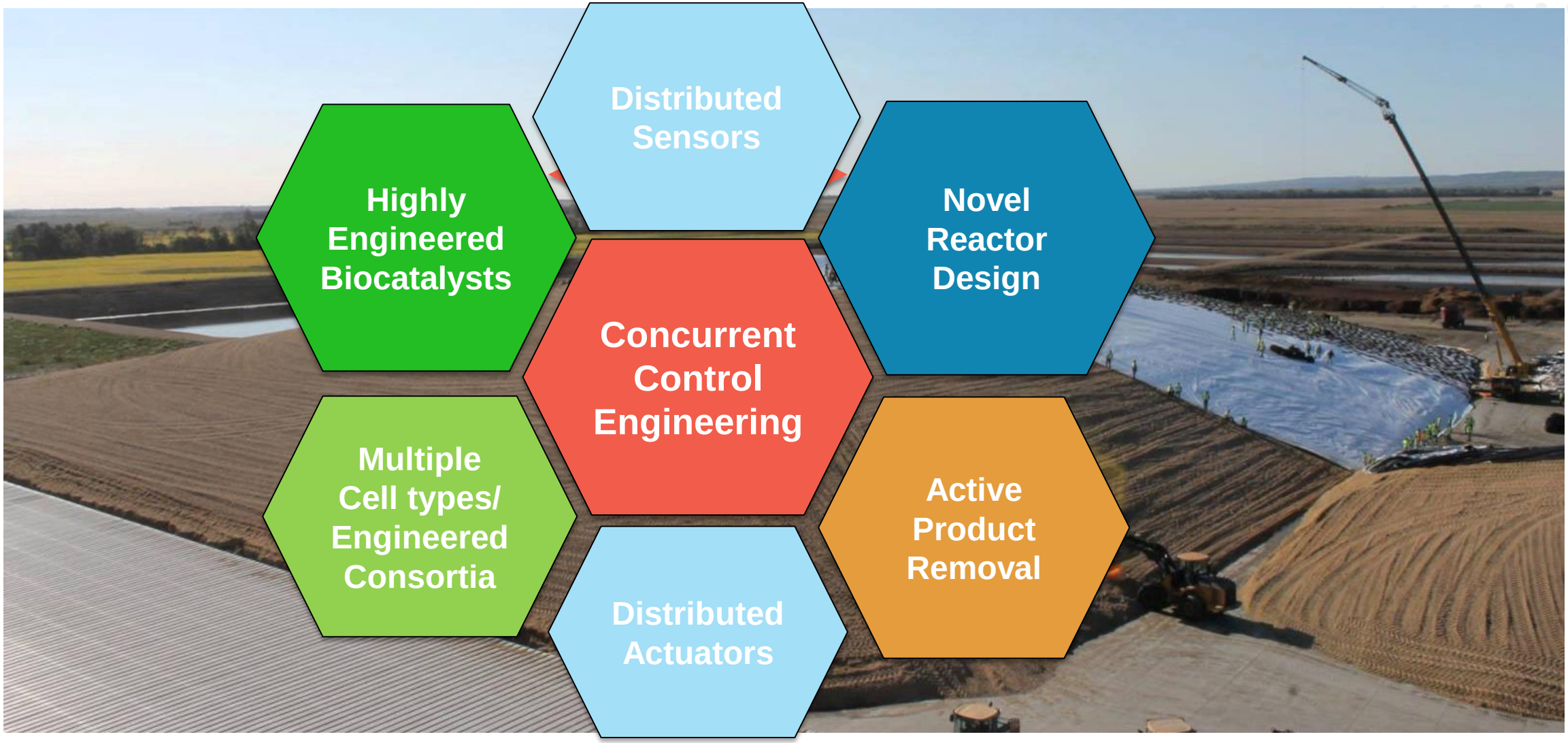
- Steady food supply
- Constant temperature
- Constant pH
- Removal of inhibitors
- Exclusion of contaminants





Complex & energy intensive → $$$

Can we envision a cheaper, more robust process?



How do you reimagine bioprocessing?

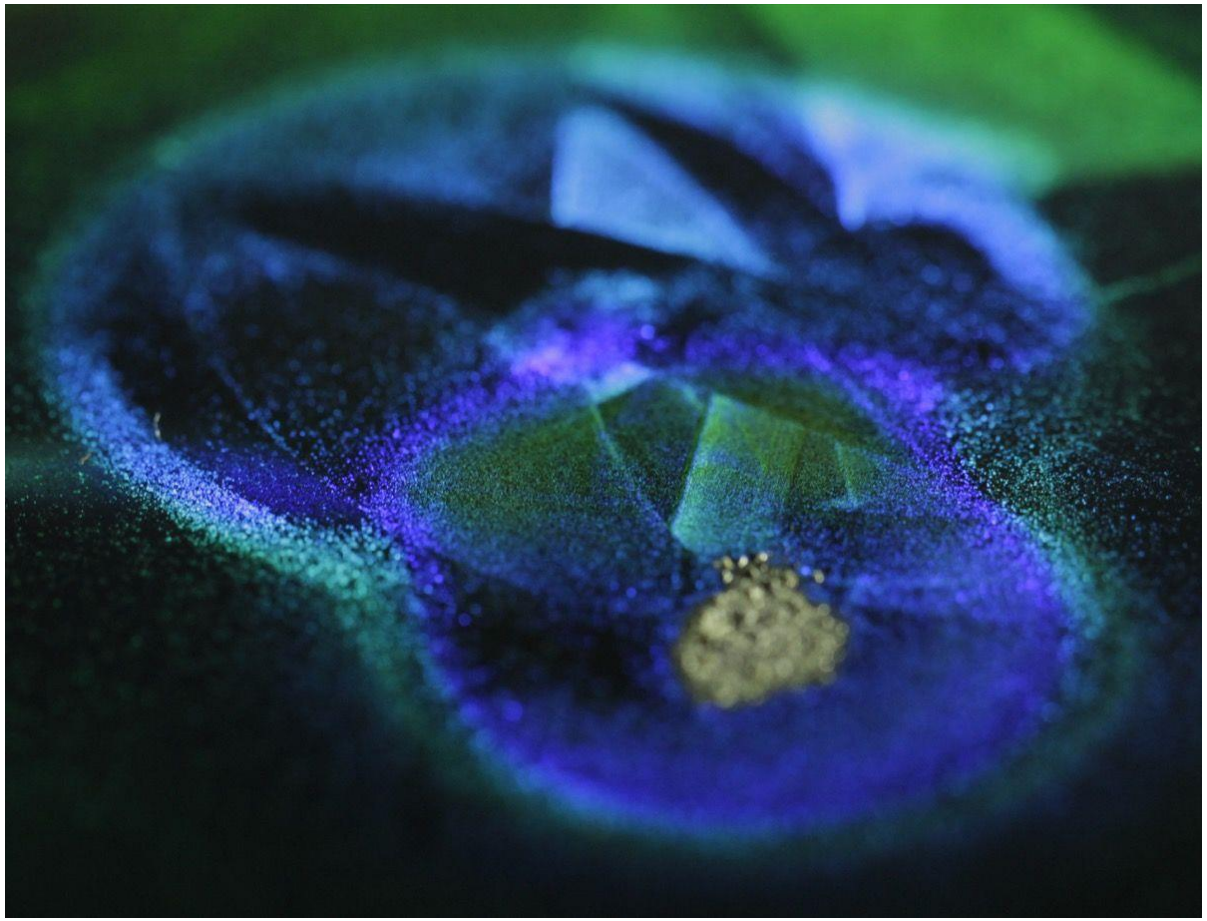


Image: University of Cambridge and Hoekmine BV

Let us know.

Thank you!

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