

# Dr. Cosme González Ayani

## PERSONAL DETAILS:

Address: Avd de Viñuelas 32 2ª. 28760 Madrid. Spain.  
Telephones numbers: +34 626 77 81 64  
E-mail address: [cosme.gonzalez@imdea.org](mailto:cosme.gonzalez@imdea.org)  
Date of birth: 5th January 1993  
Nationality: Spanish  
ID: 53846564-E

## WORK EXPERIENCE

Jan 2019 –to date Assistant professor predoctoral position.  
Department of condensed matter physics, *Universidad Autónoma de Madrid (UAM)*.  
Oct 2016- Dic 2018 Predoctoral investigator position.  
Project: Crystallographic and electronic characterization of 2D Materials.  
Supervisor: Amadeo López Vázquez de Parga.  
*IMDEA- Nanoscience*.  
June-Oct 2013 Research Fellowship for initiation in nanoscience  
Supervisor: Amadeo López Vázquez de Parga.  
*IMDEA-Nanoscience*.

## EDUCATION

Oct 2017- May2022. *Phd in condensed matter physics and biophysics*  
*Universidad Autónoma de Madrid*  
Sept 2016- Jul 2017 Master in Nanoscience and Molecular Nanotechnology.  
*Universidad de Autónoma de Madrid*.  
Sept 2011- Jul 2016 Undergraduate studies in Physics.  
*Universidad Autónoma de Madrid*.

## LANGUAGES

Spanish Native  
English Proficiency level C2, obtained in 2011

**GRANTS AND FELLOWSHIP:**

Aug 2022- Sept 2022: Stay at Nanosurf group. Prague, Czech Republic. Head of Group: Pavel Jelínek.

**LIST OF PUBLICATIONS:**

1. **Graphene catalyzes the reversible formation of a C-C bond between two molecules.**  
 JJ. Navarro, M. Pizarra, B. Nieto-Ortega, J. Villalva, C. G. Ayani, C. Díaz, F. Calleja, R. Miranda, F. Martín, E. M. Pérez, A. L. Vázquez de Parga.  
 Science Advances **4**(12), eaau9366, 2018.
2. **Thermally activated processes for ferromagnetic intercalation in graphene-heavy metal Interfaces.**  
 Fernando Ajejas, Alberto Anadon, Adrian Gudin, José Manuel Diez, C. G. Ayani, Pablo Olleros-Rodríguez, Leticia de Melo Costa, Cristina Navío, Alejandro Gutierrez, Fabian Calleja, Amadeo L. Vázquez de Parga, Rodolfo Miranda, Julio Camarero, Paolo Perna.  
 ACS Applied Materials and Interfaces **12**(3), 4088-4096, 2019.
3. **Robust, carbon related, superconducting nanostructures at the apex of a tungsten STM tip.**  
 C. G. Ayani, F. Calleja, P. Casado Aguilar, A. Norris, JJ. Navarro, M. Garnica, M. Acebrón, D. Granados, A. L. Vázquez de Parga, J. G. Rodrigo, R. Miranda.  
 Applied Physics Letter **115**(7), 073108, 2019.
4. **Efficient photogeneration of nonacene on nanostructured graphene.**  
 C. G. Ayani, M. Pizarra, J. I. Urgel, J. J. Navarro, C. Díaz, H. Hayashi, H. Yamada, F. Calleja, R. Miranda, R. Fasel, F. Martín, A. L. Vázquez de Parga.  
 Nanoscale Horizon, **6**(9), 744-750, 2021.
5. **Switchable molecular functionalization of an STM tip: from a Yu-Shiba-Rusinov tip to a Kondo tip.**  
 C. G. Ayani, F. Calleja, Iván M. Ibarburu, Pablo Casado, Nana KM Nazriq, Toyo Yamada, Manuela Garnica, Amadeo L. Vázquez de Parga, Rodolfo Miranda.  
*Nanoscale*, **14**(-), 15111-15118, 2022.
6. **Two-dimensional Kondo lattice in a TaS<sub>2</sub> van der Waals heterostructure.**  
 C. G. Ayani, Michele Pizarra, Iván M. Ibarburu, Manuela Garnica, R. Miranda, Fabián Calleja, Fernando Martín, Amadeo L. Vázquez de Parga.  
 Small (accepted)
7. **Metastable polymorphic phases in monolayer TaTe<sub>2</sub>.**  
 Iolanda Di Bernardo, Joan Ripoll-Sau, Fabian Calleja, Cosme G. Ayani, Rodolfo Miranda, Jose Angel Silva-Guillen, Enric Canadell, Manuela Garnica, Amadeo L. Vazquez de Parga  
 Small 2023, 2300262

**CONTRIBUTIONS TO CONFERENCES:**

**Young Researchers Workshop Instituto Nicolas Cabrera**

Madrid (Spain) December 2022

Oral Contribution

*“Kondo lattice development in a TaS<sub>2</sub> van der Waals heterostructure”*

**Invited talk Chiba University**

Chiba University (Japan) October 2022

Oral contribution

*“Switchable molecular functionalization of an STM tip: from a Yu-Shiba-Rusinov tip to a Kondo tip”*

**2<sup>nd</sup> International Conference on Novel 2D materials explored via scanning probe microscopy & spectroscopy (2D-SPM)**

San Sebastian (Spain) June 2022

Oral contribution

*“Atomic and Electronic Properties of a 1H/1T-TaS<sub>2</sub> Polymorphic van der Waals Heterostructure”*

**19<sup>th</sup> Nanospain Conference**

Madrid (Spain) May 2022

Oral Contribution

*“Kondo lattice development in a TaS<sub>2</sub> van der Waals heterostructure”*

**Young Researchers Workshop Instituto Nicolas Cabrera**

Madrid (Spain) January 2021

Oral Contribution

*“Switchable molecular functionalization of an STM tip: from a Yu-Shiba-Rusinov tip to a Kondo tip”*

**Virtual SPM congress 2020**

June 2020

Poster Presentation.

*“Transition from Yu-shiba-Rusinov states to Kondo screening of a charged TCNQ molecule on a Nb STM tip”*

**XXXVII Reunion Bienal de la real Sociedad Española de Física.**

Zaragoza (Spain) July 2019

Poster contribution.

*“Robust, switchable, C-related, superconducting nanostructure at the apex of a W STM tip”*

**8<sup>th</sup> International conference on scanning probe spectroscopy**

Hamburg (Germany) June 2019

Poster presentation

*“Robust, switchable, C-related, superconducting nanostructure at the apex of a W STM tip”*

**1<sup>st</sup> International Conference on Novel 2D materials explored via scanning probe microscopy & spectroscopy (2D-SPM)**

San Sebastian (Spain) June 2018

Poster presentation.

*“Superconductivity in W carbide nanostructures & its importance in STM experiments performed on metal supported graphene”*

**4<sup>th</sup> European workshop on epitaxial graphene and 2D materials conference (EWEG-2D)**

Salamanca (Spain) May 2018

Poster presentation.

*“Superconductivity in W carbide nanostructures & its importance in STM experiments performed on metal supported graphene”*

**33<sup>rd</sup> European conference on surface science (ECOSS)**

Szeged (Hungary) August 2017

Oral presentation.

*“Symmetry reduction on metal supported graphene by intercalation of Pb”*

**7<sup>th</sup> Early-stage researchers workshop in nanoscience**

Madrid (Spain) June 2017

Poster contribution.

*“Intervalley scattering in lead intercalated graphene”*