



# Quantum Designer Physics (QDP2024)



**15.Juil - 19.Juil 2024**

**Cod. Z15-24**

**Modalité:**

En personne

**Édition**

2024

**Type d'activité**

Workshop

**Date**

15.Juil - 19.Juil 2024

**Location**

Miramar Palace

**Langues**

Anglais

**Reconnaissance officielle par l'État**

50 heures

**Comité d'organisation**



## Description

The workshop will highlight recent advances in material systems designed for studying the most intriguing physical phenomena at the nanoscale. These phenomena are related to spin, topology, and coherence, which make it possible for the materials to display quantum functionalities. While Condensed Matter Physics is rich in material systems in which almost any physics can be readily found and studied, with recent developments of quantum materials, it appears possible to purposefully design material systems with a given physical phenomenon in mind. Thus, a 'toy model' which could be conceived to exhibit an interesting behavior can be implemented in quantum materials and used for basic research or applications.

This workshop brings together the leading experts working on quantum materials and aims at creating a stimulating atmosphere for discussing new physics on the marvelous sites of San Sebastian. We will discuss recent progress in creating ordinary and topological quantum systems in different dimensions, as well as some of the most exotic quantum materials based on graphene and other low dimensional materials. We will update on the progress in spin-based quantum computing with an outlook into the prominent future of quantum technologies. The quest for topologically non-trivial states in hybrid superconducting systems as well as topological quantum computing are also on our agenda. We hope the workshop will foster collaborations and inspire its attendants to tackle new problems with great ideas which make a difference for fundamental physics, lead to applications, and advance quantum technologies.

### ORGANIZING COMMITTEE:

Daniel Loss (University of Basel)

Francisco Guinea (IMDEA Nanoscience, DIPC, Ikerbasque)

Vitaly Golovach (CFM-UPV/EHU, DIPC, Ikerbasque)

### Objectifs

To bring together leading experts working on the frontiers of the design of advanced materials with quantum functionalities.

To present and discuss the recent developments in the field and determine directions of future research.

To facilitate the discussion and foster collaborations between theoretical and experimental physicists, including local scientists from Donostia.

To create the conditions for young and brilliant scientists to present their work and make themselves visible in this rapidly developing field.

### Collaborateurs spécifiques au cours



HEZKUNTZA SAILA  
DEPARTAMENTO DE EDUCACIÓN

**Directed by**



**Vitaly Golovach ---**

Materialen Fisika Zentroa CFM-UPV/EHU and Donostia International Physics Center

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## Professeurs



**Shaffique Adam**

National University of Singapore

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**Yoichi Ando**

University of Cologne

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**Christian Back Back**

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**Sebastian Bergeret**

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**Andrei Bernevig**

---



**Stefano Bosco Bosco**

QuTech

---



**Sara Catalano**

Material Physics Centre

---



**Silvano De Franceschi**

CEA

---



**Olesia Dmytruk**

CNRS, Institut Polytechnique de Paris

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**Jérôme Faist**

ETH Zurich

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**Leonid Glazman Glazman**

Yale University

---



**Shahal Ilani**

Weizmann Institute

---



**Jelena Klinovaja**

University of Basel

---



**Roza Kotlyar**

Stardust Materials

---



**Leo Kouwenhoven**

---



**Henry Legg**

Uni Basel

---



**Liang Fu Liang Fu**

Massachussetts Institute of Technology

---



**Roman Lutchyn**

Microsoft

---



**Allan MacDonald**

University of Texas at Austin

---



**Vladimir Manucharyan**

EPFL

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**Pierre Anthony Pantaleon Peralta**

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**Stuart Parkin**

MPI of Microstructure Physics

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**Jane Park**

Massachusetts Institute of Technology

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**José Ignacio Pascual**

CIC nanoGUNE

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Nacho Pascual obtained a PhD in Physical Sciences in 1998 from the Universidad Autónoma de Madrid, Department of Condensed Matter Physics. His studies about quantum electronic transport through atoms and molecules using scanning tunnelling microscopy contributed to the settlement of a new research field in nanoelectronics. In 1999, he moved to Berlin, to the Fritz-Haber Institute der Max-Planck Gessellschaft, hosting there a Marie Curie Fellowship to investigate the rules behind single-molecule vibrational spectroscopy, a newly developed method to characterize chemically absorbates with STM. After a short stay in Barcelona, at the Institut de Ciencia de Materiales (ICMAB-CSIC), hosting a Ramon y Cajal Fellowship, he moved back to Berlin, now to the Freie Universität, first (2004)

as a Junior Professor and posteriorly (2008) as full Professor. There, he expanded his research in the field of Molecular Physics at Surfaces, dealing with various molecular-scale phenomena, from molecular switching behaviour and charge transfer processes, to magnetism and superconductivity. In 2012, he joined nanoGUNE as Ikerbasque Research Professor and Group Leader of the Nanoimaging group.  
<https://www.nanogune.eu/en/nanogune/people/n>



**Elsa Prada Núñez**

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**Patrik Recher**

TU Braunschweig

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**PASCAL SIMON SIMON**

University Paris Saclay

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**Andrew Sterne**

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**Dominik Zumbuehl**

University of Basel

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# Tarifs inscription

REGISTRATION FEES	JUSQU'AU 08-07-2024
Fee Waiver	0 EUR
Regular Attendant	450,00 EUR

## **Lieu**

### **Miramar Palace**

Pº de Miraconcha nº 48. Donostia / San Sebastián

Gipuzkoa