

## Development of reliable Perovskites PV modules

*Duration:* 48 mois

*Start:* 2018, june

*Contract:* Temporary position

*Place:* CEA/LITEN/DTS/Laboratoire des Modules PhotoVoltaïques Organiques (LMPO)

INES (Institut National de l'Énergie Solaire) - Savoie Technolac BP332 - 50 avenue du Lac Léman  
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### Context:

The printed PV laboratory within CEA / LITEN works for almost 3 years about the development of photovoltaic technologies based on Perovskite materials. Such Perovskite materials are cheap to produce and simple to manufacture. Solar cell efficiencies of devices using these materials have increased from 3.8% in 2009 to 22.7% in late 2017, making it the fastest-advancing solar technology to date.

Nevertheless, these record data are obtained using small active surface area (in the range of the millimeter squared) and a lot of issues regarding stability are still challenging. These 2 axes are critical for the emergence of the Perovskite photovoltaics on the market.

### Objectives:

The LMPO lab is starting a new European project with a top class consortium. The LMPO will be mostly focused on the stability issue of the perovskite modules. The main line of action will consist in the fabrication of perovskite devices by printing processes (spin-coating, slot-die) and in the study of the intrinsic (temperature, light) and extrinsic (humidity, oxygen) lifetime. The PV devices will be encapsulated to be protected from atmosphere. The encapsulation will be performed by lamination of a gas barrier film or by direct coating of the gas barrier protection (thin film encapsulation). Benchmark and in-house materials will be used. The lifetime studies will be performed in climatic chambers with accelerated temperature/humidity/illumination conditions and in outdoor conditions. The performances will be characterized by electrical measurements and further analyzed with advanced characterization methods like photoluminescence and electroluminescence.

### Profile:

PhD in the field of physical-chemistry of materials. A further experience in polymer materials, organic or perovskite semi-conductors would be appreciated.

High affinity for lab work

Strong problem-solving skills

Quality of written reports (English)

Communication in French or English with people from various backgrounds

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