

Attracting and Encouraging Triple I Talent Mobility



Athenea3i is a research fellowship programme focused on attracting highly talented researchers to the University of Granada (UGR) in order to benefit their research career with International, Interdisciplinary and Intersectoral **opportunities**.

This programme is enclosed within the Marie Skłodowska-Curie Co-funding of Regional, National and International Programmes (**MSCA-COFUND**) category and is 50% co-funded between the European Commission and the University of Granada, being the total budget **4.248.000 euros**.



The **researchers** hired by the UGR under the Athenea3i programme have the opportunity of undertaking mobility to international institutions for an uninterrupted period of between 3 and 9 months. In this period, which is called **Outgoing Phase**, the fellows are assigned a supervisor of an external institution of their choice, who must be of high level research. They provide access to research activities at the institution, as well as contribute to enrich the scientific work of the fellow.

With this year's newsletter, we would like to share the experiences of Athenea3i fellows during their Outgoing Phase of the project. All of them have made a great effort to complete their international stays in these difficult times. Special thanks are expressed from the International Projects Office of the University of Granada for their commitment.

FEATURED NEWS

UGR scientists propose a new heavy particle with similar properties to Higgs' Boson

Adrián Carmona Bermúdez, together with collaborators from the University of Mainz, Professor Matthias Neubert and PhD student Javier Castellano, have predicted the existence of a new heavy particle with properties similar to the famous Higgs boson.

3rd FEBRUARY, 2021
IDEAL (Spanish Newspaper)



Research at the UGR: Sons and daughters of the goddess of Wisdom

16 Researchers at the top of excellence continue working within the framework of the Athenea3i programme. The main objective of Athenea3i is to attract excellent, qualified and talented researchers to improve scientific excellence at the UGR.

4th JULY, 2021
IDEAL (Spanish Newspaper)



UGR obtained 7.1M € for the acquisition of cutting-edge scientific-technical equipment

David García Burgos has obtained the highest funding among UGR projects through the State Research Agency (AEI) funding program, an entity dependent upon the Ministry of Science and Innovation.

17th SEPTEMBER, 2021
Canal UGR (Spanish UGR webpage)



Filipino book wins International Best Book Prize 2021

Stephanie Marie Co, Filipino professor of history and Marie Curie fellow, is recipient of the 2021 International Best Book Prize Award in Humanities, English Language Edition. Professor Co's book, the only one from Asia to be shortlisted, was awarded under the International Convention of Asian Scholars.

17th SEPTEMBER, 2021
Manila Bulletin (Philippines' largest English language broadsheet newspaper)

FEATURED NEWS



New asphalt materials for CO2 reduction

Ana Jiménez del Barco Carrión, talks about the relevance of achieving carbon neutrality and the creation of new materials to address climate change, specifically with regard to asphalt. In this case, they would involve the recycling of elements already in use and new bio-based materials, such as resin.

5th OCTOBER, 2021

RTVE Radio - (National Radio of Spain)

Athenea3i European Researcher's Night

Attracting and Encouraging
Triple I Talent Mobility

21 Septiembre 2021 | 27 Septiembre 2021
Hospital Real



athenea
3i International
Interdisciplinary
Intersectoral



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 754446 and UGR Research and Knowledge Transfer Found - Athenea3i

Inaguration of the "Athenea3i European Researcher's Night" exposition at Hospital Real

The Athenea3i fellows presented their work and research results in a Poster Session within the scope of the European Researcher's Night.

5th OCTOBER, 2021

Canal UGR (Spanish UGR webpage)



Castor Project: how human-induced earthquakes are created

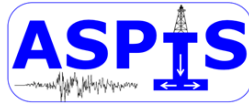
José Ángel López Comino has recently participated in the Castor Project with the aim of deciphering the origin of earthquakes. Specifically, they are working on distinguishing between induced and natural earthquakes.

24th OCTOBER, 2021

theconversation.com (not-for-profit media)

José Ángel López Comino

Assessing the Source Properties of Induced Seismicity by fluid injection on different scales through rupture directivity and extended fault inversion - ASPIS



ASPIS project aims to assess how fluid injection and fracturing operations control the nucleation and growth of seismic rupture processes of induced seismicity. Understanding why uni- or bilateral rupture modes are observed and why earthquake ruptures propagate dominantly along a certain direction is key to forecast how the rupture process of large earthquakes may evolve, their final rupture size and thus their consequences.

Outgoing Phase at GFZ (German Research Centre for Geosciences)

OP Supervisor: [Simone Cesca](#)



The **GFZ (GeoForschungsZentrum)** is the Germany's national research center for the solid Earth Sciences, located on the Telegrafenberg in Potsdam, in the German federal state of Brandenburg, and is part of the Helmholtz Association of National Research Centres. Their mission is to deepen the knowledge of the dynamics of the solid Earth, and to develop solutions for grand challenges facing society. There are 26 Research Sections at GFZ combined in four departments, each one representing a particular research focus. This Outgoing Phase was developed within the section 2.1 "Physics of Earthquakes and Volcanoes" at the Geophysics's department.



"We analyse seismic data to image complex rupture processes of induced seismic events over a broad range of scales, from moderate induced earthquakes to cm-scale hydraulic fractures."

Research carried out at GFZ covers all aspects of seismological instrumentation and specific python tools where new codes of synthetic seismogram generation and induced seismicity characterization have been developed. The GFZ has a wide experience in high-level methodological developments, targeting different seismological problems such as earthquake source modelling, which has been implemented under a compact, unified and open Python-platform, the Pyrocko software ecosystem (<https://pyrocko.org>). We analyse seismic data to image complex rupture processes of induced seismic events over a broad range of scales, from moderate induced earthquakes to cm-scale hydraulic fractures.

A probabilistic discrimination approach among induced, triggered and natural earthquakes is defined and implemented, taking into account the seismic source geometry, rupture nucleation and rupture propagation. In addition, the GFZ has provided us high-quality data to analyse acoustic emission events produced during a meter-scale underground hydraulic fracturing experiment that took place at the Äspö Hard Rock Laboratory.



Stephanie Marie Coo

Rediscovering Philippine Material Culture in European Archives - RED EU PH

This project locates and identifies historical materials relevant to the history, culture and society of the Philippines, extant specifically in European archives and private holdings, many of which have never been previously studied. This has a broader purpose of rediscovering and deciphering the archives of Philippine artifacts scattered in different repositories across the globe.

Outgoing Phase at NOVA School of Law Universidade Nova de Lisboa

OP Supervisor: [Armando Marques Guedes](#)



The objectives of the Outgoing Phase of my postdoctoral project are as follows:

- to explore, collect and catalogue sources not available in my home country, such as documents in foreign languages and artifacts, both in public and private holdings,
- to learn new methods of analysis from Portuguese experts and academics,
- to provide academic perspective to the joint activities organized by the Embassy of the Philippines in Portugal, Embassy of Portugal in Indonesia and Consulate of Portugal in Manila,
- to plan and execute high-impact, international and interdisciplinary research on my proposed topic,
- to contribute historical and analytical frameworks on the processes of Iberian colonization in Southeast Asia,
- to share and transfer knowledge about the Philippines by giving public lectures,
- to strengthen the collaborative relationship between my host and home institutions.

The Outgoing Phase also allowed me to integrate my research in Spain and Portugal by writing a book, in collaboration with Prof. Dr. Armando Marques Guedes (Outgoing Phase Supervisor) and Dr. Ana Ruiz Gutierrez (Universidad de Granada-Athenea3i Supervisor).



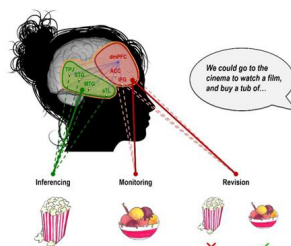
NOVA School of Law-Universidade Nova of Lisboa (UNL) has post-graduate programs that welcomes researchers from all over the world. With broad and diverse networks with museums, archives, libraries and private holders, my research activities have received significant support. Under the supervision of Professor Dr. Armando Marques Guedes, the Director of the Centre for Research in Law and Society (CEDIS), I was easily integrated in one of UNL's main research centres; thus, allowing me to attend courses on Law and Society as well as to participate in their international collaborative activities.

"My Outgoing Phase at the NOVA School of Law-Universidade Nova de Lisboa complements my research in Spain and allows me to deepen my research competencies on Iberian documents on Southeast Asia"



Ana Isabel Pérez Muñoz

Text Comprehension in the Brain: The role of Development and Bilingualism T-ComBrain



The **T-ComBrain** project aims to 1) elucidate how monolingual and bilingual children, adults and the elderly perform high-level cognitive processes during L1 and L2 text comprehension, and its relationship with cognitive control; and 2) dissociate brain areas related to monitoring and revision processes by exploring brain connectivity in monolingual and bilingual adults and the elderly. For this purpose, use a comprehensive approach combining behavioural (reading times and accuracy), electroencephalography (event-related potentials) and (f)MRI (structural and functional connectivity, and machine learning) measures.

Blended International Outgoing Phase at the University of Cambridge



UNIVERSITY OF
CAMBRIDGE

OP Supervisor: [lanthi Tsimpli](#)



I'm holding regular meetings with the Outgoing Phase supervisor, where we talk about the analyses and results of the data that have been already collected for the T-ComBrain project. Concretely, we have been discussing about the interpretations of our behavioural results in monolingual and bilingual children and young adults, as well as establishing the appropriate statistical analyses for our electrophysiological (EEG) data. Here we agreed that the best measure is the one that it was used in previous scientific articles, that is, even-related potentials

(or ERPs), and more specifically the N400 electrophysiological component. In addition, I'm also gaining research teaching experience by, together with Prof. Tsimpli, co-supervising a PhD student from the University of Cambridge, Mandy Wigdorowitz, once a week. Mandy has already published one scientific article where the T-ComBrain project has been acknowledged (Wigdorowitz, Pérez & Tsimpli, 2020), and has submitted a second article to "Bilingualism: Language and Cognition", a journal that fits perfectly with the topics of the T-ComBrain. In addition, we are currently working on Mandy's third paper, which importantly investigates the same high-level comprehension processes targeted in the T-ComBrain project (i.e., inferencing, monitoring and revision), in a South African population that differs in their native language (English vs. Zulu). As mentioned, all this is very much in line with the T-ComBrain aims and, in particular, this experience helps me to improve my skills in training students to do research, as well as to gain confidence on my own research abilities. Moreover, I'm also attending some departmental seminars and research group talks on linguistics and cognitive processes, which provide fundamental knowledge on some of the topics of the T-ComBrain project. Finally, Prof. Tsimpli and I are also arranging a date in which I can give a scientific oral presentation, in one of her research group meetings.

In the next months, I envisage to continue having regular meetings with Prof. Tsimpli as well as with the PhD student Mandy Wigdorowitz. I also expect to attend some of the scientific talks offered by the Cambridge Linguistics Forum Series (Dept. of Theoretical and Applied Linguistics or DTAL) and Psychology seminars (Dept. of Psychology). I'm also planning to provide an in-person scientific oral presentation at DTAL. Last, but not least, because Cambridge possess the MRC Cognition and Brain Sciences Unit, which is a leading research centre of human cognition using cutting edge techniques such as EEG, MEG and f-MRI, I will take advantage of this optimal environment to attend at least one (although maybe more) course in f-MRI data analysis, to accomplish the aims of the T-ComBrain's WP3.



The **University of Cambridge** is ranked the world's second best university overall and the 3rd worldwide in research (just after Oxford and Harvard). The combination of the Dept. of Theoretical and Applied Linguistics (DTAL), the Dept. of Experimental Psychology and the MRC Cognition and Brain Sciences Unit (MRC CBU) of the University of Cambridge brings an optimal environment for interdisciplinary research in the fields of Psycholinguistics, Cognitive Neuroscience and Developmental Psychology that are involved in the T-ComBrain project.

"Being a researcher at the University of Cambridge is one of the most exciting professional and personal experiences that I could have ever imagined."



Francesca Oltolina

Novel **TAR**geted functionalized **MA**gneto**LI**posomes for cancer **Therapy** – **TAR-MA-LI-T**

Innovative therapeutic treatments are required for cancer. **TAR-MA-LI-T** will develop a double tumor targeted drug delivery system encapsulating DOXO-functionalized magnetic nanoparticles (responding to continuous magnetic field) within liposomes, functionalized also with a monoclonal antibody targeting the tumor associated marker Met receptor.

Outgoing Phase at Department of Health Sciences Università del Piemonte Orientale

OP Supervisor: [Maria Prat](#)



After the successful synthesis of magnetoliposomes (LP-BMNPs) and their functionalization with DOXO (LP-DOXO-BMNPs), with the targeting antibody (mAb-LP-BMNPs) or both of them (mAb-LP-DOXO-BMNPs), the nanocomplexes were extensively characterized under chemical-physical points of view at the UGR.

The samples were then tested in biological systems (in vitro and in vivo). mAb-LP-BMNPs showed immunocompetence, reacting specifically with extracts from cells expressing the targeted tumor marker. The apposition of a magnet (GMF) improved their interaction with cells. LP-BMNPs +/- mAb were cytocompatible on different cell lines, while LP-DOXO-BMNPs exerted toxicity, which was increased specifically by the targeting mAb.

The in vivo biocompatibility of LP-BMNPs and their distribution in different organs were analysed after systemic administration by tail vein injection. All the mice receiving LP-BMNPs were alive and in good shape until the latest time point checked. A step forward was reached when the ability of tumor reduction, after multiple systemic injections of the different nanocomplexes, was investigated in a mouse model. The apposition of a magnet (GMF) allowed guidance of the nanoassembly to the tumor and improved drug delivery there, since tumor size was significantly smaller compared to that reached with soluble DOXO.

Thanks to this scientific collaboration at the Università del Piemonte Orientale as OP hosting institution, I got some important conclusions about the produced nanocomplexes that can be thus considered as innovative and promising nanocarriers for translational applications in cancer therapy.

Finally, I had also the opportunity to produce a monoclonal antibody (mAb) against MamC protein. The obtained mAbs could help to get insights into the structure/function relationship of the protein, since its role, which is essential for the nucleation of the BMNPs, is not yet fully known.

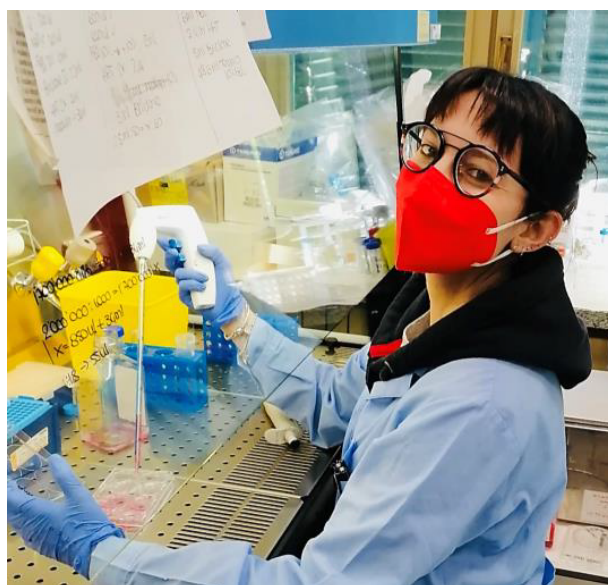


School of Medicine – Department of Health Sciences, Novara, Italy

In the Dept. of Health Sciences, Università del Piemonte Orientale in Novara, Italy, researchers have different backgrounds, i.e. from basic research to the development of biomaterials and innovative theragnostic.

Part of the TAR-MA-LI-T project was developed in the lab. of Histology led by Prof. Maria Prat who has a long experience in experimental models of antibody-mediated targeted drug delivery to tumor cells in vitro and in vivo, and in the production and purification of monoclonal antibodies.

"It has been an honour carrying out part of my TAR-MA-LI-T project in one of the departments of excellence in Italy. The research at the Department of Health Sciences is of a great standard characterised by a serious, lively hard workers in a helpful, international, stimulating, and human enriching environment. A second family at all."



Adrián Carmona Bermúdez

A quantum bridge between high energy theory and experiments - QuantumBridge

The main goal of this project is to build a bridge between new models of particle physics at high energies and current experimental data, coming from particle accelerators, astrophysical observables and experiments of flavor physics. This will be done through a computer software computing with great accuracy and in an automated way the 'so-called' matching between these new theories and the corresponding effective theories at low energy.

ETH zürich

Outgoing Phase at ETH Zürich

OP Supervisor: [Charalampos Anastasiou](#)



ETH Zürich is a science, technology, engineering and mathematics university in the city of Zürich, Switzerland. It is an integral part of the Swiss Federal Institutes of Technology Domain that is directly subordinate to Switzerland's Federal Department of Economic Affairs, Education and Research. It was founded by the Swiss Federal Government in 1855 under the name "Polytechnikum". It has 530 professors and 20,600 students, including 4,000 doctoral students, from over 120 countries. It counts with 21 Nobel Prize winners, including Albert Einstein and Wolfgang Pauli, 2 Fields Medal winners as well as 2 Pritzker Prize winners. It counts with 90 patent applications and 200 invention reports every year and has a budget of CHF 1,9 billion.

"The collaboration with the scientists at the ETH Zürich has been key to overcome some of the challenges of the project."

The group of Prof. Anastasiou at ETH Zürich, supervisor of the Outgoing Phase, has become a beacon of precision physics for the high-energy physics community. Among many other things, they were responsible for the incredible breakthrough in precision physics of calculating the Higgs gluon-fusion production cross section in quantum chromodynamics (QCD) at three loops, the first ever calculation at next-to-next-to-next-to-leading order for an hadron collider and the new state-of-the-art of perturbative QCD. Thanks to my collaboration with the members of Prof. Anastasiou's group, and in particular with Dr. Achilleas Lazopoulos, we have made tremendous progress in our project of automated one-loop matching of general new theories onto their corresponding low-energy effective field theories. As a result, we have just published a first version of our code performing such matching in an automated manner, which will be accompanied by an scientific article with all the details. This is the first code doing such a thing to be made available to the particle physics community, a milestone of the project which will open the door to a wide range of deep and interesting physical applications.



María Bermúdez Pita

Flood risk analysis under global warming for long-term coastal cities planning – FLOWPLAN

The FLOWPLAN project analyzes future flood risks in coastal urban areas, a hotspot of vulnerability to the impacts of climate change. It brings together scientific and technical approaches from different disciplines such as spatial planning, coastal engineering and ecology, to address flood risks from an integrated perspective.

Outgoing Phase at University of Florida

OP Supervisor: [Rafael Muñoz Carpena](#)



University of Florida was founded in 1853 and is currently among the nation's top five ranked public universities. The fellow worked in the Department of Agricultural & Biological Engineering, which is founded on developing, teaching, and applying engineering principles to improve and sustain agricultural and biological systems for current and future generations. The Department continually transcends disciplinary boundaries to create synergy among different knowledge areas for designing, quantifying, assessing, and managing engineering solutions for natural and managed systems.

"My stay in Florida has opened new perspectives in my research that will influence my work for years to come. And last but not least, it has been an unforgettable experience for my whole family!"

Mean sea level rise (SLR) and urbanization threaten coastal ecosystems such as wetlands, marshes, beaches or dune systems that provide natural protection against flooding. In order to reliably assess future flood risks, it is necessary to develop coupled hydraulic-ecosystem models that evaluate the response of coastal ecosystems to SLR. The main objective of the Outgoing Phase was to develop such a model adapted to the characteristics of the Spanish coast. The model was based on the Sea Level Affecting Marshes Model (SLAMM), which has been successfully used to simulate future changes in coastal habitats in many areas of the United States.

The case study site is the coastal wetlands of Bay of Cadiz Natural Park, with high ecological and socio-economic value and protected by the International Ramsar Convention. The results will allow the formulation of sustainable adaptation actions, an urgent task given the delicate environmental balance of these systems and the increasing anthropogenic and climatic pressures that they are facing.



David García Burgos

Mapping cognitive-mediated taste learning mechanisms in eating disorders – CogniTastED

Eating disorders are a public health problem with serious social, clinical and economic consequences. Increasing numbers of people now suffer from an eating disorder. Even though there have been significant improvements, effective interventions and treatment outcomes are still insufficient in eating disorders.

Therefore, the CogniTastED project promotes a shift in the field's priorities to policy translation research using an experimental psychopathology approach to investigate the learning mechanisms of eating disorders. Then, these potential mechanisms can be tested in the laboratory under highly controlled and standardized conditions. Such high quality data would allow us to develop more effective interventions.

Outgoing Phase at Department of Behavioural and Cognitive Sciences (Université du Luxembourg)

OP Supervisor: [Claus Vögele](#)

The main objective was to determine the differential affective reactions acquired to sweet compounds among eating disorders. In this sense, two specific objectives were planned: (1) to compare the hedonic sweet taste profiles between patients suffering from eating disorders and (2) to examine the sensitive/selectivity of a sweet taste-based test for the differential diagnosis of eating disorders.

In terms of added value of the mobility, this research stay promoted exchange of knowledge in order to keep up-to-date on the cutting-edge research in eating disorders; strengthened contacts with the University of Luxembourg, especially with the Prof. Claus Vögele who is a leading researcher in eating disorders; fostered of international research collaboration and international academic networks; and provided a platform for communication among high level experts to further develop investigation.

Over the last 25 years, Prof. Vögele has held academic posts at both German and British Universities (e.g., St George's Hospital Medical School, University of London; School of Psychology, University of Birmingham). He is currently Professor of Clinical and Health Psychology and Head of the Institute for Health and Behaviour, Director of the Master programme in Psychotherapy, and a founding member and Vice-Chair of the University's Ethics Review Panel at the University of Luxembourg. He is reviewer for research funding organisations including the EU FP7 programme and Horizon2020, appointed member of the Scientific Commission Sciences Humaines et Sociales (Belgium), and ad-hoc reviewer for over 50 national and international journals. He is chief-editor of international and national journals and author of more than 150 peer-reviewed papers (h-index: 34). He is an Associate Fellow of the British Psychological Society, a Fellow of the Royal Society of Medicine (United Kingdom), Chair of the Division of Health Psychology in the German Psychological Society and President of the German Society for Behavioural Medicine.



The Department of Behavioural and Cognitive Sciences (Université du Luxembourg) develops and advances scientific knowledge about the brain, human cognition, social behaviour, and culture, including research on the interplay between individuals and their physical, economic and social environments as well as their development across the life span. They are crucial for the understanding of the interactions between health, individual behaviour, cognition, personality, social environment, and contextual factors.

Research in the Department of Behavioural and Cognitive Sciences spans a wide spectrum of current areas of investigation, ranging from neurophysiology, neurocognition and behaviour, the economics of health and well-being, to clinical and health psychology, educational, social and media psychology, and developmental and cultural psychology.

*"Multilingual,
international and
research-oriented
Outgoing Phase, with a
personal atmosphere."*



CogniTast^{ED}

MSCA COFUND - ATHENEA3i



Merry Christmas



Happy New Year!

International Research Projects Office

Vice-Rectorate for Research and Knowledge Transfer, Universidad de Granada

C / Gran Vía de Colón, 48, 2nd Floor. 18071, Granada, Spain.

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