PhD position – opening soon

in

Experimental Condensed Matter Physics – Surface Science

at the

IR-Vis SFG spectroscopy laboratory – Department of Physics – University of Trieste (Italy)

Group Leader: prof. Erik Vesselli

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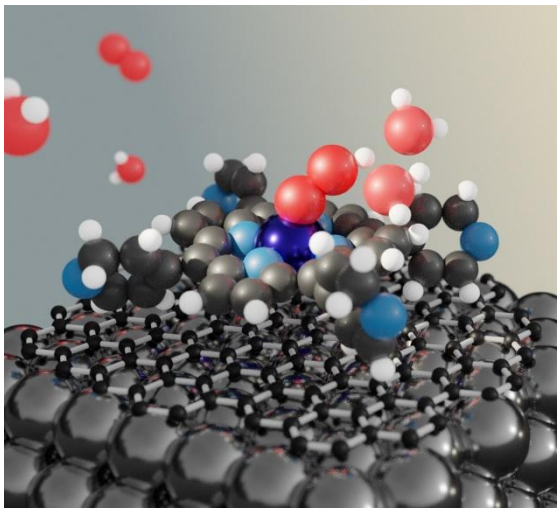
Research title:

"Development of novel functional materials for the energy transition in the hydrogen supply chain"

PhD Program Duration: 36 months
Gross salary: about 65'000 €
Starting date: 1st November 2026

Research abstract:

The design of novel biomimetic 2D functional materials is attracting increasing attention in the fields of energy harvesting, conversion, and storage. Nevertheless, a clear understanding of the link between these synthetic materials and their biochemical counterpart is lacking for limitations in accessing a detailed, atomic-level description at ambient conditions and for the intrinsic limits of 2D materials in reproducing the 3D local functional second-coordination sphere of natural biochemical pockets. The activities will tackle the role of the latter, by synthesizing model 2D materials through self-assembly of molecular tectons, including 3D single-atom sites, and by investigating lateral, support (gold, graphene), solvent, ligands, and light interactions at the fundamental level by means of laser-based non-linear InfraRed-Visible Sum-Frequency Generation (IR-Vis SFG) spectroscopy, surface science methods, also exploiting synchrotron radiation, in UHV and at near-ambient pressure. Target catalytic reactions will include the synthesis of hydrogen vectors by hydrogenation of small vector molecules (CO_2, N_2 …).



Contacts:

For more information contact the group leader: evesselli@units.it