PhD Studentship Opportunity in Nanoscience

We seek highly motivated candidates to undertake research towards a PhD on:

Nanoparticle-Assembled Films for Nanostructured Neuromorphic Devices

- Application deadline: 24 October 2025
- Start date: December 2025 – February 2026
- Duration of funding: 4 years
- Rate: *€22,000/year, gross + additional funding for stays abroad*
- Location: ApNano group Lab, University of Castilla-La Mancha (Ciudad Real, *with a low cost of life*)
- Requirements: MSc in Physics, Materials Science or Engineering, or related subjects, by the application deadline. Fluent English.
- Supervision: Dr Panagiotis Grammatikopoulos
- For more information, please contact: p.grammatikopoulos@uclm.es

The **ApNano Group** seeks to recruit a PhD candidate to work in close collaboration with the group and its academic partners worldwide. Research directions at our group include design & modelling of nanoparticles, nanoparticle fabrication using gas-phase synthesis, and integration of these nanoparticles into innovative technologies.

The Group is committed to that specific emphasis will be put on the personal and professional development of the successful candidate (both hard and soft skills), as well as their welfare and work/life balance.

Position Description:

Conventional computers are not optimised for Artificial Intelligence (AI) applications. Hence, AI is expected to greatly benefit from neuromorphic computing, a promising paradigm based on integrated brain-like systems comprising electronic circuits that mimic neuron function in performing computations. The development of cluster beam deposition enables the incorporation of nanoclusters into films and devices, with promising recent findings for implementation in neuromorphic computing.

For this PhD project, the successful candidate will investigate nanoparticle-assembled thin films close to and beyond the electrical percolation threshold, i.e., the condition where a fully connected network of nanoparticles forms and displays resistive switching behaviour, necessary for neuromorphic computations.

The project consists of:

i. Deposition of nanoparticles using magnetron-sputtering inert-gas condensation toward thin films near percolation. Expertise with the method will be obtained as various deposition parameters will be investigated.

ii. Characterisation of produced films by various methods (AFM, SEM, TEM, resistivity, SQUID).
iii. Theoretical modelling of nanoparticle synthesis/structure, filament formation and/or grain boundary migration.
iv. Dissemination of results in esteemed international peer-reviewed journals, conference presentation(s), etc.

Learning objectives

By the end of this project, the PhD graduate will have acquired:

- Technical skills (nanoparticle deposition and characterisation, computer simulations)
- Familiarisation with research ethics
- Academic skills (literature review, technical writing, presentation, project and time management)
- Soft skills (effective communication in a team, dissemination of results)
- Publishable output

Duties and Responsibilities:

- Perform high-quality experimental and theoretical research on nanoparticle synthesis from the gas phase, characterisation, and application in neuromorphic devices.
- Disseminate research in in esteemed, peer-reviewed, international journals and reputable scientific conferences.
- Help maintain a safe, healthy, and ethical academic environment within the Group and the University.

Skills:

- Good first degree in Physics, Materials Science, or equivalent discipline. MSc degree in any of these by the start date.
- Good knowledge of English, computational competence: essential.
- Experience in gas-phase synthesis of nanoparticles or PVD, nanomaterial characterisation, simulation and/or AI techniques, computer programming: highly advantageous.
- Good communication skills, competence with scientific software and scientific methodology, problem solving attitude: desirable

* UCLM is an equal opportunity and affirmative action employer.

*Information provided by applicants or references will be kept confidential, documents will not be returned.