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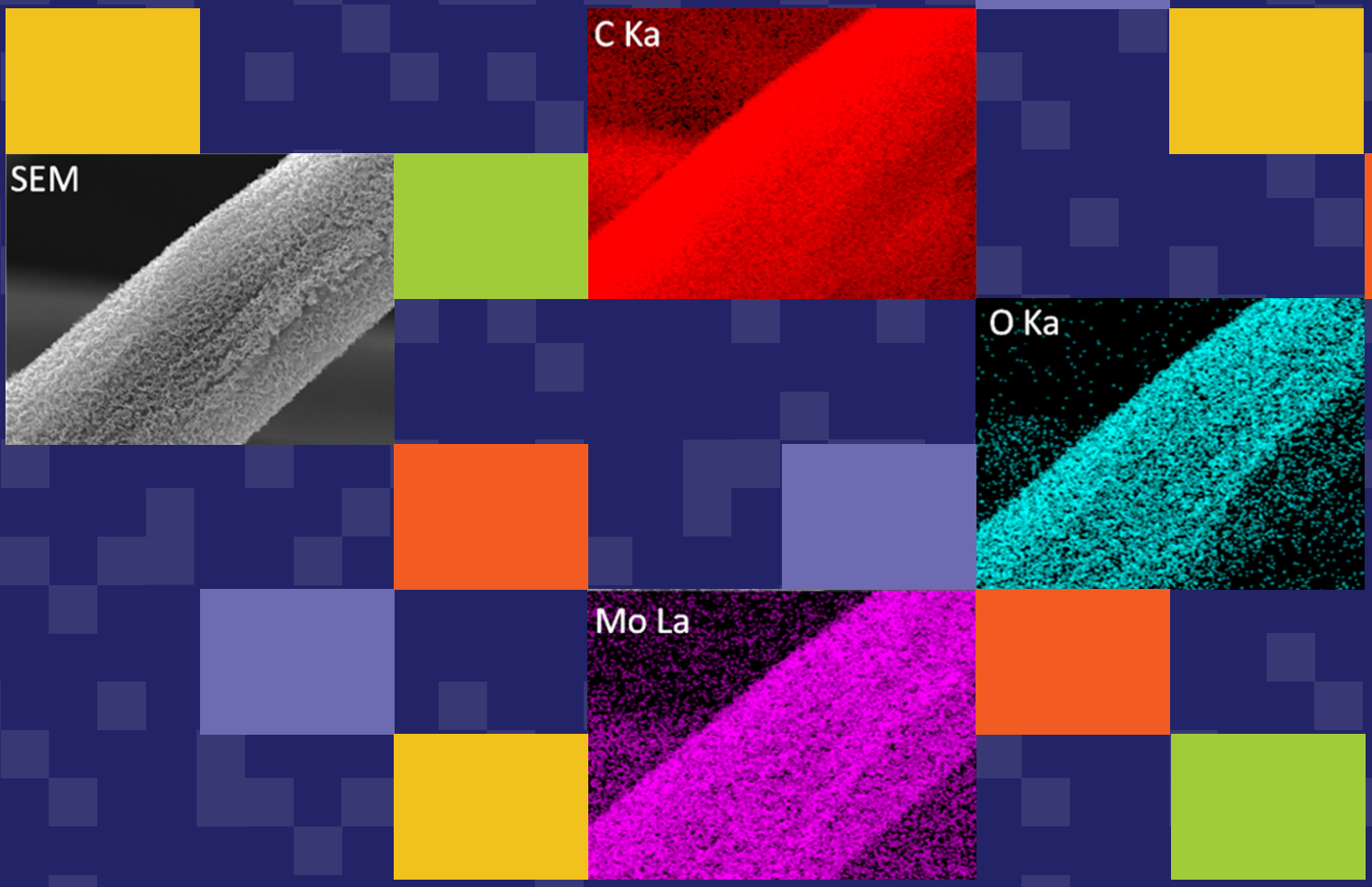
# Activity REPORT 2023




Institut de Nanociència i Nanotecnologia

Editorial Board and Scientific Management: IN²UB
Graphic Design and Layout: www.idoate.com

Cover image: Dr. Stefanos Chaitoglou and Dr. Xavier Vendrell
Legend: A novel hybrid compound based on $Mo_2C$ nanostructures deposited on vertical graphene nanowalls support, which exhibits remarkable electrocatalytic properties towards hydrogen evolution and paves the way for sustainable production of green hydrogen via water electrolysis. A work developed with the support of IN²UB (Project ART_2022_1).



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# Activity REPORT 2023

Institut de Nanociència i Nanotecnologia

Universitat de Barcelona

Activity REPORT 2023

Institut de Nanociència i Nanotecnologia

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About in2ub



# 1. ABOUT IN²UB

## 1.1. PRESENTATION

The Institute of Nanoscience and Nanotechnology of the University of Barcelona (IN²UB) was created in 2006. Its main goal is to coordinate and enhance multidisciplinary research among research groups from the Faculties of Chemistry, Physics, Pharmacy and Food Sciences, Biology, Earth Sciences and Medicine and Health Sciences that work on the different phenomena occurring at the nanoscale. This collaborative spirit aims at integrating both, internally and internationally, interdisciplinary activities which integrate equally, basic and applied research.

The IN²UB wants to contribute to the progress of science, while spurring, at the same time, industrial excellence. In this sense, several spin-off companies are now led by IN²UB researchers. Finally, all members of the IN²UB are strongly involved in teaching endeavours, the most important programs being the Master of Nanoscience and Nanotechnology and the Doctoral Program of Nanoscience. Research and Education serve us to convey our strong commitment with society.

IN²UB gathers around 200 researchers (including permanent, postdoctoral researchers and Predoctoral Researchers). They are organized in research groups distributed among seven major research areas.

1. Modeling, Simulation and Nanoscopic Methods (**NanoMet**)
2. Nanobioscience, Nanobiomechanics and BioNanotechnology (**NanoBio**)
3. Nanopharmaceutics and Nanomedicine (**NanoPharmaMed**)
4. Nanomagnetism and Spintronics (**NanoMagnetics**)
5. Nanoelectronics, Nano-optics and Nanophotonics (**NanoPhotoElectro**)
6. Nanostructured materials (**NanosMat**)
7. Nanoenergy: Production and Storage (**NanoEnergy**)

## 1.2. ORGANIZATION

The Institute is led by the Steering Committee, the Secretary and the Director. Each of the seven research areas has a coordinator. In addition, the Institute receive the advises from internal and external scientific boards.

### 1.2.1. GOVERNING BODIES

The Institute is led by the Steering Committee, the Secretary and the Director. Each of the seven research areas has a coordinator. In addition, the Institute receive the advises from internal and external scientific boards.

#### Steering committee

Director: Dr. Guillem Aromí Bedmar
Deputy Director: Dr. Albert Romano Rodríguez
Permanent Collective:

- Dr. Xavier Batlle Gelabert
- Dr. Enric Bertran Serra
- Dr. Martí Duocastella Solà
- Dr. Sònia Estradé Albiol
- Dr. Arantxa Fraile Rodriguez
- Dr. Giancarlo Franzese
- Dr. Maria José García Celma
- Dr. Sergi Hernández Márquez
- Dr. Narcís Homs Martí
- Dr. Francesca Peiró Martínez
- Dr. Eva Carolina Sañudo Zotes

#### Research Areas Coordinators

1. NanoMet: Dr. Francesca Peiró Martínez
2. NanoBio: Dra. Núria Gavara Casas
3. NanoPharmaMed: Dr. M. José García Celma
4. NanoMagnetics: Dr. Xavier Batlle Gelabert
5. NanoPhotoElectro: Dr. Martí Duocastella Solà
6. NanosMat: Dr. Enric Bertran Serra
7. NanoEnergy: Dr. Narcis Homs Martí

#### Internal Scientific Board

- Dr. M. Pilar Vinardell Martinez Hidalgo (President)
- Dr. Ramon Farré Ventura
- Dr. Amílcar Labarta Rodríguez
- Dr. Francesc Sagués Mestre

## International Scientific Advisory Board

- Dr. Ivan Schuller (UC San Diego) (President)
- Dr. Kenneth Dawson (UC Dublin)
- Dr. Katja Schenke-Layland (Eberhard Karls University Tübingen)
- Dr. Maria Jesús Vicent (Centro de Investigación Príncipe Felipe)

## Outreach Commission

Dr. Jordi Díaz Marcos; Dr. Xavier Batlle Gelabert; Dr. Giancarlo Franzese; Dr. M. Aranzazu Fraile Rodríguez; Dr. Oscar Iglesias Clotas; Dra. Francesca Peiró Martínez; Dr. M. Antònia Busquets Viñas; Dr. Giancarlo Franzese; Dr. Elena Sánchez López; Dr. Sonia Trigueros; Dra. Ana B. Caballero Hernández; Dr. Carlos Calero Borrallo; Mariona Escoda Torroella, Elena Lopez Aymerich; Contact: in2ub-divulga@ub.edu

**Executive Equal Opportunities Committee:** Dr. María Aranzazú Fraile (Coordinator), Dr. Marta Estrader, Dr. Carolina Sañudo, Dr. Ferran Macià, Dr. Sònia Estradé, Dr. Antònia Busquets. Contact: in2ub.igualtat(at)ub.edu

## Research Management and Promotion

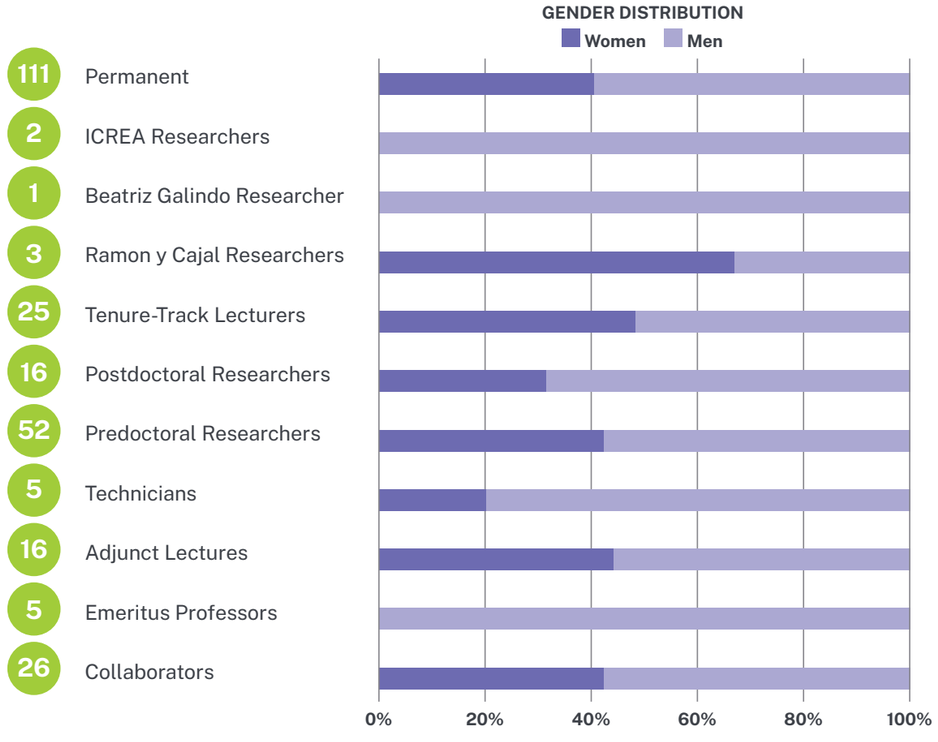
Dr. Ifigènia Saborit Villarroya

# 1.3. RESEARCH HIGHLIGHTS- RESEARCH OUTPUTS, FUNDING SOURCES AND TRANSFER INDICATORS

## 1.3.1. IN²UB IN NUMBERS & FIGURES

### 1.3.1.1. Members

The Institute currently has the following members, distributed in the following categories.






### 1.3.1.2. Scientific Production

IN²UB is a multidisciplinary research unit, mainly harvesting research in the field of Physics, Chemistry, Material Science, Pharmacology and Biology. Specifically, the following major subject areas represent IN²UB scientific production: Chemistry, Physics and Astronomy and Material Science, Biochemistry, Genetics and Molecular Biology, Engineering, Medicine and Chemical Engineering and Pharmacology, Toxicology and Pharmaceutics. The rest of IN²UB publications, are integrated in other related subject areas such as Medicine, Computer Science, Energy Environmental Science or Earth and Planetary Sciences.

The analysis of these areas during 2023 period, represented 300 papers published in indexed journals in Scopus, with 82% of this production at first quartile.

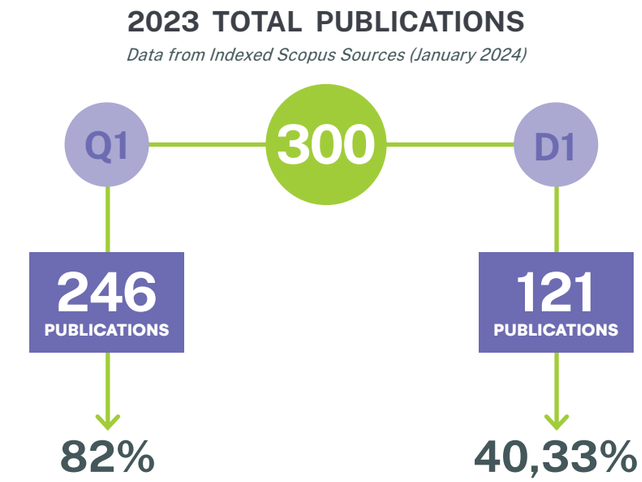
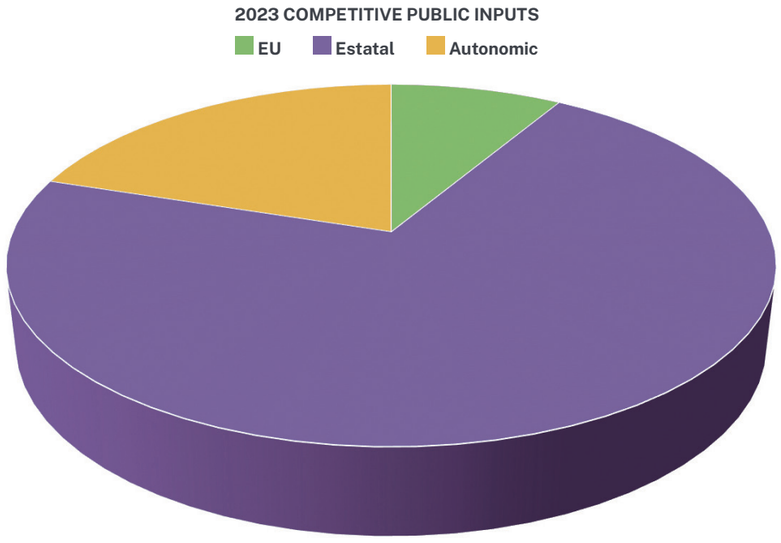




*Fig. Word Cloud of Author Keywords appearing at least 5 times at the scientific production at IN²UB (Scopus source and WordCloud.com tool)*

### 1.3.1.3. Funding Sources

During 2023 the researchers from IN²UB have been awarded with a total of 5.9M€ to be distributed in the forthcoming years. The graphic and pie below, show the amount allocated from competitive calls from public organizations achieved by our researchers, provided by the UB.




## 1.4. HIGHLIGHTS

### 1.4.1. HIGH INDEX PUBLICATIONS

- **Wireless electrical–molecular quantum signalling for cancer cell apoptosis**. Jain A.; Gosling J.; Liu S.; Wang H.; Stone E.M.; Chakraborty S.; Jayaraman P.-S.; Smith S.; Amabilino D.B.; Fromhold M.; Long Y.-T.; Pérez-García L.; Turyanska L.; Rahman R.; Rawson F.J. 2023. Nature Nanotechnology. 19, 1. Doi: 10.1038/s41565-023-01496-y

- **Observing the primary steps of ion solvation in helium droplets**. SH. Albrechtsen, CA. Schouder, A. Viñas Muñoz, JK. Christensen, C. Engelbrecht Petersen, M. Pi, M. Barranco & H. Stapelfeldt. 2023, Nature, 623, 7986. Doi: 10.1038/s41586-023-06593-5

- **Magnetic Molecules on Surfaces: SMMs and Beyond**. Gabarró-Riera, G.; Aromí, G.; Sañudo, E. C. Coord Chem Rev 2023, 475. Doi: 10.1016/j.ccr.2022.214858

- **Imaging of Antiferroelectric Dark Modes in an Inverted Plasmonic Lattice**. Rodríguez-Álvarez J.; Labarta A.; Idrobo J.C.; Dell'Anna R.; Cian A.; Giubertoni D.; Borrisé X.; Guerrero A.; Perez-Murano F.; Fraile Rodríguez A.; Batlle X. 2023, ACS Nano, 17, 9. Doi: 10.1021/acsnano.2c11016

- **Overcrowding induces fast colloidal solitons in a slowly rotating potential landscape**. Cereceda-López E.; Antonov A.P.; Ryabov A.; Maass P.; Tierno P. 2023, Nature Communications, 14, 1, 6448. Doi: 10.1038/s41467-023-41989-x

- **Counterion Variation: A Useful Lever for Maximizing the Regioselectivity in the Hydroboration of Terminal Alkynes**. Martínez-Bascuñana A.; Núñez-Rico J.L.; Carreras L.; Vidal-Ferran A. 2023, ACS Catalysis, 13, 15. Doi: 10.1021/acscatal.3c02213

- **Highly sensitive SnO2 nanowire network gas sensors**. Domènech-Gil G.; Samà J.; Fàbrega C.; Gràcia I.; Cané C.; Barth S.; Romano-Rodríguez A.  2023, Sensors and Actuators B: Chemical, 383. Doi: 133545 10.1016/j.snb.2023.133545



### 1.4.2. HIGHLIGHTED PROJECTS

Form all these projects here we highlight the most relevant ones awarded this 2023:

- **Energía e información en la nanoescala en materia biológica**. PID2022-139913NB-I00. IP: Félix Ritort Ferran. Ministerio de Ciencia e Innovación (2023-2026)

- **"Supramolecular Control of Spin-Based Qubits (SupraQubit)"** PID2022-137764OB-I00, IP: Guillem Aromí Bedmar. MCIN, Generación de Conocimiento (2023-2027)

- **Integrated thermo-optically activated Nanosensors for environmental monitoring (Nano4E)**. IP: Juan Daniel Prades Garcia. The Austrian Research Promotion Agency (FFG) (2023-2026)

Moreover, during 2023, the following highlighted Projects are being lead.

- **Ultrasonic Endoscopes for DEEP Light Focusing (DEEP)**. IP: Marti Duocastella Solà. HORIZON 2020 (2014-2020). P1. ERC CONSOLIDATOR GRANT (ERC-2020-COG) (2021-2026)

- **ENgineering FrustratiOn in aRtificial Colloidal icEs: degeneracy, exotic lattices and 3D states (ENFORCE)**. IP: Pietro Tierno. HORIZON 2020 (2014-2020). P1. ERC CONSOLIDATOR GRANT (ERC-2020-COG) (2020-2025)

- **Continuous two-dimensional Stretch monitoring of fresh tissue Biopsies (StretchBio)**. IP: Albert Romano Rodriguez. HORIZON 2020 (2014-2020). P1. FET OPEN – NOVEL IDEAS FOR RADICALLY NEW TECHNOLOGIES (H2020-FETOPEN-2018-2019-2020) (2021-2025)

- **Fully Oxide-based Zero-Emission and Portable Energy Supply (FOXES)**. IP: Juan Daniel Prades Garcia. HORIZON 2020 (2014-2020). P1. FET PROACTIVE-BOOSTING EMERGING TECHNOLOGIES (H2020-FETPROACT-2018-2020) (2020-2024)

- **Scalable Structured Micro Illumination Light Engines (SMILE)**. IP: Juan Daniel Prades Garcia. HORIZON 2020 (2014-2020). P1. FET PROACTIVE-BOOSTING EMERGING TECHNOLOGIES (H2020-FETPROACT-2018-2020) (2020-2023)

- **Technology for real-time visualizing and modelling of fundamental process in living organoids towards new insights into organ-specific health, disease, and recovery (acronym, OrganVision)**. UB-IP: Martí Duocastella. HORIZON 2020 (2014-2020). P1. FET OPEN – NOVEL IDEAS FOR RADICALLY NEW TECHNOLOGIES (H2020-FETOPEN-2018-2019-2020) (2021-2025)

- **DRop-on demand flexible Optoelectronics & Photovoltaics by means of Lead-Free halide perovskITes (DROP-IT). (H2020-FETOPEN-2018-2019-2020-01)**. IP: Garrido Fernández, Blas. (2019-2023)

- **"Molecular Quantum Processors for Quantum Communications"** NextGenerationEU (PRTR-C17.I1). Planes Complementarios: Comunicación Cuántica. Euroean Union through MCIN and Generalitat de Catalunya (2021-2025)

- **Enfermedades Respiratorias**. CB06/06/0026. IP: Isaac Almendros Lopez. Ministerio de Sanidad y Consumo (2006-2023)

### 1.4.3. HIGHLIGHTED NEWS

- Prof. *Ramon Farré* (Faculty of Medicine and Health Sciences and Group leader at Biophysics and Bioengineering Unit) receives the Research Innovation and Translation Achievement Award from the American Thoracic Society. [Read more]

- **Nanoparticles as a treatment for dry eye disease**.
The technology developed by Nanostructured systems for controlled drug delivery, will be of great benefit to patients, as it will have a curative and preventive effect on dry eye. [read more]

- **A new type of more efficient catalyst for the chemical industry**.
  A team from the University of Barcelona led by ICREA Research Professor, Anton Vidal Ferran, from the Department of Inorganic and Organic Chemistry of the Faculty of Chemistry and IN²UB researcher at Homogeneous Catalysis group, has developed a library of more efficient rhodium-based catalysts that improve the manufacturing process. [Read more]

Form all these projects here we highlight the most relevant ones:

## 1.5. TRANSFER INDICATORS

A relevant indicator is the number of spin-off companies emerged from IN²UB. The Institute has 7 spin-offs.

- **Nimble Diagnostics**, a newly created (2022) UB, IGTP and UPC spin-off, founded to monitor stent using microwave technology, being Dr. Javier Tejada Palacios a co-founder of this newly created spin-off.

- **ColorSensing, S.L.**, created in 2018 by Dr. Juan Daniel Prades García, devoted to smart packaging for food processing efficiency, quality, and safety.

- **Enlighting Technologies (Kumux),** created in 2017 by Dr. Blas Garrido Fernández and Dr. Sergi Hernández Márquez. It aims at achieving a more comfortable and adaptable light to each need and situation. They have developed the FLEXILIGHT-UB technology, which is able to reproduce any spectrum of light accurately and imitate any kind of light.

- **EndoASIC, S.L.** (2013) (Dr. Angel Dieguez Barrientos, Dr. Oscar Alonso Casanovas and Dr. Ana Vilà Arbonés, members of the entrepreneurial group). This company develops, using micro and nanotechnologies, autonomous minimally invasive systems for the substitution of gastrointestinal endoscopic systems.

- **Impetux Optics, S.L.**, created in 2012 lead by Dr. Mario Montes Usategui. Impetux Optics focuses its activity on Design, Manufacturing and Marketing of optical force measurement systems for Optical Tweezers. The company makes available a patented technology that overcomes existing limitations, providing clear advantages when measuring optical forces. The systems developed, allow force measurements in experiments where trap stiffness calibration is difficult or impossible.

- **Advanced Nanotechnologies, S.L.**, created in 2012 by Dr. Enric Bertran Serra, Dr. Esther Pascual Miralles and Dr. José Luís Andújar Bella. Advanced Nanotechnologies S.L. is devoted to materials and surface applications addressed to general consumers and to the business market. It supports R&D projects by developing specific processes and equipment for each application. The company offers innovative solutions based on nanotechnology adapted to specific developments of the costumers, related to the manufacturing of nanostructured materials. It offers also consultancy services.

- **Smalle Technologies, S.L.** (by Dr. Christophe Serre and Dr. Alejandro Pérez Rodríguez), created in 2012. Smalle Technologies is a company that develops new methods for maximizing the benefits from renewable and sustainable energy sources in order to address energy supply shortages of off-grid devices. Smalle Technologies develops generators that transform the energy contained in the waves into electricity to supply power to off-shore devices.

During this period, IN²UB has applied for 33 patents.

# 2. RESEARCH AT IN²UB

## 2.1. RESEARCH LINES

### 2.1.1. MODELING, SIMULATION AND NANOSCOPIC METHODS (NANOMET)

(Coordination: Dr. Francesca Peiró Martínez)

This research area develops instrumentation and methodology (employing experimental and theoretical tools) to characterize nanostructures and nanosystems of any nature,

A. NanobioInteractions: Interactions between biological and nanoscopic systems.
B. Confinement-related phenomena: reactivity, magnetism, optoelectronics and quantum photonics.
C. Transport and conduction.
D. Surface effects.
E. Electronic structure and excitations.
F. Bose-Einstein condensates and quantum confined gases.
G. Advanced Electronic Microscopy (EFM, TEM, STM, EELS, EDS)
H. Instrumentation and Methodology Development in Electron Microscopy.

### 2.1.2. NANOBIOSCIENCE, NANOBIOMECHANICS AND BIONANOTECHNOLOGY (NANOBIO)

(Coordination: Dr. Núria Gavara Casas)

This research area studies the organizational patterns observable in the molecular structures that control and rule the biological systems both at the cellular and at the molecular scales. Its most relevant application is that of developing techniques and devices aimed at prevention and diagnose in nanomedicine.

A. Functionalisation of surfaces.
B. Cellular and molecular biomechanics
C. Biomimetic structures and systems
D. Nanofluidics and nanorobotics. Nanomotors.
E. Diagnosis in nanomedicine: marking and molecular observation
F. Nanobiosensors; DNA and Protein Chips; lab on chip.

### 2.1.3. NANOPHARMACEUTICS AND NANOMEDICINE (NANOPHARMAMED)

(Coordination: Dr. M. José García Celma)

This area aims at developing nanostructured systems for controlled drug release and to the improvement of drug therapeutic efficiency when administered on targets to treat diseases.

A. Nanostructured Systems for controlled drug release. Nanocapsules.
B. Nanostructured systems interaction with biological structures.
C. Bioavailability, toxicity and therapeutic efficiency of nanostructured systems.
D. Non-viral vectors. Gene therapy. Pharmacogenomics and nutrigenomics.
E. Molecular internalization, molecular marking and detoxification.

### 2.1.4. NANOMAGNETISM AND SPINTRONICS (NANOMAGNETICS)

(Coordination: Dr. Xavier Batlle Gelabert)

The area aims at developing new systems for storage and processing of information at the nanoscopic scale for information processing. It is also devoted to the study of new phenomena appearing at the nanometric size for the implementation of innovative devices of application in healthcare, sustainable energy, environment, healthy food and security.

It is also involved with the preparation and study of multifunctional molecular nanomagnets for spintronics and quantum computing.

A. Magnetic nanoparticles and single molecule magnets.
B. Dynamic processes in nanomagnetism and interaction with microwaves.
C. Magnetic electronics.
D. Spin-based molecular quantum bits and quantum gates for quantum computing.

### 2.1.5. NANOELECTRONICS, NANO-OPTICS AND NANOPHOTONICS (NANOPHOTOELECTRO)

Coordination: Dr. Martí Duocastella Solà
Study and exploitation at the nanoscale of the interaction of electric, magnetic and optical properties for the design of functional nanosystems.
A. NEMS (Nanoelectromechanical Systems).
B. Nanodevices, nanosensors and electronic nanosystems, optoelectronics and photonics. Photonic crystals.

### 2.1.6. NANOSTRUCTURED MATERIALS (NANOSMAT)

Coordination: Dr. Enric Bertran Serra
This research area aims at developing new nanostructured materials or improving the properties of existing materials. This line also includes knowledge-frontier research in characterization techniques and manipulation tools at the nanoscale (as electron and probe microscopies, surface analysis, or spectroscopic and magnetic characterization).
A. Synthesis, nanomanufacturing and nanomanipulation.
B. Thin layers, nanostructured multilayers and coatings.
C. Nanoparticles, gels, nanofibers, nanorods, nanothreads and nanotubes.
D. Nanostructured metallic oxides.
E. Mesoporous Materials and Nanopatterns.

### 2.1.7. NANOENERGY: PRODUCTION AND STORAGE (NANOENERGY)

(Coordination: Dr. Narcis Homs Martí)
The aim of this research line is the application of nanomaterials to energy production and storage to overcome efficiency and lifetime limits.
A. Catalytic nanostructures for energy production. Fuel cells.
B. Nanomaterials for solar cells and photocatalytic processes.
C. Nanostructured systems for energy storage.





## 2.2. GROUPS AT RESEARCH LINES

In the following section, you will find all research groups distributed along the 7 research lines according to the research developed. However, due to the transversally of the research performed, some groups can be found in more than one main research area.

### 2.2.1. BIOELECTRICAL CHARACTERIZATION AT NANOSCALE (NANOBIO)

(Department Electronics and Biomedical Engineering, Faculty Physics)

**Team**
*Gabriel Gomila Lluch* (Full Professor)
*Annalisa Caló* (Tenure-Track Lecturer)

**Selected Papers**
- **Nanoscale Operando Characterization of Electrolyte-Gated Organic Field-Effect Transistors Reveals Charge Transport Bottlenecks**, *Tanwar S.; Millan-Solsona R.; Ruiz-Molina S.; Mas-Torrent M.; Kyndiah A.; Gomila G.* 2023, Advanced Materials. Doi: 10.1002/adma.202309767
- **Caught in Action: Visualizing Dynamic Nanostructures Within Supramolecular Systems Chemistry**. *Venugopal, A; Ruiz-Perez, L; Swamynathan K; Kulkarni, C; Calò, A; Kumar, M.* 2023, Angewandte Chemie - International Edition, 2023, 62(8), e202208681. Doi: 10.1002/anie.202208681

### 2.2.2. BIOMOLECULE AND SMALL-SYSTEMS PHYSICS: SMALL BIOSYSTEMS LAB (NANOBIO)

(Department Condensed Matter Physics, Faculty Physics)

**Team**
*Fèlix Ritort Farran* (Full Professor)
*Maria Mañosas Castejon* (Ramon y Cajal Researcher)

**Selected Papers**
- Generalized continuous Maxwell demons. J. P. Garrahan and F. Ritort. Phys. Rev. E 107, 3, 034101. March 2023. Doi: 10.1080/14756366.2022.2158822
- N-States Continuous Maxwell Demon. Raux P.; Ritort F. Entropy 2023, 25(2), 321. Doi: 10.3390/e25020321

**Selected Projects**
- Descifrando los mecanismos de motores moleculares que trabajan en el AND. CNS2022-135910. IP: Maria Mañosas Castejon. Ministerio de Ciencia e Innovación (2023-2025)
- Energía e información en la nanoescala en materia biológica. PID2022-139913NB-I00. IP: Félix Ritort Ferran. Ministerio de Ciencia e Innovación (2023-2026)
- ICREA ACADEMIA 2008, 2013, 2018. IP: Félix Ritort Ferran. Generalitat de Catalunya (2009-2023).

### 2.2.3. BIOPHYSICS AND BIOENGINEERING UNIT (NANOBIO)

(Department Biomedicine, Faculty Medicine)

**Team**
*Ramon Farré Ventura* (Full Professor)
*Pere Roca Cusachs* (Associate Professor)
*Núria Gavara Casas* (Tenure-Track Lecturer – Serra Hunter)
*Isaac Almendros López* (Associate Professor)
*Raimon Sunyer Borrell* (Tenure-Track Lecturer)
*Jorge Otero Díaz* (Tenure-Track Lecturer)
*Miguel Rodriguez Lazaro* (Technician)
*Daniel Navajas Navarro* (Collaborator)

### Selected Papers

- **Multi-Step Extracellular Matrix Remodelling and Stiffening in the Development of Idiopathic Pulmonary Fibrosis**. *Júnior C.; Ulldemolins A.; Narciso M.; Almendros I.; Farré R.; Navajas D.; López J.; Eroles M.; Rico F.; Gavara N.* 2023, International Journal of Molecular Sciences, 24, 1708. Doi: 10.3390/ijms24021708
- **Lung Micrometastases Display ECM Depletion and Softening While Macrometastases Are 30-Fold Stiffer and Enriched in Fibronectin**. *Narciso M.; Martínez Á.; Júnior C.; Díaz-Valdivia N.; Ulldemolins A.; Berardi M.; Neal K.; Navajas D.; Farré R.; Alcaraz J.; Almendros I.; Gavara N.* 2023, Cancers, 15, 8, 2404. Doi: 10.3390/cancers15082404
- **Fast cycling of intermittent hypoxia in a physiomimetic 3D environment: A novel tool for the study of the parenchymal effects of sleep apnea**. *Jurado A.; Ulldemolins A.; Lluís H.; Gasull X.; Gavara N.; Sunyer R.; Otero J.; Gozal D.; Almendros I.; Farré R.* 2023, Frontiers in Pharmacology,13, 1081345. Doi: 10.3389/fphar.2022.1081345

### Selected Projects

- **Estudio de los mecanismos involucrados en los efectos nocivos de la hipoxia intermitente en diferentes tejidos utilizando un nuevo modelo fisiomimético ex vivo**. PID2022-140774OB-I00. IP: *Isaac Almendros López*. Ministerio de Ciencia e Innovación (2023-2026)
- **Estudio de la Mecanobiología aberrante de los fibroblastos senescentes en la Fibrosis Pulmonar Idiopática**. CNS2022-135533. IP: *Raimon Sunyer Borrell*. Ministerio de Ciencia e Innovación (2023-2025)

## 2.2.4. BIOPT: OPTICAL TRAPPING LAB - GRUP DE BIOFOTÒNICA (NANOBIO)

(Department Applied Physics, Faculty Physics)

### Team

*Estela Martín Badosa* (Full Professor)
*Mario Montes Usategui* (Associate Professor)

### Selected Projects

- **Microscopía de superresolución con haces vectoriales.** PID2022-136796OB-I00. IP: *Estela Martín Badosa*. Ministerio de Ciencia e Innovación (2023-2026)

## 2.2.5. CANCER THERAPY GROUP (NANOBIO)

(Department Biochemistry and Physiology, Faculty Pharmacy and Food Sciences)

### Team

*Verònica Noé Mata* (Full Professor)
*Núria Llor Brunes* (Associate Professor)
*Rosa Griera Farres* (Associate Professor)
*Judith Cullell Moltó* (Predoctoral Researcher)
*Simonas Valiuska* (Predoctoral Researcher)
*Carlos Ciudad Gómez* (Emeritus Professor)

### Selected Papers

- **In Vitro and In Vivo Effects of the Combination of Polypurine Reverse Hoogsteen Hairpins against HER-2 and Trastuzumab in Breast Cancer Cells**. *López-Aguilar E.; Fernández-Nogueira P.; Fuster G.; Carbó N.; Ciudad C.J.; Noé V.* 2023, International Journal of Molecular Sciences, 24, 8, 7073. Doi: 10.3390/ijms24087073
- **Targeting MYC Regulation with Polypurine Reverse Hoogsteen Oligonucleotides**. *Valiuska S.; Psaras A.M.; Noé V.; Brooks T.A.; Ciudad C.J.* 2023 International Journal of Molecular Sciences, 24, 1, 378. Doi: 10.3390/ijms24010378
- **Trioleyl Pyridinium, a Cationic Transfection Agent for the Lipofection of Therapeutic Oligonucleotides into Mammalian Cells.** *Delgado A.; Griera R.; Llor N.; López-Aguilar E.; Busquets M.A.; Noé V.; Ciudad C.J.* 2023, Pharmaceutics, 15, 2, 420. Doi: 10.3390/pharmaceutics15020420



### Selected Projects

- **Aplicaciones de los PPRHs contra dianas no medicables, LNCRNAS y PCSK9. Vehiculización con liposomas, modificaciones de DNA y vectores virales. Biosensores para detección viral.** PID2021-122271OB-I00. IP. *Noe, Verònica*. Ministerio de Ciencia e Innovación (MICINN) (2022-2025)
- **Diagnòstic i tractament de Sars-Cov-2 per formació de tríplex** (MARATO TV3 202110-30). IP: *Noé, Verónica* (2021-2023)

## 2.2.6. CATALYSIS AND ADVANCED INORGANIC MATERIALS (MATCAT) (NANOENERGY)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

### Team

*Narcís Homs Martí* (Full Professor)
*Pilar Ramírez de la Piscina* (Full Professor)
*Maria Lourdes Mestres Vila* (Full Professor)
*Xavier Vendrell Villafruela* (Tenure-Track Lecturer – Serra Hunter)
*Adrià Sánchez Ruiz* (Predoctoral Researcher)
*Arturo Pajares Rojas* (External Collaborator VITO, Belgium)

### Selected Papers

- **Induced p-type semiconductivity in Mg-doped Nd2Zr2O7 pyrochlore system**. *Vendrell X.; Santos-Veiga E.L.; Beltrán-Mir H.; Cordoncillo E.; Mestres L.* 2023, Journal of the European Ceramic Society, 43, 15. Doi: 10.1016/j.jeurceramsoc.2023.07.061
- **Particle size effect on the microstructure and the aging process of flash-sintered barium titanate from micro and nanopowders**. *López-Blanco S.; Vendrell X.; Mestres L.; Ochoa D.A.; García J.E.* 2023, Journal of Materials Chemistry C, 11, 37. Doi: 10.1039/d3tc02143b

### Selected Projects

- L-Hydrogen. EMC/1124/2018, IP: EVARM Innovación SL, Acció Nuclis, Generalitat de Catalunya. (2019-2021)

## 2.2.7. CELLULAR RESPONSES TO XENOBIOTICS (NANOPHARMAMED)

(Dept Biochemistry and Physiology, Faculty Pharmacy and Food Sciences)

### Team

*Maria Pilar Vinardell Martínez-Hidalgo* (Full Professor)
*Montserrrat Mitjans Arnal* (Associate Professor)
*Maria Del Carmen Moran Bádenas* (Associate Professor)
*Michele Ferrari* (Collaborator-CNR-ICMATE Italy)

### Selected Papers

- **Size Matters? A Comprehensive In Vitro Study of the Impact of Particle Size on the Toxicity of ZnO**. *Mitjans M.; Marics L.; Bilbao M.; Maddaleno A.S.; Piñero J.J.; Vinardell M.P. 2023*, Nanomaterials, 13, 11, 1800. Doi: 10.3390/nano13111800
- **Profiling and Evaluation of the Effect of Guarana-Loaded Liposomes on Different Skin Cell Lines: An In Vitro Study.** *Roggia I.; Gomes P.; Dalcin A.J.F.; Ourique A.F.; Mânica da Cruz I.B.; Ribeiro E.E.; Mitjans M.; Vinardell M.P.* 2023, Cosmetics, 10, 3, 79. Doi: 10.3390/cosmetics10030079

### Selected Projects

- **Modelos in vitro para predecir fotosensibilización de contacto: estrategias basadas en los mecanismos celulares implicados.** PID2020-113186RB-I00. IP: *Mitjans, M.* Ministerio de Ciencia e Innovación (MICINN) (2021-2025)

## 2.2.8. CONFORMATIONAL DISEASES GROUP (NANOPHARMAMED)

(Department Pharmacy and Pharmaceutical Technology and Physical-Chemical, Faculty Pharmacy and Food Sciences)

### Team

*Raimon Sabaté Lagunas* (Associate Professor)
*M. Antonia Busquets Viñas* (Associate Professor)
*Alba Espargaró Colomé* (Tenure-Track Lecturer)

### Selected Papers

- **Discovery of novel multifunctional ligands targeting GABA transporters, butyrylcholinesterase, β-secretase, and amyloid β aggregation as potential treatment of Alzheimer's disease.** *Zaręba P.; Łątka K.; Mazur G.; Gryzło B.; Pasieka A.; Godyń J.; Panek D.; Skrzypczak-Wiercioch A.; Höfner G.C.; Latacz G.; Maj M.; Espargaró A.; Sabaté R.; Jóźwiak K.; Wanner K.T.; Sałat K.; Malawska B.; Kulig K.; Bajda M.* 2023, European Journal of Medicinal Chemistry, 261, 115832. Doi: 10.1016/j.ejmech.2023.115832
- **Thioxanthenone-based derivatives as multitarget therapeutic leads for Alzheimer's disease.** *Tonelli M.; Catto M.; Sabaté R.; Francesconi V.; Laurini E.; Pricl S.; Pisani L.; Miniero D.V.; Liuzzi G.M.; Gatta E.; Relini A.; Gavín R.; Del Rio J.A.; Sparatore F.; Carotti A.* 2023 European Journal of Medicinal Chemistry, 250, 115169. Doi: 10.1016/j.ejmech.2023.115169

### Selected Projects

- **Compuestos anti-amiloides fácilmente disponibles para prevenir la internalización celular de los coronavirus (PID2021-127863OB-I00).** IP1: *Sabaté, R.* / IP2: *Espargaró, A.* Ministerio de Ciencia e Innovación (MICINN) (2022 to 2025)

## 2.2.9. DESIGN AND IMPROVEMENT OF PROCESSES AND MATERIALS (NANOENERGY)

(Department Materials Science and Physical Chemistry, Faculty Chemistry)

### Team

*Mercè Segarra Rubí* (Full Professor)
*Ana Inés Fernández Renna* (Full Professor)
*Elena Xuriguera Martín* (Associate Professor)
*Joan Formosa Mitjans* (Associate Professor)
*José Antonio Pandilla Sánchez* (Tenure-Track Lecturer)
*Rebeca Salgado Pizarro* (Predoctoral Researcher)

### Selected Papers

- **Magnesium phosphate cement incorporating sheep wool fibre for thermal insulation Applications**. *Maldonado-Alameda A.; Alfocea-Roig A.; Huete-Hernández S.; Giro-Paloma J.; Chimenos J.M.; Formosa J.* 2023, Journal of Building Engineering, 76, 107043. Doi: 10.1016/j.jobe.2023.107043
- **Biocompatible 3D printed yttria-stabilized zirconia parts using direct ink writing.** *Buj-Corral I.; Sanz-Fraile H.; Tejo-Otero A.; Vidal D.; Padilla J.A.; Xuriguera E.; Otero J.* 2023, Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture. Doi: 10.1177/09544054231168469

### Selected Projects

- **Desarrollo de materiales con materias primas secundarias para fabricación aditiva de bajo coste hacia una Economía Circular (PID2022-139828OB-C21).** IP: *Elena Xuriguera Martín*. Ministerio de Ciencia e Innovación (2023-2026)
- **4-Deep Brain Reconstruction (4-DBR) (101047099).** IP-UB: *Elena Xuriguera Martín*. EIC Pathfinder Open 2021 (HORIZON-EIC-2021-PATHFINDEROPEN-01). From 2022 to 2023



## 2.2.10. DRUG DESIGN AND RESPONSE-EVALUATION WITHIN PHARMACEUTICAL NANOSTRUCTURED AND SELF-ORDERED SYSTEMS GROUP (NANOPHARMAMED)

(Department Pharmacy and Pharmaceutical Technology and Physical-Chemical, Faculty Pharmacy and Food Sciences)

### Team

Elvira Escribano Ferrer (Associate Professor)
Francesc Xavier García Sala (Adjunct Lecturer)

## 2.2.11. GENOMICS, PROTEOMICS AND PLANT METABOLOMICS (NANOBIO)

(Department Biology, Healthcare and the Environment and Department Biochemistry and Physiology, Faculty Pharmacy and Food Sciences)

### Team

*Jaume Bastida Armengol* (Full Professor)
*Francesc Viladomat Meya* (Full Professor)
*Laura Torras Claveria* (Associate Professor)

### Selected Papers

- **Antileishmanial Activity of Clinanthus milagroanthus S. Leiva & Meerow (Amaryllidaceae) Collected in Peru.** *Soto-Vásquez M.R.; Alvarado-García P.A.A.; Osorio E.H.; Tallini L.R.; Bastida J.* 2023, Plants, 12, 2, 322. Doi: 10.3390/plants12020322
- **Chemical and Biological Aspects of Different Species of the Genus Clinanthus Herb. (Amaryllidaceae) from South America.** *Rodríguez-Escobar M.L.; Tallini L.R.; Lisa-Molina J.; Berkov S.; Viladomat F.; Meerow A.; Bastida J.; Torras-Claveria L.* 2023, Molecules, 28, 14, 5408. Doi: 10.3390/molecules28145408
- **Candimine from Hippeastrum escoipense (Amaryllidaceae): Anti-Trypanosoma cruzi activity and synergistic effect with benznidazole.** *Ortiz J.E.; Piñeiro M.; Martinez-Peinado N.; Barrera P.; Sosa M.; Bastida J.; Alonso-Padilla J.; Feresin G.E.* 2023. Doi: Phytomedicine, 114, 154788. Doi: 10.1016/j.phymed.2023.154788

## 2.2.12. GROUP OF MAGNETIC NANOMATERIALS (NANOMET, NANOMAGNETICS, NANOPHOTOELECTRO)

(Department Condensed Matter Physics, Faculty Physics)

### Team

*Amílcar Labarta Rodríguez* (Full Professor)
*Xavier Batlle Gelabert* (Full Professor)
*Òscar Iglesias Clotas* (Associate Professor)
*Montserrat García del Muro Solans* (Associate Professor)
*Maria Aranzazu Fraile Rodríguez* (Associate Professor)
*Eric Langenberg Perez* (Tenure-Track Lecturer - Serra Hunter)
*Adriana Isabel Figueroa Garcia* (Tenure-Track Lecturer - Serra Hunter)
*Carlos Moya Alvarez* (Postdoctoral Researcher María Zambrano)
*Javier Rodríguez* Álvarez (Predoctoral Researcher)
*Ana Conde Rubio* (Collaborator)

### Selected Papers

- **Imaging of Antiferroelectric Dark Modes in an Inverted Plasmonic Lattice.** *Rodríguez-Álvarez J.; Labarta A.; Idrobo J.C.; Dell'Anna R.; Cian A.; Giubertoni D.; Borrisé X.; Guerrero A.; Perez-Murano F.; Fraile Rodríguez A.; Batlle X.* 2023, ACS Nano, 17, 9. Doi: 10.1021/acsnano.2c11016
- **Domain wall propagation and pinning induced by current pulses in cylindrical modulated nanowires.** *Bran C.; Fernandez-Roldan J.A.; Moreno J.A.; Fraile Rodríguez A.; del Real R.P.; Asenjo A.; Saugar E.; Marqués-Marchán J.; Mohammed H.; Foerster M.; Aballe L.; Kosel J.; Vazquez M.; Chubykalo-Fesenko O.* 2023, Nanoscale, 15, 18. Doi: 10.1039/d3nr00455d

**Selected Projects**

- **Diseño de bits fonónicos con control eléctrico en láminas y superestructuras epitaxiales basadas en óxidos ferroeléctricos.** PID2021-128281NA-I00. IP: *Eric Langenberg Perez*. Convocatoria 2021 de ayudas a «Proyectos de Generación de Conocimiento». Modalidad Proyectos de «Investigación No Orientada». Ministerio de Ciencia, Innovación y Universidades. (2022-2025)
- **De redes de nanoestructuras planares y 3D a nanopartículas híbridas con propiedades ópticas y magnéticas mejoradas.** PID2021-127397NB-I00. IP1: *Arantxa Fraile Rodríguez* / IP2: *Xavier Batlle Gelabert*. Convocatoria 2021 de ayudas a «Proyectos de Generación de Conocimiento». Modalidad Proyectos de «Investigación No Orientada». Ministerio de Ciencia, Innovación y Universidades. From 2022 to 2025.

## 2.2.13. HOMOGENEOUS CATALYSIS (NANOSMAT)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

**Team**

*Arnald Grabulosa Rodriguez* (Associate Professor)
*Daniel Sainz Garcia* (Associate Professor)
*Anton Vidal Ferran* (ICREA Researcher)
*José Luis Núñez Rico* (Adjunct Lecture)
*Dana Josa Hidalgo* (Predoctoral Researcher)
*Alba Martínez Bascuñana* (Predoctoral Researcher)
*Javier Eusamio Rodríguez* (Predoctoral Researcher)
*Albert Gutierrez Currius* (Technician)

**Selected Papers**

- **Counterion Variation: A Useful Lever for Maximizing the Regioselectivity in the Hydroboration of Terminal Alkynes**. *Martínez-Bascuñana A.; Núñez-Rico J.L.; Carreras L.; Vidal-Ferran A.* 2023, ACS Catalysis, 13, 15. Doi: 10.1021/acscatal.3c02213
- **TAMOF-1 as a Versatile and Predictable Chiral Stationary Phase for the Resolution of Racemic Mixtures.** *Núñez-Rico J.L.; Cabezas-Giménez J.; Lillo V.; Balestra S.R.G.; Galán-Mascarós J.R.; Calero S.; Vidal-Ferran A.* 2023, ACS Applied Materials and Interfaces, 15, 33. Doi: 10.1021/acsami.3c08843
- **Rhodium and ruthenium complexes of methylene-bridged, P-stereogenic, unsymmetrical diphosphanes.** *Eusamio J.; Medina Y.M.; Córdoba J.C.; Vidal-Ferran A.; Sainz D.; Gutiérrez A.; Font-Bardia M.; Grabulosa A.* 2023, Dalton Transactions, 52, 8. Doi: 10.1039/d2dt04026c

**Selected Projects**

- **Procesos mejorados para la valorización de productos químicos mediante hidroformilaciones reguladas y selectives.** IP*: Anton Vidal Ferran* PDC2021-120826-I00. MCIN/AEI/10.13039/501100011033 and “NextGenerationEU”/PRTR”.
- **Transformaciones catalíticas eficientes sobre productos orgánicos hacia productos de valor añadido para los sectores de ciencias de lavida y química fina** (PID2020-115658GB-I00). IP1: *Anton Vidal Ferran*. Generación de Conocimiento. Ministerio de Ciencia e Innovación. From 2021 to 2025



## 2.2.14. INSTRUMENTATION SYSTEMS AND COMMUNICATIONS (SIC) (NANOPHOTOELECTRO, NANOENERGY)

(Department Electronics and Biomedical Engineering, Faculty Physics)

**Team**

*Angel Dieguez Barrientos* (Full Professor)
*Ana Maria Vilà Arbonés* (Associate Professor)
*Mauricio Moreno Sereno* (Associate Professor)
*Christophe Serre* (Associate Professor)
*Manuel Lopez De Miguel* (Associate Professor)

**Selected Papers**

- *Influence of the Nature of Aminoalcohol on ZnO Films Formed by Sol-Gel Methods*. **Vilà A.; Gómez-Núñez A.; Alcobé X.; Palacios S.; Puig Walz T.; López C.** 2023, Nanomaterials, 13, 6, 1057. Doi: 10.3390/nano13061057

**Selected Projects**

- **Integración de Microscopios miniaturizados en dispositivos Organo en un Chip** (PID2022-136833OB-C21). IP: **Angel Dieguez Barrientos**. Ministerio de Ciencia e Innovación (2023-2026)
- **Microscopi multi-hologràfic digital en la mida d’un xip.** F2I-PdC_2021-006. IP1: *Anna Vilà Arbonés* / IP2: *Angel Dieguez Barrientos*. Convocatòria Prova de concepte 2021. Fons per a l’Impuls de la Innovació - Fundació Bosch i Gimpera. 2022-2023

## 2.2.15. LABORATORY OF ELECTRON NANOSCOPIES (LENS)- MICRO AND NANOTECHNOLOGY AND NANOSCOPIES FOR ELECTRONIC AND ELECTROPHOTONIC DEVICES (MIND) (NANOMET)

(Department Electronics and Biomedical Engineering, Faculty Physics)

**Team**

*Francisca Peiró Martínez* (Full Professor)
*Sònia Estradé Albiol* (Associate Professor)
*Lluís Yedra Cardona* (Postdoctoral Researcher-Juan de la Cierva)
*Daniel del Pozo Bueno* (Predoctoral Researcher)
*Javier Blanco Portals* (Predoctoral Researcher)
*Pranjal Nandi* (Predoctoral Researcher)
*Beatriz Vargas Carosi* (Predoctoral Researcher)
*Vanessa Costa Ledesma* (Predoctoral Researcher)
*Gemma Martin Malpartida* (Collaborator)
*Jose Manuel Rebled Corselles* (Collaborator)
*Luís López Conesa* (Collaborator)
*Catalina Coll Benejam* (Collaborator)

**Selected Papers**

- **Comparative of machine learning classification strategies for electron energy loss spectroscopy: Support vector machines and artificial neural networks**. *del-Pozo-Bueno D.; Kepaptsoglou D.; Peiró F.; Estradé S.* 2023, Ultramicroscopy, 253, 113828. Doi: 10.1016/j.ultramic.2023.113828
- **Localization and Directionality of Surface Transport in Bi2Te3 Ordered 3D Nanonetworks**. *Ruiz-Clavijo A.; Pérez N.; Caballero-Calero O.; Blanco J.; Peiró F.; Plana-Ruiz S.; López-Haro M.; Nielsch K.; Martín-González M.* 2023, ACS Nano, 17, 17. Doi: 10.1021/acsnano.3c04160
- **Enhanced diffusion barrier layers for avoiding degradation in SOFCs aged for 14000 h during 2 years.** *Bernadet L.; Segura-Ruiz J.; Yedra L.; Estrade S.; Peiró F.; Montinaro D.; Torrell M.; Morata A.; Tarancón A.* 2023, Journal of Power Sources, 555, 232400. Doi: 10.1016/j.jpowsour.2022.232400

**Selected Projects**

- **ICREA ACADEMIA 2022**. IP: *Francisca Peiró Martínez*. Generalitat de Catalunya (2023-2027)

- **Nuevos procedimientos instrumentales y de análisis de datos en microscopía electrónica de transmisión (NEOTEM)**. PID2022-138543NB-C21. IP: Francisca Peiró Martínez. Ministerio de Ciencia e Innovación (2023-2026)

## 2.2.16. LABORATORY OF MOLECULAR DESIGN (LABMOLDESIGN)

### Team

*Guillem Aromí Bedmar* (Full Professor)
*David Aguilà Avilés* (Tenure-Track Lecturer)
*Leoni A. Barrios Moreno* (Tenure-Track Lecturer - Serra Hunter)
*Valentin Novikov* (Distinguished Researcher "Beatriz Galindo")
*Zahra Hosseinzadeh* (Postdoctoral Researcher)
*Diamantuula Maniaki* (Predoctoral Researcher)

### Selected Papers

- *L. A. Barrios, S. J. Teat, O. Roubeau, G. Aromí*, **"A supramolecular helicate with two independent FeII switchable centres and a [Fe(anilate)3]3− guest"** Chem. Commun. 2023, 59, 10628-10631. Doi: 10.1039/d3cc02278a
- *D. Maniaki, A. Sickinger, L. A. B. Moreno, D. Aguila, O. Roubeau, N. S. Settineri, Y. Guyot, F. Riobe, O. Maury, L. A. Galan, G. Aromi*, **"Distributive Nd-to-Yb Energy Transfer within Pure YbNdYb Heterometallic Molecules"**, Inorg. Chem. 2023, 62, 3106-3115. Doi: 10.1021/acs.inorgchem.2c03940

### Selected Projects

LabMolDesign members are PI1 of all these projects:

- **"Supramolecular Control of Spin-Based Qubits (SupraQubit)"** PID2022-137764OB-I00, MCIN, Generación de Conocimiento (2023-2027)
- **"Supramolecular multifunctional magnetic switches (SUMUMS)"** (CNS2022-135816). MCIN, Convocatoria 2022 - «Incentivación de la consolidación investigadora» (2023-2025).
- **"Molecular Quantum Processors for Quantum Communications"** NextGenerationEU (PRTR-C17.I1). Planes Complementarios: Comunicación Cuántica. Euroean Union through MCIN and Generalitat de Catalunya (2021-2025)

## 2.2.17. LABORATORY OF NANOSTRUCTURED AND NANOCOMPOSITE MATERIALS (LM2N) (NANOMAGNETICS/NANOSMAT)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

### Team

*Albert Figuerola Silvestre* (Associate Professor)
*Marta Estrader Bofarull* (Ramon y Cajal Researcher)
*Mengxi Lin* (Predoctoral Researcher)

### Selected Papers

- **Elucidating Individual Magnetic Contributions in Bi-Magnetic Fe3O4/Mn3O4 Core/Shell Nanoparticles by Polarized Powder Neutron Diffraction**. *Golosovsky I.V.; Kibalin I.A.; Gukasov A.; Roca A.G.; López-Ortega A.; Estrader M.; Vasilakaki M.; Trohidou K.N.; Hansen T.C.; Puente-Orench I.; Lelièvre-Berna E.; Nogués J.* 2023, Small Methods, 7, 10, 2201725. Doi: 10.1002/smtd.202201725
- **Emergence of magnetic nanoparticles in photothermal and ferroptotic therapies**. *Van de Walle A.; Figuerola A.; Espinosa A.; Abou-Hassan A.; Estrader M.; Wilhelm C.* 2023, Materials Horizons, 1011. Doi: 10.1039/d3mh00831b

### Selected Projects

- **Hacia nuevos nanomateriales para tecnologías emergentes**. PID2019-106165GB-C22. Ministerio de Ciencia e Innovación. IP1: *Albert Figuerola Silvestre* / IP2: *Marta Estrader Bofarull*. 2020-2023



## 2.2.18. LASER- MICRO AND NANOTECHNOLOGY AND NANOSCOPIES FOR ELECTRONIC AND ELECTROPHOTONIC DEVICES (NANOPHOTOELECTRO)

(Department Applied Physics, Faculty Physics)

### Team

*Pere Serra Coromina* (Full Professor)
*Martí Duocastella Solà* (Full Professor – ERC Consolidator Grant (www.ub.edu/dlight))
*Juan Marcos Fernández Pradas* (Associate Professor)
*Ernest Martí Jerez* (Predoctoral Researcher)
*Narcís Vilar Solé* (Industrial Predoctoral Researcher)

### Selected Papers

- **Substrate Reshaping for Optically Tuned Liquid-Printed Microlenses Beyond Their Wetting Properties**. *Martí Jerez E.; Fernández Pradas J.M.; Serra P.; Duocastella M.* 2023, Advanced Materials Technologies, 8, 19, 2300564. Doi: 10.1002/admt.202300564
- **Enhanced light focusing inside scattering media with shaped ultrasound**. *Mestre-Torà B.; Duocastella M.* 2023, Scientific Reports, 13, 1, 11511. Doi: 10.1038/s41598-023-38598-5
- **Video-rate quantitative phase imaging with dynamic acousto-optic defocusing.** *Alexandropoulos C.; Duocastella M.* 2023, Optics and Lasers in Engineering, 169, 107692. Doi: 10.1016/j.optlaseng.2023.107692
- **Rapid quantification of 3D ultrasound fields with wavefront sensing and Schlieren tomography.** *Colom M.; Ricci P.; Duocastella M.* 2023, Ultrasonics, 135, 107115. Doi: 10.1016/j.ultras.2023.107115

### Selected Projects

- ICREA ACADEMIA 2022. IP: *Marti Duocastella Solà*. Generalitat de Catalunya (2023-2027).
- Technology for real-time visualizing and modelling of fundamental process in living organoids towards new insights into organ-specific health, disease, and recovery (OrganVision). FET OPEN, 964800. UB-IP: *Martí Duocastella Solà* (2021-2025)
- Ultrasonic Endoscopes for DEEP Light Focusing (DEEP). ERC Consolidator Grant (ERC-2020-COG), 101002460. IP: *Martí Duocastella Solà* (2021-2025)

## 2.2.19. MAGNETIC INTERACTIONS AND MOLECULAR MAGNETISM (NANOMAGNETICS)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

### Team

*Ramón Vicente Castillo* (Full Professor)
*Albert Escuer Fité* (Full Professor)
*Mohamed Salah El Fallah* (Full Professor)
*Júlia Mayans Ayats* (Tenure-Track Lecturer)
*Evangelos Pilichos* (Postdoctoral Researcher)
*Annia Tubau Ribot* (Predoctoral Researcher)
*Joan Serra Castelló* (Predoctoral Researcher)
*Ernesto Costa Villén* (Predoctoral Researcher)
*Sergio Caballero Gutierrez* (Predoctoral Researcher)

### Selected Papers

- **Field-Induced Slow Magnetic Relaxation in a New Family of Tetranuclear Double-Stranded Cu2II-Ln2III Metallohelicates**. *Caballero S.; Pilichos E.; Font-Bardia M.; Mayans J.; Escuer A.* 2023, Crystal Growth and Design, 23, 5. Doi: 10.1021/acs.cgd.3c00121
- **Slow Magnetic Relaxation in Silver(II) Macrocyclic Systems**. *Serra J.; Font-Bardia M.; Escuer A.; Mayans J.* 2023, Inorganic Chemistry, 62, 46. Doi: 10.1021/acs.inorgchem.3c02265
- **Magnetic and optical studies of a new family of multidimensional and multiproperty PO-lanthanide(iii) derived systems.** *Pilichos E.; Tubau I.; Speed S.; Font-Bardia M.; Escuer A.; Grabulosa A.; Mayans J.* 2023, Dalton Transactions, 52, 8. Doi: 10.1039/d2dt03621e

## 2.2.20. MAGNETIC SOFT MATTER GROUP (NANOBIO)

(Department Condensed Matter Physics, Faculty Physics)

### Team

*Pietro Tierno* (Full Professor - ERC Consolidator Grant)
*Eric Cereceda López* (Predoctoral Researcher)

### Selected Papers

- **Overcrowding induces fast colloidal solitons in a slowly rotating potential landscape**. *Cereceda-López E.; Antonov A.P.; Ryabov A.; Maass P.; Tierno P.* 2023, Nature Communications, 14 , 1, 6448. Doi: 10.1038/s41467-023-41989-x
- **Unvezling the Rolling to Kayak Transition in Propelling Nanorods with Cargo Trapping and Pumping.** *Junot G.; Calero C.; García-Torres J.; Pagonabarraga I.; Tierno P.* 2023, Nano Letters, 23, 3. Doi: 10.1021/acs.nanolett.2c03897
- **Large Scale Zigzag Pattern Emerging from Circulating Active Shakers.** *Junot G.; De Corato M.; Tierno P.* 2023, Physical Review Letters, 131, 6, 068301. Doi: 10.1103/PhysRevLett.131.068301
- **Geometrical control of topological charge transfer in Shakti-Cairo colloidal ice**. *Rodríguez-Gallo C.; Ortiz-Ambriz A.; Nisoli C.; Tierno P.* 2023, Communications Physics, 6, 1, 113. Doi: 10.1038/s42005-023-01236-7

### Selected Projects

- **ENgineering FrustratiOn in aRtificial Colloidal icEs: degeneracy, exotic lattices and 3D states (ENFORCE).** ERC Consolidator Grant. IP: *Pietro Tierno.* (2020-2024)

## 2.2.21. MAGNETISM (NANOMAGNETICS)

(Department Condensed Matter Physics, Faculty Physics)

### Team

Antoni García Santiago (Associate Professor)
Joan Manel Hernández Ferràs (Associate Professor)
Ferran Macià Bros (Associate Professor)
Marius Vasile Costache (Associate Professor)
Blai Casals Montserrat (Tenure-Track Lecturer)
Marc Rovirola Metcalfe (Predoctoral Researcher)
Javier Tejada Palacios (Collaborator)

### Selected Papers

- **Resonant and Off-Resonant Magnetoacoustic Waves in Epitaxial Fe3Si/GaAs Hybrid Structures.** *Rovirola M.; Waqas Khaliq M.; Casals B.; Foerster M.; Niño M.A.; Aballe L.; Herfort J.; Hernàndez J.M.; Macià F.; Hernández-Mínguez A.* 2023, Physical Review Applied, 20, 3, 034052. Doi: 10.1103/PhysRevApplied.20.034052

- **Spin pumping in NbRe/Co superconductor-ferromagnet heterostructures.** *Cirillo C.; Rovirola M.; González C.; Casals B.; Hernàndez J.M.; Macià F.; García-Santiago A.; Attanasio C.* 2023, Superconductor Science and Technology, 36, 7, 074001. Doi: 10.1088/1361-6668/acd1c0

- **GHz sample excitation at the ALBA-PEEM**. 2023. *Khaliq M.W.; Álvarez J.M.; Camps A.; González N.; Ferrer J.; Martinez-Carboneres A.; Prat J.; Ruiz-Gómez S.; Niño M.A.; Macià F.; Aballe L.; Foerster M.* Ultramicroscopy, 250, 113757. Doi: 10.1016/j.ultramic.2023.113757

### Selected Projects

- **Control acústico de excitaciones magnèticas en dispositivos nanométricos**. PID2020-113024GB-I00. IP1: *Joan Manel Hernández Ferràs* / IP2: *Ferran Macià Bros*. Ministerio de Ciencia, Innovación y Universidades. 2021-2024
- **Espín de electrones - Actuación y detección de movimiento mecánico.** CNS2022-135821. IP: *Marius Vasile Costache*. Ministerio de Ciencia e Innovación (2023-2025)



## 2.2.22. MATERIALS FOR ENERGY, PHOTONICS AND CATALYSIS (ENPHOCAMAT) (NANOSMAT)

(Department Applied Physics, Faculty Physics)

### Team

*Enric Bertran Serra* (Full Professor)
*José Luis Andújar Bella* (Associate Professor)
*Franc Güell Vilà* (Associate Professor)
*Roger Amade Rovira* (Associate Professor)
*Stefanos Chaitoglou* (Postdoctoral Researcher Beatriu de Pinós)
J*ordi Díaz Marcos* (Adjunct Lecture)
*Islam Alshaikh* (Collaborator)

### Selected Papers

- **Hybrid Nanostructured Compounds of Mo2C on Vertical Graphene Nanoflakes for a Highly Efficient Hydrogen Evolution Reaction**. *Chaitoglou S.; Amade R.; Ospina R.; Bertran-Serra E.* 2023, ACS Applied Energy Materials,6, 11. Doi: 10.1021/acsaem.3c00625
- **Efficient flexible electrodes for lithium-ion batteries utilizing well-dispersed hybrid Mo2C nanoparticles on vertically-oriented graphene nanowalls**. *Farid G.; Amade R.; Chaitoglou S.; Alshaikh I.; Ospina R.; Ma Y.; Bertran-Serra E.* 2023, Journal of Alloys and Compounds, 968, 172109. Doi: 10.1016/j.jallcom.2023.172109
- **Advancements in Plasma-Enhanced Chemical Vapor Deposition for Producing Vertical Graphene Nanowalls**. *Bertran-Serra E.; Rodriguez-Miguel S.; Li Z.; Ma Y.; Farid G.; Chaitoglou S.; Amade R.; Ospina R.; Andújar J.-L.* 2023, Nanomaterials, 13, 18, 2533. Doi: 10.3390/nano13182533
- **Temperature-modulated synthesis of vertically oriented atomic bilayer graphene nanowalls grown on stainless steel by inductively coupled plasma chemical vapour deposition**. *Bertran-Serra E.; Musheghyan-Avetisyan A.; Chaitoglou S.; Amade-Rovira R.; Alshaikh I.; Pantoja-Suárez F.; Andújar-Bella J.-L.; Jawhari T.; Perez-del-Pino A.; Gyorgy E.* 2023, Applied Surface Science, 610, 155530. Doi: 10.1016/j.apsusc.2022.155530

### Selected Projects

- **Nuevos materiales para la evolución electrocatalítica de hidrogeno**. TED2021-132070B-C21. IP1: *Roger Amade Rovira* / IP2: *Stefanos Chaitoglou*. Convocatoria 2021 de ayudas a Proyectos estratégicos orientados a la transición ecológica y a la transición digital. Ministerio de Ciencia e Innovación (MICINN). 2022-2024
- **Síntesis y funcionalización de nanoparedes de grafeno para detección de hidrogeno.** TED2021-131442B-C33. IP1: *Enric Bertran Serra* / IP2: *Frank Güell Vilà*. Convocatoria 2021 de ayudas a Proyectos estratégicos orientados a la transición ecológica y a la transición digital. Ministerio de Ciencia e Innovación (MICINN). 2022-2024
- **"Fabricación avanzada de supercondensadores híbridos"**. PDC2021-121868-C22. IP1: *Enric Bertran* / IP2: *Roger Amadé*: MCIN/AEI/10.13039/5011 00011033 and "NextGenerationEU"/PRTR".

## 2.2.23. MATERIALS: PHASE TRANSITIONS (NANOMET)

(Department Condensed Matter Physics, Faculty Physics)

### Team

*Antoni Planes Vila* (Emeritus Professor)
*Lluís Mañosa Carrera* (Full Professor)
*Maria Teresa Castán Vidal* (Full Professor)
*Enric Stern Taulats* (Postdoctoral Researcher Juan de la Cierva)
*Marcel Porta Tena* (Adjunct Lecturer)
*Michela Romanini* (Collaborator)

### Selected Papers

- **Cross-coupling contribution to the isothermal entropy change in multicaloric materials**. *Mañosa L.;*

*Stern-Taulats E.; Gràcia-Condal A.; Planes A.* 2023, JPhys Energy, 5, 2, 024016. Doi: 10.1088/2515-7655/acc6ef

- **Large barocaloric effects in two novel ferroelectric molecular plastic crystals** *Salvatori A.; Aguilà D.; Aromí G.; Mañosa L.; Planes A.; Lloveras P.; Pardo L.C.; Appel M.; Nataf G.F.; Giovannelli F.; Barrio M.; Tamarit J.L.; Romanini M.* 2023, Journal of Materials Chemistry A, 11, 23. Doi: 10.1039/d2ta10033a

### Selected Projects

- **Battery Thermal Management System Based on High Power Density Digital Microfluidic Magnetocaloric Cooling (Cool BatMan)**. PCI2022-132957. IP: *Lluís Mañosa Carrera*. Proyectos de Colaboración Internacional 2022. Ministerio de Ciencia e Innovación (MICINN). (2022-2025)

## 2.2.24. MECHANISMS OF REACTIONS IN INORGANIC CHEMISTRY (NANOSMAT)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

### Team

Manuel Martínez López (Full Professor)
Montserrat Sofia Ferrer García (Associate Professor)

### Selected Papers

- **Fe(II) complexes of pyridine-substituted thiosemicarbazone ligands as catalysts for oxidations with hydrogen peroxide**. *Castillo C.E.; Gonzálvez M.A.; Algarra A.G.; Fernández-Trujillo M.J.; Ferrer M.; Martínez M.; Basallote M.G.* 2023, Dalton Transactions, 52, 40. Doi: 10.1039/d3dt02442c
- **Kinetico-Mechanistic Studies on a Reactive Organocopper(II) Complex: Cu-C Bond Homolysis versus Heterolysis**. *Gonzálvez M.A.; Williams C.M.; Martínez M.; Bernhardt P.V.* 2023, Inorganic Chemistry, 62, 11. Doi: 10.1021/acs.inorgchem.3c00127

### Selected Projects

- **Estudios cinético-mecanísticos de la reactividad de compuestos de coordinación en disolución: la importancia de las variables inocentes en los parámetros de activación**. PID2019-107006GB-C21. IP: *Manuel Martínez López*. Ministerio de Ciencia, Innovación y Universidades. (2020-2023)

## 2.2.25. MICRO AND NANOTECHNOLOGY AND NANOSCOPIES FOR ELECTRONIC AND ELECTROPHOTONIC DEVICES (MIND) (NANOPHOTOELECTRO)

(Department Electronics and Biomedical Engineering, Faculty Physics)

### Team

*Blas Garrido Fernández* (Full Professor)
*Albert Cirera Hernández* (Full Professor)
*Juan Daniel Prades Garcia* (Full Professor)
*Albert Romano Rodríguez* (Full Professor)
*Paolo Pellegrino* (Associate Professor)
*Daniel Navarro Urrios* (Associate Professor)
*Sergio Hernández Márquez* (Associate Professor)
*Cristian Fàbrega Gallego* (Associate Professor)
*Olga Casals Guillén* (Tenure-Track Lecturer)
*Giovanni Vescio* (Postdoctoral Researcher)
*Sachin Tatyasaheb Navale* (Postdoctoral Researcher Marie Sklodowska-Curie)
*Niravkumar Joshi* (Postdoctoral Researcher)
*Elena López Aymerich* (Predoctoral Researcher)
*Joshua Diago Forero* (Predoctoral Researcher)
*Ignasi Fort Grandas* (Predoctoral Researcher)
*Yuzelfy Mendoza Gamero* (Predoctoral Researcher)
*Francisco de P. Hernandez Ramirez* (Adjunct Lecture)
*Anna Estany Macià* (Technician)



### Selected Papers

- **Back-compatible Color QR Codes for colorimetric applications**. *Benito-Altamirano I.; Martínez-Carpena D.; Casals O.; Fábrega C.; Waag A.; Prades J.D.* 2023, Pattern Recognition, 133, 108981. Doi: 10.1016/j.patcog.2022.108981
- **Highly sensitive SnO2 nanowire network gas sensors.** *Domènech-Gil G.; Samà J.; Fàbrega C.; Gràcia I.; Cané C.; Barth S.; Romano-Rodríguez A.* 2023, Sensors and Actuators B: Chemical, 383. Doi: 133545 10.1016/j.snb.2023.133545
- **Contactless characterization of the elastic properties of glass microspheres**. *Maire J.; Necio T.; Chávez-Ángel E.; Colombano M.F.; Jaramillo-Fernández J.; Sotomayor-Torres C.M.; Capuj N.E.; Navarro-Urrios D.* 2023, APL Materials, 11, 4, 041128. Doi: 10.1063/5.0146969
- **Unidirectional Synchronization of Silicon Optomechanical Nanobeam Oscillators by External Feedback**. *Alonso-Tomás D.; Capuj N.E.; Mercadé L.; Griol A.; Martínez A.; Navarro-Urrios D.* 2023, ACS Photonics. Doi: 10.1021/acsphotonics.3c01397
- **Fully Inkjet-Printed Green-Emitting PEDOT:PSS/NiO/Colloidal CsPbBr3/SnO2 Perovskite Light-Emitting Diode on Rigid and Flexible Substrates**. *Vescio G.; Mathiazhagan G.; González-Torres S.; Sanchez-Diaz J.; Villaueva-Antolí A.; Sánchez R.S.; Gualdrón–Reyes A.F.; Oszajca M.; Linardi F.; Hauser A.; Vinocour-Pacheco F.A.; Żuraw W.; Öz S.; Hernández S.; Mora-Seró I.; Cirera A.; Garrido B.* 2023, Advanced Engineering Materials, 25, 21, 2300927. Doi: 10.1002/adem.202300927

### Selected Projects

- **Tecnologías disruptivas para LEDs y Displays basadas en impresión Inkjet de perovskitas libres de plomo**. PID2022-140978OB-I00. IP: *Albert Cirera Hernández*. Ministerio de Ciencia e Innovación (2023-2026)
- **Integrated thermo-optically activated Nanosensors for environmental monitoring (Nano4E)**. IP: *Juan Daniel Prades Garcia*. The Austrian Research Promotion Agency (FFG) (2023-2026)
- **Towards ALL-optical sEnsinG and signal pRocessing using cavity and moleculaR Optomechanics**. TED2021-132040B-C21. IP1: *Daniel Navarro Urrios* / IP2: *Albert Romano Rodríguez*. Convocatoria 2021 de ayudas a Proyectos estratégicos orientados a la transición ecológica y a la transición digital. Ministerio de Ciencia e Innovación (MICINN) (2022-2024)
- **Colorimetric Indoor Air Quality Sensors (ColorIndS).** INNOTEC. ACE034/21/000057. IP: *Cristian Fàbrega Gallego*. Convocatòria per a l'any 2021 de la línia de subvencions per a la realització de projectes de recerca industrial i desenvolupament experimental entre empreses catalanes i desenvolupadors de tecnologia acreditats TECNIO (projectes INNOTEC) (2022-2024)
- **Continuous two-dimensional Stretch monitoring of fresh tissue Biopsies (StretchBio)**. H2020 FET-OPEN. IP: *Albert Romano Rodríguez* (2021-2025)

## 2.2.26. MICROBIAN ENZYMES FOR INDUSTRIAL APPLICATIONS GROUP (NANOBIO)

(Department Genetics, Microbiology and Statistics, Faculty Biology)

### Team

*Susana Valenzuela Mayorga* (Adjunct Lecturer)
*Lourdes Verónica Cabañas* (Predoctoral Researcher)

## 2.2.27. MINERAL RESOURCES RESEARCH GROUP (NANOMET)

(Department Mineralogy, Petrology and Applied Geology, Faculty Earth Sciences)

### Team

*Josep Roqué Rosell* (Associate Professor)
*Joaquín Antonio Proenza Fernandez* (Associate Professor)
*Joan Carles Melgarejo Draper* (Associate Professor)
*M. Abigaíl Jiménez Franco* (Postdoctoral Researcher)
*Robert Oliva Vidal* (Collaborator Geosciencies Barcelona (GEO3BCN-CSIC))
*Jordi Ibañez Insa* (Collaborator Geosciencies Barcelona (GEO3BCN-CSIC))

### Selected Papers

- **Nanomaterial accumulation in boiling brines enhances epithermal bonanzas.** *Cano N.; González-Jiménez J.M.; Camprubí A.; Domínguez-Carretero D.; González-Partida E.; Proenza J.A.* 2023, Scientific Reports, 13, 1, 14985. Doi: 10.1038/s41598-023-41756-4
- **A track record of Au–Ag nanomelt generation during fluid-mineral interactions**. *Domínguez-Carretero D.; González-Jiménez J.M.; Proenza J.A.; Villanova-de-Benavent C.; Llovet X.; Garcia-Casco A.* 2023, Scientific Reports, 13, 1, 7895. Doi: 10.1038/s41598-023-35066-y
- **Rare Earth Elements' particles in road dust: A mineralogical perspective for source identification.** *Navarro-Ciurana D.; Corbella M.; Farré-de-Pablo J.; Corral I.; Buixadera E.; Morera-Valverde R.; Proenza J.A.* 2023, Atmospheric Environment, 309, 119927. Doi: 10.1016/j.atmosenv.2023.119927
- **Germanium- and gallium-rich sphalerite in Mississippi Valley–type deposits: the San Vicente district and the Shalipayco deposit, Peru**. *Torró L.; Millán-Nuñez A.J.; Benites D.; González-Jiménez J.M.; Laurent O.; Tavazzani L.; Vallance J.; Chelle-Michou C.; Proenza J.A.; Flores C.; Melgarejo J.C.; Rosas S.; Fontboté L.* 2023, Mineralium Deposita, 58, 5. Doi: 10.1007/s00126-023-01160-4

### Selected Projects

- **Recursos minerales en la litosfera de arcos volcánicos intra-oceánicos: una perspectiva a partir de sistemas minerales (MISYAP)** Ministerio de Ciencia e Innovación PID2019-105625RB-C21. IP: *Joaquín Antonio Proenza Fernandez*. Ministerio de Ciencia, Innovación y Universidades. (2020-2024)

## 2.2.28. MOLECULAR NANOSCIENCE LABORATORY (NANOMAGNETICS)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

### Team

*E. Carolina Sañudo Zotes* (Associate Professor)
*Guillem Gabarró Riera* (Predoctoral Researcher)

### Selected Papers

- **Luminescent and Magnetic [TbEu] 2D Metal–Organic Frameworks.** *Bartolomé, E.; Arauzo, A.; Fuertes, S.; Navarro-Spreafica, L.; Sevilla, P.; Fernández Cortés, H.; Settineri, N.; Teat, S. J.; Sañudo, E. C.* Dalton Transactions 2023. Doi: 10.1039/d3dt00367a
- **Magnetic Molecules on Surfaces: SMMs and Beyond**. *Gabarró-Riera, G.; Aromí, G.; Sañudo, E. C. Coord Chem Rev* 2023, 475. Doi: 10.1016/j.ccr.2022.214858

### Selected Projects

- **Control supramolecular de qubits de espin**. PID2022-137764OB-I00. Ministerio de Ciencia, Innovación y Universidades. IPs: *Aromí Bedmar, Guillem / E. Carolina Sañudo* (2023-2026).
- **Diseño y Nanoestructuración de Moléculas Multifuncionales para el Avance de la Espintrónica**. PGC2018-098630-B-I00. Ministerio de Ciencia, Innovación y Universidades. IPs: *Aromí Bedmar, Guillem / E. Carolina Sañudo* (2019-2022).



## 2.2.29. MULTIFERROIC AND PHOTOVOLTAIC MATERIALS FOR RENEWABLE ENERGIES (MAMFER) (NANOENERGY)

(Department Applied Physics, Faculty Physics)

### Team

*Joan Bertomeu Balagueró* (Full Professor)
*Manuel Varela Fernández* (Full Professor)
*Cèsar Ferrater Martorell* (Associate Professor)
*Maria Del Carmen Polo Trasancos* (Associate Professor)
*Arturo Lousa Rodríguez* (Associate Professor)
*Julià Vidrier López* (Tenure-Track Lecturer)
*Regina Galceran Vercher* (Tenure-Track Lecturer)
*José Miguel Asensi López* (Associate Professor)
*Ana Luz Muñoz Rosas* (Visiting Postdoctoral Researcher)
*Thomas Tom* (Predoctoral Researcher)

### Selected Papers

- **Elimination of Interface Energy Barriers Using Dendrimer Polyelectrolytes with Fractal Geometry.** *Ros E.; Tom T.; Ortega P.; Martin I.; Maggi E.; Asensi J.M.; López-Vidrier J.; Saucedo E.; Bertomeu J.; Puigdollers J.; Voz C.* 2023, ACS Applied Materials and Interfaces, 15, 23. Doi: 10.1021/acsami.3c01930
- **Poly(amidoamine) Dendrimer as an Interfacial Dipole Modification in Crystalline Silicon Solar Cells.** *Tom T.; Ros E.; López-Vidrier J.; Asensi J.M.; Ortega P.; Puigdollers J.; Bertomeu J.; Voz C.* 2023, Journal of Physical Chemistry Letters, 14, 18. Doi: 10.1021/acs.jpclett.3c00643

### Selected Projects

- **Integración de nuevos contactos selectivos y capas activas en dispositivos de nueva generación para aplicaciones de energía renovable**. PID2022-138434OB-C53. IP: *Julià Vidrier López*. Ministerio de Ciencia e Innovación (2023-2026)

## 2.2.30. NANOBIOENGINEERING AND BIOMATERIALS UNIT (NANOBIO)

(Department Electronics and Biomedical Engineering, Faculty Physics)

### Team

*Josep Samitier Martí* (Full Professor)
*Óscar Castaño Linares* (Associate Professor)
*Romén Rodríguez Trujillo* (Tenure-Track Lecturer)
*Mònica Mir Llorente* (Adjunct Lecturer)
*Adrià Noguera Monteagudo* (Predoctoral Researcher)

### Selected Papers

- **BBB-on-a-chip with integrated micro-TEER for permeability evaluation of multi-functionalized gold nanorods against Alzheimer's disease**. *Palma-Florez S.; López-Canosa A.; Moralez-Zavala F.; Castaño O.; Kogan M.J.; Samitier J.; Lagunas A.; Mir M.* 2023, Journal of Nanobiotechnology, 21, 1, 115. Doi: 10.1186/s12951-023-01798-2
- **Cooperativity and oscillations: Regulatory mechanisms of K-Ras nanoclusters**. *Jurado M.; Zorzano A.; Castaño O.* 2023, Computers in Biology and Medicine, 166, 107455. Doi: 10.1016/j.compbiomed.2023.107455
- **Microfluidic-Assisted Interfacial Complexation of Extracellular Matrix Components to Mimic the Properties of Neural Tissues**. *Costa R.R.; Caballero D.; Soares da Costa D.; Rodriguez-Trujillo R.; Kundu S.C.; Reis R.L.; Pashkuleva I.* 2023, Advanced Materials Technologies, 8, 19, 2300983. Doi: 10.1002/admt.202300983

### Selected Projects

- **Plataforma microfluídica integrada como modelo de miocardio electrofisiológicamente relevante.** PID2021-124575OB-I00. IP: *Oscar Castaño Linares*. Convocatoria 2021 de ayudas a «Proyectos de Generación de Conocimiento». Modalidad Proyectos de «Investigación Orientada». Ministerio de Ciencia e Innovación (MICINN). (2022-2025)
- **Red de organoides neuronales humanos para el descubrimiento de fármacos** (ACE053/22/000086). ACE053/22/000086. IP: **Oscar Castaño Linares**. ACCIÓ. Agència de Suport a l'Empresa Catalana (2022-2025)

## 2.2.31. NANOBIOPHARMA (NANOPHARMAMED)

(Department Pharmacy and Pharmaceutical Technology and Physical-Chemical, Faculty Pharmacy and Food Sciences)

### Team

*Ana Calpena Campmany* (Associate Professor)
*Mireia Oliva Herrera* (Associate Professor)
*Lyda Halbaut Bellowa* (Associate Professor)
*Mireia Mallandrich Miret* (Tenure-Track Lecturer)
*Helen Lissette Alvarado Bonilla* (Adjunct Lecturer)
*Joaquim Suñer Carbó* (Adjunt Lecturer)
*Antonio De Padua Boix Montanes* (Adjunt Lecturer)
*María Rincón Díaz* (Adjunt Lecturer)
*Paola Bustos Salgado* (Postdoctoral Researcher Margarita Salas)
*Paulo Cesar Sarango Granda* (Predoctoral Researcher)
*Roya Mohammadi* (Predoctoral Researcher)
*Marcelle Silva de Abreu* (Collaborator)
*Guadalupe Del Carmen Abrego Escobar* (Collaborator)
*Beatriz Clares Maveros* (Collaborator)
*Lupe Carolina Espinoza Tituana* (Collaborator)

### Selected Papers

- **Therapeutic Applications of Essential Oils from Native and Cultivated Ecuadorian Plants: Cutaneous Candidiasis and Dermal Anti-Inflammatory Activity**. *Sosa L.; Espinoza L.C.; Valarezo E.; Bozal N.; Calpena A.; Fábrega M.-J.; Baldomà L.; Rincón M.; Mallandrich M.* 2023, Molecules, 28, 15, 5903. Doi: 10.3390/molecules28155903
- **Efficacy of Apremilast Gels in Mouse Model of Imiquimod-Induced Psoriasis Skin Inflammation**. *Silva-Abreu M.; Sosa L.; Espinoza L.C.; Fábrega M.-J.; Rodríguez-Lagunas M.J.; Mallandrich M.; Calpena A.C.; Garduño-Ramírez M.L.; Rincón M.* 2023, Pharmaceutics, 15, 10, 2403. Doi: 10.3390/pharmaceutics15102403
- **Permeation Protection by Waterproofing Mucosal Membranes**. *Coderch L.; Alonso C.; Calpena A.C.; Pérez-García M.L.; Clares-Naveros B.; Ramos A.; Martí M.* 2023, Pharmaceutics, 15, 12, 2698 Doi: 10.3390/pharmaceutics15122698

## 2.2.32. NANOENERGY AND ELECTRONIC MATERIALS (M2E) GROUP (NANOENERGY)

(Department Electronics and Biomedical Engineering, Faculty Physics)

### Team

*Joan Ramon Morante Lleonart* (Full Professor)

### Selected Papers

- **Engineering the Interfacial Microenvironment via Surface Hydroxylation to Realize the Global Optimization of Electrochemical CO2 Reduction**. *Han X., Zhang T., Biset-Peiró M., Zhang X., Li J., Tang W., Tang P., Morante J.R., Arbiol J.* ACS Applied Materials and Interfaces, 14, 28, 32157, 2022
- **Phase Engineering of Defective Copper Selenide toward Robust Lithium-Sulfur Batteries.** *Yang D., Li M., Zheng X., Han X., Zhang C., Jacas Biendicho J., Llorca J., Wang J., Hao H., Li J., Henkelman G., Arbiol J., Morante J.R., Mitlin D., Chou S., Cabot A.* ACS Nano, 16, 7, 11102, 2022

## 2.2.33. NANOMALARIA GROUP (NANOBIO)

Department Biochemistry and Molecular Biology. Faculty Biology)

### Team

*Santiago Imperial Ródenas* (Associate Professor)
*Xavier Fernández Busquets* (Collaborator-IBEC-CRESIB)

### Selected Papers

- *San Anselmo M, Lantero E, Avalos-Padilla Y, Bouzón-Arnáiz I, Ramírez M, Postigo A, Serrano JL, Sierra T, Hernández-Ainsa S, Fernàndez-Busquets X.* **Heparin-Coated Dendronized Hyperbranched Polymers for Antimalarial Targeted Delivery**. ACS Appl Polym Mater. 2023, 5, 1, 381–390. doi: 10.1021/acsapm.2c01553.
- *Fulgheri F, Manca ML, Fernàndez-Busquets X, Manconi M.* **Analysis of complementarities between nanomedicine and phytodrugs for the treatment of malarial infection.** Nanomedicine (Lond). 2023 Oct;18(23):1681-1696. doi: 10.2217/nnm-2023-0116
- *Fonte M, Fontinha D, Moita D, Caño-Prades O, Avalos-Padilla Y, Fernàndez-Busquets X, Prudêncio M, Gomes P, Teixeira C.* **New 4-(N-cinnamoylbutyl)aminoacridines as potential multi-stage antiplasmodial leads.** Eur J Med Chem. 2023 Oct 5;258:115575. doi: 10.1016/j.ejmech.2023.115575.

### Selected Projects

- Research grant, CaixaResearch Health Call 2023. Project title: **"Compact Analytical Tool for robust MALaria decentralized diagnosis and community surveillance".** (HR23-00679). IP: *Xavier Fernandez-Busquets* (2023 -2026).

## 2.2.34. NANOSCIENCE AND BIO-INORGANIC CHEMISTRY (NANOBIC) (NANOPHARMAMED)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

### Team

*Patrick Gamez Enamorado* (ICREA Researcher)
*Amparo Caubet Marín* (Associate Professor)
*Ana Belén Caballero Hernández* (Associate Professor)
*Piedad Herrera Ramírez* (Predoctoral Researcher)
*Guglielmo Spinelli* (Predoctoral Researcher)

### Selected Papers

- **Cytotoxicity of osmium(II) and cycloosmated half-sandwich complexes from 1-pyrenyl-containing phosphane ligands**. *Josa D.; Aguilà D.; Fontova P.; Soto-Cerrato V.; Herrera-Ramírez P.; Rafols L.; Grabulosa A.; Gamez P.* 2023. Dalton Transactions, 52, 24. Doi: 10.1039/d3dt00743j
- Steric hindrance, ligand ejection and associated photocytotoxic properties of ruthenium(II) polypyridyl complexes. *Herrera-Ramírez P.; Berger S.A.; Josa D.; Aguilà D.; Caballero A.B.; Fontova P.; Soto-Cerrato V.; Martínez M.; Gamez P.* 2023, Journal of Biological Inorganic Chemistry, 28, 4. Doi: 10.1007/s00775-023-01998-z
- **Cobalt(III)-py2en systems as potential carriers of β-ketoester-based ligands.** *Palmeira-Mello M.V.; Caballero A.B.; Herrera-Ramírez P.; Costa A.R.; Santana S.S.; Guedes G.P.; Caubet A.; Batista A.A.; Gamez P.; Lanznaster M.* 2023, Journal of Inorganic Biochemistry, 248, 112345. Doi: 10.1016/j.jinorgbio.2023.112345
- **Anti-toxoplasma activity and DNA-binding of copper(II) and zinc(II) coordination compounds with 5-nitroimidazole-based ligands.** *Navarro-Peñaloza R.; Anacleto-Santos J.; Rivera-Fernández N.; Sánchez-Bartez F.; Gracia-Mora I.; Caballero A.B.; Gamez P.; Barba-Behrens N.* 2023, Journal of Biological Inorganic Chemistry. Doi: 10.1007/s00775-023-02029-7

### Selected Projects

- **Fotosensibilizadores multifuncionales de rutenio(II) para fotoquimioterapia** (PID2020-115537RB-I00). IP1: *Patrick Gamez Enamorado* / IP2: *Ana Belén Caballero Hernández*. Ministerio de Ciencia e Innovación. (2021-2025)

## 2.2.35. NANOSTRUCTURE OF BIOMEMBRANES GROUP (NANOBIO)

(Department Pharmacy and Pharmaceutical Technology and Physical-Chemical, Faculty Pharmacy and Food Sciences)

### Team

*Maria Teresa Montero Barrientos* (Associate Professor)
*Òscar Domènech Cabrera* (Associate Professor)
*Martha Leticia Vázquez González* (Adjunct Lecturer)
*Adrià Botet Carreras* (Adjunct Lecturer)

### Selected Papers

- **On the uptake of cationic liposomes by cells: From changes in elasticity to internalization**. *Botet-Carreras A.; Marimon M.B.; Millan-Solsona R.; Aubets E.; Ciudad C.J.; Noé V.; Montero M.T.;*

*Domènech Ò.; Borrell J.H.* 2023, Colloids and Surfaces B: Biointerfaces, 221, 112968. Doi: 10.1016/j.colsurfb.2022.112968
- **PLGA Nanoparticles Containing Natural Flavanones for Ocular Inflammation**. *Bustos-Salgado P.; Domínguez-Villegas V.; Andrade-Carrera B.; Mallandrich M.; Calpena A.; Domènech O.; Martínez-Ruiz S.; Badía J.; Baldomà L.; Gómez de Aranda I.; Blasi J.; Garduño-Ramírez M.L.* 2023, Pharmaceutics, 15, 12, 2752. Doi: 10.3390/pharmaceutics15122752

## 2.2.36. NANOSTRUCTURED SYSTEMS FOR CONTROLLED DRUG DELIVERY (NANOPHARMAMED)

(Department Pharmacy and Pharmaceutical Technology and Physical-Chemical, Faculty Pharmacy and Food Sciences)

### Team

*Maria Luisa García López* (Full Professor)
*Espina García Marta* (Associate Professor)
*Elena Sánchez López* (Tenure-Track Lecturer)
*Gerard Esteruelas Navarro* (Predoctoral Researcher)
*Lorena Bonilla Vidal* (Predoctoral Researcher)
*Ana Laura Lopez Machado* (Predoctoral Researcher)
*Amanda Cano Fernández* (Collaborator-Fundación ACE)
*Fidencia Gamisans Linares* (Adjunct Lecturer)

### Research

- **Novel strategies enhancing endodontic disinfection: Antibacterial biodegradable calcium hydroxide nanoparticles in an ex vivo model.**

### Selected Papers

- **Novel strategies enhancing endodontic disinfection: Antibacterial biodegradable calcium hydroxide nanoparticles in an ex vivo model.** *Elmsmari F.; Delgado L.M.; Duran-Sindreu F.; Pérez R.A.; García M.L.; Teulé Trull M.; Afrashtehfar K.I.; González J.A.; Sánchez-López E.* 2023, International Journal of Pharmaceutics, 648, 123627. Doi: 10.1016/j.ijpharm.2023.123627
- **Dually Active Apigenin-Loaded Nanostructured Lipid Carriers for Cancer Treatment.** *Bonilla-Vidal L.; Świtalska M.; Espina M.; Wietrzyk J.; García M.L.; Souto E.B.; Gliszczyńska A.; López E.S.* 2023, International Journal of Nanomedicine, 18. Doi: 10.2147/IJN.S429565
- **Riluzole-Loaded Nanostructured Lipid Carriers for Hyperproliferative Skin Diseases.** *Llorente X.; Esteruelas G.; Bonilla L.; Agudelo M.G.; Filgaira I.; Lopez-Ramajo D.; Gong R.C.; Soler C.; Espina M.; García M.L.; Manils J.; Pujol M.; Sánchez-López E.* 2023, International Journal of Molecular Sciences, 24, 9, 8053. Doi: 10.3390/ijms24098053
- **Diclofenac Loaded Biodegradable Nanoparticles as Antitumoral and Antiangiogenic Therapy.** *Esteruelas G.; Souto E.B.; Espina M.; García M.L.; Świtalska M.; Wietrzyk J.; Gliszczyńska A.; Sánchez-López E.* 2023, Pharmaceutics, 15, 1, 102, Doi: 10.3390/pharmaceutics15010102

### Selected Projects

- Nanopartícules per a la desinfecció en endodòncia. F2I-PdC_2021-002. IP1: *M. Luisa García López* / IP2: *Elena Sánchez López*. Convocatòria Prova de concepte 2021. Fons per a l'Impuls de la Innovació - Fundació Bosch i Gimpera (2022-2023)
- **Comportamiento fisicoquímico y biofarmacéutico de nuevas nanoestructuras no lipídicas para la liberación de fármacos**. PID2021-122187NB-C32. IP1: *M. José García Celma* / IP2: *M. Luisa García López*. Convocatoria 2021 de ayudas a «Proyectos de Generación de Conocimiento». Modalidad Proyectos de «Investigación No Orientada» Ministerio de Ciencia, Innovación y Universidades. (2022-2025)





## 2.2.37. NANOSYSTEMS STATISTICAL PHYSICS (NANOMET)

(Department Condensed Matter Physics, Faculty Physics)

### Team

*Miguel Rubí Capaceti* (Emeritus Professor)
*Andrés Arango Restrepo* (Predoctoral Researcher)

### Selected Papers

- **Field emission in vacuum resonant tunneling heterostructures with high current densities.** *Davidovich M.V.; Nefedov I.S.; Glukhova O.E.; Slepchenkov M.M.; Rubi J.M.* 2023, Scientific Reports, 13, 1, 19365. Doi: 10.1038/s41598-023-44900-2
- **Predicting cancer stages from tissue energy dissipation.** *Arango-Restrepo A.; Rubi J.M.* 2023, Scientific Reports, 13, 1, 15894. Doi: 10.1038/s41598-023-42780-0
- **Chiral symmetry breaking induced by energy dissipation.** *Arango-Restrepo A.; Arteaga O.; Barragán D.; Rubi J.M.* 2023, Physical Chemistry Chemical Physics, 25, 13. Doi: 10.1039/d2cp05939h
- **Variations in activation energy and nuclei size during nucleation explain chiral symmetry breaking.** *Arango-Restrepo A.; Barragán D.; Rubi J.M.* 2023, Physical Chemistry Chemical Physics, 25, 42. Doi: 10.1039/d3cp03220e

### Selected Projects

- **Materia activa, confinada y autoensamblada fuera de equilibrio**. PID2021-126570NB-I00. IP: *Miguel Rubí Capaceti.* Ministerio de Ciencia, Innovación y Universidades. (2022-2025)

## 2.2.38. ORGANIC MATERIALS UNIT (NANOSMAT)

(Department Inorganic and Organic Chemistry, Faculty Chemisty)

### Team

*Maria Dolors Velasco Castrillo* (Full Professor)
*Jaume García Amorós* (Associate Professor)
*Pedro Güixens Gallardo* (Postdoctoral Researcher Margarita Salas)
*Clara Fabregat Pallejà* (Predoctoral Researcher)

### Selected Papers

- **Programming Positive Mechanofluorescence in Liquid Crystalline Elastomers.** *Güixens-Gallardo P.; Brea I.; Manrique J.; Shohraty F.; Garcia-Amorós J.; Velasco D.* 2023, ACS Applied Polymer Materials, 5, 8. Doi: 10.1021/acsapm.3c01050
- **Insight into the Diindolo[3,2-b:2′,3′-h]carbazole Core as an Air-Stable Semiconductor for OTFTs.** *Bujaldón R.; Vilche A.; Puigdollers J.; Puigjaner C.; Alcobé X.; Velasco D.* 2023, ACS Applied Electronic Materials, 5, 7. Doi:10.1021/acsaelm.3c00412
- **Photochromic heteroarylethenes with fast thermal isomerization kinetics.** *Garcia-Amorós J.; Castro M.C.R.; Raposo M.M.M.; Velasco D.* 2023, Dyes and Pigments, 210, 111000. Doi: 10.1016/j.dyepig.2022.111000

## 2.2.39. PEPTIDES AND PROTEINS: PHYSICOCHEMICAL STUDIES (NANOBIO)

(Department Pharmacy and Pharmaceutical Technology and Physical-Chemical, Faculty Pharmacy and Food Sciences)

### Team

*Yolanda Cajal Visa* (Associate Professor)
*Josefina Prat Aixelà* (Associate Professor)
*Maria Montserrat Pujol Cubells* (Associate Professor)
*Montserrat Muñoz Juncosa* (Associate Professor)

### Selected Papers

- **Novel customized age-dependent corneal membranes and interactions with biodegradable nanoparticles loaded with dexibuprofen.** *Esteruelas G.; Ortiz A.; Prat J.; Vega E.; Muñoz-Juncosa M.; López M.L.G.; Ettcheto M.; Camins A.; Sánchez-López E.; Pujol M.* 2023, Colloids and Surfaces B: Biointerfaces, 228, 113394. Doi: 10.1016/j.colsurfb.2023.113394
- **Linker-Free Synthesis of Antimicrobial Peptides Using a Novel Cleavage Reagent: Characterisation of the Molecular and Ionic Composition by nanoESI-HR MS.** *Segovia R.; Díaz-Lobo M.; Cajal Y.; Vilaseca M.; Rabanal F.* 2023, Pharmaceutics, 15, 4, 1310. Doi: 10.3390/pharmaceutics15041310

## 2.2.40. PHARMACEUTICAL NANOTECHNOLOGY (NANOPHARMAMED)

(Department Pharmacy and Pharmaceutical Technology and Physical-Chemical, Faculty Pharmacy and Food Sciences)

### Team

*Maria José García Celma* (Full Professor)
*Marta Monge Azemar* (Adjunct Lecturer)
*Esteban Figueroa Becerra* (Predoctoral Researcher)

### Selected Projects

- **Comportamiento fisicoquímico y biofarmacéutico de nuevas nanoestructuras no lipídicas para la liberación de fármacos.** PID2021-122187NB-C32. IP1: *M. José García Celma* / IP2: *M. Luisa Garcia Lopez*. Convocatoria 2021 de ayudas a «Proyectos de Generación de Conocimiento». Modalidad Proyectos de «Investigación No Orientada». Ministerio de Ciencia, Innovación y Universidades. (2022-2025)



## 2.2.41. PHYSICS IN NANOBIOPHYSICS (NANOBIO)

(Department Condensed Matter Physics, Faculty Physics)

### Team

*Aurora Hernandez Machado* (Full Professor)
*Josep Ferré Torres* (Industrial Predoctoral Researcher)
*Lourdes Elvira Mendez Mora* (Predoctoral Researcher)
*Andreu Benavent Claro* (Predoctoral Researcher)
*Oscar Castillo Fernandez* (Postdoctoral collaborator - ISGLOBAL)

### Selected Papers

- **Modelling of chemotactic sprouting endothelial cells through an extracellular matrix**. *Ferre-Torres J.; Noguera-Monteagudo A.; Lopez-Canosa A.; Romero-Arias J.R.; Barrio R.; Castaño O.; Hernandez-Machado A.* 2023, Frontiers in Bioengineering and Biotechnology, 11, 1145550. Doi: 10.3389/fbioe.2023.1145550
- **Altered blood rheology in multiwidth microchannels: Hematocrit and tonicity variation.** *Riera-Llobet C.; Méndez-Mora L.; Cabello-Fusarés M.; Hernández-Machado A.* 2023, Physics of Fluids, 35, 8, 082017. Doi: 10.1063/5.0154713
- **Vesicle formation induced by thermal fluctuations.** *Gallen A.F.; Romero-Arias J.R.; Barrio R.A.; Hernandez-Machado A.* 2023, Soft Matter, 19, 16. Doi: 10.1039/d2sm01167k

### Selected Projects

Biomecánica a la microescala y microfluídica: experimentos y teoría. PID2022-137994NB-I00. IP: Aurora Hernandez Machado. Ministerio de Ciencia e Innovación. (2023-2026)

## 2.2.42. POLARIZED LIGHT APPLICATIONS & TECHNOLOGIES (PLAT) (NANOPHOTOELECTRO)

(Department Applied Physics, Faculty Physics)

### Team

*Oriol Arteaga Barriel* (Ramon y Cajal Researcher)
*Adolf Canillas Biosca* (Full Professor)
*Esther Pascual Miralles* (Full Professor)
*Jordi Gomis Bresco* (Tenure-Track Lecturer)

### Selected Papers

- **Use of complete temporal basis in polarimeters based on photoelastic modulators.** *Gomis-Brescó J.; Arteaga O.* 2023, Optics Letters, 48, 7. Doi: 10.1364/OL.487422
- **Wide-field Mueller matrix polarimetry for spectral characterization of basic biological tissues: Muscle, fat, connective tissue, and skin**. *Pardo I.; Bian S.; Gomis-Brescó J.; Pascual E.; Canillas A.; Bosch S.; Arteaga O.* 2023, Journal of Biophotonics. Doi: 10.1002/jbio.202300252
- **"On-The-Fly" Synthesis of Self-Supported LDH Hollow Structures Through Controlled Microfluidic Reaction-Diffusion Conditions.** *Mattera M.; Sorrenti A.; De Gregorio Perpiñá L.; Oestreicher V.; Sevim S.; Arteaga O.; Chen X.-Z.; Pané S.; Abellán G.; Puigmartí-Luis J.* 2023, Small. Doi: 10.1002/smll.202307621

### Selected Projects

- **Imagen polarimétrica para la mejora de la visibilidad y la detección en medios turbios.** PID2022-138699OB-I00. IP: *Oriol Arteaga Barriel*. Ministerio de Ciencia e Innovación (2023-2026)
- **Espectroscopía de polarización ultrasensible sin monocromador basada en moduladores fotoelásticos.** CNS2022-136051. Ministerio de Ciencia e Innovación (2023-2025)

## 2.2.43. SELF-ORGANIZED COMPLEXITY AND SELF-ASSEMBLING MATERIALS (NANOBIO, NANOSMAT)

(Department Materials Science and Physical Chemistry, Faculty Chemistry)

### Team

*Francesc Sagués Mestre* (Full Professor)
*Jordi Ignés Mullol* (Associate Professor)
*Joan Antoni Farrera Piñol* (Associate Professor)
*Ignasi Vélez Cerón* (Predoctoral Researcher)
*Olga Bantysh* (Predoctoral Researcher)

### Selected Papers

- **Multimodal fluorescence microscope with fast adaptive polarimetry.** *Martínez-Prat B.; Arteaga O.; Sagués F.; Ignés-Mullol J.* 2023, HardwareX, 16, e00480 Doi: 10.1016/j.ohx.2023.e00480
- **TIC Reorientation under Electric and Magnetic Fields in Homeotropic Samples of Cholesteric LC with Negative Dielectric Anisotropy.** *Oswald P.; Poy G.; Ignés-Mullol J.* 2023, Crystals, 13, 6, 957. Doi: 10.3390/cryst13060957

### Selected Projects

- **Física de no-equilibrio de materiales activos y biomaterials**. PID2022-137713NB-C21. IP: *Jordi Ignés Mullol*. Ministerio de Ciencia e Innovación. (2023-2026)

## 2.2.44. SOLAR ENERGY MATERIALS AND SYSTEMS (SEMS) GROUP (NANOENERGY)

(Department Electronics and Biomedical Engineering, Faculty Physics)

### Team

*Alejandro Pérez Rodríguez* (Full Professor)
*Lorenzo Calvo Barrio* (Adjunct Lecturer)
*Victor Izquierdo Roca* (Collaborator)
*Marcel Placidi* (Collaborator)

### Selected Papers

- **Cu2O-Cu@Titanium Surface with Synergistic Performance for Nitrate-to-Ammonia Electrochemical Reduction.** *Chavez M.E.; Biset-Peiró M.; Murcia-López S.; Morante J.R.* 2023, ACS Sustainable Chemistry and Engineering, 11, 9. Doi: 10.1021/acssuschemeng.2c05885
- **Hydrothermal Fabrication of Carbon-Supported Oxide-Derived Copper Heterostructures: A Robust Catalyst System for Enhanced Electro-Reduction of CO2 to C2H4.** 2023, ChemSusChem, 16, 19, e202300344. Doi: 10.1002/cssc.202300344

### Selected Projects

- **Análisis combinatorial, síntesis y caracterización avanzada de nuevos materiales basados en calcohaluros de baja dimensión para su integración en dispositivos fotovoltaicos.** PID2020-116719RB-C44. IP: *Lorenzo Calvo Barrio*. Ministerio de Ciencia e Innovación. (2021-2024)

## 2.2.45. STATISTICAL PHYSICS OF BIO-NANO SYSTEMS AND COMPLEX MATTER (NANOMET)

(Department Condensed Matter Physics, Faculty Physics)

### Team

*Giancarlo Franzese* (Associate Professor)
*Carlos Calero Borrallo* (Tenure-Track Lecture)
*Oriol Vilanova Gabarrón* (Predoctoral Researcher)
*Luis Enrique Coronas Serna* (Predoctoral Researcher)
*Gionni Marchetti* (Technician)

### Selected Papers

- **Exploring optimal graphene slit-pore width for the physical separation of water-methanol mixture.** *Bellido-Peralta R.; Leoni F.; Calero C.; Franzese G.* 2023, Journal of Molecular Liquids. 391, 123356. Doi: 10.1016/j.molliq.2023.123356
- **Correction to: Protein Unfolding and Aggregation near a Hydrophobic Interface.** *March D.; Bianco V.; Franzese G.* 2023, Polymers, 15, 9, 2053. Doi: 10.3390/polym15092053
- **Size–Pore-Dependent Methanol Sequestration from Water–Methanol Mixtures by an Embedded Graphene Slit.** *Bellido-Peralta R.; Leoni F.; Calero C.; Franzese G.* 2023, Molecules, 28, 9, 3697. Doi: 10.3390/molecules28093697

### Selected Projects

- **Autotermoforesis en la nanoescala.** CNS2022-135395. IP: *Carlos Calero Borrallo*. Ministerio de Ciencia e Innovación (2023-2025)
- **Física estadística para materia blanda Bio-Nano.** PID2021-124297NB-C31. IP1: *Giancarlo Franzese* / IP2: *Carlos Calero Borrallo*. Ministerio de Ciencia, Innovación y Universidades. (2022-2025)

## 2.2.46. SUPRA AND NANOSTRUCTURED SYSTEMS GROUP (NANOSMAT)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

### Team

*Laura Rodríguez Raurell* (Full Professor)
*Inmaculada Angurell Purroy* (Associate Professor)
*Araceli De Aquino Samper* (Predoctoral Researcher)

### Selected Papers

- **Supramolecular luminescent Pt(ii) tweezers: aggregation studies and 1O2 production.** *Romo-Islas G.; Gomila R.M.; Frontera A.; Rodríguez L.* 2023, Inorganic Chemistry Frontiers, 10, 21. Doi: 10.1039/d3qi01176c
- **Effect of substituents on the 1O2 production and biological activity of (N^N^N)Pt(py) complexes.** *Romo-Islas G.; Gil-Moles M.; Saxena A.; Frontera A.; Gimeno M.C.; Rodríguez L.* 2023, Dalton Transactions. Doi: 10.1039/d3dt04050j
- **Heterometallic Au(I)-Cu(I) Clusters: Luminescence Studies and 1O2Production.** *Romo-Islas G.; Ward J.S.; Rissanen K.; Rodríguez L.* 2023, Inorganic Chemistry, 62, 21. Doi: 10.1021/acs.inorgchem.3c00046

### Selected Project

- **Sistemas supramoleculares y organometálicos con emisión en el NIR.** PID2022-139296NB-I00PI: *Laura Rodriguez Raurell*. Ministerio de Ciencia e Innovación (2023-2026)

## 2.2.47. SUPRAMOLECULAR SYSTEMS IN NANOBIOMEDICINE (NANOPHARMAMED)

(Department Pharmacology, Toxicology and Therapeutic Chemistry, Faculty Pharmacy and Food Sciences)

### Team

*M. Lluïsa Pérez Garcia* (Full Professor)
*Thais Fedatto Abelha* (Tenure-Track Lecturer)
*David Limon Magaña* (Adjunct Lecture)
*Bagherpour Saman* (Predoctoral Researcher)

### Selected Papers

- **Wireless electrical–molecular quantum signalling for cancer cell apoptosis.** *Jain A.; Gosling J.; Liu S.; Wang H.; Stone E.M.; Chakraborty S.; Jayaraman P.-S.; Smith S.; Amabilino D.B.; Fromhold M.; Long Y.-T.; Pérez-García L.; Turyanska L.; Rahman R.; Rawson F.J.* 2023. Nature Nanotechnology. 19, 1. Doi: 10.1038/s41565-023-01496-y
- **Intrinsic Permeation and Anti-Inflammatory Evaluation of Curcumin, Bisdemethoxycurcumin and Bisdemethylcurcumin by a Validated HPLC-UV Method.** *Alvarado H.-L.; Limón D.; Calpena-Campmany A.-C.; Mallandrich M.; Rodríguez-Cid L.; Aliaga-Alcalde N.; González-Campo A.; Pérez-García L.* 2023, International Journal of Molecular Sciences, 24, 7, 6640. Doi: 10.3390/ijms24076640
- **Permeation Protection by Waterproofing Mucosal Membranes.** *Coderch L.; Alonso C.; Calpena A.C.; Pérez-García M.L.; Clares-Naveros B.; Ramos A.; Martí M.* 2023, Pharmaceutics, 15, 12, 2698 Doi: 10.3390/pharmaceutics15122698

### Selected Projects

- **Bio-funcionalización de chips en suspensión innovadores para estudios químicos, bioelectrónicos y mecánicos en células vivas.** PID2020-115663GB-C32. IP1: M. *Luisa Perez Garcia* / IP2: *Elvira Gomez Valentín*. Ministerio de Ciencia, Innovación y Universidades. 2021-2024.

## 2.2.48. SUSTAINABLE ELECTROCHEMICAL PROCESSES (NANOENERGY)

(Department of Materials Science and Physical Chemistry, Faculty of Chemistry)

### Teams

*Maria Sarret Pons* (Associate Professor)
*Teresa Andreu Arbella* (Tenure-track Lecturer)
*Mohamed Amazian El Moussaoui* (Industrial Predoctoral Researcher)
*Marti Molera Janer* (Technician)

### Selected Papers

- **Electrochemical characterization of nanoporous SnO2 formed by anodization on cold spray tin coating for supercapacitor application.** *Zarei M.; Nourouzi S.; Jamaati R.; Esmaeili-Faraj S.H.; Cano I.G.; Dosta S.; Sarret M.* 2023, Journal of Electroanalytical Chemistry, 931, 117201. Doi: 10.1016/j.jelechem.2023.117201
- **Bimetallic cobalt catalysts promoted by La2O3 for the production of high-calorie synthetic gas.** *Alarcón A.; Palma O.; Martín Morales E.; Biset-Peiró M.; Andreu T.; Guilera J.* 2023, Fuel, 341, 127726. Doi: 10.1016/j.fuel.2023.127726
- **A Long Cycle Life Zinc-Iodide Flow Battery Enabled by a Multifunctional Low Cost Supporting Electrolyte.** *Chakraborty M.; Andreu T.; Guc M.; Amazian M.; Murcia-López S.* 2023, Batteries and Supercaps, 6, 6, e202300149. Doi: 10.1002/batt.202300149

### Selected Projects

- **Electrificando la industria: producción de etileno bajo en carbono por plasma catalysis.** CNS2022-135235. IP: *Teresa Andreu Arbella*. Ministerio de Ciencia e Innovación. (2023-2025)
- **Interfaces conductoras para reducir el coste de los electrolizadores** PEM. TED2021-130461B-I00. IP: *Teresa Andreu Arbella*. Ministerio de Ciencia e Innovación. (2022-2025)



## 2.2.49. THEORETICAL PHYSICS OF NANOSCOPIC SYSTEMS (NANOMET)

(Department Quantum Physics, Faculty Physics)

### Team

*Martí Pi Pericay* (Emeritus Professor)
*Manuel Barranco Gómez* (Emeritus Professor)

### Selected Papers

- **Observing the primary steps of ion solvation in helium droplets.** *SH. Albrechtsen, CA. Schouder, A. Viñas Muñoz, JK. Christensen, C. Engelbrecht Petersen, M. Pi, M. Barranco & H. Stapelfeldt.* 2023, Nature, 623, 7986. Doi: 10.1038/s41586-023-06593-5
- **Self-sustained deformable rotating liquid He cylinders: The pure normal fluid 3 He and superfluid 4 He cases.** *Pi M.; Ancilotto F.; Barranco M.; Butler S.L.; Escartín J.M.* 2023, Physical Review B, 108, 5, 054524. Doi: 10.1103/PhysRevB.108.054524
- **Nanoscopic jets and filaments of superfluid 4He at zero temperature: A DFT study.** *Ancilotto F.; Barranco M.; Pi M.* 2023, Journal of Chemical Physics, 158, 14, 144306. Doi: 10.1063/5.0143399

## 2.2.50. THIN-FILM AND NANOSTRUCTURE ELECTRODEPOSITION GROUP (NANOSMAT)

(Department Materials Science and Physical Chemistry, Faculty Chemistry)

### Team

*Elvira Gómez Valentín* (Full Professor)
*Albert Serrà Ramos* (Tenure-Track Lecturer)
*Fatemeh Mohandes* (Postdoctoral Researcher María Zambrano)
*Roger Bujaldón Carbó* (Postdoctoral Researcher)
*Judit Lloreda Rodes* (Industrial Predoctoral Researcher)
*Laura Huidobro Rodríguez* (Predoctoral Researcher)
*Arnau Fons Cervera* (Collaborador student)

### Selected Papers

- **Enhanced Activation of Peroxymonosulfate for Tetracycline Degradation Using CoNi-Based Electrodeposited Films.** *Gómez E.; Fons A.; Cestaro R.; Serrà A.* 2023, Nanomaterials, 13, 5, 790. Doi: 10.3390/nano13050790
- **Nanostructured Ir-based electrocatalysts for oxygen evolution prepared by galvanic displacement of Co and Ni.** *Holde F.B.; Sebastián-Pascual P.; Dalby K.N.; Gómez E.; Escudero-Escribano M.* 2023, Electrochimica Acta, 467, 143058. Doi: 10.1016/j.electacta.2023.143058
- **Electrodeposited manganese oxides as efficient photocatalyst for the degradation of tetracycline antibiotics pollutant.** *Cestaro R.; Philippe L.; Serrà A.; Gómez E.; Schmutz P.* 2023, Chemical Engineering Journal, 462, 142202. Doi: 10.1016/j.cej.2023.142202

### Selected Projects

- **Micro/Nano-reactores foto-termo-catalíticos escalables para la síntesis de compuestos químicos verdes con luz solar a través de biomasa lignocelulósica.** TED2021-129898B-C22. IP1: *Elvira Gomez Valentín* / IP2: *Albert Serrà Ramos*. Convocatoria 2021 de ayudas a Proyectos estratégicos orientados a la transición ecológica y a la transición digital. Ministerio de Ciencia e Innovación (MICINN). (2022-2024)
- **Bio-funcionalización de chips en suspensión innovadores para estudios químicos, bioelectrónicos y mecánicos en células vivas.** PID2020-115663GB-C32. IP1: *M. Luisa Perez Garcia* / IP2: *Elvira Gomez Valentín*. Ministerio de Ciencia, Innovación y Universidades. 2021-2024.




# 3. RESEARCHERS GROUPED BY AREAS

## 3.1. NANOMET

- **ARANGO RESTREPO, ANDRES**
  **Nanosystems Statistical Physics**
  *Predoctoral Researcher*

- **BARRANCO GOMEZ, MANUEL**
  **Theoretical physics of Nanoscopic Systems**
  *Emeritus Professor*

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- **CALERO BORRALLO, CARLOS**
  **Statistical Physics of Bio-Nano Systems and Complex Matter (BioNanoComplex)**
  *Tenure-Track Lecturer*

- **CASTAN VIDAL, MARIA TERESA**
  **Materials: Phase transitions**
  *Full Professor*

- **COLL BENEJAM, CATALINA**
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  *Adjunct Lecture*

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- **CALO, ANNALISA**
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- **SAGUÉS MESTRE, FRANCESC**
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- **BAGHERPOUR , SAMAN**
  **Supramolecular Systems in Nanobiomedicine**
  *Predoctoral Researcher*

- **BOIX MONTANES, ANTONIO DE PADUA**
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  *Adjunct Lecture*

- **BONILLA VIDAL, LORENA**
  **Nanostructured systems for controlled drug delivery**
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- **BUSQUETS VIÑAS, MARIA ANTÒNIA**
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- **BUSTOS SALGADO, PAOLA**
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- **ESCRIBANO FERRER, ELVIRA**
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- **GARCIA LOPEZ, MARIA LUISA**
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## 3.5. NANOPHOTOELECTRO

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  *Full Professor*

- **CASALS GUILLEN, OLGA**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Tenure-Track Lecturer*

- **CIRERA HERNANDEZ, ALBERT**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Full Professor*

- **DIAGO FORERO, JOSHUA**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Predoctoral Researcher*

- **DIEGUEZ BARRIENTOS, ANGEL**
  **Instrumentation Systems and Communications (SIC)**
  *Full Professor*

- **DUOCASTELLA SOLÀ, MARTI**
  **LASER-Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Full Professor*

- **ESTANY MACIÀ, ANNA**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Technician*

- **FABREGA GALLEGO, CRISTIAN**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Tenure-Track Lecturer*

- **FERNÁNDEZ PRADAS, JUAN MARCOS**
  **LASER-Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Associate Professor*

- **FORT GRANDAS, IGNASI**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Predoctoral Researcher*

- **FRAILE RODRIGUEZ, MARIA ARANZAZU**
  **Group of Magnetic Nanomaterials**
  *Associate Professor*

- **GARCIA DEL MURO SOLANS, MONTSERRAT**
  **Group of Magnetic Nanomaterials**
  *Associate Professor*

- **GARRIDO FERNANDEZ, BLAS**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Full Professor*

- **GOMIS I BRESCO, JORDI**
  **Polarized Light Applications & Technologies (PLAT)**
  *Tenure-Track Lecturer*

- **HERNANDEZ RAMIREZ, FRANCISCO**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Adjunct Lecture*

- **HERNÁNDEZ MÁRQUEZ, SERGI**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Associate Professor*

- **JOSHI, NIRAVKUMAR**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Postdoctoral Researcher*

- **LOPEZ AYMERICH, ELENA**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Predoctoral Researcher*

- **LÓPEZ DE MIGUEL, MANUEL**
  **Instrumentation Systems and Communications (SIC)**
  *Associate Professor*

- **MARTÍ JEREZ, ERNEST**
  **LASER-Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Predoctoral Researcher*

- **MENDOZA GAMERO, YUZELFY PAOLA**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Predoctoral Researcher*

- **MORENO SERENO, MAURICIO**
  **Instrumentation Systems and Communications (SIC)**
  *Associate Professor*

- **NAVALE, SACHIN TATYASAHEB**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Postdoctoral Researcher Marie Sklodowska-Curie*

- **NAVARRO URRIOS, DANIEL**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Associate Professor*

- **PASCUAL MIRALLES, ESTHER**
  **Polarized Light Applications & Technologies (PLAT)**
  *Full Professor*

- **PELLEGRINO, PAOLO**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Associate Professor*

- **PRADES GARCIA, JUAN DANIEL**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Full Professor*

- **RODRÍGUEZ ÁLVAREZ, JAVIER**
  **Group of Magnetic Nanomaterials**
  *Predoctoral Researcher*

- **ROMANO RODRIGUEZ, ALBERT**
  **Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Full Professor*

- **SERRA COROMINA, PEDRO**
  **LASER-Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Full Professor*

- **VILÀ ARBONÈS, ANNA MARIA**
  **Instrumentation Systems and Communications (SIC)**
  *Associate Professor*

- **VILAR SOLÉ, NARCÍS**
  **LASER-Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND)**
  *Industrial Predoctoral Researcher*

## 3.6. NANOSMAT

- **ALSHAIKH, ISLAM**
  **Materials for Energy, Photonics and Catalysis (ENPHOCAMAT)**
  *Collaborator*

- **AMADE ROVIRA, ROGER**
  **Materials for Energy, Photonics and Catalysis (ENPHOCAMAT)**
  *Tenure-Track Lecturer*

- **ANDUJAR BELLA, JOSE LUIS**
  **Materials for Energy, Photonics and Catalysis (ENPHOCAMAT)**
  *Associate Professor*

- **ANGURELL PURROY, INMACULADA**
  **Supra and Nanostructured Systems Group**
  *Associate Professor*

- **BANTYSH, OLGA**
  **Self-organized complexity and self-assembling materials (SOC&SAM)**
  *Predoctoral Researcher*

- **BERTRAN SERRA, ENRIC**
  **Materials for Energy, Photonics and Catalysis (ENPHOCAMAT)**
  *Full Professor*

- **BUJALDÓN CARBÓ, ROGER**
  **Thin-film and Nanostructure electrodeposition group**
  *Postdoctoral Researcher*

- **CHAITOGLOU , STEFANOS**
  **Materials for Energy, Photonics and Catalysis (ENPHOCAMAT)**
  *Postdoctoral Researcher Beatriu de Pinós*

- **DE AQUINO SAMPER, ARACELI**
  **Supra and Nanostructured Systems Group**
  *Predoctoral Researcher*

- **DIAZ MARCOS, JORDI**
  **Materials for Energy, Photonics and Catalysis (ENPHOCAMAT)**
  *Collaborator*

- **EUSAMIO RODRÍGUEZ, JAVIER**
  **Homogeneous Catalysis**
  *Predoctoral Researcher*

- **FABREGAT PALLEJÀ, CLARA**
  **Organic Materials Unit**
  *Predoctoral Researcher*

- **FARRERA PIÑOL, JOAN ANTONI**
  **Self-organized complexity and self-assembling materials (SOC&SAM)**
  *Associate Professor*

- **FERRER GARCIA, MONTSERRAT SOFIA**
  **Mechanisms of Reactions in Inorganic Chemistry**
  *Associate Professor*

- **FIGUEROLA SILVESTRE, ALBERT**
  **Laboratory of Nanostructured and Nanocomposite Materials**
  *Associate Professor*

- **FONS CERVERA, ARNAU**
  **Thin-film and Nanostructure electrodeposition group**
  *Collaborador student*

- **GARCÍA AMORÓS, JAUME**
  **Organic Materials Unit**
  *Associate Professor*

- **GOMEZ VALENTIN, ELVIRA**
  **Thin-film and Nanostructure electrodeposition group**
  *Full Professor*

- **GRABULOSA RODRIGUEZ, ARNALD**
  **Homogeneous Catalysis**
  *Associate Professor*

- **GÜELL VILÀ, FRANK**
  **Materials for Energy, Photonics and Catalysis (ENPHOCAMAT)**
  *Associate Professor*

- **GUIXENS GALLARDO, PEDRO**
  **Organic Materials Unit**
  *Postdoctoral Researcher Margarita Salas*

- **GUTIERREZ CURRIUS, ALBERT**
  **Homogeneous Catalysis**
  *Technician*

- **HUIDORBO RODRÍGUEZ, LAURA**
  **Thin-film and Nanostructure electrodeposition group**
  *Predoctoral Researcher*

- **IGNÉS MULLOL, JORDI**
  **Self-organized complexity and self-assembling materials (SOC&SAM)**
  *Associate Professor*

- **JOSA HIDALGO, DANA**
  **Homogeneous Catalysis**
  *Predoctoral Researcher*

- **LIN, MENGXI**
  **Laboratory of Nanostructured and Nanocomposite Materials**
  *Predoctoral Researcher*

- **LLOREDA RODES, JUDIT**
  **Thin-film and Nanostructure electrodeposition group**
  *Industrial Predoctoral Researcher*

- **MARTÍNEZ BACUÑANA, ALBA**
  **Homogeneous Catalysis**
  *Predoctoral Researcher*

- **MARTÍNEZ LÓPEZ, MANUEL**
  **Mechanisms of Reactions in Inorganic Chemistry**
  *Full Professor*

- **MOHANDES, FATEMEH**
  **Thin-film and Nanostructure electrodeposition group**
  *Postdoctoral Researcher María Zambrano*

- **NÚÑEZ RICO, JOSÉ LUIS**
  **Homogeneous Catalysis**
  *Adjunct Lecture*

- **RODRIGUEZ RAURELL, LAURA**
  **Supra and Nanostructured Systems Group**
  *Full Professor*

- **SAINZ GARCIA, DANIEL**
  **Homogeneous Catalysis**
  *Associate Professor*

- **SERRA RAMOS, ALBERT**
  **Thin-film and Nanostructure electrodeposition group**
  *Tenure-Track Lecturer*

- **VELASCO CASTRILLO, MARIA DOLORS**
  **Organic Materials Unit**
  *Full Professor*

- **VIDAL FERRAN, ANTON**
  **Homogeneous Catalysis**
  *ICREA Researcher*

## 3.7. NANOENERGY

- **ANDREU ARBELLA, TERESA**
  **Sustainable Electrochemical Processes**
  *Tenure-Track Lecturer*

- **ASENSI LOPEZ, JOSE MIGUEL**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Associate Professor*

- **BERTOMEU BALAGUERÓ, JOAN**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Full Professor*

- **CALVO BARRIO, LORENZO**
  **Solar Energy Materials and Systems (SEMS) Group**
  *Adjunct Lecture*

- **EL MOUSSAOUI, MOHAMED AMAZIAN**
  **Sustainable Electrochemical Processes**
  *Industrial Predoctoral Researcher*

- **FERNÁNDEZ RENNA, ANA INÉS**
  **Design and Improvement of Processes and Materials**
  *Full Professor*

- **FERRATER MARTORELL, CÈSAR**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Associate Professor*

- **FORMOSA MITJANS, JOAN**
  **Design and Improvement of Processes and Materials**
  *Associate Professor*

- **GALCERAN VERCHER, REGINA**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Tenure-Track Lecturer*

- **HOMS MARTI, NARCISO**
  **Catalysis and Advanced Inorganic Materials (MATCAT)**
  *Full Professor*

- **IZQUIERDO ROCA, VICTOR**
  **Solar Energy Materials and Systems (SEMS) Group**
  *Collaborator*

- **LOUSA RODRIGUEZ, ARTURO**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Associate Professor*

- **MESTRES VILA, MARIA LOURDES**
  **Catalysis and Advanced Inorganic Materials (MATCAT)**
  *Full Professor*

- **MOLERA JANER, MARTI**
  **Sustainable Electrochemical Processes**
  *Technician*

- **MORANTE LLEONART, JOAN RAMON**
  **NanoEnergy and Electronic Materials (M2E) Group**
  *Full Professor*

- **MUÑOZ ROSAS, ANA LUZ**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Visiting Postdoctoral Researcher*

- **PADILLA SANCHEZ, JOSE ANTONIO**
  **Design and Improvement of Processes and Materials**
  *Tenure-Track Lecturer*

- **PAJARES ROJAS, ARTURO**
  **Catalysis and Advanced Inorganic Materials (MATCAT)**
  *Collaborator*

- **PEREZ RODRIGUEZ, ALEJANDRO**
  **Solar Energy Materials and Systems (SEMS) Group**
  *Full Professor*

- **PLACIDI, MARCEL**
  **Solar Energy Materials and Systems (SEMS) Group**
  *Collaborator*

- **POLO TRASANCOS, MARIA DEL CARMEN**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Associate Professor*

- **RAMIREZ DE LA PISCINA MILLAN, MARIA DEL PILAR**
  **Catalysis and Advanced Inorganic Materials (MATCAT)**
  *Full Professor*

- **SALGADO PIZARRO, REBECA**
  **Design and Improvement of Processes and Materials**
  *Predoctoral Researcher*

- **SÁNCHEZ RUIZ, ADRIÀ**
  **Catalysis and Advanced Inorganic Materials (MATCAT)**
  *Predoctoral Researcher*

- **SARRET PONS, MARIA**
  **Sustainable Electrochemical Processes**
  *Associate Professor*

- **SEGARRA RUBÍ, MERCÈ**
  **Design and Improvement of Processes and Materials**
  *Full Professor*

- **SERRE, CHRISTOPHE GEORGES CAMILLE**
  **Instrumentation Systems and Communications (SIC)**
  *Associate Professor*

- **TOM, THOMAS**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Predoctoral Researcher*

- **VARELA FERNANDEZ, MANUEL**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Full Professor*

- **VENDRELL VILLAFRUELA, XAVIER**
  **Catalysis and Advanced Inorganic Materials (MATCAT)**
  *Tenure-Track Lecturer – Serra Hunter*

- **VIDRIER LOPEZ, JULIÀ**
  **Multiferroic and Photovoltaic Materials for Renewable Energies (MAMFER)**
  *Tenure-Track Lecturer*

- **XURIGUERA MARTIN, M ELENA**
  **Design and Improvement of Processes and Materials**
  *Associate Professor*

# 4. CALLS

## 4.1. GRANTS FOR MULTIDISCIPLINARY RESEARCH (AJUTS A LA RECERCA TRANSVERSAL-ART)

Internal call of collaborative research projects (Ajuts a la Recerca Transversal – ART). The aim of these calls is to promote transversal an innovative research among the research areas of the Institute between PhD researchers at the beginning of their career career developing a project as Principal Investigator (IP) for the first time. On 2023, 2 ART grants have been awarded to the following proposals with 12000€ each:

- **Design and Evaluation of Small Iron Oxide Nanorods as Antitumoral Therapeutic Agents. NanoPharmaMed, NanoMagnetics and NanoPhotoElectronics**
- **Magnonic wrinkles. NanoMagnetics and NanosMat**

## 4.2. MASTER FELLOWSHIPS

In order to stimulate scientific careers in master's students, in the frame of Beques de Col·laboració UB (UB Collaborating Fellowhips), Master + UB call, the Institute offers Master Fellowships to collaborate with IN2UB research groups and supports the students in the process of carrying out research and working on their master theses. During 2023, 1 student has been awarded.

## 4.3. IN²UB CALLS FOR CONGRESSES AND INVITED PROFESSORS

The institute give support to researchers organizing congress or scientific events as well as contribute to visiting scientist in the fields of the in2ub. On 2023, IN²UB has sponsored:

- **1era REUNIÓ DE QUÍMICA INORGÀNICA - I ORGANOMETÀL·LICA de la SCQ – RQIO 2023**
  First meeting on inorganic and organometallic chemistry with the goal to highlight and enhance our richness in these scientific fields.
  2-3 February 2023- La Casa de la Convalescència (Institut d'Estudis Catalans)
  Dr. *Guillem Aromí* and Dr. *Leoní A. Barrios*, from the IN²UB, being part of the Organization Committee
- **The 6th Conference in Water Biophysics.**
  May 19-24, 2023 – ETTORE MAJORANA FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE, Erice, Sicily, Italy.
  Dr. *Giancarlo Franzese* (IN²UB), one of the Course Co-Directors and of the Scientific Committee
- **Col·loqui UB-ESPCI**
  12-14 June, 2023 - Aula Magna Cassassas
  Dr. *Jordi Ignés* (IN²UB), being part of the Organization Committee

## 4.4. FUNDING SCIENTIFIC ASSOCIATIONS

The IN²UB gives support to specific scientific associations of general interest for the Institute:
Since July 2009, the IN²UB is part of the scientific cluster SECPhO (Southern European Cluster of Photonics and Optics). The IN²UB collaborates with the costs and activities of the cluster through an annual fee and, when needed, funds attendance to specialized conferences by the cluster members belonging to the IN²UB. For further details about the SECPHO Cluster, please check www.secpho.net/secpho/index.jsp
This year, IN²UB has also entered MAV Cluster as a member. The Advanced Materials Cluster of Catalonia (MAV Cluster) is the leading cluster in advanced materials and their technologies. Its strategy targets innovation and its main purpose is to make businesses and organizations in the advanced materials sector value chain more competitive.

## 4.5. SCIENTIFIC AND TECHNOLOGICAL EQUIPMENT RENEWAL CALL

In frame of the scientific and technological equipment renewal call by the UB, the IN²UB has participated by supporting with 3500€, the application led by the Faculty of Physics of improving the Nanofabrication room by acquiring a new lithography.

# 5. EVENTS

## 5.1. INTERNATIONAL RESEARCH SEMINAR (IRS)

In frame of the cycle of International Research Seminars (IRS), once a month an international researcher is invited to impart a high-level research seminar, covering one of the subject areas from the Institute, these seminars are in collaboration and with the support of PhD Program in Nanoscience:

- **Novel signal-detection approaches in optoacoustic tomography**
  By, Dr. *Amir Rosenthal*, Electrical and Computer Engineering Department, Technion — Israel Institute of Technology, Haifa 3200003, Israel
  February 6th, 2023 at 12.00h – Sala de Graus Eduard Fontseré (Faculty of Physics UB)

- **Publishing in nature portfolio journals**
  By, Dr. *Teresa Ortner*, Senior Editor at Communications Chemistry, Springer Nature, Berlin.
  April 13th, 2023 at 12.00h – Aula Magna Enric Casassas (Faculties of Chemistry and Physics)

- **Phthalos in Nanos: From molecular to nanomaterials for catalysis, energy and health**
  By, Prof. *Fabienne Dumoulin*, Acıbadem Mehmet Ali Aydınlar University, Faculty of Engineering and Natural Sciences, Department of Biomedical Engineering, Ataşehir, Istanbul, Türkiye
  May 29th, 2023 at 15.00h – Room B-207, Faculty of Pharmacy and Food Sciences, Campus Pedralbes

- **Magnetic molecules in quantum nanoscience: potential and challenges**
  June 7th, 2023 at 12.00h – Sala de Graus Eduard Fontseré (Faculty of Physics)
  By, Prof. *Roberta Sessoli*, Department of Chemistry U. Schiff, University of Florence, 50019 Sesto Fiorentino, Italy

- **Artificial Molecular Machines**
  By, Prof. *Fraser Stoddart*, 2016 Nobel Prize in Chemistry, Northwestern University (US)
  June 14th, 2023 at 16.00h – Magna Room, Faculty of Pharmacy and Food Sciences (Campus Pedralbes)

- **Magnetic Tunnel Junction-based Molecular Spintronics Devices: A Method of Harnessing Exotic Properties of Molecular Nanostructure**
  By, Dr. *Pawan Tyagi*, Center for Nanotechnology Research and Education, University of the District of Columbia, Washington DC 20008 USA
  Date and Venue: July 6th, 2023 at 12.00h – Room V11 (Faculty of Chemistry)

  **Quantum Computing with Molecules**
  By, Prof. *Mario Ruben*, INT, IQMT, Karlsruhe Institute of Technology (KIT), Karlsruhe/D and ISIS, CESQ, University of Strasbourg, Strasbourg/F
  September 28th, 2023 at 16h – Aula Magna Enric Casassas (Faculty of Chemistry)

- **IN²UB Beatriz Galindo Research Seminar: Deciphering molecular spin secrets: the resonance route from dilute solutions to spintronic devices**
  By, Dr. *Valentin Novikov*, Beatriz Galindo Researcher at IN²UB
  October 24th, 2023 at 12h - Aula Enric Casassas (Faculties of Physics and Chemistry UB)

- **Nanophotonic biosensors for ultrasensitive Point-of-Care diagnostics**
  By, Prof. *Laura M. Lechuga*, Nanobiosensors and Bioanalytical Applications Group, Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC, BIST and CIBER-BBN, Campus UAB
  Date and Venue: November 24th, 2023 at 12h – Aula Magna Enric Casassas (Faculties of Physics and Chemistry UB)

- **Cylindrical Micro- and Nanowires: From Curvature Effects on Magnetization to Sensing Applications**
  By, Prof. *Manuel Vázquez*. IEEE Magnetics Society Distinguished Lecturer 2023.
  Institute of Materials Science of Madrid, Consejo Superior de Investigaciones Científicas, Spain
  Date and Venue: January 25th, 2024 at 12.00h – Sala Graus Eduard Fontserè (Faculties of Physics and Chemistry UB)

## 5.2. JOINT SEMINARS

- **Research Seminar in Collaboration with the Department of Electronics and Biomedical Engineering**
  By, Prof. *Ralf Heiderhoff*, Institute of Electronic Devices & Wuppertal Center for Smart Materials and Systems (CM@S), University of Wuppertal, Rainer-Gruenter-Strasse 21, 42119 Wuppertal, Germany
  22nd February at 12h – Sala de Graus Eduard Fontserè (Faculty of Physics UB)

- **Research Seminar in Collaboration with the Department of Electronics and Biomedical Engineering - Silicon photonics: a new revolution in miniature**
  6th October 2023 at 11h at Aula Enric Cassases (Faculties of Physics and Chemistry UB)

- **Joint Condensed Matter Physics Department Colloquium and IN²UB International Research Seminar - Magnetism in Biomedicine: Translating Science to Clinical Applications**
  By, Prof. *Kannan M. Krishnan*, Department of Materials Sciences & Engineering and Physics, University of Washington Seattle, USA
  Date and Venue: December 18th, 2023. 14:00 h – Aula Magna Enric Casassas (Facultat de Física i Facultat de Química UB)

## 5.3. SPECIAL MINI-SYMPOSIUM IN²UB

- **Minisymposium IN²UB-IQTCUB:**
  **Spectroscopic Trends for Quantum Technologies and Spintronics with Magnetic Molecules**
  22nd March, 2023 - Aula Magna Enric Casassas (Faculties of Chemistry and Physics)

**Program**

**10:30h-11:30h "Magneto-Chiral Dichroism in Chiral Magnetic Molecules and Materials"**
By, Dr. *Matteo Atzori,* Laboratoire National des Champs Magnétiques Intenses (LNCMI) – CNRS, France. Chaired by Prof. Eliseo Ruiz, IQTCUB Director
Magneto-Chiral Dichroism (MChD) is a fascinating but scarcely investigated manifestation of light-matter interaction specific of chiral magnetized systems. It features an unbalanced absorption or emission of unpolarized light that depends on the relative orientation of the applied magnetic field and the light wavevector and the absolute configuration of the system. Its relevance is related to potential technological applications, such as the optical read-out of magnetic data, and its possible implication as a mechanism for the emergence of life homochirality. With this talk I will provide an overview of the most recent results we have achieved on this topic, that are aimed at understanding the microscopic parameters and the physico-chemical ingredients that are key to observe strong MChD responses.
**11:30h-12.00h** Coffee break
**12.00h-13.00h "Molecular Quantum Science and Technology"**
By, Prof. *Joris van Slageren*, Institute of Physical Chemistry and Center for Integrated Quantum Science and Technology, University of Stuttgart, Stuttgart, Germany. Chaired by Prof. *Guillem Aromí*, IN²UB Director
Molecular quantum architectures may spearhead the second quantum technology wave, due to favourable tunability and positionability of molecular qubit materials. We report on successful strategies to increase the quantum coherence time of such species. We also describe the immbolization of molecular quantum bits as self-assembled monolayers on surfaces, which is a critical step torwards device application. Finally, we demonstrate microwave pulse storage in strongly coupled cavity-spin ensemble systems, exploiting the large spin density of molecular qubits.

## 5.4. FIRA D'EMPRESES

The Institute has participated on the Virtual Employment Fair – 26th April 2023 Sciences and Engineering, where we had the opportunity to present the IN2UB and the research areas to students interested in nanoscience and nanotechnology.

## 5.5. STARTUB INHOUSE WORKSHOP

A workshop, done on 26th September 2023 dynamized by the Innovation Toolkit at StartUB in order to identify new challenges at the IN2UB and a space for networking for our researches.

Outreach!



# 6. OUTREACH AND EQUAL OPPORTUNITIES COMMITTEE

IN²UB is committed to transfer knowledge to society and with Equal Opportunities. In this sense, on 2019, a **Permanent Commission of Outreach** was created and put to work in order reinforce this facet of the Institute and at the end of 2022 the Equal Opportunities Committee was constituted, being Dr. E. Carolina Sañudo the representative of the Institutes of the area of Sciences at the Equality Commission of the UB . The activities done by these committees, which work in coordination, have gained greater relevance and diffusion since their creation.

Follow us at @In2Ub | In-IN2UB / IN2UB-Youtube

## 6.1. EVENTS

- **II Trobada de Divulgació de l'IN²UB - 'Si no hi ets, no existeixes': La importància de divulgar. Com (nano)divulgar a les xarxes socials?**
  26 Gener 2023, Aula Magna Enric Casassas (Facultats de Física i Química)
  Organitzadors: Jordi Díaz i Xavier Batlle (Comissió Divulgació IN²UB)
  **10h** Presentació (A càrrec de Xavier Batlle i Jordi Díaz)
  **10h05** Divulgant per les XXSS (A càrrec de Mireia Ortega, comunicadora científica)
  **11h** Com fer un vídeo científic? (A càrrec de Jordi Díaz)
  **11h10** Break
  **11h25** Taller de co-creació: Creant un guió pel teu vídeo científic (A càrrec d'Enrique Conches, formador IDEO i expert en creativitat i design thinking)
  Presentació del concurs de vídeos de l'IN²UB (A càrrec de Jordi Díaz)
  **12h45** Finalització acte

Sessió reconeguda per l'Institut de Desenvolupament Professional (IDP-ICE) i amb el suport del Programa de Doctorat en Nanociències UB

- **III Congrés AMIT-Cat – Dones en Nanociència i Nanotecnologia**
  L'IN²UB ha cofinançat Congrés AMIT-CAT – Dones en Nanociència i Nanotecnologia, coordinat per la Dra. Sònia Estradé i Dra. Arantxa Fraile, de la Comissió d'Igualtat de l'IN²UB, celebrat presencialment el 8 de febrer del 2023 a la seu de l'Institut d'Estudis Catalans de Barcelona. També comptàrem amb les Dra. Marta Estrader i Dra. Adriana I. Figueroa, investigadores de l'Institut, com a ponents.

- In frame of 11F International Day of Women and Girls in Science, researchers from the Instiute participated at the **COFFEE WITH WOMEN SCIENTIST**. An event to share with the audience own experiences and talk about the passion for research and the associated professional stages, while exemplifying the role of the female scientist: **INTERNATIONAL DAY OF WOMEN AND GIRLS IN SCIENCE COFFEE WITH WOMEN SCIENTIST**
  Organized by: IQTCUB, ICCUB, IdRAUB, Geomodels, UBICS, IRBio, IN2UB i de les Facultats de Química, Física i Biologia.
  17/02/2023 – Sala de Graus Eduard Fontseré (Facultats de Física i Química)

- **Presentació del II Llibre blanc de les nanotecnologies**
  15 de Febrer 2023 a les 10.30h a la Aula Magna Enric Casassas (Facultats Física i Química UB)
  L'obra, coral, representa un State of the Art actualitzat, una foto, de l'estat actual de la nanotecnologia en els camps de:

| | | |
|---|---|---|
| -SALUT | -ALIMENTACIÓ | -AIGUA I MEDIAMBIENT |
| -ENERGIA | -COSMÈTICA | -CARACTERITZACIÓ |
| -TIC | -PRODUCTES EN EL MERCAT | |

**Program**
**10h30** Presentació institucional de la jornada:
*Juan Fran Sangüesa*, Director CCiTUB
*Guillem Aromí*, Director IN²UB
*Mercè Segarra*, Vicerectora d'Emprenedoria, Innovació i Transferència UB
**10h45** Presentació, *Javier García-Martínez* (president de la IUPAC, universitat d'Alacant i prologuista del llibre)
**10h50** Presentació: **Llibre blanc i state de l'art de les nanos**, J*oan Mendoza* (CCiTUB) i *Giancarlo Franzese* (IN²UB)
**11h** Taula rodona amb els Investigador de l'IN²UB: *Albert Serra* (Aigües i medi ambient), Albert Romano (TIC), Francesca Peiró (Caracterització), M.Pilar Vinardell (Cosmètica)
**12.30h** Finalització jornada
Conductor de la jornada: J*ordi Díaz* (IN²UB-CCiTUB)

- **Activitat divulgativa Saló de l'Ensenyament: 15/03/2023**

- **DAY | NanoDAY**
  09.10.23
  NanoDAY is a multi-sector conference on the trends and successful cases of application of nanoscience and nanotechnology in Catalonia.
  The NanoDAY conference, organized by the MAV Cluster, which is celebrated around the International Day of Nanoscience and Nanotechnology (October 9), aims to show the latest trends, cases and experiences of application in Catalonia of the it is currently considered a key technology for industry in the 21st century.
  The event, which will be hosted by the IN²UB, will take place at the Aula Magna Enric Casassas of the Faculty of Physics and Chemistry of the University of Barcelona, and has the support of ACCIÓ.
  Institutional Welcome by Prof. *Guillem Aromí Bedmar*, IN²UB Director.

- **Nanoinventum**
  Researchers from the Institute participates on Nanoinventum. A project aiming at incorporating nanoscience at Primary Schools. More information

- **Festival 10alamenos9 (10-9 Festival)**
  The festival 10alamenos aims to bring the nanometric scale, its effects and how this knowledge is going to change our lives through countless applications and products, to all audiences.




# 7. PhD THESIS DEFENDED

Most IN²UB researchers are involved in the doctorate training This is the list of doctoral theses, supervised by IN²UB researchers this 2023:

**RESPONSIVE NANOMATERIALS FOR CANCER THERANOSTICS**
Author: Jordan Potts
Director(s): Mª Luisa Pérez García; Frankie Rawson; David Amabilino

**NEW π-FUNCTIONAL MOLECULES FOR ENERGY AT THE INTERFACE BETWEEN BIOLOGY AND MATERIALS**
Author: Ferdinando Malagreca
Director(s): Mª Luisa Pérez García; David Amabilino; Frankie Rawson

**HYDROGEL AND PHOTOSENSITIZERS FOR SINGLET OXYGEN GENERATION**
Author: Shaun Smith
Director(s): Mª Luisa Pérez García / David Amabilino / Giuseppe Mantovani

**FIGHTING BACTERIA DEVELOPMENT, SYNTHESIS AND STUDY OF POLYMYXIN DERIVATES TO IMPROVE THEIR PHARMACOLOGICAL PROPERTIES**
Author: Marina Pascual Pérez
Director(s): Francesc Rabanal Anglada i Yolanda Cajal Visa

**DESARROLLO DE MICRO-MORTEROS DE CEMENTO DE FOSFATO DE MAGNESIO FORMULADOS CON SUBPRODUCTOS Y RESIDUOS INDUSTRIALES**
Author: Huete Hernández, S
Director(s): Chimenos, JM; Formosa, J

**DESENVOLUPAMENT DE NOUS MATERIALS BASATS EN ALÚMINA PER A FABRICACIÓ ADDITIVA MITJANTÇANT ESTRIOLITOGRAFIA**
Author: Pol Barcelona Pons
Director(s): Elena Xuriguera Martín i José Antonio Padilla Sánchez

**DESENVOLUPAMENT DE NOUS MATERIALS BASATS EN ALÚMINA PER FABRICACIÓ ADDITIVA MITJANÇANT ESTEREOLITOGRAFIA**
Author: Pol Barcelona Pons
Director(s): E Xuriguera; J A Padilla

**SILICA-SUPPORTED MULTICOMPONENT MATERIALS FOR ENVIRONMENTAL REMEDIATION BIOMEDICAL AND ENERGY APPLICATIONS**
Author: Gubakhanim Shahnazarova
Director(s): Albert Serrà, Maria José Esplandiu, Borja Sepúlveda

**ALGORITHMS FOR LIGHT APPLICATIONS: FROM THEORETICAL SIMULATION TO PROTOTYPING**
Author: Adrià Huguet Ferran
Director(s): Sergi Hernández Márquez, Blas Garrido Fernández

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**ESTUDIO IN VITRO DE LAS ACTIVIDADES FOTOPROTECTORAS, ANTIOXIDANTES Y DESPIGMENTANTES DE NUEVOS INGREDIENTES COSMÉTICOS PARA LA PREVENCIÓN Y TRATAMIENTO DEL CÁNCER DE PIEL Y EL MELASMA**
Author: Adriana S Maddaleno Jiménez
Director(s): Montserrat Mitjans Arnal

**FORMACIÓN Y CARACTERIZACIÓN DE SISTEMAS TERAPÉUTICOS A PARTIR DE EMULSIONES AGUA-EN-AGUA**
Author: Esteban Gabriel Figueroa Becerra
Director(s): Elvira Escribano Ferrer y MªJosé García Celma

**SELECTIVE CONTACTS FOR CRYSTALLINE SILICON SOLAR CELLS**
Author: Thomas Tom
Director(s): Joan Bertomeu Balagueró; Julià Vidrier López

**CALCULATIONS OF WATER FREE ENERGY IN BULK AND LARGE BIOLOGICAL SYSTEMS**
Author: Luis Enrique Coronas Serna
Director(s): Giancarlo Franzese

**BIOPHYSICAL BIOMARKERS FOR DRUG SCREENING STRATEGIES IN CANCER-ACTIVATED FIBROBLASTS**
Author: Marta Beja Ferreira
Director(s): Nuria Gavara

**BIOCHEMICAL AND MECHANICAL CHANGES OF THE EXTRACELLULAR MATRIX DURING LUNG METASTASIS**
Author: Maria Leonor Narciso
Director(s): Nuria Gavara

**MECHANICAL BIOMARKERS OF THE EXTRACELULLAR MATRIC IN PULMONARY FIBROSIS**
Author: Constança Junior
Director(s): Nuria Gavara

**BIOACTIVE ION-RELEASING PLATFORMS FOR REGENERATIVE MEDICINE APPLICATIONS**
Author: Celia Ximenes Carballo
Director(s): Oscar Castaño Linares; Elisabeth Engel López; Soledad Pérez Amodio

**ESTABILITZACIÓ DE SISTEMES POLIMÈRICS NANOESTRUCTURATS DE PIOGLITAZONA PER AL TRACTAMENT DE LA INFLAMACIÓ OCULAR: ESTUDIS IN VITRO,EX VIVO N VIVO**
Author: Ester Miralles Cardiel
Director(s): Ana Cristina Calpena Campmany; Marcelle Silva de Abreu

**PARTIAL OXIDATION OF METHANE INTO SYNGAS AT LOW TEMPERATURE**
Author: Shiva Fazlikeshteli
Director(s): Xavier Vendrell Villafruela; Jordi Llorca i Piqué

**MÉTODOS AVANZADOS DE MICROSCOPÍA DE FUERZAS ELECTROSTÁTICAS PARA EL ESTUDIO DE MUESTRAS BIOLÓGICAS**
Author: Rubén Millán Solsona
Director(s): Gabriel Gomila Lluch

**NANOSCALE MULTIMODAL CHARACTERIZATION OF OPERATING ELECTROLYTE-GATED TRANSISTORS**
Author: Shubham Tanwar
Director(s): Gabriel Gomila Lluch; Adrica Kyndiah

For further information on the achievement of the Institute and its researchers, please have a look at our website wwwubedu/in2ub/

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