H2020 - MARIE SKLODOWSKA-CURIE ACTIONS Initial Training Network

ULTIMATE - Bottom-Up generation of atomicalLy precise syntheTIc 2D MATerials for high performance in energy and Electronic applications

A multi-site innovative training action

1 October 2019 – 30 September 2023

Openings A.P.E.Research srl TRIESTE – ITALY : 1 ESR position*

The "graphene rush" has triggered a great interest in the design and fabrication of **synthetic 2D materials** (S2DMs) excelling in their chemical and physical properties for future emerging technologies addressing numerous societal needs, such as faster and better performing electronics, as well as energy storage and conversion. To match the societal benefits of being at the forefront of new technological and scientific developments, the EC requires a highly skilled scientific and technical workforce that can efficiently finalize the shift to a true knowledge-based society. **ULTIMATE** will provide to talented young researchers a well-structured training in the burgeoning field of S2DMs by developing their knowledge and understanding on:

i) how to generate novel atomically precise 2D materials with defined structure and composition,

ii) how to best exploit their unique and tunable properties for electronics and energy applications. This training-through-research requires an intersectoral approach by specialized and skilled scientists from different (sub-)disciplines including molecular modeling (TUD), organic, macro-/supramolecular synthesis production of S2DMs, hierarchical self-assembly, surface and interface studies, photochemistry and photophysics, device fabrication and characterization, and other skills, as well as a strong commitment to the training of young talents with the ultimate goal of achieving scientific breakthroughs in this very topical area of science and technology.

The specific training and research objectives at A.P.E.Research are:

1. Nanoscale studies of the properties of the S2DMs by SPM techniques

Acquire skills and conduct research in: **1)** Sample preparation for advanced SPM techniques for specifically investigate S2DMs; **2)** Characterization of functional surfaces and structures by advanced SPM techniques as KPFM in air for specifically investigate S2DM; **3)** Contribute to develop new SPM-based tools and modes, especially for studying the electrical/electronic properties of S2DMs; **4)** ESR will work in close collaboration with other partners to devise new computational approaches to improve the spatial resolution of KPFM and C-AFM.

To achieve the objectives above we are currently aiming to recruit a pool of talented, energetic, strongly motivated, young scientists at Early Stage Researcher (**ESR ***).

Positions are intended primarily to encourage mobility of researchers among EU countries although a small number of appointments can be for ESRs from third countries. Women are especially encouraged to apply.

Experience in AFM and STM development will be appreciated.

Each researcher will benefit from a wide ranging training programme that will take advantage of both "indoor" (i.e. at the principal host institution) and "outdoor" activities (i.e. at other nodes, or other events such as training schools, conferences, workshops etc.). The researcher will have the opportunity to spend a significant secondment period at the another node of the network to acquire familiarity with different techniques. Details about the positions are given in the table below.

Position in APEResearch is for starting on **April 2020** or soon thereafter.

Node	**Principal investigator**	**Field of research**	**Positions**
A.P.E. Research, Trieste, Italy	Stefano Prato	**Development of new tools for Scanning Probe Microscopies**	**1 ESR* (36 months) Starting April 2020**

- *** ESR candidate**
  1) **ESRs shall, at the time of recruitment by the host organisation, be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree. I.E. he/she should have received the title that provides him/her access to the PhD from less than 4 years. Full-time equivalent research experience is measured from the date when the researcher obtained the degree entitling him or her to embark on a doctorate, (either in the country in which the degree was obtained or in the country in which the researcher is recruited) even if a doctorate was never started or envisaged. Part-time research experience will be counted pro-rata.**
  2) **He/she should have spent < 12 months (during the last 36 months) in the nation where he/she will be appointed (Italy).**