

DFM

*Design of functional materials
for advanced electronic and
photonic properties*



PROGRAMME

WINTER WORKSHOP

Bormio (IT), December 08-13, 2024

Welcome!

It is with great pleasure that we announce the first edition of the Winter Workshop on Design of Functional Materials for Advanced Electronic and Photonic Properties - DFM 2024, to be held in Bormio (SO), Italy, from December 9th to December 13th 2024.

The program will be composed by a combination of invited and contributed talks, given by both established and early-career scientists.

The idea is to create a connection between simulations and experiments in the field of advanced functional materials for electronic and photonic applications, within a stimulating and friendly atmosphere with plenty of opportunities for networking activities.

We look forward to seeing you in Bormio!

The Organizing Committee

Invited Speakers

Simona Binetti (University of Milano Bicocca, IT)
Filippo De Angelis (University of Perugia, IT)
Ahmed Dorrah (Eindhoven University of Technology, NL)
Lorenzo Malavasi (University of Pavia, IT)
Olga Smirnova (Technical University of Berlin, DE)
Cesare Soci (Nanyang Technological University, SG)
Caterina Vozzi (CNR, IT)

Scientific Committee

Antonio Ambrosio (IIT, IT)
Annamaria Petrozza (IIT, IT)

Organizing Committee

Beatrice Bizzarri (University of Perugia, IT)
Giulia Marra (CNR-SCITEC, IT)
Silvia Matti (IIT, IT)
Annalisa Letizia Nava (IIT, IT)
Chiara Raviola (IIT, IT)

Winter Workshop on Design of Functional Materials for Advanced Electronic and Photonic Properties

From December 9th to December 13th 2024

Day 1 - Sunday, December 8th, 2024

17:00 – 19:00	Welcome and Registration (Hotel Palace Bormio)
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Day 2 - Monday, December 9th, 2024

08:30 – 09:00	WELCOME
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Invited Lecture

09:15 - 10:00

Filippo De Angelis

Controlling Electronic Properties of Metal-Halide Perovskites: Defects, Doping and Surface Passivation

University of Perugia, IT

Contributed Talks - Morning Session

10:00 - 10:15

Isabella Poli

Perovskites and Derivatives for Optoelectronics

Istituto Italiano di Tecnologia, Italy

10:15 - 10:30

Federico Brivio

Introducing ML Methods in the Dear Old DFT

Università degli Studi di Padova, Italy

10:30 - 15:15

TEAM BUILDING

Contributed Talks - Afternoon Session

15:15 - 15:30

Gustavo Vasconcelos

Co-Designing Lenses and AI Models: a Comprehensive Review of Deep Optics for Task-Specific Applications

Istituto Italiano di Tecnologia, IT

15:30 - 15:45**Lin Nan***Precision Fabrication with Van Der Waals Materials – an Overview*

Istituto Italiano di Tecnologia, IT

15:45 - 16:00**Lorenzo Miele***Polymer Assisted Tin-Based Perovskite Solar Cell Formation*

University of Naples Federico II, IT

16:00 - 16:15**Antonella Treglia***The Impact of Shallow and Deep Defects on Carrier Dynamics in Tin-Iodide Perovskites*

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

16:15 – 16:30**Heyong Wang***Self-Encapsulated Tin-Halide Perovskite Thin Films for Efficient and Stable Near-Infrared Light-Emitting Diodes*

Istituto Italiano di Tecnologia, IT

16:30 – 16:45**Junhyoung Park***Optoelectronic Engineering of Formamidinium Lead Trihalide Perovskite Using Precursor Chemistry*

Istituto Italiano di Tecnologia, IT

16:45 - 17:15**COFFEE BREAK**

17:15 - 17:30**Tommaso Losi***High-Mobility, Flexible and Low Voltage Solution Processed OFETs for High-Speed Electronics*

Istituto Italiano di Tecnologia, IT

17:30 – 17:45**Martino Cambiaggio***Fully Printed Flexible OFETs via Ink-Jet Printing of Electrodes and a High Mobility Organic Semiconducting Blend*

Politecnico di Milano & Istituto Italiano di Tecnologia, IT

17:45 – 18:00**Elda Sala***Exploration on the Charge Transport Properties of Cumulenic sp-Carbon Wires*

Politecnico di Milano, IT

18:00 – 18:15

Pierluigi Mondelli*Towards Edible Gas Sensors to Reduce Food Waste*

Istituto Italiano di Tecnologia, IT

18:15 – 18:30

Andrea Pianetti*Materials-Driven Strategies to Engineer Bacterial Motile Behaviour: Using Light to Understand and Control Dynamic Membrane Potential Modulation*

Istituto Italiano di Tecnologia, IT

18:30 – 19:30	FREE TIME
19:30 – 20:30	DINNER
20:30	POSTER SESSION

Day 3 - Tuesday, December 10th, 2024

Invited Lectures

08:30 – 09:15

Lorenzo Malavasi*Metal Halide Perovskites (& Derivatives): the Playground for Materials Chemistry*

University of Pavia, IT

09:15 – 10:00

Ahmed Dorrah*Spatiotemporal Light Manipulation with Flat Optics: Challenges & Opportunities*

Eindhoven University of Technology, NL

Contributed Talks – Morning Session

10:00 – 10:15

Michael Almeida de Oliveira*Ultrafast Dynamics of Space-Time Structured Light*

Istituto Italiano di Tecnologia, IT

10:15 – 10:30

Daniele Cortecchia*Solid State NMR Spectroscopy of Low-Dimensional Perovskites*

University of Bologna, IT

10:30 – 15:15

TEAM BUILDING

Contributed Talks - Afternoon Session

15:15 – 15:30

Mario Caironi

Activities on Sustainable Electronics in the Printed and Molecular Electronics Group of IIT

University of Roma Sapienza, Italy

15:30 – 15:45

Yarong He

Amplified Spontaneous Emission Properties of Metal Cation Two Dimensional Perovskites

Istituto Italiano di Tecnologia, IT

15:45 – 16:00

Clarissa Coccia

Engineering Bonding Network in Chiral Metal Halides Through Ligand Design

University of Pavia, IT

16:00 – 16:15

Andrea Olivati

Tracking Charge Dynamics in the Light-Driven Oxidation of Benzyl Alcohol Over a Silver Single-Atom Catalyst

Istituto Italiano di Tecnologia, IT

16:15 – 16:30

Maria Rosa Antognazza

Cell Mechanotransduction Driven by Bio-Organic Optoelectronic Devices

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

16:30 – 16:45

Arsalan Ul Haq

Can Organic Semiconductors Enable Touchless Control of Cell Mechanotransduction?

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

16:45 – 17:15

COFFEE BREAK

17:15 – 17:30

Stefano Chiodini

Investigating Twisted HBN Moiré Superlattices by AFM

Istituto Italiano di Tecnologia, IT

17:30 – 17:45**Andrea Mancini***Extending Nanoscale Spectroscopy with Photo Induced Force Microscopy to the Visible Range*

Istituto Italiano di Tecnologia, IT

17:45 - 18:00**Elena Mancinelli***Aerosol Jet Printed Conductive Polymer Patterns for Endothelial Cell Alignment Inside a Microfluidic Chamber*

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

18:00 - 18:15**Alessandro Luzio***Copper Phthalocyanine Based Electrochemical Transistors for Future Edible Electronics*

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

18:15 - 18:30**Valerio Galli***Edible Rechargeable Batteries*

Politecnico di Milano & Istituto Italiano di Tecnologia, IT

18:30 - 19:30	FREE TIME
19:30 - 20:30	DINNER
20:30	POSTER SESSION

Day 4 - Wednesday, December 11th, 2024**Invited Lectures****08:30 – 09:15****Olga Smirnova***Ultrafast Molecular Chirality: a Topological Connection*

Technical University of Berlin, DE

09:15 – 10:00**Simona Binetti***Advances and Perspectives in Kesterite Solar Cells*

University of Milano Bicocca, IT

Contributed Talks - Morning Session

10:00 – 10:15

Luca Gregori

Quantifying the Effect of Interfacial Dipoles on the Energy Level Alignment of Metal-Halide Perovskites

University of Perugia, IT

10:15 - 15:15

TEAM BUILDING

Contributed Talks - Afternoon Session

15:15 – 15:30

Ludovico Aloisio

Conductive Thiophene-Based Fibers Assembled by Living Cells as Novel Bioelectronic Materials

Politecnico di Milano, IT

15:30 – 15:45

Xenofon Karagiorgis

Fully Degradable, Transparent, and Flexible Photodetectors Using ZnO Nanowires and Pedot:PSS:Ag Nanowires-Based Nanofibers

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

15:45 – 16:00

Adrica Kyndiah

Beyond Patch Clamp: Printed Organic Transistors for Intracellular Action Potential Monitoring

Istituto Italiano di Tecnologia, IT

16:00 – 16:15

Cristiano Bortolotti

Detection of Chloride in Sweat with Extended-Gated Organic Electrochemical Transistors

Politecnico di Milano, IT

16:15 - 16:30

Valerio F. Annese

Towards Edible Technology for Gastrointestinal Tract Monitoring at the Point-of-Care

Istituto Italiano di Tecnologia, IT

16:30 - 16:45

Martina Zanolini

Wide Bandgap Perovskite for Tandem Solar Cells Application

Istituto Italiano di Tecnologia, IT

16:45 - 17:15	COFFEE BREAK
17:15 – 17:30	<u>Nicola Melchioni</u> <i>Spectral Manipulation of Quantum Emitters in Hexagonal Boron Nitride</i> Istituto Italiano di Tecnologia, IT
17:30 - 17:45	<u>Giacomo Venturi</u> <i>Natural Hyperbolic Polaritons at Visible Frequencies</i> Istituto Italiano di Tecnologia, IT
17:45 - 18:00	<u>Alberto Scaccabarozzi</u> <i>From Organic Semiconductors Engineering to Edible Electronics and Beyond</i> Politecnico di Milano, IT
18:00 - 18:15	<u>Elena Feltri</u> <i>Edible Semiconductors for Edible Electronics</i> Istituto Italiano di Tecnologia, IT
18:15 - 18:30	<u>Giulia Coco</u> <i>Monolithic Integrated Food-Based Logic Circuits for Future Edible Systems</i> Istituto Italiano di Tecnologia, IT
18:30 – 19:30	FREE TIME
19:30 – 20:30	DINNER
20:30	POSTER SESSION

Day 5 - Thursday, December 12th, 2024

Invited Lecture

08:30 – 09:15

Caterina Vozzi*Development of Table-Top Ultrafast Soft-X Spectroscopy for Material Science*

Consiglio Nazionale delle Ricerche, IT

Contributed Talks - Morning Session

09:15 - 09:30

E Laine Wong*Understanding the Photoemission Spectra of Lead Halide Perovskites*

Istituto Italiano di Tecnologia, IT

09:30 – 09:45

Dong-Ho Kang*Local Structure Analysis on Defect Passivated Halide Perovskite Photovoltaic Materials and Devices*

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

09:45 – 10:00

Davide Regaldo*Unveiling Photoluminescence Quenching Mysteries*

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

10:00 – 10:15

Gabriele Tullii*Optical Control of Cell Activity Mediated by Composite Opto-Nanotransducers*

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

10:15 - 10:30

Shubham Tanwar*Designing Miniaturised Implantable Electronic Biosensor for Cardiac Health Monitoring*

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

10:30 - 15:15

TEAM BUILDING

Contributed Talks - Afternoon Session

15:15 - 15:30

Cosimo D'Andrea*Multispectral Fluorescence Lifetime Imaging Microscope Based on Computational Imaging Techniques*

Politecnico di Milano, IT

15:30 – 15:45

Giuseppe Maria Paternò

Phototaming of Bacterial Bioelectricity

Politecnico di Milano, IT

15:45 – 16:00

Isabel Pinto Goncalves

All-Printed Planar Photoconductors for X-Ray Detection

Istituto Italiano di Tecnologia, IT

16:00 – 16:15

Luigino Criante

Laser Assisted Micromachining

Istituto Italiano di Tecnologia, IT

16:15 - 16:30

Hui Li

Interface Optimization for Efficient and Stable Perovskite Solar Cells

Istituto Italiano di Tecnologia, IT

16:30 - 16:45

Vito Vurro

Amphiphilic Molecular Phototransducer Enables Control of Skeletal Muscles Cells and Tissues Contraction

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

16:45 - 17:15

COFFEE BREAK

17:15 - 17:30

Camilla Marzuoli

Optical Control of Intracellular Redox Balance in Cardiovascular Cells by Conjugated Semiconducting Polymers

Istituto Italiano di Tecnologia, IT

17:30 - 17:45

Tommaso Moretti

2D or not 2D? That is the Question

University of Perugia, IT

17:45 - 18:00

Fabio Marangi

Azobenzene-Substituted Polymer Nanoparticles for Living Cells Stimulation

Istituto Italiano di Tecnologia, IT

18:00 - 18:15

Pietro Bertolotti*Membrane Potential Modulation in Bacteria Via Push-Pull Azobenzene*

Politecnico di Milano, IT

18:15 - 18:30

Chiara Florindi*Unveiling the Biophysical Mechanism of Cardiomyocyte Excitation-
Contraction Coupling Modulation by a Membrane-Targeted Photoswitch*

University of Milano-Bicocca, IT

18:30 – 19:30	FREE TIME
19:30 – 20:30	DINNER
20:30	POSTER SESSION

Day 6 - Friday, December 13th, 2024

Invited Lecture

09:00 - 09:45

Cesare Soci*Nanophotonic Strategies for Superconducting Single Photon Detectors*

Nanyang Technological University, SGP

Contributed Talks - Morning Session

09:45 - 10:00

Chunsheng Wu*Stimulated Emission of Perovskite with Hyperspectral Imaging
Spectroscopy*

Center for Nano Science and Technology, Istituto Italiano di Tecnologia, IT

10:00 - 10:15

Noemi Contreras Pereda*Assembly of Edible Electronic Devices and Smart Food Monitoring
Labels Via a Corn-Based Conductive Glue*

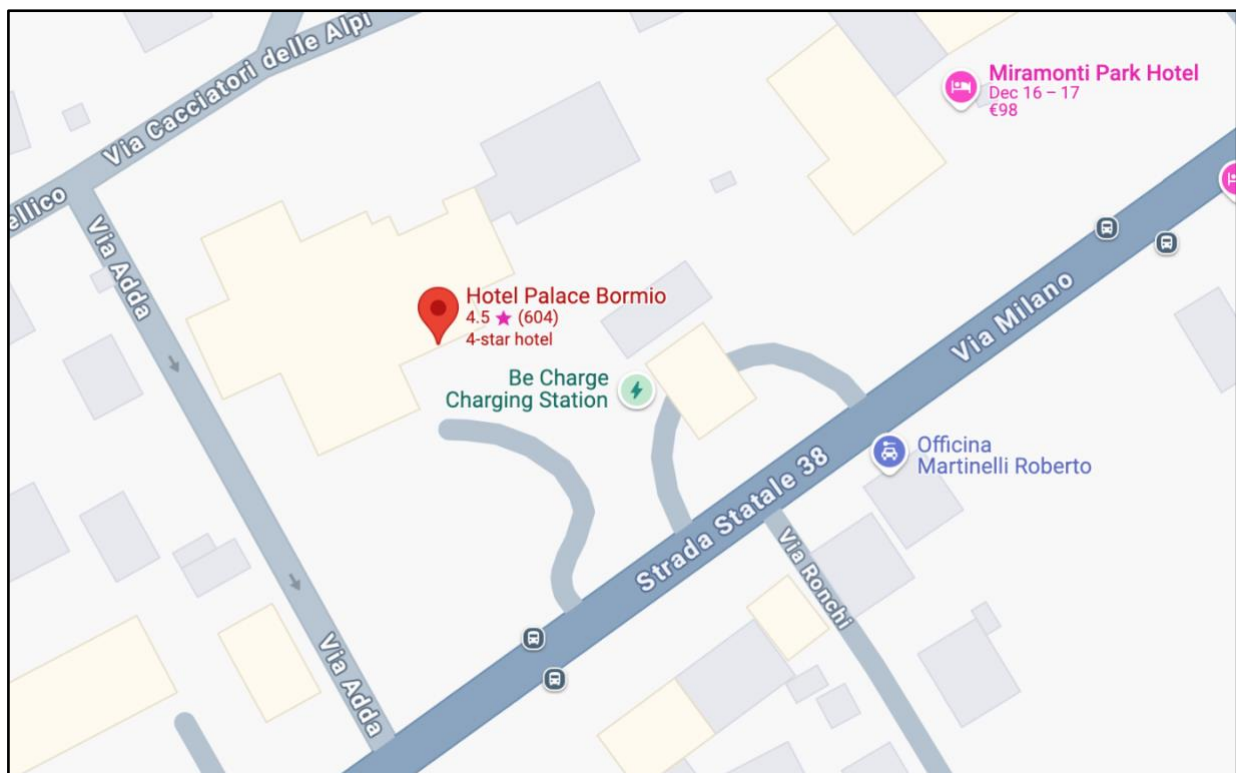
Istituto Italiano di Tecnologia, IT

10:15	FINAL DISCUSSION
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Conference Venue

The conference will be held at the Hotel Palace Bormio, in Bormio (SO), Italy. This prestigious venue offers a special setting for conferences, meetings and events, combining modern facilities with the charm of the Alpine environment. The hotel regularly hosts educational and professional initiatives, making it a perfect location for this workshop.

[Hotel Palace Bormio – via Milano 54, 23032 Bormio (SO)]



Social Program

Welcome and Registration

Sunday, December 8th, 2024

Hotel Palace Bormio

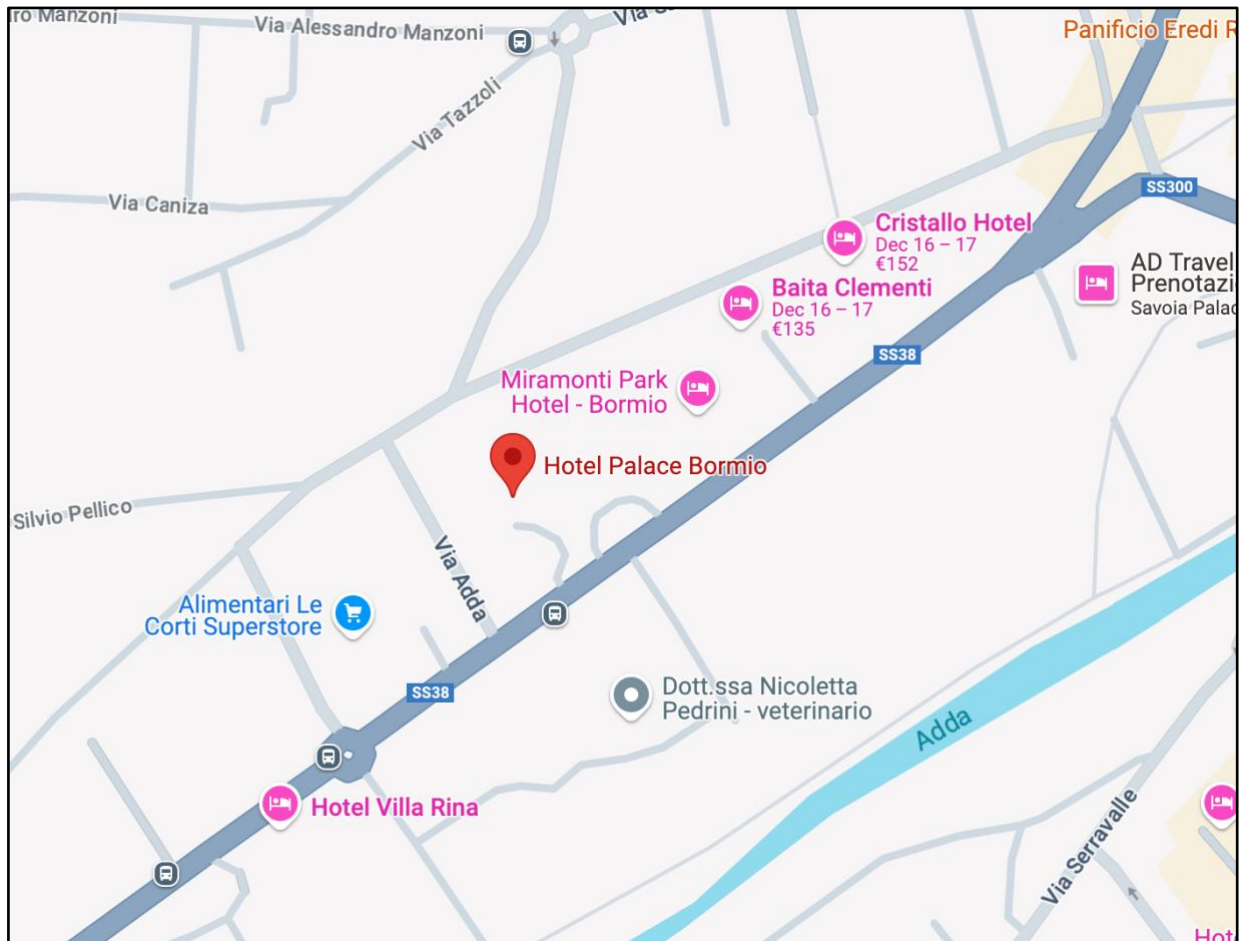
Via Milano 54, 23032 Bormio (SO)

Social Dinners

December 9th - 12th 2024

Hotel Palace Bormio

Via Milano 54, 23032 Bormio (SO)



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WINTER WORKSHOP

Bormio (IT), December 09-13, 2024

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