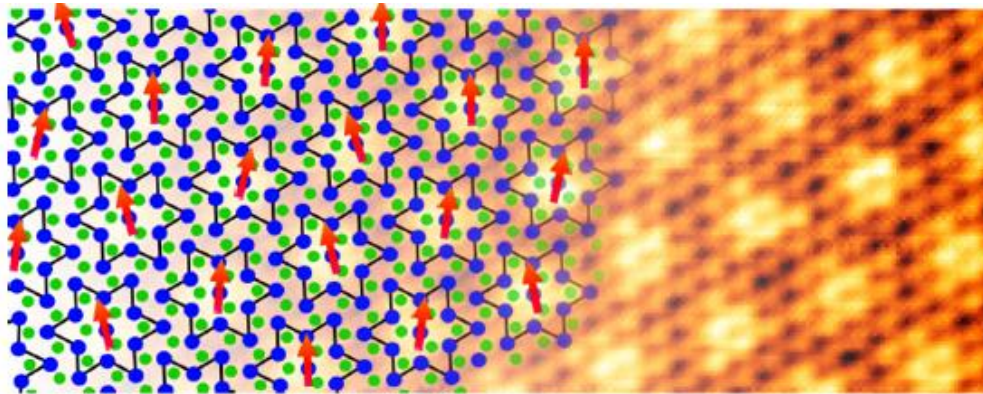
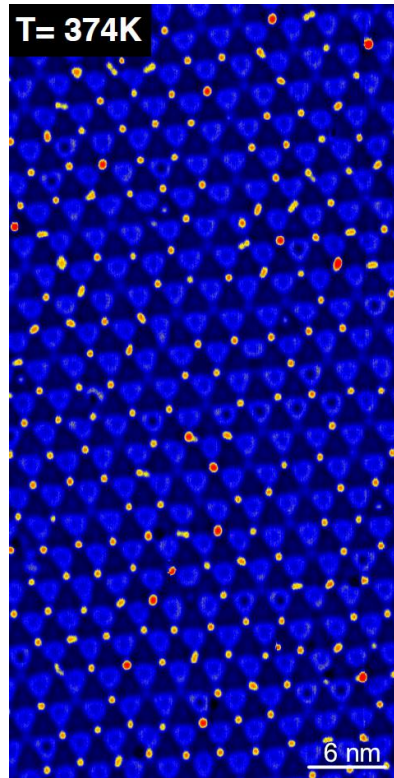


Imaging 2D materials

Amadeo L. Vázquez de Parga



09 de Marzo de 2022
12:00 h
PRESENCIAL + ONLINE
(sala de Seminarios
del Departamento C03, 5 planta)
+ MS-TEAMS,
Seminarios del Departamento FMC

Department Seminar

Imaging 2D materials

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In the last few years our research has been focused on both the intrinsic properties of 2D materials and the possibility of modifying them at will. In this seminar I am going to summarize the results we have obtained with special emphasis on the most recent results. I will start by discussing the properties of graphene grown on transition metal surfaces and its subsequent functionalization [1]. I will show in detail how the growth of graphene on Ru(0001) can be used to tune the electronic properties of the surface to enhance the photogeneration of highly reactive molecules on surfaces [2]. Surprisingly enough, graphene on Ru(0001) presents a catalytic activity for the formation of C-C bonds between molecules [3]. I will end the seminar by discussing a couple of results obtained in transition metal dichalcogenides. First, I will report on the growth of different crystallographic phases in TaTe₂ and the delicate balance between Te-Te and Ta-Ta interactions that dictate the stability [4] and finally I demonstrate the formation of a Kondo lattice in a van der Waals heterostructure comprising a Mott insulator on a metallic substrate [5].

[1] “*Graphene grown on transition metal substrates: Versatile templates for organic molecules with new properties and structures*”, C. Diaz et al., Surface Science Reports **77**, 100575 (2022).

[2] “*Efficient photogeneration of nonacene on nanostructured graphene*”, C. G. Ayani et al., Nanoscale Horizon **6**, 744 (2021)

[3] “*Graphene catalyzes the reversible formation of a C–C bond between two molecules*”, J.J. Navarro et al., Science Advances **4**, eaau9366 (2018)

[4] “*Metastable polymorphic phases in monolayer TaTe₂*”, I. Di Bernardo et al., arXiv:2301.06445 (2023)

[5] “*Two-dimensional Kondo lattice in a TaS₂ van der Waals heterostructure*”. C.G. Ayani et al., arXiv:2205.11383 (2022)