Soap Film based Artificial Photosynthesis

Results

Project Information

SoFiA
Grant agreement ID: 828838

Funded under
H2020-EU.1.2.
H2020-EU.1.2.1.

DOI
10.3030/828838

Overall budget
€ 3 235 280

EU contribution
€ 3 205 280

Start date
1 January 2019

End date
30 June 2023

Coordinated by
UPPSALA UNIVERSITET
Sweden

Deliverables

Documents, reports (5)

Multi-physics model of soap-film in COMSOL environment
Multiphysics model of soapfilm in COMSOL environment

1st update of Dissemination and Exploitation plan
1st update of Dissemination and Exploitation plan

Database of transport coefficient in Matlab environment
Database of transport coefficient in Matlab environment. Main modelling results will be disseminated through the European Materials Modelling Council ensuring
A draft “plan for the dissemination and exploitation” (D6.2) is presented below: Actions taken according to this plan will be updated periodically (M12, M30, M42) by tracking & monitoring key performance indicators (KPIs). Dissemination to Scientific Community: Interdisciplinary results will be communicated to diverse peer groups. The leadership of key SoFiA members in national AP platforms is already established (UK Solar Fuels Network, Swedish AP consortium) and will facilitate networking and community building with other interested members. Data management Plan (DMP): SoFiA will participate in the Pilot on Open Research Data and will provide open access to raw data corresponding to modelling & simulation, as well as data required to reproduce the results presented in scientific publications. These data will be stored in Zenodo (a research data repository created by CERN) ensuring their public availability and long-time preservation. Details will be provided in a data management plan (DMP, D5.3), to be delivered by M6 and updated periodically (M12, M30). Main modelling results will be disseminated through the European Materials Modelling Council ensuring wide research visibility. Publications: We will prioritise Gold or Green (with 6 months embargo) open access publication. At least 8 publications are estimated in journals with the highest impact in multidisciplinary science, in materials sciences, in nanotechnology, and in chemistry. KPI- Impact factor of accepted journals, citations, author h-index. Course Materials, Conferences & Workshops: In June 2020, our partner ICTP (UNESCO flagship institute) will host Conference on the Complex Interactions of Light and Biological Matter: Experiments meet Theory. We will organize in a special AP session showcasing our project through posters and oral communications and will host a workshop and an information kiosk dedicated to SoFiA. A summer school for PhD students, on AP will be organized and hosted by UU (by M30) Our start-up executive body WI (non-beneficiary) is supported by Sofia Tech Park (STP) - a (Bulgarian flagship) EU project. With support of WI and STP we will host a workshop (by M46) on solar fuels with focus on AP in Bulgaria (energetically poor/unsustainable region), and tailored for an audience usually remote from the EU policy dialogue. All partners will attend the most relevant conferences (including MRS, ACS, ISF, etc.). SoFiA will also participate in the annual FET Conferences. Our IPR protected findings, concept design and selected experimental results will be included as graduate level course material at partner Universities. Course update plans will be included as chapters in final two project periodic reports on M30 & M48. KPI- Attendance in Summer School, Workshop, and attendee/student feedback. Related EU projects will be monitored and contacted. Key representatives will be invited for lectures at the Bulgaria workshop. SoFiA will enhance networking possibilities
with the following programs: FET projects – A-Leaf (Proactive) and Diacat (Open), from ERC Grantees in AP (COFLef; ENLIGHT; HyMAP; HYMEM; photocatH2ode; TripleSolar; and others.) KPI- New collaborations for Phase II, III and feedback from AP experts. Dissemination to Industrial sector and to Policy Makers- SoFiA will participate in relevant industrial fairs, for instance: SSIS (smart systems industry summit), W3+FAIR. For critical coverage of breakthrough results we have identified policy journals: ENDS Europe, and Brussels based Politico and Euractiv. To communicate with EU policymakers, the coordinator will contact OBSERVE- a FET-CSA that supports Europe in FET, and FET2RIN, a network connecting FET projects to potential investors. Through EAB meetings, IPR protected research findings will be communicated to Shell, Air Liquide and Unilever who are interested in commercial exploitation. Climate & Policy experts at EAB will be consulted to indicate policy hook for market uptake.

**EAB feedback**

Websites, patent fillings, videos etc. (1)

Project website with open and restricted access [🔗]

Project website & social media networking will be set up by M2 (D5.1) and updated on a monthly basis. We have a logo. Website will include news & events, links to partners’ websites, a press desk, publications, and search functionalities. The website will also promote important (public) results from related projects in AP and will administer an open forum as a knowledge-sharing tool for partners and user communities. Facebook, Twitter and LinkedIn will be used to promote the website content. An impact assessment of the entire social media communications activities will be carried out by monitoring web hits, likes, followers, retweets (KPI). Videos & news bytes will also be promoted through Hassim Al-Ghaili’s science communication website which has >16M fans. The existing Wikipedia page on AP will be updated with critical results from SoFiA.

Open Research Data Pilot (2)

2nd update of Data management plan [🔗]

2nd update of Data management plan

Data management plan [🔗]

Data management Plan (DMP): SoFiA will participate in the Pilot on Open Research Data and will provide open access to raw data corresponding to modelling & simulation, as well as data required to reproduce the results presented in scientific publications. These data will be stored in Zenodo (a research data repository created by CERN) ensuring their public availability and
Publications

Peer reviewed articles (5)

Shorter Alkyl Chains Enhance Molecular Diffusion and Electron Transfer Kinetics between Photosensitisers and Catalysts in CO₂-Reducing Photocatalytic Liposomes.
Author(s): David M. Klein; Santiago Rodríguez-Jiménez; Marlene E. Hoefnagel; Andrea Pannwitz; Andrea Pannwitz; Amrutha Prabhakaran; Maxime A. Siegler; Tia E. Keyes; Erwin Reisner; Albert M. Brouwer; Sylvestre Bonnet
Publisher: John Wiley & Sons Ltd.
DOI: 10.1002/chem.202102989

Molecularly engineered photocatalyst sheet for scalable solar formate production from carbon dioxide and water
Author(s): Qian Wang, Julien Warnan, Santiago Rodríguez-Jiménez, Jane J. Leung, Shafeer Kalathil, Virgil Andrei, Kazunari Domen, Erwin Reisner
Published in: Nature Energy, 2020, ISSN 2058-7546
Publisher: Nature
DOI: 10.1038/s41560-020-0678-6

Emergence of Electric Fields at the Water–C12E6 Surfactant Interface
Author(s): Rahul Gera, Huib J. Bakker, Ricardo Franklin-Mergarejo, Uriel N. Morzan, Gabriele Falciani, Luca Bergamasco, Jan Versluis, Indraneel Sen, Silvia Dante, Eliodoro Chiavazzo, and Ali A. Hassanali
Published in: J. Am. Chem. Soc., 2021, 143, 37, 2021, Page(s) 15103–15112, ISSN 0002-7863
Publisher: American Chemical Society
DOI: 10.26434/chemrxiv.14661360.v1
Roadmap towards solar fuel synthesis at the water interface of liposome membranes†

Author(s): A. Pannwitz, D.M. Klein, S. Rodríguez-Jiménez, C. Casadevall, H. Song, E. Reisner, L. Hammarström, S. Bonnet
Published in: Chem. Soc. Rev., 2021, 50, 2021, Page(s) 4833–4855, ISSN 0306-0012
Publisher: Royal Society of Chemistry
DOI: 10.1039/d0cs00737d

A multi-scale perspective of gas transport through soap-film membranes

Author(s): Gabriele Falciani, Ricardo Franklin, Alain Cagna, Indraneel Sen, Ali Hassanali, Eliodoro Chiavazzo
Published in: Molecular Systems Design & Engineering, 5/5, 2020, Page(s) 911-921, ISSN 2058-9689
Publisher: Royal Society of Chemistry
DOI: 10.1039/c9me00186g

Datasets

Datasets via OpenAIRE (2)

CCDC 2062217: Experimental Crystal Structure Determination
Author(s): Klein, David M.; Rodríguez-Jiménez, Santiago; Hoefnagel, Marlene E.; Pannwitz, Andrea; Prabhakaran, Amrutha; Siegler, Maxime A.; Keyes, Tia E.; Reisner, Erwin; Brouwer, Albert M.; Bonnet, Sylvestre
Published in: Cambridge Crystallographic Data Centre

Data set for Molecularly engineered photocatalyst sheet for scalable solar formate production from carbon dioxide and water
Author(s): Reisner, Erwin; Wang, Qian; Warnan, Julien; Rodriguez-Jimenez, Santiago; Leung, Jane; Kalathil, Shafeer; Domen, Kazunari
Published in: Apollo - University of Cambridge Repository

Last update: 2 November 2022
Record number: 220558