

PhD POSITION
EXFOLIATION AND OPTICAL CHARACTERISATION OF
NOVEL 2D MATERIALS FOR HYDROGEN
PRODUCTION

**Funded by the proyectos estratégicos orientados a la transición ecológica y a la transición digital.
Spanish Science and Innovation Ministry**

PROJECT. MOSES

SUPERVISORS. Dr. Víctor Vega-Mayoral (victor.vega@imdea.org)
Dr. Sara H. Mejías

EMPLOYMENT OFFER. 2-year employment contract, starting in March 2023 (flexible) with the possibility of expanding the contract.

PROJECT DESCRIPTION. Hydrogen production is one of the technologies called to substitute mineral fuels. Among the different methods to obtain Hydrogen, water-based photocatalysis is the cleanest route and produces what is called green hydrogen. Green hydrogen is one of the most promising options humanity has to battle climate change.

The research assistant will study the use of novel 2D materials as catalytic active materials for hydrogen production. The process will involve the exfoliation of novel 2D materials, their characterisation via steady-state and time-resolved optical techniques (photoluminescence, time-resolved photoluminescence, absorption, femtosecond and nanosecond transient absorption). The final stage of the project focuses on the functionalization of exfoliated 2D nanosheets with ad-hoc produced proteins and the study of the developed active materials in photocatalysis.

POSITION PROFILE

- Bachelor in physics, chemistry, material science, physics engineer or similar.
- Master in photonics, nanotechnology, material science, nanoscience, lasers or in a related field.
- Good English level, both written and spoken.
- Team working skills (highly important).

In addition to the listed items, the evaluation committee will value the following items:

- Programming skills (Matlab, Wolfram Mathematica, C++, labview...).
- Experience with any of the above-mentioned characterisation techniques.
- Experience with liquid phase exfoliation.
- Experience in nanoscience/nanotechnology.

WHAT IS OFFERED FOR THE CANDIDATE. We offer the possibility of joining a department with a healthy working environment in a lab with cutting edge facilities. The research assistant will develop her/his activity with guidance and help in an environment of freedom and with internal and external synergies. Moreover, IMDEA offers a good training program for early-stage researchers with courses on topics such as scientific and technological management, career development, and science communication.

RESEARCH ENVIRONMENT. Our group is part of the time-resolved spectroscopy department at IMDEA Nanoscience with a collaborative and international environment. In the department, we have an active seminar program to share and discuss scientific progress having the input of scientists from different areas. Moreover, IMDEA offers a good training program for PhD students with courses on

topics such as scientific and technological management, career development, and science communication.

SALARY: The salary has been fixed in agreement with national standards for the position.

INSTRUCTIONS. Interested candidates must submit **their application before January the 15th, 2023 to the email victor.vega@imdea.org**, including a presentation letter and a CV. A recommendation letter is desirable. Candidates will be called for an online interview.



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