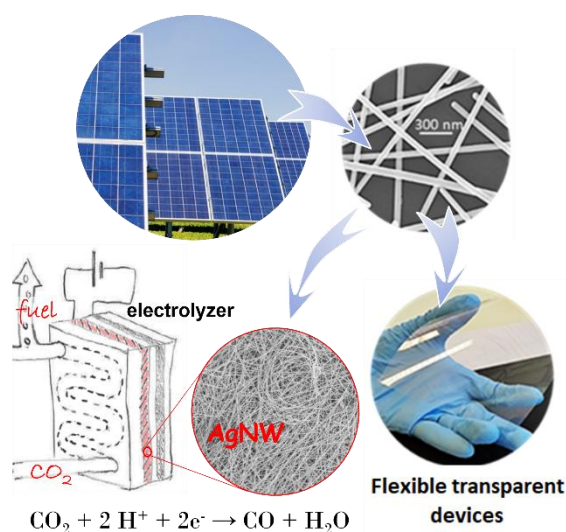


## PhD Thesis offer (starting October 2025)

**Title:** Silver nanowires synthesized from end-of-life solar panels for CO<sub>2</sub> reduction and transparent electrodes

**Hiring place:** CEA-IRIG Univ. Grenoble Alpes, Grenoble, France (in collaboration with LMGP, Grenoble INP)

**Subject:** Silver nanowire (AgNW) networks are remarkable materials, made from silver which exhibits the highest electrical and thermal conductivity at ambient temperature, and a good chemical stability. AgNW networks are used in transparent electrodes, for instance in solar cells, heating films or electrochromic devices. Their synthesis has been upscaled at the industrial level with high yield and reproducibility. More recently, they also found promising applications in low-emissivity layers on windows, and in catalysis of CO<sub>2</sub> reduction at ambient temperature as a selective electrocatalyst.



In the present project, we will turn to recycled sources of silver from dismantled end-of-life silicon solar panels for the synthesis of AgNWs, in a “green chemistry” approach. The quality of the nanomaterial will be checked directly in two relevant devices, namely IR-low-emissivity films for reduction of heat loss, and electroreduction of CO<sub>2</sub> for the production of e-fuels. The project will focus on understanding the physical basis of the impact of impurities on the synthesis of AgNWs, the physical properties of the AgNW networks, their stability under electrical stress or chemical wear, and their performance as active material in the devices.

The work will be done in Grenoble, the second scientific hub in France. The PhD student will be hired by CEA, a major French research institution with a high focus on alternative energies. He/she will join the fundamental research lab SyMMES, expert in nanomaterial design and energy devices such as batteries and electrolyzers. She/he will work in co-supervision in the partner lab LMGP expert in materials science, synthesis and implementation at Grenoble INP, which has a strong activity on AgNW since 2012. SyMMES and LMGP belong to University Grenoble Alpes and host widely international teams. This thesis will be the fruit of close collaboration between chemists and physicists who have solid expertise in this project. The latter will be actively supported by a local industrial recycling company.

Applicants should hold a Master 2 degree in chemistry, physics or materials science with skills in nanomaterials, electrochemistry or physical chemistry and in basic science for energy. Good English proficiency and a strong interest for innovation and collaborative work are required. We are looking for a highly motivated student who is interested to work in an inter-disciplinary project. Interpersonal skills, dynamism, rigor and teamwork abilities will be appreciated.

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