



2025

Master thesis proposal – up to 5 months

Hosting laboratory:

ICube <https://icube.unistra.fr/>

23 rue du Loess BP 20 CR - 67037 Strasbourg Cedex 2 - France

<p>p-type Transparent Conductive Oxide thin films for photovoltaic applications</p>
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The aim of this internship is to fabricate and characterize novel thin film transparent conductive oxides (TCOs) for photovoltaic applications. The work is part of the PEPR TASE consortium, involving 9 research laboratories of CNRS, CEA and University of Strasbourg, in particular ICube in Strasbourg and IJL in Nancy.

In order to meet the increasing energy demand and current environmental challenges, photovoltaic module production capabilities must reach 3 TeraWatt (TW) per year in the next 10 years. New PV technologies are being developed for increasing conversion efficiency. They often use silver (Ag) based electrodes and indium-tin oxide films (ITO). However the limited Ag and In supply is a major challenge for TW development.

We aim to develop novel p-type TCOs preventing the use of Ag and In while offering the best properties and performance. The C3Fab platform of ICube provides cutting edge equipment and advanced techniques to fabricate, pattern and characterize thin films and solar cell devices. Training on techniques such as thin film growth, electron microscopy and analysis, Raman spectroscopy, spectroscopic ellipsometry, atomic force microscopy, Hall effect, Kelvin probe, Surface Photovoltage and PV measurements will be provided.

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