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AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2020

Turno de acceso general

Nombre: GUARDIOLA SALMERON, CONSUELO
Referencia: RYC2020-030247-I
Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad
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Título:

Microdetectors for medical physics

Resumen de la Memoria:

My overall research career has been multidisciplinary due to my interest to develop micro devices in medical physics applications. Due to it, I have focused my postdoc elections in different types of research and clinical centres to complete and extend my skills in transversal areas in order to propose tools facing current clinical challenges.

During my PhD in micro technology, I was focused on developing of a new silicon radiation detector based on the innovative sensor 3D architecture. I developed the first 3D-ultrathin neutron detector capable of characterizing the field of secondary neutrons generated in a LINAC radiotherapy treatment (higher than 8MeV) with high rejection to gamma radiation.

At the end of my PhD, I got the renowned Ramón Areces grant to perform my first postdoctoral stay in the Radiation Oncology department of the University of Pennsylvania in US. It was crucial for understanding the clinical issues in-situ. There, I spent 2 years involved in radiobiology and microdosimetry experimental tests.

Later, I did a stay of 4 years in the Imagerie et Modélisation en Neurobiologie et Cancérologie laboratory (CNRS, France), first as postdoc and later as Marie-Curie IF fellow. It allowed me to build a multidisciplinary network in proton therapy, radiobiology and medical physics. There, I was involved in pre-clinical trials for new proton therapy approaches and became an expert in advance Monte Carlo simulations in Tier-0 computational grids.

In line with everything above, currently I am a senior researcher developing new micro devices based on those novel 3D-microdetectors above for further microdosimetry studies in hadron therapy. It is one of the main challenges in the field. I have been involved in this project since I was awarded with the Marie-Curie IF fellow in 2017. Based on this proposal, in 2019 I obtained the prestigious CNRS-Momentum grant (only 19 national grants were given in all France) to talented young scientists to imagine and carry out an innovative and ambitious project [sic]. I allowed me to consolidate my main research line with the additional support of a postdoc and an engineer. Additionally, this work have been recently included in the IAEA Technical Meeting on New Trends and Advances in Microdosimetry and its Applications. It addresses the current microdosimetry challenges as well as measurement protocols and reference sensors, being the one that I developed with my colleagues as one of the few as benchmark to be used at clinical conditions.

It is worth noting that I have not followed the conventional route/subject started in my PhD, which had likely generated more papers, etc. Instead, I assumed the risk of starting transversals fields in each postdoc, all related to medical physics although, which certainly created some productivity gaps between postdoc. Even though, my papers have got a high impact in the last years, e.g. more than 510 citations, duplicating the number of citations every 1.5 year. It is expected this tendency will continue in the incoming years. Thus, I consider that I have been able to envision my long-term career and evolve to a particular profile, i.e. extending my knowledge in medical physics from different multidisciplinary points of views. It has given to me a wider scientific background for carrying out challenging projects.

Resumen del Currículum Vitae:

I have 13 years of research experience in medical-physics in varied research groups (in EU&USA). Although initially my field of expertise was the characterization of silicon radiation detectors for radiotherapy, at the end of my PhD in Physics, I was interested in the new proton/hadron therapy advances. As a result, I faced the challenge of designing a novel architecture of radiation 3D-microdetectors to be used in these fields and, additionally, I got internal funding at my PhD centre to manufacture them. I obtained the extraordinary award of best Physics thesis in 2013.

To develop the measurements required with these prototypes, I was awarded with the renowned Spanish Ramón Areces grant to carry out a multidisciplinary study of cellular microdosimetry at the Roberts Proton Therapy Centre in the University of Pennsylvania (UPenn, USA). In UPenn, I carried out not only microdosimetry measurements in proton beams, but also was involving voluntarily to expand my research skills in several projects related to radiobiology and optical imaging. As a consequence, I co-founded 2 start-up companies with the UPenn transfer tech. department called MikroDose and SphereVis LLCs. One of them was awarded by the NIH (National Institute of Health, USA). These are examples of my enthusiasm as entrepreneur for transferring micro/nano-devices to cancer research needs. Thus I realized that,



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once that I had demonstrated that the microsensors worked properly in proton beams in UPenn, I had to try to use them clinical in-situ. The encouraging results sparked my interest in applying them to new approaches that are decisive to treat complex cancer cases like brain tumours. This led me to the IJCLab-CNRS laboratory (Univ. Paris-Saclay, France) that offers an ideal research environment and was working in a promising proton therapy approach. There, I strengthened my career through multiple collaborations with medical-physics research teams (Inst. Curie, Proton Therapy centre of Orsay, etc). Additionally, I got a highly competitive Marie Curie Individual fellowship in 2017 to start being independent researcher and, in 2019, a CNRS-Momentum grant that funds until 180k during 3 years and also allows me to contract a postdoc researcher to create my own research group. Both grants were/are focused in the development of innovative radiation sensors for advanced radiotherapy applications to optimize patient treatments.

All this work has resulted in 42 peer-review papers (40 in the Q1, first author in almost the half of them) and 19 proceedings, 5 patents as main inventor, and I have been PI of 4 projects. I have supervised 8 MSc students (5 in Univ. Pennsylvania and 3 in Univ. Paris-Saclay). I have been involved in 9 national and 1 European projects related to radiation detectors for radio/proton therapy, microdosimetry and radiobiology. I am also member of two work-groups of the European Radiation Dosimetry Group (EURADOS), namely Computational dosimetry and Radiation dosimetry in radiotherapy. Currently I am the head of my own group that consists in 1 postdoctoral researcher in physics, 1 biologist, and 2 master students in electronic engineer.



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Turno de acceso general

Nombre: MARCO RIUS, IRENE

Referencia: RYC2020-029099-I

Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad

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Título:

Bioengineering Molecular Imaging Tools for Precision Medicine

Resumen de la Memoria:

My current research line brings two emerging technologies together: organ-on-chips and metabolic imaging by DNP-MR. When developed the new technology will be applied (i) to the early diagnosis and staging of disease and (ii) detection of tissue responses to therapy, with the long term objective of identifying appropriate personalised therapies.

I majored in Physics at the Autonomous University of Barcelona (BSc, top 15% in class) and completed my first research project during my 4th-year study at Heidelberg University (Germany) on AGAUR and Erasmus scholarships. In 2009, I was awarded a la Caixa-DAAD fellowship to study for my MSc in Medical Physics at Heidelberg University (top 5% in class), and subsequently an excellence stipend from Heidelberg to perform the laboratory work of my MSc project at Harvard University (USA).

I have nine years of experience performing autonomous research in the field of NMR during my PhD at Cambridge (funded by a Marie Curie ITN fellowship), postdocs at University of California San Francisco and Cambridge, and in my current Junior Group Leader position at the Institute for Bioengineering of Catalonia. In this time I have worked at the highest level, conducting award winning research.

As an early-stage researcher I have been publishing for eight years, and in this time have produced 26 publications in both specialist journals as well as in general-audience, high-impact titles. Of these works I am first- author of nine, and corresponding author of four. These publications are all published in international journals of the first quartile (and 20 of them in journals of the first decile). I have published in the top journals of my research field (i.e. Magnetic Resonance in Medicine and NMR in Biomedicine) as well as in high-impact journals including Angewandte Chemie, Journal of the American Chemical Society (x2) and Nature Communications.

My research focuses on the development of molecular imaging technologies to study metabolic pathologies in human disease and evaluate response to treatment. I currently lead a team of six researchers.

The importance of this research has been recognized by oral presentations at seven international conferences, including ISMRM 2016 & 2017, ENC 2016 & 2017 and WMIC 2015. To help fund this research and conference travel, I have written successful applications for more than 10 research and travel grants, raising a total of over 3M (notably a European Commission FET Open grant as co-Coordinator in 2019).

Resumen del Currículum Vitae:

I majored in Physics at the Autonomous University of Barcelona (BSc, top 15% in class) and completed my first research project during my 4th-year study at Heidelberg University (Germany) on AGAUR and Erasmus scholarships. In 2009, I was awarded a la Caixa-DAAD fellowship to study for my MSc in Medical Physics at Heidelberg (top 5% in class), and subsequently an excellence stipend from Heidelberg to perform the laboratory work of my MSc project at Harvard University (USA). My assignment was to develop an accurate method to calculate x-ray doses for application in small-animal radiotherapy studies.

I returned to Europe to work for 6 months at the Cardiovascular Research Center (CSIC-ICCC) in Barcelona, then I started on a PhD at Cambridge University (UK), supervised by Prof. Brindle and funded by a Marie Curie ITN fellowship. I worked on the technique of Dynamic Nuclear Polarisation (DNP) using ¹³C MR to follow metabolism in tumour tissue non-invasively in real time. My work focused on ways to prolong the observation window of the DNP-MR signal. My PhD work resulted in 2 papers as main author, 5 papers as a co-author, 13 conference abstracts and 2 prizes for presented work. I developed collaborations with Southampton University (UK), Radboud University (Netherlands), Danmarks Tekniske Universitet (Denmark) and Weizmann Institute (Israel).

For my first postdoctoral position, I worked under Prof. Vigneron at University of California San Francisco (UCSF, USA, 2014-2016). My main achievement was to develop a DNP ¹³C MR scan protocol to detect the response of liver metastases to tumour therapy in clinical trials. I also collaborated with Prof. Merritt (Florida University, USA) to demonstrate that a new metabolic probe molecule, dihydroxyacetone, clearly differentiated between liver and kidney metabolic responses after an acute fructose dose to animals, a significant new tool to study liver diseases. I was awarded seed grant money from the Department of Radiology (UCSF, \$10K) to fund this project for 12 months under my own leadership. My research at UCSF resulted in 3 first-author papers, 8 co-author papers and 17 conference abstracts.



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In October 2016 I returned to Cambridge (Cancer Research UK Cambridge Institute) for my second postdoctoral position. I joined the ERC consolidator grant project ASSIMILES led by Dr. Comment. I developed new DNP-MR instrumentation and experimental protocols, aiming for on-demand, rapid repetitions of the DNP 13C MR protocol. My work at Cambridge resulted in 2 first-author papers, 3-coauthor papers, 5 conference abstracts and 1 patent application (pending).

In 2018, I started to lead my own independent research line at the Institute for Bioengineering of Catalonia (IBEC), for which I was awarded a Junior Leader la Caixa fellowship. In 2020 I obtained a European Commission FET Open Grant (which I lead and coordinate). In December 2020 I was appointed Junior Group Leader and lead the Molecular Imaging for Precision Medicine group at IBEC.



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Turno de acceso general

Nombre: POSTIGO REBOLLO, CRISTINA

Referencia: RYC2020-028901-I

Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad

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Título:

Water disinfection and innovative wastewater treatments to produce high-quality water and expand water reuse.

Resumen de la Memoria:

I am an internationally recognized water scientist. My endeavors have been focused on the protection of the environment, and in particular, of water quality. My research aims at i) improving and developing innovative water treatments to control and minimize emerging organic contaminants (EOCs) release into the water cycle and the formation of disinfection byproducts (DBPs) in reclaimed and drinking water, and ii) exploring wastewater-based epidemiology (WBE) to evaluate lifestyle, contaminant exposure, and health status of a given population. For this, I make use of advanced analytical techniques for wide-scope screening of chemicals in water and other matrices and participate in multidisciplinary studies with scientists from diverse disciplines.

During my Ph.D. (at the Institute for Environmental Assessment and Water Research, IDAEA-CSIC) I conducted novel research on the removal of illicit drugs in water using conventional and advanced treatment techniques (e.g., solar-assisted advanced oxidation processes), and the application of the WBE to evaluate drug use at the community level. After Ph.D. completion (2011) with Cum Laude and

Extraordinary Doctorate distinctions, I wrote and was awarded a Marie Curie International Outgoing Fellowship (2012) to do a 2-y post-doc stay with outstanding researchers in the field of water disinfection and DBPs at the U.S. Environmental Protection Agency. Upon my return to Spain (2014), during the third year of the Marie Curie grant, I applied the newly acquired knowledge and started a new line of research at the IDAEA-CSIC to lead multidisciplinary studies on water disinfection and DBP formation, supported by the Beatriu de Pinós (2015) and the ComFuturo (2018) post-doc programs. The DBP-related research has been focused on the study of the formation of iodinated and other emerging DBPs under various disinfection treatments and using different water sources. In parallel to this work, I have contributed to the development of innovative treatments (e.g., fungal bioremediation, algae ponds, constructed wetlands) to remove EOCs from water, and the establishment of the WBE as a valuable tool to explore population lifestyle and contaminant exposure. Most of my research objectives were achieved with the development of innovative tools based on the combination of high-resolution mass spectrometry and computational chemistry.

Since 2011, I have attracted > 0.5 M (>50% as lead principal investigator) in the framework of different competitive grant schemes and R&D contracts. During the 13 years of (inter)national scientific experience, I have acquired priceless laboratory, knowledge transfer (2 BSc, 3 MSc, and 2 Ph.D. students supervised, all of them completed with awards), and management skills. I have established an extensive research network, and have generated highly cited scientific contributions (H-index of 34, resulting from 62 peer-reviewed publications (95% in Q1 journals, first author in 19 and corresponding in 32), and 19 book chapters). I was appointed, by competitive call, as a guest researcher at the Swedish University of Agricultural Sciences until 2022. All these are excellent indicators of my capacity to lead scientific research that contributes to improving water quality, and the potential award of the Ramón y Cajal grant would contribute undoubtedly to achieve this goal.

Resumen del Currículum Vitae:

I obtained an M.Sc. in Applied Environmental Geosciences from the University of Eberhard Karls of Tübingen (Germany) in 2006 and a Ph.D. from the University of Barcelona. My Ph.D. thesis, carried out at the Institute for Environmental Assessment and Water Research of the Spanish National Research Council (IDAEA-CSIC) and supported by a FI grant of the Catalan Government, was granted with the Extraordinary Doctorate Award by the University of Barcelona. During my Ph.D. I did two short-term Ph.D. stays, one at the Plataforma Solar de Almería and another one at the University of Florence (Italy), both funded in competitive programs.

Upon my Ph.D. completion in 2011, I was awarded a post-doctoral Marie Curie International Outgoing Fellowship (IOF) that allowed me to work for two years at the U.S. Environmental Protection Agency in the field of drinking water disinfection by-products (DBPs). The one-year return phase of this grant allowed me to start a new line of research on water disinfection and DBPs at the IDAEA-CSIC. This line of research has got also the support of a Beatriu de Pinós (2015) and a ComFuturo (2018) post-doctoral fellowships. During this time, I established collaborations with relevant water industries in Catalonia (ATLL CGC, EMATSA, Aiguës de Blanes) and negotiated and conducted two research contracts with ATLL CGC valued in >50 k. In 2017 I was appointed in competitive call as a guest researcher at the Swedish University of Agricultural Sciences.

I have authored/coauthored 54 original works and 8 review articles in SCI journals (first author in 27% and corresponding in 42%), 19 book chapters, and one encyclopedia article. Jointly, these publications have been cited more than 3000 times, leading to an H-index of 32. The research has been presented in numerous conferences at the national and international levels (> 100, invited speaker in four of them) and in twelve seminars/courses (invited in all). Since 2006, I have been involved in research projects/contracts with a total budget of > 3,000,000. From this amount, I was directly responsible for attracting >500,000. My participation in 8 research projects at the national



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level (acting as PI in three of them) and 6 research projects at the EU/international level has contributed to expanding my contact network to reputed international and national scientists and institutions. My research has been disseminated in the media.

I am a lecturer on drinking water treatment and related topics in the M.Sc. program Environmental Engineering of the Polytechnic University of Catalonia since 2015. Besides training and counseling several visiting scientists, I have supervised BSc (2), MSc (3), and Ph.D. (2) students, and I am currently co-supervising two Ph.D. students.

I have experience as a member of scientific committees, organizer and chair of scientific sessions at international conferences (4), and member of evaluation panels (EU 2017 Water JPI Joint Call, the Science Fund of the Republic of Serbia, and the Scientific and Technological Research Fund of Argentina). I am a frequent reviewer of scientific manuscripts for leading journals in the SCI (150). I also have experience in editorial activities.

I am a member of research excellence networks for wastewater-based epidemiology application and the investigation of laccase enzymes for the degradation of pollutants.



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Turno de acceso general

Nombre: DIAZ VILARIÑO, LUCIA

Referencia: RYC2020-029193-I

Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad

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Título:

Geospatial intelligence for the indoor/outdoor seamless modelling towards multimodal mobility and universal accessibility

Resumen de la Memoria:

The research line developed by Dr. Díaz-Vilariño has been focused on the development of highly automated methods and algorithms for the generation of semantically rich and topologically coherent 3D models from geospatial data, with the ultimate purpose of integration with mobility, and accessibility tools and instruments. Efforts have been oriented to model the navigable space, both indoors and outdoors, from a triple perspective: geometrical, semantical, and topological. In this way, models are updated and realistic, enabling accurate analysis in terms of pedestrian mobility and accessibility.

Due to the multidisciplinary character of this research, the predoctoral career was mainly focused on the study of indoors, while the research was extended to outdoors in the postdoctoral period. The applicant has carried out 29 months in international research institutions, being the stays at the University of Twente, the Delft University of Technology and the Politecnico di Milano, crucial for the development of the research career.

Dr. Díaz-Vilariño serves as officer for the Working Group IV/5 Indoor/Outdoor Seamless Modelling, LBS and Mobility, from the International Society for Photogrammetry and Remote Sensing. She was member of the organizing committee, scientific committee, area chair and session chair of a large number of international scientific conferences of relevance in the field. Moreover, she has been co-principal investigator of a national project, two international scientific initiatives, and member of the management committee of a European COST Action. All these contributions have been carried out with independence from PhD supervisors, evidencing her leadership and her consolidation in the international research community.

Resumen del Currículum Vitae:

Publications

The applicant has co-authored a total of 83 articles indexed in Scopus, from which 46 are journal papers (43 T1 -93%, 31 Q1 -67%, 17 D1 -37%), 5 book chapters and 32 communications in peer-reviewed international conferences. From these documents, 29 are published in collaboration with international researchers (36 international co-authors) and 42 with independence from PhD supervisors. Her high impact on the research community is evidenced by her H-index 20 in Scopus with 1119 citations (178 average citations/year during 2015-20).

Participation in R&D projects

The applicant has participated in 20 R&D projects funded with more than 11.7 million through competitive public calls (4 from H2020 program, 9 national projects), and 19 in R&D contracts with companies funded with more than 400 mil. She has been co-principal investigator of two international non-UE Scientific Initiatives in collaboration with international universities, and co-principal investigator of a project funded by the Retos Colaboración 2016 program. Lucía has also been part of the management committee of several European COST Actions.

Scientific committees and conference organization

Lucía was elected secretary and co-chair of the ISPRS WG IV/5 Indoor/Outdoor Seamless Modelling, LBS and Mobility, for the periods 2016-18 and 2018-21, respectively. She was member of the organizing committee of ISPRS Indoor 3D Workshop 2017 (Wuhan, China) and ISPRS Indoor 3D 2019 (Enschede, The Netherlands), area chair for ISPRS XXIV Congress 2020 (Nice, France), and session chair for several international conferences. She also served as scientific committee for more than 16 international conferences, such as the 3DGeoInfo Conference, Ai3D conference, BIM & GIS Integration Workshop, Big Data & Urban Analytics Workshop, etc.

Research stays

The applicant has been visiting researcher at several international research institutions, spending a total of 39 months abroad and from which 29 months correspond to postdoctoral stays at the University of Minho (1 mo.), UWE Bristol (3 mos.), Politecnico di Milano (1 mo.), Delft University of Technology (12 mos.) and University of Porto (12 mos.).



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Grants & Awards

The applicant obtained several predoctoral and postdoctoral competitive grants (FPU, postdoctoral grant from Government of Galicia Mod. A & Mod. B) and was awarded with the Honorific mention in Research Ernesto Viéitez Cortizo 2020 by the RAGC, and with the Best Paper Award 2019 by the JCCE Editorial Board from the ASCE.

Teaching

The applicant has supervised 4 PhD students (1 concluded in 2019 with Cum Laude, Extraordinary Award, Abertis Award 2020, and 3 still on-going -2 from UVigo and 1 from Polimi-). She has also supervised 33 BSc theses and 3 MSc theses, including 1 at the Delft University of Technology.

Lucía has also lectured at international universities such as the Polimi (8h), the TUDelft (80h) and the UPorto (80h). From October 2020, Lucía holds the accreditation to 'Profesor Titular de Universidad' from ANECA.

Evaluation of R&D projects & articles

The applicant is member of the editorial board and reviewer for several journals. She has also served as research project evaluator for the National Center of Poland (2016), the European Union -call Industrial Sustainability-(2018), and for the Agencia Estatal de Investigación (2020).



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Nombre: ALTOMARE , CORRADO
Referencia: RYC2020-030197-I
Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad
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Título:

Composite modelling for Coastal Safety and Wave Energy

Resumen de la Memoria:

My research activity focuses on fundamental and applied research on wave-structure interaction (WSI) and SPH modelling. My contribution to the scientific community in the field of Coastal and Ocean Engineering is therefore twofold:

Experimental modelling of wave overtopping, post-overtopping and wave impacts processes for coastal safety assessment, focused on coastal defences and harbour breakwaters under new scenarios of sea level rise and increased storminess.

Enhancing the development of a novel meshless particle method to study free-surface problems with application to coastal and ocean engineering and wave energy, along with the implementation of optimized coupling techniques with wave propagation solvers, to attain a scalable coupled-model for real engineering cases.

Due to its meshless approach not requiring special surface tracking and inherently capable to capture nonlinearities, SPH has shown a great potential in providing solutions to Coastal Engineering problems. However, further research is still necessary to attain efficiency and robustness typical of more affirmed CFD technologies. In this respect, five so-called SPHERIC Grand Challenges (<http://spheric-sph.org/>) have been identified for a mature development of SPH method, including boundary conditions and coupling to other models. Along with SPH development, I plan to continue my research on wave overtopping, a major cause of flooding in coastal areas and a key aspect for any Coastal Engineering design, but still considered a significant deficiency in flood modelling of urban areas.

The main research blocks answering specific fundamental research questions (FRQ) and applied research questions (ARQ) are defined by specific scientific goals, which I have been and still am pursuing during my career. These goals are as follows:

to develop robust wall and inlet/outlet Open Boundary Conditions (OBCs) for complex geometries in SPH: OBCs are the most versatile solution to introduce any kind of transient or steady flow and forcing source for wave and current generation, but also potentially applicable to any kind of flow regimes and conditions (FRQ).

to implement a generic coupling methodology and ensure wide applicability to 3D and multi-scales problems (FRQ)

to assess the risk associated with extreme overtopping events by means of an accurate characterization of overtopping and post-overtopping flow characteristics in complex three-dimensional urban environments (ARQ).

to analyse the effects of flooding on typical multi-purposes coastal defences and relate them to horizontal and vertical evacuation policies for pilot areas in macro-meso and micro tidal regimes (ARQ).

to investigate the wave-energy transfer in SPH between short and long waves (FRQ).

to model the near-bottom boundary layer, including turbulence and coupling with phase resolving models for code acceleration (FRQ).

to employ data-driven mining techniques applied to WSI to derive new families of design formulas based on the parsimony principle (ARQ) and to identify the scaling laws for wave overtopping flows and related WSI phenomena (FRQ).

Resumen del Currículum Vitae:

My research combines experimental and numerical modelling applied to coastal and ocean engineering with the aim of:

1. Studying the interaction of sea waves and coastal structures under climate change scenarios investigating viable and resilient countermeasures.
2. Assessing the efficiency and survivability of wave energy converters (WECs) with power-take-off (PTO) systems.

In 2006, I obtained a MSc degree in Civil Engineering from the Politecnico di Bari (Italy). I completed my PhD in Engineering and Chemistry for Environmental Protection in 2010 and then worked for two years at Universitat Politècnica de Catalunya-BarcelonaTech (UPC), taking part in research and consultancy projects on coastal protection and renewable wave energy.

In 2012, I was hired as a postdoctoral researcher by the Ghent University for "detached" work at Flanders Hydraulics Research (FHR), in Belgium. I am currently a Marie Skłodowska-Curie Postdoctoral fellow at UPC (EU Horizon 2020 R&D program).

My track record includes 39 peer-reviewed articles in top-level international journals in the maritime field, 21 in Q1 journals. The number



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of coauthors of my works is 109 (based on Scopus). My articles have been cited 742 times (h-index = 14); two of these are the first and second most cited papers in Coastal Engineering (Elsevier) since 2017. I am co-author of 34 technical reports and 64 works presented in international conferences (16 indexed in Scopus).

I am co-editor of Infrastructures (MDPI), guest editor for Computational Particle Mechanics (Springer), JMSE (MDPI) and Hydrolink, and Associate Editor of Coastal and Offshore Engineering (specialty section of Frontiers in Built Environment).

I participated in 12 national and European R&D projects and 7 consulting projects (both at UPC and FHR), acting as IP in 6 of them and managing.

I participated in the organization of 5 international conferences/workshops and was part of 4 scientific committees.

I am core developer of the SPH-based DualSPHysics project released as open source code under LGPL license.

Due to the international relevance of my research, I have been appointed as Steering Committee member for the European design manual for overtopping of coastal defences (EurOtop, 2018) and one of the leaders of the Grand Challenge Coupling to other models defined by the SPHERIC community (<https://spheric-sph.org/grand-challenges>).



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Nombre: GARCIA DE MARINA PEINADO, HECTOR
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Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad
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Título:

Taming robotic swarms: collaborating by disagreeing

Resumen de la Memoria:

In 2012, I started my Ph.D. at the University of Groningen, the Netherlands (Top 1 university in the EU in Automation and Control according to Shanghai ranking 2019 and 2020). In 2016, my Ph.D. thesis in systems and control for the coordination of robot swarms was shortlisted (top 5) for the best thesis of the year awarded by the Dutch Institute on Systems and Control. From March 2016, I held a postdoctoral position for two years focused on aerial swarms at the École Nationale de l'Aviation Civile in Toulouse, France. From February 2018 until March 2020, I was appointed Assistant Professor with Tenure Track in the Unmanned Aerial Systems Center at the University of Southern Denmark.

Since April 2020, I secured 160k under the competitive funding program Atracción de Talento Modalidad 2 (finished in 2nd position) at the University Complutense of Madrid co-funded by Madrid's government. In the same year, I received the Seal of Excellence from the European Commission for my H2020-MSCA-IF-19 proposal with a score of 90.6. I also secured (as Co-IP, I-Link+, Spanish Ministry of Science) 24k to enhance my network with world-class groups.

The control of distributed robot swarms, i.e., without any centralized supervision, is one of the seven grand challenges in robotics as world-class researchers acknowledged in Science Robotics in 2018. For the first time, my research has shown rigorously that discrepancies in robots' local objectives and their sensors' imperfections can be both regarded as novel control inputs. Counterintuitively, I have shown that many cooperative tasks are efficiently done if robots disagree on how to cooperate or if they perceive their environment imperfectly. This approach can handle complex coordinated emergent behaviors with performance guarantees while considering robustly faulty sensors. My proposed paradigm shift 'collaborating by disagreeing' represents a massive leap towards full distributed robot swarms boosting our industry and assisting us in our challenges such as disaster management or environmental monitoring.

My research's independence, novelty, and rigor are backed by sole-authored papers in the top Control journals Automatica and IEEE Trans. on Automatic Control. The robotics applications are backed by publications in top journals like IEEE Trans. on Robotics and flagship robotics conferences such as ICRA and IROS. My results have been applied successfully in 5 international European projects, lead to the supervision of 15+ master's and bachelor's theses, and the current supervision of 1 Ph.D. student. Most of these results are freely available in the open-source project for autopilots Paparazzi, where I am a developer in Guidance Navigation and Control (GNC) algorithms since 2009.

World-class groups in multi-agent systems such as the Aerospace Control Laboratory at MIT in the USA, Automatic Control at Lund University in Sweden, or the Aerospace MAVLab at TU Delft in the Netherlands have invited me to visit them to know about my results in robot swarms.

Currently, my research focuses on: distributed GNC algorithms with formal guarantees for robot swarms; algebraic and graph theory to design more robust distributed swarms; and I am opening a new research line in data-driven control theory and game theory so that neighboring robots in a swarm can learn how to disagree to coordinate emergent behaviors.

Resumen del Currículum Vitae:

I received the engineering degree (5 years study) in electronics from the University Complutense of Madrid, Spain, in 2008, and the master's degree in control engineering from the University of Alcalá de Henares, Spain, in 2010. From 2008 until 2011, I was a research assistant in the European FP6 project Smartfuel at the University Complutense of Madrid. From 2011 until 2012, I was an aerospace control engineer at Deimos Space, Madrid, subcontracted by the European Space Agency. In 2012, I started my Ph.D. at the University of Groningen, the Netherlands (Top 1 university in the EU in Automation and Control according to Shanghai ranking 2019 and 2020). In 2016, my Ph.D. thesis in systems and control for the coordination of robot swarms was shortlisted (top 5) for the best thesis of the year awarded by the Dutch Institute on Systems and Control. From March 2016, I held a postdoctoral position for two years focused on aerial swarms at the École Nationale de l'Aviation Civile in Toulouse, France. From February 2018 until March 2020, I was appointed Assistant Professor with Tenure Track in the Unmanned Aerial Systems Center at the University of Southern Denmark.

Since April 2020, I secured 160k under the competitive funding program Atracción de Talento Modalidad 2 (finished in 2nd position) at



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the University Complutense of Madrid co-funded by Madrid's government. In the same year, I received the Seal of Excellence from the European Commission for my H2020-MSCA-IF-19 proposal with a score of 90.6. I also secured (as Co-IP, I-Link+, Spanish Ministry of Science) 24k to enhance my international network. This network has been built with world-class groups such as the Aerospace Control Laboratory at the Massachusetts Institute of Technology, USA (2 solo-authored D1 papers while visiting them in 2019), the Microaerial Vehicles Lab at the TU Delft, the Netherlands (1 first-author ICRA paper, visited in 2017), and the Department of Automatic Control at the University of Lund, Sweden (2 D1 publications in 2019). I remark that these groups invited me to introduce them to my Ph.D. thesis's novel techniques.

In swarm robotics, for the first time, I have rigorously shown that sensors imperfections and discrepancies between robots local objectives can be regarded as control inputs. This approach enables the control of complex coordinated emergent behaviors with formal guarantees while considering robustly faulty sensors. My results have been successfully applied in 5 international European projects, lead to the supervision of 15+ master/bachelor theses, and the current supervision of 1 PhD student. Most of these results are freely available in the open-source project for autopilots Paparazzi, where I am a developer in Guidance Navigation and Control algorithms since 2009.

Since 2015, my proposed paradigm shift in swarm robotics has been backed by 15 articles (14 of them as first or corresponding author) in the top journals of Control Theory and Robotics, including two sole-authored articles in IEEE Transactions on Automatic Control and Automatica. I have also published 28 (23 of them as first or corresponding author) articles in the most relevant peer-reviewed conferences in the areas of Control Theory and Robotics, including ICRA, IROS, and CDC. I have been cited 618 (414) times, according to Google Scholar (Scopus), with an h-index of 11 (10).



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Turno de acceso general

Nombre: BIJLSMA , LUBERTUS

Referencia: RYC2020-028936-I

Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad

Correo Electrónico: bijlsma@uji.es

Título:

Holistic and specific solutions for a comprehensive evaluation of organic compounds in the watercycle

Resumen de la Memoria:

The world of chemicals is very complex, with more than 100.000 substances in commercial use globally. Emissions of these substances into the aquatic environment pose an emerging risk to water quality and is of great concern. Moreover, practices such as drinking water disinfection and advance treatments for wastewater reuse, can also lead to the formation of new chemicals that pose a risk to ecosystems. Significant questions and huge gaps remain about their adverse human health impacts and societal costs. My research strived for increased knowledge about emerging contaminants and their efficient removal during water treatment processes. I developed new strategies for identification of known and previously unknown chemical risks with a focus on water quality and human health. I have initially focused on the use of analytical methodologies based on liquid chromatography and mass spectrometry for a comprehensive monitoring of contaminants (e.g. illicit drugs, pharmaceuticals and their metabolites) in different matrices including influent and effluent wastewater, surface water and drinking water. Where I have specialized in using the technical and creative improvements of analytical instrumentation and which has led to the detection of a growing number of emerging contaminants in the environment. Moreover, the innovative workflows designed have been applied to evaluate and improve conventional and alternative wastewater treatments.

My research has been strongly directed towards the use of wastewater-based epidemiology (WBE), also known as wastewater surveillance, a cutting-edge approach that uses wastewater produced by a society as a source of information and to assess community health-related aspects. This new and innovative research field has a strong cross-sectoral and multidisciplinary character and requires expertise and close collaboration between numerous disciplines: wastewater and environmental engineers, analytical chemists, pharmacologists, epidemiologists and social scientists. I developed an early warning system and new strategies for the identification of human biomarkers with emphasis on lifestyle biomarkers and strived for increased knowledge to support strategic and policy decision-making. Recently, I have been interested on assessing the rates of exposure to environmental or food contaminants (i.e. phthalate plasticizers and pesticides) employing the same approach. Furthermore, I have initiated a sampling campaign in close collaboration with engineers of local water treatment facilities to monitor wastewater for SARS-CoV2. My work has been crucial to the implementation and acceptance of this research discipline in the scientific community, as well as the general public and authorities both nationally and internationally.

Overall, my research has been devoted to serve the society and generate knowledge and tools that help improving the aquatic environment, but also to provide comprehensive information for community-wide health diagnostics via urban wastewater profiling for human biomarkers. I have published 61 peer-reviewed papers and 4 chapters together with 269 researchers from 25 countries. I have collaborated with a wide range of research teams from Europe, America and Oceania. Therefore, I consider my research trajectory as highly multidisciplinary and multicultural.

Resumen del Currículum Vitae:

My research strived to improve water treatment processes as well as to find solutions to different environmental challenges related to contaminants using the last advances in analytical chemistry. I developed new strategies to identify known and unknown chemicals and evaluate the performance of water treatments as well as contribute to the development of new technologies in this field. Also, I developed a cutting-edge approach called wastewater-based epidemiology (WBE) that uses wastewater produced by a society as a source of information and to assess community health-related aspects.

I carried out my PhD at University Jaume I, and focused on advancing towards a comprehensive understanding on the presence as well as the removal of illicit drugs and the possible formation of transformation products during water treatment. Moreover, as co-founder of an international network (SCORE), I got highly involved in the development, streamlining and improving WBE as novel scientific discipline. During this period, I published 16 articles, one of his papers got the SETAC Best Publication award 2012 and my international PhD (excellent cum laude) received the extraordinary award for PhD thesis by the UJI.

After my PhD studies, I was contracted as post-doc researcher by the Environmental and Public Health Analytical Chemistry research group of UJI and embedded in an EU-funded project NPS-Euronet. I performed international post-doc research stays at EAWAG (Switzerland); Univ. Antwerp (Belgium); Mario Negri Institute (Italy); Institute Marine Research (Norway) (1 year), and developed innovative workflows and modelling strategies for the discovery of WBE biomarkers as well as creative improvements for a comprehensive assessment of the overall efficiency of water treatment. Subsequently, I moved to Univ. of Amsterdam (1 year) to explore WBE as holistic tool to assess human exposure to pesticides.



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During this period, I officially collaborated in writing 4 projects/tenders as co-applicant that obtained funding (1,200,000) and was member of the management committee, progress committee and leader of 3 working packages. Currently, I am principal investigator of a project (50.000) that provide an early warning SARS-CoV-2 surveillance within the university s faculties and student residence.

In past six years, I evolved to an international recognized expert of the two research lines built. Despite a relatively short academic career to date (PhD obtained in November 2014), I achieved an exceptionally strong track record in conducting interdisciplinary research. Overall, my research has been published in 61 peer-reviewed papers and 4 book chapters (H-index: 31), and more than 60 conference communications (8 invited talks), which positions me within the top 2% of scientists of my main discipline. I have been lecturer in 3 international PhD courses and 3 national masters (Univ of Almería, Girona, Jaume I and Pais Vasco). I co-supervised 3 master theses and currently supervise 1 PhD student and 1 post-doc researcher. Furthermore, I was (i) member of the jury of 5 PhD dissertations (ii) member of scientific - organizing committees of 5 international conferences, (iii) chair of 2 plenary sessions (iv) guest-editor of Sci. Total Environ 2016. At present, I am member of the Associate Advisory Board of J. Mass Spectrom and the Editorial Board of Sci. Total Environ and vice-coordinator of the SCORE network consisting of 71 members, 98 WWTPs in 37 countries.



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Turno de acceso general

Nombre: MURILLO RODRIGUEZ, GONZALO

Referencia: RYC2020-030501-I

Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad

Correo Electrónico: gonzalo.murillo@csic.es

Título:

Energy harvesting and self-powered microdevices for IoT, wearables and cell biology

Resumen de la Memoria:

My research topics are related to energy harvesting materials and devices for biology and industrial applications. Since 2008, I carried out my PhD at the Universidad Autónoma de Barcelona (Spain), focused on vibration-based energy harvesting. During my PhD, I conducted numerous stays in international institutions, such as Nanotech DTU (Copenhagen, Denmark), CEA-Leti (Grenoble, France) and Georgia Institute of Technology (Atlanta, GA, USA), with prof. ZL Wang (top author in nanogenerators, piezotronics and tribotronics, h>200) where start working on ZnO nanogenerators. In 2011, obtaining my PhD Doctor Europeus" with the highest score cum laude. After this period, I studied several courses of entrepreneurship and business management (University to Business (U2B)" in 2012, Climate KIC and Clean Tech Camp in 2017). In 2012-2013, I was Research Fellow at the International Iberian Nanotechnology Laboratory (INL, Portugal), working intensively on cleanroom micro and nanofabrication. In 2013, I got a competitive JAE-DOC postdoctoral fellowship to go work at the Institute of Microelectronics of Barcelona (IMB-CNM, CSIC)

I was WP subleader of the 4 M FP7 project, SINERGY (2013-2016) and principal investigator of EnSO project, "Energy for Smart Systems" (H2020-ECSEL-2015-2-IA-two-stage, 2016-2019) (www.enso-ecsel.eu). In October 2016, MIT Technology Review chose me as one of the Innovators under 35 years of Spain from among more than 300 nominations. In November 2016, I was named "Most novel Innovator under 35 of Europe" between the last 50 finalists from all around Europe. After working a decade on that topic, part of my efforts on industrial energy harvesting were focused on knowledge transfer via patents or the creation of startups (WO2016207458A1 and EP1641.1241_20170119). I founded ENERGIOT DEVICES SL (www.energiot.com), a spin-off company to create autonomous devices for the Internet of Things. In 2019 and 2020, I have been selected as 100 Economic Leader for Tomorrow in Spain by Choiseul Institute. Also I published 10 high impact articles on the topic of triboelectric and piezoelectric nanogenerators and nanomaterials for energy harvesting (Adv. Func. Mat.: 15.62, Nano Energy: 15.54).

In addition, since 2013 I am pioneer in the use of nanogenerators for biological applications, especially interacting with living cells. In 2017, I demonstrated that nanogenerators modulate cell activity, without applying an additional external stimulation. My work entitled Electromechanical Nanogenerator Cell Interaction Modulates Cell Activity was published in Advanced Materials (IF: 25.80) in 2017, patented and highlighted in the main cover. After, several pioneer works has been published in Small (10.85), Biomaterials (10.27) and Nanoscale: (6.97), allowing me to obtain A score after interview at the StG 2019 call.

In 2019, I got the Fellowship Junior Leader La Caixa Retaining (2.3% of success rate, >480 excellence applicants) for the creation of new research group (www.nemesis-lab.es). Now I am managing my own R&D projects (SPARKDUST La Caixa, 294 k and Europa Excelencia, EUR2020-112082m 60k) supervising 3 PhD students, 3 undergraduate students) and developing my research lines focused on smart micro and nanosystems applied to energy harvesting and cell biology.

Resumen del Currículum Vitae:

Dr. Gonzalo Murillo received his Electronic Engineering Degree from the Universidad de Granada (Spain) in 2007 and his PhD at the Electronic Engineering Department of the Universitat Autònoma de Barcelona (UAB) in 2011. His PhD was focused on vibration-based energy harvesting.

After his PhD, he was a Research Fellow at the International Iberian Nanotechnology Laboratory (INL) in Portugal. There, he was working intensively on cleanroom processing for piezoelectric energy harvesting MEMS. In 2013, he joined the Microelectronic Institute of Barcelona (IMB-CNM, CSIC), where he is now principal investigator and Junior Leader thanks to a competitive grant from "la Caixa" Foundation for excellent junior researchers (294 k , 2.5% success ratio). In 2016, he was obtained the prestigious award as "Innovator under 35" and "Most Novel Innovator in Europe" by the MIT Technology Review (MIT TR35). Also, he was recipient of the Engega, Climate KIC and CleanTech Camp awards (with prizes of 35 k), and finalist of Premio Joven Relevante Circulo Ecuestre, EDF Pulse Awards and Premio Everis. In 2019 and 2020, he has been selected as Economic Leader of Tomorrow by Choiseul Institute, a prestigious nomination as future international leader.

In July 2017, he founded an awarded spin-off company called "Energiot Devices SL" with more than 135 k of investment. In 2018, he also co-founded a NPO, "Clubes de Ciencia España" to give access to high quality education and collaborative networks in Spain. He has published 40 documents (in Scopus, 22 Q1 - 7 Q2), 10 in high-impact factor (IF>10) and 3 Journal covers. His research obtained 149 /yea in 2020, showing an increase of >50% every year. He has participated in 32 research projects, leading 8 of them as PI (H2020 (442 k), La



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Caixa Retaining (293 K), Europa Excelencia (60 k), and others). Thus, he start establishing his own group at the IMB-CNM (CSIC) in 2019. He attended 60 international conferences (8 invited, 42 first/corresponding author). He has coordinated some European project proposals (StG, CoG, NMBP, FET with a total budget of >13 M), fulfilling all the Excellence criteria in StG call 2019 (A-score after interview) and the Seal of Excellence in the EIC Accelerator call 2020. He has supervised 17 Master and graduate students and 4 PhD students (3 of them still on-going). He has filled 2 patents: one European (PCT Phase) and one Spanish patent (with PCT), extended to Europe and EEUU and licensed for exploitation.

He has been visiting or staff for a total of 26 months in foreign organisms such as, Georgia Institute of Technology (Atlanta, GA, USA) with Prof. ZL Wang (h>200), INHA University (Korea), MINATEC (France), DTU-Nanotech (Denmark), Infineon (Germany) or INL (Portugal). He was assistant professor at the UAB and holds the accreditation for Associate professor (AQU Lector 2011 and Agregat 2017). He serves as Guest and Topic Editor and Editorial Board Member of several Journals. He has been Conference and Symposium Organizer and Chairman (EMRS, MNE, etc). Also, he has strongly worked on divulgation through interviews on several Spanish and international media, such as in newspapers (La Vanguardia, El Mundo, El Periodico, El Independiente, El Ideal, etc.), radio (RNE, Radio Exterior, Onda Cero, Canal Sur Radio and Radio Andalucía Information) and television (TVE "La 2", TeleSur and UNED TV).



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Turno de acceso general

Nombre: PUJADES GARNES, ESTANISLAO
Referencia: RYC2020-029225-I
Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad
Correo Electrónico: estanislao.pujades@gmail.com

Título:

Urban hydrogeology and geo-energies

Resumen de la Memoria:

Estanislao Pujades (EP) is geologist (Autonomous University of Barcelona - UAB, 2005), holds a postgraduate in hydrogeology (Technical University of Catalonia - UPC, 2006) and a PhD in Geotechnical Engineering (UPC, 2013). EP research lines are focused in urban hydrogeology, geo-energies and large scale groundwater modelling.

During his PhD at the Institute of Environmental Assessment and Water Research (IDAEA-CSIC), EP investigated the interaction between groundwater and underground constructions and proposed solutions to increase the efficiency of underground constructions reducing the environmental impacts and increasing the safety. He was also involved in projects to investigate the fate and evolution of emerging organic contaminants in urban aquifers.

Afterwards, at the University of Liège (ULg), he investigated the interaction between underground pumped storage hydropower and groundwater. He was the first researcher in evaluating the consequences of this interaction. He also participated in investigating the presence and behaviour of greenhouses gases in groundwater.

Later, EP was postdoctoral researcher at the Helmholtz Centre for Environmental Research (UFZ) in Germany. His research was focused on the development of global groundwater models that are needed to predict the groundwater response to the climate change effects.

Currently, he is postdoctoral researcher at IDAEA-CSIC where he holds two R+D+i projects (HEAT4WATER-BCN and Low-enthalpy geothermal energy systems in urban aquifers and in the context of abandoned mines). His investigation is focused on hydrogeological aspects of shallow geothermal energy for district heating.

During his career, EP has co-authored 39 indexed publications, 14 works in books, 61 conference works, 8 scientific reports, 33 technical reports, 3 divulgation articles, 4 not indexed publications and 33 conference abstracts. He has participated in 8 R+D+i projects, in which he has been PI of 3, and 19 research contracts. He has gained PhD (1) and postdoctoral (2) fellowships, obtained 3 research awards from national and international institutions, supervised 1 PhD and 1 MSc thesis and mentored 3 PhD and 1 BSc students.

Resumen del Currículum Vitae:

Estanislao Pujades (EP) is geologist (Autonomous University of Barcelona, 2005), holds a postgraduate in hydrogeology (Technical University of Catalonia - UPC, 2006) and a PhD in Geotechnical Engineering with speciality in groundwater hydrology (UPC, 2013). EP research lines are focused in urban hydrogeology, geo-energies and large scale groundwater modelling. In a short period of time (since 2011), EP has produced a high impact on the research community, specifically in the fields of urban hydrogeology, geo-energies and large scale groundwater modelling, which can be deduced from the high number of cites (1300 in Scholar). He has h-indexes of 19, 20 and 20 in WOS, Scopus and Scholar, respectively. He has co-authored 39 publications in SCI indexed journals, out of which 35 are in the first quartile (JCR or SJR). He has also co-authored up to 14 works published in books, 4 not indexed publications, 61 works presented in national and international conferences, 8 scientific reports, 33 technical reports and 3 divulgation articles. He has given 5 talks as invited speaker in events organized by the different institutions and in different countries.

He has received meaningful awards for his scientific output, including the Outstanding Early Career Scientists Award 2020 of the European Geosciences Union (EGU), the Award for Scientific Research into Urban Challenges in the City of Barcelona 2020 and the Prix des Amis de l'ULg of the University of Liège (ULg). Moreover, he obtained in 2010 a predoctoral fellowship (FI) from the Government of Catalonia, a postdoctoral fellowship (Marie Curie actions) in 2014 from the European Commission and the ULg and, in 2020, a Talent Attraction contract at the Institute of Environmental Assessment and Water Studies (IDAEA-CSIC) framed in Severo Ochoa actions.

He is member of the editorial board of 4 journals and leader guest editor of a special issue in the journal WATER. He is reviewer of more than 15 indexed journals and has participated as reviewer of 2 PhD theses (UPC and University of Bologna). In addition, he has successfully organized 3 sessions in the European Geosciences Union (EGU) general assembly (2018, 2019 and 2020). Finally, on November 2020, he has become a Peer Reviewer of the Science Fund of the Republic of Serbia.

The applicant has been principal investigator (IP) of 3 R+D+i projects, one funded by the European Commission and the other two, currently under development, funded by the Barcelona City Council and IDAEA-CSIC through Severo Ochoa actions. In total, he has participated in 8 competitive R+D+i projects funded by public entities (4 of them international) and in 19 research contracts funded by national (SACYR, OHL, ADIF) and international (metro Quito, SQM) companies.

EP has been supervisor of 1 PhD and 1 MSc thesis and he has mentored 3 PhD and 1 BSc students. He has also coordinated an investigation/discussion group at the Helmholtz Centre for Environmental Research (UFZ), made up by 8 researchers, focused on the coupling between hydrological and hydrogeological models at large scale.



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Regarding the international character of his activity, EP has 5 years and 5 months of international experience as he was enrolled in the ULg (Belgium) from December 2014 to October 2017, and at the Helmholtz Center for Environmental Research in Leipzig (Germany) from November 2017 to September 2020.



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Turno de acceso general

Nombre: POZO ANTONIO, JOSE SANTIAGO

Referencia: RYC2020-028902-I

Área Temática: Producción industrial, ingeniería civil e ingenierías para la sociedad

Correo Electrónico: iagopozoantonio@gmail.com

Título:

Diagnosis and intervention on materials from the tangible Cultural Heritage

Resumen de la Memoria:

My research line is devoted to the characterization of the materials used in tangible Cultural Heritage (CH), their deterioration and the different treatments to conserve them (cleaning, consolidation, etc). I made my PhD (2010-13) in Dpto. de Ing. Rec. Natu. y Medio Amb. (DIRNMA) at UVigo supervised by Prof. Rivas, renowned researcher. Although my PhD (Extraordinary PhD award) was focused on granite, different construction materials were included. Currently, working on the European project CAPuS, I am evaluating the deterioration forms of paints used in street art. My research is composed of 5 different sub-lines: 1) characterization of CH and its deterioration forms, 2) cleaning of deterioration forms, 3) consolidation and water repelling, 4) application of non-invasive techniques to CH and 5) green alternatives to mitigate deterioration (Preventive conservation). This line agrees with the SDG11- target 11.4 recognized by the UN Agenda 2030. My main contributions were the novel application of the isotopic analyses of sulphur and oxygen to characterize the gypsum in black crust on granite. Also, the novel application of laser ablation to clean coatings: biological colonization, graffiti and black crust, from granite. I performed 5 different postdoc stays in international institutions through competitive calls. I was selected as a postdoctoral researcher in Getty -USA (with 30 other candidates, from more than 1000). There, for 12 months, I participated in the international project MOSAIKON seeking for a sustainable solution to conserve Mediterranean mosaics. Afterwards, in University Coruña (8 months), I started to apply the non-invasive hyperspectral imaging to assess the cleaning effectiveness. Then, I was awarded with a postdoc contract by the Mod. A-Xunta de Galicia for 2015-18. I was leading a group composed of researchers of Vigo and Coruña universities, Instituto Superior Tecnico (IST, Lisbon) and Foundation for Research and Technology (FORTH, Crete). In IST (12 months), I investigated the genesis of black crust on granite. In FORTH (12 months), I optimized the laser cleaning of different deterioration forms using a dual wavelength laser methodology. In a second project financed by a European COST (Horizon2020) and performed in Nottingham Trent University, I investigated non-invasively tempera paints. In May 2017, I went back to DIRNMA. In 2018, I was awarded with two postdoc fellowships: a Mod.B -Xunta and a Juan de la Cierva-incorp. (JC, 1st in civil engineering and architecture field with the score:96/100) at DIRMA. During my JC, I am involved in four R+D+I projects funded by EU and Spanish government (KA-107 (26,000) as coordinator, CAPuS (990,000), 3D laser texturing (99,000) and Electrocinetic project (200,000), as researcher). In 2019, I applied to Ramón y Cajal fellowship, being placed in the 1st position of the reserve list in civil engineering field (90.2/100). In 2020 I was selected as Distinguished Research of UVigo in a competitive call. I am editor of Coatings (Q2) and Minerals (Q2). I belong to the civil engineering-commission of experts of the State Investigation Agency. I supervised 1 PhD thesis defended on 2020 and I am supervising 3 more.

Resumen del Currículum Vitae:

72 papers in JCR journals (48 in Q1 journals, 32 without my PhD supervisors, 22 as supervisor and 26 articles with researchers of foreign institutions). Also, 5 papers under revision. Regarding the number of citations, my co-authored papers have received 647 citations (in 357 different publications, 71.8 citation/year). My h-index is 14 following SCOPUS.

6 books related to mining engineering, minerals, geology and water and 3 books as collaborator related with social-ethical issues.

20 book chapters (12 related with research and 8 with teaching innovation).

88 national and international conference contributions:35 oral presentations, 43 posters and 10 oral presentations invited by different relevant scientific institutions.

I am a regular reviewer of JCR journals (mainly Q1 journals). I am an associate editor for EJARS and editor for the journals Coatings and Minerals (Q2)

13 R+D+I projects (5 international, 8 national), being the main researcher of three of them; one financed by the European union through Call 2018 Higher education student and staff mobility between Programme and Partner Countries (KA107), one financed for Xunta de Galicia and the other one for European actions. I also have participated in 10 R+D+I projects with corporations. Regarding the international projects, the current one is financed by Key Action 2 (Knowledge Alliances) of the Erasmus+ Programme. After my PhD, 38 months in different recognized international research institutions (USA, Portugal, UK and Greece) and 47 months in centers different to the university where I made the PhD. I have gained six postdoctoral positions, prevailing over other candidates (international and national). Currently, I am financed by a Juan de la Cierva-incorporación contract with the UVIGO. I was awarded with the first position in the civil engineering and architecture field in the call 2017. In 2019, I applied to Ramón y Cajal fellowship, being placed in the first position of the reserve list in the architecture and civil engineering field (90.2/100).

I have gained different grants, comprising a predoctoral from UVIGO, a short time mobility fellowship by MINECO, an international postdoctoral fellowship by The Getty, two postdoctoral fellowships financed by XuntadeGalicia (mod. A and B), one by European Union



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AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2020

Turno de acceso general

(STM) and Juan de la Cierva-incorporación by the Spanish Government. Since 2020, I am Distinguished Researcher of University of Vigo. I am involved in international committees about CH: COSCH, TechnoHeritage, Construrock. I belong to the strategic group- Centro de Investigación en Tecnologías, Energías y Procesos Industriales (Cintecx) of the UVIGO. Since 2014, I have the credentials: Profesor Ayudante Doctor, Profesor Contratado Doctor and Profesor de Universidad Privada awarded by the ANECA. Since November 2020, I am waiting for the I3 accreditation. I have more than 500h in courses about teaching and 200h in research trainings. I have the experience in training and co-supervising 13 bachelor, 8 master (one ERASMUS+) and 4 PhD theses (1 already defended and 1 awarded with a predoctoral grant). I have taught over 430 hours in undergraduate and master courses (UVIGO, UGR). I belong to the teaching committee of the CH protection PhD program at UVIGO, UDC and USC. Since 2018, I am the External Relations and Mobility Subdirector and the Scientific Dissemination Coordinator of the Mining and Energy Engineering School (UVIGO)