

Quantum Phenomena in Multilayers and Heterostructures (QPMH)

*Registration at Miramar Palace on Monday from 8:20 am

Date	02/09/2024	03/09/2024	04/09/2024	05/09/2024	06/09/2024
Time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:50 - 9:00	Welcome*				
9:00 - 9:35	Xiaodong Xu	Miguel Ugeda	Santiago Grigera	Silke Paschen	
9:35 - 10:10	Long Ju	Louk Rademaker	Andrey Chubukov	María José Calderón	Maia G. Vergniory
10:10 - 10:50	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
10:50 - 11:25	Zhi-Xun Shen	Laura Classen	Monica Allen	Roser Valentí	Anand Bhattacharya
11:25 - 12:00	Anna Seiler	Maria Gastiasoro	Carmen Rubio-Verdú	Rebeca Ribeiro	Kaveh Ahadi
12:00 - 12:40	Lucile Savary	Ziyang Wang	Ilaria Maccari	Simone Fratini	Giulia Venditti
		Shantanu Mukherjee	Vadim Geschkenbein	Sergi Batlle Porro	Gyanendra Singh
12:45 - 14:45	Lunch @ Costa Vasca	Lunch @ Costa Vasca	Lunch @ Costa Vasca	Lunch @ Costa Vasca	End of workshop
15:00 - 15:35	Ali Yazdani	Leon Balents	Free afternoon	Raquel Queiroz	
15:35 - 15:55	Christophe Mora	Ignacio Gutierrez Lezama		Giulia Pacchioni (Q&A Nature)	
15:55 - 16:35	Coffee Break			Coffee Break	
16:35 - 17:10	Sahal Ilani	Posters & Coffee		Paula Mellado	
17:10 - 17:30					
20:00 - 23:00				CONFERENCE DINNER**	** Conference dinner at Txirrita Sagardotegia (San Bartolome 32)

Long talks: 35 min (30+5). Short talks 20 min (15+5).

Monday, September 2

08:20 - 08:50 Registration

08:50 - 09:00 Opening of the workshop

Chair: Ali Yazdani

09:00 - 09:35 **Xiaodong Xu**

Fractional Quantum Anomalous Hall Effect

09:35 - 10:10 **Long Ju**

Emergent Quantum Phenomena in Rhombohedral Graphene

10:10 - 10:50 Coffee Break

Chair: Long Ju

10:50 - 11:25 **Zhi-Xu Shen**

Local probe of bulk and edge states in a fractional Chern insulator

11:25 - 12:00 **Anna Seiler**

Cascade of correlated phases in the vicinity of tunable van Hove singularities in Bernal bilayer graphene

12:00 - 12:35 **Lucile Savary**

Formulas for the anomalous Hall effect in itinerant magnets

12:45 - 14:45 Lunch at Costa Vasca

Chair: Anna Seiler

15:00 - 15:35 **Ali Yazdani**

Visualizing quantum phenomena in multilayers and heterostructures

15:35 - 15:55 **Christophe Mora**

Hofstadter spectrum and Chern bands in twisted transition metal dichalcogenides

15:55 - 16:35 Coffee Break

16:35 - 17:10 **Shahal Ilani**

News from the Quantum Twisting Microscope

Tuesday, September 3

Chair: Leni Bascones

09:00 - 09:35 **Miguel Ugeda**

Superconductivity in 1T layered dichalcogenides

09:35 - 10:10 **Louk Rademaker**

Moiré is Different: Unconventional phases in TMD bilayers

10:10 - 10:50 Coffee Break

Chair: Lucile Savary

10:50 - 11:25 **Laura Classen**

Unconventional charge density waves from multiple flavors

11: 25 - 12:00 **Maria Gastiasoro**

Domain wall networks from intertwined CDWs in monolayer TiSe_2

12:00 - 12:20 **Ziying Wang**

Doublon-like Excitations in a Twisted Mott Charge-Density-Wave System

12:20 - 12:40 **Shantanu Mukherjee**

Nature of bulk and edge state properties of monolayer $1\text{T}'\text{-WTe}_2$

12:45 - 14:45 Lunch at Costa Vasca

Chair: Louk Rademaker

15:00 - 15:35 **Leon Balents**

An exciton Mott transition

15:35 - 15:55 **Ignacio Gutierrez Lezama**

Quenching the band gap of two-dimensional semiconductors with a perpendicular electric field

15:55 - 17:30 Posters and Coffee

Wednesday, September 4

Chair: Paula Mellado

09:00 - 09:35 **Santiago Grigera**

Topological transitions and hidden order in a frustrated spin system

09:35 - 10:10 **Andrey Chubukov**

Unconventional discontinuous transitions in iso-spin systems

10:10 - 10:50 Coffee Break

Chair: Miguel Ugeda

10:50 - 11:25. **Monica Allen**

In-situ twisting and imaging of moiré superlattices

11:25 - 12:00 **Carmen Rubio-Verdú**

Flat bands in twisted 2D materials

12:00 - 12:20 **Ilaria Maccari**

Possible emergence of fermion quadrupling condensates in twisted bilayer Graphene

12:20 - 12:40 **Vadim Geshkenbein**

Superconductivity in atomically thin films: diodes and 2D critical state model

12:45 - 14:45 Lunch at Costa Vasca

[Thursday, September 5](#)

Chair: Maria Gastiasoro

09:00 - 09:35 **Silke Paschen**

Towards heavy fermion structures and devices.

09:35 - 10:10 **María José Calderón**

The unconventional normal state in twisted bilayer graphene

10:10 - 10:50 Coffee-Break

Chair: Monica Allen

10:50 - 11:25 **Roser Valentí**

Dynamical correlations and order in twisted bilayer graphene

11:25 - 12:00 **Rebeca Ribeiro**

Moiré effects in bilayer graphene

12:00 - 12:20 **Simone Fratini**

Planckian transport in the t-J model and application to Magic-angle bilayer Graphene

12:20 - 12:40 **Sergi Batlle Porro**

Unraveling Moiré Heavy Fermion Thermopower by Cryogenic Photovoltage Nanoscopy

12:45 - 14:45 Lunch at Costa Vasca

Chair: Rebeca Ribeiro

15:00 - 15:35 **Raquel Queiroz**

Protected flatness in moiré flat bands

15:35 - 15:55 Q & A with **Giulia Pacchioni**, Chief Editor, Nature Reviews Materials

15:55 - 16:35 Coffee Break

16:35 - 17:10 **Paula Mellado**

Quantum fluctuations in NiPS₃

20:00 Conference Dinner at Txirrita Sagardotegia (San Bartolome Kalea 32, 20007 Donostia-San Sebastian)

Friday, September 6

Chair: Shantanu Mukherjee

09:35 - 10:10 **Maia G. Vergniory**

New electronic properties with a shake

10:10 - 10:50 Coffee Break

10:50 - 11:25 **Anand Bhattacharya**

Superconductivity at interfaces of KTaO_3

11:25 - 12:00 **Kaveh Ahadi**

Robust and anisotropic superconductivity at oxide interfaces

12:00 - 12:20 **Giulia Venditti**

Rashba coupling to polar modes in superconducting KTaO_3

12:20 - 12:40 **Gyanendra Singh**

Signature of unconventional superconductivity in 2D oxide interfaces

12:40 - 12:50 Conclusions and end of the workshop

POSTER LIST

Manex Alkorta. Analysis of the competition between the possible emerging Charge-Density-Wave phases of CsV_3Sb_5 .

Francisco Manuel Ballester Maciá. Phonon Topology in 3D materials.

Dandan Guan. Tunable topological edge states in black phosphorus-like Bi thin films

Haojie Guo. Atomic scale characterization of edge states in the correlated Mott insulator NiS_2

Aprem P Joy. Gauge Field Dynamics in a Multilayer Kitaev Spin Liquid.

Roman Kuzian. Non-tunneling Hartman effect and negative transit time in electron transmission through graphene multilayers.

Yunhao Lu. Two-dimensional elemental ferroelectricity.

Johannes Motruk. Optical detection of a chiral spin liquid in transition metal dichalcogenide moiré bilayers.

Dario Rossi. Chiral spin liquids and non-collinear spin textures in moiré magnets.

Irián Sánchez-Ramírez. Ab-initio systematic study of charge transfer in T/H heterostructures of transition metal dichalcogenides.

Junseok Seo. On-chip terahertz spectroscopy for dual-gated van der Waals heterostructures.