



DC 1	Ultrafast spectroscopy of ternary halide indoor photovoltaics for sustainably powering IoT electronics.
Host Institution	University of Cambridge
Supervisor	Akshay Rao
Duration	36 months
Subject Area	Materials, Semiconductor, Photovoltaic
Doctoral degree	Materials Science, University of Cambridge

Description

Using indoor photovoltaics (IPVs) to power the IoT device and recharge its energy storage device (e.g., supercapacitor) when lights are on, and using the energy storage device to power the IoT device in the dark, obviates the need to replace batteries. However, commercial-standard IPV (hydrogenated amorphous silicon; a-Si:H) have power conversion efficiencies (PCEs) up to ~20%, with most showing <10% efficiency. The selected candidate will use ultrafast spectroscopy techniques to characterize ternary halide thin films towards improving their efficiency by understanding how the composition and stoichiometry influences in the bandgap, exciton binding energy, charge-carrier recombination kinetics and mobility. Special attention will be given to loss processes in the bulk and interfaces. The candidate will spend a period at the University of Oxford, at the University of Cambridge and Saule to grow and characterize the IPVs.

Project-specific selection criteria:

- Master's degree in physics, chemistry and materials engineering.
- Affinity for experimental work.

Other criteria:

- Highly proficient English language skills.
- Willingness to work collaboratively in a research environment.
- A strong commitment to their own continuous professional development.
- Willingness to travel and work across Europe.

Additional information

As part of the MSCA programme, all recruited MASAUTO researchers must comply with the Horizon Europe MSCA eligibility criteria:

- Do not have a doctoral degree at the date of the recruitment by the host organisation.
- At the time of recruitment by the host organisation, DCs must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation for more than 12 months in the three years immediately prior to the recruitment date. Compulsory national service and/or short stays such as holidays and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.

