Post-doctoral position in Photoelectrochemical Hydrogen Production

In the context of PROSPER-H2, an industrial chair project co-funded by ENGIE and the French Research Agency, a three-year post-doctoral position in chemistry of materials and chemical design in Photoelectrochemical Hydrogen Production is available at the SolHyCat group (www.solhycat.com) in CEA/Grenoble (France).

Project summary

Photoelectrochemical hydrogen production has made huge progress since the first report of TiO_2 ability to split water by Fujishima and Honda in 1972. Still photoelectrochemical cells remain at the lab level. The PROSPER-H2 project, co-funded by the industrial Major ENGIE, aims at developing an alternative technology for a self-sustained water-splitting photoelectrochemical cell producing hydrogen out of the grid through (i) developing novel electrodes and photoelectrode materials to achieve high overall photoelectrochemical performances and stability for light-driven hydrogen production, (ii) engineering the system of materials to make a safe system working under neutral or near neutral conditions, (iii) modelling the whole device as well as optimizing light management and finally (iv) prototyping two photoelectrochemical cells at scale and testing them under realistic conditions. PROSPER-H2 will combine efforts of ENGIE and 5 laboratories at CEA with expertise in electrocatalysis, photonics, photo-electrocatalysis, materials science, multiscale-multiphysics modelling and chemical engineering to tackle the key above-mentioned scientific challenges and produce two pre-industrial PV-biased and tandem PEC prototypes for the decentralized production of solar hydrogen. Furthermore, the consortium will address RSE implications of such technology through life-cycle analysis, technoeconomic and sociotechnical studies.

The applicant will have a central position in the project. Hosted in the team of V. Artero, the Coordinator of the PROSPER-H2 project, he/she will (i) help in the project management, (ii) prepare and benchmark various mesoporous and inverse-opal photoelectrode substrates (TiO_2, NiO, $BiVO_4$…) (iii) optimize water-oxidation catalysts deposition (iv) engineer electrolytes and (v) in collaboration with other PhD students funded within the project, measure the various photoelectrodes prepared by consortium members in lab-scale (10-100 cm^2) PV-biased and tandem photoelectrochemical cells.

Qualifications

The applicants should hold a PhD in materials chemistry and have a strong background in photo(electro)catalysis; the applicant should be ready to broaden her/his knowledge and to work in a multidisciplinary collaborative environment.

Applications

Candidates should contact Vincent Artero (vincent.artero@cea.fr) with:

- Cover letter (max. two pages)
- detailed CV with a list of communication and publication
- Letters of recommendation or contact details for potential referees

The date of opening of the position is 1st of September (the candidates should take into account that the hiring procedure takes about two months).