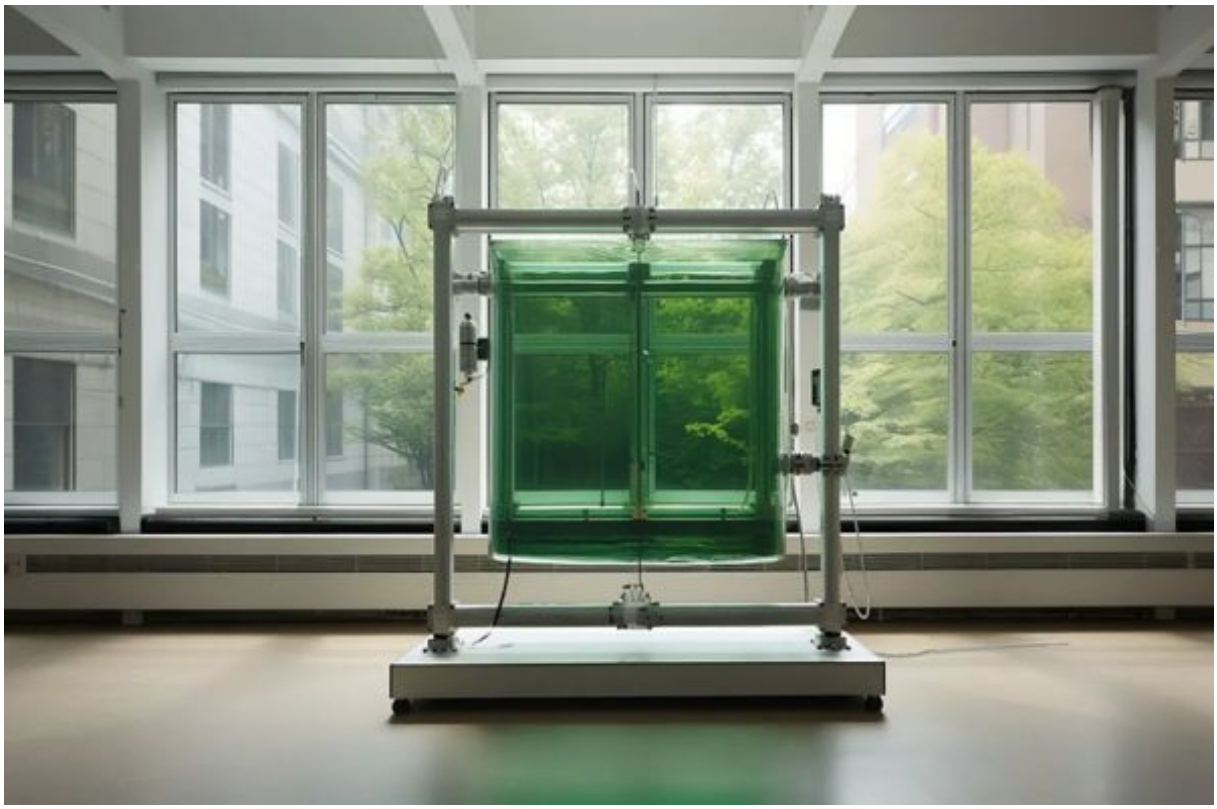

THE SOLAR SHARE: An Edible Solar Currency

The Photon Harvesting in Plants and Biomolecules group collaborates with artists through the EU's S+T+ARTS in the City Artists in residency initiative

September 10, 2024

ICFO's Photon Harvesting in Plants and Biomolecules (PHPB) group led by Prof Nicoletta Liguori is part of the Clean Planet program at ICFO, exploiting the underlying physics of light interactions with matter to develop and implement renewable, clean energy technologies that can contribute to the mitigation of climate change.?

There are many pieces of this puzzle and the PHPB group utilizes experimental an computational tools to explore the regulatory mechanisms governing sunlight harvesting i photosynthetic organisms. They aim to deepen the fundamental understanding of natura photosynthesis in order to potentially uncover strategies to optimize the utilization of sola energy in photosynthetic organisms. In what they see as an urgent priority for th environment, the group is working to engineer photosynthesis for a more sustainable future a challenge that led them to participate in the EU'sS+T+ARTS in the CITY initiative which

brings artists into research centers through a residency program with the goal of enhancing art-driven innovation. The residencies take place over 9 months, allowing time for the artists, the host institutes and local experts groups, in this case HacTe)the Barcelona Hub for Art, Science and Technology), to converge and connect, followed by reflection and th development of the artwork

THE CHALLENGE: Understanding and Engineering Photosynthesis for a More Sustainable Future

How does photosynthesis function at the molecular scale, and can we improve it? Unveiling the processes governing light-harvesting regulation in plants and how we might possibly improve it, could advance sustainable agriculture. The PHPB group invited artists to support the scientific challenge of making plants even stronger allies in the fight against climate change.

Artists from DISNOVATION.ORG took up the challenge, creating i¿½THE SOLAR SHARE: n Edible Solar Currencyi¿½. This project challenges prevailing economic models with insi hts from sunlight-harvesting organisms, crucial to the metabolism of life on Earth. Staged s a one-square-meter microalgae bioreactor, the artwork foregrounds human en rgy dependence on photosynthesis and proposes harvested edible microalgae as a rad cal economic unit: The Solar Share. This unit is the biomass produced on one square mete of the Earth's surface that day. This edible algae unit is a photosynthetic proof of work that can be consumed, exchanged, or stored as a currency. The Solar Share is an invitatio to experience firsthand a transformative economic model that reintegrates human metabo ism and energy needs with the actual new energy entering the Earth system as photosynthe is. The Solar Share provocatively recenters Earth's metabolism in economics, redefi ing sustainability within planetary lim

s. **W¿½were motivated to launch this challenge through S+T+ARTS to inspire conversations between researchers and society, in particular with artist that could help us find ways to not only explain to large audiences the importance of fundamental science, but also to put into much larger context the type of research that we are performing in our group. It has been an amazing experience**,i¿½ reflects Liguor
. The first showcasing of this artwork was at the ARS Elctronica Festival in Linz (Sept 4-
, 2024

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Credits

Conception & realisation: DISNOVATION.ORG
Co-design: Katharina Ammann
Project assistants: Romain Theron, Leo Lima

Co-production: IFT Paris, Xcenter Nova Gorica, ART2M, and More-Than-Planet

The Solar Share was produced with the support of the S+T+ARTS program of the European Union, and co-commissioned by HacTe. It was inspired by the challenge «Understanding an engineering photosynthesis for a more sustainable future», launched by the Institute f Photonic Sciences (ICFO), and by the conversations held with the Photon Harvesting in Plan s and Biomolecules research group (ICFO) during the research phase of the project.

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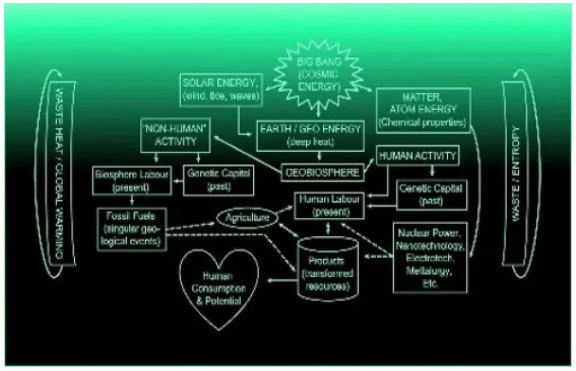
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