

ITI HiFunMat Master Internship Proposal

M 1

M 2

Title: Surface Functionalization with Photoinitiators for Plasma Polymers Deposition

Internship supervisor

Name, first name	OLIVEIRA, Jamerson
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Laboratory	Institut de Science des Matériaux de Mulhouse (IS2M)
Collaboration with a HiFunMat member (<i>please indicate their name</i>)	<input type="checkbox"/> No <input type="checkbox"/> Yes :

Student profile looked for

Master program (<i>more than one box can be ticked</i>)	<input checked="" type="checkbox"/> Material science and engineering <input checked="" type="checkbox"/> Chemistry <input type="checkbox"/> Physics
Other indications if necessary	

Internship description

The goal of the internship is to elaborate functional surfaces, containing photoinitiators, and test their influence on the final properties of polymers deposited via plasma enhanced chemical vapor deposition (PECVD).

The internship will offer the intern practical training in surface functionalization strategies through wet chemistry and PECVD. The intern is expected to work on the preparation of reactive self-assembled monolayers, the photo-assisted functionalization of those through wet chemistry and the evaluation of the surface influence on the formation kinetics and morphology of polymers deposited through PECVD. In addition, surface patterning will be generated through the use of a SmartPrint UV (Microlight3D) based on Digital Light Processing (DLP) or alternatively through Direct Laser Writing (DLW). The intern will carry out chemical, physico-chemical and morphological characterizations of the functional substrates and polymers using the available techniques at the IS2M (contact angle measurements, ellipsometry, infrared spectroscopy (FTIR), X-ray photoelectron spectroscopy (XPS), atomic force microscopy (AFM)...). The intern will develop disciplinary skills in materials chemistry, particularly in surface characterization as well as in PECVD. More generally, she/he will learn how to work within a research team, exploit data, use scientific databases, write a report and communicate on her/his results.

References:

Carneiro de Oliveira, J.; Meireles Brioude, M. de et al., Plasma polymerization in the design of new materials: looking through the lens of maleic anhydride plasma polymers. *Materials Today Chemistry* 2022, 23, 100646.

Zhang, Junning et al., Facile Surface Functionalization Strategy for Two-Photon Lithography Microstructures. *Small* 2021, vol. 17, n° 34, e2101048.