

## Research Studentships for Doctoral students

Applications are open for 1 Research Studentship, within the framework of CeFEMA, Centro de Física e Engenharia de Materiais Avançados, projecto FCT UIDB/04540/2020, financed by national funds through FCT/MCTES (PIDDAC), under the following conditions:

**Scientific Area: Chemical Engineering Sciences: Materials Science**

**Admission Requirements:** *To be enrolled at a doctoral programme.*

**Workplan:** The optical properties of metals textured with nano and femtosecond lasers have been extensively studied by measures of reflectivity, ellipsometry and polarimetry. Nanostructures have been found to change the polarization of light identically to quarter- or half-wave plates, depending on the material. The presence of nanostructures also changes the color of the samples due to chemical and topographical effects, allowing the creation of white or golden silver, for example. This project aims to relate optical properties such as specular and diffuse reflectivity, ellipsometry measurements, spectral distribution of reflected light, etc. previously performed on samples of austenitic stainless steel, a commercial silver-copper alloy, high-purity silver and high-purity platinum, either in the polished state or after controlled treatments with a femtosecond laser conducted in order to generate LIPSS – Laser-induced periodic surface structures with the surface topography generated by the laser treatment, in order to understand the mechanisms of creation of this structural color. The results of the analyzes carried out will be compared with the results of the modeling carried out with the help of the COMSOL software. Modeling these structures using ellipsometry data will clarify the role of different effects at play in reflectivity measurements.

**Legislation and Regulations:** Statute of Scientific Research Fellow, approved by Law nr. 40/2004, of August 18, as worded by Decree-Law nr. 123/2019, of August 28; FCT Regulation for Research Studentships and Fellowships, available on <https://www.fct.pt/apoios/bolsas/docs/RegulamentoBolsasFCT2019.pdf> and <https://dre.pt/application/file/a/127230968>.

**Workplace:** The work will be developed at CeFEMA, of Instituto Superior Técnico under the scientific supervision of Professor Rui Mário Correia da Silva Vilar.

**Duration:** The research fellowship(s) will have the duration of 6 months. It's expected to begin on the 1<sup>st</sup> of November 2022 and may be eventually renewed up to the duration of the project.

**Monthly maintenance allowance:** According to the values for Research Fellowships awarded by FCT in Portugal (<http://www.fct.pt/apoios/bolsas/valores>), the amount of the monthly maintenance allowance is 1.144,64€, being the payment method an option of the Fellow by Wire Transfer/Check.

**Selection methods:** The selection methods will be the following: *The selection methods to be used will be the following: curricular assessment and previous experience, with the respective valuation of 60 and 40 out of a total of 100 values.*

**Composition of the selection Jury:** Professor Alberto Ferro, Professor Augusto Moita de Deus and Professor Rui Vilar.

**Announcement/ notification of the results:** The final evaluation results will be communicated to all applicants by email.

**Deadlines and procedures of complaint and appeal.** A complaint may be lodged from the final decision within 15 working days, or an appeal to the Executive Board of IST-ID within 30 working days, both counted from the respective notification

**Application deadline and formalization:** The call is open from September 14 until September 27, 2022.

It is mandatory to formalize applications with the submission of the following documents: i) B1 Form – Fellowship application (<https://ist-id.pt/concursos/bolsas/> ); ii) *Curriculum Vitae*; iii) academic degree certificate; iv) proof of enrollment at an academic degree course (Doctoral programme) v) motivation letter;

Applications must be submitted to the email: [rui.vilar@tecnico.ulisboa.pt](mailto:rui.vilar@tecnico.ulisboa.pt)