BIENNIAL REPORT
2022-2023

SCIENTIFIC ADVISORY BOARD EVALUATION

November 2024

Founded in 2015, the *Institute of Advanced Materials* (INAM) at *Universitat Jaume I* excels in interdisciplinary research across physics, chemistry, and engineering. With a strong global reputation and a record of high-impact publications, INAM attracts national and international funding and talent while fostering international collaborations. Committed to knowledge transfer, INAM partners with industry and engages in outreach to promote scientific awareness.

During 2022-2023, INAM's research included three main lines involving 12 groups and 105 members, aligned with our vision to become a world-leading centre for materials research. We focused on advancing materials science through interdisciplinary collaboration, creating innovative solutions, and bridging the gap between materials and practical applications for societal benefit.

Moreover, INAM achieved notable advancements, including a significant increase in both the number of publications and citations compared to the previous biennium. Additionally, INAM successfully secured substantial research funding from a diverse array of public grants and private sector contracts, reinforcing its position as a leader in advanced materials research and collaboration. These accomplishments underscore INAM's ongoing commitment to scientific excellence and its impact on both academia and industry. INAM remained committed to continuous professional development, especially for doctoral candidates, and upheld fair, transparent hiring practices to attract top talent and foster an innovative research environment.

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1. OVERVIEW OF THE INSTITUTE

The Institute of Advanced Materials (INAM) at *Universitat Jaume I* (UJI), funded in 2015, is devoted to material interdisciplinary research combining physics, chemistry, engineering, and related fields. We have strong international reputation thanks to our scientific leadership in Advanced Materials, with strong track record of highly impactful publications and Highly Cited Researchers. We hold a solid ability to attract inter/national funding and young talented researchers, while pursuing international collaboration. In addition, we are highly committed to knowledge transfer to society in the form of technology transfer to industry and a plethora of dissemination actions addressed to society with the aim to increase social awareness on science. Our scientific activity is currently structured in three Research Lines, involving 12 Research Groups, with a total critical mass of 105 people, aligned with our Vision and Mission while upholding our strategic values.

During 2022-2023, INAM has pursued the Vision of achieving a world class research centre on the understanding and creation of materials, bringing scientific insight, and producing advanced applications for a better future. Our Mission has involved physical chemical understanding of advanced materials properties and their operation to create new knowledge that bridges the gap between materials and devices. We have focused on:

- Advancing the frontiers of knowledge in materials science from interdisciplinary research in physics, chemistry, engineering, and related fields.
- Fostering interdisciplinary collaboration among researchers to address multifaceted challenges from diverse angles.
- Pioneering the creation of innovative solutions that positively impact society and the environment.

1.1 ORGANIZATION AND MANAGEMENT MODEL.

INAM operates under a versatile and cooperative organizational model, fostering to encourage researchers to explore novel ideas and methodologies to accomplish our objectives. Our organizational structure is designed to facilitate communication and collaboration, promoting a dynamic and innovative atmosphere (Fig. 1).

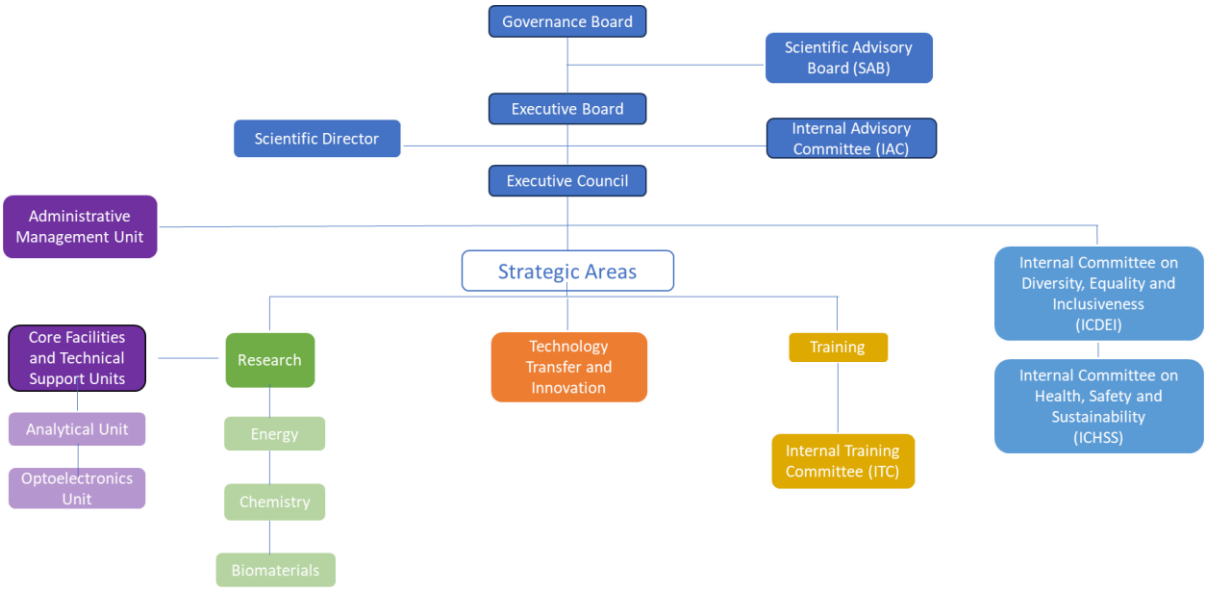


Figure 1. Organization scheme of INAM

Scientific Advisory Board (SAB): oversees the assessment of the scientific quality and structure of INAM, including the long-term objectives, the balance of knowledge and skills, and leadership and communication effectiveness. Composed by distinguished experts in the research domains of the institute. During 2022-2023 we have renewed the SAB, being the current members (Fig. 2):

Figure 2. Composition of INAM Scientific Advisory Board

Executive Board (EB): represents and manages INAM. Coordinates all activities within INAM and ensures the execution of agreements resulting from decisions made by the Executive Council. It is composed by the Director, Deputy Director, and Secretary. Composition of the current EB: Elena Mas-Marzá, Beatriu Escuder and María Teresa Roca Moliner, respectively.

Scientific Director: assists the EB in scientific aspects, including periodic update of our mission and vision, coordination and evaluation of research lines and projects, elaboration of synergies and alignment of objectives between the research lines. Plans and directs the scientific policy and research strategies. Elected by the Internal Advisory Committee among the doctoral members of the Institute. Scientific Director during 2023: Juan Bisquert. Current Scientific Director: Iván Mora-Seró.

Internal Advisory Committee (IAC): provides advice to the Executive Board on relevant decisions for the institute. Formed by representatives (max 6) of the Executive Council elected by its members.

Executive Council (EC): the collegiate representative and governing body of a university's institute. Formed by: Director, all research staff of INAM, a representation of the research staff in training (Doctoral Candidates and Postdocts), a representation of the technical, management and administration staff and services, a representation of students taking courses taught by the institute (undergraduate students).

During 2022-2023, we have stablished a structure of **Support Units and Internal monitoring Committees**. The Units support INAM's activities, whereas Committees oversee the fulfilment of the different regulations, resolving any conflict that may arise.

Administrative Management Unit: in charge of our administration and economics. Coordinator: Mª Dolores Merchán Mundina.

Core Facilities and Technical Support Units: open to UJI community and external academic or industrial users, foster robust collaborative research, stablishing agreements, creating synergies and dynamic working groups to address shared research challenges. Assisted by support technicians. Coordinator: Jose A. Mata Martínez.

Innovation Scientific Unit (UCIE-INAM): bridges the INAM research with science transfer and innovation, connecting researchers with companies and stakeholders. Coordinator: Francisco Fabregat-Santiago.

Internal Committee on Training (ICT): oversees the training activities at all levels of knowledge (PhD. candidates, Postdocs, senior researchers, administration…). Coordinator: Macarena Poyatos.

Internal Committee on Diversity, Equality, and Inclusiveness (ICDEI): controls that INAM's follows the III Equality Plan of UJI at all levels, warranting equality, and inclusiveness at the different stages of INAM.

Internal Committee on Health, Safety, and Sustainability (ICHSS): supervises that INAM follows the Regulations of the Safety, Health Promotion, and Environment of UJI. Coordinator: Iván Sorribes.

2. STRATEGIC PLAN.

Our activity has been organized according to our Strategic Plan for 2020-2023 (SP-20/23). The main scientific objectives of this plan were:

- Development of *Advanced Materials and Applications for a Better Society*.
- *Technology Transfer* to generate wealth and employment.
- *Training and Education* of outstanding researchers, and *Dissemination.*

To fulfil these objectives, we have worked in **3 strategic areas**: Research, Technology Transfer and Training.

2.1 RESEARCH

During 2022-2023, our line of action on Research has been strategically structured to exploit our full potential and excellence, aiming to produce impactful scientific breakthroughs at the forefront of materials scientific knowledge. Our primary goal has been to develop innovative solutions and methodologies to address societal challenges in the field of advanced materials for energy and sustainable chemical production, aligning with the priorities outlined in European, National, and Regional R&D strategies and the UN Sustainable Development Goals (SDG).

2.1.1 RESEARCH LINES

Three collaborative Research Lines (RLs) have been developed focused on pioneering scientific exploration at the intersection of Chemistry, Physics, Engineering, and (Bio)Materials Science:

- RL1 Energy materials: advanced configuration for more efficient production, conversion, and storage (SDG 7, 9, 13, 11).
- RL2 Chemistry to transform society: fundamental reactions and catalysis, decontamination, and high added value chemical production (SDG 9, 12, 13).
- RL3 Adapting Biological materials for functional applications. (SDG 3, 9, 12), incorporated at INAM in 2020.

RL1 Energy materials: advanced configuration for more efficient energy production, conversion, and storage

The deep impact of climate change on global conditions highlights the necessity for research-driven adaptations to mitigate its effects. Advanced materials present transformative potential for enhancing energy production, utilization, and living standards, leveraging both physical and chemical methodologies. During 2022-2023, INAM has applied multilevel research to exploit the synergies between materials and a broad range of energy applications. This RL has been devoted to:

- Solving challenges of energy storage and distribution. Identify and develop efficient methods for energy storage requiring the minimum amount of energy consumption.
- (Photo)electrocatalytic hydrogen production from water splitting. Development of efficient photoactive materials to convert solar energy into H_2.
- Development of emerging photovoltaic materials and devices based on new generation halide perovskites and quantum dots.
- Development and characterization of organic mixed ionic-electronic materials for energy storage, bioelectronics and optoelectronics, data storage, neuromorphic computing, sensors and spintronics. This topic has the contribution of a new Research Group (see Human Resources, section 3).
- Emerging materials for advanced light emitting systems with low energy consumption, for lighting, communications, up- down-conversion or anti-counterfeiting applications.
- Advanced Optoelectronic Characterization. Different aspects of physical description of materials, interfaces and devices need to be addressed to obtain a consistent and useful picture of materials and device operation, optimization, and innovation. The characterization by means of techniques in the frequency domain, as impedance spectroscopy, is particularly useful to separate the response of the diverse interfaces, allowing an appropriate modelling. INAM plays an international leading role on the use and interpretation of these characterization techniques.

RL 2 Chemistry to transform society: fundamental reactions and catalysis, decontamination and high added value chemical production.

The demand for chemical products continues to rise with the growth of various industries, further intensifying these challenges. However, in some cases traditional chemical processes often involve high energy consumption, generate hazardous by-products, and deplete finite resources, contributing significantly to environmental degradation, climate change, and ecosystem

disruption. With this RL, INAM has addressed environmental concerns while meeting industrial and societal demands. This RL has been applied to:

- Development of advanced materials for safety. Monitoring hazardous materials poses significant challenges in ensuring human health and safety. Utilizing noncovalent interactions in supramolecular approaches enables a reversible detection mechanism, offering reusable molecular sensors. In particular, toxic polyaromatic hydrocarbons (PAHs) and inorganic cations such as Tl^{+} were effectively encapsulated by metal-based architectures.

- Advanced reactor engineering of catalytic materials employing additive manufacturing for the development of sustainable continuous-flow CO_2 capture and conversion systems.

- Assessment of materials as catalyst in biomass transformations for selective transformations, including electrocatalytic approaches.

- Development of hybrid materials from bottom-up approach as models for catalytic transformations.

- Development of metal-free catalysts by design of carbonaceous materials in hydrogenation and dehydrogenation transformations.

- Tunning the catalytic activity of well-defined catalysts by supramolecular and redox stimuli. Our studies in this regard highlight the importance of supramolecular interactions for tuning the reactivity and catalytic activity of very simple metal complexes. By introducing a redox tag, we also proved that the introduction of a redox stimulus can be used to improve the catalytic outcome, and even to reversibly toggled between the active and inactive forms of the catalyst.

RL3 Adapting biological materials for functional applications.

Combining biological matter with organic and inorganic materials unlocks fundamental knowledge and crucial applications. Designing novel biomaterials, bioactive compounds, and functional polymers enables the development of new systems for drug delivery, cell-signalling factors, and biomolecules. These innovations find diverse applications in medical (tissue repair and replacement) and environmental biocatalysis. INAM has devoted this RL to:

- Peptide-based hydrogels for drug delivery and regenerative medicine. Design and preparation of biocompatible and biodegradable hydrogels with antimicrobial, anti-inflammatory and pro-angiogenic abilities for chronic wound healing.

- Next Generation materials with out of equilibrium properties (transient/steady-state) such as ‘disease’ fuelled assemblies, hierarchically ordered soft-materials with intricate structures

with complex mechanical response, and basic research aimed to create stable Turing patterns and supramolecular oscillations. This topic has been developed by a new RG (see Human Resources, section 3).

- Development of advanced materials for antimicrobial additively manufactured devices.

2.1.2 RESEARCH GROUPS

Our Research Lines have been developed during 2022-2023 by 12 Research Groups (RG), each one headed by one or two group leaders (Principal Investigator, PI). Two of this RG, led by young PI, were incorporated during 2022-2023.

RG1. Energy and Advanced Materials. PI: Juan Bisquert, Germà Garcia-Belmonte.

RG2. Organometallic Chemistry and Homogeneous Catalysis. PI: Eduardo Peris.

RG3. Photoelectrochemistry for Sustainable Fuel Production and Chemical Synthesis. PI: Francisco Fabregat-Santiago, Sixto Giménez.

RG4. Advanced Semiconductors. PI: Iván Mora-Seró.

RG5. Multifunctional Materials. PI: Beatriz Julián-López.

RG6. Materials for Advanced Sustainable Production. PI: Víctor Sans.

RG7. Bioinspired Supramolecular Chemistry and Materials. PI: Beatriu Escuder.

RG8. Neurobiotechnology. PI: Ana Mª Sánchez-Pérez.

RG9. Computational Biochemistry. PI: Vicente Moliner.

RG10. Hybrid Catalytic Materials. PI: Jose A. Mata, Iván Sorribes.

RG11. Dynamic Materials and Self-Assembling Systems. Young PI: Nishant Singh.

RG12. Spintronics for Advanced Devices Lab. Young PI: Víctor López-Domínguez.

2.1.3 COLLABORATIVE RESEARCH AT THE INSTITUTE LEVEL

Collaborative synergy actions have been developed between our RLs, leading to a complementary interaction between research expertise and focus. Overview of the most remarkable cooperation:

- Integration of photovoltaics and photoelectrochemical approaches to produce added-value chemicals (RL1&RL2).
    - Representative Articles: *Solar RRL*, **2022**, *6*, 202200826; *Solar RRL*, **2022**, *6*, 2200132; *Adv. Sustain. Syst,* **2022**, 2100367; *ACS Energy Letters* **2023**, *8* 4488;

Energy Environ. Sci., **2023**, *6*, 1644; *Angew. Chem. Int. Ed*. **2022**, *134*, e202211587.

- Projects: European EIC GA 101071010, H2020 GA 732840; National PID2020-116093RB-C41; Regional PROMETEO/2020/028, MFA/2022/043; Industry contract with Blue Plasma Power.
- Patent: 1 under exploitation.

- Novel synthetic procedures for energy materials (RL1&RL2)
  - Representative Articles: *Electrochim. Acta*, **2022**, *439*, 141701; *J Solgel Sci Technol*, **2023**, 06171-1; *Carbon* **2023**, *206*, 314; *ACS Catal*. **2022**, *12*, 6238.
  - Projects: European HORIZON-CL5-2022-D3-03-05 GA 101122345; National PID2019-107314RB-100, PDC2022-133612-I00; Regional CIPROM/2021/078.
  - Patent: 2 requested
- Additive manufacturing for energy materials (RL1&RL2)
  - Representative Articles: *Nanoscale*, **2023**, *15*, 496.
  - Projects: European H2020 GA 884444, FETOPEN GA 862656; National PDDC2022-133612-I00, PID2020-119628RB-C33, TED2021-131600B-C31; Regional MFA/2022/020, CIDEGENT2018/036.
  - Patent: 1 requested.

2.2. TECHNOLOGY TRANSFER

In 2019 we launched an extensive innovation strategy: "Unitat Científica d'Innovació Empresarial (Business Innovation Scientific Unit)" (UCIE-INAM) to transform our knowledge into applications that can be scaled to an industrial level for effective and practical innovations. The current coordinator of UCIE-INAM is Francisco Fabregat-Santiago. The funding of UCIE-INAM during 2022-2023 has been 350 k€ provided by *Agencia Valenciana de la Innovación (AVI)*.

Specialized personnel have been hired at UCIE-INAM: *i)* two Postdoc researchers with experience in technology have supported the research of UCIE-INAM and developed technology transfer activities; *ii)* an engineer with commercial and enterprise experience was hired to intensify contact with industrial companies to start new projects and joint product development processes.

Along 2022-2023 UCIE-INAM has been focused on six technological development areas that appear collected in Figure 3.

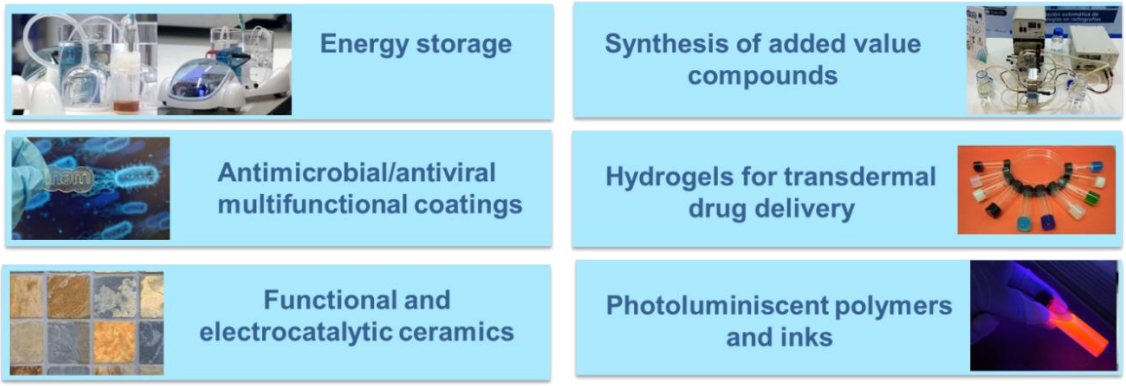
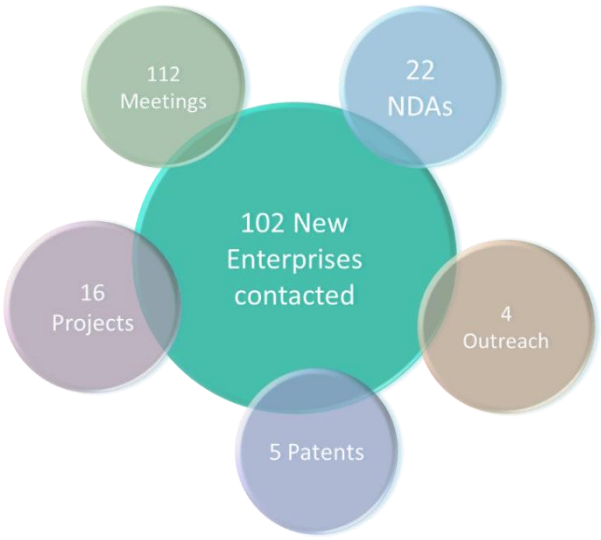


Figure 3. Technological development areas of UCIE-INAM during 2022-2023.

During 2022-2023, UCIE-INAM has promoted 5 patents and 1 requested. Two patents from previous periods are currently licenced and under exploitation by Porcelanosa (WO2022129669A1) and H2B2 Electrolysis Technologies (WO2020254705A1). Additionally, we have hold > 100 meetings with > 100 companies, 22 NDAs and 16 projects with companies with private (260 k€) and public investments (100 k€). We have established cooperation frameworks with inter/national industries (i.e. UBE, Ferro, BP, REPSOL, Covestro, Henkel, Evonik, P&G, H2B2, Curapath, ENI, BASF, DuPont, Porcelanosa, Dismuntel), associations (QUIMACOVA, AVEP, SENTIATECH) and technological institutes (ITE, AITEX, ITENE, ITC).



In 2023, the spin-off *Molecular Sustainable Solutions* was created with the participation of INAM's RG 6 (see section 2.1.2). This spin-of is based on patents P202230591 and EP 23383392.0, being dedicated to developing a portable system to generate disinfectant solutions on demand with low environmental impact, without generating waste and eliminating the need to store dangerous products.

In 2023, we have developed a prototype for solar energy production, storage and management in collaboration with UJI's Technology Park (ESPAITEC), see Figure 4. This prototype consists of a 5.5 kW solar station, 6kW inverter, 5.3 kWh battery, 2 kW electrolyser and 1kW fuel cell to

show students, companies and policy makers how to combine solar energy production, storage, and management with innovative technology.

Figure 4. Prototype for solar energy production, storage and management.

2.3 TRAINING AND EDUCATION

Training at all levels of knowledge is at the base of SDG 4 and is one fundamental pillar for the scientific and technological advancement. Our Training Program is directed to all stages of formal education, including technicians and administration staff. Our plan considered basic and advanced training, as well as inter and cross-disciplinary training. The main aims of our Program were:

- To develop high-quality academic training in the field of advanced materials to foster the development of technical competencies and professional skills.
- To encourage international mobility for students and faculty by establishing collaborative agreements with prestigious inter/national universities and research centres.
- To promote the training of young researchers and the integration of emerging talent through doctoral programs, scholarships, and research stays.

In INAM researchers are in contact with front-line science and technology, working in an inter-disciplinary research environment. We ensure access to state-of-the-art equipment and highly specialized scientific personnel and offer the opportunity to enjoy an international and multicultural working atmosphere.

Undergraduate students

We offer 4 training-through-research courses for undergraduate students' year, with recognition from the UJI (2 credits), to have close contact with the activities performed at INAM. The guest students participate of all the activities: common tasks in the lab, group meetings, seminars, or invited talks.

Courses:

- Starting Research course (40 hours). First approach to the foundations of applied research in advanced materials for innovative applications.
- Advanced Research course (100 hours). Focused on materials' characterization.
- Advanced Materials Laboratory course (40 hours). Introduction to materials applications and devices fabrication.
- Applications of Advanced Materials course (100 hours). Design, synthesis, characterization and application of a certain material.

During 2022 and 2023, 16 undergraduate students from the Chemistry Degree have enrolled in these courses.

Master students

We are involved in different UJI Master's Degrees, related to materials chemistry, and host students for the Final Master Project:

- Applied and Pharmacological Chemistry
- Energy Efficiency and Sustainability
- Sustainable Chemistry (Interuniversity)
- Theoretical Chemistry and Computational Modelling (Interuniversity)

During 2022-2023 we have supervised 13 Master Students.

Doctoral Candidates

INAM has a specific Training Plan for PhD students, who enrol the Doctoral Programmes in Science or Sustainable Chemistry of UJI's Doctoral School, that includes General Training, Specific Straining, Interdisciplinary Training and Cross-disciplinary Skills Training.

General Training activities: general aspects of laboratory work. This training is carried out based on the training courses offered by the UJI and those offered by INAM.

Specific Straining: courses and seminars related to instrumental techniques, training in handling of advanced equipment available at INAM, workshops and Schools organized by INAM (Impedance School, School of Gels, SUSGEM 2023 Sustainable Sol-Gel Energy Materials, etc).

Interdisciplinary Training: attendance to international and national conferences, organized by INAM or UJI, INAM's Seminars, INAM Annual Symposium, Recent Advances in Materials and Sustainability for the Future symposium (organized by INAM's young researchers), etc.

Cross-disciplinary Skills Training: attendance to the courses offered by the UJI Doctoral School, such as: Research and gender perspective; Mental, emotional health and resilience; Responsible research and innovation; Instrumentation for research in science and technology, etc.

PhD students are encouraged to learn or perfect their language skills at the Language Learning Centre of UJI.

Additionally, PhD students carry out research stays abroad (> 3 months), in internationally recognized research centres.

The number of Doctoral Candidates at INAM during 2022-2023 has been 46 in average, with 13 PhD thesis defended by December 2023.

Postdoctoral researchers

We support Postdoctoral fellows to enhance their research skills in a resource-rich multidisciplinary scientific environment. Multidisciplinarity and internationalization is prioritized in our postdoctoral training scheme. Postdoctoral stays have a duration of 1 to 5 years. To enhance and refine their research abilities and their career prospects our plan provides: i) a dual mentoring plan to capitalize the synergies at the borders of overlapping scientific fields, ii) a mobility plan to foster their internationalization and iii) a training plan for supervision (research and teaching supervision abilities).

The number of Postdoctoral researchers at INAM during 2022-2023 has been 26 in average.

Technicians and administration staff

Technicians are trained in the different skills needed, including risk prevention, laboratory management, basic characterization techniques. A personalized training plan is created attending their needs. The administration staff is trained in issues related with ergonomics, health and security, Innovation management, organization skills, Human Resources and emotional intelligence in organization.

3. HUMAN RESOURCES.

3.1. HUMAN RESOURCES BY CATEGORY

In December 2023, over 105 people (43% female) were working at INAM. The distribution of categories is shown in the Figure 5.

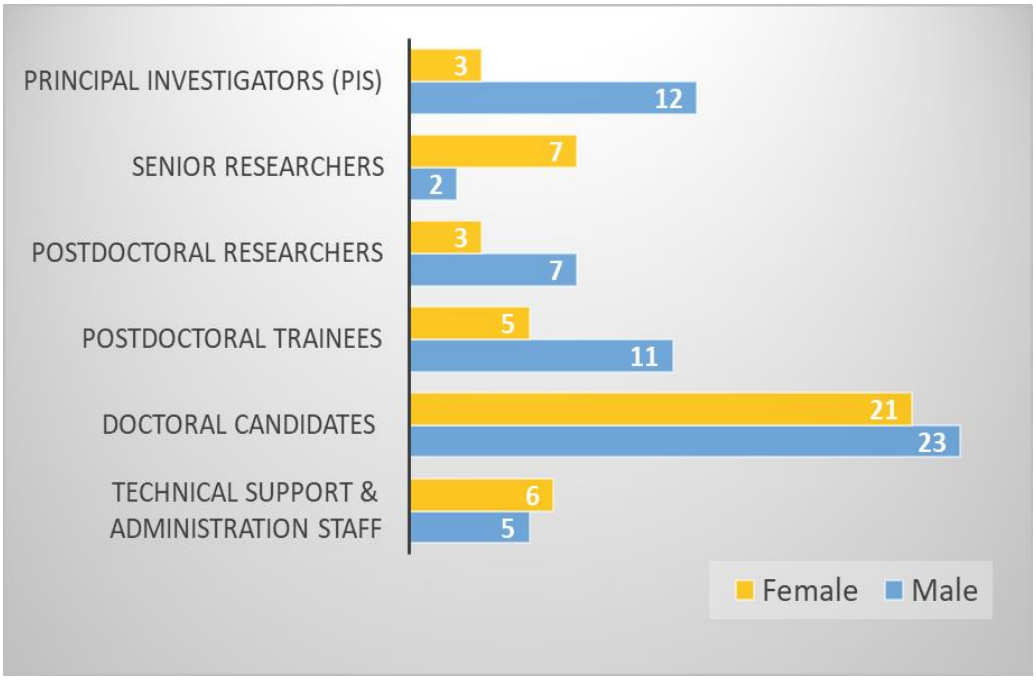


Figure 5. Human resources of INAM by category and gender at 31/12/2023.

Compared to the previous period (2020-2021), the total number of personnel at INAM has increased by 44%. Three new PIs have been hired, including two young PIs through the prestigious CIDEGENT grant. Additionally, the number of senior researchers has risen from 7 to 9. In terms of postdoctoral staff, there has been a 73% increase, with 10 postdoctoral researchers and 16 postdoctoral trainees as of December 2023. The number of doctoral candidates has grown from 33 in 2020-2021 to 44 in December 2023, marking a 33% increase. Finally, the number of technicians and administrative staff has expanded from 7 to 11, reflecting a 57% growth.

In 2022-2023, women represented nearly 43% of the total staff at INAM, achieving near parity. However, numbers vary across different staff categories, as illustrated in figure above. The proportion of women among PIs remains notably low, highlighting the need for further measures to promote gender parity in this category. In contrast, the percentage of women among senior researchers is significantly higher than that of men and remains consistent with the previous period (2020-2021). A trend toward gender parity is evident in both postdoctoral and predoctoral categories, with female representation ranging from 30% to 50% between the two periods. Meanwhile, women configure the majority within the technical and administrative staff.

3.2 RECRUITMENT STRATEGIES

In 2020, UJI was granted with the HRS4R quality award by European Commission. INAM, as part of UJI, follow the 40 principles of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. Thus, we aim to promote a stimulating and favourable work environment in which to undertake research activities, as well as to ensure transparent and merit-based procedures for the recruitment and evaluation of researchers. We also follow the UJI's III Equality Plan, under the supervision of our Internal Committee on Diversity, Equality, and Inclusiveness, to achieve a healthy balance between personal, family, and professional life. Besides, professional development and continuing training opportunities are offered to support staff's research careers.

Open positions are extensively advertised (INAM's website, X, LinkedIn and Euraxess), and announced at national and international conferences, in our visits to other scientific institutions, in scientific societies websites. There is a specific hiring platform in our website to directly submit applications.

The specific strategies for recruitment for each category during 2022-2023 has been as follows:

Principal Investigator. Recruited by the Executive Board, following SAB advice, and negotiation with UJI's Rectorate. Evaluation and interviewed by IAC. Approved by the Executive Council. During 2022-2023, a senior PI was incorporated to a previous Research Group (RG10). To recruit Young PIs, calls were opened at INAM to select candidates and support them in their application to tenure track excellence programs such as Regional Gent T (modality CIDEGENT). During 2022-2023, two Young PIs were incorporated as CIDEGENT distinguished researchers, who stablished two new Research Groups within INAM:

RG11: Dynamic Materials and Self-assembling Systems (DyMSaS)- PI: Nishant Singh

The group deals with complex chemical reaction networks to control non-equilibrium self-assemblies. The objective is to mimic the non-equilibrium behaviour of naturally occurring self-assemblies while creating catalytically controlled synthetic reaction cycles which can give multi-level control over artificial materials. The targeted assemblies are supramolecular hydrogels and phase separated coacervates used as protocell models. The group also focuses on bottom-up self-assembly based synthesis of complex organic superstructures which form autonomously in response to chemical signals. Such bio-inspired highly porous hierarchical superstructures are targeted towards catalysis, gas storage and responsive soft materials. The objectives of the group align with the strategic research line 3 (RL3), and also partially with the RL1 and RL2.

Since September 2022 (~2 years), the group has already published original research in the form of 3 papers in reputed journals (2 *Angew. Chem*. (2023, 2024 *HOT PAPER* and *Cover Image*) and

ChemSystemsChem (2024). Not only this, but the PI has also been interviewed by prestigious *Angew. Chem.* as an up-and-coming young researcher recognizing the importance and field of work. The PI has acquired ~800K Euros in funding in last 2 years with winning proposals at national and regional levels. The group comprises of 2 Masters, 2 Bachelors, 2 PhDs and 2 Postdocs. The PI is involved in national level collaborative network involving top scientists in computational, supramolecular and biological/pharmaceutical fields from Spain. The immediate plan of the group is to acquire European level funding like ERC consolidator (6 chances), ERC synergy and other prestigious European grants while doing cutting edge research in the above-mentioned fields.

RG12: Spintronics for Advanced Devices Lab (SPINAD Lab)- PI: Víctor López-Domínguez

The SPINAD Lab research is focused on spintronic materials to develop new device concepts for electronic circuits and unconventional computing paradigms. We focus on controlling the charge and spin of electrons, aiming to reduce the power consumption in electronic circuits due to device miniaturization (Moore's law) and improve the latency between memory and the CPU (Von Neumann bottleneck). The group works in different materials, including transition metals, heavy metals, and complex alloys, all grown with fabrication methods compatible with CMOS technology. Based on the above-mentioned materials, we fabricate structures for memory applications (MRAM), high-frequency detectors (Spin Diodes), and nano oscillators for solving combinational problems, aligned with INAM's goal of sustainable technologies, strategic line 1 (RL1).

Since the establishment of the group in May of 2023 (~1.5 years), the group has already published 3 original research articles in Nanotechnology and Advanced Materials journal, as well as a collaborative review of Neuromorphic Technologies in Spain, published in IEEE Nano 2024. During this time, the group has secured approximately ~610 k€ in regional funding. The group is formed, in addition of the PI, by 1 PhD, and participates in international Spintronics networks and national Neuromorphic networks through the Spanish Association of Semiconductor Industry (AESEMI). Currently, the group is actively working in the acquisition of European funding, including ERC Consolidator grant program, ERC Pathfinder projects, and collaborations with leading Memory companies.

Senior researcher. Recruited following specific conditions depending on their program (i.e. Ramón y Cajal). Executive Board made the first contact, interview with IAC and approval by the Executive Council. Negotiation with UJI's Rectorate is done when needed. During 2022-2023 one 'Ramón y Cajal' and one 'Juan de la Cierva-Incorporación' were recruited.

Postdoctoral and Doctoral Candidates. Available positions extensively advertised (explained above), contacts with other institutions, presentation of INAM to undergraduate and master

students, application to specific funding to regional and inter/national programs (MSCA, La Caixa Junior, Margarita Salas, Maria Zambrano, etc). In 2022-2023, we have hosted a total of 26 Postdoc researchers, 14 of which came from abroad. At the end of 2023, the funding source to hire Postdoctoral researchers from personal competitive calls came from: EU (2 MSCA PF), National calls (6, Juan de la Cierva-Formación, Margarita Salas and Maria Zambrano). INAM has hosted a total of 46 Doctoral Candidates, 23 of them from non-EU countries. At the end of 2023, the funding source to hire Doctoral Candidates came from EU projects and National and Regional projects, including Santiago Grisolía program for foreign students (Generalitat Valenciana), AEI FPI program, regional government Generalitat Valenciana, UJI grants, among others.

Technicians and administration. At the end of 2023, 11 technical and administrative staff were working at INAM (8 + 3). One of the administrative staff is part of UJI's permanent personnel since 2021. One of the technicians is co-funded between INAM and UJI, and another one is contracted thanks to INVESTIGO Program and 3 were contracted at the UCIE-INAM. Undoubtedly these numbers are not sufficient in view of the size and growth of the institute, and measures should be taken in our new Strategic Plan for the period 2024-2027.

4. RESEARCH FACILITIES

All our facilities are shared in an integrated fashion. During 2022-2023, we have established 2 Technical Support Units (TSU): Analytical, and Optoelectronic. These TSUs, opened to all UJI's community and to external academic or industrial users, allow developing strong collaborative research leading to synergies and dynamic working groups to approach common research problems as well to solve concrete problems of external users. The TSUs are supervised by a Coordinator, with the support of two technicians.

The *Analytical Unit* includes state-of-the-art analytical instruments, such as gas chromatographs with TCD and FID and MS detectors, in-line Micro gas chromatographs, HPLCs systems and an ITC microcalorimeter.

The *Optoelectronic Unit* is equipped with cutting-edge instruments for optoelectronic and electric characterization, including spectrophotometers, fluorimeter, integrating sphere setup, CCDs based setups, lasers diodes, ns-pulsed laser, incident photon to current (IPCE) setups, solar simulators with a module for photothermal deflection spectroscopy (PDS) measurements, oscilloscopes, probe station with temperature control, AC and DC power supplies, AFM equipment, potentiostats, etc. INAM is internationally recognized in Advanced Optoelectronic characterization, and this TSU plays a pivotal role in such succeed.

During 2022-2023, we have successfully acquired specialized equipment through two GVA-IDIFEDER projects (up to 800k€) to establish:

- An intelligent platform for advanced materials and chemical process manufacturing, unique in Spain. This equipment includes a robotic, modular continuous flow synthesis system, integrating technologies such as catalysis and electrochemistry with automated reagent management and real-time data collection. Advanced analytics and machine learning optimize processes, increasing experimentation speed by tenfold. Key applications of this platform include the development of sensors for hazardous substances and CO_2 capture for cyclic carbonate production (Figure 6, left).
- GPU and CPU modules for computer-aided drug design for the treatment of viral infections using "Machine Learning" and "Quantum mechanics/molecular mechanics (QM/MM)" methods (Figure 6, right).

Figure 6. Advanced materials manufacturing platform (left) and new GPU/CPU modules (right).

Additionally, we also have access to the Scientific Central Instrumentation Services of UJI which provides us with extensive support on electron microscopy, mass spectrometry, nuclear magnetic resonance, among others.

Of special relevance for us has been the provision of a new building in which INAM will be allocated in 2024-2025, significantly increasing our current space, and allowing our further growth (Figure 7). This reflects the commitment of UJI to support INAM.

Figure 7. INAM's premises are being allocated in Edifici d'Investigació II.

5. FINANCIAL REPORT

The total funding obtained by INAM during 2022-2023 reached > 8.7 M€, which represents an increase of almost 50% compared to the previous biennial period. These numbers clearly reflect INAM's ability to attract R&D funds. Our funding is highly supported by European projects, that reach more than 2.7 M€, national projects with >2.1 M€, and regional >3.3 M€ (see Figure 8).

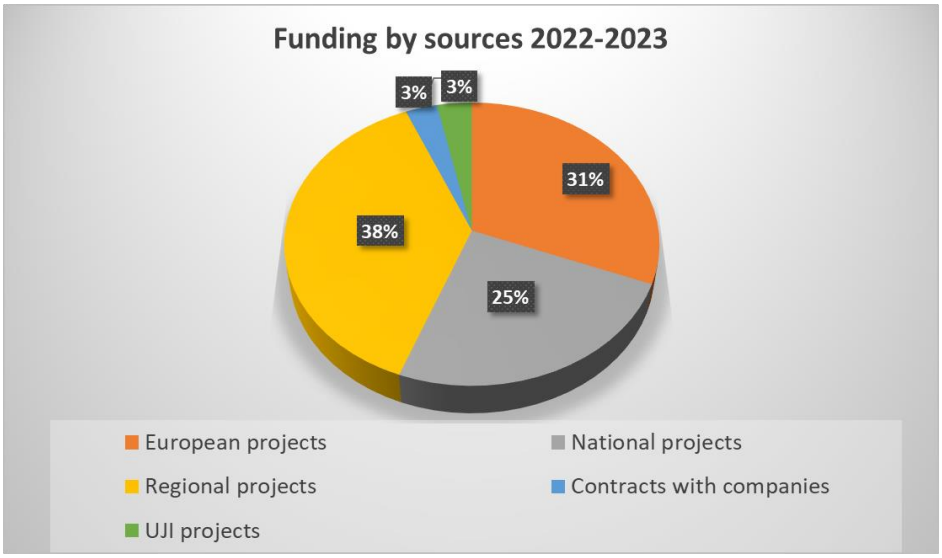


Figure 8. R&D funds raised by INAM during 2022-2023.

In terms of the number of competitive projects, the overall success rate was 52% out of 58 submitted proposals. This includes a success rate of 30% for European funding, 70% for national funding, and 45% for regional funding, respectively.

Regarding regional funds, it must be highlighted that funding has been obtained for large equipment and infrastructure for general use and to expand activities with industry through UCIE-INAM, funded by *Agencia Valenciana de la Innovación (AVI)*.

Several major projects have been active: 1 ERC Consolidator grant, 1 ERC Advanced Grant, and H2020 and Horizon Europe grants, including: 1 Doctoral Network, 1 FETOPEN, 1 EIC PATHFINDER, among others. A detailed of EU funded projects and networks can be seen below:

- ERC CoG NO-LIMIT (2017/2022). I. Mora-Seró. Interaction of halide perovskites (PVK) and semiconductor quantum dots (QDs). Contributed significantly to position Europe as leader in the understanding and developing of PVK optoelectronics.
- ERC AdG PEROSPIKER (2023/2028). J. Bisquert. Development of compact elements based on PKV to emulate neuronal dynamics, enabling efficient spiking computational models. Through impedance spectroscopy and equivalent circuit analysis, devices will be fabricated for tasks like visual object recognition.

- SUN2CHEM. INAM PI: S. Giménez (2020/2023). Direct conversion of sunlight into storable ethylene, one of the most attractive molecules due to its widespread usage and commercial value. INAM contributed to the development of novel photoanodes.
- PEROXIS. INAM PI: G. Garcia-Belmonte (2020/2022). New X-ray imaging system with higher sensitivity and spatial resolution compared to conventional ones, which supports diagnosis during intervention and treatments of various diseases.
- DROP-IT. INAM PI I. Mora-Seró (2019/2022). The project proposes combining optoelectronics and photonics in a single flexible drop-on demand inkjet technology platform. INAM developed Pb-free perovskite (PVK) optoelectronic devices, producing the first inkjet-printed Sn-based perovskite LED.
- OHPERA. INAM PI S. Giménez and project coordinator (2022/2026). Aims to develop a proof-of-concept eco-design PEC device with efficient halide lead-free perovskite nanocrystal-based photoelectrodes and customized catalytic/passivation layers, eliminating critical raw materials.
- HEPAFLEX. INAM PI I. Mora-Seró (2023/2027). Achieving an efficient and sustainable photovoltaic addressing large-area efficiency by combining rapid photonic annealing and large-area thin-film fabrication methods with green chemistry routes.
- MULTISMART. INAM PI B. Escuder (2023/2026). This Doctoral Network provides interdisciplinary training to young researchers with a focus on the development of multicomponent soft materials based on innovative self-assembling small molecules. These materials are being designed for their use in sustainable personal/home care products and regenerative therapies.

As an example of a major project, OHPERA, is a HORIZON EIC PATHFINDERS project, coordinated by INAM, that aims to integrate highly efficient and stable photoelectrodes based on halide lead-free perovskite nanocrystals (PNCs) and tailored catalytic/passivation layers, avoiding the use of critical raw materials (CRM), in a proof-of-concept eco-design PEC device. Theoretical modelling both at an atomistic and device scales will assist the materials development and mechanistic understanding of the processes, and all materials and components will be integrated in a proof-of-concept device, targeting standalone operation at 10 $mA \cdot cm^{-2}$ for 100 hours, 90% Faradaic efficiency to H_2, and including a clearly defined roadmap for upscaling and exploitation. OPHERA will offer a dual process to produce green H_2 concomitant to the treatment of industrial waste generating added-value chemicals with high economic and industrial interest, thus offering

a competitive levelized cost of green H_2. Coordinated by Sixto Giménez from INAM, the consortium is composed by: INAM, Ben-Gurion University of the Negev, ICIQ, Helmholtz Zentrum Berlin, Lomartov S.L. and eChemicles Zrt.

We have also participated in national Excellence Networks (ORFEO-CINQA, CAT&SCALE, SUPRAMAT, FOTOFUEL, and PEROVSKITE), as well as in international cooperative actions (EPKI European Perovskite Initiative, EIT Climate-KIC, COST Action StableNextSol, COST Action "The European Upconversion Network", Fuel Cells and Hydrogen Joint Undertaking, etc).

6. SUMMARY OF SCIENTIFIC RESULTS

Bibliometric data are traditionally used as indicator of quality. However, the research community is shifting towards a more holistic, fair, and accurate system for evaluating scientific outputs, based on The San Francisco Declaration on Research Assessment (DORA). Being aware of this, and following UJI's through its adhesion to The Coalition for the Advancement of Research Activity Assessment (CoARA), we present our scientific results (2022-2023) based on numbers of publications and citations, comparing with the previous period (2020-2021).

Table 1. Comparison of bibliographic data for biennial periods 2020-2021 and 2022-2023.

Number of articles 2020-2021	137
Number of articles 2022-2023	166
Total citations at Jan 2020	5832
Total citations at Dec 2021	12303
Biennial citations increment 20-21	6471
Total citations at Dec 2023	20461
Biennial citations increment 22-23	8158
Increment in biennial citations (2020-2021/2022-2023)	**26%**

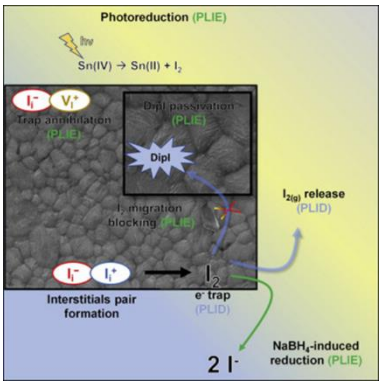
Information obtained from WoS, date September 2024

With respect to peer recognition, during 2022-2023, we successfully positioned two researchers (J. Bisquert and I. Mora-Seró) on the Highly Cited Researchers list from Clarivate. Additionally, in 2023, E. Peris received the Mond-Nyholm Prize from the Royal Society of Chemistry, while I. Mora-Seró was honoured in 2022 with the Excellence Award from the Royal Spanish Society of Chemistry. Furthermore, Sergio Gonell was awarded with the 2022 Young Researchers prize by the Specialized Group in Organometallic Chemistry of the Royal Spanish Society of Chemistry.

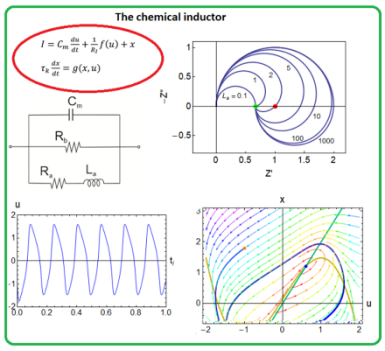
We present here a selection of twelve of our most outstanding publications (2022-2023), organised by RL. Number of citations reported from WoS/Google Scholar.

RL1 Energy materials: advanced configuration for more efficient production, conversion, and storage.

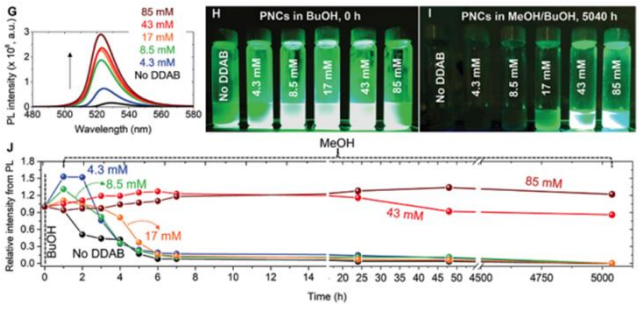
INAM has produced a significant impact in photovoltaics and solar fuels. Our characterization of these systems has contributed enormously to the understanding of their working principles, positioning INAM as a reference institution.



Joule **2022**, *6*, 1. *Tin perovskite solar cells with >1,300 h of operational stability in N_2 through a synergistic chemical engineering approach*. Citations **104/114**. Highly Cited Paper. Pb-free tin-based halide perovskite with the highest current stability (more than 1300 hr under 1sun illumination at working maximum power point conditions). Detailed analysis of additives, halides and light soaking in the photoconversion performance and device long term stability. Led by INAM, external collaboration for XPS and TRPL.

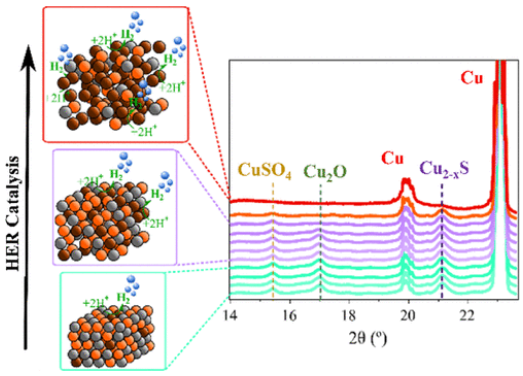


J. Am. Chem. Soc. **2022**, *144*, 5996. *Chemical Inductor*. Citations **56/70**. In this article, a general inductive behaviour that is not electromagnetic in origin is described. This effect has very deep implications in a multitude of chemical, biological, and material systems. The process arises from two electrical processes highly coupled with some specific characteristic kinetics (slow/fast). Significant attention with a high number of citations since publication. Developed by INAM exclusively.



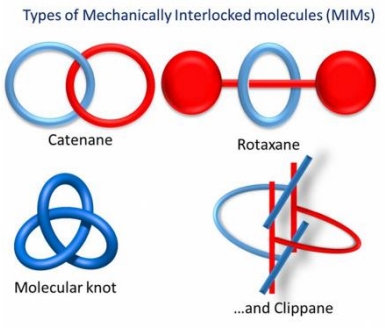
Adv. Opt. Mater. **2023**, *11*, 2203096. *Efficient Ligand Passivation Enables Ultrastable $CsPbX_3$ Perovskite Nanocrystals in Fully Alcohol Environments*. Citations **14/15**. In this paper the capping of $CsPbBr_3$ perovskite nanocrystals is modified to enhance the stability of these nanoparticles in alcohol solvent in orde to increase the stability of these systems in polar solvents. Stabilities longer than 5000 hr in alcoholic solvents (Butanol/metanol) were reported. Collaboration within INAM.

ACS Catal. **2023**, *13*, 10457. *Highly Durable Nanoporous Cu2-x S Films for Efficient Hydrogen Evolution Electrocatalysis under Mild pH Conditions*. Citations **6/7**. In this article, we report a facile, cost-effective, and scalable synthetic route to produce Cu 2–x S electrocatalysts, exhibiting hydrogen evolution rates that increase for ∼1 month of operation. Our Cu 2–x S electrodes reach a state-of-the-art performance of ∼400 mA cm –2 at −1 V vs RHE under mild conditions (pH 8.6), with almost 100% Faradaic efficiency for hydrogen evolution. Collaboration between INAM, UPV, ICN2, IMDEA Energía, University of Montreal and Universidad Central de Bogotá.



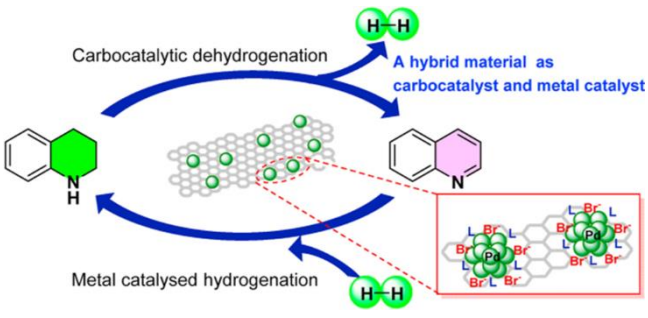
<u>*RL2 Chemistry to transform society: fundamental reactions and catalysis, decontamination, and high added value chemical production.*</u>

Noteworthy achievements were produced in discovering novel catalysts to efficiently convert raw materials into valuable products, a pivotal challenge in Chemistry. Our advancements in this RL have attracted world-wide scientific attention.

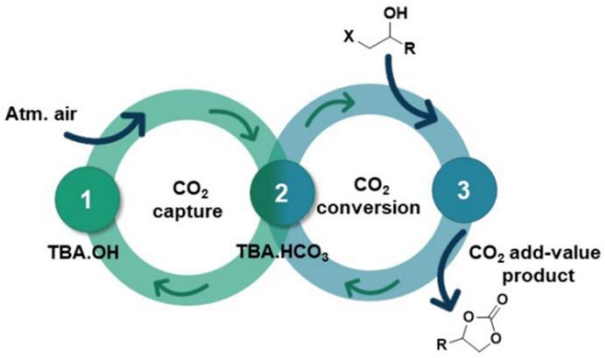


Angew. Chem. Int. Ed. **2022**, *61*, e202112513. *Clippane: A Mechanically Interlocked Molecule (MIM) Based on Molecular Tweezers*. Citations **22/28**. The description of a new MIM with extraordinary impact in the scientific community. Study highlighted in Chemistry World, Chemistry Views and in the prestigious Science Magazine. Developed by INAM exclusively.

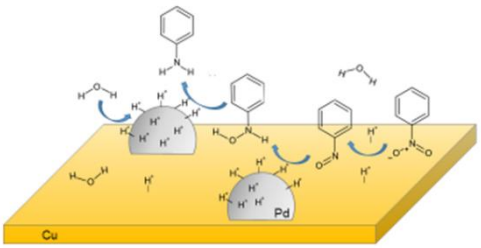
Carbon **2023**, *206*, 314. *Dual role of graphene as support of ligand-stabilized palladium nanoparticles and carbocatalyst for (de)hydrogenation of N-heterocycles.* Citations **4/4**. This work describes the synthesis of a hybrid catalyst based on palladium nanoparticles and graphene that play a dual role in catalysis. The material acts as an efficient catalyst for reversible hydrogenation/dehydrogenation of N-heterocycles using molecular



hydrogen. This work has implications in the development of catalytic systems for hydrogen storage technologies based on liquid organic hydrogen carriers. Collaboration between INAM, CSIC, and University of Zaragoza.



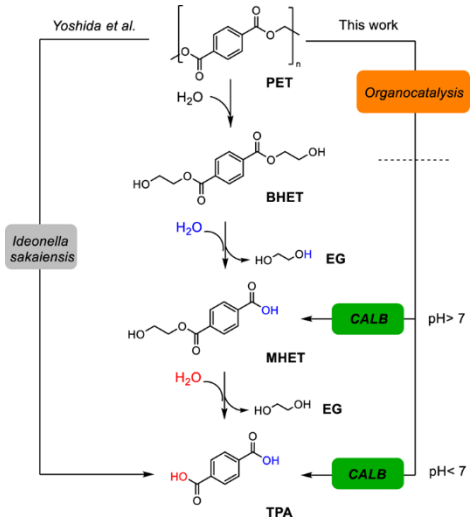
ACS Sustain. Chem. Eng. **2023**, *11*, 9613. *Direct Air Capture and Integrated Conversion of Carbon Dioxide into Cyclic Carbonates with Basic Organic Salts*. Citations **18/18**. This work presents a novel, cost-effective method that captures CO_2 from air and converts it into cyclic carbonates using commercially available ionic liquids. The process operates under mild conditions without expensive co-catalysts or sorbents. CO_2 was captured efficiently and fully converted into cyclic carbonates with epoxides or halohydrins, achieving 100% selectivity through a mechanism involving halohydrin intermediates. Collaboration between INAM and UJI.



Adv. Sustainable Syst. **2022**, *6*, 2100367. *Role of Pd in the Electrochemical Hydrogenation of Nitrobenzene Using CuPd Electrodes*. Citations **20/22**. This study examines the electrochemical reduction and hydrogenation of nitrobenzene to aniline at neutral pH using copper electrodes, both with and without palladium decoration. Palladium significantly reduces the overpotential for nitrobenzene reduction and the hydrogen evolution reaction, improving activity and selectivity. Impedance spectroscopy revealed for the first time how palladium facilitates the generation of H radicals, essential for the reduction process, thereby increasing selectivity for aniline. Developed as a collaboration within INAM.

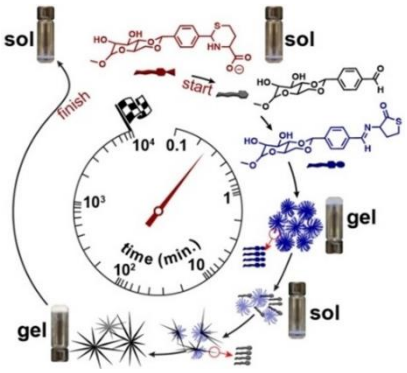
RL3 Adapting Biological materials for functional applications. (SDG 3, 9, 12), incorporated at INAM in 2020.

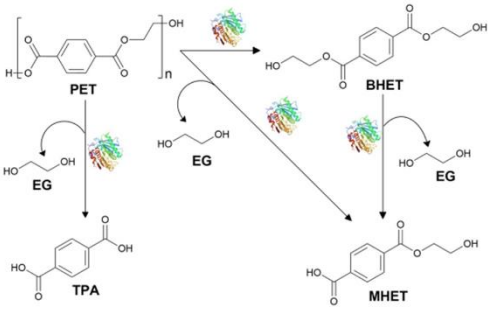
Since 2020, we have broadened our scientific portfolio with the combination of organic and inorganic materials with biological matter. This seminal work has established a novel conceptual advance, leading to innovative applications in energy, catalysis, and health.



Nat. Commun. **2023**, *14*, 3556. *Mechanistic studies of a lipase unveil effect of pH on hydrolysis products of small PET modules*. Citations **15/23**. Theoretical-experimental work led by INAM in collaboration with groups from the CIC biomaGUNE and the UPV/EHU. Theoretical study of the degradation of PET oligomers catalysed by a promiscuous lipase CALB. Experimental collaborators performed a pH-controlled biotransformation that selectively hydrolyses BHET to its corresponding diacid or monoesters using soluble and immobilised CALB.

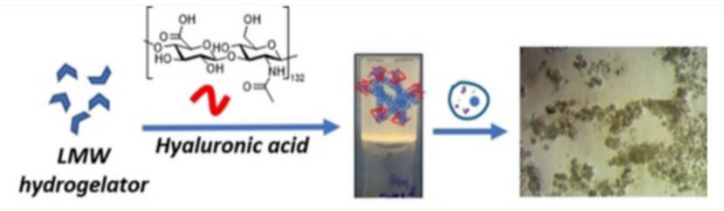
Angew. Chem. Int. Ed. **2023**, *62*, e202301529. *Chemically Fueled Autonomous Sol→Gel→Sol→Gel→Sol Transitions*. Citations **18/18**. In this article, a first of its kind two back-to-back non-equilibrium reentrant phase transitions between solution and gel states are achieved by a chemically fuelled autonomous reaction cycle. Project led by INAM, in collaboration with Institute of Supramolecular Science and Engineering, University of Strasbourg.





ChemBioChem **2023**. *24*, e202200503. *Accelerated Polyethylene Terephthalate (PET) Enzymatic Degradation by Room Temperature Alkali Pre-treatment for Reduced Polymer Crystallinity*. Citations **12/16**. This paper describes how alkali pre-treatment at mild temperatures modifies the surface of polyethylene terephthalate (PET) samples and reduces the crystallinity. These two effects improve the access of PETase to hydrolysable chemical bonds increasing the production of terephthalic acid (TPA) and monohydroxyethyl terephthalate (MHET) by one order of magnitude. Collaboration within INAM.

ChemBioChem **2023**. *24*, e202300438. *Effect of Hyaluronic Acid on the Self-Assembly of a Dipeptide-Based Supramolecular Gel*. Citations **2/1**. This study explores two-component hydrogels composed of hyaluronic acid (HA) and a dipeptide-based gelator.



Results show that HA reduces polymorphism in the LMW network, leading to reproducible hydrogels with enhanced mechanical properties, while the LMW network stabilizes HA without irreversible crosslinking. These materials hold significant potential for biomedical applications. Developed exclusively by INAM.

7. COMMUNICATION AND OUTREACH

We develop an institutional initiative adapted to different target audiences. We have an advanced website tool (www.inam.uji.es) with information of the institute. We use X (@inam_uji) and LinkedIn (https://www.linkedin.com/in/inam-uji-256a78142/). We have a permanent activity of promotion of science to society, by participation in scientific societies and developing communication and outreach activities.

Examples of our activities for different target audiences:

a) Scientific audience. During the period from 2022 to 2023, INAM has organized a series of scientific events, including:

- Seminars conducted by prominent national and international researchers.
- The INAM Annual Symposium, a multidisciplinary forum featuring top-ranked keynote speakers and networking sessions with INAM members and visiting scientists.
- The Annual PhD Seminar, which convenes scientists from nearly all research groups at INAM to facilitate knowledge exchange and promote potential collaborations among senior PhD candidates.
- Seminars presented by newly appointed senior researchers and postdoctoral fellows at INAM.
- Joint seminars with other research institutions, such as the INAM-BINA Conference Day, an interdisciplinary meeting that brought together scientists from the Bar Ilan Institute for Nanotechnology and Advanced Materials (BINA) and the INAM scientific community, aimed at reinforcing existing collaborations and cultivating new synergies.
- Scientific talk-tour in Germany by Prof. E. Peris as Humboldt Research Award recipient.
- Invited talks and plenary lectures in major scientific conferences.

Furthermore, we have also provided support for various additional events organized by INAM's members, including:

- 8th Latin American Symposium on Coordination and Organometallic Chemistry-SILQCOM-08
- 4th and 5th International Meeting on Trends in Enzyme Catalysis: Merging Theory and Experiment
- VI Chemical Biology Group Meeting
- 8th International Sol Gel Society Workshop: SUSGEM 2023 Sustainable Sol-Gel Energy Materials.

b) Industrial and end-user audience. Organization and participation in technology transfer workshops and seminars (promoted by UCIE-INAM), including: TECH4CV (Valencia), Transfiere 2022 (Málaga), Eco Chemical Solutions (Valencia), eMobility World Congress (Valencia), etc.

c) Youngsters. Encourage STEM careers, especially women.

- Participation of women PI, Doctoral Candidates and Postdocs in seminars at High/Schools to encourage young females to STEM.
- "Jornadas STEM+: Ciencia, Tecnología, Matemáticas y más" at Planetarium CS.
- Participation in Joves i Ciència program of Fundació Catalunya la Pedrera to promote STEM to young students.
- Participation in Firujiciència, UJI's fair of science, focused on early childhood and Primary/Secondary Schools.
- Participation in Scientific Fair (University of Murcia).
- Participation in Mediterranean Night of Researchers (Science GTS), organized at UJI.
- INAM's Annual Program *Scientists Women in the Shadow,* for the International Day of Women and Girls in Science.
- Participation in European Olympiad of Experimental Science and Local Physics Olympiad.
- Host visits of Secondary School students at INAM's premises.

d) General audience. Communication in an adapted language, INAM's achievements in popular press channels, in general journals and in local and university press.

- ‘‘Pint of Science”: V. Moliner (2022) “Química computacional: el laboratori quìmic del segle XXI”. S. Giménez (2022) “La hoja artificial y otros artilugios para evitar el colapso energético”. N. Singh (2023) “Molecular dance at the rithm of Biology”
- ‘‘La aventura del saber (La 2, RTVE)”, “La universidad responde”: participation of I. Mora-Seró, A. Sánchez, E. Mas-Marzá.
- Participation in Foro de Economía by Levante-EMV and A punt TV, Juan Bisquert.
- Conference DivulgaNobel2023, University Miguel Hernández, I. Mora-Seró.

8. RESEARCH OUTPUTS

8.1 PUBLICATIONS

2023

1. *ACS Catalysis*, **2023**, *13*, 13354. Fernández-de-la-Pradilla, A.; Royo, S.; Schirmeister, T.; Barthels, F.; Świderek, K.; González, F.V.; Moliner, V. **Impact of the Warhead of Dipeptidyl Keto Michael Acceptors on the Inhibition Mechanism of Cysteine Protease Cathepsin L.**
2. *Nature Communications*, **2023**, *14*, 3556. Świderek, K.; Velasco-Lozano, S.; Galmés, M.À.; Olazabal, I.; Sardon, H.; López-Gallego, F.; Moliner, V. **Mechanistic studies of a lipase unveil effect of pH on hydrolysis products of small PET modules.**
3. *ACS Catalysis*, **2023**, *13*, 6289. Arafet, K.; Royo, S.; Schirmeister, T.; Barthels, F.; González, F.V.; Moliner, V. **Impact of the Recognition Part of Dipeptidyl Nitroalkene Compounds on the Inhibition Mechanism of Cysteine Proteases Cruzain and Cathepsin L.**
4. *Journal of American Chemical Society*, **2023**, *145*, 6691. Movilla, S.; Roca, M.; Moliner, V.; Magistrato, A. **Molecular Basis of RNA-Driven ATP Hydrolysis in DExH-Box Helicases.**
5. *Journal of Chemical Informatics and Modeling*, **2023**, *63*, 1301.. Arafet, K.; Scalvini, L.; Galvani, F.; Martí, S.; Moliner, V.; Mor, M.; Lodola, A. **Mechanistic Modeling of Lys745 Sulfonylation in EGFR C797S Reveals Chemical Determinants for Inhibitor Activity and Discriminates Reversible from Irreversible Agents.**
6. *RSC Medicinal Chemistry*, **2023**, *14,* 1767.. Abdel-Rahman, S.A.; Świderek, K.; Gabr, M.T. **First-in-class small molecule inhibitors of ICOS/ICOSL interaction as a novel class of immunomodulators.**
7. *Mathematics*, **2023**, *11*, 279. Pérez, G.Alfonso; Castillo, R. **Categorical Variable Mapping Considerations in Classification Problems: Protein Application.**

8. *Medicine*, **2023**, *59*, 1218. Pérez, G.Alfonso; Castillo, R. **Gene Identification in Inflammatory Bowel Disease via a Machine Learning Approach.**
9. *Mathematics*, **2023**, *11*, 1795. Pérez, G.Alfonso; Castillo, R. **Nonlinear Techniques and Ridge Regression as a Combined Approach: Carcinoma Identification Case Study.**
10. *Journal of Energy Chemistry*, **2023**, *73*, 109136. Burgos, J.; Mondragon, R.; Martinez-Cuenca, R.; Nithiyanantham, U.; Barison, S.; Mancin, S.; Fabregat-Santiago, F.; Hernández, L. **Photothermal properties and performance of hybrid carbon-paraffin/water emulsions.**
11. *Journal of Power Sources*, **2023**, *588*, 233725. Pereira, J.; Mediayati, Y.; Sleutels, T.; Fabregat-Santiago, F.; Heijne, A.Ter **Quantification of charge carriers and acetate diffusion lengths in intermittent electro-active biofilms using Electrochemical Impedance Spectroscopy.**
12. *ChemBioChem*, **2023**, *24*, e202200503, S Giraldo-Narcizo[1], N. Guenani[1], AM Sánchez-Pérez, and A Guerrero. **Accelerated Polyethylene Terephthalate (PET) Enzymatic Degradation by Room Temperature Alkali Pre-treatment for Reduced Polymer Crystallinity.**
13. *Journal of Alzheimer disease reports* **2023**, *7*,1007., Laryssa Alves-Borba, Verónica Espinosa-Fernández, Ania Canseco-Rodríguez1, Ana María Sánchez-Pérez. **ABA Supplementation Rescues IRS2 and BDNF mRNA Levels in a Triple-Transgenic Mice Model of Alzheimer's Disease.**
14. *Cells*, **2023**, *12*, 465. Meseguer-Beltrán M, Sánchez-Sarasúa S, Landry M, Kerekes N, Sánchez-Pérez AM **Targeting Neuroinflammation with Abscisic Acid Reduces Pain Sensitivity in Females and Hyperactivity in Males of an ADHD Mice Model.**
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69. *Chemistry of Materials*, **2022**, 34, 7, 3076. Vázquez-Cárdenas, R.; Rodríguez-Romero, J.; Echeverría-Arrondo, C.; Sanchez-Diaz, J.; Chirvony, V.S.; Martínez-Pastor, J.P.; Díaz-Leyva, P.; Reyes-Gomez, J.; Zarazua, I.; Mora-Seró, I. **Suppressing the Formation of High n-Phase and 3D Perovskites in the Fabrication of Ruddlesden–Popper Perovskite Thin Films by Bulky Organic Cation Engineering.**

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72. *Advanced Optical Materials*, **2022**, 2102566, 1. Rakshit, S.; Piatkowski, P.; Mora-Seró, I.; Douhal, A. **Combining Perovskites and Quantum Dots: Synthesis, Characterization, and Applications in Solar Cells, LEDs, and Photodetectors.**

73. *Applied Physics Reviews*, **2022**, *9*, 011318. Bisquert, J. **Hopf bifurcations in electrochemical, neuronal, and semiconductor systems analysis by impedance spectroscopy.**

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E. **Direct observation of the chemical transformations in BiVO4 photoanodes upon prolonged light-aging treatments.**

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80. *Advanced Materials Technologies*, **2022**, 2101525, 2-11. Vescio, G.; Frieiro, J.Luis; Gualdrón-Reyes, A.F.; Hernández, S.; Mora-Seró, I.; Garrido, B.; Cirera, A. **High Quality Inkjet Printed-Emissive Nanocrystalline Perovskite $CsPbBr_3$ Layers for Color Conversion Layer and LEDs Applications.**

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84. *Nanoscale*, **2022**, *14*, 1468. Adhikari, S.Das; Echeverría-Arrondo, C.; Sánchez, R.S.; Chirvony, V.S.; Martínez-Pastor, J.P.; Agouram, S.; Muñoz-Sanjosé, V.; Mora-Seró, I. **White light emission from lead-free mixed-cation doped Cs_2SnCl_6 nanocrystals.**

85. *ACS Catal*. **2022**, *12*, 12596. Assaf E. A.; Gonell, S.; Chen, C-H.; Miller, A:J.M. **Accessing and Photo-Accelerating Low-Overpotential Pathways for CO_2 Reduction: A Bis-Carbene Ruthenium Terpyridine Catalyst**.

86. *Advanced Sustainable Systems*, **2022**, 2100367. Carvajal, D.; Arcas, R.; Mesa, C.A.; Giménez, S.; Fabregat-Santiago, F.; Mas-Marzá, E. **Role of Pd in the electrochemical hydrogenation of nit**

8.2 PATENTS

2022-2023

1. Electrodo electrocatalítico de óxido mixto de Hierro-Vanadio, procedimiento para su obtención y sus usos en la producción de hidrógeno. P202330270.

Authors: Sixto Giménez, Alejandro Saura Avilés, Rafael Abargues López.

Application date: 31/03/2023, pending.

Owner: UV (55%), UJI (45%)

2. Procedimiento reversible de almacenamiento-liberación de hidrógeno en forma líquido +L5. ES2958262A1; WO2024/013417A2.

Authors: José Antonio Mata Martínez, Elena Mas Marzá, Francisco Fabregat Santiago; Antonio Guerrero Castillejo; Carmen Mejuto Nieblas; Andres Mollar Cuni; Nihal El Guenani Mir; David Eduardo Carvajal Guayapero.

Application dates: 07/11/2022, 23/07/2023.

Owner: UJI (100%)

3. Method for the production of tin halide organic-inorganic based perovskites, thin films and devices thereof. ES2957359A1; PCT/ES2024/070416.

Authors: Iván Mora Seró, Samrat Das Adhikari;Victor Sans Sangorrín; Ileana Beatriz Recalde Ruiz; Andrés Fabián Gualdrón Ruiz.

Application dates: 05/07/2023, 02/07/24.

Owner: UJI (100%)

4. Procedimiento de almacenamiento de hidrógeno en forma líquida (Phenol-cyclohexanol). ES2978419A2; WO2023/118635A1.

Authors: José Antonio Mata Martínez, Carmen Mejuto Nieblas; Andrés Mollar Cuni; Laura Ibáñez Ibáñez; Miguel Baya García; Gregorio Guisado Barrios.

Application dates: 20/12/2022.

Owner: UJI (80 %) UNIZAR (20 %)

5. Procedimiento y sistema para la producción de soluciones de desinfección y/o esterilización. P202230591, WO2024003436A1.

   Authors: Eduardo García Verdugo, Víctor Sans, María Maciá; Santiago Vicente Luis; Julián Eduardo Sánchez.

   Application dates: 30/06/2022, 04/01/2024

   Owner: UJI (100%)

6. Método in vitro para predecir y/o pronosticar la compatibilidad de biomateriales en un sujeto. ES2602620B1, WO2018115553A1.

   Authors: Ana María Sánchez.

   Application dates: 17/12/2018, 16/12/2023

   Owner: UJI (40 %), Universidad del País Vasco (40 %), CIC Biogune (20 %).

8.3 PhD THESES

2023

1. Structural and Processing Modification of Perovskite for the Optimization of Photovoltaic Devices
   Patricio Serafini (2023)
   Directors: Iván Mora-Seró, Eva Mª Barea
   Tutor: Prof. Iván Mora Seró
2. Modulated Techniques to Analyse Photoconversion Devices
   Agustin Alvarez Ojeda (2023)
   Directors: Francisco Fabregat-Santiago, Elena Mas Marzá
3. Hysteresis Control in Hybrid Perovskite-based Devices for Photovoltaic and Neuromorphic Computing Applications
   Cedric Gonzales (2023)
   Directors: Juan Bisquert, Antonio Guerrero
   Tutor: Juan Bisquert
4. Development of Advanced Materials Based on Polymeric Ionic Liquids Formulated for Additive Manufacturing
   Sara Miralles (2023)
   Directors: Victor Sans Sangorrin, Sixto Giménez
5. Development and characterization of electro- and photo-electrochemical systems for high-added-value products
   Ramón Arcas Martínez (2023)
   Directors: Francisco Fabregat-Santiago, Elena Mas Marzá

6. Small Perturbation Techniques for the Electronic Analysis of Perovskite Devices
   Agustín Bou Catalá (2023)
   Directors: Juan Bisquert
   Tutor: Juan Bisquert
7. Design of catalytic systems for sustainable processes development: hydrogen storage and biomass transformation
   Andrés Mollar Cuni (2023)
   Directors: Jose Mata, Gregorio Guisado-Barrios
8. Computational Study on the Reactivity and Inhibition of Arginine Gingipain B, a Potential Target for the Treatment of Alzheimer's Disease
   Santiago Movilla Núñez (2023)
   Directors: Vicent Moliner, María Teresa Roca

2022

1. High Quality Perovskite Materials for X-Ray Detection: Effect of Mobile Ions on Dark Current Stability
   Marisé García-Batlle (2022)
   Directors: Germà Garcia-Belmonte, Antonio Guerrero
   Tutor: Germà Garcia Belmonte
2. Optoelectronic Properties of Excitonic and Biexcitonic Complexes in Metal Chalcogenide Semiconductor Nanoplatelets
   David Macias (2022)
   Directors: Iván Mora-Seró
3. Inhibition studies on the human 20S proteasome: molecular insights from a computational approach
   Natalia Serrano Aparicio (2022)
   Directors: Katarzyna Świderek, Vicent Moliner
   Tutor: Raquel Castillo
4. Computational studies of the Retro-Aldol reaction catalyzed by different protein scaffolds. Towards the redesign of an improved enzyme
   Daria De Raffele (2022)
   Directors: Sergio Martí, Vicent Moliner
   Tutor: Katarzyna Swiderek
5. Molecular insights into the promiscuity of serine hydrolases. Towards a computationally guided protocol for the redesign of enzymes
   Miquel Àngel Galmés Ordinas (2022)
   Directors: Katarzyna Świderek, Vicent Moliner
   Tutor: Sergio Martí

8.4 MASTER THESES

2023

1. Effects of ABA exposure on oxidative stress in a triple transgenic mice model of Alzheimer´s disease
   Rose Guirlene Lafortune (2023)
   Tutor: Ana María Sánchez-Pérez
2. The effect of abscisic acid on behavior and neuroinflammation in an animal model of ADHD
   Neus Ibañez Sempere (2023)
   Tutor: Ana María Sánchez-Pérez
3. Síntesis de nanoláminas de sulfuro de molibdeno y estudio de su actividad catalítica en procesos de deshidrogenación de ácido fórmico
   Daniela Melissa Romero Ordóñez (2023)
   Tutor: Iván Sorribes
4. Estudio teórico de la primera etapa del mecanismo de reacción catalizada por la CD38
   Ágata Llobet Mut (2023)
   Tutor: Raquel Castillo
5. Modeling of proteins
   Gerardo Alfonso Pérez (2023)
   Directora: Raquel Castillo
   Tutora: Raquel Castillo

2022

1. Origen de la actividad catalítica en el diseño de materiales híbridos: Estudio de la variación de la distancia entre el centro activo y el soporte
   David Ruiz Almoguera (2022)
   Tutor: José A. Mata
2. Evaluación de las propiedades catalíticas de compuestos de rutenio en reacciones de acoplamiento entre alcoholes y silanos
   Adrián Sánchez Honrado (2022)
   Tutor: José A. Mata
3. Ruthenium Catalysts design for the production of hydrogen on-demand from the coupling of alcohols and silanes
   Raquel Navarrete (2022)
   Tutor: José A. Mata
4. Synthesis of $BiVO_4$ Nanoparticles through a Continuous Flow System for up-scalable photoelectrochemical devices

Christian Robles Peris (2022)

Tutor: Beatriz Julián López

PRICE: BEST TFM - EIX D'ALIANCES DELS OBJECTIUS DE DESENVOLUPAMENT SOSTENIBLE (CONVENI UJI-GVA, CÀTEDRA 2022)

5. Zr-doped BiVO4 Photoanodes for Photoelectrochemical Applications

   Victor Carbajo Benet (2022)

   Tutor: Beatriz Julián López

6. 3D printing of catalytic reactors for CO_2 transformation

   Simone Marchetti (2022)

   Tutor: Victor Sans Sangorrin, Dr. Marcileia Zanatta

7. Desarrollo de tintas supramoleculares para bio-impresión 3D

   Laura Pascual Asensio (2022)

   Tutor: Beatriu Escuder

8. Eco-design of a Direct Air Capture System for Atmospheric CO_2 Removal through a Life Cycle Assessment-based methodology

   Edgar Contreras (2022)

   Tutor: Sixto Giménez Juliá

   PRICE: BEST TFM ON SUSTAINABILITY – AULA CIMSA, UPV.

8.5 PROJECTS

EU-funded projects

1. Title: Perovskite spiking neurons for intelligent networks

   Acronym of the project: PeroSpiker

   Funding entity: European Commission

   Modality: HORIZON-ERC-2022-ADG / ERC ADVANCED GRANT

   Entity code: 101097688 - PeroSpiker

   Principal researcher: Juan Bisquert Mascarell

   Dates: 2023-2028

   Total amount: 2.498.004,00€

2. Title: Optimised Halide Perovskite nanocrystalline based PhotoElectrolyser for clean, Robust, efficient and decentrAlised H_2 production.

   Acronym of the project: OPHERA

   Funding entity: European Commission

   Modality: HORIZON-EIC-2021-PATHFINDERCHALLENGES-01

   Entity code: 101071010

   Project coordinator: Sixto Giménez Julia

Dates: 2022-2025

Total amount: 695,323.87 €

3. Title: HEPAFLEX - High-efficiency perovskites on flexible substrates for sustainable applications

   Acronym of the project: HEPAFLEX

   Funding entity: European Commission

   Modality: HORIZON-CL5-2022-D3-03-05 NOVEL THIN FILM TECHNOLOGIES TARGETING HIGH EFFICIENCIES

   Entity code: Project 10112234

   Principal researchers: Iván Mora-Seró

   Dates:2023-2027

   Total Amount: 554.103,75 €

4. Title: MULTISMART - MULTI-COMPONENT SOFT MATERIALS ADVANCED RESEARCH TRAINING NETWORK

   Acronym of the project: MULTISMART

   Funding Entity: European Commission

   Modality: HORIZON-MSCA-2021-DN/ MARIE SKLODOWSKA-CURIE DOCTORAL NETWORKS

   Entity code: Project 101072585 — MultiSMART

   Principal researchers: Beatriu Escuder

   Dates: 2023-2026

   Total Amount: 475.142,40 €

5. Title: Enzymatic cascade biotransformations in digitally manufactured continuous-flow bioreactors

   Acronym of the project: FLOWBIOCAT

   Funding entity: European Commission

   Modality: HORIZON-MSCA-2021-PF-01 MARIE SKLODOWSKA CURIE ACTIONS

   Entity code: Project 101064606

   Principal researchers: Victor Sans Sangorrín

   Dates: 2023-2025

   Total Amount: 165.312,96 €

6. Title: Efficient CO_2 capture and valorisation with 3D printed catalytic reactors

Acronym of the project: 3DPILCAT
Funding entity: European Commission
Modality: H2020-MSCA-IF-2020 MARIE CURIE INDIVIDUAL FELLOWSHIP
Entity code:
Principal researcher: Victor Sans Sangorrín
Dates: 2021-2023
Total amount: 172.932 €

7. Title: Novel photo-assisted systems for direct Solar-driven redUctioN of CO_2 to energy rich CHEMicals
Acronym of the project: SUN2CHEM
Funding entity: European Commission
Modality: H2020-SC3-SC3-RES-29-2019
Entity code: 884444
Principal researchers: Sixto Giménez Juliá
Dates: 2020-2023
Total amount:316.248 €

8. Title: Ground- breaking Perovskite Technologies for Advanced X Ray medical imaging systems
Acronym of the project: PEROXIS
Funding entity: European Commission
Modality:H2020-ICT-2018-2020
Entity code: 871336
Principal researchers: Germà Garcia-Belmonte
Dates: 2020-2023
Total amount: 376.032 €

9. Title: DROP-IT – Drop- on demand flexible optoelectronics & photovoltaics perovskites
Acronym of the project: DROP-IT
Funding entity: European Commission
Modality: FETOPEN-01-2019
Entity code:862656
Principal researchers: Iván Mora-Seró

Dates: 2019-2022

Total amount:424.277,00€

10. Title: No-Limit - Boosting Photovoltaic Performance By The Synergistic Interaction Of Halide Perovskites And Semiconductor Quantum Dots
    Acronym of the project: NO LIMIT
    Funding entity: ERC- European Research Council
    Modality: ERC consolidator
    Entity code: ERC-2016-COG/ERC-2016-COG-724424
    Principal researchers: Iván Mora-Seró
    Dates: 2017-2022
    Total amount: 2.000.000 €

National projects

1. Title: Red de investigación en perovskitas de haluro y sus aplicaciones tecnológicas
   Acronym: RED PEROVSKITAS
   Funding Entity: Convocatoria del año 2022 de las ayudas a redes de investigación
   Modality: Ministerio de Ciencia e Innovación
   Entity Code: RED2022-134344-T
   Principal Researcher: Ivan Mora Seró
   Dates: 2023-2025
   Total Amount: 15.000 €

2. Title: Diseño racional de catalizadores para la liberación y el almacenamiento de hidrógeno
   Acronym of the project: REALNESS
   Funding entity: Ministerio de Ciencia e Innovación
   Modality: Procedimiento de concesión de ayudas para incentivar la consolidación investigadora
   Entity code: CNS2022-136183 I
   Principal researchers: Iván Sorribes
   Dates: 2023-2025
   Total amount: 195.536,00 €

3. Title: Superestructuras Macroscópicas a través de la estrategia de polimerización activa
   Acronym of the project: MASS-UP
   Funding entity: Ministerio de Ciencia e Innovación

Modality: Proyectos Generación de Conocimiento
Entity code: PID2022-143047NA-I00
Principal researchers: Nishant Singh
Dates: 2023-2025
Total amount: 106.250,00€

4. Title: Construction racional de defectos en co-catalizadores para la síntesis de combustibles y productos químicos solares
Acronym of the project: CatSolFuChem
Funding entity: Ministerio de Ciencia e Innovación
Modality: Proyectos Generación de Conocimiento
Entity code: PID2022-143164OA-I00
Principal researchers: Iván Sorribes
Dates: 2023-2026
Total amount: 106.250,00 €

5. Title: Memorias tandem con materiales perovskita/orgánico para computación analógica robusta con multiples estados: preparación, caracterización eléctrica y herramientas de simulación
Acronym of the project: TAROT
Funding entity: Ministerio de Ciencia e Innovación
Modality: Proyectos Generación de Conocimiento
Entity code: PID2022-141850OB-C21
Principal researchers: Antonio Guerrero
Dates: 2023-2026
Total amount: 187.500,00 €

6. Title: Desarrollo de diodos emisores de luz de perovskitas de haluro con estabilidad mejorada
Acronym of the project: PLEDS
Funding entity: Ministerio de Ciencia e Innovación
Modality: Proyectos de Generación de Conocimiento
Entity code: PID2022-140090OB-C21
Principal researchers:Iván Mora-Seró/Eva Maria Barea
Dates:2023-2026
Total amount: 370.000,00 €

7. Title: Células solares sostenible y mejoradas de perovskita para aplicaciones al aire libre en agrovoltaica, ventanas semitransparentes e integración en edificios
   Acronym of the project: StepUp
   Funding entity: Ministerio de Ciencia e Innovación
   Modality: Convocatoria 2021 de ayudas a proyectos estratégicos orientados a la transición ecológica y a la transición digital
   Entity code: TED2021-131600B-C31
   Principal researchers: Iván Mora-Seró/Sofia Masi
   Dates: 2022-2024
   Total amount: 264.500,00 €

8. Title: Desarrollo de matrices de diodos emisores de luz impresos basados en perovskitas de haluros
   Acronym of the project: LUZ
   Funding entity: Ministerio de Ciencia e Innovación
   Modality: Prueba de concepto
   Entity code: PDC2022-133612-I00
   Principal researchers: Iván Mora-Seró
   Dates: 2022- 2024
   Total amount: 149.500,00 €

9. Title: Memristores de perovskita para redes de impulsos
   Acronym of the project: Peromem
   Funding entity: Ministerio de Ciencia e Innovación
   Modality: Proyecto I+D+I (Plan Estatal) «Europa Excelencia 2022»
   Entity code: EUR2022-134045
   Principal researchers: Juan Bisquert Mascarell
   Dates: 2022-2024
   Total amount: 89.646,00 €

10. Title: Descarbonización de la síntesis escalable y sostenible de productos químicos y combustibles mediante la hidrogenación de CO2 a productos C1
    Acronym of the project: CO2VAL
    Funding entity: Ministerio de Ciencia e Innovación
    Modality: Convocatoria 2021 de ayudas a proyectos estratégicos orientados a la transición ecológica y a la transición digital
    Entity code: TED2021-130288B-I00

Principal researchers: Victor Sans Sangorrín

Dates:2022-2024

Total amount: 204.240,00 €

11. Title: Ligandos inteligentes para la reducción de CO_2

Acronym of the project: OUTCO2

Funding entity: Ministerio de Ciencia e Innovación

Modality: Convocatoria 2021 de ayudas a proyectos estratégicos orientados a la transición ecológica y a la transición digital

Entity code: TED2021-130647B-I00

Principal researchers: Eduardo Peris

Dates: 2022-2024

Total amount: 183.655,00€

12. Title: Combinando geles supramoleculares de origen natural y clústeres catalíticos biomiméticos para la transición hacia una economía circular

Acronym of the project: GelClusCat

Funding entity: Ministerio de Ciencia e Innovación

Modality: Convocatoria 2021 de ayudas a proyectos estratégicos orientados a la transición ecológica y a la transición digital

Entity code: TED2021-132328B-I00

UJI accounting code: 22I631

Principal researchers: Beatriu Escuder

Dates: 2022- 2024

Total amount: 86.250,00 €

13. Title: Perovskitas hibridas estables por control de dimensionalidad e interfaces

Acronym of the project: PHYDIM

Funding entity: Ministerio de Ciencia e Innovación

Modality:Programa Estatal de I+D+i Orientada a los Retos de la Sociedad

Entity code: PID2019-107348GB-100

Principal researchers: Juan Bisquert

Dates: 2020-2023

Total amount:254.000 €

14. Title: Fabricación avanzada para procesos de cristalización de perovskitas
Funding entity: Ministerio de Ciencia e Innovación
Modality:Convocatoria del programa estatal de I+D+I orientada a los retos de la sociedad
Entity code:PID2020-119628RB-C33
Principal researchers: Victor Sans Sangorrín
Dates:2021-2024
Total amount:90.750,00€

15. Title: Desarrollo de sistemas electrocatalíticos integrados para la síntesis de productos químicos de alto valor añadido
Acronym of the project: ECOCAT
Funding entity: Ministerio de Ciencia e Innovación
Modality: Convocatoria de ayudas correspondientes al programa estatal fomento de la investigación
Entity code: PID2020-116093RB-C41
Principal researchers: Sixto Giménez
Dates: 2021-2024
Total amount: 229.900,00 €

16. Title: Convocatoria Juan de la Cierva Formación
Contratación : Silver Turren
Funding entity: Ministerio de Ciencia e Innovación
Modality: Juan de la cierva formación
Entity code: FJC2019-041835-I
Principal researchers: Iván Mora-Seró
Dates: 2021-2023
Total amount: 50.000 €

17. Title: Convocatoria Juan de la Cierva Incorporación
Contratación. Sergio Gonell
Funding entity: Ministerio de Ciencia e Innovación
Modality: Juan de la cierva incorporación
Entity code: IJC2019-039982-I
Principal researchers: Eduardo Peris

Dates: 2021-2024
Total amount: 75.000,00€

18. Title: Convocatoria Juan de la Cierva Incorporación
Contratación. Sofia Masi
Funding entity: Ministerio de Ciencia e Innovación
Modality: Juan de la cierva incorporación- Sofia Masi
Entity code: IJC2020-042618-I
Principal researchers: Iván Mora Seró
Dates: 2022-2024
Total amount: 97.800€

19. Title: Nuevas perovskitas de haluro obtenidas mediante la estabilización de la fase Perovskita a través de la energía superficial para dispositivos optoelectrónicos avanzados
Acronym of the project: STABLE
Funding entity: Ministerio de Ciencia e Innovación
Modality: Programa Estatal de I+D+i Orientada a los Retos de la Sociedad
Entity code: PID2019-107314RB-100
Principal researchers: Iván Mora-Seró
Dates: 2020-2023
Total amount: 242.000,00€

20. Title: Biocatalisis computacional: una aproximación al diseño racional de inhibidores enzimáticos y biocatalizadores con aplicaciones en biomedicina
Acronym of the project: COBIDE
Funding entity: Ministerio de Ciencia e Innovación
Modality: Proyectos Generación de Conocimiento
Entity code: PID2021-123332OB-C21
Principal researchers: Vicent Moliner
Dates: 2022-2025
Total amount: 157.300,00 €

21. Title: Aplicaciones catalíticas de mxeneos funcionalizados con metales de transición: organometalicos y nanopartículas metálicas
Acronym of the project: TMcatMAX

Funding entity: Ministerio de Ciencia e Innovación
Modality: Proyectos de Generación de Conocimiento
Entity code: PID2021-126071OB-C22
Principal researchers: Jose Mata
Dates: 2022-2024
Total amount: 102.850,00€

22. Title: Nhcs inteligentes para la obtención de ensamblajes supramoleculares y catalizadores conmutables
Acronym of the project: SMART-NHCs
Funding entity: Ministerio de Ciencia e Innovación
Modality: Proyectos Generación de Conocimiento
Entity code: PID2021-127862NB-I00
Principal researchers: Eduardo Peris
Dates: 2022-2025
Total amount: 193.600,00 €

23. Title: Funcionalización de grafeno con complejos metálicos definidos en transformaciones catalíticas sostenibles: almacenamiento de hidrógeno y conversión de biomasa
Funding entity: Ministerio de Ciencia e Innovación
Modality: Proyectos Generación de Conocimiento
Entity code: RTI2018-098237-B-C22
Principal researchers: Jose Mata
Dates: 2019-2022
Total amount: 71.148 €

24. Title: Puntos cuánticos de perovskita (pqd) completamente cubiertos por una capa cristalina a través de la ingeniería de núcleo / capa para diodos emisores de luz (led) estables
acronym of the project: She-LED
Funding entity: Ministerio de Ciencia e Innovación
Modality: Proyectos Generación de Conocimiento
Entity code: PID2021-122960OA-I00
Principal researchers: Sofia Masi

Dates: 2021-2024

Total amount: 84.700,00€

25. Title: Ayudas para la Promoción de Empleo Joven e Implantación de la Garantía Juvenil en I+D+I

Funding entity: Ministerio de Ciencia e Innovación

Modality: Ayudas para la Promoción de Empleo Joven e Implantación de la Garantía Juvenil en I+D+I

Entity code: PEJ2018-002801-A

Principal researchers: Juan Bisquert Mascarell

Dates: 2019-2022

Total amount: 47.300 €

Regional projects

1. Title: Emerging Spintronic Device Concepts for Neuromorphic computing

acronym of the project:

Funding entity: Generalitat Valenciana

Modality: CIDEGENT

Entity code: CIDEXG/2022/26

Principal researchers: Victor López Dominguez

Dates: 2023-2027

Total amount: 610.000,00 €

2. Title: Programmable non-equilibrium supramolecular systems.

acronym of the project: PRONESS

Funding entity: Generalitat Valenciana

Modality: CIDEGENT

Entity code:CIDEXG/2022/16

Principal researchers: Nishant Singh

Dates: 2022-2026

Total amount: 610.000,00 €

3. Title: Células solares sostenibles de alto rendimiento y estabilidad basadas en perovskitas híbridas impresas

Acronym of the project: PRINT-P

Funding entity: Generalitat Valenciana

Modality: Proyectos de investigación alineados con determinadas líneas de actuación del

programa de I+D+I “materiales con funcionalidades avanzadas para la nueva transformación tecnológica”
Entity code: MFA/2022/020
Principal researchers: Iván Mora-Seró
Dates: 2022-2025
Total amount: 269.996,00€

4. Title: Low dimensional quantum materials for advanced solutions in optoelectronics
Acronym of the project: Q-SOLUTIONS
Funding entity: Generalitat Valenciana
Modality: Programa PROMETEO
Entity code: CIPROM/2021/078
Principal researchers: Iván Mora-Seró
Dates: 2022-2025
Total amount: 600.000,00€

5. Title: Memristores 2-dimensionales de perovskita para visión inteligente de computación neuromórfica superficial
Acronym of the project: NeurovisionM
Funding entity: Generalitat Valenciana
Modality: Proyecto de investigación alineado con determinadas líneas de actuación del programa de I+D+i “Materiales
con Funcionalidades Avanzadas para la Nueva Transformación Tecnológica”
Entity code: MFA/2022/055
Principal researchers: Antonio Guerrero/Juan Bisquert
Dates: 2022-2025
Total amount: 265.995,00 €

6. Title: Materiales funcionales para la producción y almacenamiento eficiente de hidrógeno verde
Funding entity: Generalitat Valenciana
Modality: Proyecto de investigación alineado con determinadas líneas de actuación del programa de I+D+i “Materiales
con Funcionalidades Avanzadas para la Nueva Transformación Tecnológica”
Entity code: MFA/2022/043
Principal researchers: Elena Mas Marzá

Dates: 2022-2025

Total amount: 239.988 €

7. Title: Nuevas aplicaciones para los materiales de perovskita híbrida en computación como dispositivos de almacenamiento de memoria
   Funding entity: Generalitat Valenciana
   Modality: Programa Santiago Grisolía. Contracte predoctoral
   Entity code: CIGRIS/2022/150
   Principal researchers: Antonio Guerrero
   Dates: 2023-2027
   Total amount: 93.878,00€

8. Title: Transformaciones foto- y electrocatalíticas eficientes para la obtención de productos de alto valor añadido (TRANSCAT)
   Funding entity: Generalitat Valenciana
   Modality: Programa Santiago Grisolía. Contracte predoctoral
   Entity code: CIGRIS/2022/121
   Principal researchers: Elena Mas Marzá
   Dates: 2023-2027
   Total amount: 93.878,00€

9. Title: Nuevas aplicaciones para las células solares de perovskita híbrida como fotoeletrodos para la producción de hidrógeno
   Funding entity: Generalitat Valenciana
   Modality: Ajuda FPI-GV / Programa Santiago Grisolía. Contracte predoctoral
   Entity code: GRISOLIAP/2021/078
   Principal researchers: Sixto Giménez Juliá
   Dates: 2022 to 2026
   Total amount: 95.478€

10. Title: AVI UCIE-INAM
    Funding entity: Generalitat Valenciana
    Modality: CONVENIO PARA LA CREACIÓN DE UNIDADES CIENTIFICAS DE LA INNOVACIÓN EMPRESARIAL INAM
    Entity code: INNVA2/2022/9
    Principal researchers: Francisco Fabregat-Santiago

Dates: 2022-2024

Total amount: 499.799€

11. Title: Desarrollo del proceso de escalado en la fabricación de pulsadores cerámicos y su sistema de control electrónico (PULSACER)

Funding entity: Generalitat Valenciana

Modality: Proyectos estrátegicos de innovación

Entity code: INNVEST/2022/105

Principal researchers: Francisco Fabregat-Santiago

Dates: 2022-2024

Total amount: 184.822,35 €

12. Title: Plataforma inteligente para la fabricación escalable de materiales avanzados

Funding entity: Generalitat Valenciana

Modality: IDIFEDER 2021 -2022

Entity code: IDIFEDER/2021/029

Principal researchers: Juan Bisquert

Dates: 2021-2022

Total amount: 394.515,00€

13. Title: Diseño de fármacos asistido por ordenador para el tratamiento de la covid-19 mediante el uso de “machine learning” y métodos “qm/mm”

Funding entity: Generalitat Valenciana

Modality: IDIFEDER 2021 -2022

Entity code: IDIFEDER/2021/027

Principal researchers: Vicent Moliner

Dates: 2021-2022

Total amount: 394.915,00€

14. Title: Materiales avanzados 2d/3d para soluciones eficientes en la producción y el almacenamiento de energía sostenible

Acronym of the project: SOLPEN

Funding entity: Generalitat Valenciana

Modality: Programa PROMETEU

Entity code: PROMETEO/2020/028

Principal researchers: Juan Bisquert

Dates: 2020-2023

Total amount: 248.814 €

15. Title: Integrating Desing Across the Scales (IDEAS): from molecules to active devices with Additive manufacturing

Acronym of the project: CIDEGENT

Funding entity: Generalitat Valenciana

Modality: Convocatoria 2018 de subvenciones del programa para el apoyo a personas investigadoras con talento-plan gent

Entity code: CIDEGENT/2018/036

Principal researchers: Victor Sans Sangorrin

Dates:2019-2024

Total amount:368.665,00€

16. Title: Economía verde (energías renovables, tratamiento de aguas y residuos e industria agroalimentaria)

Funding entity: Generalitat Valenciana

Modality: PROGRAMA INVESTIGO 2023 CV

Entity code: INVEST/2023/467 E.M.M.-

Principal researchers: Elena Mas Marzá

Dates: 2023-2025

Total amount: 70000 €

17. Title: Development of Pb-free Perovskite Solar Cells

Funding entity: Generalitat Valenciana

Modality: Programa Santiago Grisolía. Contracte predoctoral

Entity code: CIGRIS/2022/122

Principal researchers: Iván Mora Seró

Dates: 2023-2027

Total amount: 93.000 €

18. Title: Renewable energy to valuable chemicals (REVCHEM)

Funding entity: Generalitat Valenciana

Modality: Proyecto Postdoctoral

Entity code: APOSTD/2021/251 MESA ZAMORA, CAMILO ARTURO

Principal researchers: Sixto Giménez Juliá

Dates: 2021-2023

Total amount: 92470 €

19. Title: A combined theoretical and experimental approach to the rational design of high value chemicals with implications for biotherapeutic engineering (REVCHEM)
Funding entity: Generalitat Valenciana
Modality: Programa PROMETEU
Entity code: CIPROM/2021/079
Principal researchers: Vicente Moliner, Macarena Poyatos
Dates: 2021-2025
Total amount: 574617 €

UJI-funded Projects

1. Title: Metal nanoparticles immobilized onto 2d materials for catalytic applications in hydrogen storage technologies (m4hys)
Funding entity: UJI
Modality: Pla Propi d'Investigació UJI
Entity code: UJI-B2022-20
Principal researchers: José Mata Rodriguez
Dates: 2023-2025
Total amount: 18.000 €

2. Title: Alternativas catalíticas eficientes para la producción de compuestos de alto valor añadido (ALTERCAT)
Funding entity: UJI
Modality: Pla Propi d'Investigació UJI
Entity code: UJI-B2022-33
Principal researchers: Elena Mas Marzá
Dates: 2023-2025
Total amount: 18.000€

3. Title: Estudio computacional del mecanismo de las reacciones catalizadas por la glucoproteína cd38. diseño de nuevos inhibidores
Funding entity: UJI
Modality: Pla Propi d'Investigació UJI
Entity code: UJI-B-2022-12
Principal researchers: Raquel Castillo Solsona

Dates: 2023-2025

Total amount: 12.030 €

4. Title: Pb-free Snbased perovskites for the development of solar cells in flexible substrates (Sn-Flex)

   Funding entity: UJI

   Modality: Pla Propi d'Investigació UJI

   Entity code: UJI-B2022-35

   Principal researchers: Iván Mora Seró

   Dates: 2023-2024

   Total amount: 21.999 €

5. Title: Escalado y potenciación de células solares de perovskita bidimensionales. (epcesbi*)*

   Acronym of the project: EPCEBIL

   Funding entity: UJI

   Modality: Pla Propi d'Investigació UJI - Modalitat B) Grups consolidats investigador individuals

   Entity code: UJI-B2022-08

   Principal researchers: Eva Maria Barea Berzosa

   Dates: 2023-2025

   Total amount: 16.000 €

6. Title: Generación de proteínas irs1 resistentes a condiciones inflamatorias, mediante mutagénesis dirigida.

   Funding entity: UJI

   Modality: Pla Propi d'Investigació UJI

   Entity code: UJI-B2021-21

   Principal researcher: Ana Maria Sánchez Pérez

   Dates: 2022-2024

   Total amount: 17.405 €

7. Title: Preparación de complejos luminiscentes que incorporan un centro Redox

   Funding entity: UJI

   Modality: Pla Propi d'Investigació UJI –

   Entity code: UJI-B2021-39

   Principal researchers: Macarena Poyatos

Dates: 2022-2024

Total amount: 19.940€

8. Title: Cobalt electrocatalysts for CO_2 valorization (CO_2-valt)
   Funding entity: UJI
   Modality: Pla Propi d'Investigació UJI –
   Entity code: UJI-A2021-09
   Principal researchers: Sergio Gonell Gómez
   Dates: 2022-2023
   Total amount: 25.870€

9. Title: Exploring new lanthanide-doped metal halide perovskites as advanced optoelectronic materials (LANPER)
   Funding entity: UJI
   Modality: Pla Propi d'Investigació UJI –
   Entity code: UJI-B2021-50
   Principal researchers: Beatriz Julian López
   Dates: 2022-2024
   Total amount: 19.100 €

10. Title: Desarrollo de dispositivos fotoelectrocatalíticos avanzados para la conversión de CO_2 en productos químicos de alto valor añadido
    Acronym of the project: CO2VAL
    Funding entity: UJI
    Modality: Pla Propi d'Investigació UJI - Modalitat B) Grups consolidats investigador individuals
    Entity code: UJI-B2020-50
    Principal researchers: Sixto Giménez
    Dates: 2021-2023
    Total amount: 20.000,00€

11. Title: Decoupling manufacturing from application: 3D-printable smart antimicrobial devices with nanoparticles activated on demand
    Acronym of the project: Nano3D
    Funding entity: UJI
    Modality: Convocatoria de Proyectos de Plan de Promoción de la Investigación UJI

Entity code: UJI-B2020-44

Principal researchers: Victor Sans Sangorrín

Dates: 2021-2022

Total amount: 20.000,00€

12. Title: Grups d'Investigació actius en captació de recursos del Pla Estatal d'I+D+I, A

Funding entity: UJI

Modality: GAC UJI

Entity code: GACUJI/2022/19

Principal researcher: Eduardo Peris

Dates:2022

Total amount: 7380€

13. Title: Grups d'Investigació actius en captació de recursos del Pla Estatal d'I+D+I, A

Funding entity: UJI

Modality: GAC UJI

Entity code: GACUJI/2022/17

Principal researcher: Vicente Moliner

Dates:2022

Total amount: 7380€

14. Title: Grups d'Investigació actius en captació de recursos del Pla Estatal d'I+D+I, A

Funding entity: UJI

Modality: GAC UJI

Entity code: GACUJI/2022/13

Principal researcher: Jose Mata

Dates:2022

Total amount: 7380€

15. Title: Sistemas Organometálicos Supramoleculares. Aplicaciones en catálisis y reconocimiento molecular

Funding entity: UJI

Modality: Plan propio de la Investigación UJI

Entity code: UJI-B2020-01

Principal researchers: Eduardo Peris

Dates:2021-2023

Total amount: 31.888,00€

16. Title: Células Solares Orgánicas y Flexibles diseñadas para condiciones de baja iluminación

Acronym of the project: SOLARFLEX

Funding entity: UJI

Modality: Pla de Promoció de la Investigació UJI

Entity code: UJI-B2020-49

Principal researchers: Antonio Guerrero

Dates:2021-2023

Total amount:26.000,00€

17. Title: Desarrollo de perovskitas bidimensionales (2D) para la mejora del transporte electrónico en dispositivos fotovoltaicos de alta estabilidad

Acronym of the project: DEPE2D

Funding entity: UJI

Modality: Pla de Promoció de la Investigació UJI

Entity code: UJI-B2019-09

Principal researchers: Eva Mª Barea

Dates:2020-2022

Total amount:18.000,00€

18. Title: Desarrollo de rutas fotoelectrocatalíticas para la síntesis de productos de alto valor añadido

Acronym of the project: FOTOSIN

Funding entity: UJI

Modality: Pla Propi d'Investigació UJI

Entity code: UJI-B2019-20

Principal researchers: Elena Mas Marzá

Dates: 2020-2022

Total amount:24.000,00€

19. Title: Estudio computacional de la inhibición de proteínas que participan en el desarrollo de la enfermedad del cáncer. Diseño de nuevos fármacos.

Funding entity: UJI

Modality: Pla Propi d'Investigació UJI

Entity code: UJI-B2019-43

Principal researchers: María Teresa Roca Moliner

Dates: 2020-2022

Total amount:15.017,08€

Research Contracts

1. Title: Recuperación de residuos de tinta cerámica de inkjet, mediante métodos electroquímicos

   Funding entity: AICE-ASOCIACIÓN DE INVESTIGACIÓN DE LAS INDUSTRIAS CERÁMICAS

   Modality: Art. 60 LOSU

   Principal researchers: Francisco Fabregat-Santiago

   Dates: 2023-2024

   Total amount: 14.500 €

2. Title: PEROVSOL

   Funding entity: AIMPLAS-ASOCIACIÓN DE INVESTIGACIÓN DE MATERIALES PLÁSTICOS Y CONEXAS

   Modality: Art. 60 LOSU

   Principal researchers: Iván Mora Seró

   Dates: 2023-2024

   Total amount: 13455 €

3. Title: Formulación y Caracterización de Nanomateriales Polipeptídicos

   Funding entity: POLYPEPTIDE THERAPEUTIC SOLUTIONS, S.L.

   Modality: Art. 60 LOSU

   Principal researchers: Beatriu Escuder

   Dates: 2021-2023

   Total amount: 72000 €

4. Title: Avaluació de 5 composicions integrants del càtode de bateries d'ió liti+anàlisi de temps llarg (2 composicions)

   funding entity: ITC-AICE ASOCIACIÓN DE INVESTIGACIÓN DE LAS INDUSTRIAS CERÁMICAS

   Modality: Art. 60 LOSU

   Principal researchers: Germà Garcia Belmonte

Dates: 2022

Total amount: 5.040 €

5. Title: Diseño, desarrollo y validación de un prototipo de electrolizador de membrana aniónica español (ESPAEM)

Funding entity: H2B2 ELECTROLYSIS TECHNOLOGIES, S.L.

Modality: Art. 60 LOSU

Principal researchers: Sixto Gimenez/Beatriz Julian

Dates: 2023-2026

Total amount: 60.000 de €

6. Title: Servei tècnic d'assaig de bateries

funding entity: ITC-AICE ASOCIACIÓN DE INVESTIGACIÓN DE LAS INDUSTRIAS CERÁMICAS

Modality: Art. 60 LOSU

Principal researchers: Germà Garcia Belmonte/Elena Mas

Dates: 2023-2024

Total amount: 6.515 €

7. Title: Plan de trabajo SOLARFLEX

Funding entity: AIMPLAS-ASOCIACIÓN DE INVESTIGACIÓN DE MATERIALES PLÁSTICOS Y CONEXAS

Modality: Art. 60 LOSU

Principal researchers: Iván Mora Seró

Dates: 2022-2023

Total amount: 14.950 €

8. Title: Programa joves i ciència - estades al centre de recerca

Funding entity: FUNDACIÓ CATALUNYA LA PEDRERA

Modality: Art. 60 LOSU

Principal researchers: Sixto Gimenez Julia/Camilo Mesa

Dates: 2022-2024

Total amount: 3.500€

9. Title: Desarrollo de materiales polipeptídicos funcionales

Funding entity: POLYPEPTIDE THERAPEUTIC SOLUTIONS, S.L.

Modality: Art. 60 LOSU

Principal researchers: Beatriu Escuder

Dates: 2022-2023

Total amount: 30.000 €

10. Title: Contrato de evaluación tecnológica y opción de licencia de patente

Funding entity: KERABEN GRUPO, S.A.U. Y KERAFRIT, S.A.

Modality: Art. 60 LOSU

Principal researchers: Francisco Fabregat Santiago

Dates: 2021-2022

Total amount: 24.778 €

11. Title: Producción industrial de SYNGAS a partir de electroreducción de CO_2

Funding entity: Blueplasma Power SL

Modality: Art. 60 LOSU

Principal researchers: Francisco Fabregat-Santiago

Dates: 2021-2022

Total amount: 20.000,00€

12. Title: H2B2 ELECTROLYSIS TECHNOLOGIES

Funding entity: H2B2

Modality: Art. 60 LOSU

Principal researchers: Sixto Giménez

Dates:2020-2022

Total amount: 38.000 €