

ADVANCED NANOSCIENCE AND NANOTECHNOLOGY MASTER, YEAR 23/24
PROPOSALS FOR MASTER THESIS

No.	Institute/Department/Unit (group)	Website	Research line, topic	Supervisor, e-mail	Additional information
Catalan Institute of Nanoscience and Nanotechnology (ICN2)					
1	Ultrafast Dynamics in Nanoscale Systems	https://www.ultrafastdynamics.com/	Heat and charge dynamics in two-dimensional materials down to the monolayer	Klaas-Jan Tielrooij (klaas.tielrooij@icn2.cat)	
2	Phononic and Photonic Nanostructures	https://www.icn2-p2n.eu/	Phonon-phonon scattering in silicon classical and topological waveguides	Clivia M Sotomayor Torres (clivia.sotomayor@icn2.cat)	
3	Phononic and Photonic Nanostructures	https://www.icn2-p2n.eu/	Phonon-phonon scattering in TMDC topological edge waveguides and twisted layers	Clivia M Sotomayor Torres (clivia.sotomayor@icn2.cat)	
4	Physics and Engineering of Nanodevices (PEN)	http://nanodevices.icn2.cat/	Spin transport and thermal effects in van der Waals systems	Juan F. Sierra (juan.sierra@icn2.cat)	
5	Physics and Engineering of Nanodevices (PEN)	http://nanodevices.icn2.cat/	Proximity effects in van der Waals heterostructures	Sergio O. Valenzuela (SOV@icrea.cat)	
6	Atomic Manipulation and spectroscopy	http://ams.icn2.cat/	Atomically precise graphene nanoarchitectures for optoelectronic and sensing devices: synthesis of atomically precise graphene nanoarchitectures, characterization with STM and nanodevice fabrication	Jose Ramon Durán (joseramon.duran@icn2.cat) & Aitor Mugarza (aitor.mugarza@icn2.cat)	
7	Thermal Propertis of Nanoscale materials	https://icn2.cat/en/thermal-properties-of-n	Pyroelectric and electrocaloric measurements on ultrathin oxide membranes	Javier Rodríguez-Viejo (javier.rodriguez@uab.cat) & Tapas Bar (tapas.bar@icn2.cat)	
8	Thermal Propertis of Nanoscale materials	https://icn2.cat/en/thermal-properties-of-n	Heat capacity of 2D materials	Javier Rodríguez-Viejo (javier.rodriguez@uab.cat) & Aitor Lopeandia ((aitor.lopeandia@uab.cat))	
9	Thermal Propertis of Nanoscale materials	https://icn2.cat/en/thermal-properties-of-n	Organic solar cells based on ultra-stable glasses: towards stable and efficient devices	Javier Rodríguez-Viejo (javier.rodriguez@uab.cat) & Cristian Rodríguez (cristian.rodriguez@uab.cat)	
10	Thermal Propertis of Nanoscale materials	https://icn2.cat/en/thermal-properties-of-n	Thermal transport in oxide membranes	Aitor Lopeandia (aitor.lopeandia@uab.cat)	
11	Phononic and Photonic Nanostructures	https://www.icn2-p2n.eu/	Thermal transport in amorphous 2D materials	Marianna Sledzinska (marianna.sledzinska@icn2.cat) & Emigdio Chavez (emigdio.chavez@icn2.cat)	
12	Nanostructured Materials for Photovoltaic Energy Group	https://icn2.cat/en/nanostructured-materia	Perovskite solar cells: synthesis of novel materials and complete device applications	Monica Lira-Cantu (monica.lira@icn2.cat)	
13	Nanostructured Materials for Photovoltaic Energy Group	https://icn2.cat/en/nanostructured-materia	Flexible perovskite solar cells with ferroelectric oxides	Monica Lira-Cantu (monica.lira@icn2.cat) & Masoud Karimpour (masoud.karimpour@icn2.cat)	
14	Nanostructured Materials for Photovoltaic Energy Group	https://icn2.cat/en/nanostructured-materia	Pb-free halide perovskites for perovskite solar cells: double perovskites	Monica Lira-Cantu (monica.lira@icn2.cat) & Sonia Raga (sonia.raga@icn2.cat)	
15	Nanostructured Materials for Photovoltaic Energy Group	https://icn2.cat/en/nanostructured-materia	Perovskite solar cells with organic additives to enhance device stability	Monica Lira-Cantu (monica.lira@icn2.cat) & Fatemeh Ansari (fatemeh.ansari@icn2.cat)	
16	Nanobiosensors and Bioanalytical Applications	https://nanob2a.icn2.cat/	Development of nanophotonic sensors for infectious diseases diagnostics	Laura M. Lechuga (laura.lechuga@icn2.cat)	
17	Nanobiosensors and Bioanalytical Applications	https://nanob2a.icn2.cat/	Design and evaluation of multiplexed nanophotonic interferometric systems	Laura M. Lechuga (laura.lechuga@icn2.cat)	
18	Oxide Nanophysics	https://icn2.cat/en/oxide-nanophysics-grou	Avalanche dynamics on ferroelectric materials	Blai Casals (blai.casals@icn2.cat)	
19	Supramolecular NanoChemistry & Materials	www.nanoup.org	Porous metal-organic framework-based composites for pollutant removal and antimicrobial coatings	Daniel Maspoch (daniel.maspoch@icn2.cat)	
20	Nanostructured Functional Materials	www.nanosfun.com	Bioinspired materials for tissue regeneration (from artificial skin to neuro repair)	Salvio Suárez (salvio.suarez@icn2.cat)	
21	Nanostructured Functional Materials	www.nanosfun.com	Multifunctional mussel-inspired coatings for environment remediation	Salvio Suárez (salvio.suarez@icn2.cat)	
22	Nanostructured Functional Materials	www.nanosfun.com	Visible-light activated photochromic materials for smart windows applications	Claudio Roscini (claudio.roscini@icn2.cat)	
23	Nanostructured Functional Materials	www.nanosfun.com	Deciphering the relevance of melanin nanostructures on Parkinson disease	Daniel Ruiz-Molina (dani.ruiz@icn2.cat)	
24	Nanostructured Functional Materials	www.nanosfun.com	Visible-light activated photochromic materials for smart windows applications	Claudio Roscini (claudio.roscini@icn2.cat)	
25	Nanomedicine	www.nanomedicinelab.com	Design of graphene oxide nanosheets with biologically active molecules	Neus Lozano (neus.lozano@icn2.cat) & Kostas Kostarelos (kostas.kostarelos@icn2.cat)	
26	Nanobioelectronics and Biosensors Group	https://www.nanobiosensors.org/	Ink-jet printed nanosensors for heavy metals detection	Arben Merkoçi (arben.merkoci@icn2.cat) & Giulio Rosati (giulio.rosati@icn2.cat)	
27	Nanobioelectronics and Biosensors Group	https://www.nanobiosensors.org/	Development of new nanoinks printing protocols for sensing applications	Arben Merkoçi (arben.merkoci@icn2.cat) & Giulio Rosati (giulio.rosati@icn2.cat)	
28	Nanobioelectronics and Biosensors Group	https://www.nanobiosensors.org/	Graphene-based biosensors for diagnostics	Arben Merkoçi (arben.merkoci@icn2.cat)	
29	Novel Energy-Oriented Materials (ICN2)	http://neoenergy.cat/	Hybrid nanomaterials development for energy storage applications	Rosa María González-Gil (rosamaria.gonzalez@icn2.cat) & Pedro	
30	Advanced Electronic Materials and devices	http://www.aemd.icn2.cat/	2D materials based neuro-electronics	Jose A. Garrido (joseantonio.garrido@icn2.cat) & Elena del Corro (elena.delcorro@icn2.cat)	
31	Advanced Electronic Materials and devices	https://icn2.cat/en/advanced-electronic-ma	Development of 2D semiconductors in a semi-industrial environment for a new generation of microelectronic chips	Jose A. Garrido (joseantonio.garrido@icn2.cat) & Amador Pérez (amador.perez@icn2.cat)	
32	Advanced Electronic Materials and devices	https://icn2.cat/en/advanced-electronic-ma	FlexSwitch: development of MoS2 transistors for flexible electronics	Jose A. Garrido (joseantonio.garrido@icn2.cat) & Eduard Masvidal (eduard.masvidal@icn2.cat)	
33	Theory and Simulation	https://icn2.cat/en/theory-and-simulation-g	Molecular modeling applied to metallic/liquid interfaces: evaluation of the quality of different models to describe water-metal interctions	Pablo Ordejón (pablo.ordejon@icn2.cat) & Ernane de Freitas Martins (ernane.defreitas@icn2.cat)	
34	Theory and Simulation	https://icn2.cat/en/theory-and-simulation-g	Electronic and structural properties of VdW heterostructures from a density functional theory approach	Pablo Ordejón (pablo.ordejon@icn2.cat) & Roberta Farris (roberta.farris@icn2.cat)	
35	Theory and Simulation	https://icn2.cat/en/theory-and-simulation-g	Quantum atomistic simulations of nickelates thin films under strain	Miguel Pruneda (miguel.pruneda@icn2.cat) & Catalina Coll (catalina.coll@icn2.cat)	
36	Oxide Nanophysics Group & Nanomaterials Growth Unit	https://icn2.cat/en/oxide-nanophysics-grou	Epitaxial growth of ferroic thin-film solid solutions using advanced deposition methods (dual PLD or co-sputtering)	Gabriele De Luca (gabriele.deluca@icn2.cat) & José Santiso (jose.santiso@icn2.cat)	
37	Oxide Nanophysics Group & Nanomaterials Growth Unit	https://icn2.cat/en/oxide-nanophysics-grou	Development of novel epitaxial strain platform (with tunable cell parameters) for fluorite ferroics	Gabriele De Luca (gabriele.deluca@icn2.cat) & José Santiso (jose.santiso@icn2.cat)	
38	Oxide Nanophysics Group & Nanomaterials Growth Unit	https://icn2.cat/en/oxide-nanophysics-grou	Integration of HF02-related epitaxial fluorite ferroics onto Si	Gabriele De Luca (gabriele.deluca@icn2.cat) & José Santiso (jose.santiso@icn2.cat)	
39	Collaboration between Nanomaterials Growth Unit at ICN2 & Nanionics and Fuel Cells group at IREC	https://icn2.cat/en/nanomaterials-growth-u	Development of free-standing/flexible single crystal thin film oxide heterostructures based on fast ionic conducting materials for solid state ionic devices with close-to-room temperature operation	José Santiso (jose.santiso@icn2.cat) & Albert Tarancón (atarancon@irec.cat)	
40	Inorganic Nanoparticles	https://icn2.cat/en/inorganic-nanoparticles-	New nanoparticle-antioxidant adjuvants for inflammatory related diseases	Neus Bastús (neus.bastus@icn2.cat) & Victor Puentes (victor.puentes@icn2.cat)	
41	Inorganic Nanoparticles	https://icn2.cat/en/inorganic-nanoparticles-	Complex inorganic nanocrystals for artificial photosynthesis, and fuel cells	Neus Bastús (neus.bastus@icn2.cat) & Victor Puentes (victor.puentes@icn2.cat)	
42	Inorganic Nanoparticles	https://icn2.cat/en/inorganic-nanoparticles-	Nanoremediation: emerging-micropollutants and nanopharmaceuticals	Neus Bastús (neus.bastus@icn2.cat) & Victor Puentes (victor.puentes@icn2.cat)	
43	NanoElectrocatalysis and Sustainable Chemistry	https://icn2.cat/en/nanoelectrocatalysis-and	Nanomaterials as electrocatalysts for renewable energy conversion	Maria Escudero Escribano (maria.escudero@icn2.cat)	

44	NanoElectrocatalysis and Sustainable Chemistry	https://icn2.cat/en/nanoelectrocatalysis-and-sustainable-chemistry	Nanocharacterisation of electrocatalysts for renewable energy	María Escudero Escribano (maria.escudero@icn2.cat)	
45	Collaboration between Nanostructured Functional Materials group at ICN2 & Fernando Novio's Lab at Chemistry Department (UAB)	www.nanosfun.com	Nanostructured coordination polymers for photodynamic therapy applications	Fernando novio (fernando.novio@uab.cat) & Daniel Ruiz-Molina (dani.ruiz@icn2.cat)	
46	Collaboration between Nanostructured Functional Materials group at ICN2 & Fernando Novio's Lab at Chemistry Department (UAB)	www.nanosfun.com	Platinum prodrug-based coordination polymer nanoparticles for biomedical applications	Fernando novio (fernando.novio@uab.cat) & Daniel Ruiz-Molina (dani.ruiz@icn2.cat)	
Microelectronics Institute (IMB-CNM-CSIC)					
47	Micro NanoTools (MNTL)	http://mnt.imb-cnm-csic.es/index.php/	Optomechanical nanostructures for wireless cell stimulation	Borja Sepúlveda (borja.sepulveda@imb-cnm-csic.es)	
48	SPEED - Self Powered Engineered Devices	Under construction	Self-powered sensors development for enzymatic and molecular diagnostics	Susana Lieñana (susana.lieñana@imb-cnm-csic.es) & Neus Sabaté (neus.sabate@imb-cnm-csic.es)	
49	Radiation Detector Group	https://rdg.imb-cnm-csic.es/	Sensors for medical physics to improve patient treatments	Consuelo Guardiola (consuelo.guardiola@imb-cnm-csic.es)	
50	Radiation Detector Group	https://rdg.imb-cnm-csic.es/	Nanowires for nanodosimetry in radiobiology studies	Consuelo Guardiola (consuelo.guardiola@imb-cnm-csic.es)	
51	Biomedical Applications Group (GAB)	http://gab.imb-cnm-csic.es/	Implementation of ion-sensitive membranes on graphene FETs	Anton Guimerà (anton.guimera@csic.es) & Sergi Brosel (sergi.brosel@csic.es)	
52	Biomedical Applications Group (GAB)	http://gab.imb-cnm-csic.es/	Selective functionalization of graphene transistors for biomedical applications	Elisabet Prats (elisabet.prats@csic.es) & Sergi Brosel (sergi.brosel@csic.es)	
53	Biomedical Applications Group (GAB)	http://gab.imb-cnm-csic.es/	Surface modification of substrates with Self-assembled-Monolayers (SAMs) to study graphene interface	Elisabet Prats (elisabet.prats@csic.es) & Sergi Brosel (sergi.brosel@csic.es)	
54	Grupo de Microfabricación e integración de sensores y fuentes de energía (MESSI)	https://www.imb-cnm-csic.es/ca/recerca	Fabrication, assembly and characterization of micro-thermoelectric generators	Joaquín Santander (joaquin.santander@imb-cnm-csic.es)	
55	Grupo de Microfabricación e integración de sensores y fuentes de energía (MESSI)	https://www.imb-cnm-csic.es/ca/recerca	Heat exchanger packaging strategies for micro-thermoelectric generators: assembly and characterization	Mar Salleras (mar.salleras@imb-cnm-csic.es) & Joaquín Santander (joaquin.santander@imb-cnm-csic.es)	
56	Grupo de Microfabricación e integración de sensores y fuentes de energía (MESSI)	https://www.imb-cnm-csic.es/ca/recerca	Micro-thermoelectric generators based on block copolymer nanostructured thin films. Fabrication and characterization	Marta Fernández (marta.fernandez@imb-cnm-csic.es) & Llibert Abad (llibert.abad@imb-cnm-csic.es)	
57	Grupo de Microfabricación e integración de sensores y fuentes de energía (MESSI)	https://www.imb-cnm-csic.es/ca/recerca	Mg-silicide thin films: deposition, thermal processes and electrical and structural characterization for thermoelectric applications	Iñigo Martín (inigo.martin@imb-cnm-csic.es) & Llibert Abad (llibert.abad@imb-cnm-csic.es)	
58	Grupo de Microfabricación e integración de sensores y fuentes de energía (MESSI)	https://www.imb-cnm-csic.es/en/research	Memristor Devices for Artificial Intelligence Hardware	Mireia Bargalló González (mireia.bargallo.gonzalez@csic.es)	
59	PDS	Dra. Gemma Rius (csic.es)	Superconducting Thin Films and Devices for Quantum Computing and Sensing	Gemma Rius (gemma.rius@csic.es)	
60	Nanomems	http://nanomems.imb-cnm-csic.es/	Design and fabrication of semiconductor spin qubits for quantum computing	Francesc Pérez Murano (francesc.perez@csic.es)	
Materials Science Institute of Barcelona (ICMAB-CSIC)					
61	Solid State Chemistry / Electrochemistry and Electroactive materials	https://icmab.es/ssc/electrochemistry-and-electroactive-materials	Induced non contact electrochemistry	Nieves Casañ Pastor (nieves@icmab.es)	Influence of induced electrochemistry in energy storage
62	Smart Molecular Inorganic and Hyvud Materials / SusMoSys	https://icmab.es/amabilino-david-brian	Sustainable Energy Conversion and Storage Systems	David Brian Amabilino (amabilino@icmab.es)	The project involves nanostructuring composite chiral organic materials for use in photovoltaic energy conversion. Aspects of synthesis, processing and characterization will be important to the success of the research.
63	Molecular Nanoscience and Organic Materials / Molecular Materials for Electronic Devices (eMolMat)	https://molecularelectronics.icmab.es/	Molecular electronics, biosensors	Marta Mas-Torrent (mmas@icmab.es)	Organic electronic devices for the development of biosensors: Organic electronic devices have high potential in the field of biosensors for the development of label-free point-of-care tests. In this project, organic electrochemical transistors will be
64	Materials Science Institute of Barcelona (ICMAB-CSIC) / Solid State Chemistry / Supercritical fluids and functional materials (SFFM)	https://icmab.es/ssc	Green preparation of porous Graphene-based nanocomposites for energy production and storage	Concha Domino (conchi@icmab.es)	
65	Materials Science Institute of Barcelona (ICMAB-CSIC) / Solid State Chemistry / Supercritical fluids and functional materials (SFFM)	https://icmab.es/ssc	Synthesis of MOF-based composites for health & environmental remediation	Ana María López Periago (amlopez@icmab.es)	
66	Materials Science Institute of Barcelona (ICMAB-CSIC) / Theory and Simulation / Laboratory of Electronic Structure of Materials (LEEM)	https://departments.icmab.es/leem/Grupo/members/riccardo/index.html	Thermal transport in semiconducting nanowires	Ricardo Rurali (rrurali@icmab.es)	The goal of this Master project is providing a theoretical framework aimed at understanding and controlling the manipulation of heat flux within semiconducting nanowires. The student will perform numerical simulations in order to devise realistic approaches for the engineering of efficient thermoelectric materials, i.e. materials where a temperature difference creates an electric potential. Nanowires present some advantages over bulk materials to achieve this goal and proof-of-concepts of nanowire-
67	Materials Science Institute of Barcelona (ICMAB-CSIC) / Max Planck Partner Group "Dynamic Biomimetics for Cancer Immunotherapy" (Nanomol-Bio, NMMO department)	https://dynamic-biomimetics.icmab.es/	Nanostructured Hydrogels for Cancer Immunotherapies	Judith Guasch (jguasch@icmab.es)	
68	Materials Science Institute of Barcelona (ICMAB-CSIC) / Molecular Nanoscience and Organic Materials / Nanomol-Bio	https://molecularelectronics.icmab.es/	Molecular electronics, sensing, gold nanoparticles	Núria Crivillers (ncrivillers@icmab.es)	Preparation and functionalization of gold nanoparticles with electroactive and paramagnetic organic radicals. Characterization of the nanoparticles for their implementation as novel oxygen sensors. In the project we will develop a proof of concept and it is expected that these systems could be applied in biologically
69	Materials Science Institute of Barcelona (ICMAB)/Nanostructured Materials for Optoelectronics and Energy Harvesting (NANOPTO) / Nanostructures Materials for Optoelectronics and Energy	https://nanopto.icmab.es/	Photovoltaic Energy: Assessing Molecular Orientation in Organic Photovoltaics for Enhanced Solar Cell Performance	Sergi Riera-Galindo (sriera@icmab.es) & Mariano Campoy-Quiles (mcampoy@icmab.es)	
70	Materials Science Institute of Barcelona (ICMAB-CSIC) / Smart molecular inorganic and hybrid materials / Nanoparticles and nanocomposites	nn.icmab.es	Bacterial cellulose composites	anna Iaromaine (alaromaine@icmab.es)	Bacterial nanocellulose (BNC) is produced by bacteria strains like K. xylinus. BNC is obtained as highly pure cellulose and its properties such as high water holding capacity and porosity, tunable morphology, mechanical strength, and biocompatibility make it a unique material. As a result, BNC has attracted interest in the paper and food industry, biotechnology, photonics, and optoelectronics. The group of Nanoparticles and Nanocomposites we have experience in the biosynthesis of bacterial cellulose, and its modifications with a variety of compounds, ranging from nanoparticles to polymers.
71	Materials Science Institute of Barcelona (ICMAB-CSIC) / Magnetic Materials and Functional Oxides / FOXEM	https://icmab.es/	New ferroelectric materials for memory devices	Ignasi Fina (ifina@icmab.es) & Florencio Sánchez (fsanchez@icmab.es)	
72	Materials Science Institute of Barcelona (ICMAB-CSIC) / Nanostructured Materials / Laser processing research	http://icmab.es/laserprocessing	Laser fabrication of hybrid supercapacitor electrodes	Ángel Pérez (aperez@icmab.es)	Hybrid electrodes composed of carbon and metal oxide nanostructures will be synthesized and fully characterized for the development of high-performance supercapacitors.

73	Materials Science Institute of Barcelona (ICMAB-CSIC) / Nanostructured Materials for Optoelectronics and Energy Harvesting / Laser processing research group	http://icmab.es/laserprocessing	Laser synthesis of photocatalyzers for hydrogen generation through water splitting.	Eniko Gyorgy (egyorgy@icmab.es)	Photocatalytic powder composed of graphene derivatives and transition metal oxide nanostructures will be developed through intense laser radiation. Their structure, composition and functional properties will be characterized.
74	Materials Science Institute of Barcelona (ICMAB-CSIC) / Advanced Structural and Functional Crystallography / Crystallography&X-ray Diffraction	https://www.icmab.es/asfc/crystallography	Hydrogen production based on amorphous/crystalline catalysts	Elies Molins (elies.molins@icmab.es)	Project with UPC and Alba. https://www.researchgate.net/profile/Elies-Molins
75	Materials Science Institute of Barcelona (ICMAB-CSIC) / Advanced Structural and Functional Crystallography / Crystallography&X-ray Diffraction	https://www.icmab.es/asfc/crystallography	Synthesis and characterization of pharmaceutical cocrystals: new materials for a better life	Mónica Benito (mbenito@icmab.es)	https://www.researchgate.net/profile/Monica-Benito-4
76	Materials Science Institute of Barcelona (ICMAB-CSIC) / Magnetic Materials and Functional Oxides / Multifunctional Thin Films and Complex Structures (MULFOX)	https://mulfox.icmab.es/	Spintronic Materials and Devices	Can Onur Avci (cavci@icmab.es)	Investigation of novel spin transport phenomena at magnetic insulator/metal interfaces
77	Materials Science Institute of Barcelona (ICMAB-CSIC) / Functional Surfaces and Interfaces / Functional Nanomaterials and Surfaces (FunNanoSurf)	https://funnanosurf.icmab.es/	Research Line: RL4, Tuneable and Low Cost Molecular Electronics Topic: design of new semiconductors based on molecules called Curcuminoids and deposition studies toward the evaluation of their electronic capabilities	Núria Aliaga-Alcalde (naliaga@icmab.es), Daniel Herrera-Miranda (dherrera@icmab.es) & Rossella Zaffino (rzaffino@icmab.es)	Multidisciplinary project where the student will be able to perform chemistry, creating new molecular-based materials through well-established synthetic methods and learn about the deposition of such material substrates, including on field effect transistors (FETs) learning the fundamentals of device engineering towards the evaluation of the final molecular-FET assembly.
78	Materials Science Institute of Barcelona (ICMAB-CSIC) / Magnetic Materials and Functional Oxides / Multifunctional Oxides and Complex Structures (MULFOX)	https://mulfox.icmab.es/	Synthesis and characterization of two-dimensional topological materials	Gyanendra Singh (gsingh@icmab.es) & Gervasi Herranz (gherranz@icmab.cat)	
79	Materials Science Institute of Barcelona (ICMAB-CSIC) / Theory and simulation of materials / SoftMatter group	https://www.youtube.com/channel/UCkrTDh1VQw06o0dzPcF2NgA	Modelling and Simulation of nanomaterials based on biomolecules for biomedical applications	Jordi Farauo (jfarauo@icmab.es)	
80	Materials Science Institute of Barcelona (ICMAB-CSIC) / Magnetic Materials and Functional Oxides / Multifunctional Oxides and Complex Structures (MULFOX)	http://www.icmab.es/mulfox/	Orbital currents in early transition metals	Josep Fontcuberta (fontcuberta@icmab.cat)	
81	Materials Science Institute of Barcelona (ICMAB-CSIC) / Smart Molecular Inorganic and Hybrid Materials / Nanoparticles & Nanocomposites	https://nn.icmab.es/	Magnetic nanoparticles for beyond 5G devices	Marti Gich (mgich@icmab.es)	
82	Materials Science Institute of Barcelona (ICMAB-CSIC) / Smart Molecular Inorganic and Hybrid Materials / Nanoparticles & Nanocomposites	https://nn.icmab.es/	Growth and characterization of magnetic thin films for novel microwave assisted switching memories	Nico Dix (ndix@icmab.es)	
83	Materials Science Institute of Barcelona (ICMAB-CSIC) / Smart Molecular Inorganics and Hybrids Materials / Inorganic Material and Catalysis	https://icmab.es/giner-planas-jose-permanent-researchers	Synthesis of Highly Water Stable Carborane-MOFs for Energy and Environmental Applications	José Giner Planas (jginerplanas@icmab.es)	The Master work will seek to correlate structural features with physical properties and to design synthetic methods to prepare porous and functional Metal-Organic Frameworks (MOF) and to tune their structures and properties. Unprecedented carborane-based building blocks will be synthesized and combined with suitable transition metals to provide MOFs and then use a wide variety of techniques to study their structure and properties with
84	Materials Science Institute of Barcelona (ICMAB-CSIC) / Nanostructured Materials for Optoelectronics & Energy Harvesting (NANOPTO)	https://www.icrea.cat/Web/ScientificStaff/Goni-Alejandro-R-254	Understanding the temperature dependence of the bandgap of Cs _x MA _{1-x} Pb ₃ hybrid perovskites	Alejandro R. Goni (goni@icmab.es)	Lead halide perovskites, which are causing a paradigm shift in photovoltaics, exhibit an atypical temperature dependence of the fundamental gap. In general, the gap decreases in energy with decreasing temperature but for Cs-containing compounds the dependence is by far more complicated. Such a behavior is often ascribed to a strong electron-phonon renormalization of the gap, neglecting contributions from thermal expansion. However, high-pressure experiments performed on different hybrid perovskites yield a negative pressure coefficient for the gap, which speaks against the assumption of negligible thermal expansion effects. In the present work, the idea is to combine temperature and pressure-dependent photoluminescence experiments to disentangle the contributions of the thermal expansion and electron-phonon interaction to the temperature-induced gap renormalization of Cs _x MA _{1-x} Pb ₃ single crystals with low Cs content (x=0, 0.1 and 0.05). These experiments are particularly challenging, because they involve the application of high
85	Materials Science Institute of Barcelona (ICMAB-CSIC) / Functional Surfaces and Interfaces / Physical Chemistry of Surfaces and Interfaces	PHYSICAL CHEMISTRY OF SURFACES AND INTERFACES – ICMAB CSIC	PHYSICAL CHEMISTRY OF SURFACES AND INTERFACES – ICMAB CSIC: nanoscale mapping of the electrical properties of organic semiconductor films by scanning probe microscopy	Esther Barrena (e.barrena@icmab.es)	The technological progress achieved in the last years in the fabrication of devices based on organic semiconductors (OSCs) such as organic solar cells, light emitting diodes or field effect transistors has been possible thanks to advances in the structure-property relationships. The goal of this experimental work is to evaluate how local variations in the structure of the OSC influences the electrical transport at the level of single molecular
86	Materials Science Institute of Barcelona (ICMAB)/Nanostructured Materials for Optoelectronics and Energy Harvesting (NANOPTO) / Nanostructures Materials for Optoelectronics and Energy	https://nanopto.icmab.es/	Thermal Transport at the Nanoscale - "Thermal conductivity and mean free path determination in alpha-Ga ₂ O ₃ "	Sebastián Reparaz (jsreparaz@icmab.es)	Experimental Work / Low Temperature / Use of Several Lasers (Frequency-Domain Thermoreflectance)
87	Materials Science Institute of Barcelona (ICMAB-CSIC) / Solid State Chemistry / Nanointerfaces	https://icmab.es/ssc/nanointerfaces	Microbatteries for operando microscopy	Dino Tonti (dino@icmab.es)	
88	Materials Science Institute of Barcelona (ICMAB-CSIC) / Functional Surfaces and Interfaces / Physical Chemistry of Surfaces and Interfaces	https://surfaces.icmab.es/	Nanotechnology and Molecular Electronics	Daniel Martín (dmartin@icmab.es)	Atomic Force Microscopy technique to characterize polymorphs of thin organic layers and determine their transition temperatures
89	Materials Science Institute of Barcelona (ICMAB-CSIC) / Superconducting Materials and Large Scale Nanostructures	https://icmab.es/palau-masoliver-anna-permanent-researchers	Nano-Engineered Functional oxides for Quantum Devices	Anna Palau (palau@icmab.es)	
90	Materials Science Institute of Barcelona (ICMAB-CSIC) / Functional Surfaces and Interfaces / Physical Chemistry of Surfaces / Supercritical Fluids and Functional Materials	https://funnanosurf.icmab.es/ https://icmab.es/ssc/supercritical	Preparation of Biocompatible Metal-Organic Frameworks (Bio-MOFs) and their immobilization on surfaces using ecofriendly technologies	Arántzazu González-Campo (agonzalez@icmab.es) & Ana López Periago (alopez@icmab.es)	Preparation and characterisation of metal-organic materials and their immobilisation on surfaces using conventional methods and supercritical CO ₂ technology for their application as multifunctional biomaterials. The project brings together different scientific areas: nanotechnology, nanofabrication, surface chemistry, green synthesis and biomaterials indicating a high

91	Materials Science Institute of Barcelona (ICMAB-CSIC) / Molecular Nanoscience and Organic Materials / Nanomol-Bio	https://nanomol.icmab.es/	Luminescent Organic Radical Nanoparticles for Sensing and Bioimaging	Imma Ratera (iratera@icmab.es)	Preparation of Organic Nanoparticles (ONPs) doped with organic radicals looking for an enhancement of the Luminescence Quantum Yield and emission in the biological window (Red/NIR region) opening the way to new strategies in the fabrication of sensors (i.e. for nanothermometry) and also OLEDs with high Internal Quantum Efficiency. Structural and optoelectronic characterization of the ONPs will be addressed by appropriate spectroscopic (absorption, emission, DLS) and microscopic (SEM, TEM, confocal) techniques. Finally, we will develop a proof of concept applying the ONPs for in-vitro nanoscale thermometry
Biochemistry and Molecular Biology, UAB					
92	Grupo de Ingeniería de Proteínas y Nanomedicina	ibb.uab.cat/wp-content/themes/viral/modu	Design and validation of nanocarriers and nanomaterials for biomedical applications related to brain disease treatment and diagnosis.	Julia Lorenzo (julia.lorenzo@uab.cat)	
93	Grupo de Ingeniería de Proteínas y Nanomedicina		Nanotechnological development of new drug delivery systems based on engineered enzymes for their use in enzyme replacement therapies.	Julia Lorenzo (julia.lorenzo@uab.cat)	
94	Systems Biology of Infection Lab	https://sites.google.com/site/marctorrentbu	Use of liposome-encapsulated peptides as a new strategy to treat bacterial infections	Marc Torrent (marc.torrent@uab.cat)	
95	Lipid-based nanosized drug delivery systems	https://www.uab.cat/web/unitats-departam	Metallosurfactant based CO releasing systems for biomedical applications	Ramon Barnadas (ramon.barnadas@uab.cat)	
96	Human Rnases Involved in Host Defense	https://grupsderecerca.uab.cat/hrnases/en	Design of antimicrobial protein nanoconjugates to inhibit bacterial resistance in biofilms	Ester Boix (ester.boix@uab.cat)	
97	Protein Folding and Conformational Diseases	https://ibb.uab.cat/wp-content/themes	Bioengineering Nanomaterials to Trap and Neutralize SARS-CoV-2	Salvador Ventura (salvador.ventura@uab.cat)	
98	Protein Folding and Conformational Diseases	https://ibb.uab.cat/wp-content/themes	Bioengineering Nanomaterials to Develop Novel Immunotherapies	Salvador Ventura (salvador.ventura@uab.cat)	
99	Self-Organization In Biological Systems Lab	https://sites.google.com/view/degrootlab/	Bacteria biofilms as a living and therapeutic material	Natalia Sánchez de Groot (Natalia.sanchez@uab.cat)	In collaboration with ICN2
Chemical, biological and environmental engineering, UAB					
100	Chemical engineering department UAB - GICOM	www.gicom.cat	Nanomaterials synthesis for CO2 catalysis to methanol	Javier Moral (antoniojavier.moral@uab.cat)	
101	Chemical engineering department UAB - GICOM	www.gicom.cat	Interaction between nanomaterials and biosurfactants	Javier Moral (antoniojavier.moral@uab.cat) & Anna Carrasco (anna.carrasco@uab.cat)	
Physics, UAB					
102	Group of Smart Nanoengineered Materials, Nanomechanics and Nanomagnetism (Gnm3), Physics Department, UAB	https://isort-icrea.uab.cat/	Magnetic invisibility switching in thin films via magneto-ionics for data security	Nicolau López (nicolau.lopez@uab.cat), Jordi Sort (sort.jordi@gmail.com) & Enric Menéndez (enric.menendez@uab.cat)	There will be the possibility to perform a PhD Thesis on this topic under the ERC Advanced Grant project REMINDS (Voltage-Reconfigurable Magnetic Invisibility: A New Concept for Data
103	Group of Smart Nanoengineered Materials, Nanomechanics and Nanomagnetism (Gnm3), Physics Department, UAB	https://isort-icrea.uab.cat/	Metallic Fe-Mn nanofoams infiltrated with biodegradable polymer for temporary implant applications	Aleksandra Bartkowska (aleksandra.bartkowska@uab.cat) & Eva Pellicer (eva.pellicer@uab.cat)	
104	Group of thermal properties of nanoscale materials, GTNaM	https://grupsderecerca.uab.cat/gnam/es	Organic thin film glasses for solar cell applications	Cristian Rodríguez (cristian.rodriguez@uab.cat) & Marta González (marta.gonzalez@uab.cat)	
105	Group of thermal properties of nanoscale materials, GTNaM		Thermal transport and thermoelectricity in low dimensional materials	Aitor Lopeandia (aitor.lopeandia@uab.cat) & Javier Rodríguez (javier.rodriguez@uab.cat)	
106	Unitat Electromagnetisme (Sky-Bit project)	https://grupsderecerca.uab.cat/supercondu	Magnetoresistance with spatially varied polarization	Carles Navau (carles.navau@uab.cat)	
107	Unitat Electromagnetisme (Sky-Bit project)	https://grupsderecerca.uab.cat/supercondu	Antiferromagnetic skyrmions	Carles Navau (carles.navau@uab.cat)	
108	Group of Magnetic Nanomaterials, Department of Condensed Matter Physics & Institute of Nanoscience and Nanotechnology (IN2UB), University of Barcelona	https://magneticnanomaterialsub.wordpress	Development of phononic memories capable of allowing or inhibiting phonon transport by applying electric fields	Eric Langenberg (eric.langenberg@ub.edu)	The TFM will be carried out at the Department of Condensed Matter Physics of University of Barcelona. Upon finishing, there will be the possibility to perform a PhD Thesis on this topic.
Cellular Biology, Physiology and Immunology, UAB					
108	Cell Biology and Cell-Material Interactions (CBCMI)	Departament de Biologia Cel·lular, de Fisiolo	The in vitro biocompatibility of new materials and nanodevices for vascular and orthopaedic applications	Andreu Blanquer (andreu.blanquer@uab.cat) & Carme Nogués (carme.nogues@uab.cat)	
110	Cell Biology and Cell-Material Interactions (CBCMI)	Departament de Biologia Cel·lular, de Fisiolo	The effect of piezoelectric and electroactive nanomaterials on skin cells behaviour	Andreu Blanquer (andreu.blanquer@uab.cat) & Carme Nogués (carme.nogues@uab.cat)	
Chemistry, UAB					
111	Computational BioNanoCat	https://compbionanocat.wordpress.com/	Development of BCN-M, a computational tool for the generation of Wulff-like nanoparticle models	Xavier Solans Monfort (xavier.solans@uab.cat)	
112	Computational BioNanoCat		Modeling of electrocatalysis for sustainable energy conversion and storage using nanocatalysts	Xavier Solans Monfort (xavier.solans@uab.cat)	
113	Computational BioNanoCat		Development of force fields for metal oxide materials through machine learning techniques	Xavier Solans Monfort (xavier.solans@uab.cat)	
114	SelOxCat	https://seloxcat.com/	Surface-functionalized nanoparticles for light driven reactions	Xavier Sala (xavier.sala@uab.cat) & Laia Francàs Forcada (laia.francas@uab.cat)	
115	SelOxCat	https://seloxcat.com/	Nanomaterials for the production of liquid renewable fuels from CO2	Roger Bofill (roger.bofill@uab.cat) & Xavier Sala (xavier.sala@uab.cat)	
116	SelOxCat	https://seloxcat.com/	Emerging 2D inorganic nanomaterials for Green Energy conversion	Jordi García-Antón (jordi.garciaanton@uab.es) & José Muñoz (josemaria.munoz88@gmail.com)	
117	SelOxCat	https://seloxcat.com/	Preparation and testing of nanocatalysts for the production of solar fuels	Laia Francàs (laia.francas@uab.cat) & Eliana Sousa (souseliana@gmail.com)	
118	Integrated Analytical Microsystems. Microfluidics for (Bio)Chemical Sensing. Group of Sensors and Biosensors	https://gsbanalyticalmicrosystems.wordpres	Microreactors assisted synthesis of Carbon Dots as luminescent reagents for analytical chemistry. Tasks: development of microreactors and micro Total Analysis Systems (μ TAS) by CAD design and microstructuring using polymer and ceramics technology; synthesis and physical/chemical characterization of nanoparticles; environmental analytical application to heavy metals detection of polluted waters (using a spectrofluorimeter and μ TAS).	Mar Puyol Bosch (mariadelmar.puyol@uab.cat)	
119	CatSyNanoMat	CatSyNanoMat Group (uab.cat)	Nanostructured organic semiconductors for light driven chemical transformations	Carolina Gimbert (carolina.gimbert@uab.cat)	The master thesis will focus on the preparation of organic materials with semiconducting properties and the testing of their catalytic activity in photochemical reactions such as the transformation of water into hydrogen fuel
120	Superconducting Materials and Functional Nanoengineered Structures (ICMAB-CSIC)	http://departments.icmab.es/suman/	Synthesis of perovskite nanoparticles for doping YBCO superconductors	Ramón Yáñez (ramon.yanez@uab.cat)	In collaboration with ICMAB

121	Inorganic Chemistry	https://portalreerca.uab.cat/en/persons/10	Nanoparticles with catalytic activity like-enzyme for colorimetric paper-based assays	Adaris López (AdarisMaria.Lopez@uab.cat) & Josefina Pns (josefina.pons@uab.cat)	Metal Nanoparticles have been used as enzyme mimeting for sensing applications. It is known that the metal centre in metalloenzymes is the responsible of their catalytical properties. The property of some metal nanoparticles to show catalytic activity like-enzymes by changes in their oxidation states associated with colour changes when interact with the analyte or substrate is fruitful for colorimetric sensing applications. This master's project proposes to develop a very simple and low-cost colorimetric paper assay using metal nanoparticles and
Electronic Engineering, UAB					
122	Electronic Circuits and Systems Group (ECAS)	https://portalreerca.uab.cat/en/organisations/electronic-circuits-and-systems-group-ecas-grup-de-circuits-i-sis	Micro and Nanoelectromechanical Systems (M/NEMS). Topics: Resonators, Non-linearities, Synchronization, Sensors Ultrasound transducers based on piezoelectric materials (PMUTs). Topics: fingerprint, ultrasound image (medical image), airborne sensing	Núria Barniol (nuria.barniol@uab.cat), Arantxa Uranga (arantxa.uranga@uab.cat) & Francesc Torres (francesc.torres@uab.cat)	
123	REDEC: Reliability of Electron Device and Circuits	https://grupsderecerca.uab.cat/redec/es/biblio/author/180	Nanoscale characterization with AFM of materials for nanoelectronic applications. Characterization of CMOS nanoelectronic devices for security applications. Characterization of emerging nanoelectronic devices: graphene based devices, organic devices, devices for neuromorphic applications. Modeling.	Montserrat Nafria (montse.nafria@uab.cat)	
124	NANOCOMP		Simulation and modelling of nanoelectronic devices at THz frequencies	Xavier Cartoixa (xavier.cartoixa@uab.cat) & Xavier Oriols (xavier.oriols@uab.cat)	
Geology, UAB					
Biotechnology and Biomedicine Institute (IBB), UAB					