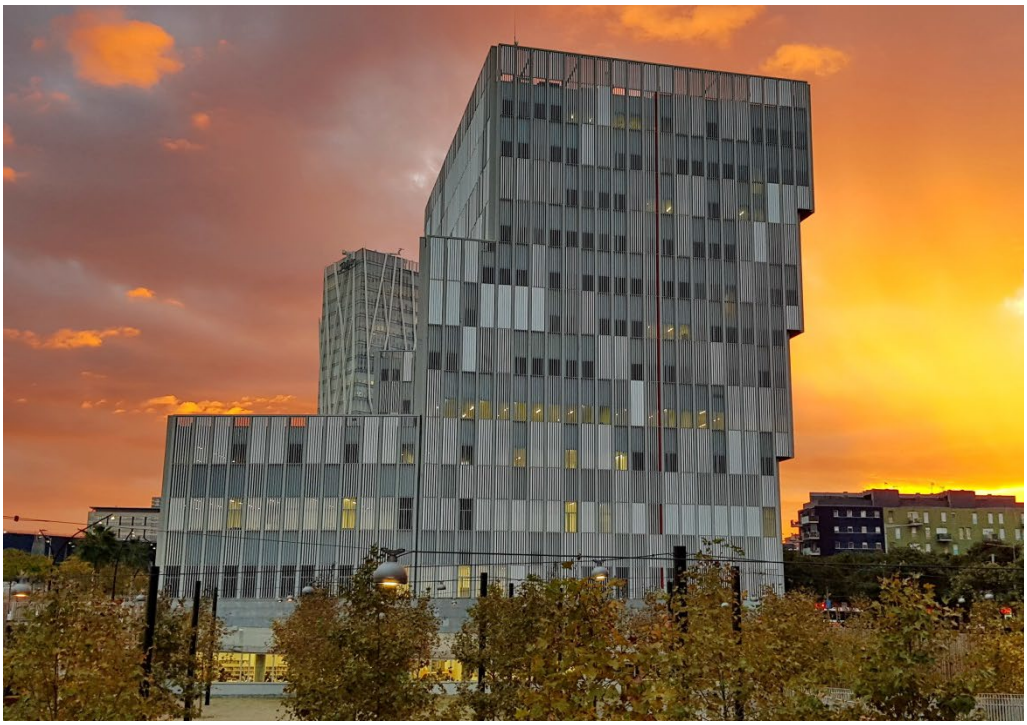


CAMPUS DIAGONAL -BESÒS

Research Newsletter

Winter 2022

FOREWORD

Campus Diagonal-Besòs

Connecting Science and Society

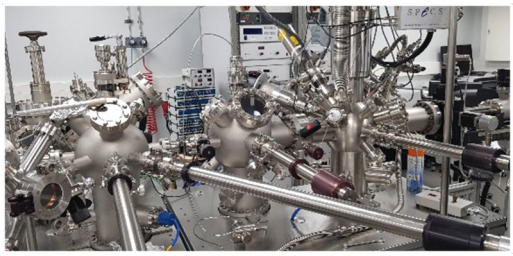
Science and technology undeniably surround us. And for us, privileged citizens of the so-called *First World*, this translates into access to every sort of mind-blowing gadgets (from smartphones to the last generation of laptops or 3D printers) and efficient medical services. In fact, our life expectancy exceeds in more than 10 years the Earth's average. And yet, we live in a society that feels disentangled from Science, and too often attracted by conspiracy theorists and supporters of unscientific facts (e.g., flat-Earth believers and anti-vaccine activists).

As researchers, we have the duty to pursue impact and excellence in our cutting-edge scientific projects (Pages 2-3). But we cannot (and should not) seclude ourselves in the ivory tower of knowledge. Instead, we should keep an eye on Society (to the same tax-payers that indirectly contribute to research funds).

To that end, ***Sciencescapes***, a new initiative, has been launched at the Campus Diagonal-Besòs (CDB), a collection of short clips that display the progress done in science and technology by CDB researchers in an accessible language and digestible format to reach Society (see Page 5, for details).

Welcome to the Campus Diagonal-Besòs, where future's science and technology is being forged.

IN THIS ISSUE

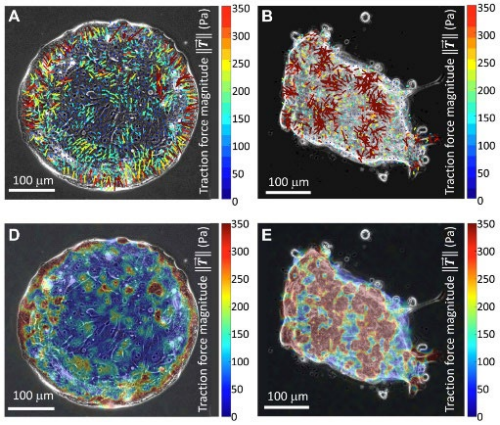


Research Highlights

A NEW INSIGHT ON CANCER PROGRESSION

A. Nyga, **J.J. Muñoz**, S. Dercksen, G. Fornabaio, M. Uroz, X. Trepat, B. Baum, H. Matthews & V. Conte, "Oncogenic RAS instructs morphological transformation of human epithelia via differential tissue mechanics", ***Science Advances*** 7, eabg6467 (2021) [*Q1, 3/138 in Multidisciplinary; IF=4.59*]

Epithelia are cell tissues that separate a domain with a specific function. This work, performed by researchers of the **Laboratory of Numerical Analysis (LaCàN)** and an international team of collaborators, shows that mutated epithelia with RAS oncogen (a gene that has the potential to cause cancer) alters the homeostatic mechanics, namely the contractility, frictional conditions with substrate, and evolution of spreading.



In vitro analysis shows that while epithelial area strongly decreases, contractility is increased in a non-linear manner, and with a high potential to induce cell extrusion, cell migration, and multilayered structures.

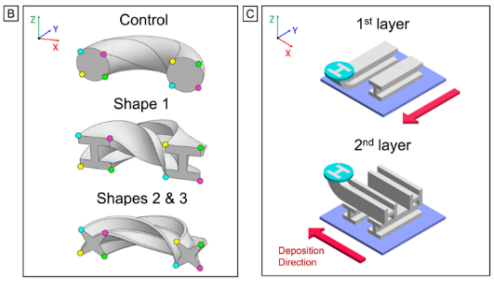
Numerical modeling demonstrates that concomitant to contractility increase at external boundary of monolayer, adhesion reduction has also a prominent role in the mechanical instabilities and morphological transformation.

3D PRINTING AND BONE REGENERATION

Y. Raymond, E. Thorel, M. Liversain, A. Riveiro, J. Pou & **M.P. Ginebra**, "3D printing non-cylindrical strands: Morphological and structural implications", ***Additive Manufacturing*** 46, 102129 (2021) [*Q1, 6/414 in Engineering (misc.); IF=11.3*]

3D-printing technologies have opened up unprecedented possibilities for the design of personalized bone implants, tailored to the patient's defect and taking into account the variation in bone anatomy. The 3D-printed structures act as scaffolds for bone ingrowth. Recent studies have shown that the scaffold architecture plays a key role in tissue regeneration. Specifically, concave pores are known to promote bone formation, contrary to 3D-printed scaffolds with convex-surface filaments.

In this work, researchers of the group of **Biomaterials, Bioengineering, and Tissue Engineering (BBT)** have developed 3D printed structures with complex filament section morphologies, using a modular nozzle and a self-setting ceramic ink. The fast elastic recovery of the ink allows obtaining good shape fidelity in the printed filaments, enabling the creation of concave surfaces and increasing the specific surface area compared to cylindrical strands, thus improving the bone regeneration potential.

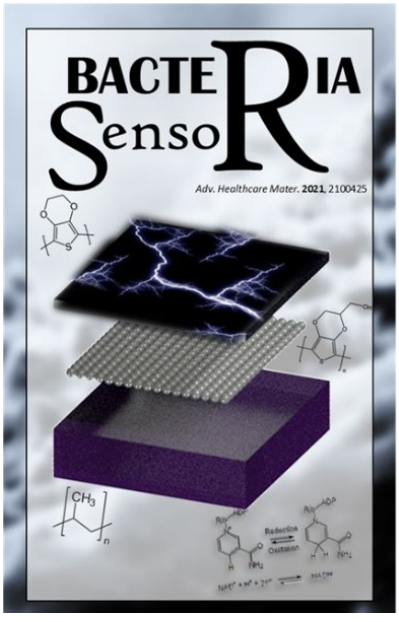


FIGHTING BACTERIAL GROWTH ON IMPLANTED MEDICAL DEVICES

B.G. Molina, L.J. del Valle, J. Casanovas, **S. Lanzalaco, M.M. Pérez-Madrigal**, P. Turon, **E. Armelin & C. Alemán**, "Plasma-Functionalized Isotactic Polypropylene Assembled with Conducting Polymers for Bacterial Quantification by NADH Sensing", ***Advanced Healthcare Materials*** 10, 2100425 (2021) [*Q1, 3/189 in Pharmaceutical Science; IF=11.1*]

All implantable medical devices are susceptible to biofilm formation and, as a consequence, device-associated infection. Although the most typical strategy to fight against bacteria colonization involves coating the device surface with an antiseptic agent, a promising alternative to minimize the risks is the early detection and treatment by monitoring bacteria growth on implanted devices.

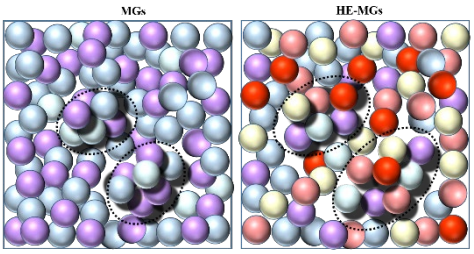
This work, conducted by researchers of the **IMEM-BRT** group (**Innovation in Materials and Molecular Engineering - Biomaterials for Regenerative Therapies**), presents a smart approach to integrate electrochemical sensors for detecting bacterial infections in biomedical implants made of non-absorbable polypropylene, such as surgical meshes and surgical sutures. The developed strategy involves a low-pressure oxygen plasma treatment and two in situ polymerization steps to coat the PP surface with a stable conducting polymer layer for quantitative detection of a specific bioanalyte through its electrocatalytic oxidation. This proposed approach would prevent worsening of the clinical condition of the patient and act before the patient exhibits symptoms typically associated with contamination of the device and subsequent formation of biofilm.



HIGH-ENTROPY METALLIC GLASSES

L.T. Zhang, **Y.J. Duan**, T. Wada, H. Kato, J.M. Pelletier, **D. Crespo, E. Pineda** & J.C. Qiao, "Dynamic mechanical relaxation behavior of $Zr_{35}Hf_{17.5}Ti_{5.5}Al_{12.5}Co_{7.5}Ni_{12}Cu_{10}$ high entropy bulk metallic glass", ***Journal of Materials Science & Technology*** 83, 248 (2021) [*Q1, 4/165 in Materials Science: Polymers and Plastics; IF=9.72*]

High-entropy alloys are metals containing five or more atomic species that occupy disordered positions in a crystalline, usually face-centered, cubic phase. The high entropy, coming from the multiple components, stabilizes the solid solution making possible homogeneous phases with improved resistance to corrosion or to extremely high temperatures.



Metallic glasses (MGs) are non-crystalline alloys, which become solid through vitrification instead of crystallization. This provides exotic properties and, similar to their relatives the ordinary window glasses, they can transit from liquid to solid without a discontinuous change of volume, thus allowing thermoplastic forming.

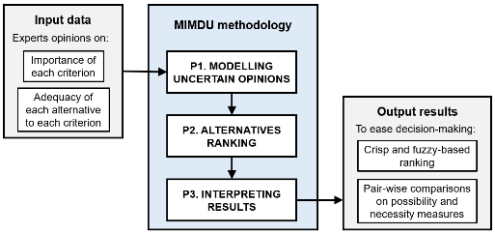
High-entropy metallic glasses (HE-MGs) combine these two qualities, i.e., they are solid, high-entropy phases with liquid structure. Researchers of the **Group of Characterization of Materials (GCM)**, in collaboration with Chinese, Japanese and French groups, characterized the viscoelastic behavior of these new type of materials.

NEW STRATEGIES IN DECISION-MAKING

M. Juanpera, **B. Domenech**, L. Ferrer-Martí, A. García-Villoria & **R. Pastor**, "Methodology for integrated multicriteria decision-making with uncertainty: extending the compromise ranking method for uncertain evaluation of alternatives", ***Fuzzy Sets and Systems*** 434, 135 (2022) [*Q1, 1/34 in Logic; IF=4.76*]

Multicriteria analysis offers a quantitative approach to ease decision-making, but uncertainty can arise since answers are usually expressed in linguistic terms that do not have a unique quantification and there might be a lack of confidence in responses.

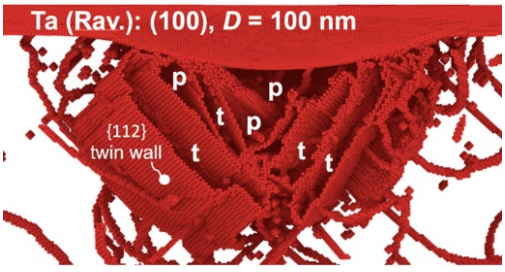
This work, developed by the research group on **Design and Optimisation of Processes and Services (DOPS)**, proposes a Methodology for Integrated Multicriteria Decision-making with Uncertainty (MIMDU), considering both factors of uncertainty. The validation shows that MIMDU obtains significant differences in ranking with and without uncertainty, and worse rankings are obtained for alternatives that are less confidently evaluated. A comparison with the standard fuzzy VIKOR shows MIMDU's major preciseness in modeling non-confident opinions and providing information to better assist decision-making.



RESPONSE OF METAL SURFACES WITH SMALL TIPS

J. Varillas, J. Očenášek, **J. Torner** & **J. Alcalá**, "Understanding imprint formation, plastic instabilities and hardness evolutions in FCC, BCC and HCP metal surfaces", ***Acta Materialia*** 217, 117122 (2021) [*Q1, 2/165 in Materials Science: Polymers and Plastics; IF=9.21*]

This work deals with the response of metal surfaces when pressed with small tips, creating tiny dents (or nanoimprints) whose size lies within the nanometer range. These dents can cause defects and can be used in the assessment of whether one material is harder than another at the nanoscale.



An international team, led by researchers from the **Surface Interaction in Bioengineering and Materials Science Research Group (InSup)**, used computer simulations to study these changes and compared them to real experiments. They found that there are many different processes involved in creating nanoimprints in metallic surfaces, which reflect on the fundamental plastic properties of the indented materials. They also found that the way the metal behaves at this tiny scale is different from how it behaves at a larger scale. This research could help scientists understand how materials behave under pressure as well as to the fundamental size-effects associated with these small-scale plastic deformation phenomena.

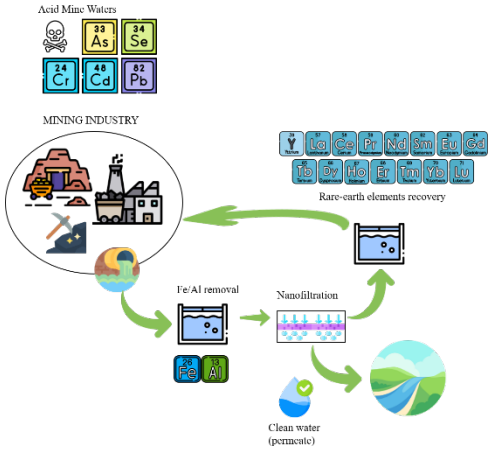
ARSENIC RECOVERY IN ACID MINE WATERS

J. Lopez, M. Reig, X. Vecino & J.L. Cortina, "Arsenic impact on the valorisation schemes of acidic mine waters of the Iberian Pyrite Belt: Integration of selective precipitation and spiral-wound nanofiltration processes", ***Journal of Hazardous Materials*** 403, 123886 (2021) [*Q1, 6/161 in Environmental Engineering; IF=12.5*]

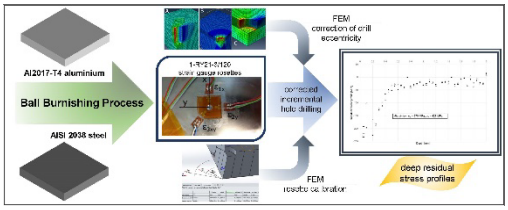
Nowadays, rare-earth elements recovery from acid mine waters is promoted. However, the presence of arsenic (As) and selenium (Se) may impact their recovery and their disposal due to environmental regulations. Nanofiltration provides rare-earth elements recovery, reduces nominal flow and removes hazardous species.

In this work, conducted by researchers from the **Resource Recovery and Environmental Management** group **(R2EM)**, Iberian Pyrite Belt acid mine waters with up to 10 mg of rare-earth elements per liter and 2 mg of arsenic per liter, were treated by nanofiltration. Firstly, acid mine waters were pre-treated to oxidize Fe(II) to Fe(II) and As(III) to As(V), promoting their removal.

Subsequently, nanofiltration pressure effect was studied, removing metals (>95%), whereas arsenic rejections ranged from 60 to 71%. Then, water recovery was evaluated by reproducing a 10-stage nanofiltration plant. Results showed that the proposed treatment could be an alternative for As and Se removal (70 µg/L and 0.5 µg/L permeate concentrations, respectively) to achieve mining discharge limits according to regulations.



RESEARCH GROUPS



TECNOFAB in a nutshell

TECNOFAB is a Generalitat de Catalunya's Consolidated Research Group (2017 SGR605) of the UPC. The group consists of 15 researchers, with a subset currently settled at the Campus Diagonal-Besòs (CDB): Toni Travieso, Jordi Llumà, and Ramón Jerez, and five in-training young researchers (also PhD students), Bàrbara Adrover, Eric Velázquez, Jordi Marqués, Walter Crupano and Alejandra Torres. In addition, some undergraduate and master students actively collaborate in the main research lines of the Group.

TECNOFAB conducts applied research in different manufacturing technologies, including the manufacturing processes themselves, methodologies, computer-aided systems, and on the integration of different technologies. The section of the group at CDB focuses its research activity on two fundamental lines: the characterization of the mechanical properties of materials for 3D printing and their applications, and the processes of superfinishing of metal surfaces, aided with ultrasonic vibrations, such as burnishing and machining.

Other research and technology transfer activities are also carried out in connection with the fields of material machinability, 3D printers, and fusion stir welding, among others.

TECNOFAB's RECENT RESEARCH HIGHLIGHT

Jerez-Mesa, R., Fargas, G., Roa, J. J., Llumà, J., & Travieso-Rodriguez, J.A., *Superficial effects of ball burnishing on trip steel AISI 301LN sheets,* **Metals** *11, 82* (2021)

TECNOFAB's RESEARCH FAST FACTS

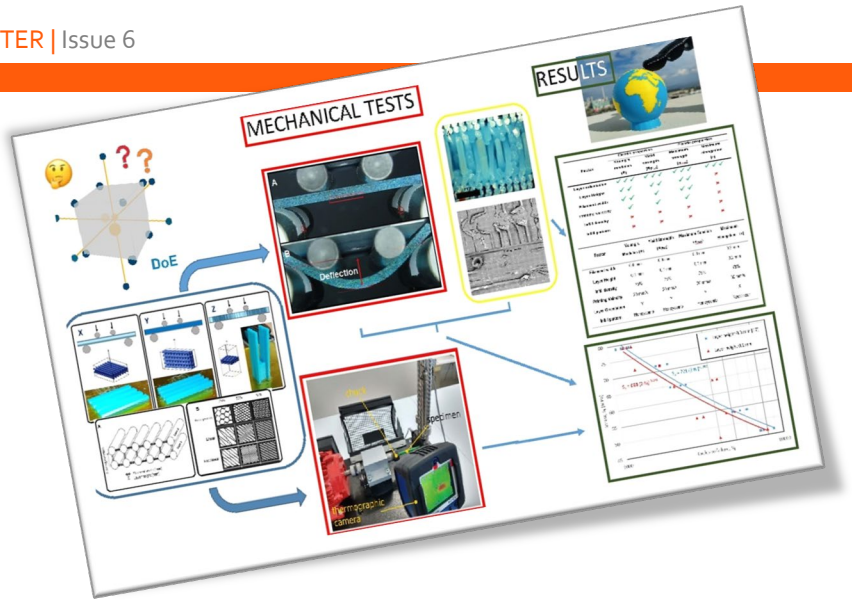
Source: https://futur.upc.edu/TECNOFAB

RESEARCH OUTPUTS

- 260 Research Papers in indexed journals
- 388 contributions to Conference Proceedings
- 144 Scientific Documents
- 76 Research and Text Books
- 21 PhD Theses
- 27 Patents and utility models

FUNDING & AWARDS

- 137 R&D&I international & national competitive projects
- 24 awards and special grants



RESEARCH GROUPS @ CDB

Manufacturing Technologies Reseach Group (TECNOFAB)

At present time, the main TECNOFAB research lines at CDB include:

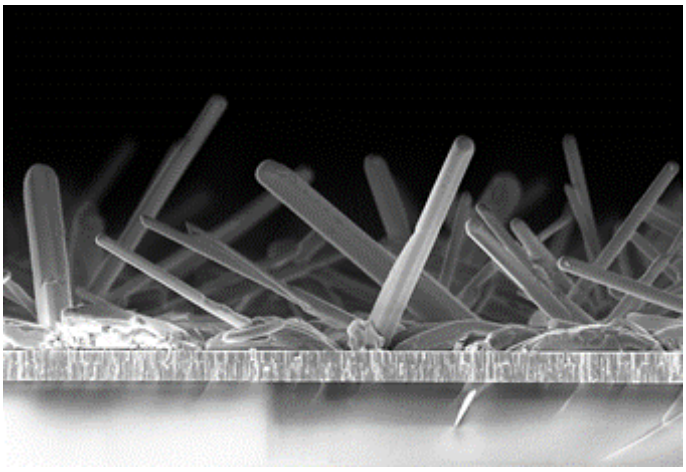
- Ultrasonic vibration-assisted ball burnishing applied to the finishing of parts in the aeronautical transport sector
- Ball-burnishing process applied to the finishing of injection molds and stamping dies parts
- Ultrasonic vibration-assisted cutting to improve surface integrity of revolution parts
- Characterization of mechanical properties of new elastomeric polymers and compounds used in 3D printing
- Manufacturing process of new polymers used in 3D printing, with biomedical applications such as prostheses, orthoses, insoles, organ printing, etc.
- Characterization of mechanical properties and improvements of the manufacturing process by SLA of resins
- Rapid manufacturing of protective system against COVID-19

FOR MORE INFORMATION

Dr. J. Antonio Travieso-Rodriguez,
antonio.travieso@upc.edu

WHAT/WHICH/HOW

WHAT is the Future of Photovoltaic Materials?

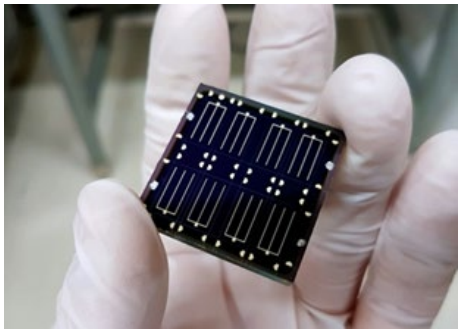


By Prof. Edgardo Saucedo (MNT-Solar, Dept. Electronic Engineering, EEBE-CDB)

Photovoltaic materials have the power to change our energy consumption model, contributing to stop the undeniable climate change. Currently, the technologies based on crystalline silicon are everywhere, but the photovoltaic market is continuously expanding in size and requiring new customized products. Then, what is the future of photovoltaic materials? In one hand, to go towards ultra-high efficient photovoltaic panels putting together **crystalline silicon** with emerging materials such as **hybrid perovskites** or **inorganic thin films** in a tandem concept, that combines in a device a bottom cell absorbing in the infrared with a top cell absorbing in the visible and ultraviolet.

This way, cheap solar panels with **efficiencies above 30%** have been already demonstrated! On the other hand, novel exotic materials based on earth-abundant and non-toxic elements, can give unprecedented opportunities for high-tech applications such as semi-transparent and transparent solar cells, flexible, lightweight, and wearable devices.

It's time to think out of the box for photovoltaic materials, and in the UPC Campus Diagonal-Besòs, our **Photovoltaic Group (MNT-Solar)** is developing a new class of van der Waals materials in the frame of the **SENSATE ERC-CoG project**, that can revolutionize our conception of these materials!



FURTHER READING ON PHOTOVOLTAIC MATERIALS

I. Caño, P. Vidal-Fuentes, **A. G. Medaille, Z. Jehl, A. Jiménez-Arguijo,** M. Guc, V. Izquierdo-Roca, C. Malerba, M. Valentini, **M. Jiménez-Guerra, M. Placidi, J. Puigdollers,** & **E. Saucedo,** "Challenges and improvement pathways to develop quasi-1D $(Sb_{1-x}Bi_x)_2Se_3$-based materials for optically tuneable photovoltaic applications. Towards chalcogenide narrow-bandgap devices", ***Solar Energy Materials and Solar Cells*** 251, 112150 (2023)

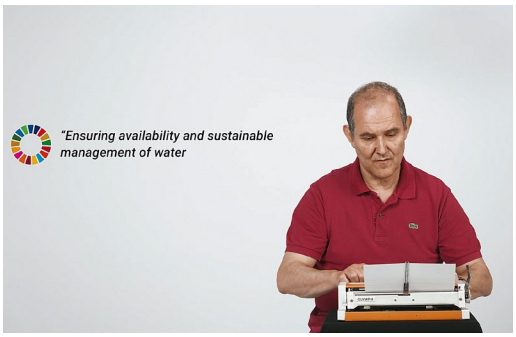
SCIENCESCAPES

Two new episodes of **Sciencescapes** have been released. This series of short videos is aimed at introducing current advances and challenges in science and technology at a reasonably basic level. Each video is hosted by a CDB researcher.

In episode 2, **Prof. Maria Pau Ginebra** (BBT) talks about new advances on bioengineering and biomaterials, addressing the question: **Can we teach cells how to regenerate tissues?**

https://youtu.be/8MowrCNY9dQ

In episode 3, **Prof. José Luis Cortina** (R2EM) argues about circular economy and recycling, through the question: **Are we ready to make the urban water cycle circular?**



https://youtu.be/soR8vKxkgIA

The series is coordinated by Prof. Jordi José (GAA).

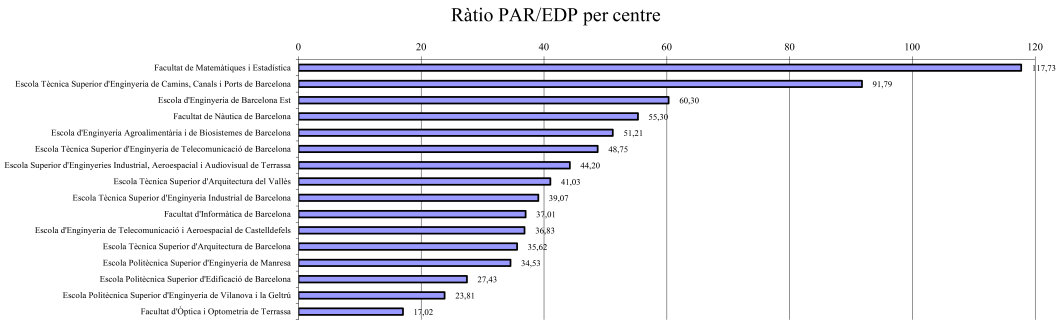
THE EEBE @ THE UPC RESEARCH RANKINGS

The last research report (2020) endorsed by the Vice-Rectorate for Science Policy of the Universitat Politècnica de Catalunya (UPC),

https://drac.upc.edu/info/ca/lavaluaciodel-curriculum-vitae/upc-punts-par/informe/informe-any-2020

has once more positioned the *Barcelona East School of Engineering* (**EEBE**) at the forefront of the 16 UPC Schools and Faculties in overall research outputs, with 9829 PAR. This represents an increase in research productivity of 9% with respect to 2019.

In terms of normalized ratios, the EEBE ranks third, with a noticeable average of 60.3 research points per researcher (PAR/EDP).



With regard to the pool of EEBE-based Research Groups, the ranking is led once again by **NEMEN** (Nanoengineering of Materials Applied to Energy), with 247 PAR/EDP (and 70539 PATT/EDP, which measures the normalized funding per researcher, in terms of research grants, contracts, patents...).

Four additional research groups based at EEBE (i.e., **e-PLASCOM, PROCOMAME, PSEP**, and **ANCORA**) have exceeded 100 PAR/EDP during 2019, despite the Covid pandemic.

AWARDS, GRANTS, & EVENTS

PhD Theses Defended

Enoc Martínez (Advisor: Joaquín del Río/Spartacus Gomáriz, SARTI), "Marine Sensor Interoperability Applied to in situ Ocean Sound Processing" (Jul/2021)

Henry Bory (Advisor: Herminio Martínez/Luis Vázquez, EPIC), "Contribución a la regulación de frecuencia por carga lastre de efecto resistivo en micro centrales hidroeléctricas autónomas" (Jul/2021)

Xiangwei Yu (Advisor: Montserrat Pérez/Moisès Graells, CEPIMA), "Optimization strategies for efficient dosage of H_2O_2 in Fenton and photo-Fenton processes" (Jul/2021)

Jorge A. Avila (Advisor: Alejandro H. Barbat/Luis G. Pujades/José R. González-Drigo, RMEE/GIES), "Análisis estructural probabilista orientado a evaluación del daño sísmico de edificios de mampostería no reforzada: aplicación a edificios aislados y agregados del distrito del ensanche de Barcelona" (Jul/2021)

Congcong Xing (Advisor: Jordi Llorca/Andreu Cabot, NEMEN), "TiO2-based heterostructure photocatalysts for enhanced hydrogen production" (Jul/2021)

Shabnam Morakabatchiankar (Advisor: Antonio Espuña/Moisès Graells, CEPIMA), "A contribution to Sustainable Management of Integrated Material/Energy networks in Process Industries" (Jul/2021)

Pablo Gamonal (Advisor: Maria L. Maspoch/Miguel A. Sanchez-Soto, e-PLASCOM), "Perceived quality characterization of micro-textured injection moulded components for automotive interior applications" (Jul/2021)

Cristian Olmo (Advisor: Jordi Puiggalí/Maria L. Franco, PSEP), "Ultrasound micromolding technique and real-time X-ray diffraction using synchrotron radiation. Applications to porous scaffolds for biomedical devices and study of thermal-induced transitions" (Jul/2021)

Joaquim Minguela (Advisor; Joan J. Roa/Carlos Mas-Moruno, CIEFMA), "Surface characterization and cell instructive properties of superficially modified dental zirconia" (Jul/2021)

Mohammad Kamrani (Advisor: Miguel A. Sanchez-Soto/Jonathan Cailloux, e-PLASCOM), "Preparation and characterization of reactive extrusion modified PLA/ABS blends and its foams" (Jul/2021)

Daniela Tovar-Vargas (Advisor: Marcos Anglada/Emilio Jimenez-Pique, CIEFMA), "Processing, microstructure and mechanical properties of ceria-stabilized zirconia-based ceramics co-doped with calcia and alumina" (Jul/2021)

Cyrus Amini (Advisor: Ramon Jerez-Mesa/Soran Hasanifard/Mohammad Zehsaz, TECNOFAB), "Finite Element & Experimental Analysis and Design optimization of process parameters Low Plastic Burnishing (LPB) effect on Friction Stir Welding of AA2024-T3 Aluminum Alloy Plate" (Sep/2021)

Rodrigo E. Alva (Advisor: Luis G. Pujades/José R. Gonzalez-Drigo, GIES), "Daño sísmico y propiedades modales en estructuras de edificación" (Sep/2021)

Vicenç Puig (Advisor: Mohamadou Nassourou/Joaquín Blesa, SAC), "Robust Economic Model Predictive Control of Smart Grids" (Sep/2021)

Santiago Raymond (Advisor: Maria Pau Ginebra, BBT), "Biomimetic Bone Grafts: from the lab to the clinic" (Sep/2021)

Jorge El Mariachet (Advisor: José Matas/Maria H. Martín, EPIC), "New Approach of Power Calculation for droop-controled inverters supplying nonlinear loads" (Sep/2021)

Jonathan F. Gebbia (Advisor: Michela Romanini/Josep L. Tamarit, GCM), "Propiedades vitreas emergentes en cristales moleculares" (Sep/2021)

Joanna M. Konka (Advisor: Maria Pau Ginebra/Montserrat Español, BBT), "3D-Printed Biomimetic Bone" (Oct/2021)

Agustín Corruchaga (Advisor: Adriana Palacios/Joaquim Casal, CERTEC), "Estudio de la evaporación de vertidos de disoluciones acuosas de amoníaco" (Oct/2021)

Mauro A. Cerra (Advisor: Marcelo da Silva/Gemma Fargas, CIEFMA), "Synthesis and characterization of oxides produced by high temperature corrosion on grade 300 and 350 maraging steels" (Oct/2021)

Diego Torres (Advisor: José A. Calero/José M. Manero/Elisa Rupérez de Gracia, BBT), "Desarrollo de un nuevo proceso basado en la inyección 3D de tintas con carga metálica para fabricar prótesis porosas de titanio bioactivas y con propiedades antibacterianas" (Oct/2021)

Ignasi Ferrer (Advisor: Raimon Jané, BIOSPIN), "Novel mHealth and multimodal physiological biomarkers for non-invasive monitoring and home healthcare of obstructive sleep apnea and COPD patients with comorbidities" (Oct/2021)

Paulina Tapia (Advisor: Mercè Granados/Mònica Reig/José Luis Cortina, R2EM), "Recovery of phenolic compounds from olive mill and winery wastes: evaluation of extraction and membrane processing technologies" (Nov/2021)

Ilaria Lucentini (Advisor: Jordi Llorca, NEMEN), "Producción de hidrógeno a partir de amoniaco en reactores de paredes catalíticas" (Nov/2021)

Diego A. Sandoval (Advisor: Urko Leturiondo/Francesc Pozo/Yolanda Vidal, CoDAlab), "Diagnosis of Low-Speed Bearings via Vibration-Based Entropy Indicators and Acoustic Emissions" (Nov/2011)

Guillem Ruano (Advisor: Carlos E. Alemán/Juan Torras, IMEM-BRT), "Conducting polymers and hybrid materials for technological applications" (Nov/2021)

Judith Medina (Advisor: Muriel Botey/Ramon Herrero, DONLL), "Smart control of light in edge-emitting lasers" (Nov/2011)

Marc Juanpera (Advisor: Laia Ferrer-Martí/Rafael Pastor, SCOM), "Methodology for the evaluation and design of projects considering multiple criteria and uncertainty. Application to the development of energy projects in rural areas" (Dec/2021)

Yago Herrera (Advisor: Glòria Sala/Jordi José, GAA), "Models of stellar winds from X-ray bursts" (Dec/2021)

Nubia I. Ponce de León (Advisor: José Rodellar/Leonardo Acho, CoDAlab), "Design of a Hysteresis Predictive Control Strategy with Engineering Application Cases" (Dec/2021)

New Research Grants

Circular Economy Deployment in the Process Industry (CEPI): Methods and tools for circular integration management, MICINN, PID2020-116051RB-I00 (2021-2024), PI: M. Graells, A. Espuña (CEPIMA)

SMARTGEL: Bioactive and multifunctional peptide-based hydrogels obtained by bottom-up self-assembly for advanced biomedical applications, MICINN, PID2020-114019RB-I00 (2021-2024), PI: C. Mas-Moruno (BBT)

White Dwarfs, Neutron Stars, and Black Holes. The Physics of Compact Stars, MICINN, PID2020-117252GB-I00 (2021-2024), PI: J. José, D. García-Senz (GAA)

Computational analysis of the impact of genetic and clinical risk on molecular signaling and electrophysiological dysfunction in atrial fibrillation, MICINN, PID2020-116927RB-C22 (2021-2024), PI: B. Echebarria, R. Benítez (ANCORA)

DISorder AS a Tool for EneRgy harvesting (DISASTER), MICINN, PID2020-117252GB-I00 (2021-2024), PI: J.L. Tamarit, E. Pineda (GCM)

A novel non-invasive respiratory pattern monitoring tool in patients with severe COVID-19 pneumonia, Fundació La Marató de TV3, 202122-30-31 (2021-2024), PI: A. Mas, B. Giraldo (BIOSPIN)

EEBE 3DDay- Feria participativa de impresión 3D. Motivando a los estudiantes de secundaria desde la universidad, MICINN, V-00342 (2021-2022), PI: J.A. Travieso (TECNOFAB)

Adhesion Driven Dynamics in contractile cellular systems, MICINN, PID2020-116141GB-I00 (2021-2025), PI: J.J. Muñoz (LaCàN)

PlasTHER: Therapeutical Applications of Cold Plasmas, COST Action, CA20114 (2021-2025), PI: C. Canal (BBT)

INNOTEC: Millora de la vida útil de les canonades dels sistemes de recollida pneumàtica de residus sòlids urbans, ACCIO (Generalitat de Catalunya), ACE034/21/000031 (2022- 2024), PI: C. Alemán, M. Ll. Maspoch, A. Mateo (IMEM-BRT, e-PLASCOM, CIEFMA)

Desarrollo de una nueva metodología basada en IA y CFD para una gestión y planificación dinamica del riesgo, MICINN, PID2020-114766RB-I00 (2021-2024), PI: E. Planas (CERTEC)

WUICOM-BCN Comunitats d'interfície resilients al foc de Barcelona, Ajuntament de Barcelona, 21S09274-001 (2021-2023), PI: E. Pastor (CERTEC)

Awards

Dr. Alexander Vallmitjana got an honorific mention for his thesis entitled *Multiscale Image Analysis of Calcium Dynamics in Cardiac Myocytes*, advised by Prof. R. Benitez (ANCORA), in the 7th Edition of the *Justiniano Casas Award on Research in Optical Imaging*.

Dr. J. M. Sadowska (BBT) got the *Julia Polak European Doctorate Award 2020*, by the European Society of Biomaterials.

Dr. M. Miguel Mateu (BBT) was awarded for the *Best Thesis Presentation*, by Institut de Recerca Sant Joan de Déu (IRSJD), at the *III Jornada Científica IRSJD*.

Dr. C. Labay (BBT) got the *Best Photo Award*, by the European Society of Biomaterials.

Dr. Núria Divins has obtained a Marie Sklodowska-Curie Fellowship.

Other Research News

A workshop on 'Catalysis and design of advanced reactors', organized by NEMEN, was held at the CDB on December 13-16, 2021

CAMPUS DIAGONAL-BESOS
Research Newsletter

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