Activity REPORT 2024

Institut de Nanociència i Nanotecnologia

UNIVERSITAT DE BARCELONA

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Cover images: *Optimized monodisperse small iron oxide nanorods synthesized*. Kindly provided by Dr. Carlos Moya. A work developed with the support of IN²UB (Project ART call 2023).
The wrinkles of a 30 nm cobalt film on a PDMS polymer substrate. The colormap represents the wrinkle orientation angle.Kindly provided by Dr. Blai Calsals. A work developed with the support of IN²UB (Project ART call 2023)

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www.ub.edu/in2ub

Activity REPORT **2024**

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UNIVERSITAT DE BARCELONA

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ABOUT IN²UB

1. ABOUT IN²UB

1.1. PRESENTATION AND OUR MISSION

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 compose equally, basic and applied research.
The main goals of the (IN²UB) are:

- **To encourage suitable synergies among researchers, to favour the necessary interdisciplinary work patterns needed for frontier research**
- **To favour interactions between researchers and companies interested in nanotechnology applications and their business opportunities.**

AT THE IN²UB WE WORK TO PROMOTE AND DYNAMIZE THE RESEARCH IN THE FIELD OF NANOSCIENCE AND NANOTECHNOLOGY (N&N) AT UB TO REACH THE FUTURE.

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, but not less important, IN²UB is strongly involved in teaching duties, the most important program being the Master of Nanoscience and Nanotechnology and the Doctoral Program in Nanoscience and Nanotechnology at UB.

RESEARCH AND EDUCATION ARE OUR STRONG COMMITMENT WITH SOCIETY.

1.2. RESEARCH AREAS

The main areas of interest of IN²UB are Human Health, Environmental and Technologies of Information and Instrumentation. The IN²UB exhibits a solid scientific base, gathering around 200 researchers (including Permanent, Non-Permanent, Postdoctoral and Predoctoral Researchers), organized in research groups distributed among these major research areas:

1. **Modeling, Simulation and Nanoscopic Methods (NanoMet):** This research area develops instrumentation and methodology (employing experimental and theoretical tools) to characterize nanostructures and nanosystems of any nature

2. **Nanobioscience, Nanobiomechanics and BioNanotechnology (NanoBio):** 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.

3. **Nanopharmaceutics and Nanomedicine (NanoPharmaMed):** 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.

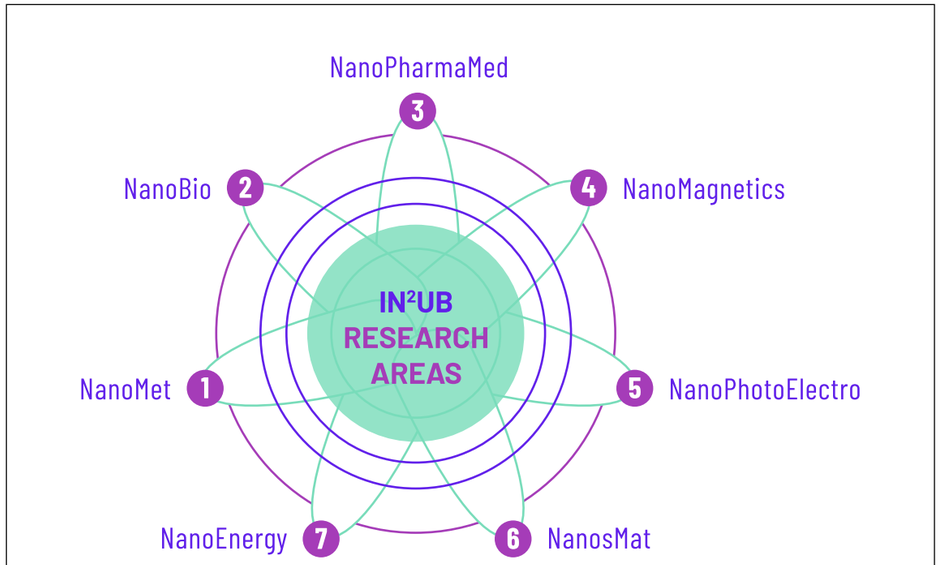
4. **Nanomagnetism and Spintronics (NanoMagnetics):** The area aims at developing new systems for storage and processing of information at the nanoscopic scale for information processing. It is also devoted to the study of new phenomena appearing at the nanometric size

for the implementation of innovative devices of application in healthcare, sustainable energy, environment, healthy food and security.

5. **Nanoelectronics, Nano-optics and Nanophotonics (NanoPhotoElectro):** Study and exploitation at the nanoscale of the interaction of electric, magnetic and optical properties for the design of functional nanosystems.

6. **Nanostructured materials (NanosMat).** 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).

7. **Nanoenergy: Production and Storage (NanoEnergy):** The aim of this research line is the application of nanomaterials to energy production and storage to overcome efficiency and lifetime limits.



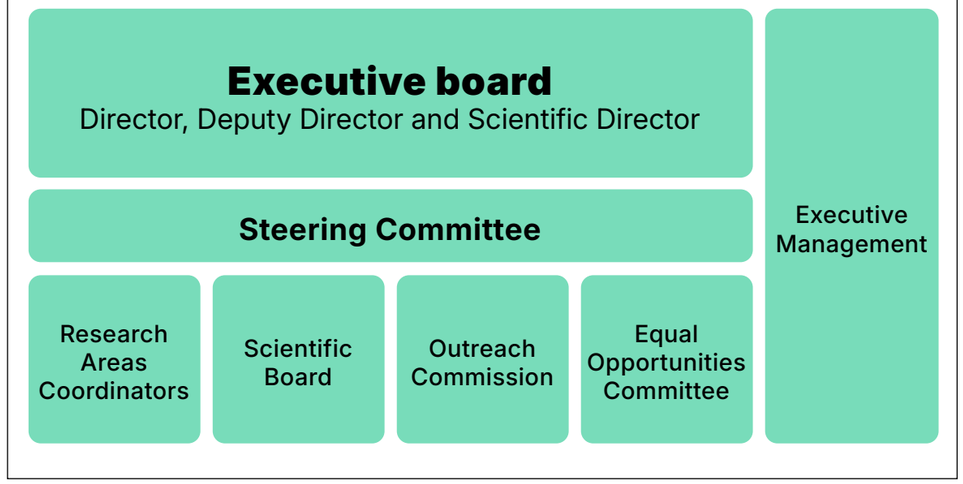
Research Areas diagram

1.3. ORGANIZATION

1.3.1. 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.

Governance Structure



Steering committee

Director: Dr. Guillem Aromí Bedmar
Deputy Director: Dr. Martí Duocastella Solà

Permanent Collective:

Dr. Xavier Batlle Gelabert
Dr. Oscar Castaño Linares
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. Daniel Navarro Urrios
Dr. Francesca Peiró Martínez
Dr. Eva Carolina Sañudo Zotes

Research Areas Coordinators

NanoMet: Dr. Francesca Peiró Martínez
NanoBio: Dra. Núria Gavara Casas
NanoPharmaMed: Dr. M. José García Celma
NanoMagnetics: Dr. Xavier Batlle Gelabert
NanoPhotoElectro: Dr. Martí Duocastella Solà
NanosMat: Dr. Enric Bertran Serra
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 (Contact: in2ub-divulga@ub.edu)

Dr. Jordi Díaz (Coordinator); Dr. Xavier Batlle; Dr. Francesca Peiró; Dr. María Aranzazú Fraile; Dr. Elena Sánchez; Dr. Ana Belén Caballero; Dr. Carles Calero; Dr. Ferran Macià; Dr. Lorena Bonilla; Dr. J. Antonio Padilla; Gerard Esteruelas.

Executive Equal Opportunities Committee (Contact: in2ub.igualtat@ub.edu)

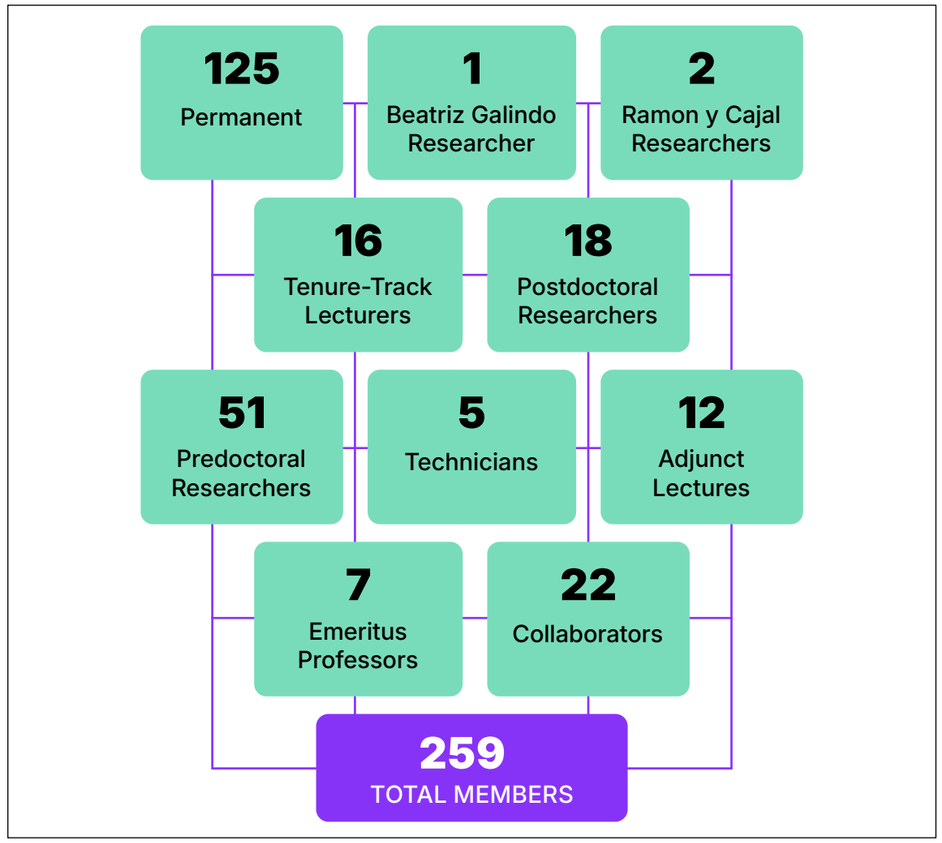
Dr. María Aranzazú Fraile (Coordinator), Dr. Marta Estrader, Dr. Carolina Sañudo, Dr. Ferran Macià, Dr. Sònia Estradé.

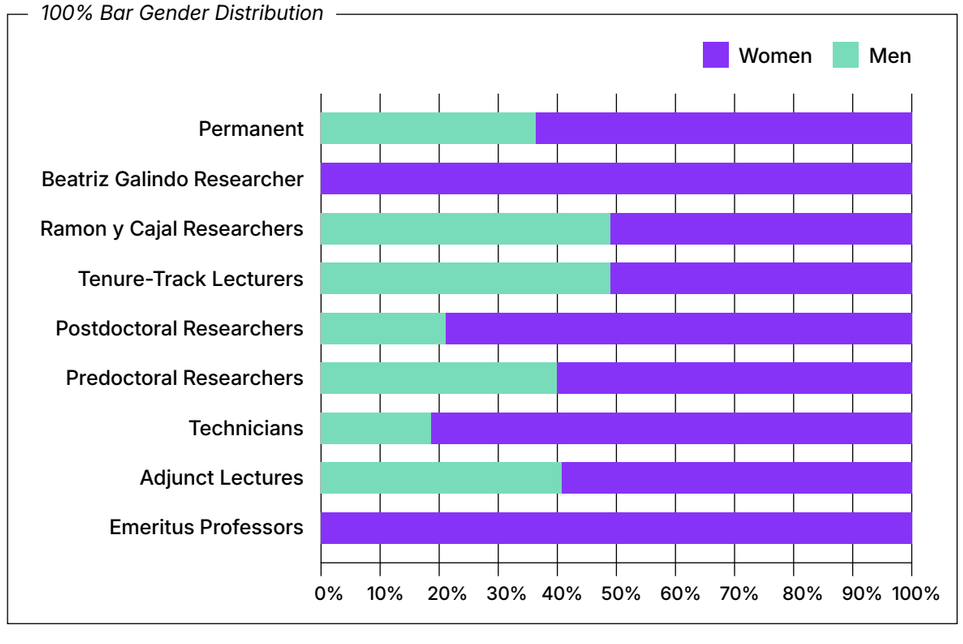
Research Management & Promotion

Dr. Ifigènia Saborit Villarroya

1.3.2. MEMBERS

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





2

RESEARCH AT IN²UB

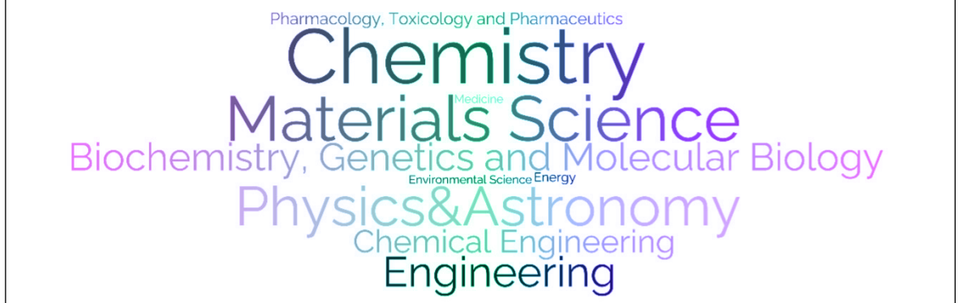
2. RESEARCH AT IN²UB

2.1. RESEARCH IN FIGURES AND HIGHLIGHTS

2.1.1. 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, Energy, Environmental Science and Medicine.

Subject Areas Keywords Distribution



The analysis of these areas during 2024 period, represented 292 papers published in indexed journals in Scopus, with 81.5% of this production at first quartile.

TOTAL PUBLICATIONS 292			
Q1 PUBLICATIONS	238	% Q1 PUBLICATIONS	81.51
D1 PUBLICATIONS	125	% D1 PUBLICATIONS	42.81

Data from Indexed Scopus Sources (January 2025)

2.1.1.1. Highlighted Publications

Scientists Develop the First Heat Map for Individual Red Blood Cells - Variance Sum Rule for Entropy Production I. Di Terlizzi, M. Gironella, D. Herraez-Aguilar, T. Betz, F. Monroy, M. Baiesi, and **F. Ritort**. **Science**, 1st March 2024.

- **Spin-crossover materials as a good alternative to be implemented in ecofriendly refrigerators based on elastocaloric effects** - Elastocaloric, barocaloric and magnetocaloric effects in spin crossover polymer composite films. Lünser K.; Kavak E.; Gürpinar K.; Emre B.; Atakol O.; **Stern-Taulats E.; Porta M.; Planes A.**; Lloveras P.; Tamarit J.-L.; **Mañosa L.** **Nature Communications**, Volume 15, Issue 1, 2024, Article number 6171.

- **New technological breakthrough for fast and efficient 3D imaging of objects** - Fast topographic optical imaging using encoded search focal scan. **Vilar N.**; Artigas R.; **Duocastella M.**; Carles G. **Nature Communications**. Volume 15, Isseu 1, Article number 2065, 2024

- **New molecular compound designed with technological applications at the nanoscale** - On-surface magnetocaloric effect for a van der Waals Gd(iii) 2D MOF grown on Si. Kumar S.; **Riera G.G.**; Arauzo A.; Hrubý J.; Hill S.; Bogani L.; Rubio-Zuazo J.; Jover J.; Bartolomé E.; **Sañudo E.C.** **Journal of Materials Chemistry A**, Volume 12, Issue 11, Pages 6269 – 627920, February 2024

- **Development of an innovative microfabrication technique in the design of future micro-machines built on the principles of active matter** - Probing active nematics with in situ microfabricated elastic inclusions. **Vélez-Cerón I.**; Guillamat P.; **Sagués F.**; **Ignés-Mullol J.** **Proceedings of the National Academy of Sciences (PNAS).** March 7, 2024, 121 (11) e2312494121

- **A methodology to read QR codes on uneven surfaces** - Reading QR Codes on challenging surfaces using thin-plate splines. Benito-Altamirano I.; Martínez-Carpena D.; Lizarzaburu-Aguilar H.; **Fàbrega C.**; **Prades J.D.** **Pattern Recognition Letters**, Volume 184, Pages 37 - 43, August 2024.

- **Researchers design a therapeutic tool to inhibit the proliferation of the SARS-CoV-2 virus that causes COVID-19** - Polypurine reverse hoogsteen hairpins as a therapeutic tool for SARS-CoV-2 infection. **Ciudad C.J.**; **Valiuska S.**; Rojas J.M.; Nogales-Altozano P.; Aviñó A.; Eritja R.; Chillón M.; Sevilla N.; **Noé V.** **The Journal of Biological Chemistry**, October, 2024.

- **An innovative theoretical study to explain the anomalous properties of water** - Phase behavior of metastable water from large-scale simulations of a quantitatively accurate model near ambient conditions: The liquid–liquid critical point. **L.E. Coronas** and **G. Franzese**. **J. Chem. Phys.** 161, 164502 (2024).

- **New biochemistry for RNA at low temperatures is decribed** - Universal cold RNA phase transitions. Rissone, P.; Severino, A.; Pastor, I.; **Ritort, F.** **Proceedings of the National Academy of Sciences (PNAS)**, August 2024.

- **New Approach to Designing Functional Materials for Stealth Technology: Radar Experiment with Bilayer Absorbers and Optimization of the Reflection Loss**. Calvo-de la Rosa J.; Bou-Comas A.; Manel Hernàndez J.; Marín P.; Lopez-Villegas J.M.; **Tejada J.**; Chudnovsky E.M. **Advanced Functional Materials.** Volume 34, Issue 6, Article number 2308819, 2024.

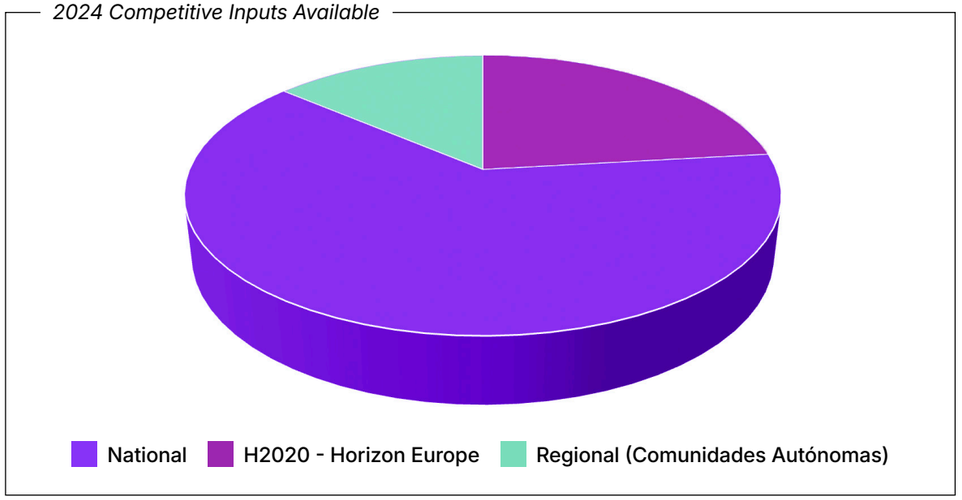
- **Massively parallel analysis of single-molecule dynamics on next-generation sequencing chips**. Aguirre Rivera J.; Mao G.; Sabantsev A.; Panfilov M.; Hou Q.; Lindell M.; Chanez C.; **Ritort F.**; Jinek M.; Deindl S. **Science**, Volume 385, Issue 6711, Pages 892 - 89823, August 2024.

- **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. **Nature Nanotechnology**, Volume 19, Issue 1, January 2024.

In **bold blue**, IN²UB researchers.

2.1.2. FUNDING SOURCES

On 2024 the researchers from IN²UB have been awarded with a total of 6.6M€ to be distributed in the forthcoming years. The total amount allocated for 2024 rises 9M€. In the graphic pie the distribution from public/competitive funding organizations achieved by our researchers is shown. Dates provided by SIRA/GREC UB (February 2025).



2.1.2.1. Highlighted Projects

Form all these projects here we highlight the most relevant ones awarded this 2024:

- **WATERsense**, coordinated by Ramón y Cajal researcher, Dr. Marta Estrader (Laboratory of Nanostructured and Nanocomposite Materials (LM2N)) has been selected by the European Innovation Council to develop cutting-edge technologies within the 2024 Pathfinder Open call. The aim of the project is to remotely detect the presence of pollutants in water at any time - [Read more]

- The project **Portable high-speed infrared camera based on coded light** led by Dr. Martí Duocastella, from the LASER- Micro-nanotecnologies i nanoscòpies per a dispositius electrònics i fotònics (MIND), has been awarded with a Proof of Concept (PoC) grant in frame of the Funds for the Promotion of Innovation (F2I) 2023 call - [Read more]

- **Nanotechnology to treat glaucoma:** The project led by Professor María Luisa García as responsible scientist, and with Dra. Elena Sánchez as an entrepreneur, Nanostructured systems for controlled drug delivery, has received a Llavor grant, from the Generalitat de Catalunya, to develop a nanotechnological drug based on natural compounds to treat the degeneration caused by this disorder - [Read more]

- **An ultra-compact microscope for monitoring organs on a chip:** The project, led by the Professor Ángel Diéguez, from Instrumentation Systems and Communications (SIC) has received a grant Product of the call Industry of Knowledge 2023 of the Generalitat of Catalonia to produce a prototype of this innovative technology, that allows the instrument to be brought to the sample and, therefore, analyzed continuously and in real time - [Read more]

- **A highlighted collaboration between NanoPharmaMed & NanoPhotoElectro & NanoMagnetics Research Areas to develop a drug nanocarrier controlled by light, with applications in cancer therapy and diagnosis:** The project, that recieved a Llavor grant from the Generalitat de Catalunya, has potential applications in cancer therapy, but also in its diagnosis, will be carried out by a multidisciplinary collaboration, led by Dr. Ana Belén Caballero (Nanoscience and Bio-Inorganic Chemistry (nanoBIC)), with researchers from Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND) and Group of Magnetic Nanomaterials - [Read more]

- **Dr. Adriana Isabel Figueroa, receives the L'Oréal-UNESCO for women in science award:** Dr. Adriana Isabel Figueroa, researcher at Group of Magnetic Nanomaterials, has been awarded by the L'Oréal-UNESCO for women in science award, for her research on "Magnetic effects at the interface of heterostructures with 2D materials (iMAG2D)", a line of work that aims to study the fundamental properties of 2D material layers and their interfaces. The initiative aims to highlight female leadership in science throughout the country - [Read more]

- **The UB develops an innovative cooling and heating technology based on more efficient rubber and without greenhouse gases:** The project, which has received a Product grant under the Knowledge Industry program of the Generalitat de Catalunya, will be carried out jointly with Dr. Enric Stern (researcher at Materials: Phase transitions), who is the enterprising scientist - [Read more]

2.1.3. HIGHLIGHTED NEWS

- The ICREA Academia programme has awarded IN²UB Researchers: Prof. Guillem Aromí and Prof. Felix Ritort - [Read more]

- Nineteen IN²UB Researchers among **Authors top2% UB scientists** according to the Stanford Ranking - [Read more]

- Prof. Amílcar Labarta and Prof. Xavier Batlle awarded with the **"Salvador Velayos" Prize from The Spanish Magnetism Club** - [Read more]

- Researchers from Materials for Energy, Photonics & Catalysis Research Group (ENPHOCAMAT) have developed a new hybrid nanomaterial with long life cycle and high resistance to corrosion and extreme temperatures - [Read more]

2.1.4. TRANSFER INDICATORS

A relevant indicator is the number of spin-off companies emerged from IN2UB. There are 7 spin-offs currently active led by IN²UB researchers:

- **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 former member of the IN2UB) a co-founder.

- **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.

- **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.

- **Enlighting Technologies**, created in 2016 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.

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

During this period, IN²UB has applied for 43 patents.

2.2. GROUPS AT RESEARCH AREAS

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 (Associate Professor)

Selected Papers

- Sharma P.; Venugopal A.; Verdi C.M.; Roger M.S.; Calò A.; Kumar M. ***Heparin Binding Induced Supramolecular Chirality Into The Self-Assembly Of Perylenediimide Bolaamphiphile.*** 2024, Journal of Materials Chemistry B, 2, 30, 7292

2.2.2. BIOPHYSICS AND BIOENGINEERING UNIT (NANOBIO)
(Department Biomedicine, Faculty Medicine)

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

Selected Papers
- Ulldemolins A.; Narciso M.; Sanz-Fraile H.; Otero J.; Farré R.; Gavara N.; Almendros I. ***Effects of aging on the biomechanical properties of the lung extracellular matrix: dependence on tissular stretch.*** 2024, Frontiers in Cell and Developmental Biology, 12, 1381470.

- Farré R.; Rodríguez-Lázaro M.A.; Otero J.; Gavara N.; Sunyer R.; Farré N.; Gozal D.; Almendros I. ***Low-cost, open-source device for simultaneously subjecting rodents to different circadian cycles of light, food, and temperature.*** 2024, Frontiers in Physiology, 15, 1356787.

- Carter E.P.; Yoneten K.K.; Gavara N.; Tyler E.J.; Gauthier V.; Murray E.R.; ten Dijke P.; Cameron A.J.; Pearce O.; Grose R.P. ***Opposing roles for ADAMTS2 and ADAMTS14 in myofibroblast differentiation and function.*** 2024, Journal of Pathology, 262, 1, 90.

2.2.3. BIOPT: OPTICAL TRAPPING LAB - GRUP DE BIOFOTÒNICA (NANOBIO)
(Department Applied Physics, Faculty Physics)

Team
Estela Martín Badosa (Full Professor)
Mario Montes Usategui (Associate Professor)
David Maluenda Niubó (Associate Professor)
Jordi Tiana Alsina (Associate Professor)
Nick Toledo García (Predoctoral Researcher)

Selected Papers
- Gijon M.D.; Masoller C.; Tiana-Alsina J. ***Effect of current modulation on the coherence of a semiconductor laser with optical feedback.*** 2024, Optics Express, 32, 20. 10.1364/OE.533601.

2.2.4. 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)
Ester López Aguilar (Predoctoral Researcher)
Carlos Ciudad Gómez (Emeritus Professor)

Selected Papers
- Ciudad C.J.; Valiuska S.; Rojas J.M.; Nogales-Altozano P.; Aviñó A.; Eritja R.; Chillón M.; Sevilla N.; Noé V. ***Polypurine reverse hoogsteen hairpins as a therapeutic tool for SARS-CoV-2 infection.*** The Journal of Biological Chemistry, October, 2024.

- Isanta B.; Delgado A.; Ciudad C.J.; Busquets M.A.; Griera R.; Llor N.; Noé V. ***Synthesis and Validation of TRIFAPYs as a Family of Transfection Agents for Therapeutic Oligonucleotides.*** 2024, Biomolecules, 14, 4, 390.

2.2.5. CATALYSIS AND ADVANCED INORGANIC MATERIALS (MATCAT) (NANOENERGY)
(Department Inorganic and Organic Chemistry, Faculty Chemistry)

Team
Narcis 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
- Pajares A.; Ramírez de la Piscina P.; Homs N. ***Selective reduction of CO2 to CO over alumina-supported catalysts of group 5 transition metal carbides.*** 2024, Applied Catalysis A: General. 687, 119963. 10.1016/j.apcata.2024.119963

- Wang Y.; Pajares A.; Serafin J.; Alcobé X.; Güell F.; Homs N.; Ramírez de la Piscina P. MoxC ***Heterostructures as Efficient Cocatalysts in Robust MoxC/g-C3N4 Nanocomposites for Photocatalytic H2 Production from Ethanol.*** 2024. ACS Sustainable Chemistry and Engineering, 12, 11. 10.1021/acssuschemeng.3c06261

2.2.6. CATALYSIS AND APPLIED KINETICS (NANOENERGY)
(Department of Chemical Engineering and Analytical Chemistry, Faculty Chemistry)

Team
Javier Tejero Salvador (Full Professor)
Montserrat Iborra Urios (Full Professor)
Eliana Ramírez Rangel (Associate Professor)
Carles Fité Piquer (Associate Professor)
Roger Bringué Tomàs (Associate Professor)
Jordi Hug Badia Córcoles (Associate Professor)
Rodrigo Soto López (Tenure-Track Lecturer)

Selected Papers
- Bringué R.; Soto R.; Badia J.H.; Ramírez E.; Fité C.; Iborra M.; Tejero J. ***Optimization of the One-Pot Synthesis of Butyl Levulinate from Fructose and 1-Butanol***. 2024, Industrial and Engineering Chemistry Research, 63, 39. 10.1021/acs.iecr.4c01580

- Ramírez E.; Iborra M.; Tejero J. ***Catalysts: Advances in the Catalytic Behavior of Ion-Exchange Resins.*** 2024, Catalysts, 14, 10, 704. 10.3390/catal14100704

2.2.7. CELLULAR RESPONSES TO XENOBIOTICS (NANOPHARMAMED)

(Department of 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)
Adriana Solange Maddaleno Jiménez (Adjunct Lecture)
Michele Ferrari (Collaborator-CNR-ICMATE Italy)

Selected Papers

- Vinardell M.P.; Maddaleno A.S.; Mitjans M. Harmonizing I***n Vitro Techniques for Anti-Aging Cosmetic Ingredient Assessment: A Comprehensive Review.*** 2024, Cosmetics, 11 5, 170.

- Maddaleno A.S.; Vinardell M.P.; Mitjans M. ***Innovative Strategies for Photoallergy Assessment: Breaking Free from Animal Models in Cosmetic Ingredient Development.*** 2024, Cosmetics, 11, 2, 47.

2.2.8. 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

- Salgado-Pizarro R.; Puigjaner C.; García J.; Fernández A.I.; Barreneche C. ***Copper- and manganese-based layered hybrid organic-inorganic compounds with polymorphic transitions as energy storage materials.*** 2024, Journal of Materials Chemistry A, 12, 29. 10.1039/d4ta01060d

- Zhao L.; Murrieta M.F.; Padilla J.A.; Lanzalaco S.; Cabot P.L.; Sirés I. ***Bimetallic FeCu-MOF derivatives as heterogeneous catalysts with enhanced stability for electro-Fenton degradation of lisinopril***. 2024, Science of the Total Environment, 953, 176110. 10.1016/j.scitotenv.2024.176110

- Zhao L.; Padilla J.A.; Xuriguera E.; Cabot P.L.; Brillas E.; Sirés I. ***Enhanced mineralization of pharmaceutical residues at circumneutral pH by heterogeneous electro-Fenton-like process with Cu/C catalyst.*** 2024, Chemosphere, 364, 143249. 10.1016/j.chemosphere.2024.143249

2.2.9. 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)

2.2.10. 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

- Tallini L.R.; Manfredini G.; Rodríguez-Escobar M.L.; Ríos S.; Martínez-Francés V.; Feresin G.E.; Borges W.D.S.; Bastida J.; Viladomat F.; Torras-Claveria L. ***The Anti-Cholinesterase Potential of Fifteen Different Species of Narcissus L. (Amaryllidaceae) Collected in Spain.*** 2024, Life, 14, 4, 536. 10.3390/life14040536.

2.2.11. 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 (Full Professor)
Montserrat García del Muro Solans (Associate Professor)
Maria Aranzazu Fraile Rodríguez (Associate Professor)
Eric Langenberg Perez (Associate Professor)
Adriana Isabel Figueroa Garcia (Tenure-Track Lecturer - Serra Hunter)
Javier Rodríguez Álvarez (Predoctoral Researcher)

Selected Papers

- Moya C.; Ara J.; Labarta A,; Batlle X. ***Unraveling the Magnetic Properties of NiO Nanoparticles: From Synthesis to Nanostructure.*** Magnetism. 2024, 4(3), 252-280. 10.3390/magnetism4030017

- Moya C.; Escoda-Torroella M.; Rodríguez-Álvarez J.; Figueroa A.I.; García I.; Ferrer-Vidal I.B.; Gallo-Cordova A.; Puerto Morales M.; Aballe L.; Fraile Rodríguez A.; Labarta A.; Batlle X. ***Unveiling the crystal and magnetic texture of iron oxide nanoflowers.*** 2024, Nanoscale , 16, 4. 10.1039/d3nr04608g.

- Nizet P.; Chiabrera F.; López-Pintó N.; Alayo N.; Langner P.; Valencia S.; Fraile Rodríguez A.; Baiutti F.; Smekhova A.; Morata A.; Sort J.; Tarancón A. ***Analog control of La0.5Sr0.5FeO3-δ electrical properties through oxygen deficiency induced magnetic transition.*** Applied Physics Reviews, Volume 11, Issue 41, December 2024, Article number 041426. 10.1063/5.0234003

2.2.12. HOMOGENEOUS CATALYSIS (NANOSMAT)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

Team

Arnald Grabulosa Rodriguez (Associate Professor)
Daniel Sainz Garcia (Associate Professor)
José Luis Núñez Rico (Adjunct Lecture)
Dana Josa Hidalgo (Predoctoral Researcher)
Javier Eusamio Rodríguez (Predoctoral Researcher)
Albert Gutierrez Currius (Technician)

Selected Papers

- Eusamio J.; Saumell N.; Vidal-Ferran A.; Grabulosa A. ***Rhodium(I) Complexes with a η1-Fluorenyl-P-phosphanylphosphorane Ligand.*** 2024, Inorganic Chemistry, 63, 30. 10.1021/acs.inorgchem.4c01934

2.2.13. 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)
Oscar Alonso Casanovas (Associate Professor)

Selected Papers

- Moreno S.; Moro V.; Canals J.; Diéguez A. ***Area-Efficient Mixed-Signal Time-to-Digital Converter Integration for Time-Resolved Photon Counting***. 2024, Sensors, 24, 17, 5763. 10.3390/s24175763.

- Moro V.; Canals J.; Moreno S.; Higgins-Wood S.; Alonso O.; Waag A.; Prades J.D.; Dieguez A. ***Fluorescence Multi-Detection Device Using a Lensless Matrix Addressable microLED Array***. 2024, Biosensors, 14, 6,2 64. 10.3390/bios14060264.

- Soler-Fernández J.L.; Casals O.; Fàbrega C.; Li H.; Diéguez A.; Daniel Prades J.; Alonso O. ***Verilog-A Model for a Light-Activated Semiconductor Gas Sensor.*** 2024, IEEE Sensors Journal. 24, 14. 10.1109/JSEN.2024.3407651.

2.2.14. 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)
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

- Martínez-Revuelta R.; Hernández-Gutiérrez C.A.; Escobosa-Echavarría A.; Vargas Carosi B.; Peiró F.; López-López M. ***Nanoscopic analysis of rapid thermal annealing effects on InGaN grown over Si(111).*** 2024, Materials Science in Semiconductor Processing, 184, 108831. 10.1016/j.mssp.2024.108831

- Sha Z.; Douglas J.O.; Yedra L.; Seymour I.D.; Estradé S.; Peiró F.; Skinner S.J.; Kilner J.A. ***Revealing Local Grain Boundary Chemistry and Correlating it with Local Mass Transport in Mixed-Conducting Perovskite Electrodes***. 2024, Small, 20, 50, 2404702. 10.1002/smll.202404702

- del-Pozo-Bueno D.; Kepaptsoglou D.; Ramasse Q.M.; Peiró F.; Estradé S. ***Machine Learning Data Augmentation Strategy for Electron Energy Loss Spectroscopy: Generative Adversarial Networks.*** 2024, Microscopy and Microanalysis, 30, 2. 10.1093/mam/ozae014

2.2.15. 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

- Maniaki D.; Sickinger A.; Barrios L.A.; Aguilà D.; Roubeau O.; Guyot Y.; Riobé F.; Maury O.; Abad Galán L.; Aromí G. Chemical Science. Volume 15, Issue 44, Pages 18295 - 18302, 18 October 2024. 10.1039/d4sc03994g. ***Energy exchange between Nd3+ and Er3+ centers within molecular complexes***. **Work featured on the cover**.

- Risa A.; Barrios L.A.; Diego R.; Roubeau O.; Aleshin D.Y.; Nelyubina Y.; Novikov V.; Teat S.J.; Ribas-Ariño J.; Aromí G. Chemical Science. Volume 15, Issue 24, Pages 9047 - 9053, 28 May 2024. 10.1039/d4sc01365d. ***Engineered π···π interactions favour supramolecular dimers X@[FeL3]2 (X = Cl, Br, I): solid state and solution structure***. **Work featured on the cover**.

- Repollés A.; Pallarés M.C.; Aguilà D.; Roubeau O.; Velasco V.; Gella D.; Barrios L.A.; Martínez-Pérez M.J.; Sesé J.; Drung D.; Martínez J.I.; Schurig T.; Le Guennic B.; Lostao A.; Aromí G.; Luis F. ***Asymmetric [Dy2] molecules deposited into micro-SQUID susceptometers: in situ characterization of their magnetic integrity***. 2024. Nanoscale, 17, 1. 10.1039/d4nr03484h.

2.2.16. 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

- Lin M.; Vargas B.; Yedra L.; van Gog H.; van Huis M.A.; Mendes R.G.; Llorca J.; Estruch-Blasco M.; Pernia Leal M.; Pajuelo E.; Estradé S.; Peiró F.; Rodríguez L.; Figuerola A. ***Unraveling the Formation of Ternary AgCuSe Crystalline Nanophases and Their Potential as Antibacterial Agents.*** 2024, Chemistry of Materials, 36, 20. 10.1021/acs.chemmater.4c01604

2.2.17. 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 (website: www.ub.edu/dlight))
Juan Marcos Fernández Pradas (Associate Professor)
Laura Rodríguez Suñé (Postdoctoral Researcher)
Ernest Martí Jerez (Predoctoral Researcher)
Narcís Vilar Solé (Industrial Predoctoral Researcher)

Selected Papers

- Vilar N.; Artigas R.; Duocastella M.; Carles G. ***Fast topographic optical imaging using encoded search focal scan***. Nature Communications. Volume 15, Issue 1, Article number 2065, 2024. 10.1038/s41467-024-46267-y.
- Martí-Jerez E.; Fernández-Pradas J.M.; Serra P.; Duocastella M. ***3D Shape Control of Printed Micro-Electrodes with Substrate Reshaping.*** 2024, Advanced Materials Technologies.10.1002/admt.202401641
- Marchese A.; Ricci P.; Saggau P.; Duocastella M. ***Scan-less microscopy based on acousto-optic encoded illumination***. 2024, Nanophotonics, 13, 1. 10.1515/nanoph-2023-0616

2.2.18. 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

- Pilichos E.; Font-Bardia M.; Aullón G.; Mayans J.; Escuer A. ***Family of Quasi-Isotropic MnII and Mn2II Complexes Exhibiting Slow Relaxation of the Magnetization***. 2024, Inorganic Chemistry, 63, 43. 10.1021/acs.inorgchem.4c02826.

- Costa-Villén E.; Font-Bardia M.; Mayans J.; Escuer A. ***Field-Induced Slow Relaxation of the Magnetization in Two Families of [MIILnIII] Complexes***. 2024, Crystal Growth and Design, 24, 13. 10.1021/acs.cgd.4c00598.

- Tubau I.; Rodríguez L.; Pander P.; Weatherill L.; Dias F.B.; Font-Bardía M.; Vicente R. ***Slow magnetic relaxation and luminescence properties in β-diketonate lanthanide(iii) complexes. Preparation of Eu(iii) and Yb(iii) OLED devices***. 2024, Journal of Materials Chemistry C, 12, 22. 10.1039/d4tc00902a.

- Athanasopoulou A.A.; Abbasi P.; Alexandropoulos D.I.; Hayward J.J.; Beavers C.M.; Teat S.J.; Wernsdorfer W.; Mayans J.; Escuer A.; Pilkington M.; Stamatatos T.C. ***A Nanosized {NiII18} Cluster with a 'Flying Saucer' Topology Exhibiting Slow Relaxation of Magnetisation Phenomena at Both 15 K and 1.3 K***. 2024, Chemistry - A European Journal. 10.1002/chem.202403462

2.2.19. MAGNETIC SOFT MATTER GROUP (NANOBIO)

(Department Condensed Matter Physics, Faculty Physics)

Team

Pietro Tierno (Full Professor - ERC Consolidator Grant)

Selected Papers

- Boniface D.; Leyva S.G.; Pagonabarraga I.; Tierno P. ***Clustering induces switching between phoretic and osmotic propulsion in active colloidal rafts.*** 2024, Nature Communications, 15, 1, 5666. 10.1038/s41467-024-49977-5.

- Boniface D.; Straube A.V.; Tierno P. ***Photocatalytic Magnetic Microgyroscopes with Activity-Tunable Precessional Dynamics***. 2024, Nano Letters, 24, 47. 10.1021/acs.nanolett.4c03386.

2.2.20. 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

- Rovirola M.; Waqas Khaliq M.; Gustafson T.; Sosa-Barth F.; Casals B.; Hernàndez J.M.; Ruiz-Gómez S.; Niño M.A.; Aballe L.; Hernández-Mínguez A.; Foerster M.; Macià F. ***Study of the magnetoelastic effect in nickel and cobalt thin films at GHz range using x-ray microscopy.*** 2024, Physical Review Research, 6, 2, 023285. 10.1103/PhysRevResearch.6.023285

- Khaliq M.W.; Amin O.J.; Hernández-Mínguez A.; Rovirola M.; Casals B.; Omari K.; Ruiz-Gómez S.; Finizio S.; Campion R.P.; Edmonds K.W.; Novák V.; Mandziak A.; Aballe L.; Niño M.A.; Hernàndez J.M.; Wadley P.; Macià F.; Foerster M. ***Néel vector waves in antiferromagnetic CuMnAs excited by surface acoustic waves.*** 2024, Physical Review Materials, 8, 8, 084406. 10.1103/PhysRevMaterials.8.084406

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

(Department Applied Physics, Faculty Physics)

Team

José Luis Andújar Bella (Associate Professor)
Franc Güell Vilà (Associate Professor)
Roger Amade Rovira (Associate Professor)
Stefanos Chaitoglou (Postdoctoral Researcher Beatriu de Pinós)
Jordi Díaz Marcos (Adjunct Lecture)
Enric Bertran Serra (Emeritus Professor)

Selected Papers

- Chaitoglou S.; Ma Y.; Ospina R.; Farid G.; Serafin J.; Amade Rovira R.; Bertran-Serra E. ***Laser-Induced Vertical Graphene Nanosheets for Electrocatalytic Hydrogen Evolution***. 2024, ACS Applied Nano Materials7, 19. 22631-22639. 10.1021/acsanm.4c03320

- Majumdar S.; Chaitoglou S.; Serafin J.; Farid G.; Ospina R.; Ma Y.; Amade Rovira R.; Bertran-Serra E. ***Enhancing hydrogen evolution: Carbon nanotubes as a scaffold for Mo2C deposition via magnetron sputtering and chemical vapor deposition.*** 2024. International Journal of Hydrogen Energy, 89. 10.1016/j.ijhydene.2024.09.425

- Farid G.; Amade-Rovira R.; Ma Y.; Ospina R.; Serafin J.; Chaitoglou S.; Majumdar S.; Poveda A.; Bertran-Serra E. ***Improving lithium-ion battery performance through patterned growth of carbon nanotubes over vertically aligned silicon nanowires.*** 2024, Journal of Energy Storage, 101, 113830, 10.1016/j.est.2024.113830

- Rodriguez-Miguel S.; Ma Y.; Farid G.; Amade R.; Ospina R.; Andujar J.L.; Bertran-Serra E.; Chaitoglou S. ***Vertical graphene nanowalls supported hybrid W2C/WOx composite material as an efficient non-noble metal electrocatalyst for hydrogen evolution.*** 2024, Heliyon, 10, 10, e31230. 10.1016/j.heliyon.2024.e31230

2.2.22. MATERIALS: PHASE TRANSITIONS (NANOMET)

(Department Condensed Matter Physics, Faculty Physics)

Team

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)
Antoni Planes Vila (Emeritus Professor)

Selected Papers

- Lünser K.; Kavak E.; Gürpinar K.; Emre B.; Atakol O.; Stern-Taulats E.; Porta M.; Planes A.; Lloveras P.; Tamarit J.-L.; Mañosa L. ***Elastocaloric, barocaloric and magnetocaloric effects in spin crossover polymer composite films.*** Nature Communications, Volume 15, Issue 1, 2024, Article number 6171. doi.org/10.1038/s41467-024-50373-2

.

- Hou R.; Xiao F.; Zuo S.; Cai X.; Zhou Y.; Porta M.; Planes A.; Jin X. ***A macroscopically inhomogeneous stress-induced R-phase transformation in Ti50Ni48.5Fe1.5 with enhanced elastocaloric effect.*** 2024, Acta Materialia, 278, 120272. 10.1016/j.actamat.2024.120272.

2.2.23. MECHANISMS OF REACTIONS IN INORGANIC CHEMISTRY (NANOSMAT)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

Team

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

Selected Papers

- Raïch Panisello O.; Jover J.; Puigjaner C.; Ferrer M.; Martínez M. ***No Switching Cooperativity between Coordinated Azo Ligands on Complexes Having {MII(phosphane-κ2P)}2+ (M = Pd, Pt) Scaffolds.*** 2024. Inorganic Chemistry, 63, 35. 10.1021/acs.inorgchem.4c02169.

- Pla D.; Ferrer M.; Gómez M.; Martinez Lopez M. ***Kinetico-Mechanistic Studies of Cu(II)-Mediated Cyclization of Imines via C−H Bond Activations.*** 2024, European Journal of Inorganic Chemistry, 27, 36, e202400564. 10.1002/ejic.202400564.

2.2.24. 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)
Sergio Hernández Márquez (Full Professor)
Paolo Pellegrino (Associate Professor)
Daniel Navarro Urrios (Associate Professor)
Cristian Fàbrega Gallego (Associate Professor)
Olga Casals Guillén (Tenure-Track Lecturer)
Giovanni Vescio (Postdoctoral Researcher)
Francisco Palacio Bonet (Postdoctoral Researcher)
Júlia Marí Guaita (Postdoctoral Researcher Juan de la Cierva)
Guillem Domènech Gil (Postdoctoral Researcher Marie Sklodowska-Curie)
David Alonso Tomás (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

- Jaramillo-Fernandez J.; Poblet M.; Alonso-Tomás D.; Bertelsen C.V.; López-Aymerich E.; Arenas-Ortega D.; Svendsen W.E.; Capuj N.; Romano-Rodríguez A.; Navarro-Urrios D. ***Strong Cavity-Optomechanical Transduction of Nanopillar Motion.*** 2024, ACS Nano, 18, 35. 10.1021/acsnano.4c09014.

- Benito-Altamirano I.; Martínez-Carpena D.; Lizarzaburu-Aguilar H.; Fàbrega C.; Prades J.D. ***Reading QR Codes on challenging surfaces using thin-plate splines. Pattern Recognition*** Letters, Volume 184, Pages 37 - 43, August 2024.

- Estany-Macià A.; Fort-Grandas I.; Joshi N.; Svendsen W.E.; Dimaki M.; Romano-Rodríguez A.; Moreno-Sereno M. ZIF-8-Based Surface Plasmon Resonance and Fabry–Pérot ***Sensors for Volatile Organic Compounds.*** 2024, Sensors, 24, 13, 4381. 10.3390/s24134381.

- Vescio G.; Dirin D.N.; González-Torres S.; Sanchez-Diaz J.; Vidal R.; Franco I.P.; Adhikari S.D.; Chirvony V.S.; Martínez-Pastor J.P.; Vinocour Pacheco F.A.; Przypis L.; Öz S.; Hernández S.; Cirera A.; Mora-Seró I.; Kovalenko M.V.; Garrido B. ***Inkjet-Printed Red-Emitting Flexible LEDs Based on Sustainable Inks of Layered Tin Iodide Perovskite.*** 2024, Advanced Sustainable Systems, 8, 9, 2400060. 10.1002/adsu.202400060.

2.2.25. MINERAL RESOURCES RESEARCH GROUP (NANOMET)

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

Team

Joaquín Antonio Proenza Fernandez (Full Professor)
Josep Roqué Rosell (Associate Professor)
Joan Carles Melgarejo Draper (Associate Professor)
Robert Oliva Vidal (Collaborator Geosciencies Barcelona (GEO3BCN-CSIC))
Jordi Ibañez Insa (Collaborator Geosciencies Barcelona (GEO3BCN-CSIC))

Selected Papers

- Torró L.; Harlaux M.; Castro-Morante A.; Vallance J.; Tavazzani L.; Bouvier A.-S.; Bovay T.; Chelle-Michou C.; Sempere T.; Melgarejo J.C. ***Tin Mineralization in the Triassic Chacaltaya District (Cordillera Real, Bolivia) Traced by In Situ Chemical and δ18O-δ11B Compositions of Tourmaline.*** 2024, Economic Geology, 119, 2 . 10.5382/econgeo.5051.

- Liritzis I.; Cazottes S.; Douillard T.; Véron M.; Roqué-Rosell J.; Marini C.; Das P.P.; Gomez-Perez A.; Galanis A.S.; Nicolopoulos S.; Manti P.; Yang J.; Zhang X. ***Nano-microcrystals revealed on Tang dynasty gilded bronze using advanced TEM-SEM and synchrotron methods.*** 2024, Nanoscale, 16, 33. 10.1039/d4nr02030h.

2.2.26. MOLECULAR NANOSCIENCE LABORATORY (NANOMAGNETICS)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

Team

E. Carolina Sañudo Zotes (Associate Professor) esanudo(at)ub.edu
Guillem Gabarró Riera (Predoctoral Researcher)

Selected Papers

- Kumar S.; Riera G.G.; Arauzo A.; Hrubý J.; Hill S.; Bogani L.; Rubio-Zuazo J.; Jover J.; Bartolomé E.; Sañudo E.C. ***On-surface magnetocaloric effect for a van der Waals Gd(iii) 2D MOF grown on Si.*** Journal of Materials Chemistry A, Volume 12, Issue 11, Pages 6269 – 627920, February 2024. 10.1039/d3ta06648g.

- Gabarró-Riera G.; Sañudo E.C. ***Challenges for exploiting nanomagnet properties on surfaces.*** Communications Chemistry, May 2024, 7(1). 10.1038/s42004-024-01183-6.

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

(Department Applied Physics, Faculty Physics)

Team

Julià Vidrier López (Associate Professor) (Coordinator)
Joan Bertomeu Balagueró (Full Professor)
Manuel Varela Fernández (Full Professor)
César Ferrater Martorell (Associate Professor)
M Carmen Polo Trasancos (Associate Professor)
Arturo Lousa Rodríguez (Associate Professor)
José Miguel Asensi López (Associate Professor)
Regina Galceran Vercher (Tenure-Track Lecturer)
Umer Aziz (Predoctoral Researcher)

Selected Papers

- Rodríguez-Tapiador M.I.; Merino J.; Jawhari T.; Muñoz-Rosas A.L.; Bertomeu J.; Fernández S. ***Power effect on the properties of copper nitride films as solar absorber deposited in pure nitrogen atmosphere.*** 2024, Applied Research, 3, 1, e202200105.

- Hiller D.; Munnik F.; López-Vidrier J.; Solonenko D.; Reif J.; Knaut M.; Thimm O.; Grant N.E. ***Comparison of three titanium-precursors for atomic-layer-deposited TiO2 for passivating contacts on silicon.*** 2024, Journal of Vacuum Science and Technology A: Vacuum, Surfaces and Films, 42, 3, 032406. 10.1116/6.0003309.

2.2.28. 2.2.28 NANOBIOENGINEERING AND BIOMATERIALS UNIT (NANOBIO)

(Department Electronics and Biomedical Engineering, Faculty Physics)

Team

Josep Samitier Martí (Full Professor)
Óscar Castaño Linares (Associate Professor)
Jordi Colomer Farrarons (Associate Professor)
Romén Rodríguez Trujillo (Associate Professor)
Mònica Mir Llorente (Adjunct Lecturer)
Adrià Noguera Monteagudo (Predoctoral Researcher)

Selected Papers

- Ximenes-Carballo C.; Rey-Viñolas S.; Blanco-Fernandez B.; Pérez-Amodio S.; Engel E.; Castano O. ***Combining three-dimensionality and CaP glass-PLA composites: Towards an efficient vascularization in bone tissue healing.*** Biomaterials Advances. Volume 164, November 2024, 213985. 10.1016/j.bioadv.2024.213985.

- Prat-Trunas J.; Arias-Alpizar K.; Álvarez-Carulla A.; Orio-Tejada J.; Molina I.; Sánchez-Montalvá A.; Colomer-Farrarons J.; del Campo F.J.; Miribel-Català P.L.; Baldrich E. ***Paper-based microfluidic electro-analytical device (PMED) for magneto-assay automation: Towards generic point-of-care diagnostic devices.*** 2024, Biosensors and Bioelectronics, 246, 115875. 10.1016/j.bios.2023.115875.

2.2.29. 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)
Roya Mohammadi (Predoctoral Researcher)
María Rincón Díaz (External Collaborator)
Marcelle Silva de Abreu (External Collaborator)
Guadalupe Del Carmen Abrego Escobar (External Collaborator)
Beatriz Clares Maveros (External Collaborator)
Lupe Carolina Espinoza Tituana (External Collaborator)
Paulo Cesar Sarango Granda (External Collaborator)

Selected Papers

- Folle C.; Marqués A.M.; Díaz-Garrido N.; Carvajal-Vidal P.; Sánchez López E.; Suñer-Carbó J.; Halbaut L.; Mallandrich M.; Espina M.; Badia J.; Baldoma L.; García M.L.; Calpena A.C. ***Gel-Dispersed Nanostructured Lipid Carriers Loading Thymol Designed for Dermal Pathologies.*** 2024, International Journal of Nanomedicine, 19. 10.2147/IJN.S433686.

- Folle C.; Sánchez-López E.; Mallandrich M.; Díaz-Garrido N.; Suñer-Carbó J.; Halbaut L.; Carvajal-Vidal P.; Marqués A.M.; Espina M.; Badia J.; Baldoma L.; García M.L.; Calpena A.C. ***Semi-solid functionalized nanostructured lipid carriers loading thymol for skin disorders.*** 2024, International Journal of Pharmaceutics, 651, 123732. 10.1016/j.ijpharm.2023.123732.

- Folle C.; Marqués A.M.; Mallandrich M.; Suñer-Carbó J.; Halbaut L.; Sánchez-López E.; López-Machado A.L.; Díaz-Garrido N.; Badia J.; Baldoma L.; Espina M.; García M.L.; Calpena A.C. ***Colloidal hydrogel systems of thymol-loaded PLGA nanoparticles designed for acne treatment.*** 2024, Colloids and Surfaces B: Biointerfaces, 234, 113678. 10.1016/j.colsurfb.2023.113678

2.2.30. NANOENERGY AND ELECTRONIC MATERIALS (M2E) GROUP (NANOENERGY)

(Department Electronics and Biomedical Engineering, Faculty Physics)

Team

Joan Ramon Morante Lleonart (Emeritus Professor)

Selected Papers

- Han X.; Zhang T.; Biset-Peiró M.; Roldan A.; Ceccato M.; Lock N.; Pedersen S.U.; Morante J.R.; Arbiol J.; Daasbjerg K. ***Mesopore-Augmented Electrochemical CO2 Reduction on Nitrogen-Doped Carbon.*** 2024, Small. 10.1002/smll.202406883.

2.2.31. NANOMALARIA GROUP (NANOBIO)

Department Biochemistry and Molecular Biology. Faculty Biology)

Team

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

2.2.32. NANOSCIENCE AND BIO-INORGANIC CHEMISTRY (NANOBIC) (NANOPHARMAMED)

(Department Inorganic and Organic Chemistry, Faculty Chemistry)

Team

Amparo Caubet Marín (Associate Professor)
Ana Belén Caballero Hernández (Associate Professor)
Carlos Moya Alvarez (Postdoctoral Researcher Beatriu de Pinós)
Piedad Herrera Ramírez (Predoctoral Researcher)
Guglielmo Spinelli (Predoctoral Researcher)

Selected Papers

- Vigueras G.; Sabate R.; Barrios L.A.; Caballero A.B.; Hernández-García S.; Bayón P.; Gandía-Herrero F.; Ruiz J.; Gamez P. ***Piano-stool metal complexes as inhibitors of amyloid-β aggregation in vitro and in vivo.*** 2024, Inorganic Chemistry Frontiers, 11, 18. 10.1039/d4qi01460j.

- Vázquez G.; Espargaró A.; Caballero A.B.; Di Pede-Mattatelli A.; Busquets M.A.; Nawrot D.; Sabaté R.; Nicolás E.; Juárez-Jiménez J.; Gamez P. ***A versatile luminescent probe for sensing and monitoring amyloid proteins.*** 2024, Dyes and Pigments, 231, 112348. 10.1016/j.dyepig.2024.112348.

2.2.33. 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)
Adrià Botet Carreras (Adjunct Lecturer)

Selected Papers

- Navarro N.; Aviñó A.; Domènech Ò.; Borrell J.H.; Eritja R.; Fàbrega C. ***Defined covalent attachment of three cancer drugs to DNA origami increases cytotoxicity at nanomolar concentration.*** 2024, Nanomedicine: Nanotechnology, Biology, and Medicine, 55, 102722. Doi: 10.1016/j.nano.2023.102722

2.2.34. 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)
Fidencia Gamisans Linares (Adjunct Lecturer)

Selected Papers

- Bonilla-Vidal L.; Espina M.; García M.L.; Baldomà L.; Badia J.; González J.A.; Delgado L.M.; Gliszczyńska A.; Souto E.B.; Sánchez-López E. ***Novel nanostructured lipid carriers loading Apigenin for anterior segment ocular pathologies.*** 2024, International Journal of Pharmaceutics, 658, 124222. Doi: 10.1016/j.ijpharm.2024.124222.

- Vega E.; Burgos J.M.; Souto E.B.; García M.L.; Pujol M.; Sánchez-López E. ***Biodegradable nanoplatforms for antigen delivery: part I–state of the art review of polymeric nanoparticles for cancer immunotherapy.*** 2024, Expert Opinion on Drug Delivery, 21, 8. Doi: 10.1080/17425247.2024.2400293

- Thiruchenthooran V.; Świtalska M.; Maciejewska G.; Palko-łabuz A.; Bonilla-Vidal L.; Wietrzyk J.; Souto E.B.; Sánchez-López E.; Gliszczyńska A. ***Multifunctional Indomethacin Conjugates for the Development of Nanosystems Targeting Cancer Treatment.*** 2024, International Journal of Nanomedicine, 19. 10.2147/IJN.S477512.

- Thiruchenthooran V.; Espina M.; Świtalska M.; Bonilla-Vidal L.; Wietrzyk J.; Garcia M.L.; Souto E.B.; Sánchez-López E.; Gliszczyńska A. ***Combination of Indomethacin with Nanostructured Lipid Carriers for Effective Anticancer Therapy.*** 2024, International Journal of Nanomedicine, 19. 10.2147/IJN.S464239.

2.2.35. NANOSYSTEMS STATISTICAL PHYSICS (NANOMET)

(Department Condensed Matter Physics, Faculty Physics)

Team

Miguel Rubí Capaceti (Emeritus Professor)
Ivan Latella (Tenure-Track Lecturer)
Andrés Arango Restrepo (Postdoctoral Researcher)

Selected Papers

- Arango-Restrepo A.; Rubi J.M. ***Interplay of phoresis and self-phoresis in active particles: Transport properties, phoretic, and self-phoretic coefficients.*** 2024, Journal of Chemical Physics. 161, 5, 054906.10.1063/5.0220323.

- Arango-Restrepo A.; Rubi J.M. ***Thermodynamic Insights into Symmetry Breaking: Exploring Energy Dissipation across Diverse Scales.*** 2024, Entropy, 26, 3, 231. 10.3390/e26030231.

- Torrenegra-Rico J.D.; Arango-Restrepo A.; Rubí J.M. ***Self-organization of Janus particles: Impact of hydrodynamic interactions in substrate consumption for structure formation.*** 2024, Journal of Chemical Physics, 161, 22, 224101. 10.1063/5.0236588.

2.2.36. ORGANIC MATERIALS UNIT (NANOSMAT)

(Department Inorganic and Organic Chemistry, Faculty Chemisty)

Team

Maria Dolors Velasco Castrillo (Full Professor)
Jaume García Amorós (Associate Professor)
Roger Bujaldón Carbó (Postdoctoral Researcher)
Clara Fabregat Pallejà (Predoctoral Researcher)

Selected Papers

- Cuadrado A.; Bujaldón R.; Fabregat C.; Puigdollers J.; Velasco D. ***Confronting positions: para- vs. meta-functionalization in triindole for p-type air-stable OTFTs.*** 2024, Organic Electronics, 128, 107020. 10.1016/j.orgel.2024.107020

2.2.37. 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

- García-Gros J.; Cajal Y.; Marqués A.M.; Rabanal F. ***Synthesis of the Antimicrobial Peptide Murepavadin Using Novel Coupling Agents.*** 2024, Biomolecules, 14, 5, 526. 10.3390/biom14050526

2.2.38. 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)

Selected Papers

- Zhao B.; Alonso N.F.; Miras J.; Vílchez S.; García-Celma M.J.; Morral G.; Esquena J. ***Triggered protein release from calcium alginate/chitosan gastro-resistant capsules. 2024, Colloids and Surfaces A: Physicochemical and Engineering Aspects***, 693, 133998. 10.1016/j.colsurfa.2024.133998

2.2.39. 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)

Selected Papers

- Benavent-Claró A.; Granados Leyva S.; Pagonabarraga I.; Ledesma-Aguilar R.; Hernández-Machado A. ***Enhanced Imbibition in Liquid-Infused Coated Microchannels.*** 2024, Langmuir , 40, 50. 10.1021/acs.langmuir.4c03514.

- Leyva S.G.; Pagonabarraga I.; Hernández-Machado A.; Ledesma-Aguilar R. ***Capillary imbibition in lubricant-coated channels.*** 2024, Physical Review Fluids, 9, 7, L072002. 10.1103/PhysRevFluids.9.L072002.

2.2.40. POLARIZED LIGHT APPLICATIONS & TECHNOLOGIES (PLAT) (NANOPHOTOELECTRO)

(Department Applied Physics, Faculty Physics)

Team

Oriol Arteaga Barriel (Associate Professor)
Adolf Canillas Biosca (Full Professor)
Esther Pascual Miralles (Full Professor)
Jordi Gomis Bresco (Associate Professor)
Subiao Bian (Predoctoral Researcher)
Iago Pardo González (Predoctoral Researcher)

Selected Papers

- Jellison G.E.; Cureton W.F.; Arteaga O. ***Optical functions of uniaxial rutile and anatase (TiO2) revisited.*** 2024, Surface Science Spectra, 31, 2, 026001. 10.1116/6.0003719.

- Bian S.; Ossikovski R.; Canillas A.; Jellison G.; Arteaga O. ***Spatial dispersion in silicon.*** 2024, Physical Review B, 109, 3, 035201, 10.1103/PhysRevB.109.035201.

- Li C.; Arteaga O.; Ehlers F.; Krüsmann M.; Sun B.; Poisson J.; Karg M.; Vana P.; Zhang K. ***Self-assembled small molecule spherulites under mild conditions: High solid-state quantum yield and unique interconnected structural and fluorescent colors.*** 2024, Aggregate. 10.1002/agt2.695.

2.2.41. 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 (Full Professor)
Joan Antoni Farrera Piñol (Associate Professor)
Ignasi Vélez Cerón (Predoctoral Researcher)
Olga Bantysh (Predoctoral Researcher)
Joel Torres Andrés (Predoctoral Researcher)

Selected Papers

- Vélez-Cerón I.; Guillamat P.; Sagués F.; Ignés-Mullol J. ***Probing active nematics with in situ microfabricated elastic inclusions.*** 2024, Proceedings of the National Academy of Sciences of the United States of America, 121, 11, e2312494121. 10.1073/pnas.2312494121.

- Velez-Cerón I.; Ignes-Mullol J.; Sagues F. ***Active nematic coherence probed under spatial patterns of distributed activity.*** 2024, Soft Matter, 20, 48. 10.1039/d4sm00651h.

2.2.42. SMALL BIOSYSTEMS LAB (NANOBIO)

(Department Condensed Matter Physics, Faculty Physics)

Team

Fèlix Ritort Farran (Full Professor)
Maria Mañosas Castejon (Associate Professor)

Selected Papers

- I. Di Terlizzi, M. Gironella, D. Herraez-Aguilar, T. Betz, F. Monroy, M. Baiesi, and F. Ritort. ***Variance Sum Rule for Entropy Production*** Science, 1st March 2024.

- Aguirre Rivera J.; Mao G.; Sabantsev A.; Panfilov M.; Hou Q.; Lindell M.; Chanez C.; Ritort F.; Jinek M.; Deindl S. ***Massively parallel analysis of single-molecule dynamics on next-generation sequencing chips.*** Science, Volume 385, Issue 6711, Pages 892 - 89823, August 2024.

- Rissone, P.; Severino, A.; Pastor, I.; Ritort, F. ***Universal cold RNA phase transitions.*** Proceedings of the National Academy of Sciences (PNAS), August 2024.

2.2.43. 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

- Lopez-Garcia A.J.; Alvarez-Suarez G.; Ros E.; Ortega P.; Voz C.; Puigdollers J.; Pérez Rodríguez A. ***Enhanced Selective Contact Behavior in a-Si:H/oxide Transparent Photovoltaic Devices via Dipole Layer Integration.*** 2024, Solar RRL, 8, 14, 2400276. 10.1002/solr.202400276.

2.2.44. 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)
Gionni Marchetti (Technician)

Selected Papers

- L.E. Coronas and G. Franzese. ***Phase behavior of metastable water from large-scale simulations of a quantitatively accurate model near ambient conditions: The liquid–liquid critical point.*** J. Chem. Phys. 161, 164502 (2024). 10.1063/5.0219313.

- Franzese G.; Tassaing T.; Vega L.F. ***Editorial of virtual special issue EMLG/JMLG 2022: Molecular liquids at interfaces.*** 2024, Journal of Molecular Liquids, 399. 10.1016/j.molliq.2024.124334.

2.2.45. 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

- Romo-Islas G.; Burguera S.; Frontera A.; Rodríguez L. ***Investigating the Impact of Packing and Environmental Factors on the Luminescence of Pt(N^N^N) Chromophores.*** 2024, Inorganic Chemistry, 63, 5. 10.1021/acs.inorgchem.3c04562.

- Agrelo-Lestón A.; Llorca J.; Martínez E.; Angurell I.; Rodríguez L.; Soler L. ***Thiocoumarin-based Au(I) Complexes and Au(0) Systems over TiO2 as Hybrid Photocatalysts for Hydrogen Generation under UV–Vis Light.*** 2024, Advanced Science, 11, 47, 2404969. 10.1002/advs.202404969.

2.2.46. SUPRAMOLECULAR SYSTEMS IN NANOBIOMEDICINE (NANOPHARMAMED)

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

Team

M. Lluïsa Pérez Garcia (Full Professor)
Bagherpour Saman (Postdoctoral Researcher)
Naga Venkata Lakshmi Kavya Anguluri (Predoctoral Researcher)
Hina Younis (Predoctoral Researcher)
Daniela Dupkalová (Predoctoral Researcher)
Aysha Fasna (Predoctoral Researcher)
Ruxin Li (Predoctoral Researcher)
David Limon Magaña (Collaborator)

Selected Papers

- 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. ***Wireless electrical–molecular quantum signalling for cancer cell apoptosis.*** Nature Nanotechnology, Vol. 19, Issue 1, 2024.

2.2.47. 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 (Predoctoral Researcher)

Selected Papers

- Garfias A.; Sarret M.; Sánchez J.; Cano I.G.; Albaladejo-Fuentes V.; Andreu T. ***Manufacturing and properties characterization of Ti patterned coatings for water electrolyzers by CSAM.*** 2024, Applied Surface Science Advances, 24, 100649. 10.1016/j.apsadv.2024.100649.

- Molera M.; Sarret M.; Fàbrega C.; Andreu T. ***Effect of Light and Electrode Polarization on BiVO4 and TiO2 Photoanodes for Glycerol Oxidation.*** 2024, Journal of the Electrochemical Society, 171, 8, 086503. 10.1149/1945-7111/ad6bc3.

2.2.48. THEORETICAL PHYSICS OF NANOSCOPIC SYSTEMS (NANOMET)

(Department Quantum Physics, Faculty Physics)

Team

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

Selected Papers

- García-Alfonso E.; Ancilotto F.; Barranco M.; Cargnoni F.; Halberstadt N.; Pi M. ***Revisiting Thomson's model with multiply charged superfluid helium nanodroplets.*** 2024, Journal of Chemical Physics, 161, 22, 224303. 10.1063/5.0244260.

- García-Alfonso E.; Barranco M.; Halberstadt N.; Pi M. ***Time-resolved solvation of alkali ions in superfluid helium nanodroplets.*** 2024, Journal of Chemical Physics, 160, 16. 10.1063/5.0205951.

2.2.49. 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)
Roger Bujaldón Carbó (Postdoctoral Researcher)
Judit Lloreda Rodes (Industrial Predoctoral Researcher)
Laura Huidobro Rodríguez (Predoctoral Researcher)
Pol Vilariño Casaus (Predoctoral Researcher)

Selected Papers

- ***Bismuth oxyiodide-based composites for advanced visible-light activation of peroxymonosulfate in pharmaceutical mineralization.*** 2024, Chemosphere, 366, 14353. 10.1016/j.chemosphere.2024.143532.

- Hjiri M.; Bujaldón R.; Lloreda J.; Gómez E.; Serrà A. ***Advanced degradation of organic pollutants using sonophotocatalytic peroxymonosulfate activation with CoFe2O4/Cu- and Ce-doped SnO2 composites.*** 2024, Chemosphere, 354, 141656. 10.1016/j.chemosphere.2024.141656.

- Gómez E.; Sousa C.; Serrà A. ***Colloidal Cards: Effects of Game-Based Learning on Student's Achievements in Colloidal Science.*** 2024, Journal of Chemical Education, 101, 12. 10.1021/acs.jchemed.4c00847.

- Ortiz M.; Gómez E.; Serrà A. ***Recyclable Biomimetic Sunflower Pollen-based Photocatalyst for Enhanced Degradation of Pharmaceuticals.*** 2024, Small, 20, 46, 2405204. 10.1002/smll.202405204

3

CALLS

3. CALLS

3.1. 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 2024, 2 ART grants have been awarded to the following proposals:

- **Biomass Derived Cellulose Alkanoates for Biodegradable Active Food Packaging Films (BIOPACK).**
  NanoEnergy & NanosMat collaboration

- **Impact of Spin Orbit Coupling on Decoherence in Molecular Quantum Bits (ImSOC).**
  NanoMagnetics (Faculty of Chemistry and Faculty of Physics) collaboration

3.2. MASTER FELLOWSHIPS

In order to stimulate scientific careers in master's students, in the frame of *Beques de Col·laboració UB (UB Collaborating Fellowhips)*, 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 2024, 2 students has been awarded.

3.3. 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 2024, IN2UB has sponsored:

Invited speakers

- **Fast and reliable electrochemical detection of bisphenol S in thermal paper**
  By, Dr. *Kristina Žagar Soderžnik*. Department for Nanostructured Materials at Jožef Stefan Institute. Ljubljana, Slovenia
  Date and Venue: 16th April, 2024 at 10.30h – Sala Graus Eduard Fontserè (Faculties of Physics and Chemistry UB)
  (Chaired by Dr. Cristian Fàbrega, IN²UB and Faculty of Physics)

- **Terphenyl phosphines as supporting ligand in cross-coupling reactions catalyzed by Pd and Ni**
  Prof. *M. Carmen Nicasio* – Univ. Sevilla Date and Venue: 14th June, 2024 at 12h – Aula Magna Enric Casassas.
  (Chaired by Prof. Laura Rodríguez Raurell IN²UB and Faculty of Chemistry)

- **Biomimetic Polymers: Bridging Protein and Material Design**
  By, Dr. *Ivan Coluzza*, Professor Ikerbaske, BCMaterials, Leioa, Spain. Visiting Professor at the Center for Theoretical Biological, Physics, Rice University, Texas.
  Date & Venue: November 26th, 2024 at 12:00h – Sala de Graus E. Fontserè, Facultat de Física
  (Chaired by Dr. Giancarlo Franzese, IN²UB and Faculty of Physics)

Congresses

- **ACTIVE NANO/MICROSYSTEMS IN THE SPANISH CONTEXT**

Date and Venue: 24–25 Oct 2024

Chemistry Faculty and Physics Faculty at the University of Barcelona

The development of active nano- and microsystems has attracted special interest both in the biomedical (e.g., drug delivery) and environmental (e.g., detection, remediation) fields. Their ability to be selectively functionalized and promote localized mixing at the micro/nanoscale accelerates reaction processes, as well as envisioning its use as advances sensing platforms. Research in this area spans from understanding the mechanisms behind their mobility, including the corresponding hydrodynamic studies and collective behavior, and reactivity to exploring their practical applications.

This symposium focuses both on the fundament and applied studies around active microsystems, with the aim of fostering networking opportunities and collaboration within Spanish groups, as well as how to promote and pushing forward our research internationally. The multidisciplinary nature of active nano- and microsystems motors encompasses a wide range of expertise, requiring not only a deep understanding of material reactivity but also on the physical events related that promote their enhanced motion. In that regard, both chemistry, physics and engineering meets, and this is reflected in this Symposia, organized both by researchers at the Chemistry Faculty and Physics Faculty at the University of Barcelona.

- **2a REUNIÓ DE QUÍMICA INORGÀNICA I ORGANOMETÀL·LICA DE LA SOCIETAT CATALANA DE QUÍMICA (2RQIO-SCQ)**

Date and Venue: 5-7 Febrer 2025 – Sala Paranimf a l'antic escorxador de Tarragona, seu del Rectorat de la Universitat Rovira i Virgili (Tarragona)

Segona trobada sobre química inorgànica i organometàl·lica per tal de ressaltar i potenciar la riquesa al nostre àmbit en aquests camps científics.

- **2025 AFM BioMed CONFERENCE**

Venue: Historic Building of University Barcelona.

Date: April 8 to April 11, 2025

AFM BioMed Conference is dedicated to life sciences and nanomedicine applications and will investigate how Atomic Force Microscopy (AFM) solves relevant biological bottlenecks and provides innovative solutions for healthcare. The conferences link International academic and industrial experts in life science, being involved either with AFM use or with medical/biological studies. The meetings provide a clear and comprehensive overview on advances in this field through keynote presentations, lectures, poster sessions and discussion forums. Topics include single molecules, membrane, and cell biology and nanomedicine studies combining imaging and affinity measurements. Presentations stress the impact of AFM techniques in life sciences and nanomedicine. The meetings act as a forum to promote innovative cross linked research and highlight the power of integrating AFM with other optical and analytical techniques.

Who should attend? Biologists, biophysicists and medicinal scientists with research interest in the following areas: cell, cell interactions, single-molecule recognition, affinity, functional studies including forces, high resolution imaging and more...

4

SCIENTIFIC AND TECHNOLOGICAL EQUIPMENT RENEWAL

4. SCIENTIFIC AND TECHNOLOGICAL EQUIPMENT RENEWAL CALL

In frame of the scientific and technological equipment renewal call by the UB (23-24), the IN²UB has participated by supporting the *Equip de difracció de raigs X de pols Malvern Panytical Empyrean alpha1 renewal proposal*.

Moreover, the IN²UB has collaborated with the upgrade to *Bruker Multimode IV Atomic Force Microscope*. This is an equipment from both the IN²UB and the Faculty of Pharmacy and Food Sciences, installed at the *Campus Nord* of this Faculty.

5

SCIENTIFIC ASSOCIATIONS

5. SCIENTIFIC ASSOCIATIONS

The IN²UB gives support to specific scientific associations of general interest for the Institute, through an annual fee:

Since July 2009, the IN²UB is part of the scientific cluster SECPhO (Southern European Cluster of Photonics and Optics) promoting technological innovation through deep tech. For further details about the SECPHO Cluster, please check https://www.secpho.org

Since 2023, 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. For further details about the Cluster MAV, please check https://www.clustermav.com

These clusters promote research in the fields of IN²UB and are an opportunity to interact with the private sector.

6

EVENTS

6. EVENTS

6.1. ANNUAL MEETING

After some years of exceptionality, we resumed our **"Jornada Anual"** which aims at showcasing and sharing the research being done at the Institute, therefore creating a space for networking. This Inhouse event took place on *26th June of 2024* at the Aula Magna and Solar Atrium of the Faculties of Chemistry and Physics, on its 12th Edition, with the following outstanding program:

9:00h – 9:30h Registration

9:30h – 9:40h Welcome&Opening: Prof. Guillem Aromí, IN²UB Director & Laboratory of Molecular Design (LabMolDesign) (NanoMagnetics)

SESSION I – Chaired by Dr. Giancarlo Franzese, Statistical Physics of Bio-Nano Systems Complex Matter (NanoMet)

9:40h – 10:40h Plenary – Zoom in: from seeing to experiment in a nanolaboratory. Prof. Francesca Peiró, Laboratory of Electron Nanoscopies (LENS)- Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic devices (MIND) (NanoMet).

10:45h – 11:10h 2022–ART grantee (ART1): Development of chemoresistive gas sensors made from metal-organic frameworks (MOFs) for early thermal runaway detection in Lithium-ion batteries. Prof. Albert Romano, Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic Devices (MIND). (NanoPhotoElectro&NanosMat collaboration). (* as the Group Responsible, the IP can't attend).

11:10h – 11:50h Coffee Break & Poster Session I (from Poster 1 to 36)

SESSION II – Chaired by Prof. Mª José Garcia-Celma, Pharmaceutical Nanotechnology (NanoPharmaMed)

11:50h – 12:15h 2022–ART grantee (ART2): Hierarchically nanostructured transition metal carbides and MXenes on carbon felt for CO2 reduction and green H2 production (2IPs): Dr. Stefanos Chaitoglou*, ENPHOCAMAT group (NanosMat) & Dr. Xavier Vendrell, MATCAT group (NanoEnergy) (* Speaker).

12:15h – 12:35h Oral (O1): Anti-ferroelectric dark modes in an inverted plasmonic lattice. Javier Rodríguez, Group of Magnetic Nanomaterials (NanoMagnetics).

12:35h – 12:55h Oral (O2): Smart gel-dispersed calcium hydroxide-loaded nanoparticles for endodontics. Xavier Roig, Nanostructured systems for controlled drug delivery group. (NanoPharmaMed).

12:55h – 13:15h Oral (O3): Machine Learning Strategies for Low-Loss Electron Energy Loss Spectroscopy. Vanessa Costa, Laboratory of Electron Nanoscopies (LENS)- Micro and Nanotechnology and nanoscopies for Electronic and Electrophotonic devices (MIND) (NanoMet).

13:15h – 15:00h Lunch & Networking

SESSION III – Chaired by Dr. Teresa Andreu, Sustainable Electrochemical Processes (NanoEnergy)

15:00h – 15:25h 2022–ART grantee (ART3): ELectronic and PHOtoelectronic properties of multifunctional Semiconducting nanostructures (ELPHOS). Dr. Adriana Figueroa, Group of Magnetic Nanomaterials (NanoMagnetics&NanoPhotoElectro&NanoBio Collaboration).

15:25h – 15:50 h 2023–ART grantee (ART4): Magnonic wrinkles. Dr. Blai Casals, Grup de Magnetisme (NanoMagnetics&NanoEnergy Collaboration).

15:50h – 16:10h Oral (O4): Scanless and Camera-Free Fd-Flim With Frequency Encoded Light. Dr. Laura Rodríguez Suñé, LASER- Micro and Nanotechnology and Nanoscopies for Electronic and Electrophotonic Devices (MIND) (NanoPhotoElectro).

16:10h – 16:30h Oral (O5): Mathematical model of fluid front dynamics driven by porous media pumps. Andreu Benavent, Physics in Nanobiophysics (NanoBio).

16:30h – 17:10h Coffee Break & Poster Session II (from Poster 37 to 72)

SESSION IV – Chaired by Dr. Núria Gavara, Biophysics and Bioengineering Unit (NanoBio)

17:10h – 17:30h Oral (O6): Motion and control of virtual colloidal particles in confined chiral liquid crystals. Joel Torres, SOC&SAM group (NanosMat)

17:30h – 17:50h Oral (O7): Magnetic nanocomposites for radar shielding applications. Dr. Jaume Calvo, Grup de Magnetisme (NanoMagnetics).

17:50h – 18:10h Oral (O8): Usage of Polypurine Reverse Hoogsteen Hairpins for Therapeutic Intervention Against SARS-CoV-2. Prof. Verónica Noé, Cancer Therapy Group (NanoBio).

18:10h – 18:30h Oral (O9): Carbides, MAX and MXenes as co-catalysts in nanocomposites for the h2 photoproduction from bioetanol. Adrià Sánchez, MATCAT group (NanoEnergy)

18:30h – 18:50h Poster award

18:50h – 19h Closing Remarks: Prof. Martí Duocastella, IN²UB Deputy Director & LASER- Micro and Nanotechnology and Nanoscopies for Electronic and Electrophotonic Devices (MIND) (NanoPhotoElectro).

Have a look at: Book of Abstracts IN2UB - MEETING 2024
As a novelty, there was the lunch of the award for the best two posters.

6.2. 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:

- *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)
(Chaired by Prof. Xavier Batlle, IN²UB and Faculty of Physics)

- *Molecular nanoparticles processing with green compressed fluids: basic and applied research*

By, Prof. **Nora Ventosa i Rull**, Institut de Ciència de Materials de Barcelona (CSIC)-CIBER-BBN
Date and Venue: April 25th, 2024 at 12h – Aula Magna Enric Casassas (Faculties of Physics and Chemistry UB)
(Chaired by Dr. E. Carolina Sañudo, IN²UB and Faculty of Chemistry)

- *Molecular Mosaics Discovery and Electron Crystallography*

By, Prof. **Kasper S. Pedersen**, Department of Chemistry, Technical University of Denmark
Date and Venue: May 30th, 2024 at 16.00h – Aula Magna Enric Casassas
(Chaired by Dr. E. Carolina Sañudo, IN²UB and Faculty of Chemistry)

- *From electrically conductive MOFs to sustainable batteries*

By, Prof. **Mircea Dincă**, Department of Chemistry, Massachusetts Institute of Technology.
Date and Venue: October 1st, 2024 at 12.00h – Aula Magna Enric Casassas (Faculties of Physics and Chemistry UB)
(Chaired by Prof. Guillem Aromí, IN²UB and Faculty of Chemistry)

- *Spin-charge interconversion with low-symmetry materials*

By, Prof. **Fèlix Casanova**, CIC nanoGUNE BRTA, San Sebastian, Basque Country (Spain) / IKERBASQUE, Basque Foundation for Science, Bilbao, Basque Country (Spain)
Date and Venue: November 29th, 2024 at 12.00h – Sala de Graus Eduard Fontserè (Faculties of Physics and Chemistry UB)
(Chaired by Prof. Xavier Batlle, IN²UB and Faculty of Physics UB)

6.3. JOINT SEMINARS

- **Hybrid 2D/CMOS microchips for memristive applications**

By, Mario Lanza, Ph.D. – IEEE Fellow
Associate Professor of Materials Science & Engineering, Physical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Saudi Arabia
Date and Venue: 20th March, 2024 at 12h – Sala Graus Eduard Fontserè (Faculty of Physics and Chemistry UB)
(Chaired by Dr. Blas Garrido, IN²UB and Faculty of Physics)

- **Polydopamine Interfaces in Energy Production: Functional Films and Coatings**

By, Dr. Emerson Coy, NanoBioMedical Centre, Adam Mickiewicz University, Poznan, Poland
Date and Venue: May 2, 2024 at 15h – Sala Graus (A01S) (Faculty of Physics UB)
(Chaired by Dr. Roger Amade, IN²UB and Faculty of Physics)

6.4. SPECIAL SYMPOSIUMS AND WORKSHOPS IN²UB

- *Sessió Informativa sobre Programes Europeus de Finançament per a la Recerca a l'IN²UB*

18 de gener 2024 d'11h a 14h a l'Aula Magna (Facultats de Física i Química UB)
A càrrec de:
Armando J Palomar (Assessor de recerca internacional- Àrea de Ciències i Enginyeries UB)
Mireia Via (Promotora de recerca internacional – Oficina de Projectes Internacionals de Recerca UB (OPIR))
Loli Molina (Promotora de recerca internacional – Oficina de Projectes Internacionals de Recerca UB (OPIR))

- *Deciphering Nature from Data: An Applied Machine Learning Course (and little bit of AI)*

By, Dr. *Matias Nuñez*, Centro Atomico de Bariloche (Argentina)/Investigador Adjunto, CONICET
From 19 to 23 February 2024 – 14h-15h – Room A34M – Faculty of Physics (UB)

- *Functional Molecular Materials Symposium*

Faculty of Chemistry of the University of Barcelona, Auditorium Enric Casassas, from 15:00h to 17:30h – December 17th, 2024.

PROGRAM

15:00h - 15:30h – Prof. **Christopher J. Chang**, Princeton University (USA), Editor-in-Chief Acc. Chem. Res. "*Metals on the Brain: Deciphering an Elemental Code for Signaling and Behavior*".

15:30h – 16:00h – Prof. **Danna Freedman**, Massachusetts Institute of Technology (USA), Associate Editor JACS. "*Molecular Color Centers*".

16:00h – 16:30h – Coffee Break.

16:30h – 17:00h – Prof. **Jeffrey R. Long**, UC Berkeley (USA), Director of Institute for Decarbonization Materials. "*Cooperative Adsorption and Gas Separations in Metal-Organic Frameworks*".

17:00h – 17:30h – Dr. **Daniel Maspoch**, ICREA Professor, ICN2 (Spain). "*Clip-off Chemistry: a 'solid-to-molecule' approach for the synthesis of new molecules via bond cleavage*".

6.5. FIRA D'EMPRESES

The Institute has participated on the Employment Fair 2024 Sciences and Engineering, where we had the opportunity to present the IN²UB and the research areas to students interested in nanoscience and nanotechnology.

7

OUTREACH AND EQUAL OPPORTUNITIES COMMITTEE

7. 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.

The IN²UB is part of the SNSSN (SustainableNano – Spanish Network on Safe and Sustainable Nanotechnologies) network comprises the leading Spanish research centres working on nanoscale research and development, with the aim of working together towards generating safe, sustainable and societally beneficial nanosciences and nanotechnologies, by involving sustainability criteria along the whole process. A focus is given to research with a perspective towards production, consumption, waste generation and management and waste recycling. The IN²UB Outreach Commission has launched to edition of the III White Book on Nanotechnology in frame of this network.

7.1. EVENTS

- **Concurs de nanorelats del Festival 10alamenos9** - L'Institut de Nanociència i Nanotecnologia de la Universitat de Barcelona (IN2UB) acull la final catalana del concurs de nanorelats del Festival 10alamenos9. Aquest esdeveniment únic celebra la creativitat i la innovació en el camp de la nanotecnologia, reunint els millors talents literaris joves de Catalunya – [Read more]

- **NanoDay - under the motto "For a sustainable and responsible nanotechnology"** the NanoDay is organized by the MAV Cluster, together with the Scientific and Technological Centers (CCiTUB) and the Institute of Nanoscience and Nanotechnology of the University of Barcelona (IN²UB), the Catalan Institute for Occupational Safety and Health (ICSSL) and the Agency for Business Competitiveness (ACCIÓ) – [Read more]

- Outreach activity with 1st grade higher secondary students, an activity for 1st grade higher secondary students to introduce them to the nanoscale research – [Read more]

- **L'IN²UB protagonista del IX Festival 10alamenos9**

Centenars alumnes de secundària i batxillerat han tingut l'oportunitat de participar en el Festival Nacional de Nanociència i Nanotecnologia 10alamenos9, que enguany arriba a la novena edició. Les activitats realitzades pel nostre Institut de Nanociència i Nanotecnologia han estat variades i impactants:

1. **Concurs de Nanorelats:** Amb 99 nanorelats rebuts, el concurs ha estat un espai creatiu per als estudiants. En la categoria ESO, s'han presentat 54 relats, mentre que en la categoria de batxillerat, n'hi ha hagut 44.
2. **Taula Rodona "L'impacte de la Nanotecnologia en Sostenibilitat":** Els experts de l'IN²UB, Sònia Trigueros, Xavier Batlle i Teresa Andreu, van debatre sobre com la nanotecnologia pot configurar el futur en termes de sostenibilitat, salut i energia.
3. **Taller de Microscòpia Electrònica, Difracció i Àtoms:** El Grup LENS-MIND va oferir un taller pràctic per explorar els secrets de la nanotecnologia mitjançant microscopis electrònics.
4. **Taula Rodona "Pregunta a un Nanotecnòleg":** Carlos Moya i José Ruiz, experts en nanotecnologia, van respondre preguntes i debatre sobre els reptes i oportunitats d'aquest camp emergent.

- **Organització del Vermú de Nanociència:** A través d'aquesta sèrie de vídeos, hem compartit coneixements i curiositats sobre la nanociència i la nanotecnologia amb el públic. Podeu veure els vídeos aquí: Vermú de Nanociència.

La participació activa del nostre institut en aquest tipus d'esdeveniments és fonamental per divulgar el coneixement del món de les coses petites i inspirar les futures generacions de científics. La nanociència i la nanotecnologia són àrees crucials per a la recerca i el desenvolupament, i estem orgullosos de contribuir al seu creixement i impacte.

- **Scinetific Podcast** by E. Carlinoa Sañudo on Cugat Mèdia [Read more]

- **Activities in frame of the International Day of Women and Girls in Science, on 11 February:**
  1. An interview to IN²UB Nanoinfluencers: Marta Estrader Bofarull, Ana Belen Caballero Hernàndez, Francesca Peiró Martínez and Arantxa Fraile Rodríguez [Read more]
  2. IN²UB researchers, Sònia Estradé and Regina Galcerán, participates in the Cinefòrum "Women in Science" i taula rodona [Read more]
  3. IN²UB researcher, MªAntònia Busquets participates in the CIENTÍFIQUES PER UN DIA address to 3rt and 4th grade higher secondary students [Read more]

8

PhD THESIS DEFENDED

8. PhD THESIS DEFENDED

Most IN²UB researchers are involved in the doctorate training. This is the list of doctoral theses, supervised by IN²UB researchers this 2024:

TITLE	AUTHOR	DIRECTOR(S)
Hydrogel and photosensitizers for singlet oxygen generation	Shaun Smith	Mª Luisa Pérez García David Amabilino Giuseppe Mantovani
BODIPY-functionalized nanostructured materials for intracellular glutathione sensing and mitochondria bioimaging	Saman Bagherpour	Mª Luisa Pérez García
Peptide-based Approaches for the Race Against Resistant Bacteria	Julia Garcia Gros	Francesc Rabanal Anglada Yolanda Cajal Visa
Experimental and Simulation Studies on the Interaction Between Biomolecules and Nanomaterials	Alberto Martinez Serra	Franzese, G. Monopoli, M.
PPRHs against undruggable KRAS and MYC oncogenes and for the diagnosis and treatment of SARS-CoV-2	Simonas Valiuska	Carlos J Ciudad Verónica Noé
Lactames tricícliques quirals com a scaffolds enantiomèrics eficients per a la síntesi de cisdecahidroquinolines substituïdes a l'anell carbocíclic. Síntesi total d'alcaloides de mirioneurones	Arnau Calbó	Amat, M. Griera, R.
Development of optomechanical sensors based on silicon nanopillars for biological applications	López Aymerich, Elena	Romano Rodríguez, Albert Svendsen, Winnie Edith
Inkjet printing next-generation flexible devices: memristors, photodetectors and perovskite LEDs	Sergio Gonzá-lez Torres	Blas Garrido Giovanni Vescio
Nanopartículas lipídicas de Apigenina y Melatonina en farmacoterapia oncológica y ocular	Lorena Bonil-la Vidal	Elena Sánchez Marta Espina
Experimental study of the coherence of the light emitted by a semiconductor laser with optical feedback	María Duque Gijón	Cristina Masoller Jordi Tiana-Alsina
Advanced Machine Learning for EELS Spectroscopy: Magnetic Characterization, Classification and Data Generation	Daniel del Pozo	Dra. Francesca Peiró Dra. Sònia Estradé
“Synthesis, deposition and characterization of magnetic molecules on surfaces”	Guillem Gabarró	E. Carolina Sañudo Guillem Aromí

TITLE	AUTHOR	DIRECTOR(S)
Estudi De Liposomes De Baricitinib Com A Nova Formula Pel Tractament Tòpic De Malalties Autoimmunes	Garrós, N.	Colom, H. Malalndrich, M.
Development and Evaluation of Novel Baricitinib Formulations for Psoriasis Treatment	Roya Mo-hammadi Mey Abadi	Ana Cristina Calpena Campmany Mireia Mallandrich Miret
Preparation of nanostructured systems of natural and derived flavo-noids,biopharmaceutical study and the determination of anti-inflammatory efficacy in vitro and in vivo	Berenice Andrade Carreras	Ana Cristina Calpena Campmany Maria Luisa Del Carmen Garduño
Non-equilibrium dynamics of driven and confined colloidal systems	Carolina Rodriguez Gallo	Pietro Tierno
Bringing Transition Metal Dichalcogenides to the Forefront: Advancements in Gas Sensing Beyond Metal Oxides	Shuja Bashir Malik	Frank Güell Vilà Eduard Llobet Valero

For further information on the achievement of the Institute and its researchers, follow us at:

Institut de Nanociència i Nanotecnologia

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