Climate Change Overview Project

A collaboration between

THE Port Humanitarian Hackathon at CERN

climate.space gluoNNet

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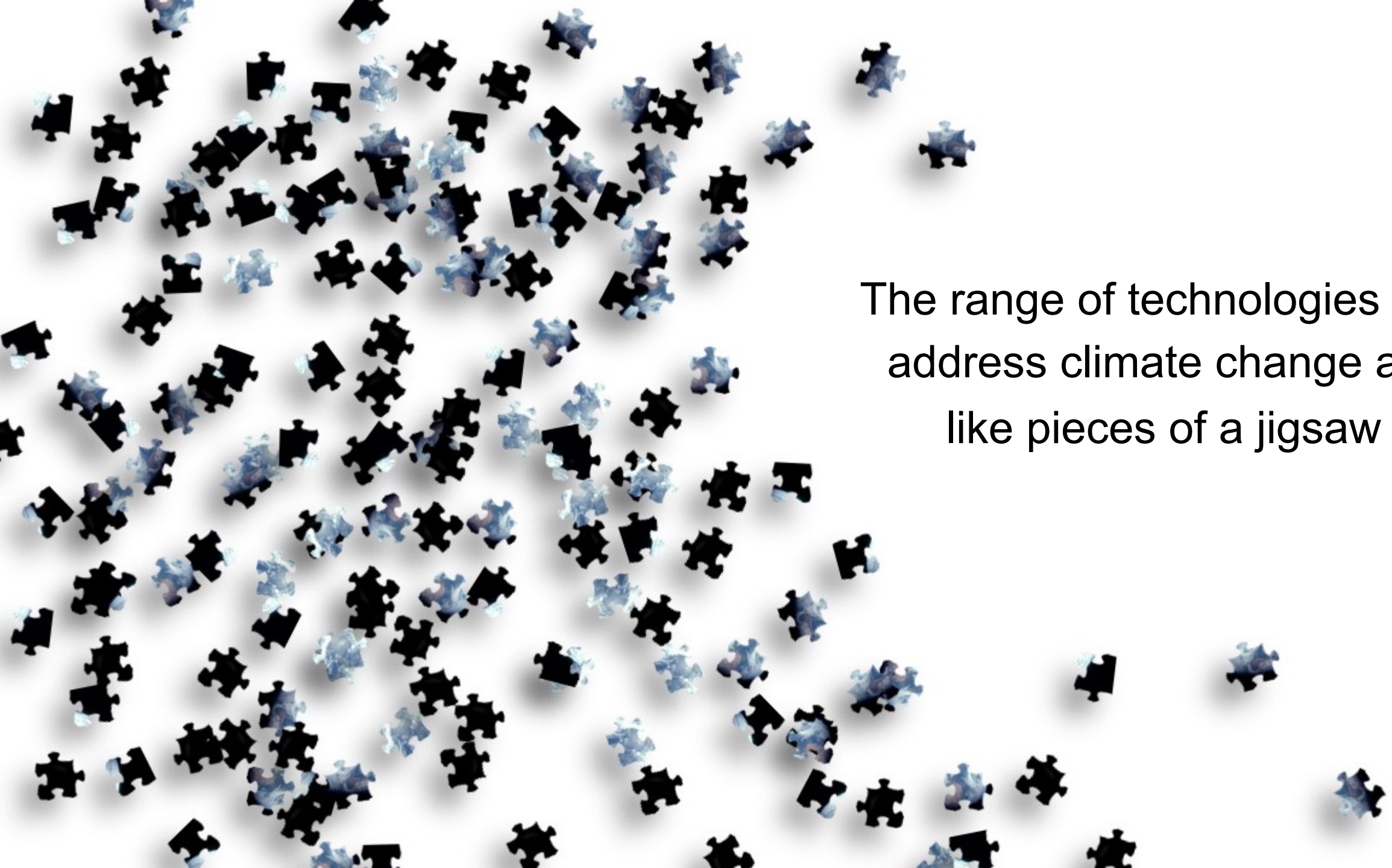
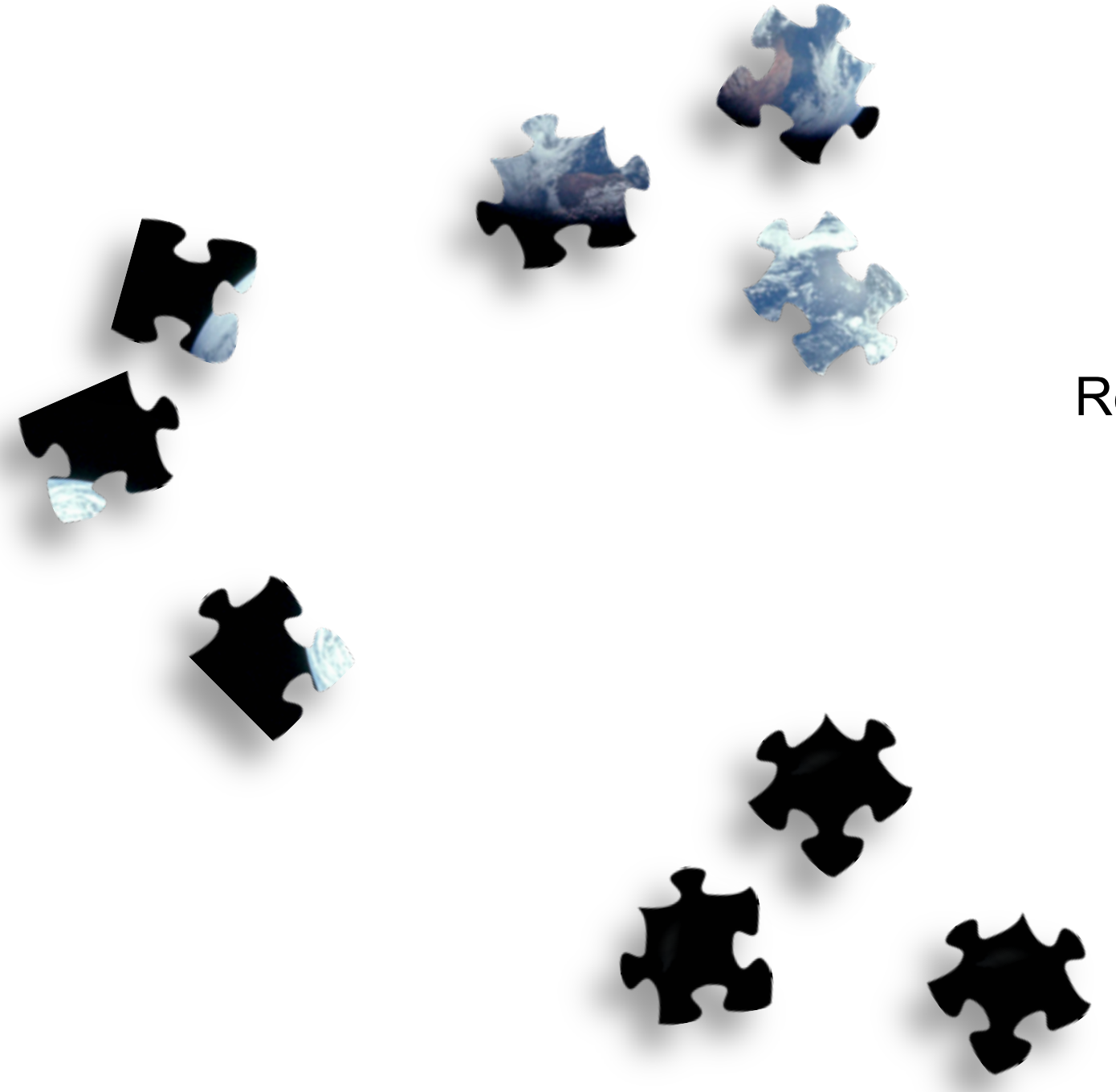
No-fly conference ethos:
Stefan joins us from
Cambridge via Video Conf.



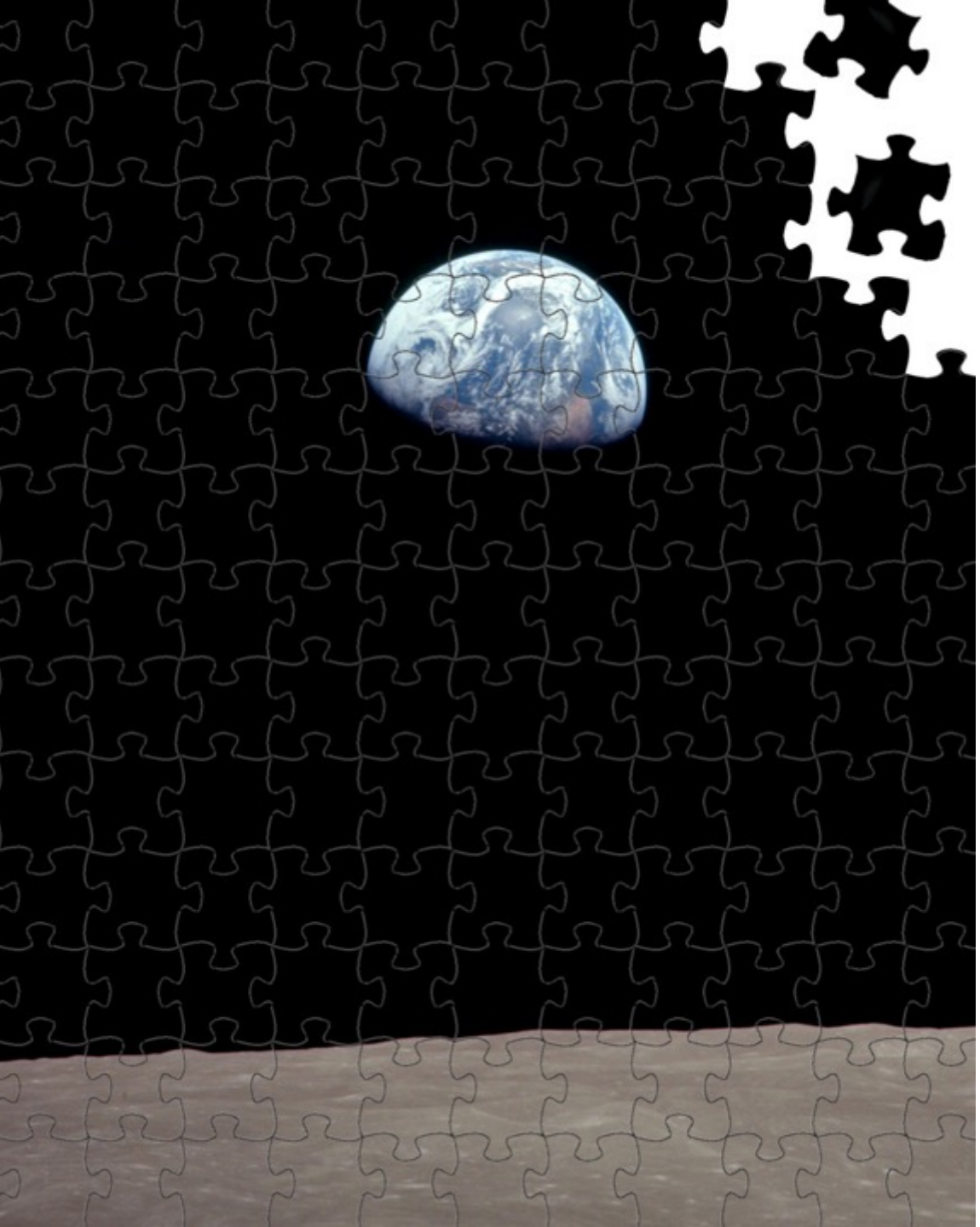
The range of technologies that address climate change are like pieces of a jigsaw

For each individual researcher, the focus of study is often narrow and precise

It can be difficult to see how one field of research fits in with other fields



Researchers may be unaware of
potential collaborators
in areas outside their
field of expertise



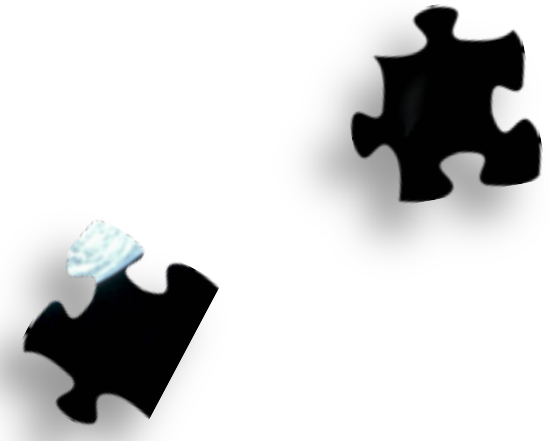
A visual **overview** changes the perspective, shows how different areas of research relate to one another and highlights potential collaborations

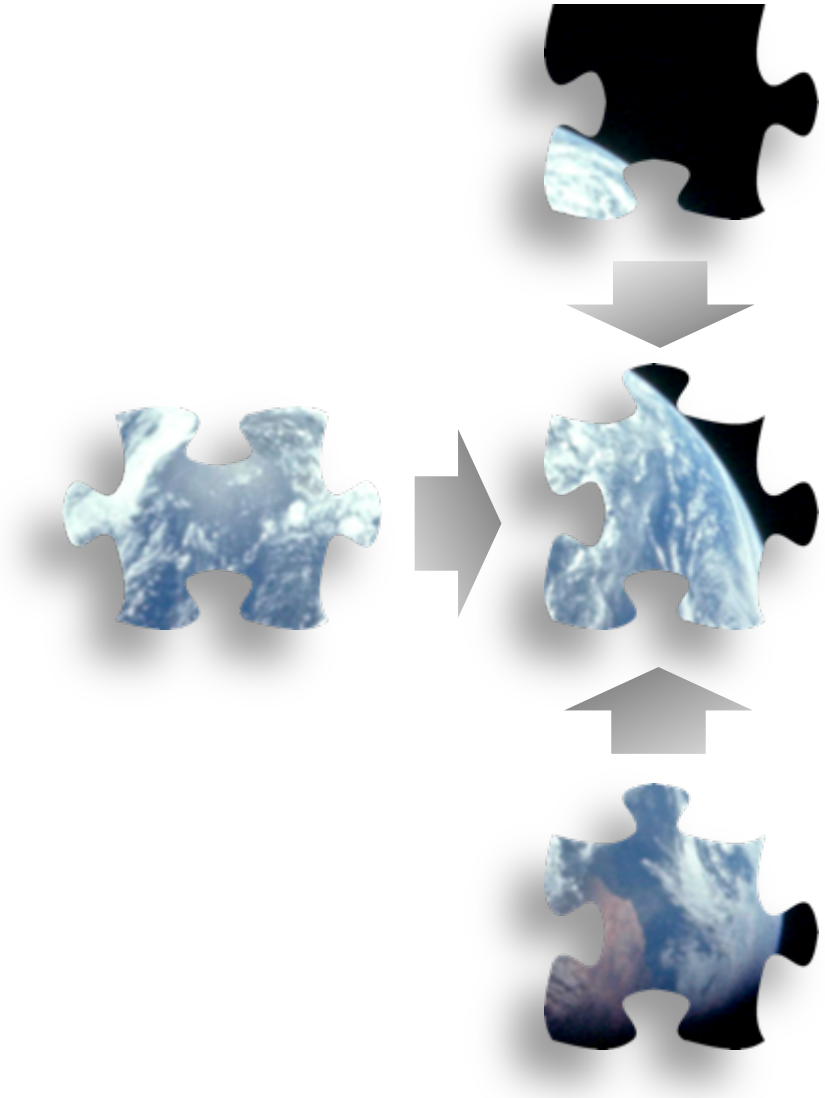
An overview can transform the way people work together…

Image: Apollo 8 “Earthrise”


Climate Change Overview Project will transform
collaboration on climate change innovation through a
shared visual overview

Bringing the pieces together





Inspired by CERN's Collaboration Spotting

"Collaboration Spotting" identifies shared areas of interest among researchers – like finding common features in jigsaw pieces

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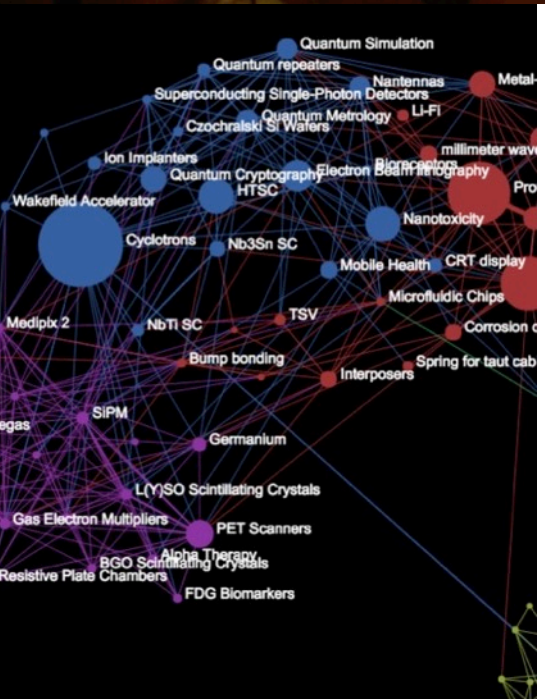
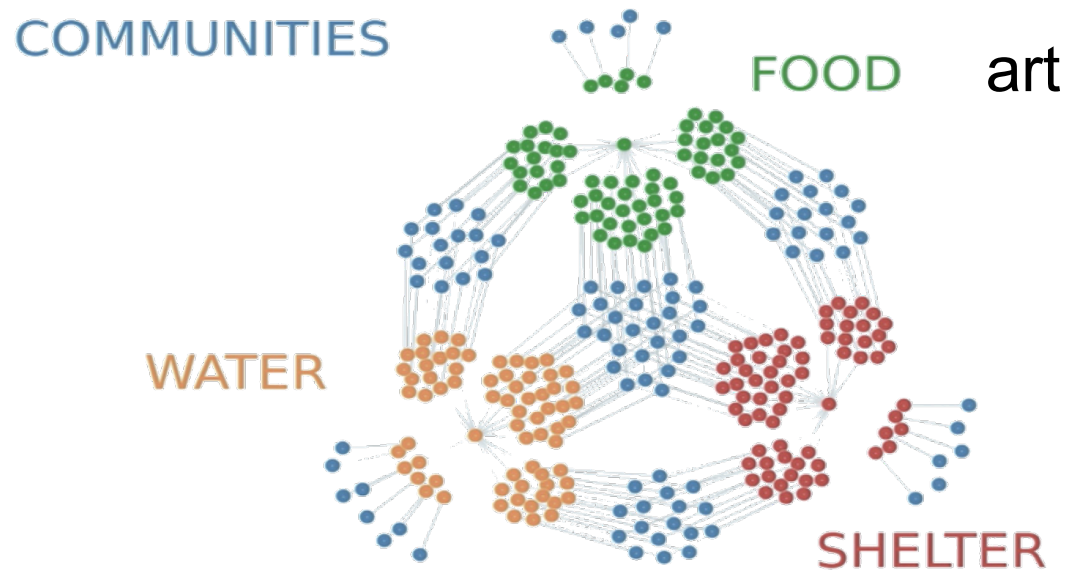
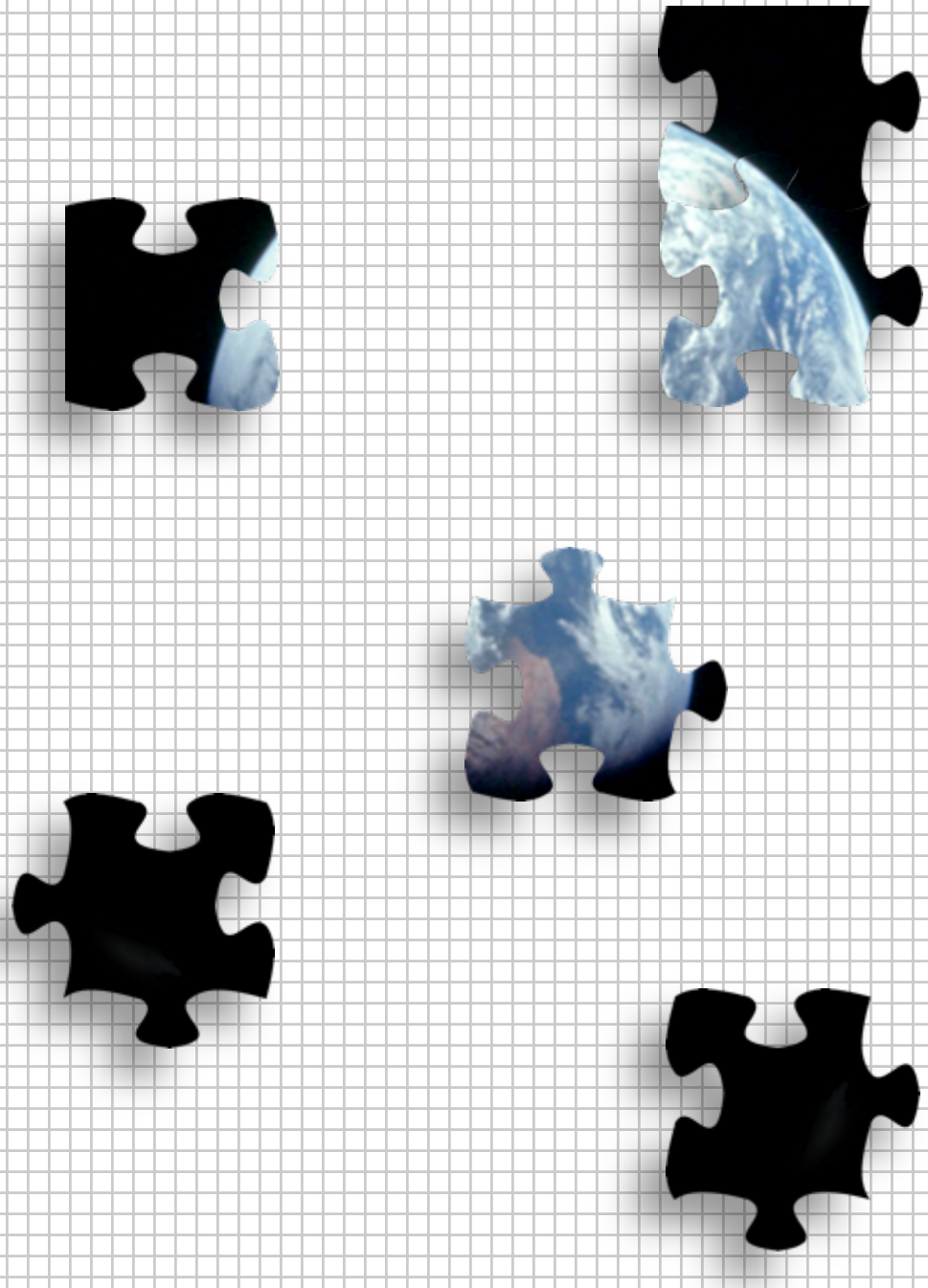
CERN's **Collaboration Spotting** technology provides state-of-the-art AI algorithms for identifying shared areas of interest among researchers







Topic Positioning

Positioning topics in an absolute coordinate system helps create an overview – crucial when common features are ambiguous

concept.space

concept.space's **Topic Positioning** technology uses advanced AI techniques to determine topic positions based on big data text databases

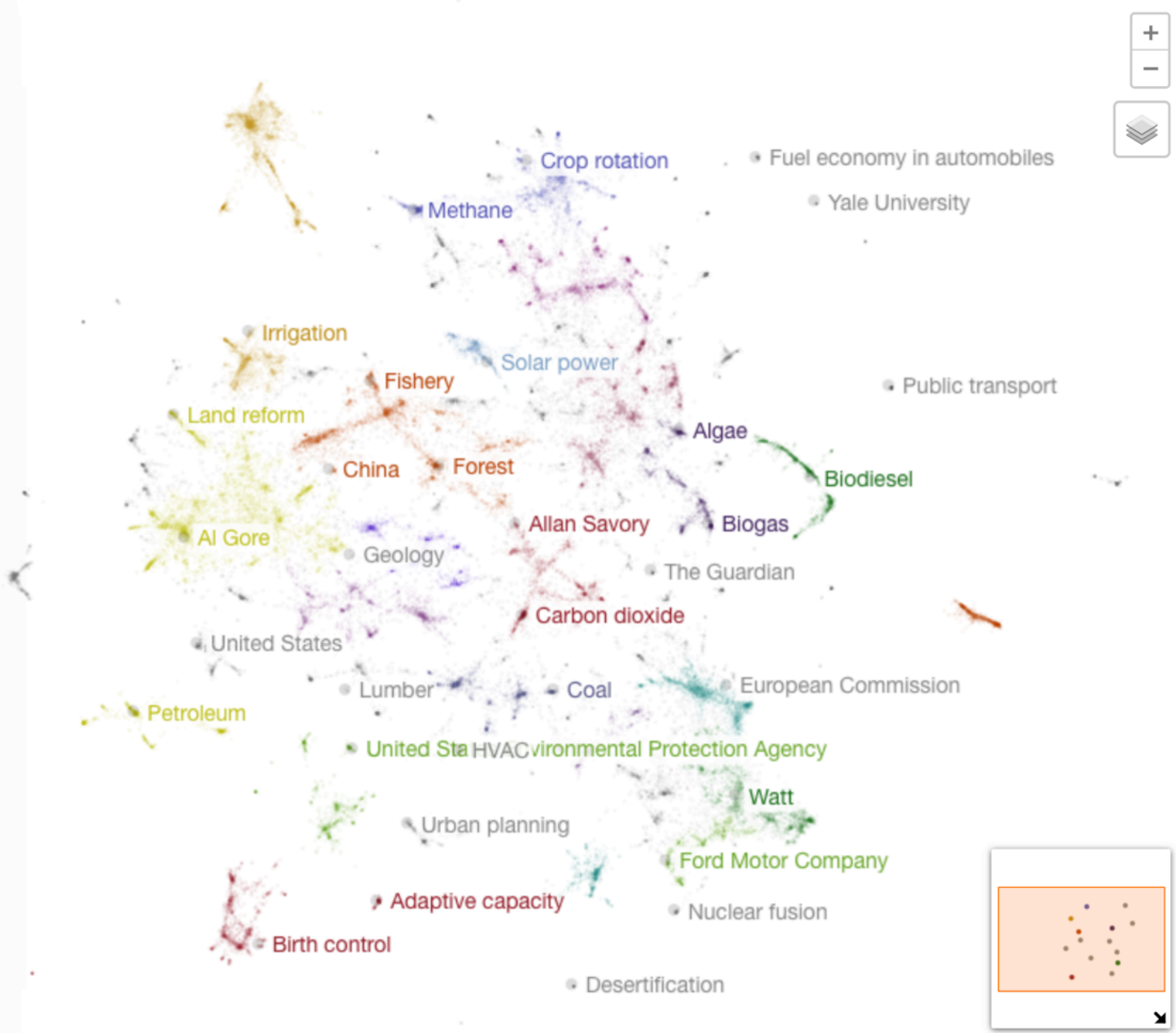
Carbon Nanotubes Modified Carbon Cloth Cathode Electrode for Self-Pumping Enzymatic Biofuel Cell

Ngoc Bich Duong, Sheng L. You, Li Z. Huang, Hsiharng Yang

Journal of Renewable Energy

2018

A self-pumping enzymatic biofuel cell (self-pumping EBC) with a new cathodic catalyst which was modified by coating the mixture of carbon nanotubes/caffeic acid (CNTs/CA) on a carbon cloth (CC) to form a CNTs/CA/CC cathode electrode was fabricated. By using UV spectrophotometer, the absorbance of CA, CNTs, and the CNTs/CA composite was observed. To evaluate how the CNTs/CA/CC cathodic electrode improves the electrochemical performance of the self-pumping EBC, the measurement of the redox reaction current peak by cyclic voltammetry (CV) was implemented. In accordance with CV measurement, the utilization of the modified CNTs/CA/CC cathodic electrode exhibited a higher oxygen reduction current peak at 319.1μA under the saturated oxygen. The anode and cathode flow rates were 0.416μls−1 and 0.844 μls−1 which contribute to obtaining the capillary driven liquid efficiency as 30% for the former and 59% for the latter. Moreover, the self-pumping EBC performance tests showed that the maximum power density (MPD) of the self-pumping EBC with the modified cathodic electrode achieved 0.592 mWcm−2 which improved 10% in the performance compared with the bare CC electrode, 0.534 mWcm−2.



Features – Open Access

- Due to urgency of climate change, open access data sources will be used to maximise rapid spread of latest research
- System currently uses **Wikipedia** and **DOAJ** open access data sources and **OAI-PMH** open access protocol
- Plans to include **Core.ac.uk** and **GEOSS Portal** to provide greatest possible overview of latest open access research

Features – Collaboration-focused

- Utilises collaboration expertise of former CERN scientists, experienced in both international collaboration with cutting-edge research (ATLAS project discovering Higgs Boson) and collaboration for humanitarian purposes (THE Port international hackathon at CERN)

Humanitarian Hackathon at CERN

- Utilises advanced “collaboration spotting” technology specifically developed at CERN to improve collaboration and reduce duplication of research effort

Features – One-stop Shop

- Team will develop protocols and APIs so new data providers can be easily added, ensuring a visual "one-stop shop" for latest climate change technology research

Features – Public Engagement

- Simple "Google Maps" user interface encourages anyone to engage with latest research
- Potential for game interfaces to create "massively multiplayer online game" (MMOG) to deliver citizens science at scale

Support

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"The threats to humanity from climate change are now recognised to be more severe than predicted twenty years ago... initiatives like ***climate.space*** *are crucial to bringing together global partners to tackle humanity's greatest challenge with renewed urgency."*

Sir David King, UK's Former Special Representative for Climate Challenge

Collaboration is crucial to tackling climate change

Help bring the pieces together at

climate.space