



## PhD positions in Nonlinear Optics and Nanophotonics

We offer a **full time PhD grant** (4 years - FPI grants from Ministerio de Ciencia, Innovación y Universidades) within the research project “**Enhancement of Nonlinear Interactions in Optical Metasurfaces**” at the **Nonlinear Optics and Lasers Laboratory**, [Nonlinear Dynamics, Nonlinear Optics and Lasers \(DONLL\)](#) research group, [Universitat Politècnica de Catalunya](#), Barcelona, Spain. The project will be developed under the supervision of **Profs. Jose Trull** [jose.francisco.trull@upc.edu](mailto:jose.francisco.trull@upc.edu) and **Crina Cojocaru** [crina.maria.cojocaru@upc.edu](mailto:crina.maria.cojocaru@upc.edu)

**Application:** Candidates may only submit their applications in the UPC e-services portal available at [2<sup>nd</sup> call application form](#). **Please note there are different links for European and Non-European candidates.**

**Name of the project:** please select [PID2023-148620NB-I00](#) – IPs: Jose Francisco Trull + Crina Maria Cojocaru

**The details and of the call** are available here: [2nd call for PhD grant application](#)

**Deadline:** March 25th, 2025 at 14:00h.

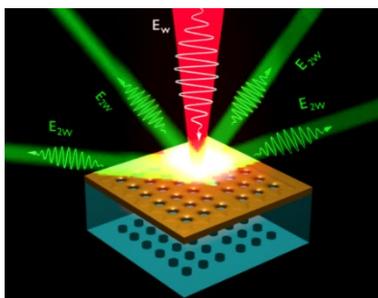
**Required documents:** The following documents must be attached to the application:

- A copy of a valid Spanish ID card (DNI), foreigner ID card (NIE) or passport. The copy of the passport may only be presented by foreigners who do not reside in Spain. Foreign residents in Spain must provide a copy of the NIE.
- If the applicant studied at universities other than the UPC, including those located abroad, they must provide a copy of the **personal academic transcript of all degrees** (bachelor’s degrees and master’s degrees) stating the grades obtained for each subject, with the corresponding quantitative marks, the credits taken and the date on which the qualifications were obtained, together with a sworn translation of the same if applicable.
- If the applicant studied at a foreign University, the average grade equivalency statement for the **bachelor’s and master’s degrees**, using the [form of the Spanish Ministry](#).
- A **Curriculum Vitae in the particular CVA format**, available on the website of the call (see specific format here: model CVA [\(anglès\)](#))
- Additional recommended documents:** a motivation letter, one or two recommendation letters and an official English certificate will also be positively evaluated.

### **Requirements:**

- Bachelor’s and master’s degree in physics, physical engineering, photonics, electrical and/or electronic engineering, or similar.
- Knowledge of optics, electromagnetism, nonlinear optics, photonics.
- Experimental skills, internships and projects in the field will be positively evaluated.
- Basic computational skills.
- English official certificate

**Project overview:** Experimental and theoretical study of linear and nonlinear light-matter interaction in nano-structured artificial materials (photonic crystals and optical metasurfaces), in a search for new functionalities in Photonics. Some of the physical phenomena involved are the **harmonic generation in opaque region of semiconductors**, **excitation of plasmonic waves** in metals and conductive oxides and





**topological surface waves.** The aim is to maximize the potential impact of nonlinear metasurfaces to new nanophotonic devices, such as multiple frequency generators, tunable emitters extended in the UV and optical sensors, all into the interconnected fields of **nanomaterials** and **nonlinear optics**.

The selected candidate will work on the design and measurement of novel nanophotonic structures performing a combination of theoretical and experimental tasks: developing numerical simulations, setting new experimental set-ups and experimentally proving the optical properties of the nanostructures. Occasionally he/she could participate in the sample fabrication through short stays in our collaborator's labs. He/she will participate in our international collaborations having the opportunity to carry out international internships in prestigious research groups in USA, Italy or Australia and will participate in national and international congresses to disseminate his results to the scientific community.

Student will be part of our active [research group](#), being in contact with other PhD students working on different subjects in the fields of nonlinear optics, nonlinear dynamics and lasers, research well recognized at the international level.

We look forward to receiving your application!