



## Characterization of Innovative Carbon-Based Nanomaterials

A fully funded (2 years) postdoc position, in the frame of the i-DEMO régionalisé (France 2030) M.A.G.I.C. (Advanced Materials for Innovation in Graphene and Crystallography) project, is available until 1<sup>st</sup> of April 2025 in the “Physics of Ionic and Molecular Interactions” (PIIM) laboratory at Aix-Marseille University, CNRS (France).

As part of the M.A.G.I.C. project, we are seeking for an experimental postdoctoral researcher to work on the development and characterization of innovative carbon-based nanomaterials, such as Ginstium©, multilayer rhombohedral graphene and other relevant systems. Ginstium© could be a possible groundbreaking nanostructured carbon material developed by company EffiBLUE [1]. Multilayer rhombohedral graphene and some twisted few layer graphene are known to be superconductive at temperature close to 1K. Manipulating the structural properties of carbon-based materials, such as the sp<sup>2</sup>/sp<sup>3</sup> ratio and stacking configurations, enables fine tuning of their physical characteristics, including electronic conductivity, optical response, and mechanical strength. These tunable materials hold significant potential for applications in electronics, telecommunications, and energy sectors. Working within the PIIM research team, the postdoctoral researcher will conduct detailed characterization of these materials, examining its electrical, structural and vibrational properties, mainly under ultra-high vacuum conditions.

Ideal candidates will hold a Ph.D. in Materials Science, Physical Chemistry, Nanotechnology, or a related field, with specialized expertise in carbon-based materials (e.g., graphene, carbon nanostructures) or low-dimensional materials. Proficiency in advanced surface analysis techniques, such as Raman [A, B] and photoelectron spectroscopies [C], is essential. Experience with ultra-high vacuum (UHV) environments is highly valued, along with practical expertise in high-resolution imaging (e.g., AFM, confocal microscopy), surface treatments (e.g., annealing, ion bombardment), and ellipsometry [D].

The ideal candidate will have a demonstrated ability to work effectively within an interdisciplinary team, contributing their expertise to collaboratively achieve project goals and manage deliverables efficiently. They should possess excellent scientific communication skills, including proficiency in reporting, preparing publications, and delivering presentations.

Applications are to be addressed to Marco Minissale ([marco.minissale@univ-amu.fr](mailto:marco.minissale@univ-amu.fr)) and Cédric Pardanaud ([cedric.pardanaud@univ-amu.fr](mailto:cedric.pardanaud@univ-amu.fr)) with a CV, cover letter outlining relevant experience, transcript of grades and at least two referees contact.

The postdoctoral vacancy must be filled by the 1<sup>st</sup> of April 2025.

The post-doc will be based between the Plasma-Surface and H2M groups of the PIIM laboratory. Aix-Marseille University (AMU) is the biggest University in France and one of the four “Initiative d’excellence IDEX” French Universities. AMU is located on the shore of the Mediterranean Sea in the Provence area.



[1] <https://effiblu.com>

[A] A. Merlen, J. G. Buijnsters and **C. Pardanaud** *A Guide to and Review of the Use of Multiwavelength Raman Spectroscopy for Characterizing Defective Aromatic Carbon Solids: from Graphene to Amorphous Carbons Coatings* 7 (2017), 153

[B] D. Nikolaievskiy, M. Torregrosa, A. Merlen, S. Clair, O. Chuzel, J. L. Parrain, T. Neisus, A. Campos, M. Cabie, C. Martin, **C. Pardanaud** *Wrinkling and crumpling in twisted few and multilayer CVD graphene: High density of edge modes influencing Raman spectra* *Carbon* 203 (2023) 650

[C] **M. Minissale**, E. Salomon, K. Iliopoulos, J. Lumeau, T. Angot  
*Growth of Sb<sub>2</sub>Te<sub>3</sub> thin films on Ge(111) sample by thermal deposition: Morphological and electronic properties*, *Physica E* 160 (2024) 115952

[D] F. Pappalardo, L. Rayneau, C. Martin, M. Cabie, E. Salomon, T. Angot, G. Cartry, R. Bisson, **M. Minissale**, *In-situ monitoring of tungsten oxides reduction during deuterium plasma exposure by spectroscopic ellipsometry*, *Nuclear Materials and Energy* 41 (2024) 101751