

June 24th – 28th, 2024
Donostia / San Sebastián
Basque Country, Spain

Novel 2D materials explored via scanning probe microscopy & spectroscopy

Organizers

Miguel M. Ugeda (DIPC)
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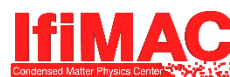
Haojie Guo

DIPC, Spain

Sponsors



SPECSGROUP



Monday 24th

08:45 – 09:00	WELCOME	
09:00 – 09:45	Joseph Stroschio NIST, USA	<i>How to measure Berry curvature derived orbital magnetism with Landau level spectroscopy in moiré quantum matter</i>
09:45 – 10:30	Paco Guinea IMDEA – DIPC, Spain	<i>Superconductivity and junctions in twisted bilayer graphene</i>
10:30 – 11:15	COFFEE BREAK / POSTER SESSION I	
11:15 – 12:00	Stevan Nadj-Perge CALTECH, USA	<i>Imaging strongly correlated phases in twisted trilayer graphene using scanning tunneling microscopy</i>
12:00 – 12:20	Pierre Pantaleon IMDEA, Spain	<i>Umklapp-driven evolution of superconductivity in twisted graphene multilayers</i>
12:20 – 12:40	Chen-Yue Hao Beijing Normal U., China	<i>Robust flat bands in twisted trilayer graphene quasicrystals</i>
12:40 – 13:00	Gautam Rai U. Hamburg, Germany	<i>Dynamical correlations and order in twisted bilayer graphene</i>
13:00 – 15:00	LUNCH	
15:00 – 15:45	Shahal Ilani Weizmann Institute of Science, Israel	<i>News from the Quantum Twisting Microscope</i>
15:45 – 16:05	Shiyong Wang Shanghai Jiao Tong U., China	<i>STM study of the strongly correlated states in Rhombohedral graphene few-layers</i>
16:05 – 16:25	Árpád Pásztor U. Geneva, Switzerland	<i>Ambiguous chirality and periodic strain patterns in moiré systems: a cautionary tale about geometric phase analysis</i>
16:25 – 16:45	Florie Mesple U. Washington, USA	<i>Bilayer graphene with biaxial heterostrain relaxes in a giant atomic swirl</i>
16:45 – 17:30	COFFEE BREAK / POSTER SESSION I	
17:30 – 18:15	Feng Wang UC Berkeley, USA	<i>Electron solids in two-dimensional semiconductor heterostructures</i>
18:15 – 18:35	Taner Esat Forschungszentrum Jülich, Germany	<i>A quantum sensor for atomic-scale electric and magnetic fields</i>

Tuesday 25th

09:00 – 09:45	Stuart Parkin MPI of Microstructure Physics, Germany	<i>2D van der Waals layers for spintronics</i>
09:45 – 10:30	Joaquín F. Rossier INL Braga, Portugal	<i>Probing entanglement and fractionalization with scanning probe microscopy</i>
10:30 – 11:15	COFFEE BREAK / POSTER SESSION I	
11:15 – 12:00	Roman Fasel EMPA, Switzerland	<i>Nanographene spin chains</i>
12:00 – 12:20	Beatriz Viña UAM, Spain	<i>Controlling magnetic interactions between $S=1/2$ spins at unusually large distances</i>
12:20 – 12:40	Felix Lüpke Peter Grünberg Institut, Germany	<i>Interplay of inelastic tunneling gap, magnetic states and Faraday screening in graphene/Fe_3GeTe_2 heterostructures</i>
12:40 – 13:00	Chenxiao Zhao EMPA, Switzerland	<i>Construction and manipulation of low-dimensional many-body Spin Systems based on nanographenes</i>
13:00 – 15:00	LUNCH	
15:00 – 15:45	Katharina Franke Freie U. Berlin, Germany	<i>Tuning one- and two-impurity Kondo systems by a moiré superstructure</i>
15:45 – 16:05	A. Rodríguez-Sota U.Hamburg, Germany	<i>SP-STM study of frustrated antiferromagnetic Mn islands on Ir(111) & coexistence with Mn trimer clusters</i>
16:05 – 16:25	Jeison Fischer U. Cologne, Germany	<i>Spin polarization of an Anderson impurity in MoS_2 mirror twin boundaries</i>
16:25 – 16:45	Lewis Powell U. Manchester, UK	<i>Magnetic-field induced phase transition in a centrosymmetric superconductor β-$PdBi_2$</i>
16:45 – 17:30	COFFEE BREAK / POSTER SESSION I	
17:30 – 18:15	Vincent Renard CEA – U. Grenoble Alpes, France	<i>Observation of Kekulé vortices around hydrogen adatoms in graphene</i>
18:15 – 18:35	Ellis Thompson U. Washington, USA	<i>Direct visualization of twisted molybdenum ditelluride with scanning tunneling microscopy-spectroscopy</i>

Wednesday 26th

09:00 – 09:45	Maia Vergniory DIPC, Spain	<i>Phonon-induced phase transitions in topological materials</i>
09:45 – 10:30	Haim Beidenkopf Weizmann Inst., Israel	<i>The Kagome ferromagnetic metal $Co_3Sn_2S_2$</i>
10:30 – 11:15	COFFEE BREAK / POSTER SESSION II	
11:15 – 12:00	Roser Valentí U. Frankfurt, Germany	<i>Modelling correlated electrons in two-dimensional van der Waals platforms</i>
12:00 – 12:20	Haojie Guo DIPC, Spain	<i>Decoupled superconducting states in $4H_b$-TaSSe</i>
12:20 – 12:40	Sandra Sajan DIPC, Spain	<i>Mapping superconductivity in the incoherent CDW mosaic phase of a transition metal dichalcogenide</i>
12:40 – 13:00	Nurit Avraham Weizmann Inst., Israel	<i>Correlated and topological states in the transition metal dichalcogenide $4H_b$-TaS₂</i>
13:00 – 15:00	LUNCH	
15:00 – 15:45	Nadine Hauptmann IMM, Netherlands	<i>Influence of the surface corrugation to the CDW contrast of $2H$-NbSe₂ in SPM images</i>
15:45 – 16:05	Fernando de Juan DIPC, Spain	<i>Domain wall networks from intertwined CDWs in monolayer TiSe₂</i>
16:05 – 16:25	Huiru Liu SLAB, China	<i>Manipulation of intrinsic polaron in two-dimensional transition-metal halides</i>
16:25 – 16:45	Bruno Schuler EMPA, Switzerland	<i>Layer-dependent charge transfer lifetimes and ultrafast THz-STM of Se vacancies in WSe₂</i>
16:45 – 17:30	COFFEE BREAK / POSTER SESSION II	
17:30 – 18:15	S. Refaely-Abramson Weizmann Inst. Israel	<i>Excited-state dynamics in materials: an ab initio approach</i>
18:15 – 18:35	Daniel Hernangómez CIC nanoGUNE, Spain	<i>A theoretical perspective of electronic and optical properties of TMDC-graphene interfaces</i>
20:30	CONFERENCE DINNER at “Txirrita Sagardotegia” (Calle San Bartolomé 32, Donostia-San Sebastián)	

Thursday 27th

09:00 – 09:45	Natxo Pascual CIC nanoGUNE, Spain	<i>Inducing magnetism and superconductivity in graphene</i>
09:45 – 10:30	R. Wiesendanger U. Hamburg, Germany	<i>Non-Trivial Topological and Strongly Correlated Electron States in Model-Type Low-Dimensional Magnet – SC Hybrid Systems</i>
10:30 – 11:15	COFFEE BREAK / POSTER SESSION II	
11:15 – 12:00	Peter Liljeroth Aalto U., Finland	<i>Visualizing symmetry breaking in vdW quantum materials</i>
12:00 – 12:20	Anuva Aishwarya Harvard U., USA	<i>Spectroscopic visualization of robust sign-changing s-wave superconductivity in monolayer Fe(Se,Te) on Bi₂Te₃</i>
12:20 – 12:40	Somesh Ganguli Aalto U., Finland	<i>Realization of heavy fermion phase diagram in van der Waals heterostructures</i>
12:40 – 13:00	Tatiana Webb Columbia U., USA	<i>Uncovering the mesoscale structure of quantum and topological phases with low temperature atomic force microscopy</i>
13:00 – 15:00	LUNCH	
15:00 – 15:45	Lin He Beijing Normal U., China	<i>Quantum confinement of Dirac fermions</i>
15:45 – 16:05	Aran Garcia-Lekue DIPC, Spain	<i>Addressing orbital confinement at edges and pores of carbon nanoarchitectures</i>
16:05 – 16:25	Carolyn Gold Columbia U., USA	<i>Engineering and imaging microscopic properties in graphene heterostructures</i>
16:25 – 16:45	Mads Brandbyge DTU, Denmark	<i>First principles investigations of tunnelling into and contact to graphene</i>
16:45 – 17:30	COFFEE BREAK / POSTER SESSION II	
17:30 – 17:50	Agustin Schiffrin Monash U., Australia	<i>Gate control of correlated-electron phases in a 2D metal-organic framework</i>
17:50 – 18:10	Jorge Lobo INMA, Spain	<i>2D-Ferromagnetism unveiled on an atom-thick & extended 2D-MOF</i>
18:10 – 18:30	Hongde Yu TU Dresden, Germany	<i>Metal-free magnetism in 2D polymers</i>

Friday 28th

09:00 – 09:45	Eva Andrei Rutgers U., USA	<i>Moiré x Moiré: self-alignment, topology and quasi-crystals</i>
09:45 – 10:30	Ali Yazdani Princeton U., USA	<i>Visualizing quantum matter in flat bands: from Wigner crystal to electron Kekulé lattices</i>
10:30 – 11:15	COFFEE BREAK / POSTER SESSION II	
11:15 – 12:00	Abhay Pasupathy Columbia U., USA	<i>Teaching an old dog some new tricks</i>
12:00 – 12:20	Haoyu Hu DIPC, Spain	<i>Spectroscopy of strongly correlated topological states: NbSe₂, Twisted Bilayer Graphene, and WSe₂</i>
12:20 – 12:40	Zhizhan Qiu National U. Singapore, Singapore	<i>Electron-hole crystals in a Mott insulator α-RuCl₃</i>
12:40 – 13:00	Wei Li Tsinghua U., China	<i>Stripe charge order and its interaction with Majorana bound states in 2M-WS₂ topological superconductor</i>

Poster List – Session I

Contributor	Title
Andrea Aguirre	<i>Ferromagnetic order in 2D layers of transition metal dichlorides</i>
Florian Albrecht	<i>Generation and Characterization of Cyclocarbons</i>
Mohammad Amini	<i>Atomic-scale visualization of multiferroicity in monolayer NiI₂</i>
Isaac Brotons	<i>Exploiting the AFM power for unveiling the chemical nature of 2D hybrid materials</i>
María Camarasa	<i>Non-empirical prediction of electronic and optical properties of van der Waals materials from a Wannier-localized optimally tuned screened range-separated hybrid functional</i>
Gonçalo Catarina	<i>Mechanical tuning of magnetic interactions in nanographenes</i>
Outhmane Chahib	<i>Probing charge redistribution at the interface of self-assembled cycloP5 pentamers on Ag(111)</i>
Iolanda Di Bernardo	<i>Origin of spatial modulations of the local density of states in WTe₂</i>
Xabier Diaz de Cerio	<i>Electronic transport in twisted nanoporous graphene/graphene bilayers</i>
João Henriques	<i>Designer spin models in tunable two-dimensional nanographene lattices</i>
Madisen Holbrook	<i>STM Characterization of Point Defects in Self-Flux TMDs</i>
Liwei Jing	<i>Strain-Induced Topological Edge States in Bilayer SnTe</i>
Abhishek Karn	<i>Spatially Extended Charge Density Wave Switching by Nanoscale Local Manipulation in a ML-VTe₂</i>
Houda Koussir	<i>Large-Area Epitaxial Mott Insulating 1T-TaSe₂ Monolayer on GaP(111)B</i>
Diego López Alcalá	<i>Exploring magnetic insulator proximity effect in 2D biphenylene network from first-principles calculations</i>
Christian Lotze	<i>Electronic and magnetic properties of single chalcogen vacancies in MoS₂/Au(111)</i>
Luisa Madail	<i>Exotic edge states of C₃ high-fold fermions in honeycomb lattices</i>
Matjaž Malok	<i>Effect of charge injection into single MoS₂ nanotube</i>
Hermann Osterhage	<i>Exploring the evolution of bottom-up engineered quantum states in high magnetic field</i>
Clara Rebanal	<i>Unveiling the inter-layer interaction in a 1H/1T-TaS₂ van der Waals heterostructure</i>
Ya-Ning Ren	<i>One-dimensional moiré chains with partially-filled flat bands in two-dimensional twisted bilayer WSe₂</i>

Lisa Rütten	<i>Wave-function engineering on superconducting substrates: Chiral Yu-Shiba-Rusinov molecules</i>
Morgan Thinel	<i>Atomlike Bound States in a 2D Metallic Continuum</i>
Ke Xiao	<i>Exciton-exciton Interaction in Monolayer MoSe₂ from Mutual Screening of Coulomb Binding</i>
Zhen Zhan	<i>Pseudo-magnetic field in graphene systems</i>
Mo-Han Zhang	<i>Tunable interfacial chemical adsorption of individual Se atoms on graphene with atomic-level precision in a graphene/WSe₂ heterostructure</i>
Ruo-Han Zhang	<i>In situ generation and manipulation of mirror twin boundaries in transition metal dichalcogenides</i>
María Alfonso Moro	<i>Magnetic-like frustration within C₆₀ molecular assemblies</i>
Xiao-Feng Zhou	<i>Relativistic artificial molecules with tunable coupling and orbitals</i>

Poster List – Session II

Contributor	Title
Paula Angulo	<i>Assisted on-surface synthesis of porous graphene nanoribbons on vicinal surfaces</i>
Emma Berger	<i>Magneto-transport and STM of gate-tunable spin impurities on monolayer graphene devices</i>
Roberto Carrasco	<i>Building graphene-superconductor hybrids: Insights into Pb nano-island manipulation</i>
Adrian Ceferino	<i>Semiclassical description of topological and non-topological states in electrostatically gapped AB/BA bilayer graphene domain walls</i>
Diego Expósito	<i>First results from the new Transport-LT/UHV-STM/AFM: From macro to nano in 5 minutes</i>
Héctor González-Herrero	<i>Topological Quantum Phase Transition in π-Conjugated Polymers Driven by Their Length</i>
Yixuan Han	<i>Moiré flat band in twisted double bilayer NbSe₂</i>
Kevin Hauser	<i>Low-cost multi-frequency lock-in amplifier to speed up scanning tunneling spectroscopy</i>
Zhiwei Huang	<i>The construction of a millikelvin STM system for 2D material research</i>
Daniel Jansen	<i>Tip-induced creation and Jahn-Teller distortions of sulfur vacancies in single-layer MoS₂</i>
Keda Jin	<i>Engineering quantum dot nanoarrays in van der Waals heterostructures</i>
Antti Karjasilta	<i>Effect of Ferroelectric Domains on Coulomb gap in SnTe-CrBr₂ bilayer</i>
Felix Küster	<i>Two-dimensional Shiba lattices as a possible platform for crystalline topological superconductivity</i>
Yi-Wen Liu	<i>Visualizing orbital angular momentum induced single wavefront dislocation in graphene</i>
María N. Gastiasoro	<i>Discommensuration arrays from coupled CDWs in TiSe₂</i>
Benjamin November	<i>Real-Space Imaging of 2-D Surface Acoustic Wave Metamaterials in Lithium Niobate</i>
Jon Ortuzar	<i>Effects of Coulomb blockade on Josephson phenomena</i>
Seunghyun (Elizabeth) Park	<i>Current Induced Hidden States in Josephson Junctions</i>
Ishita Pushkarna	<i>Investigating electronic behavior of monolayer molybdenum disulfide on Au(111) through twist angle modulation</i>
Lucía Romero	<i>Development of a UHV system to atomically characterize and clean 2D devices</i>

Francisco Romero-Lara	<i>Design of 2D Rare Earth – Au substrates for Spin Studies on Magnetic Nanographenes</i>
Irián Sánchez	<i>Systematic ab-initio study of transfer in T/H heterostructures of transition metal dichalcogenides</i>
Cenyao Tang	<i>Visualizing the electronic structure of atomically thin FeSe crystals</i>
Stefano Trivini	<i>Coulomb blockade effects on the excitation spectrum of small Pb islands</i>
Kaycee Underwood	<i>Polymorph control of monolayer NbSe₂ grown via MBE</i>
Katerina Vaxevani	<i>On-surface synthesis of nanographenes on proximitized superconducting substrates</i>
Yu Wang	<i>Orientation-selective spin-polarized edge states in monolayer NiI₂</i>
Tobias Wichmann	<i>One-dimensional topological superconductivity in a van der Waals heterostructure</i>
Hyungryul Yang	<i>Spectroscopic evidence for surface reconstruction in bulk 1T-TaS₂</i>
María Alfonso Moro	<i>Magnetic Interactions of Dy Adatoms and Clusters on HOPG</i>
Aistis Grigas	<i>Self-assembled magnetic islands vertically stacked by successive capping with a 2D material</i>

Venues

Conference

The workshop will take place in the **Miramar Palace** located in La Concha Bay in the city of San Sebastian.

Address: Paseo de Miraconcha, 48; Donostia-San Sebastián, Guipúzcoa

Phone: +34 943 21 90 22

Web: <http://palaciomiramar.eus/>

Lunch

The lunch will take place in the **Barceló Costa Vasca Hotel** at 7-10 minutes walk from the Conference venue.

Address: Avenida Pio Baroja, 15. Donostia-San Sebastián, Guipúzcoa.

Phone: +34 943 31 79 50

https://www.barcelo.com/en-us/barcelo-hotels/hotels/spain/san-sebastian/barcelo-costa-vasca/

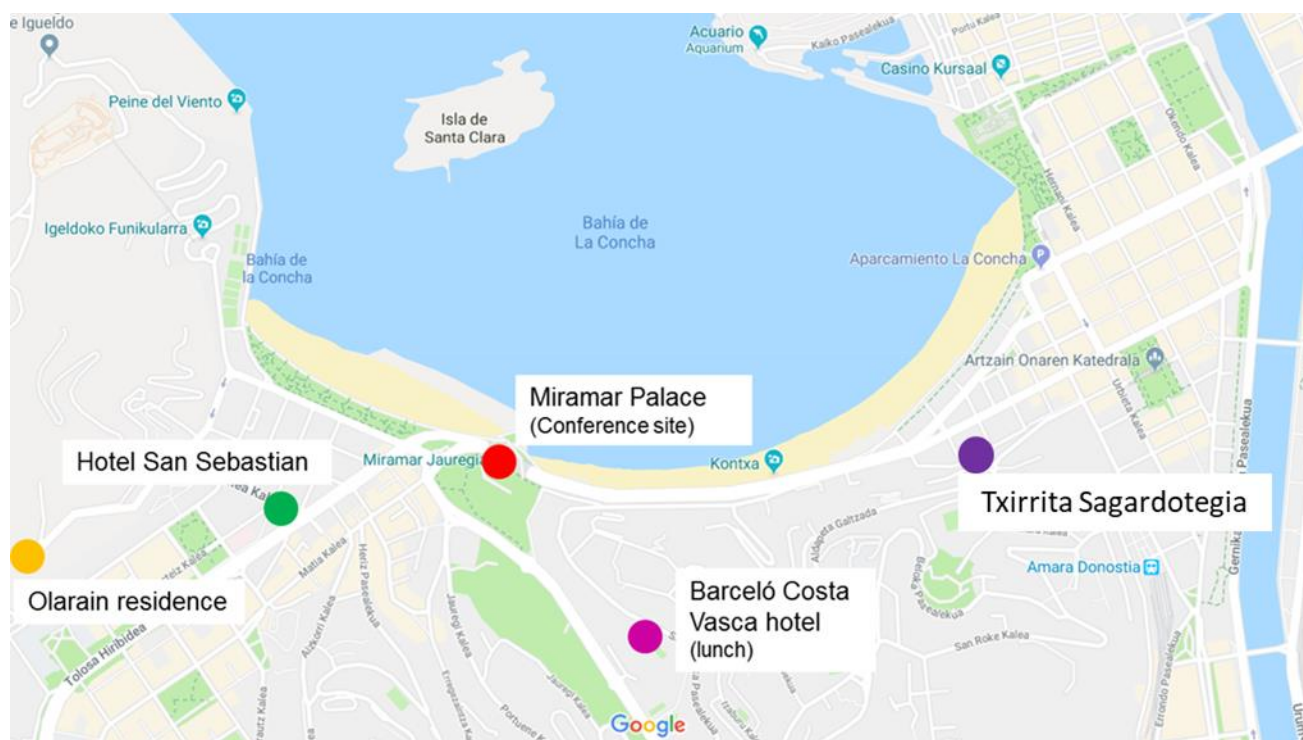
Conference dinner

The Conference dinner will take place at **Txirrita Sagardotegia**.

Address: Calle San Bartolomé 32, Donostia-San Sebastián

Phone: +34 943 467 638

Web: <https://txirritasagardotegia.com/>



How to get to the **2DSPM conference** (follow “Summer Courses” indicators)

Access from Matia street (from **A** to **C**)



How to get to the **lunch place** (Barceló Costa Vasca hotel)

The total route (7-10 mins)



Take the east exit from the palace



Scientific program at a glance

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:45 - 9:00	Welcome				
9:00 - 9:45	Joseph Stroschio	Stuart Parkin	Maia Vergniory	Natxo Pascual	Eva Andrei
9:45 - 10:30	Paco Guinea	Joaquín F. Rossier	Haim Beidenkopf	R. Wiesendanger	Ali Yazdani
10:30 - 11:15	COFFE BREAK / POSTER SESSION I		COFFE BREAK / POSTER SESSION II		
11:15 - 12:00	Stevan Nadj-Perge	Roman Fasel	Roser Valentí	Peter Liljeroth	Feng Wang
12:00 - 12:20	Pierre Pantaleon	Beatriz Viña	Haojie Guo	Anuva Aishwarya	Haoyu Hu
12:20 - 12:40	Chen-Yue Hao	Felix Lupke	Sandra Sajan	Somesh Ganguli	Zhizhan Qiu
12:40 - 13:00	Gautam Rai	Chenxiao Zhao	Nurit Avraham	Tatiana Webb	Wei Li
Lunch	Lunch				
15:00 - 15:45	Shahal Ilani	Katharina Franke	Nadine Hauptmann	Lin He	
15:45 - 16:05	Shiyong Wang	A. Rodríguez-Sota	Fernando de Juan	Aran Garcia-Lekue	
16:05 - 16:25	Árpad Pásztor	Jeison Fischer	Huiru Liu	Carolin Gold	
16:25 - 16:45	Florie Mesple	Lewis Powell	Bruno Schuler	Mads Brandbyge	
16:45 - 17:30	COFFE BREAK / POSTER SESSION I		COFFE BREAK / POSTER SESSION II		
17:30 - 18:15	Abhay Pasupathy	Vincent Renard	S. Refaely-Abramson	Agustin Schiffrin <i>(17:30 - 17:50)</i>	
18:15 - 18:35	Taner Esat	Ellis Thompson	Daniel Hernangómez	Jorge Lobo <i>(17:50 - 18:10)</i>	
				Hongde Yu <i>(18:10 - 18:30)</i>	
20:30			CONFERENCE DINNER		

My notes

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