fct Fundação para a Ciência e a Tecnologia

TEXAS The University of Texas at Austin

UT AUSTIN PORTUGAL 2022 Annual Report

UTAustin Portugal

2022 ANNUAL REPORT

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A word of appreciation goes out to all our Exploratory and Strategic Research Projects for their inputs to the sections in the report, highlighting the Program's R&D portfolio, as well as to our ten interns who participated in the Short-Term Research Internships at UT Austin and everyone we relied on to coordinate and implement in 2022 the training and networking events described in the following pages. A special thank you to the FCT International Partnerships Office.

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FOREWORD: CELEBRATING A 15-YEAR JOURNEY TOGETHER

Foreword: Celebrating a 15-year journey together

God wants, man dreams, and work is born.

These words by the Portuguese writer Fernando Pessoa remind us of the character of the Portuguese people who, back in the 15th and 16th centuries, set sail into the unknown and defied an unforgiving Ocean to expand the horizons of humankind.

The drive and stamina that guided the Portuguese through unchartered seas and led them to discover new worlds are the same that placed Texas and its people at the forefront of one of the most extraordinary human explorations in the 20th century. Only this time, the unchartered territory was outer space - Portuguese and Texans: two fearless people bonded by a love of exploring the unknown and breaking frontiers.

Fifteen years ago, a thriving partnership between Portugal and The University of Texas at Austin (UT Austin) was born. May the sea unite, no longer separate, as Pessoa wrote. The unbeaten paths we committed to walking together have been many since then, from the ocean to the earth and space...always in quest of science-based answers to the grand borderless challenges humankind is faced with.

This STEM-based research partnership stood the test of time: It grew stronger every year, bringing out the best in both partners and leaving its mark on Portugal's homegrown research and entrepreneurial community.

Many of these outstanding achievements can be sensed in present times: talent trained and mentored by the Program turning into successful entrepreneurs and experienced technology commercialization professionals; Portugal's participation in the European High-Performance Computing Joint Undertaking; strong research partnerships prompted by the Program, which continue flourishing beyond its instruments.

In 2022, we celebrated this legacy by looking back into the future while going on caring for those who navigate with us today, from our Principal Investigators and their research teams to the researchers admitted to our international mobility programs, our industry affiliates, the scientific coordinators of our advanced training, to mention a few.

It's time to place the compass towards the next destination of our transatlantic alliance: the 2030 Agenda for Sustainable Development.

We remain determined to navigate together to advance common interests on a broad spectrum of issues and to connect the next generation of minds who will help both Portugal and Texas be up to the complex challenges ahead of our societies.

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15 YEARS IN NUMBERS

15 years in Numbers | Education

2007 — 2017

341
Students supported

120 PhD
211 MSc
10 Post-Docs

76
New PhDs

3 Doctoral Programs
1 MsC Program

2018 — 2022 2023

2
International Mobility Programs

19 Researchers from Portuguese institutions

1476 days of immersive hands-on training at UT

Total investment of nearly € 115K

31
Short Courses

247,5 hours

2513 Participants

15 years in Numbers | Research

2007 — 2017 — 2018 — 2022 — 2023

50
Projects awarded funding

2007-2012: 20
2014: 16
2017: 14

27
Projects funded to date

4 Calls

11 industry-led
16 high-risk/high-potential

€ 21,8M
Total public funding

Around 40 entities in Portugal and 32 PIs at UT Austin

Between 2018 and 2022(*):

40
scientific jobs created

180
international peer-reviewed publications

235
academic works supported, 45% being Doctoral works

(*)

- Includes the outcomes of projects awarded funding in 2018 after the 2017 ERP Call.
- As for "international peer-reviewed publications", the indicator comprises publications in scientific journals, conferences and books either reported by research teams to the Program or tracked by the Program's team beyond formal reports.

15 years in Numbers | Innovation

2007 — 2012

2012 — 2016

Portuguese Universities

20%
increase in patents granted/year

137%
increase in license income

26%
increase in executed licenses/year

132%
increase in new academic spinoffs

Technology-based companies

127%
annual growth in revenue

38%
annual growth in hiring

37%
growth in exporting technology

UTEN Portugal Global Startup Program

$ 130 M
Total Economic Impact

(Returned $40 for every $1 invested by FCT)

> 200
Companies trained and mentored

3

STATEMENT FROM THE LEADERSHIP

Statement from the Leadership

José Manuel Mendonça
National Director
Portugal

Have you ever stared at the Ocean, watching the waves come and go, trying to picture what lies beyond the skyline? We know what lies, not only because maps show, but also because we know, for centuries now, that although it seems infinite, the Ocean has the power to unite people. When we lay our eyes on the horizon, we know that other people are also looking at the same skyline on the other side. The skyline no longer becomes a limit, a boundary, but a passage to get us going further.

In 2022, we celebrated the 15th anniversary of the UT Austin Portugal Program. From the very beginning, the Program has successfully brought together people from two countries connected by the Atlantic – Portugal and the United States. Time has passed and the Partnership has evolved. Still, the foundational drive remained unchanged: team up with the best talents to advance science and technology to find solutions for global challenges.
I have been part of this Program since the beginning, and I can tell you something: the UT Austin Portugal Program has been more than a partnership. It has been a fertile ground for bold science-based ideas leading to innovation and growth. Thanks to its potential and the opportunities it provides, it gives researchers from both sides the tools to beat new tracks together. Tracks that open-up a new world of possibilities for science and innovation, industries, companies, governments and citizens. In a nutshell: science with impact.

Throughout the coming pages of this report, we will take you back to 2022 to give you an overview of the activities we carried out, the events we put together, and the opportunities we created. But more than that, you will have the chance to meet some of the people who make up our community, their journey with us, and how their research is contributing to a better world.
Lastly, you'll get a glimpse of the Program's work to put forward a value proposition for the Partnership after 2023. A value proposition that honors the Partnership's legacy but also reflects its readiness to take on even bolder challenges. Many important and impactful things happened that would never have existed if it weren't for the UTAustin Portugal and many more are expected in the future for the benefit of all.

John Ekerdt
Principal
Investigator
UT Austin

The UT Austin Portugal Program reached an impressive milestone this year as it celebrated the 15th anniversary. Over this time the specific scientific and technology foci have changed to the present portfolio of advanced computing, nanotechnology, space-earth interactions, medical physics, and technology commercialization. Through the changes over the years the Program has remained centered on building intellectual capacity with knowledge-based innovation and game-changing research that train and prepare the next generation of scientists and engineers. From the beginning the Program has worked in partnership with the Portuguese Foundation of Science and Technology and the Minister of Science, Technology and Higher Education to address pressing societal problems and foster transatlantic research collaborations.

The report documents the breadth of the research performed collaboratively in eleven multi-year strategic projects and in ten shorter-term exploratory projects.Much of this was highlighted at the 2022 Conference in October. This was our first in-person conference in several years and the atmosphere was electric!Professor Peppas' keynote presentation, "Intelligent Biomaterials for Treatment of Autoimmune Diseases and Cancer," highlighted the legacy and impact of work supported by the Program. I was impressed by the student presentations during the poster sessions. Their enthusiasm for what they had accomplished was palpable and all spoke to the value of the collaboration.

The Program's education programs build intellectual capacity and help broaden the reach beyond the numbers that are actively engaged in the research. Online courses workshops taught by subject matter experts are but two examples. More and expanded offerings are being rolled out for 2023. This past fall we were able to restart the exchanges that COVID forced us to cease. I encourage you to read the summaries of the ten researchers who visited research groups at UT and see how they grew professionally, and how this strengthened the research programs. There is just no substitute for in-person experiences that exchanges afford and more are planned for this year.

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THE 2022 ANNUAL REPORT: A YEAR IN REVIEW

Some Context on Phase 3

A Structured Approach to Knowledge-Based Innovation

In Phase 3 (2018-2023), the Program was structured around core knowledge areas deemed strategic to Portugal and its competitiveness in the international arena: Nanotechnologies, Advanced Computing, Space-Earth Interactions and Medical Physics.

The Program relies on specific activities to build intellectual capital and foster transatlantic research collaborations to help shape solutions for borderless challenges: from training to research exchanges and joint projects supporting both exploratory and industry-driven research.

Although its approach to science-based innovation rests upon three interdependent instruments - Education - Research - Innovation, the Program's success with the Research instrument in 2019 dictated a reorientation of all funds devoted to the Innovation component to support an unanticipated higher number of industry-driven projects.

KNOWLEDGE AREAS

- NANOTECHNOLOGIES
- ADVANCED COMPUTING
- MEDICAL PHYSICS
- SPACE-EARTH INTERACTIONS
- TECHNOLOGY INNOVATION AND ENTREPRENEURSHIP

THREE STRANDS

EDUCATION

Advanced Training Programs
Workshops
Research Exchanges

RESEARCH

Exploratory Research Projects
Strategic Research Projects

INNOVATION

Coaching & Mentoring
Residency in Austin
Industry Affiliates

VISION

To contribute to a knowledge-based society & foster science & innovation-based companies, enabling Portugal to better face the challenges of the future.

MISSION

To promote and enable the engagement of Portuguese scientists and companies with the University of Texas at Austin, and the University of Texas System at large, in multidisciplinary research, technology transfer and commercialization activities.

2018
Agreement closed between FCT and UT Austin (Phase 3)

2019
Inauguration of the Minho Advanced Computing Center (MACC)

2020
Start of 1st batch of Strategic and Exploratory Research Projects

2021
Monitoring of ongoing projects
Organization of training events proposed by UT Austin Portugal's community
Selection of new batch of exploratory research projects for funding

2022
1st ECTS-awarding course (Medical Physics)
Short-Term Research Internships at UT Austin
15th Anniversary Celebration at the Annual Conference
2022 Exploratory Research Projects Call

2023
End of Phase 3

The 2022 Annual Report: A Year in Review

At the end of every year, the Program takes time to reflect on its activities and achievements between January and December and prepare for the year ahead. It is a joint exercise that builds on the contributions of many stakeholders and shows the Program's commitment to self-accountability, self-improvement, transparency, and excellence. It couldn't be any other way, especially when one bears the responsibility of preserving fifteen years of remarkable accomplishments and must stay up to the expectations of a loyal yet demanding transatlantic community.

2022 was a year of celebration for the Program turned 15 years old. It was also a year to go deeper in discussing the Partnership's future as the current funding cycle is nearing its end. Such discussions were also held at the highest level, first with the former Minister of Science, Technology and Higher Education, Manuel Heitor - a long-standing champion of FCT's International Partnerships - and later with the newly appointed Minister, Elvira Fortunato, and the new President of FCT, Madalena Alves.

Past, Present and Future, all packed into a year that started with the feeling that the COVID-19 pandemic would soon be under control and people could resume their lives as they knew before the pandemic. For the Program, this ray of hope meant getting its researchers to travel again between Portugal and Texas in the frame of ongoing research projects or short-term internships. It also meant resuming onsite networking and training activities in parallel with online activities, which had proven effective during the pandemic. However, other challenges would come about.

The impact of the increase in prices that followed the Ukraine war breakout and the subsequent energy crisis, aggravated by the budget cut for the Program's Portuguese office in 2022, should not be underestimated. With a return to onsite events and the reopening of borders that increased global mobility, the Program had to be even more careful with selecting suppliers to ensure sound management of its budget, while keeping its high standards and sticking to the 2022 Activity Plan as much as possible. Some ongoing projects bearing the Program's seal were faced with stockouts, which inevitably led to project delays.

Nevertheless, the energy crisis that came along with the war, and the acknowledgement that the transition to a non-fossil-based economy was more urgent than ever, gave the Program a chance to step forward and explain how it could contribute towards a cleaner and more sustainable energy future, building on its community's knowledge capital, trustful relationships, and advanced infrastructures in Nanotechnologies, Advanced Computing and Space-Earth Interactions both in Portugal and at UT Austin. Our Annual Conference brought this leadership potential to the foreground as you'll get to find out some sections ahead.

The 2022 Annual Report: A Year in Review

Our Main Highlights in 2022

Eight new Exploratory Research Projects (ERPs) were added to the Program's portfolio in early 2022, strengthening the Program's contribution to the cancer fight, energy transition, climate adaptation and the digital society through disruptive science. A new call to fund eight more Exploratory Research Projects was opened in the last quarter of the year, with its results due to be announced in April 2023. This instrument of the Program is expected to have funded 24 transatlantic teams by the end of Phase 3. As we got to learn at the 2022 External Review Committee Meeting, the ERPs have been allowing younger researchers a head start - the coordination of an international project for the first time, a key achievement for ascending in their professional careers.

The Strategic Research Projects selected at the end of 2019 kept progressing and reporting their outcomes to the Program. As they are closer to completing their 3-year work plans, they look for opportunities to leverage further funds and intensify their participation in closer-to-the-market and dissemination activities.

By keeping a close watch over the project it supports, the Program can track the impact of its funding choices. In 2022, the Program worked on mapping new research initiatives from projects championed or funded during Phase 3.

After two years of travel restrictions, the Program finally managed to launch a new call to provide ten researchers affiliated with Portuguese institutions with the opportunity to cross the Atlantic for short-term research internships at the University of Texas at Austin.

Additionally, several training activities were organised throughout the year, engaging various stakeholders in training design and delivery. For the first time since 2018, the Program included an ECTS(*) awarding course in its training offer. Being a Program targeted primarily to Portuguese institutions, 64% of our registered participants came from Portugal, 10% from the USA and the remainder from 55 countries. Academia and research institutions remain the primary recipients of our training portfolio (81% of registered participants).

The Annual Conference International Science & Technology Partnerships as Platforms for Science Diplomacy was the culmination of the Partnership's 15th-anniversary program. It provided a venue for taking stock of UT Austin Portugal's entrepreneurship and technology commercialization legacy, its disruptive contributions to the biomedical field, and its (future) role in society's energy transition.

(*) ECTS stands for European Credit Transfer System

The 2022 Annual Report: A Year in Review

How close did the Program stick to the 2022 Activity Plan?

Management & Coordination Activities

- Submission of 2021 Annual Report
- Annual Meeting with the GB (approval of the 2022 Activity Plan)
- Publication of 2021 Annual Report
- Individual Meetings with 2019 ERPs
- Individual Meetings with 2019 SRPs
- Interim Reports (2019 SRPs and 2021 ERPs)
- ERC Annual Meeting
- Submission of 2022 Activity Plan and Budget Proposal

Stakeholders' Engagement & Communication Activities

- Presentation of 2022 Activity Plan to Area Directors
- Publication and dissemination of 2021 Annual Report
- Organization of the Program's Annual Conference
- Annual Visit to UT Austin - Program Leadership and PT Delegation

Activities under the Program's Main Strands

- 2022 Exploratory Research Projects Call
- Organization of Short-Term Courses and Other Training Activities (with Call)
- Call for Research Exchanges Program

Done Readjusted Canceled

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STRAND EDUCATION: BUILDING HUMAN CAPITAL

Strand Education: Building Human Capital

The Program remained committed to promoting training to enhance the human capital in the Partnership. In 2022, training took place through courses, workshops and research exchanges organized in the frame of ongoing projects or awarded through a competitive call. This section covers the mobility initiative and training organized in 2022.

Short-Term Research Internships

Support of research mobility between Portugal and The University of Texas at Austin has always been one of the Program's hallmarks. It supported and encouraged researchers from both sides to cross the Atlantic to develop an international mindset and establish long-standing relationships with their counterparts.

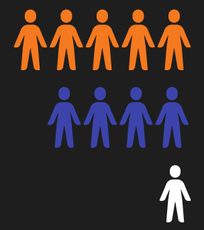
In 2022, after a two-year halt on research exchanges, the Program finally opened a Call for Expressions of Interest (EoIs) for Short-Term Research Internships at UT Austin. Between April 27 and June 13, 29 Expressions of Interest from researchers affiliated with Portuguese institutions were submitted, with only two applications deemed ineligible to move on to the evaluation stage. Although many candidates scored well beyond the funding threshold – an indication of the merit and quality of their profiles – the Program's budget for this initiative was limited to ten vacancies, all of which were assigned. Among the awarded candidates, we can identify some junior researchers involved in research work under the Program's exploratory and strategic research projects.

Between September and December 2022, selected applicants had the chance to develop their research work in one of the best public universities in the United States under the supervision of seasoned researchers and faculty. Interestingly, the ten work plans aligned with the main application areas of the Program's Phase 3 project portfolio (see page 34). It is worth mentioning that during their time at UT Austin, some interns and their respective hosts successfully prepared and submitted joint project proposals to the Program's Exploratory Research Projects Call or co-authored papers submitted to top-tier Conferences.

After their return to Portugal, the interns shared that they expect this mobility experience, sponsored by FCT, to open up opportunities for further international collaboration that can advance their research careers and benefit Portuguese institutions.

Based on the overall assessment of UT Austin hosts, there is room and, most of all, a shared wil to pursue established collaborations beyond the Program's internships. To better understand this initiative's impact on the interns' research pathways, the Program plans to survey them sometime after their post-visit report.

10 VISITING RESEARCHERS AT UT AUSTIN



5 MSc in PhD Programs

4 PhDs

1 BSc

Strand Education: Building Human Capital

Short-Term Research Internships

Dalinda Eusébio
(PhD Student)

The main goal of Dalinda's Short-Term Research Internship Program was to prepare and characterize a dry powder formulation of a mannosylated DNA nanovaccine against coronavirus disease (COVID-19) for potential pulmonary administration.

> Overall, this experience allowed me to learn new methodologies and techniques with experts in the field, particularly the proprietary TFFD technology developed at UT Austin. The lab of Professor Zhengrong Cui had excellent working conditions. The elements of the lab group were welcoming and collaborative. Thank you to UT Austin Portugal for this opportunity, and, as the signature motto of UT Austin says: "What starts here changes the world", and I hope that what I had started at UT Austin would ultimately change the world.

NANOTECHNOLOGIES

Home Institution: Health Sciences Research Centre, University of Beira Interior | Host Institution: College of Pharmacy, Division of Molecular Pharmaceutics and Drug Delivery, The University of Texas at Austin | Host: Zhenrong Cui, Professor of Molecular Pharmaceutics and Drug Delivery | Mobility Period: October 7 – December 12, 2022

Estela Carvalho
(PhD Student)

The main goal of Estela's Short-Term Research Internship Program was to develop a conceptually novel approach capable of ensuring rapid osseointegration, thereby laying the groundwork for finding a solution to surgical site infections in patients with prosthetic implants.

> I would like to thank the UT Austin Portugal Program for accepting my application for the short-term internships at the University of Texas at Austin. Being a part of multidisciplinary research teams and learning firsthand about group dynamics at a top-ranked university was a once-in-a-lifetime opportunity that will undoubtedly shape my scientific career.

NANOTECHNOLOGIES

Home Institution: Centre of Physics (CF-UM-UP), University of Minho | Host Institution: McKetta Department of Chemical Engineering, Cockrell School of Engineering, the University of Texas at Austin | Host: Adrianne Rosales and Brian Belardi, Assistant Professors at Cockrell School of Engineering, the University of Texas at Austin | Mobility Period: October 7 – December 12, 2022

Strand Education: Building Human Capital

Short-Term Research Internships

Fábio Ferreira
(Researcher)

The main goal of Fábio's Short-Term Research Internship Program was to evaluate the friction and wear response of a class of advanced coatings with high wear resistance, lubricated with a class of green, energy-efficient lubricants, and understand the interactions with one another.

> This short-term internship at UT Austin represents a unique opportunity to work with some of the most capable Researchers in my field. The program will have an impact on my future research directions.

Immediate Output
Joint Project Application (2022 ERP Call)

NANOTECHNOLOGIES

Home Institution: CEMMPRE Laboratory, Department of Mechanical Engineering, University of Coimbra | Host Institution: Walker Department of Mechanical Engineering | Host: Filippo Mangolini, Assistant Professor at Cockrell School of Engineering, the University of Texas at Austin | Mobility Period: September 15 – December 16, 2022

Hugo Silva
(Master's Student)

The main goal of Hugo's Short-Term Research Internship Program was to develop a code for satellite orbit and attitude determination using Matlab as a numerical tool.

> Overall, the proposed objectives for the internship were achieved. A code for orbit determination was built and successfully tested. As for the code for attitude determination, it was implemented and is currently being tested, however, it was not possible to finish the tests before the end of the internship. The missing part of the tests will be finished in Portugal. Afterwards, this code will be used in a project that is being developed at the Instituto Superior Técnico and will be available to other students. To conclude, I would like to say that working and living these last months in Austin, Texas was a unique and very enriching experience for me.

SPACE-EARTH INTERACTIONS

Home Institution: Instituto Superior Técnico, University of Lisbon | Host Institution: Aerospace Engineering and Engineering Mechanics, Cockrell School of Engineering, the University of Texas at Austin | Host: Moriba K. Jah, Associate Professor of Aerospace Engineering and Engineering Mechanics at The University of Texas at Austin | Mobility Period: October 22 – December 31, 2022

Strand Education: Building Human Capital

Short-Term Research Internships

João Duarte
(Researcher)

The main goal of João's Short-Term Research Internship Program was to extend his theoretical knowledge and practical skills with MRI and autonomously develop, perform and assess his own MRI study protocols.

“With the educational training I received during this internship, I achieved a better understanding of the theoretical and technical details that underly the acquisition and reconstruction of MRI image data and acquired the skills to perform basic troubleshooting. Practical training and L2 certification granted me local system-operator status so I can operate the BIC's Siemens 3T MRI scanners independently. After completing my internship, I am better capable of designing, understanding, and implementing my own MRI studies on Siemens systems, equivalent to the scanner at my home institution in Coimbra.”

MEDICAL PHYSICS

Home Institution: Institute of Nuclear Sciences Applied to Health (CIBIT), University of Coimbra | Host Institution: Biomedical Imaging Center, the University of Texas at Austin | Host: Douglas Befroy, Director of the Biomedical Imaging Center, the University of Texas at Austin | Mobility Period: October 4 – December 31, 2022

Jorge Silva
(Associate Professor & Researcher)

The main goal of Jorge's Short-Term Research Internship Program was to propose and explore new joint models for Internet of Things, integrating them with Human in the Loop systems.

“[...] this scientific mission opened new communication channels between the two research groups and will constitute a first step for the identification of common research interests, potentially enabling the strengthening of co-operation.”

Immediate Outputs

- **Paper accepted or published in international peer-reviewed (proceedings) Conferences | Sanchez, O. T., Raposo, D., Rodrigues, A., Boavida, F., Marculescu, R., Chen, K., & Sa Silva, J. (2023). An IIoT-Based Approach to the Integrated Management of Machinery in the Construction Industry. In IEEE Access (Vol. 11, pp. 6331–6350). Institute of Electrical and Electronics Engineers (IEEE). https://doi.org/10.1109/access.2023.3236254**
- **Joint Project Application (2022 ERP Call)**

ADVANCED COMPUTING

Home Institution: Electrical and Computer Engineering Department (DEEC), University of Coimbra & INESC Coimbra | Host Institution: Department of Electrical and Computer Engineering, Cockrell School of Engineering, the University of Texas at Austin | Host: Radu Marculescu, Professor of Electrical & Computer Engineering at Cockrell School of Engineering, the University of Texas at Austin | Mobility Period: October 13 – December 14, 2022

Strand Education: Building Human Capital

Short-Term Research Internships

Maria Gonçalves
(PhD Student)

The main goal of Maria's Short-Term Research Internship Program was to obtain the mechanical properties of the breast.

> This internship was a unique experience that allowed me to work with collaborative, welcoming, and open-minded researchers and learn a great deal in areas distinct from my academic background in a university with excellent working conditions. Additionally, Austin is a vibrant, welcoming city with great places and events to visit.

Immediate Output

Paper accepted or published in international peer-reviewed (proceedings) Conferences | Maria C.T. Gonçalves, Michael R. Haberman, Emily Porter, Raquel C. Conceição. Development of Mechanically and Dielectrically Realistic Breast Models for Microwave Therapy and Healing Simulations. European Conference of Antennas and Propagation (EuCAP 2023)

MEDICAL PHYSICS

Home Institution: Institute of Biophysics and Biomedical Engineering, University of Lisbon | Host Institution: Engineering Education and Research Center, Cockrell School of Engineering, the University of Texas at Austin | Host: Emily Porter, Assistant Professor at Cockrell School of Engineering, the University of Texas at Austin | Mobility Period: October 3 – December 16, 2022

Mariana Miranda
(PhD Student & Researcher Assistant)

The main goal of Mariana's Short-Term Research Internship Program was to further advance her research on how to improve the Quality-of-Service of storage systems and HPC centers.

> This was an enriching experience, at both the professional and personal levels, which allowed me to get deeper insights into what it means to work in HPC.

Immediate Output

Paper accepted or published in international peer-reviewed (proceedings) Conferences | Macedo, R., Miranda, M., Tanimura, Y., Haga, J., Ruhela, A., Harrell, S. L., Evans, R. T., Pereira, J., & Paulo, J. (2023). Taming Metadata-intensive HPC Jobs Through Dynamic, Application-agnostic QoS Control. In CCGRID 2023 |

ADVANCED COMPUTING

Home Institution: INESC TEC and University of Minho | Host Institution: Texas Advanced Computing Center, the University of Texas at Austin | Host: John Cazes, Director Of High-Performance Computing at Texas Advanced Computing Center, the University of Texas at Austin | Mobility Period: October 1 – December 16, 2022

Strand Education: Building Human Capital

Short-Term Research Internships

Mário Vieira
(Consultant)

The main goal of Mário's Short-Term Research Internship Program was to develop the architecture of a decision tool for the planning of maintenance procedures of floating offshore wind farms and a state-of-art routine for the acquisition and processing, using deep learning, of its satellite imagery

> This short-term internship served to lay the foundation for what we hope to be a long-term partnership between Portuguese R&D institutions from the offshore renewable sectors and UT Austin.

Immediate Output

Joint Project Application (2022 ERP Call)

SPACE-EARTH INTERACTIONS

Home Institution: +ATLANTIC CoLab | Host Institution: Walker Department of Mechanical Engineering, Cockrell School of Engineering, the University of Texas at Austin | Host: Dragan Djurdjanovic, Accenture Endowed Professorship in Manufacturing Systems Engineering at Cockrell School of Engineering, the University of Texas at Austin | Mobility Period: September 29 – December 17, 2022

Tiago Ribeiro
(PhD Student)

The main goal of Tiago's Short-Term Research Internship Program was to build and test an alternating magnetic field device and to test its efficacy for magnetic hyperthermia.

> My visit to the University of Texas at Austin was very helpful, productive, and pleasant. I was able to learn new technologies and further my knowledge in the field of physics. I was also able to improve on my PhD work and participate in other projects. Moreover, I am very thankful to the BioPhotonics group at the UTAustin, specially to Professor James Tunnell and Doctor Jason King, for welcoming me and for teaching me all these new techniques. I was able to see how the group works and how they interact which provided me with new ideas for knowledge transfer. I hope that in the future I can employ some of them within my Portuguese group.

NANOTECHNOLOGIES

Home Institution: Institute for Research and Innovation in Health (i3S) | Host Institution: Biomedical Engineering, Cockrell School of Engineering, the University of Texas at Austin | Host: James Tunnel, Associate Professor at Cockrell School of Engineering, the University of Texas at Austin | Mobility Period: September 29 – December 17, 2022

Strand Education: Building Human Capital

2022 Training Activities

Portfolio Overview

The Program's 2022 training season kicked out in January with the online course 2D Materials for Biomedical Applications, under the scientific coordination of Artur Pinto (LEPABE – Faculty of Engineering of the University of Porto, Portugal) and Jean Anne Incorvia (The University of Texas at Austin, USA). Designed to give in-depth coverage of the extensive library of 2D materials and pinpoint potential applications in healthcare, the course also shed light on some of the theoretical foundations and research challenges underpinning the work Pinto and Incorvia would be tapping into on their about-to-start 2021 Exploratory Research Project (2D-Therapy) New 2D nanomaterials for cancer phototherapy and immunotherapy. 278 people from 22 countries registered for the course to learn what it takes to bring innovative 2D materials into disease diagnosis and treatment.

After the success of the 1st BigHPC Webinar Series which ended in January 2022 with a talk on Software-defined Scientific Visualization, the Program and the consortium of the 2019 Strategic Research Project BigHPC returned with the second round of webinars, planned to run every two months from March 2022 to March 2023. The second series, Towards a New Generation of Big Data & HPC Applications, debuted on March 10 with a talk by Samuel Bernardo, Software Engineer at BigHPC's partner Laboratório de Instrumentação e Física Experimental de Partículas (LIP) and moderation by Bruno Antunes, Research and Development Manager at Wavecom, the Portuguese SME leading the BigHPC project.

This second webinar series broke away from the 1st Webinar Series On the Road to HPC: Major Challenges and New Opportunities as it staged talks on concrete applications of High-Performance Computing and Big Data.

Another sucessful training activity hosted in 2021 that was reedited in 2022 was the Online Advanced Course on Biomedical Imaging. In the 2022 edition, the Program took a different role, acting as the course's main organiser along with the Faculty of Medicine of the University of Coimbra (FMUC), charged with syllabus design.

The International Partnership had been invited by Maria Filomena Botelho, Director of the Biophysics Institute of FMUC and Area Director for Medical Physics, to come aboard and put together two thematic sessions coordinated by Narayan Sahoo, from The MD Anderson Cancer Center.

Covering state-of-the-art research on PET (Positron Emission Tomography) and Proton Therapy, the two sessions featured experts from the Progam's community in Houston (USA) and Heidelberg (Germany) and showcased two projects the Program had been funding: TOF-PET for Proton Therapy and AT@PT – Automatic Treatment Planning for Proton Therapy. The course kicked off in March and culminated with an examination for attendees wishing to obtain credits under the European Credit Transfer System (ECTs).

The MACC User Group Workshop, in short MUG, premiered in 2021 as an event organized by the Minho Advanced Computing Centre (MACC).

Strand Education: Building Human Capital

2022 Training Activities

In 2022, UT Austin Portugal was one of the main sponsors and organizers of MUG's 2nd edition, which gathered in Porto around 70 people, from experts to users and potential users, to get them looking into the upcoming challenges of the HPC sector - from green supercomputing to educating developers and users in Advanced Computing- and how MACC and its community are preparing for them.

Among the panel of invited speakers were John D. McCalpin and Melyssa Fratkin, both from the Texas Advanced Computing Center of The University of Texas at Austin (TACC). John gave a talk on Energy Efficiency in Computer Architecture: From Transistors to Data Centers, while Melyssa delved into the Challenges of Industry Partnerships with HPC centres.

UT Austin Portugal Program's collaboration with TACC was pivotal to placing Portugal at the forefront of research and innovation in the European HPC landscape through the creation of MACC. Thanks to the Program, in 2019, the country became home to one of the best-performing supercomputers in Europe, brought from TACC to MACC. TACC's Stampede 1 supercomputer, renamed BOB, played a key role in Portugal's successful application to the EU HPC Joint Undertaking to host Deucalion, an even more powerful supercomputer that will push the envelope of the country's computational capabilities in the European landscape while ensuring the country meets the European Green Deal targets.

Space Exploration relies on several fields of knowledge, such as medicine, robotics, geology, and astronomy, among many others.

With that in mind, on July 7, just five days before the fascinating first Jason Webb Space Telescope images came public, top-notch experts met at the Porto School of Engineering for the SOE'22 Workshop – Space, Ocean and Earth Insights | Bio, Geo and Tek come together to discuss the current frontier of Space Exploration – to navigate the interdisciplinary research that is feeding into Space Exploration and reflect on its future.

The main takeaways from this 5-hour workshop can be summed up in the following ideas: it is essential to make Space accessible to all nations, communities and generations and use Space Exploration to solve the most pressing challenges humankind is confronted with, from climate change to space pollution.

Strand Education: Building Human Capital

2022 Training Activities

Area	Training/Mode of Delivery	Co-Organizers	Date	Training Hours	Registered Participants
Nanotechnologies	Workshop 2D Materials for Biomedical Applications / Online	Artur Pinto, University of Porto, PT Jean Anne Incorvia, The University of Texas at Austin, USA	27/01/2022 - 28/01/2002	6	278
Advanced Computing	On the Road to HPC: Major Challenges and New Opportunities Webinar Series #4: Software Defined Scientific Visualization / Online	João Paulo Rodrigues, INESC TEC, PT	20/01/2022 - 20/01/2022	1	32
Advanced Computing	Towards a New Generation of Big Data & HPC Applications 2nd BigHPC Webinar Series Webinar 1: Linking GitOPS towards fast innovation over BigHPC / Online	João Paulo Rodrigues, INESC TEC, PT	10/03/2022 - 10/03/2022	1	114 (total number of participants for the 2nd BigHPC Webinar Series)
Medical Physics	Online Advanced Course on Biomedical Imaging 2022 / Online	Maria Filomena Botelho, University of Coimbra, PT Francisco Caramelo, University of Coimbra, PT Narayan Sahoo, The University of Texas MD Anderson Cancer Center, USA Margarida Abrantes, University of Coimbra, PT Salomé Pires, University of Coimbra, PT	11/03/2022 - 17/06/2022	59.5	247
Advanced Computing	Towards a New Generation of Big Data & HPC Applications 2nd BigHPC Webinar Series Webinar 2: User-level Software-Defined Storage Data Planes / Online	João Paulo Rodrigues, INESC TEC, PT	05/05/2022 - 05/05/2022	1	114 (total number of participants for the 2nd BigHPC Webinar Series)
Space-Earth Interactions	SOE'22 | Space, Ocean and Earth Insights / On-site	Ana Pires, INESC TEC, PT Rui Moura, INESC TEC, PT Paula Lima, INESC TEC, PT	07/07/2022 - 07/07/2022	5	123
Advanced Computing	MUG: MACC User Group Workshop / On-site	Rui Oliveira, University of Minho, INESC TEC, MAAC, PT	07/07/2022 - 08/07/2022	14	53
Advanced Computing	Towards a New Generation of Big Data & HPC Applications 2nd BigHPC Webinar Series Webinar 3: Building High-Performance Storage Systems for Persistent Memory / Online	João Paulo Rodrigues, INESC TEC, PT	14/07/2022 - 14/07/2022	1	114 (total number of participants for the 2nd BigHPC Webinar Series)
Advanced Computing	Towards a New Generation of Big Data & HPC Applications 2nd BigHPC Webinar Series Webinar 4: Experiments in implementing the BigHPC Virtual Manager / Online	João Paulo Rodrigues, INESC TEC, PT	22/09/2022 - 22/09/2022	1	114 (total number of participants for the 2nd BigHPC Webinar Series)
Advanced Computing	Towards a New Generation of Big Data & HPC Applications 2nd BigHPC Webinar Series Webinar 5: Monitoring in BigHPC: Lessons Learned / Online	João Paulo Rodrigues, INESC TEC, PT	17/11/2022 - 17/11/2022	1	114 (total number of participants for the 2nd BigHPC Webinar Series)

Strand Education: Building Human Capital

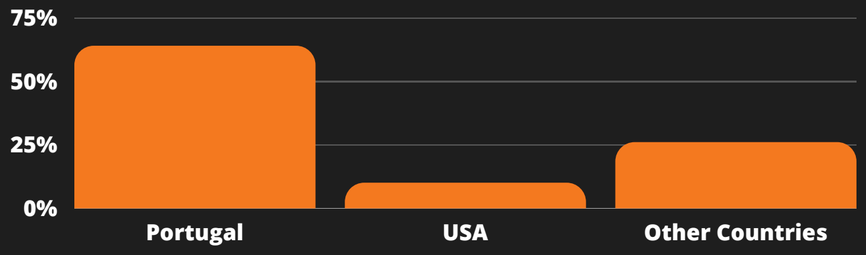
2022 Training Activities

847
Registered Participants

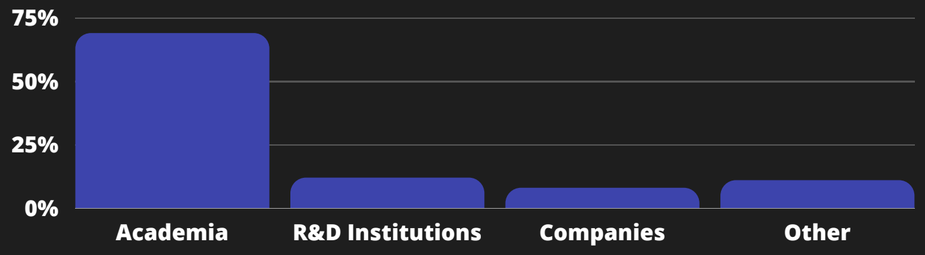
90,5
Hours

57
Countries

Registered Participants by Country of Home Institution



Registered Participants by Type of Home Institution



Strand Education: Building Human Capital

Other Educational Activities

Women in STEM

Raising our community awareness about gender diversity in STEM research, July 6, Porto

On July 6, the UT Austin Portugal Program organized a talk about Women in STEM at the headquarters of INESC TEC and open to anyone with a genuine interest in gender-related matters. In a very informal, relaxed and open-minded setting, Ana Freitas from AMONET (Portuguese Association for Women in Science) and Melyssa Fratkin from The Texas Advanced Computing Center (TACC) at The University of Texas at Austin shared insights about a topic which is nothing but light: women's representation in science, in particular in STEM fields.

The event was structured to favour discussion between the two speakers and the audience, predominantly composed of women – perhaps an indication that in the gender debate, women remain the most affected by gender biases. Ana focused on the underrepresentation of women in STEM in Portugal, while Melyssa gave the audience a picture of the situation in High-Performance Computing in industry, academia and government across Texas. Graça Barbosa, a Member of the Board of Directors of INESC TEC, served as the moderator.

Both Ana and Melyssa agreed that women have been making their way to gain more visibility and take leadership roles in areas of science historically reserved for men. Nevertheless, gender stereotypes, educational models, male-dominated cultures and fewer role models are some of the factors perpetuating the gender gap and preventing modern societies from becoming more equitable and fairer.

The Program's Footprint in Energy Transition

Bracing for a Cleaner Future with Science at Ciência 2022 - May 16, Lisbon

How is UT Austin Portugal contributing to speeding up energy transformation? This was the main question driving the 90-minute workshop organized by the International Partnership at Ciência 2022. In attendance were four speakers from Portugal and UT Austin. Their presentations showed that energy transition is a pathway convoking many fields of knowledge and actors and that the Program has been playing, directly and indirectly, a part in this change towards a zero-carbon economy.

The session started with the opening remarks from José Manuel Mendonça, the Program's National Director. Then, Brian Korgel, Director of UT Austin's Energy Institute and UT Austin Portugal's Area Director for Nanotechnologies, talked the audience through new approaches to solve the world's greatest energy and climate challenges. Lance Manuel and Javad Mohammadi, Principal Investigators of UT Austin Portugal's Projects SOS-WindEnergy and ML@GridEdge, respectively, highlighted the projects' outcomes and future perspectives.

The session closed with a presentation by Carlos Silva, on Deucalion, MACC's new sustainable supercomputer. Silva, a researcher at INESC TEC, talked about the project Sustainable HPC and how MACC's Deucalion will support the development and application of the global principles of green computing. This supercomputing center is one of the Program's most important contributions to the country.

Ciência 2022 is an annual meeting promoted by the Portuguese Foundation for Science and Technology – FCT, in partnership with Ciência Viva and the Committee on Education and Science, with the Portuguese Government's institutional support through the Minister of Science, Technology and Higher Education.

Strand Education: Building Human Capital

Our World-Class Speakers, Training Coordinators, and Hosts in 2022

Aaron Persad
IIAS, USA
SOE'22 | Space, Ocean and Earth Insights

Adrianne Rosales
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022

Alexandra Monteiro
University of Aveiro, Portugal
MUG: MACC User Group Workshop

Alfredo Martins
INESC TEC, Portugal
SOE'22 | Space, Ocean and Earth Insights

Amit Ruhela
TACC, UT Austin, USA
2nd BigHPC Webinar Series

Ana Costa Freitas
AMONET, Portugal
Women in STEM Talk

Ana Cristina Santos
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Ana Pires
INESC TEC, Portugal
SOE'22 | Space, Ocean and Earth Insights

Anders Jensen
EuroHPC Joint Undertaking, Luxembourg
MUG: MACC User Group Workshop

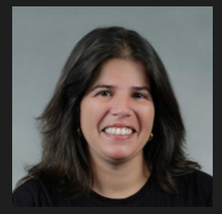
Andreia Oliveira
FEUP, Portugal
SOE'22 | Space, Ocean and Earth Insights

António Cunha
CCDR-N, Portugal
MUG: MACC User Group Workshop

António Sousa
INESC TEC, Portugal
MUG: MACC User Group Workshop

Artur Pinto
University of Porto, Portugal
Workshop 2D Materials for Biomedical Applications

Augusto Silva
University of Aveiro, Portugal
Online Advanced Course on Biomedical Imaging 2022



Bárbara Oliveiros
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Brian Belardi
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022

Brian Korgel
UT Austin, USA
Workshop 2D Materials for Biomedical Applications and Ciência 2022

Bruno Antunes
Wavecom, Portugal
2nd BigHPC Webinar Series

Carlos Rojas
IST, Portugal
MUG: MACC User Group Workshop

Carlos Silva
IST, Portugal
MUG: MACC User Group Workshop

Carlos Silva
INESC TEC, Portugal
MUG: MACC User Group Workshop and Ciência 2022

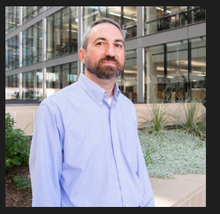
Catarina Guerreiro
National Scientific Computing Unit, FCT, Portugal
MUG: MACC User Group Workshop

Deji Akinwande
UT Austin, USA
Workshop 2D Materials for Biomedical Applications

Dmitry Kireev
UT Austin, USA
Workshop 2D Materials for Biomedical Applications

Douglas Befroy
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022

Dragan Djurdjanovic
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022

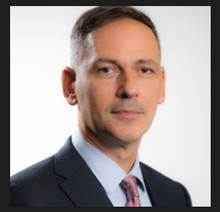


Emanuel Tutuc
UT Austin, USA
Workshop 2D Materials for Biomedical Applications

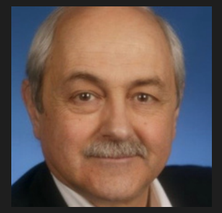
Strand Education: Building Human Capital

Our World-Class Speakers, Training Coordinators, and Hosts in 2022

Emily Porter
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022



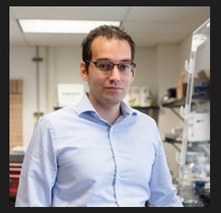
Evangelos Floros
EuroHPC Joint Undertaking, Luxembourg
MUG: MACC User Group Workshop



Fabrizio Gagliardi
Barcelona Supercomputing Center, Spain
MUG: MACC User Group Workshop

Falk Poenisch
MDACC, University of Texas, USA
Online Advanced Course on Biomedical Imaging 2022

Filipe Caseiro Alves
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022



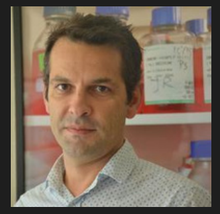
Filippo Mangolini
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022

Francisco Caramelo
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Francisco Santos
FCT, Portugal
MUG: MACC User Group Workshop

Graça Barbosa
INESC TEC, Portugal
Women in STEM Talk

Guilherme Vaz
blueOASIS, Portugal
MUG: MACC User Group Workshop



Henrique Girão
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Inês Nobre Gois
Coimbra Hospital & University Centre, Portugal
Online Advanced Course on Biomedical Imaging 2022

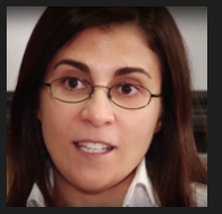
Isabel Prata
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

James Tunnell
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022

Jason Reimuller
IIAS, USA
SOE'22 | Space, Ocean and Earth Insights

Javad Mohammadi
UT Austin, USA
Workshop | The Program's Footprint in Energy Transition (Ciência 2022)

Jean Anne Incorvia
UT Austin, USA
Workshop 2D Materials for Biomedical Applications



Joana Matos
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

João Barbosa
MACC, INESC TEC, University of Minho, Portugal
1st BigHPC Webinar Series & MUG: MACC User Group Workshop

João Nuno Ferreira
FCT, Portugal
MUG: MACC User Group Workshop

João Paulo Rodrigues
INESC TEC, Portugal
1st BigHPC Webinar Series

João Seco
DKFZ, Germany
Online Advanced Course on Biomedical Imaging 2022

John Cazes
TACC, UT Austin, USA
2nd BigHPC Webinar Series & Host, Short-term Research Internships at the UT Austin 2022

John D. McCalpin
UT Austin, USA
MUG: MACC User Group Workshop

Jorge Marques
University of Coimbra, Portugal
MUG: MACC User Group Workshop

José Carlos Lopes
Net4CO2 CoLAB, Portugal
MUG: MACC User Group Workshop

José Manuel Mendonça
INESC TEC, Portugal
SOE'22 | Space, Ocean and Earth Insights & MUG: MACC User Group Workshop

Strand Education: Building Human Capital

Our World-Class Speakers, Training Coordinators, and Hosts in 2022

José Monteiro
INESC-ID, IST, Portugal
MUG: MACC User Group Workshop

José Sereno
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Júlio Costa
Wavecom, Portugal
2nd BigHPC Webinar Series

Lance Manuel
UT Austin, USA
Workshop | The Program's Footprint in Energy Transition (Ciência 2022)

Lori Magruder
UT Austin, USA
SOE'22 | Space, Ocean and Earth Insights

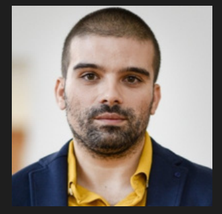
Luís Marques
CF-UM-UP, University of Minho, Portugal
MUG: MACC User Group Workshop

Luís Paulo Santos
INESC TEC, Portugal
MUG: MACC User Group Workshop

Luísa Bastos
University of Porto, Portugal
SOE'22 | Space, Ocean and Earth Insights

Mafalda Laranjo
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Manuela Gonçalo
Surgical Center of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022



Marco Alves
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Margarida Abrantes
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Maria de Fátima Martins
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Maria Filomena Botelho
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Maria João Viamonte
ISEP, Portugal
SOE'22 | Space, Ocean and Earth Insights

Maria Oliveira
INEB, i3S, Portugal
Workshop 2D Materials for Biomedical Applications

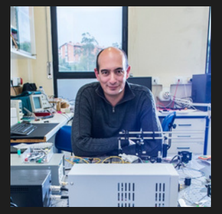
Maria-Ribera Sancho
Barcelona Supercomputing Center, Spain
MUG: MACC User Group Workshop

Marta Rodrigues
LNEC, Portugal
MUG: MACC User Group Workshop

Mateo Valero
Barcelona Supercomputing Center, Spain
MUG: MACC User Group Workshop

Melyssa Fratkin
UT Austin, USA
MUG: MACC User Group Workshop & Women in STEM Talk

Miguel Gonçalves
RTP Magazine, Portugal
SOE'22 | Space, Ocean and Earth Insights



Miguel Morgado
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Miguel Nóbrega
University of Minho, Portugal
MUG: MACC User Group Workshop

Miguel Viana
LIP, portugal
2nd BigHPC Webinar Series

Moriba K. Jah
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022

Narayan Sahoo
MDACC, University of Texas, USA
Online Advanced Course on Biomedical Imaging 2022

Nuno Ferreira
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Strand Education: Building Human Capital

Our World-Class Speakers, Training Coordinators, and Hosts in 2022

Oliver Jäkel
DKFZ, Germany
Online Advanced Course on Biomedical Imaging 2022

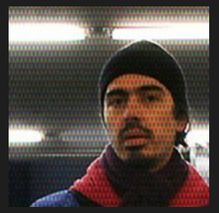
Om Saran
TACC, UT Austin, USA
2nd BigHPC Webinar Series

Osama Mawlawi
MDACC, University of Texas, USA
Online Advanced Course on Biomedical Imaging 2022

Paula Lapa
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Paula Lima
INESC TEC, Portugal
SOE'22 | Space, Ocean and Earth Insights

Paulo Abreu
University of Coimbra, Portugal
MUG: MACC User Group Workshop



Paulo César Simões
Coimbra Hospital & University Centre, Portugal
Online Advanced Course on Biomedical Imaging 2022

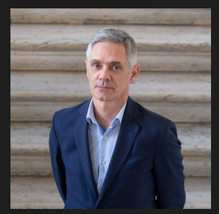
Paulo Crespo
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Paulo Donato
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Pedro Belo Soares
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Radhe Mohan
MDACC, University of Texas, USA
Online Advanced Course on Biomedical Imaging 2022

Radu Marculescu
UT Austin, USA
Host, Short-term Research Internships at the UT Austin 2022



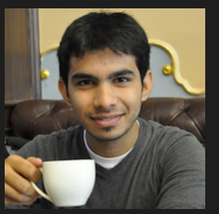
Ricardo Conde
PT Space, Portugal
SOE'22 | Space, Ocean and Earth Insights

Ricardo Macedo
INESC TEC, Portugal
1st BigHPC Webinar Series

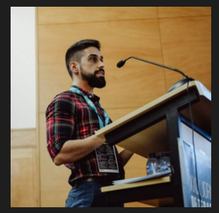
Ricardo Oliveira
University of Aveiro, Portugal
SOE'22 | Space, Ocean and Earth Insights

Ricardo Vilaça
MACC, INESC TEC, University of Minho, Portugal
MUG: MACC User Group Workshop

Rita Nunes
University of Lisbon, Portugal
Online Advanced Course on Biomedical Imaging 2022



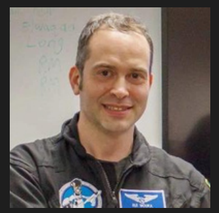
Rohan Kadekodi
UT Austin, USA
2nd BigHPC Webinar Series



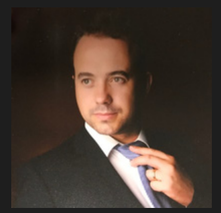
Ruben Gaio
Coimbra Hospital & University Centre, Portugal
Online Advanced Course on Biomedical Imaging 2022

Rui Bernardes
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Rui Brito
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022



Rui Moura
INESC TEC, Portugal
SOE'22 | Space, Ocean and Earth Insights



Rui Oliveira
Coimbra Hospital & University Centre, Portugal
Online Advanced Course on Biomedical Imaging 2022

Rui Oliveira
MACC, INESC TEC, University of Minho, Portugal
MUG: MACC User Group Workshop

Salomé Pires
University of Coimbra, Portugal
Online Advanced Course on Biomedical Imaging 2022

Samuel Bernardo
LIP, Portugal
1st and 2nd BigHPC Webinar Series

Sangamithra Goutham
UT Austin, USA
2nd BigHPC Webinar Series

Strand Education: Building Human Capital

Our World-Class Speakers, Training Coordinators, and Hosts in 2022

Sergi Girona
Barcelona Supercomputing Center, Spain
MUG: MACC User Group Workshop

Simon McIntosh-Smith
University of Bristol, UK
MUG: MACC User Group Workshop

Slavka Andrejkovičová
University of Aveiro, Portugal
SOE'22 | Space, Ocean and Earth Insights

Stefaan Tavernier
PETsys, Portugal
Online Advanced Course on Biomedical Imaging 2022

Stephen Harrell
TACC, UT Austin, USA
2nd BigHPC Webinar Series

Susana Barbosa
INESC TEC, Portugal
MUG: MACC User Group Workshop

Susana Santos
INEB, i3S, Portugal
Workshop 2D Materials for Biomedical Applications

Tânia Esteves
INESC TEC, Portugal
2nd BigHPC Webinar Series

Telmo Geraldes Dias
Instituto Hidrográfico, Portugal
MUG: MACC User Group Workshop

Thomas J. Whitaker
MDACC, University of Texas, USA
Online Advanced Course on Biomedical Imaging 2022

Tiago Oliveira
University of Aveiro, Portugal
MUG: MACC User Group Workshop

Todd Evans
TACC, UT Austin, USA
1st BigHPC Webinar Series

Xintong Li
UT Austin, USA
Workshop 2D Materials for Biomedical Applications

Yvette Gonzalez
IIAS, Germany
SOE'22 | Space, Ocean and Earth Insights

Zhengrong Cui
MDACC, University of Texas, USA
Host, Short-term Research Internships at the UT Austin 2022

123 Experts from 31 Institutions and 6 Countries

6

STRAND RESEARCH: SEED FUNDING FOR GAME-CHANGING RESEARCH

Strand Research: Seed Funding for Game-changing Research

Overview

The Program's Research Instrument funds, supports and monitors collaborative transatlantic projects on emerging and transformative R&D topics with global resonance.

It is structured around competitive calls open to the Portuguese community (in partnership with UT Austin), managed by FCT alone or alongside other sponsors, and anchors on two different types of projects which ensure a wall-to-wall approach to the knowledge-to-value chain: Exploratory Research Projects and Strategic Research Projects.

Project proposals are assessed by international independent evaluation panels officially appointed by FCT or ANI'l to ensure alignment with the sponsors' standards and requirements and the adequate handling of conflicts of interest, should they arise.

As highlighted in previous reports, the Program's project portfolio in Phase 3 has created science-based knowledge for current and emerging societal needs well-known to Portugal. To address such needs, which have a global resonance, science and technology are essential. Combined with Portugal's unique assets, they give the country the necessary conditions to take a more prominent role in spurring borderless groundbreaking solutions. For reporting purposes, Phase 3 research projects have been grouped into four application areas: Health, Competitive and Cleaner Industries, Climate Change and Energy Transition, and Digital Society.

Funds devoted to joint projects have been thought out to provide an avenue for game-changing research that may lead to new research initiatives and competitive proposals able to leverage additional third-party funding.

Strand Research: Seed Funding for Game-changing Research

Overview

2019 SRPs
TOF-PET for Proton Therapy | ExtreMed | NanoStim | SENTINEL

2019 ERPs
ImmuneNanoVac | AT&PT | TARGET | PIEZOFLEX

2021 ERPs
MagTubeCancer | THER-PBCT | NxGNanoTher | 2D-Therapy

RESEARCH FOR HEALTH

Health is one of the primary recipients of the Program's scientific results through academic and business-led projects. Two scientific areas have been contributing substantially to health research: Nanotechnologies and Medical Physics.

Selected projects are responding to global health priorities from personalized medicine to advanced cancer diagnosis, treatment and remote patient monitoring solutions, ageing-related disabilities or improved vaccine efficacy to mitigate new risks and threats to public health and healthcare systems worldwide.

RESEARCH FOR MORE COMPETITIVE AND CLEANER INDUSTRIES

Research goals range from combining nanomaterials with digital solutions to develop high-performance and long-lasting cutting tools to making electromagnetic interference shielding more flexible, affordable and lighter for vehicle industries where weight reduction is imperative to rolling out technologies reconciling environmental concerns and resource-use efficiency with upgraded industries.

2019 SRPs
MCTool21 | Soft4Sense | GEMIS | NanoCatRed

2019 ERPs
TARGET | COFforH2 | PIEZOFLEX

2021 ERPs
LubEnergy

Strand Research: Seed Funding for Game-changing Research

Overview

2019 SRPs
MAGAL Constellation | uPGRADE

2019 ERPs
SOS-WindEnergy | TARGET

2021 ERPs
MMO | ML@GridEdge

RESEARCH TO TURN THE TIDE ON CLIMATE CHANGE AND FUEL ENERGY TRANSITION

Although experts have warned about the effects of climate change in the present and its implications in the future, there is still a lot to uncover about how we can better monitor climate change and understand its impacts on different ecosystems. Various entities have joined forces to address these challenges from academia to industry, and the UT Austin Portugal Program is no exception.

We have been supporting several projects creating science-based knowledge to mitigate climate change, especially its effects on the ocean, of which 80% remain unexplored. From three-dimensional ocean models to constellations of satellites and space accelerometers that evaluate Earth's gravity to the potential use of decommissioned oil platforms as potential sites for offshore wind energy generation, the Program's Area for Space-Earth Interactions is helping turn the tide on climate change and fuel energy transition.

RESEARCH TOWARDS THE DIGITAL SOCIETY

Europe's digital leadership is highy contingent on a sustainable and resilient digital infrastructure allowing improved connectivity, fast communication, secure data transfers, and storage and processing of large amounts of data generated by multiple sources.

The Program is helping Portugal make the path towards digitalization through its exploratory and industry-driven research, mainly in the area of Advanced Computing but also Nanotechnologies. The ongoing collaboration with UT Austin's Texas Advanced Computing Center (TACC) has placed Portugal at the forefront of research and innovation in the European HPC landscape.

2019 SRPs
BigHPC

2019 ERPs
ACT-PM | PAStor

2021 ERPs
ML@GridEdge | QMETA

Strand Research: Seed Funding for Game-changing Research

Key Activities

In 2022, the Program:

- **Went on monitoring projects through periodic reporting and meetings;**
- **Organized with the National Innovation Agency an Info Session to help consortia spot funding opportunities to continue their collaboration;**
- **Raised visibility of undertaken research work through stories, podcasts and an E-Poster session at the Annual Conference;**
- **Drafted a new Call Announcement and the Terms of Reference for the 2022 Exploratory Research Projects Call;**
- **Disseminated the Call widely and offered matchmaking support. Thirty-nine applications were lodged for a total of eight awards.**

Horizon Europe: exploring funding opportunities for the UT Austin Portugal community

One of the main objectives of the UT Austin Portugal Program is to support disruptive science-based ideas that create solutions to some of society's main challenges. To this end, the Program relies on two funding instruments: one for exploratory research activities and another for closer-to-market research. In addition to its own funding schemes, the Program encourages projects bearing its seal to leverage other funding sources to keep progressing along the knowledge-to-innovation chain.

To prepare projects funded by the Program for such a possibility, the UT Austin Portugal Program, in collaboration with the Portuguese National Innovation Agency (ANI), organized an online Info Session for Principal Investigators of Exploratory and Strategic Research Projects about funding opportunities within Horizon Europe on September 21.

The session was led by João Ribau, ANI's Horizon Europe National Representative and Contact Point. Since the UT Austin Portugal Program is a transatlantic partnership with The University of Texas at Austin, the Horizon Europe National Representative informed participants about how research teams from the United States could take advantage of collaborative opportunities available under this European Commission's funding program.

During the presentation, João Ribau mentioned some of the European Strategies & Initiatives and how the European Innovation Council (EIC) can help bring new ideas to the market. "The EIC wants to finance disruptive technologies, radical solutions, advanced science that can give rise to new markets and solutions for society", said the National Contact Point for Horizon Europe.

In addition to the info session, ANI met with some UT Austin Portugal consortia who had booked individual appointments for tailored advice.

Adapted from news item published on the Program's website.

Strand Research: Seed Funding for Game-changing Research

Key Indicators

In 2022, the Program recorded:

21
Active Research Projects

11
Strategic Projects

10
Exploratory Projects

€ 20,7 M
Total Public Funding

Generating the Following Outcomes as per 2022 reporting instruments:

50 New International Peer-Reviewed Publications(*)
2021: 30

4 New Scientific Jobs
2021: 36

23 New Prototypes
2021: 21

10 New Research Fellowships
2021: 28

82 New Research Works
(48% PhD dissertations)
2021: 84

3 New Patents Submitted
2021: 2

(*) Only Journals and Conferences

Strand Research: Seed Funding for Game-changing Research

List of Active Projects in 2022

Area	Acronym	Principal Investigators	Title	Status	Type of Project	Connection to other initiatives under the Program
Advanced Computing	BigHPC	Bruno Antunes (PT) Vijay Chidambaram (UT Austin) John Cazes (UT Austin)	A Management Framework for Consolidated Big Data and HPC	Ongoing	2019 SRP	Education: BigHPC Webinar Series Education: Short-Term Research Internship (Mariana Miranda - Intern | John Cazes - Host)
Nanotechnologies	ExtreMed	Rosa Romero (PT) Andrew Dunn (UT Austin) Adela Ben-Yakar (UT Austin)	Extreme Ultrashort Pulses for Advanced Medical Applications and Diagnostics	Ongoing	2019 SRP	
Nanotechnologies	GEMIS	Bruno Antunes (PT) Brian Korgel (UT Austin)	Graphene-enhanced Electro-Magnetic interference Shielding	Ongoing	2019 SRP	
Nanotechnologies	MCTool21	Nuno André (PT) Gregory J. Rodin (UT Austin) Filippo Mangolini (UT Austin)	Manufacturing of cutting tools for the 21st century: from nano-scale material design to numerical process simulation	Ongoing	2019 SRP	Research: 2017 ERP Controllub
Nanotechnologies	NanoCatRed	Sérgio Silva (PT) Charles J Werth (UT Austin) Simon M Humphrey (UT Austin)	Novel metallic NANOparticles on NANOstructured supports for oxyanion CATalytic REDuction in water	Ongoing	2019 SRP	
Nanotechnologies	NanoStim	Alfredo Silva (PT) George Biros (UT Austin) Michael A Cullinan (UT Austin)	Nanomaterials for wearable-based integrated biostimulation	Ongoing	2019 SRP	
Nanotechnologies	SENTINEL	Rui Sousa (PT) James Tunnell (UT Austin)	Novel injectable biosensor for continuous remote monitoring of cancer patients at high-risk of relapse	Ongoing	2019 SRP	
Nanotechnologies	Soft4Sense	Ricardo Alexandre (PT) Rui Huang (UT Austin) Kenneth M. Liechti (UT Austin)	Smart Surfaces for Reliable Tooling Integration	Ongoing	2019 SRP	
Space-Earth Interactions	MAGAL Constellation	Arlindo Marques (PT) Byron D. Tapley (UT Austin) Patrick Heimbach (UT Austin)	Setting the cornerstone of a future ocean and climate change monitoring constellation, based on radar altimeter data combined with gravity and ocean temperature and salinity measurements	Ongoing	2019 SRP	
Space-Earth Interactions	uPGRADE	Tiago Hormigo (PT) Byron Tapley (UT Austin) Brandon Jones (UT Austin)	Miniaturized Prototype for GRavity field Assessment using Distributed Earth-orbiting assets	Ongoing	2019 SRP	

Strand Research: Seed Funding for Game-changing Research

List of Active Projects in 2022

Area	Acronym	Principal Investigators	Title	Status	Type of Project	Connection with other initiatives under the Program
Medical Physics	TOF-PET for Proton Therapy (TPPT)	Stefaan Tavernier (PT) Karol Lang (UT Austin) Narayan Sahoo (UT Austin)	In-beam Time-of-Flight (TOF) Positron Emission Tomography (PET) for proton radiation therapy	Ongoing	2019 SRP	
Medical Physics	AT@PT	Joana Dias (PT) Radhe Mohan (UT Austin)	Automatic Treatment Planning for Proton Therapy: Investigations of Robustly Optimized Intensity Modulated Proton Therapy Incorporating LET/RBE Criteria and Physical and Biological Uncertainties	Concluded	2019 ERP	
Nanotechnologies	PIEZOFLEX	Paula Ferreira (PT) Donglei (Emma) Fan (UT Austin)	High-performance piezoelectric flexible materials enabled by hierarchically porous graphite for application as mechanical energy harvesters and sensors	Concluded	2019 ERP	
Nanotechnologies	2D-Therapy	Artur Pinto (PT) Jean Anne Incorvia (UT Austin)	New 2D nanomaterials for cancer phototherapy and immunotherapy	Ongoing	2021 ERP	Education: 2D Materials for Biomedical Applications Course
Nanotechnologies	LubEnergy	Fábio Ferreira (PT) Fillippo Mangolini (UT Austin)	Engineering Lubricious Interfaces for Enhancing Energy Efficiency	Ongoing	2021 ERP	Education: Short-term Research Internship (Fábio Ferreira - Intern; Filippo Mangolini - Host)
Nanotechnologies	MagTubeCancer	Marta Laranjeira (PT) James Tunnell (UT Austin)	Magnetic Nanoparticles For Cancer Therapy: Collection And Elimination of Circulating Tumor Cells	Ongoing	2021 ERP	Research: Joint Proposal to 2022 ERP Call
Advanced Computing	ML@GridEdge	Pedro Moura (PT) Javad Mohammadi (UT Austin)	Distributed Machine Learning Solutions for Coordinating Distributed Energy Resources at the Edge of the Power Grid	Ongoing	2021 ERP	
Space-Earth Interactions	MMO	Leonardo Azevedo (PT) Tan Bui-Thanh (UT Austin)	Multi-source Modelling of The Ocean: Coupling Earth Observations with Acoustic Waves	Ongoing	2021 ERP	Education: Advanced Computer Training Program (Leonardo Azevedo - Intern | Tan Bui-Than - Host)
Nanotechnologies	NxGNanoTher	Helena Florindo (PT) Nicholas Peppas (UT Austin)	Next-generation Nanomaterials to Sensitize Breast Cancer to Immunotherapy	Ongoing	2021 ERP	Research: 2019 ERP ImmuneNanoVac
Nanotechnologies	QMETA	Paloma Huidobro (PT) Yuebing Zheng (UT Austin)	Realising Quantum METAmaterials with Quantum Dot Arrays	Ongoing	2021 ERP	
Medical Physics	THER-PBCT	António Paulo (PT) Chun Li (UT Austin)	Theranostic Strategy for Proton Boron Capture Therapy of Pancreatic Cancer	Ongoing	2021 ERP	

Strand Research: Seed Funding for Game-changing Research

Our Publications

The projects the Program supports are producing scientific outputs(*) to the best standards

2019 SRP | Soft4Sense
Morovati, V., Xue, Z., Liechti, K. M., & Huang, R. (2022). Interlayer coupling and strain localization in small-twist-angle graphene flakes. In Extreme Mechanics Letters (Vol. 55, p. 101829). Elsevier BV. https://doi.org/10.1016/j.eml.2022.101829

2019 SRP | TOFPET
Coelho, C. M., Pereira, L., Teubig, P., Santos, P., Mendes, F., Viñals, S., Galaviz, D., & Herrera, F. (2022). Radiation as a Tool against Neurodegeneration—A Potential Treatment for Amyloidosis in the Central Nervous System. In International Journal of Molecular Sciences (Vol. 23, Issue 20, p. 12265). MDPI AG. https://doi.org/10.3390/ijms232012265

2019 SRP | TOFPET
Marques, A., Belchior, A., Silva, F., Marques, F., Campello, M. P. C., Pinheiro, T., Santos, P., Santos, L., Matos, A. P. A., & Paulo, A. (2022). Dose Rate Effects on the Selective Radiosensitization of Prostate Cells by GRPR-Targeted Gold Nanoparticles. In International Journal of Molecular Sciences (Vol. 23, Issue 9, p. 5279). MDPI AG. https://doi.org/10.3390/ijms23095279

(*) Papers in International Peer-Reviewed Journals and Conferences Reported in 2022

2019 SRP | TOFPET
Silva, F., D'Onofrio, A., Mendes, C., Pinto, C., Marques, A., Campello, M. P. C., Oliveira, M. C., Raposinho, P., Belchior, A., Di Maria, S., Marques, F., Cruz, C., Carvalho, J., & Paulo, A. (2022). Radiolabeled Gold Nanoseeds Decorated with Substance P Peptides: Synthesis, Characterization and In Vitro Evaluation in Glioblastoma Cellular Models. In International Journal of Molecular Sciences (Vol. 23, Issue 2, p. 617). MDPI AG. https://doi.org/10.3390/ijms23095279

2019 SRP | TOFPET
Silva, F., Mendes, C., D'Onofrio, A., Campello, M. P. C., Marques, F., Pinheiro, T., Gonçalves, K., Figueiredo, S., Gano, L., Ravera, M., Gabano, E., & Paulo, A. (2023). Image-Guided Nanodelivery of Pt(IV) Prodrugs to GRP-Receptor Positive Tumors. In Nanotheranostics (Vol. 7, Issue 1, pp. 22–40). Ivyspring International Publisher. https://doi.org/10.7150/ntno.78807

2019 SRP | TOFPET
Layden, C., Klein, K., Matava, W., Sadam, A., Abouzahr, F., Proga, M., Majewski, S., Nuyts, J., & Lang, K. (2022). Design and modeling of a high resolution and high sensitivity PET brain scanner with double-ended readout. In Biomedical Physics & Engineering Express (Vol. 8, Issue 2, p. 025011). IOP Publishing. https://doi.org/10.1088/2057-1976/ac4f0a

2019 SRP | TOFPET
Lang, K. (2022). Towards high sensitivity and high-resolution PET scanners: imaging-guided proton therapy and total body imaging. In Bio-Algorithms and Med-Systems (Vol. 18, Issue 1, pp. 96–106). Walter de Gruyter GmbH. https://doi.org/10.2478/bioal-2022-0079

2019 SRP | MCTOOL21
Lenzi, V., Cavaleiro, A., Fernandes, F., & Marques, L. (2021). Diffusion of silver in titanium nitride: Insights from density functional theory and molecular dynamics. In Applied Surface Science (Vol. 556, p. 149738). Elsevier BV. https://doi.org/10.1016/j.apsusc.2021.149738

2019 SRP | MCTOOL21
AL-Rjoub, A., Cavaleiro, A., Rajput, S. S., & Fernandes, F. (2021). High Si multilayered TiSiN/TiN(Ag) films with superior oxidation resistance. In Journal of Materials Research and Technology (Vol. 12, pp. 2340–2347). Elsevier BV. https://doi.org/10.1016/j.jmrt.2021.04.040

2019 SRP | NanoCatRed
Costa, J. M. C. B. da, Barbosa, J. R. M., Restivo, J., Orge, C. A., Nogueira, A., Castro-Silva, S., Pereira, M. F. R., & Soares, O. S. G. P. (2022). Engineering of Nanostructured Carbon Catalyst Supports for the Continuous Reduction of Bromate in Drinking Water. In C (Vol. 8, Issue 2, p. 21). MDPI AG. https://doi.org/10.3390/c8020021

2019 SRP | NanoCatRed
Barbosa, J. R. M., Sousa, J. P. S., Restivo, J., Pereira, M. F. R., & Soares, O. S. G. P. (2022). Palladium Impregnation on Electrospun Carbon Fibers for Catalytic Reduction of Bromate in Water. In Processes (Vol. 10, Issue 3, p. 458). MDPI AG. https://doi.org/10.3390/pr10030458

2019 SRP | NanoCatRed
Santos, A. S. G. G., Restivo, J., Orge, C. A., Pereira, M. F. R., & Soares, O. S. G. P. (2022). Synthesis of monometallic macrostructured catalysts for bromate reduction in a continuous catalytic system. In Environmental Technology (pp. 1–16). Informa UK Limited. https://doi.org/10.1080/09593330.2022.2074319

2019 SRP | NanoCatRed
Restivo, J., Pinto Soares, O. S. G., Orge, C. A., & Pereira, M. F. R. (2021). Towards the efficient reduction of perchlorate in water using rhenium-noble metal bimetallic catalysts supported on activated carbon. In Journal of Environmental Chemical Engineering (Vol. 9, Issue 6, p. 106397). Elsevier BV. https://doi.org/10.1016/j.jece.2021.106397

2019 SRP | NanoCatRed
Santos, A. S. G. G., Restivo, J., Orge, C. A., Pereira, M. F. R., & Soares, O. S. G. P. (2022). Design of macrostructured bimetallic MWCNT catalysts for multi-phasic hydrogenation in water treatment with pre- and post-coating metal phase impregnation. In Applied Catalysis A: General (Vol. 643, p. 118790). Elsevier BV. https://doi.org/10.1016/j.apcata.2022.118790

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Our Publications

2019 SRP | ExtreMed
Alonso, B., Torres-Peiró, S., Romero, R., Guerreiro, P. T., Almagro-Ruiz, A., Muñoz-Marco, H., Pérez-Millán, P., & Crespo, H. (2020). Detection and elimination of pulse train instabilities in broadband fibre lasers using dispersion scan. In Scientific Reports (Vol. 10, Issue 1). Springer Science and Business Media LLC. https://doi.org/10.1038/s41598-020-64109-x

2019 SRP | ExtreMed
Salgado-Remacha, F. J., Alonso, B., Crespo, H., Cojocaru, C., Trull, J., Romero, R., López-Ripa, M., Guerreiro, P. T., Silva, F., Miranda, M., L'Huillier, A., Arnold, C. L., & Sola, Í. J. (2020). Single-shot d-scan technique for ultrashort laser pulse characterization using transverse second-harmonic generation in random nonlinear crystals. In Optics Letters (Vol. 45, Issue 14, p. 3925). Optica Publishing Group. https://doi.org/10.1364/ol.397033

2019 SRP | ExtreMed
Sytcevich, I., Guo, C., Mikaelsson, S., Vogelsang, J., Viotti, A.-L., Alonso, B., Romero, R., Guerreiro, P. T., Sola, Í. J., L'Huillier, A., Crespo, H., Miranda, M., & Arnold, C. L. (2021). Characterizing ultrashort laser pulses with second harmonic dispersion scans. In Journal of the Optical Society of America B (Vol. 38, Issue 5, p. 1546). Optica Publishing Group. https://doi.org/10.1364/josab.412535

2019 SRP | GEMIS
Liao, C.-D., Capasso, A., Queirós, T., Domingues, T., Cerqueira, F., Nicoara, N., Borme, J., Freitas, P., & Alpuim, P. (2022). Optimizing PMMA solutions to suppress contamination in the transfer of CVD graphene for batch production. In Beilstein Journal of Nanotechnology (Vol. 13, pp. 796–806). Beilstein Institut. https://doi.org/10.3762/bjnano.13.70

2019 SRP | GEMIS
Faggio, G., Grillo, R., Lisi, N., Buonocore, F., Chierchia, R., Jung Kim, M., Lee, G.-H., Capasso, A., & Messina, G. (2022). Nanocrystalline graphene for ultrasensitive surface-enhanced Raman spectroscopy. In Applied Surface Science (Vol. 599, p. 154035). Elsevier BV. https://doi.org/10.1016/j.apsusc.2022.154035

2019 SRP | GEMIS
Rodrigues, J., Grzonka, J., Fernandes, J., Santos, J., Bondarchuk, O., Ferreira, P., Alpuim, P., & Capasso, A. (2022). Strain-modulated optical response in 2D MoSe2 made by Na-assisted CVD on glass. In Applied Physics Letters (Vol. 120, Issue 21, p. 213104). AIP Publishing. https://doi.org/10.1063/5.0090034

2019 SRP | GEMIS
Fernandes, J., Queirós, T., Rodrigues, J., Nemala, S. S., LaGrow, A. P., Placidi, E., Alpuim, P., Nieder, J. B., & Capasso, A. (2022). Room-temperature emitters in wafer-scale few-layer hBN by atmospheric pressure CVD. In FlatChem (Vol. 33, p. 100366). Elsevier BV. https://doi.org/10.1016/j.flatc.2022.100366

2019 SRP | ExtreMed
Zhou, A., Engelmann, S. A., Mihelic, S. A., Tomar, A., Hassan, A. M., & Dunn, A. K. (2022). Evaluation of resonant scanning as a high-speed imaging technique for two-photon imaging of cortical vasculature. In Biomedical Optics Express (Vol. 13, Issue 3, p. 1374). Optica Publishing Group. https://doi.org/10.1364/boe.448473

2019 SRP | GEMIS
Fernandes, J., Nemala, S. S., De Bellis, G., & Capasso, A. (2022). Green Solvents for the Liquid Phase Exfoliation Production of Graphene: The Promising Case of Cyrene. In Frontiers in Chemistry (Vol. 10). Frontiers Media SA. https://doi.org/10.3389/fchem.2022.878799

2019 SRP | GEMIS
Silva, B. M., Oliveira, J., Rebelo, T., Isfahani, V. B., Rocha-Rodrigues, P., Lekshmi, N., Belo, J. H., Deepak, F. L., Lopes, A. M. L., Araújo, J. P., & Almeida, B. G. (2023). Synthesis, structural and dielectric properties of Ca3Mn2O7 thin films prepared by pulsed laser deposition. In Materials Research Bulletin (Vol. 158, p. 112066). Elsevier BV. https://doi.org/10.1016/j.materresbull.2022.112066

2019 SRP | GEMIS
Baptista, R. M. F., Moreira, G., Silva, B., Oliveira, J., Almeida, B., Castro, C., Rodrigues, P. V., Machado, A., Belsley, M., & de Matos Gomes, E. (2022). Lead-Free MDABCO-NH4I3 Perovskite Crystals Embedded in Electrospun Nanofibers. In Materials (Vol. 15, Issue 23, p. 8397). MDPI AG. https://doi.org/10.3390/ma15238397

2019 SRP | GEMIS
Baptista, R. M. F., Silva, B., Oliveira, J., Isfahani, V. B., Almeida, B., Pereira, M. R., Cerca, N., Castro, C., Rodrigues, P. V., Machado, A., Belsley, M., & Gomes, E. de M. (2022). High Piezoelectric Output Voltage from Blue Fluorescent N,N-Dimethyl-4-nitroaniline Nano Crystals in Poly-L-Lactic Acid Electrospun Fibers. In Materials (Vol. 15, Issue 22, p. 7958). MDPI AG. https://doi.org/10.3390/ma15227958

2019 SRP | NANOSTIM
Lopes, C., Fiedler, P., Rodrigues, M. S., Borges, J., Bertollo, M., Alves, E., Barradas, N. P., Comani, S., Haueisen, J., & Vaz, F. (2021). Me-Doped Ti–Me Intermetallic Thin Films Used for Dry Biopotential Electrodes: A Comparative Case Study. In Sensors (Vol. 21, Issue 23, p. 8143). MDPI AG. https://doi.org/10.3390/s21238143

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Our Publications

2021 ERP | LubEnergy
Fontes, M. A., Serra, R. G. H., Fernandes, F. D., Cavaleiro Rodrigues de Carvalho, A. A., & Ferreira, F. E. de S. (2022). Comparison of mechanical and tribological properties of diamond-like carbon coatings doped with Europium and Gadolinium produced by HiPIMS. In Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture (p. 095440542211365). SAGE Publications. https://doi.org/10.1177/09544054221136528

2021 ERP | NxGNanoTher
Acúrcio, R. C., Pozzi, S., Carreira, B., Pojo, M., Gómez-Cebrián, N., Casimiro, S., Fernandes, A., Barateiro, A., Farricha, V., Brito, J., Leandro, A. P., Salvador, J. A. R., Graça, L., Puchades-Carrasco, L., Costa, L., Satchi-Fainaro, R., Guedes, R. C., & Florindo, H. F. (2022). Therapeutic targeting of PD-1/PD-L1 blockade by novel small-molecule inhibitors recruits cytotoxic T cells into solid tumor microenvironment. In Journal for ImmunoTherapy of Cancer (Vol. 10, Issue 7, p. e004695). BMJ. https://doi.org/10.1136/jitc-2022-004695

2021 ERP | NxGNanoTher
Lei, L., Huang, D., Gao, H., He, B., Cao, J., & Peppas, N. A. (2022). Hydrogel-guided strategies to stimulate an effective immune response for vaccine-based cancer immunotherapy. In Science Advances (Vol. 8, Issue 47). American Association for the Advancement of Science (AAAS). https://doi.org/10.1126/sciadv.adc8738

2021 ERP | NxGNanoTher
Lanier, O. L., Pérez-Herrero, E., Andrea, A. P. D. ', Bahrami, K., Lee, E., Ward, D. M., Ayala-Suárez, N., Rodríguez-Méndez, S. M., & Peppas, N. A. (2022). Immunotherapy approaches for hematological cancers. In iScience (Vol. 25, Issue 11, p. 105326). Elsevier BV. https://doi.org/10.1016/j.isci.2022.105326

2021 ERP | THER-PBCT
Nuez-Martínez, M., Queralt-Martín, M., Muñoz-Juan, A., Aguilella, V. M., Laromaine, A., Teixidor, F., Viñas, C., Pinto, C. G., Pinheiro, T., Guerreiro, J. F., Mendes, F., Roma-Rodrigues, C., Baptista, P. V., Fernandes, A. R., Valic, S., & Marques, F. (2022). Boron clusters (ferrabisdicarbollides) shaping the future as radiosensitizers for multimodal (chemo/radio/PBFR) therapy of glioblastoma. In Journal of Materials Chemistry B (Vol. 10, Issue 47, pp. 9794–9815). Royal Society of Chemistry (RSC). https://doi.org/10.1039/d2tb01818g

2021 ERP | 2D-Therapy
Pires, L. S., Magalhães, F. D., & Pinto, A. M. (2022). New Polymeric Composites Based on Two-Dimensional Nanomaterials for Biomedical Applications. In Polymers (Vol. 14, Issue 7, p. 1464). MDPI AG. https://doi.org/10.3390/polym14071464

2021 ERP | ML@GridEdge
Soares, A., Goncalves, G., & Moura, P. (2022). Management of Energy Storage in Transactive Energy Communities. In 2022 International Conference on Smart Energy Systems and Technologies (SEST). 2022 International Conference on Smart Energy Systems and Technologies (SEST). IEEE. https://doi.org/10.1109/sest53650.2022.9898494

2021 ERP | ML@GridEdge
Mendes, N., Moura, P., Mendes, J., Salles, R., & Mohammadi, J. (2022). Federated Learning Enabled Prediction of Energy Consumption in Transactive Energy Communities. In 2022 IEEE PES Innovative Smart Grid Technologies Conference Europe (ISGT-Europe). 2022 IEEE PES Innovative Smart Grid Technologies Conference Europe (ISGT-Europe). IEEE. https://doi.org/10.1109/isgt-europe54678.2022.9960350

2019 SRP | BigHPC
Macedo, R., Tanimura, Y., Haga, J., Chidambaram, V., Pereira, J., & Paulo, J. (2022, February). PAIO: General, Portable I/O Optimizations With Minor Application Modifications. In Proceedings of the USENIX Conference on File and Storage Technologies (FAST) (pp. 1-13). USENIX.

2019 SRP | BigHPC
TACCL: Guiding Collective Algorithm Synthesis using Communication Sketches. Aashaka Shah, Vijay Chidambaram, Meghan Cowan, Saeed Maleki, Madan Musuvathi, Todd Mytkowicz, Jacob Nelson, Olli Saarikivi, Rachee Singh. To appear in the proceedings of 20th

2019 SRP | BigHPC
Chipmunk: Investigating Crash-Consistency in Persistent-Memory File Systems. Hayley LeBlanc, Shankara Pailoor, Om Saran, Işıl Dillig, James Bornholt, Vijay Chidambaram. Proceedings of European Conference on Computer Systems (EuroSys 2023).

2019 SRP | ExtreMed
Almagro-Ruiz, A., Torres-Peiró, S., Muñoz-Marco, H., Dauliat, R., Jamier, R., Romero, R., Guerreiro, P. T., Cunquero, M., Castro, G., Loza, P., Crespo, H., Roy, P., & Pérez-Millán, P. (2021). Few-cycle all-fiber temporally coherent supercontinuum sources. In P. R. Herman, M. Meunier, & R. Osellame (Eds.), Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXI. SPIE. https://doi.org/10.1117/12.2577641

Strand Research: Seed Funding for Game-changing Research

Our Publications

2019 SRP | ExtreMed
Maibohm, C., Ferreira, R., Silvestre, O. F., Romero, R., Crespo, H., & Nieder, J. B. (2021). Ultra-broadband few-cycle laser pulses for simultaneous multi-color fluorescence microscopy applications via the SyncRGB-FLIM method. In E. Beaurepaire, A. Ben-Yakar, & Y. Park (Eds.), Advances in Microscopic Imaging III. SPIE. https://doi.org/10.1117/12.2615698

2019 SRP | ExtreMed
Herman, P. R., Osellame, R., & Ben-Yakar, A. (Eds.). (2022). Front Matter: Volume 11991. In Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XXII. SPIE. https://doi.org/10.1117/12.2635766

2019 SRP | ExtreMed
Yazgi, S. G., Camli, B., Andrus, L. P., & Ben-Yakar, A. (2022). An improved fluorescence collection method for two-photon imaging endoscopy. In M. J. Suter, G. J. Tearney, & T. D. Wang (Eds.), Endoscopic Microscopy XVII. SPIE. https://doi.org/10.1117/12.2610023

2019 SRP | ExtreMed
Roy, A., & Ben-Yakar, A. (2023). Numerical studies for exploring the effect of cold surface thermal conditions on two-photon brain imaging. In H. W. Kang, R. Sroka, B. L. Ibey, & N. Linz (Eds.), Optical Interactions with Tissue and Cells XXXIII; and Advanced Photonics in Urology. SPIE. https://doi.org/10.1117/12.2609232

2019 SRP | BigHPC
Faria, A., Macedo, R., & Paulo, J. (2021). Pods-as-Volumes. In Proceedings of the Seventh International Workshop on Container Technologies and Container Clouds. Middleware '21: 22nd International Middleware Conference. ACM. https://doi.org/10.1145/3493649.3493653

2019 SRP | SENTINEL
Hashemi, M., King, J., Chen, M., Relvas, M., Aranda, M., Cela, S. A., Dieguez, L., & Tunnell, J. (2022). Machine Learning Model for Multiplexed Surface-Enhanced Raman Scattering Quantification in Skin. In Biophotonics Congress: Biomedical Optics 2022 (Translational, Microscopy, OCT, OTS, BRAIN). Clinical and Translational Biophotonics. Optica Publishing Group. https://doi.org/10.1364/translational.2022.tw3b.7

2019 SRP | GEMIS
Pinto, R. M. R., Sankar Nemala, S., Faraji, M., Capasso, A., & Vinayakumar, K. B. (2022). Inkjet-Printing of Carbon Nano Onions for Sensor Applications in Flexible Printed Electronics. In 2022 IEEE International Conference on Flexible and Printable Sensors and Systems (FLEPS). 2022 IEEE International Conference on Flexible and Printable Sensors and Systems (FLEPS). IEEE. https://doi.org/10.1109/fleps53764.2022.9781548

2019 SRP | ExtreMed
Ben-Yakar, A. (2022). LEAD fluorescence microscopy performing at 0.8 million frames per second for 3D imaging flow cytometry. In M. P. Georges, G. Popescu, & N. Verrier (Eds.), Unconventional Optical Imaging III. SPIE. https://doi.org/10.1117/12.2628699

2019 SRP | NANOSTIM
Franco, T., Henriques, P. R., Alves, P., Varanda Pereira, M. J., Pedrosa, T., Silva, F., Leitão, P., & Oliveira, L. (2022). System Architecture for Home Muscle Rehabilitation Treatment. In Information Systems and Technologies (pp. 305–315). Springer International Publishing. https://doi.org/10.1007/978-3-031-04829-6_27

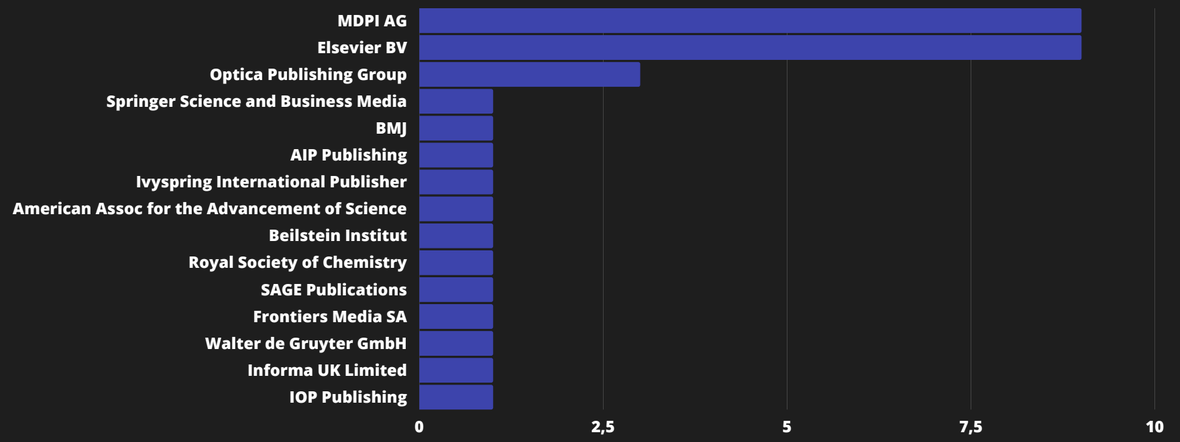
2019 SRP | NANOSTIM
Sestrem, L., Kaizer, R., Gonçalves, J., Leitão, P., Teixeira, J., Lima, J., Franco, T., & Carvalho, J. (2022). Data Acquisition, Conditioning and Processing System for a Wearable-based Biostimulation. In Proceedings of the 15th International Joint Conference on Biomedical Engineering Systems and Technologies. 15th International Conference on Biomedical Electronics and Devices. SCITEPRESS - Science and Technology Publications. https://doi.org/10.5220/0011002300003123

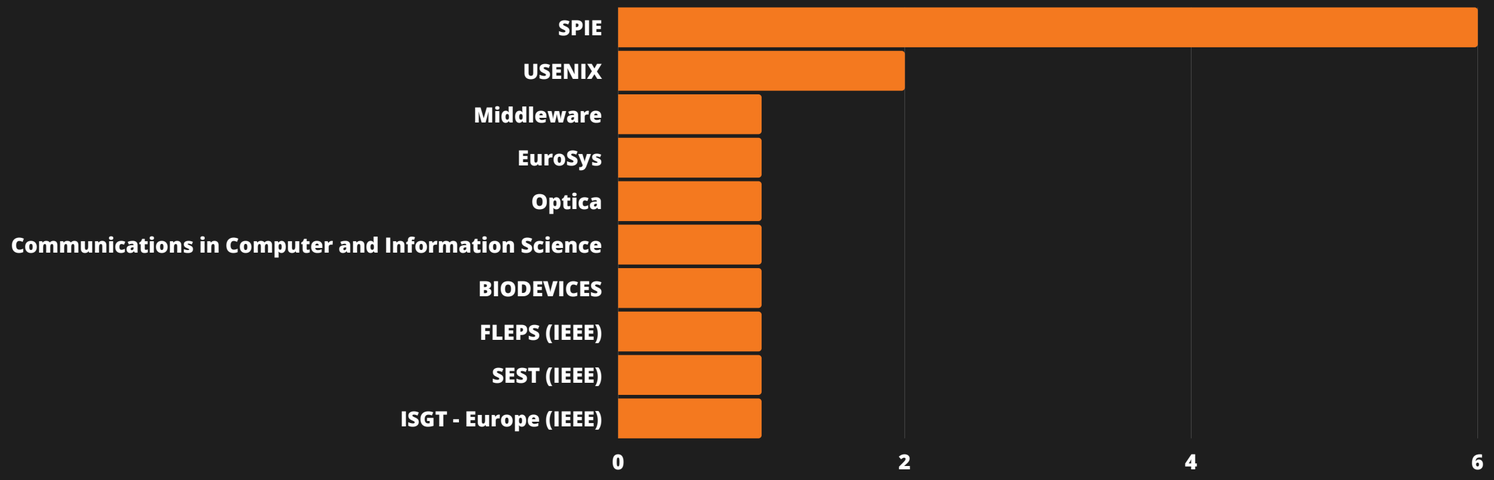
2019 SRP | NANOSTIM
Franco, T., Henriques, P. R., Alves, P., & Pereira, M. J. V. (2021). Approaches to Classify Knee Osteoarthritis Using Biomechanical Data. In Communications in Computer and Information Science (pp. 417–429). Springer International Publishing. https://doi.org/10.1007/978-3-030-91885-9_31

Strand Research: Seed Funding for Game-changing Research

Regarding publications reported in 2022, these were:

The most popular publishers among our project community





The top Conferences among our project community

Strand Research: Seed Funding for Game-changing Research

Students' Works in 2019 SRPs

[BigHPC] Hugo Gião, PhD Student, PT Team: A model-driven approach for DevOp (Ongoing)

[BigHPC] José Emanuel, PhD Student, PT Team: Analysis and Optimisation of the Performance of Strategic Programming based on Zippers (Ongoing)

[BigHPC] Pedro Henrique, PhD Student, PT Team: Quorum management techniques and identities on byzantine fault environments (Ongoing)

[BigHPC] Diogo Ribeiro, PhD Student, PT Team: Non-authoritarive systems of digital identity (Ongoing)

[ExtreMed] Morgana Ferreira, Master's Student, PT Team: Machine Learning approaches for a novel type of biomedical imaging microscopy technique based on the use of ultrafast laser sources (Ongoing)

[ExtreMed] Maria Leonor Ribeiro, PhD Student, PT Team: Development of a novel nanoparticle system for combined photodynamic and immunotherapy of lung cancer characterized in a 3D model by metabolic imaging (Ongoing)

[MCTool21] Princess Stephanie Llanos, Master's Student, PT Team: Tribological and machining performance of TiAlN, TiAlCN and TiAlN/TiAlCN coatings for machining of Ti6Al4V aerospace alloy (Concluded)

[MCTool21] Logan Kirsch, PhD Student, UT Austin Team: Stress-Assisted Diffusion in Thin Layers (Ongoing)

[MCTool21] Nicolas Molina, PhD Student, UT Austin Team: Quantification of Diffusivity in Thin Ceramic Layers (Ongoing)

[NanoCatRed] Chenxu Yan, PhD Student, UT Austin Team: Novel Electrode Fabrication and Reactor Design for Electrocatalytic Nitrate and Nitrite Reduction in Drinking Water Treatment (Ongoing)

[NanoCatRed] Kuan-Lin (Eric) Lee, PhD Student, UT Austin Team: Scaleup of Electrocatalytic Reactors for Bromate and Nitrate Removal From Drinking Water (Ongoing)

[Soft4Sense] M. Aaquib Ansari, PhD Student, UT Austin Team: Optimal Loading Configurations for Extracting Mixed-Mode Cohesive Relations of Interfaces (Ongoing)

[Soft4Sense] Sida Hao, PhD Student, UT Austin Team: Cavitation in Elastomers and Hydrogels (Ongoing)

[Soft4Sense] Ganbin Chen, PhD Student, UT Austin Team: Mechanics of Multilayer van der Waals Materials and Heterostructures (Ongoing)

[TOFPET] António Carvalho, Master's Student, PT Team: Fast algorithms of simulation of the positron-emitting activity generation for multi-beamlet proton therapy treatment plans (Ongoing)

[TOFPET] Margarida Simões, Master's Student, PT Team: Monte Carlo simulation of an in-beam TOF-PET system for range monitoring in proton therapy (Concluded)

[TOFPET] Ana Rita Teixeira, PhD Student, PT Team: Irradiation experiments with X-rays and protons of GBM cells and in assessment of consequent radiobiological effects (Ongoing)

[TOFPET] Bruno Jesus, PhD Student, PT Team: Development of deep learning strategies for image reconstruction optimization (Ongoing)

Strand Research: Seed Funding for Game-changing Research

One of the indicators of the Program's success can be measured by its projects' ability to raise additional funding beyond that offered through the Program's standard funding instruments.

Although these instruments support downstream and upstream research, looking out for other synergistic funding programs is often necessary to get results progressing. One of the challenges faced by our transatlantic teams is that apart from the Program, there are very scarce funding opportunities enabling joint research between Portuguese and US institutions. This means that sometimes teams have to carry on their work separately.

In 2022, the Program's Communications Office wrote a long article on some Phase 3 projects which have successfully led to other research initiatives involving at least one of the Program's PIs (see side text).

The history of ideas or how the UT Austin Portugal Program has leveraged research

The projects we will present here share two common traits: they were supported by the UT Austin Portugal Program, as exploratory projects, and they started from the conviction of researchers who, believing in the potential of their ideas, seized the opportunity and advanced their research. Even if preliminary, the results achieved allowed to validate ideas, consolidate knowledge and promote the submission of new proposals for funding under other sources.

We challenged five researchers to tell us the story behind said projects: from the original idea to the results they achieved gradually - which inspired new proposals and even helped advance patent applications. They also told us how the UT Austin Portugal Program provided good opportunities to get in touch with other research groups, namely at the University of Texas (Austin), and how the joint promotion of projects and the exchange of knowledge and experiences contributed – and still contribute – to advance their work. We went on a journey that took us from nanotechnology to advanced computing, and we were left with one certainty: ideas are the starting point, but the answer to social challenges and the generation of science with impact is motivation.

Since 2018, the UT Austin Portugal Program has allocated roughly €21.8M to fund exploratory and industrial research projects. The industrial sector also participated with €2.1M, namely in terms of R&D co-promotion projects launched for the first time in 2019, under the International Partnerships by the Portuguese Foundation for Science and Technology (FCT). In all, and since its establishment in 2007, the Program has supported more than 80 projects along the value chain. In the case of exploratory research projects, the objective of this international partnership, funded by FCT, is to support joint research work between teams of non-business entities from the Portuguese technological and scientific system and teams from the University of Texas at Austin. This transnational collaborative work consists of scientific projects considered disruptive, with a high potential for progression and impact, but also a certain degree of risk. The DREAM, Electrowave, MECHANO, ACT-PM and ImmuneNanoVac projects are good examples. Evaluated by independent scientific panels who then recommend them for funding under the Program, these projects had such promising results that they encouraged research teams to follow up on the work at hand, capturing new competitive funding inside and outside the Program.

Read Full Article Here.

Strand Research: Seed Funding for Game-changing Research

Examples of Projects in Phase 3 that raised additional funds

UT Austin Portugal Projects	Subsequent Project	Funding Instrument
DREAM (2017 ERP) Carla Cruz, PI in PT Andrew Ellington, PI in Austin	PAPILOMA	Project funded by CENTRO 2020, FEDER, and national funds. This project has also the participations of the company Labfit.
Electrowave (2017 ERP) Ana Moita, PI in PT Vaibhav Bahadur, PI in Austin	COOLSPOT - Interfacial COOLing Strategies for high POwer dissipation conversion Technologies	Project funded by FCT - Fundação para a Ciência e a Tecnologia, I.P. (PTDC/EME-TED/7801/2020)
MECHANO (2017 ERP) Ana Pêgo, PI in PT Laura Suggs, PI in Austin	ASTROTECH - Disruptive materials, technologies & approaches to unravel the role of Astrocytes in brain function and dysfunction: towards to Glial interfaces STRESS - Towards the study of the impact of environmental mechanostimulus on oligodendrocyte precursor differentiation and myelination	Project funded by the European Community's Framework programme Horizon2020, Marie Skłodowska-Curie Actions Air Force Office of Scientific Research, Arlington, US (Grant Number: FA9550-20-1-0417)
ACT-PM (2019 ERP) Miguel Matos, PI in PT Vijay Chidambaram, PI in Austin	Ainur - Evaluation of crash-consistency guarantees in multi-threaded PM applications	Project funded by FCT - Fundação para a Ciência e a Tecnologia, I.P. (PTDC/CCI-COM/4485/2021)
ImmuneNanoVac (2019 ERP) Luís Graça, PI in PT Nicholas A. Peppas, PI in Austin	NxGNanoTher - Next-generation Nanomaterials to Sensitize Breast Cancer to Immunotherapy NanoPanther - Sensitizing pancreatic cancer to immunotherapy with multimodal precision nanomedicines	Project funded by FCT - Fundação para a Ciência e a Tecnologia, I.P. (UTAP-EXPL/NPN/0041/2021) Project funded by "La Caixa" Banking Foundation (LCF/PR/HR19/52160021)

Featured in a long article produced by the Communications Team, these projects have successfully raised additional funding in the course of Phase 3 after their research work was sponsored by the Program's Research instrument.

7

COMPILING 15 YEARS INTO A CONFERENCE: INTERNATIONAL S&T PARTNERSHIPS: PLATFORMS OF SCIENCE DIPLOMACY

Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

+100
Participants

+20
Speakers

1
Keynote Session

3
Round Table Sessions

36
Posters Exhibited

19
UT Austin Portugal projects with Posters

Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

The Conference theme explained:

In today's world, with many of the problems communities and organisations face at the local level calling for globally orchestrated responses - think of climate change or cancer diseases, for instance: they are utterly oblivious of territorial borders - science for/in diplomacy has gained prominence as never before.

For a host of reasons, some may argue that science diplomacy serves, first and foremost, expansionist and selfish ideals rather than genuinely altruistic purposes. At the same time, it would be naïve to think that science diplomacy can be sustainable if detached from (national) self-interests.

However, if we think of "science as a process for pursuing answers" and "diplomacy" as a "process for dialogue and cooperation between countries and citizens, by integrating the two, we can face challenges and take opportunities to advance humanity". [1]

In other words, if both sides of a partnership find common ground – with common ground including the pursuit of social and economic progress through science-based knowledge – then science for/in diplomacy becomes a valuable tool for the good of nat. Scientists will have much to gain from a peaceful and collaborative environment between countries and regions.

In the 2022 edition of its Annual Conference, the Program challenged its community and beyond to reflect on how S&T Partnerships like this FCT Partnership stand in Science Diplomacy.

October 19 | Porto Cruise Terminal, Portugal

10 a.m.	**Check-in and Welcome Coffee**
10.30 a.m.	**Opening Session**
11 a.m.	**International S&T Partnerships: Platforms of Science Diplomacy Round Table**
12 noon	**Contributions of a 15-Year UT Austin Portugal Program to Intelligent Biomaterials for Treatment of Autoimmune Diseases and Cancer Keynote Session**
1.15 p.m.	**Networking Lunch (Courtesy of the Program) & E-Poster Exhibition**
2.45 p.m.	**UT Austin Portugal's Footprint in Technology Commercialization Round Table**
3.50 p.m.	**A Look to the Future: Clean Energy and the UN Sustainable Goals – Notes from the Program's Community**
4.50 p.m.	**Closing Session**
5.10 p.m.	**Afternoon Reception (Courtesy of the Program)**

[1] Source: https://www.aaas.org/programs/center-science-diplomacy/introduction

Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

Vítor Vasconcelos
CIIMAR

José Manuel Mendonça
UT Austin Portugal

John Ekerdt
UT Austin Portugal

Madalena Alves
FCT

Elvira Fortunato
Minister of Science, technology and Higher Education

Luís Lacerda
UCL

Amélia Polónia
FCT

Elsa Henriques
FLAD

Sona Ramesh
United States Embassy Lisbon

Tim Flink
Deutscher Bundestag

Adriano Cerqueira
90 Segundos de Ciência

Brian Korgel
UT Austin

João A.Peças Lopes
FEUP & INESCTEC

João Matos Fernandes
University of Porto

Helena Florindo
University of Lisbon

Nicholas A.Peppas
UT Austin

Marco Bravo
UT Austin Portugal

André E. dos Santos
SWORD Health

Maria Oliveira
UPTEC

Marta Catarino
University of Minho

Verónica Orvalho
Didimo

Joana Mendonça
ANI

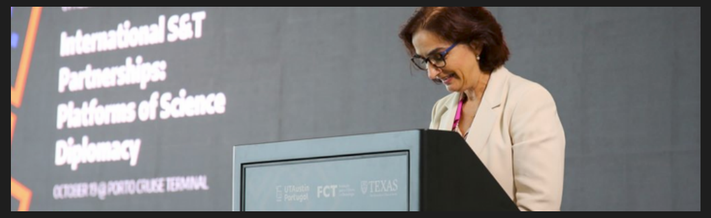
Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

The morning began with the opening speeches of Vítor Vasconcelos (President of CIIMAR), José Manuel Mendonça (Program's National Director), John Ekerdt (Principal Investigator at UT Austin), Madalena Alves (President of the Portuguese Foundation for Science and Technology) and Elvira Fortunato (Minister of Science, Technology and Higher Education).

In different ways, they all underscored the Program's importance to scientific and technological development for the benefit of research communities, companies and society, evidencing the Program's ability to connect with a broader ecosystem across the Atlantic and beyond.

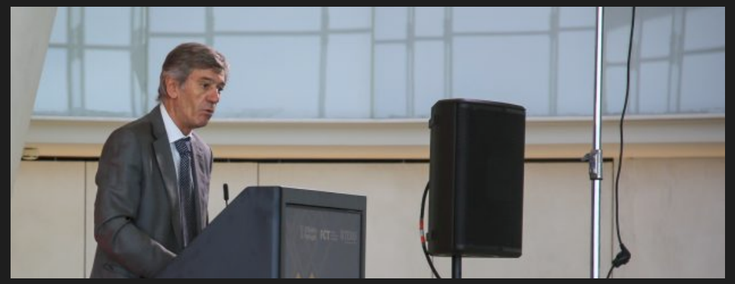
The high point of the Partnership's 15th anniversary was the Annual Conference held on October 19 at the Porto Cruise Terminal, home to the University of Porto's Interdisciplinary Centre of Marine and Environmental Research (CIIMAR). Attendants had the opportunity to learn from top-notch speakers invited to share their views on International Science & Technology Partnerships as platforms for Science Diplomacy, reflect on the Program's entrepreneurship legacy and disruptive contributions to the biomedical field and ideate its role in society's energy transition.

Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

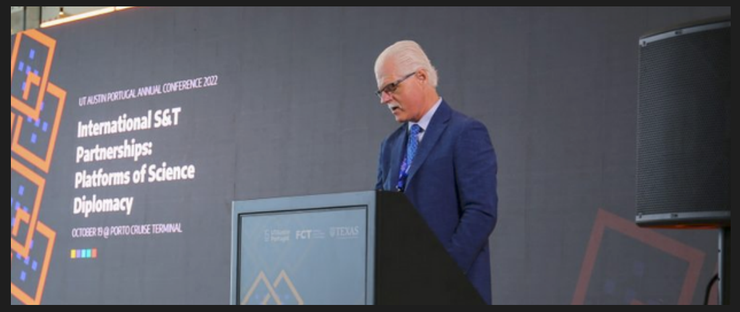


“Thanks to UT Austin Portugal Program we are being able to engage international research and innovation networks, promoting a highly qualified entrepreneurial culture in Portuguese institutions and enabling an expansion of an ecosystem to support research and development activities through national companies in close cooperation and coordination with academia.”
Elvira Fortunato
Minister of Science, Technology and Higher Education

“I believe these international partnerships contributed to step changes in some strategic fields and resulted in capacity building in those areas of research, development and innovation.”
Madalena Alves
President of the Portuguese Foundation for Science and Technology



“I have always believed and still believe in the power that science holds to bring people and nations together to create knowledge for the common good.”
José Manuel Mendonça
UT Austin Portugal National Director (Portugal)



“I think that the importance of this partnership is that it is focusing on technological solutions for large societal problems. We make advances in these technologies and move society forward.”
John Ekerdt
UT Austin Portugal Principal Investigator (UT Austin)

“...the ocean has no borders, except those that are imposed by anthropogenic needs and greed. (...) To tackle global changes and their mitigation we also need global responses and for that, obviously, we need diplomacy. A continuous and sincere dialogue and cooperation between countries and citizens is the only way to face challenges and to take opportunities to advance humanity and, especially, the sustainability of our planet.”
Vítor Vasconcelos
President of CIIMAR

Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

Round Table

This round table set the tone of the Annual Conference, with invited discussants being teased out to ellaborate on the role of science and technology in diplomatic action and policymaking, particularly in support of tackling critical global challenges.

Some of the key messages provided by the guests were how creating science with impact is impossible when researchers shut the door to collaboration. In the era of globalization, transnational research is mandatory as societal issues, such as climate change, cannot be tackled alone and within a country's own borders. Science diplomacy is crucial to breaking down barriers towards coordinated solutions between nations and ensuring a fairer distribution of resources that benefits developing countries.

FCT's joint venture with the University of Texas at Austin gave discussants an opportunity to elaborate on the importance of similar initiatives to enhance international scientific cooperation and strengthen interdisciplinary collective responses to societal missions.

With:

Amélia Polónia
(FCT)

Elsa Henriques
(Luso-American Development Foundation)

Sona Ramesh
(United States Embassy Lisbon)

Tim Flink
(German Parliament)

Luís Lacerda
(University College London)

Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

Contributions of a 15-Year UT Austin Portugal Program to Intelligent Biomaterials for Treatment of Autoimmune Diseases and Cancer Keynote Session

The last session of the morning featured a keynote presentation by Nicholas Peppas, Principal Investigator (PI) of the NxGNanoTher 2021 Exploratory Research Project and an awarded professor from the University of Texas at Austin in the field of drug delivery development. Professor Peppas was introduced by his counterpart at the UT Austin Portugal project, Professor Helena Florindo, Group Leader at the Research Institute for Medicines of the University of Lisbon.

Professor Peppas has been part of UT Austin Portugal's community for a long time, which is why his keynote was a compelling testimonial to the Program's unique contribution to intelligent biomaterials for the treatment of autoimmune diseases and cancer.

Keeping in mind the scientific advances which led to the expansion of the biomedical area, Professor Peppas underscored the importance of several fields working together to solve critical questions in medicine and nanotechnology and pointed out how the Program helped connect people beyond its geographical scope. A notable example was the very successful Interdisciplinary Online Training on Principles, Applications and Nanotechnology Innovation in Pharmaceutical Sciences, Biological Engineering and Medicine, held in 2021, which brought together 290 registered participants from 17 countries.

With:

Nicholas Peppas
(UT Austin)

Helena Florindo
(University of Lisbon)

Keynote Speech Abstract

Engineering the molecular design of intelligent biomaterials by controlling structure, recognition and specificity is the first step in coordinating and duplicating complex biological and physiological processes.

Recent developments in siRNA and protein delivery have been directed towards the preparation of targeted formulations for protein delivery to specific sites, use of environmentally-responsive polymers to achieve pH- or temperature-triggered delivery, usually in modulated mode, and improvement of the behavior of their mucoadhesive behavior and cell recognition. We address design and synthesis characteristics of novel crosslinked networks capable of protein release as well as artificial molecular structures capable of specific molecular recognition of biological molecules. Molecular imprinting and microimprinting techniques, which create stereospecific three-dimensional binding cavities based on a biological compound of interest, can lead to the preparation of biomimetic materials for intelligent drug delivery, drug targeting, and tissue engineering.

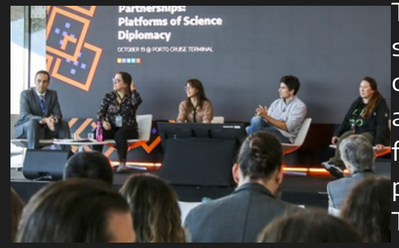
We have been successful in synthesizing novel glucose- and protein-binding molecules based on non-covalent directed interactions formed via molecular imprinting techniques within aqueous media. We have also developed structurally superior materials to serve as effective carriers for siRNA delivery to combat Crohn disease and ulcerative colitis.

Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

UT Austin Portugal's Footprint in Technology Commercialization Round Table

UT Austin Portugal, particularly with its University-Technology-Enterprise Network (UTEN), has generated a deep and significant economic and social impact in Portugal through training and business development activities. From 2007 to 2012, through the development of a country-wide network of technology transfer offices and professionals, UTEN's actions have contributed, at the university level in Portugal, to a 20% increase in patents granted per year, 26% rise in executed licenses per year, a staggering 137% of increased licensing income, and 132% more new academic spinoff companies, 37% of which exported technology to the world, growing at an average annual rate of 127% in revenue.

From 2012 to 2016, with the creation of the Global Startup Program, UTEN had an overall economic impact of $95 million, translated into venture capital captured from U.S. investors, sales, and trials. Three Portuguese companies have been spun out by direct program actions, and these ventures generated 67 qualified jobs with a $35 million wage impact in Portugal. The total economic impact of this initiative during this period raised $130 million, meaning that UTEN's actions returned $40 for every dollar invested by FCT in the Program.



With:

Verónica Orvalho (Didimo)

Marta Catarino (University of Minho)

Maria Oliveira (UPTEC, University of Porto)

André Santos (Sword Health)

Marco Bravo (UT Austin Portugal)

Today, some of the companies supported by UTEN fuel economies, create jobs and foster innovation. They are the perfect example of how founders can create unique commercial products if they find the right support. Therefore, keeping track of the impact of initiatives such as UT Austin Portugal's GSP – which has helped would-be entrepreneurs and company founders take innovation from the lab bench into the (global) market – calls for long-term monitoring and is pivotal to inspiring similar entrepreneurial support approaches.

This round table brought together national talent acknowledged internationally in their areas who have participated in some of the Program's research, technology commercialization and entrepreneurial activities to discuss the Program's contribution to Portugal's current vibrant entrepreneurial and innovation ecosystem.

Marco Bravo, the Program's Executive Director at UT Austin, and himself an entrepreneur and technology commercialization expert, led the panel through an informal but rather juicy conversation packed with helpful, practical advice.

He also got to share his experience dealing with Portuguese entrepreneurs and the common mistakes they make when entering the US to fight for an opportunity.

Those who build startups from scratch don't have it easy. Founders need to grab an academic idea and turn it into a business plan while worrying about funding, managing stakeholders and dealing with the overall job of handling what could soon be a real company.

The panel unanimously agreed on the Program's role in providing tools for Portuguese entrepreneurs to step up their business approach to enter the US and other markets. They also underlined that a business idea, no matter how good, will hardly thrive if wannabe entrepreneurs are not focused, courageous, persistent, and genuinely passionate about pushing ideas forward.

Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

A Look to the Future: Clean Energy and the UN Sustainable Goals – Notes from the Program's Community

Besides inviting the community to reminisce about the Partnership's past years, this conference was also an opportunity to look to the future and how the Program can be a part of it. As climate change and energy-related topics are making the headline and shaping high-level agendas, the Program seized the opportunity to invite experts to bring their insights on the future of clean energy and the UN Sustainable Goals, with Adriano Cerqueira, Producer and Editor at "90 Segundos de Ciência", as moderator.

For the future of decarbonization, electrification, along with the introduction of more renewable sources of energy and optimization, were singled out by Brian Korgel - Director of the UT Austin Energy Institute and one of the Program's Area Director for Nanotechnologies - and João Peças Lopes -Associate Director and Coordinator of the TEC4Energy initiative at the Institute for Systems and Computer Engineering, Technology and Science (INESC TEC) - as necessary components of a broader strategy to achieve clean energy.

However, the experts also argued that the electrification approach should be complemented with other methods since renewable energy storage is still a challenge that needs to be solved. Several storage methods are being developed, and the Program has been contributing through projects in that area for some time now.

With:

Adriano Cerqueira
(90 Segundos de Ciência)

Brian Korgel
(Energy Institute, UT Austin)

João Matos Fernandes
(University of Porto)

João Peças Lopes
(INESC TEC)

Additionally, hydrogen production towards a carbon-free future deserved the panellists' attention, with them agreeing that decarbonization can go hand in hand with the needs of the industry and economy.

About Portugal's ambitions, João Matos Fernandes, Professor at the University of Porto and former Minister for the Environment and Energy Transition, shed light on how the Portuguese Government plans to reach the goal of 80% renewable-based energy consumption earlier than 2030, i.e., by 2026. Fernandes also mentioned that it may be possible for Portugal to become carbon neutral by 2050.

Wrapping up with an eye to the future

Joana Mendonça, President of the Portuguese Innovation National Agency (ANI) at the time, wrapped up the conference. On stage, she underscored the importance of collaborating and having a multidisciplinary approach to complex global challenges and was very clear about ANI's standing on S&T partnerships:

"Our vision at the innovation agency is to transform the future, making the future today by transforming the economy through science... I believe our future has to be built and supported by partnerships like this one."

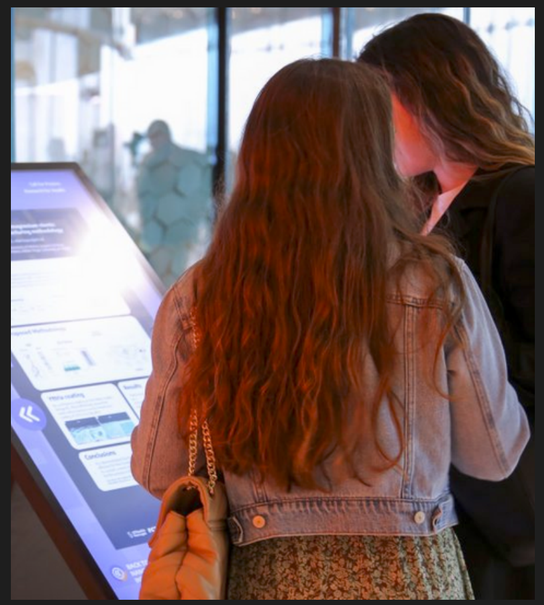
Compiling 15 years into a Conference
International S&T Partnerships: Platforms of Science Diplomacy

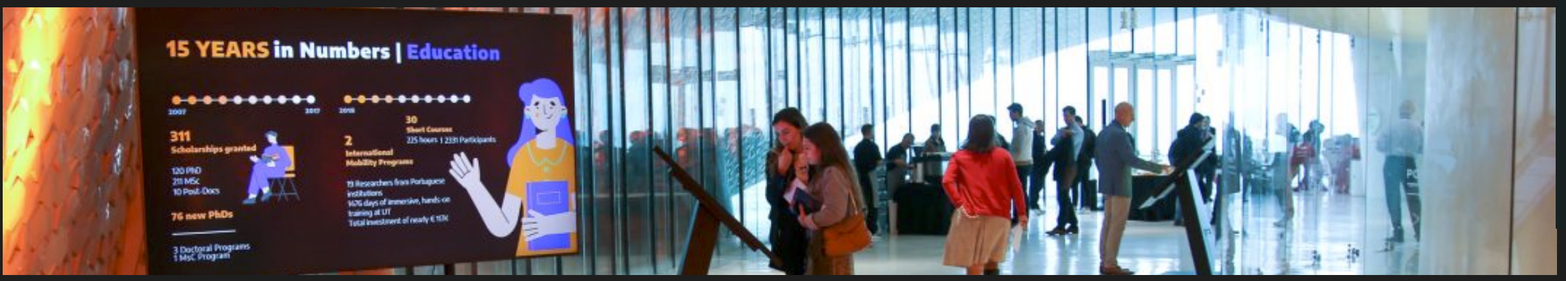
From the lab bench to the screen: the E-Poster Gallery showcased the researchers' scientific contributions to the Program's community

The Conference offered a venue for younger researchers to display their research alongside more senior peers at the Conference E-Poster Gallery.

Two touchscreens strategically located at the entrance of the Conference room sparked participants' curiosity: they gave a glimpse of research work being undertaken across four scientific areas of the Program.

Of the thirty-six posters exhibited, nineteen highlighted results of exploratory and strategic research projects bearing the Program's seal in Phase 3.





SRP 2019	**SENTINEL - Novel injectable biosensor for continuous remote monitoring of cancer patients at high risk of relapse**	Research for Health
SRP 2019	**ExtreMED - Extreme Ultrashort Pulses for Advanced Medical Applications and Diagnostics** **Poster Title: Few-cycle ultra-broadband beam scanning microscope prototype** **Poster Title: ENORA Ultrafast Laser**	Research for Health
SRP 2019	**TOF-PET for Proton Therapy (TPPT) - In-beam Time-of-Flight (TOF) Positron Emission Tomography (PET) for proton radiation therapy** **Poster Title: Time-of-Flight PET for Proton Therapy**	Research for Health
ERP 2021	**NxGNanoTher -Next-generation Nanomaterials to Sensitize Breast Cancer to Immunotherapy** **Poster Title: Next-generation nanomaterials against breast cancer**	Research for Health
ERP 2021	**THER-PBCT - Theranostic Strategy for Proton Boron Capture Therapy of Pancreatic Cancer**	Research for Health
ERP 2021	**MagTubeCancer: Magnetic Nanoparticles For Cancer Therapy: Collection And Elimination Of Circulating Tumor Cells**	Research for Health
ERP 2021	**2DTherapy: New 2D nanomaterials for cancer phototherapy and immunotherapy** **Poster Title: New 2D Nanomaterials For Cancer Phototherapy**	Research for Health
SRP 2019	**NanoCatRed - Novel metallic NANOparticles on NANOstructured supports for oxyanion CATalytic REDuction in water** **Poster Title: Optimizing bimetallic alloy catalysts for the cost-efficient reduction of bromate**	Research for More Competitive and Cleaner Industries
SRP 2019	**MCTool21 -Manufacturing of cutting tools for the 21st century: from nano-scale material design to numerical process simulation** **Poster Title: Modeling diffusi** **Poster Title: Simulation of t**	Research for More Competitive

See full poster list here

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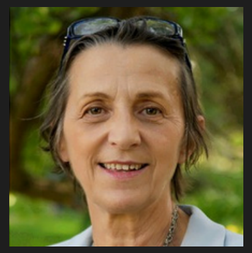
THE POST-CONFERENCE: THE EXTERNAL REVIEW COMMITTEE MEETING

The Post-Conference: The External Review Committee Meeting

On October 20, the External Review Committee (ERC) met in person for the first time since they were appointed by the Program's sponsor, FCT, back in 2019. The meeting was structured to allow the ERC members to understand the Program's progress in 2022 and discuss several concrete ideas for the Partnership's future.

The panel had the chance to hear directly from Principal Investigators, researchers participating in this year's mobility initiative at UT Austin, and scientific coordinators of training activities organized with the Program's seal. Some of the session's main takeaways include the Partnership's support to less senior researchers making their way into research project coordination, allowing them to serve as Principal Investigators and team up with senior counterparts at UT Austin, and the intertwining between the Program's instruments which enables researchers to leverage complementary funds to keep the collaboration going and develop joint result further.

Alfred Ng
Area of Space-Earth Interactions



Marie-Paule Pileni
Area of Nanotechnologies

Oliver Jäkel
Area of Medical Physics

Peter Arzberger
Chair of the Committee
Area of Advanced Computing

FCT President Madalena Alves and the Program's Board of Directors were also in attendance and participated in the discussion on the Program's impact over the past 15 years, which had been in the spotlight on the previous day at the Annual Conference thanks to contributions from former alumni and stakeholders. With the Program nearing the end of the current funding cycle, the Program Leadership shared its vision for the future, this time with a clearer picture of what the Program should brace for and how. The ERC commented on that vision with concrete feedback and suggestions that reflect the panel's extensive international and science management experience. Following this meeting, the ERC has issued a report with critical conclusions and recommendations that should help FCT decide on the Program's continuity when the time for that decision arrives.

The guide for success: the role of ERC in the Program's development

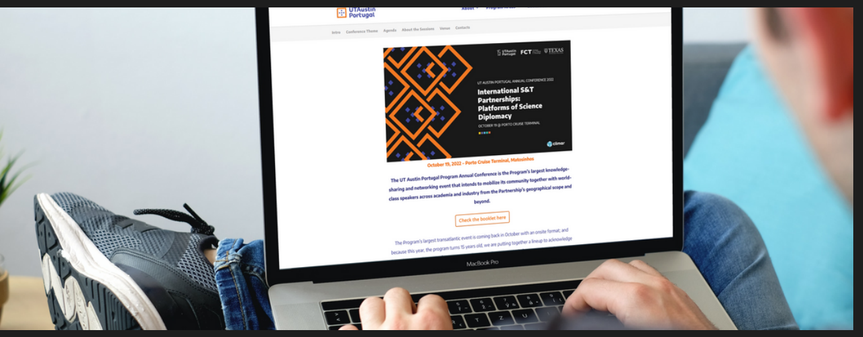
ERC is an independent committee appointed by FCT, composed of distinguished peers from internationally recognized institutions in academia, industry and technology transfer. Their primary mission is to annually evaluate the Program's performance and provide recommendations to be followed in the future.

The Committee is currently constituted by Peter Arzberger, chair of the Committee, Oliver Jäkel (Head of the Division of Medical Physics in Radiation Oncology at the German Cancer Research Center), Alfred Ng (Deputy Director at the Canadian Space Agency), and Marie-Paule Pileni (Emeritus Professor at Sorbonne University).

9

TELLING STORIES OR THE ART OF COMMUNICATING SCIENCE

Telling stories or the art of communicating science



One of the biggest challenges of science communication is to put into words that anyone can understand the complexity of research work and how it will impact people's lives when it gets off the lab. Since scientific jargon is reserved for scientific audiences, we must find ways to make science understandable and accessible to society at large, i.e., to nonexpert audiences who have nothing to do with science but, through their taxes, fund and expect to benefit from scientific endeavours. Stories are one way to bridge the gap between researchers and society.

Why? Because through compelling stories, science jargon is deconstructed, we can more easily relate to researchers and their research and understand the work they have in their hands. That is why - at the UT Austin Portugal Program - we have been privileging storytelling for some time now, and we are confident that our bet is paying off. Because we love stories – and you too certainly - would you like to open the book about our communication and dissemination activities?

Celebrating

To kick off our 15th-anniversary celebrations, we launched a logo and a video teaser evoking the three phases of the Program, in begining of 2022. Under the motto "Celebrate with us", we challenged the entire transatlantic community to join and live this important milestone throughout the year with us.

Writing

Where does UT Austin Portugal's research stand in climate change monitoring for a prosperous future? On World Earth Day in April 2022, we wrote a long feature about the Program's projects tackling climate change.

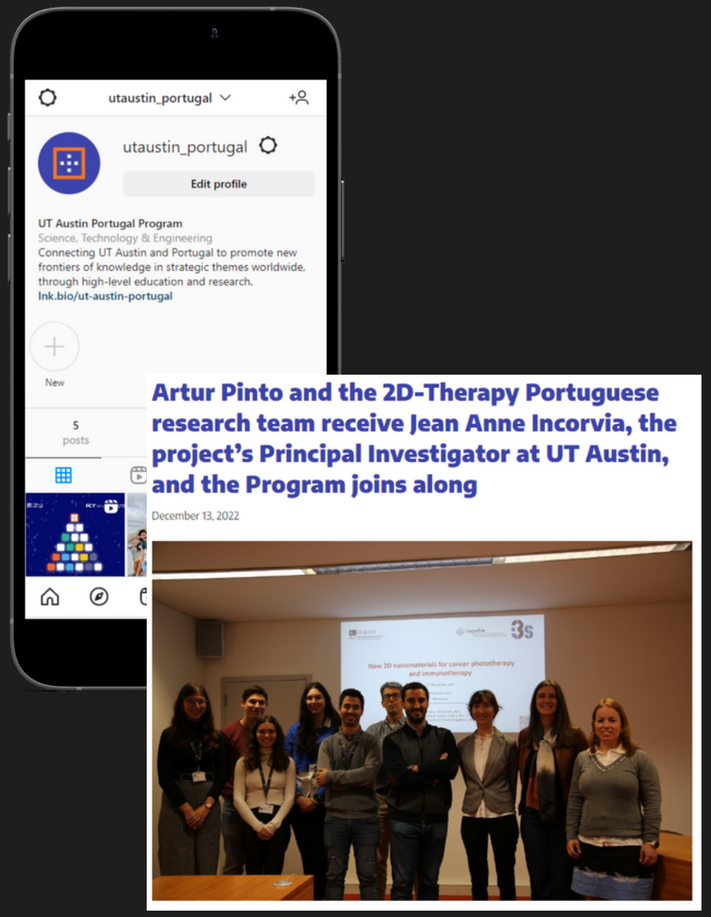
Inspiring

More than celebrating the successes we achieve in our careers, it is important to recognize the paths that have been taken to get us there. In 2022, we continued to carry out the "Meet our Directors" and "Meet our ERC Members" sections to learn about the stories of Marie-Paule Pileni, Alfred Ng, Nuno Castro and Oliver Jäkel and be able to inspire our community to remain determined to achieve their goals.

Engaging

Our strong suits are the opportunities we can provide to our community. In 2022, we increased our efforts in disseminating our events, funding calls and short-term research internships through our social media, e-mail and website, making sure to engage as many people as possible. For the UT Austin Portugal Annual Conference 2022, we created a new webpage on our website that contained all the information needed with just a few clicks.

Telling stories or the art of communicating science



Sharing

We don't want to keep our stories to ourselves, so we are always searching for new ways to spread the word about our people, activities, outcomes and achievements. In 2022, we arrived at Instagram and stepped up our social media presence.

Exploring

Because we love a good challenge, we decided to move into uncharted waters and launched our first multimedia news, combining text with video. Our team met with Artur Pinto and Jean Anne Incorvia, the two masterminds behind the 2021 Exploratory Research Project 2D-Therapy, on the occasion of Jean Anne's visit to Porto, in November, and here is the result.

Updating

Getting media coverage for the Program is very important, and therefore, we work to build rapport with journalists and outlets. Thanks to this work, our press release on the 2022 Call for Exploratory Research Projects got us a news item on the online edition of the Portuguese newspaper Dinheiro Vivo. We also had the pleasure of having Adriano Cerqueira, a well-known science journalist, as a round table moderator at our 2022 Annual Conference.

Multimedia

One of the most versatile ways to communicate is through videos. With them, we can learn, inspire and tell stories. Having this in mind, our team kept editing and posting videos of our training events, making knowledge available for all. We have also involved members of our community to tell their stories and experiences through video and created engaging visuals to share our best moments and achievements.

Telling stories or the art of communicating science

Here's a snapshot of our communication efforts and outcomes in numbers:

Website

Taking our brand across the Atlantic and beyond

- 22691 users (+33% than in 2021) from more than 150 countries
- 32% from Portugal
- 31% from the United States
- 37% from other countries, such as India, Brazil, Germany, The Netherlands, The United Kingdom, France or Spain
- 63601 pageviews (+27% than in 2021)
- 50% of the users entered directly on the website, 34% through organic search, 10% through references on other websites, and 7% via social media.
- Besides the Homepage (13677 pageviews), the pages of the Annual Conference (2658), the Online Advanced Course on Biomedical Imaging (2220), the Call for Expressions of Interest on Short-term Research Internships (1925), the SOE Workshop (1718) and the Workshop on Library of 2D Materials (1718) got most of the page views. [1]

[1] Google Analytics is monitoring the UT Austin Portugal Program's website. Also, since 2022, we have been using Matomo for monitoring. Matomo is a platform suggested by INESC TEC. Nevertheless, to guarantee a fair comparison between the data from 2021 and 2022, we used the stats provided by Google Analytics.

Social Media

Seeking relationships with our community through social media

- Followers on Twitter: 1796 (+43 than in 2021)
- Followers on LinkedIn: 1496 (+276 than in 2021)
- Followers on Facebook: 500 (+30 than in 2021)
- Subscribers on Youtube: 206 (+120 than in 2021)
- 40 videos uploaded on Youtube
- 642.5 hours of watch time and 7800 views
- Followers on Instagram: 35 [2]

- [2] The Instagram page was launched in October, that is why it only has 35 followers. The page will grow throughout 2023.

Podcast

Raising our projects' visibility through science podcasts

- 3 new episodes
- 267 plays across Soundcloud and Spotify, with listeners from around the world, mostly Portugal and United States

Email Marketing

Keeping our community posted

- 16 campaigns
- 3 Newsletters
- Average number of people opening our email marketing campaigns and newsletters: 358 subscribers (+23% than in 2021)

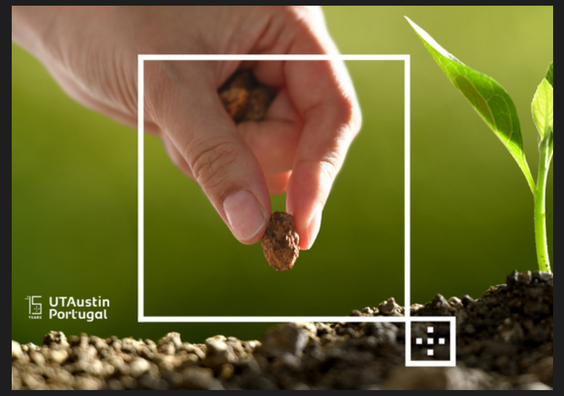
Telling stories or the art of communicating science

Newsletters

March 2022

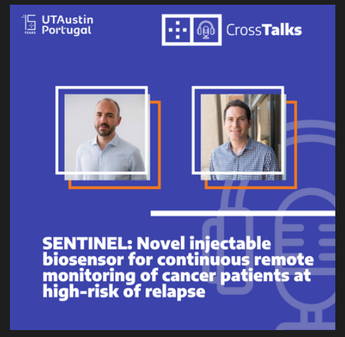
July 2022

December 2022



Podcast

Episode 6
ExtreMED: Extreme Ultrashort Pulses for Advanced Medical Applications and Diagnostics



Episode 7
SENTINEL: Novel injectable biosensor for continuous remote monitoring of cancer patients at high-risk of relapse

Episode 8
MAGAL Constellation – Setting the cornerstone of a future ocean and climate change monitoring constellation, based on radar altimeter data combined with gravity and ocean temperature and salinity measurements

Telling stories or the art of communicating science

Institutional Videos in 2022

15 Years of UT Austin Portugal - "Celebrate with us!" Campaign

2021 Annual Report Introduction

15 Years of UT Austin Portugal Program - Annual Conference Opening Video

UT Austin Portugal Annual Conference 2022 After Movie

10

IDEATING THE FUTURE THROUGH THE PROGRAM

Ideating the Future through the Program

The Program is moving into its fifth and last year under the current funding Phase. The ideation exercise about its future, which started in 2021 with the support of the Program's Governing Board and the External Review Committee, gathered pace in 2022.

The main stakeholders involved in this exercise agree that future directions must consider the Program's accomplishments over its 15-year journey and the main challenges Portugal and the world are faced with, now and in the years to come. Many of these challenges, if not all, have never before been so contingent on transnational and collective science-based efforts.

What has the Program generated that can be used to design scientific solutions to the most pressing societal problems? Drawing on its past outcomes and impact, where can the Program make a difference in the future? Or the ultimate question: Why should the transatlantic partnership and its sponsors continue to devote resources to the Program?

Fifteen years have passed since the inception of this International Partnership of the Portuguese Foundation for Science and Technology with the University of Texas at Austin. Since then, much has changed in the Portuguese Science, Technology and Innovation landscape.

Mindful of the time lag between outcomes - outputs - impact, the Program's contribution to that change, which has been intrinsically related to the Portuguese Governments' priorities and innovation policy objectives, must be emphasized.

Published annual reports and the several meetings held between the Partnership's governing bodies throughout the different phases are indicative of the Program Leadership and FCT's strong commitment to tracking the payoff of the country's public investment in this S&T joint venture. In 2012, the Portuguese Ministry of Science, Technology and Higher Education (MCTES) commissioned the Academy of Finland to produce an independent evaluation report of the US Universities-Portugal Partnerships. As the Executive Summary of that report pointed out:

"Portuguese collaboration with U.S. universities in research and education is a bold example of an international university-government programme with high-profile science and innovation policy objectives. These models are few and far between, and even globally, creating a governmental internationalisation programme with significant public funding is quite uncommon."

The country's position regarding S&T and Innovation is no longer the same as in 2007 nor when the Academy of Finland issued its evaluation report a decade ago. Thanks to FCT's International Partnerships, one of which is with UT Austin, Portugal's research and innovation communities have come a long way. They are now at the forefront of breakthrough science and technological advances in many areas of knowledge.

As mentioned earlier, fifteen years may be considered a long time to have a return on investment with public funds. Still, one must remember that research, incredibly collaborative and international, takes a long time to establish: first, to build trust and communication, then to produce results. Moreover, as stated in the 2021 Annual Report, impactful change does not happen overnight. The Partnership's framework is in place and has been tested, fine-tuned and proven to benefit the Portuguese community and the country's international standing. As the Program PT and US Leadership strategize about the future, the answers to the following questions may be the key to laying out the Partnership's value proposition for a new cycle.

Ideating the Future through the Program

1. What should be our focus in a post-2023 Partnership?

It might be worth considering the explicit adoption of a mission-oriented approach while maintaining core scientific areas where Portugal and UT Austin can have a significant contribution. By a mission-oriented approach, we mean identifying and describing the main societal challenges the Program commits itself to address through its core scientific areas, either individually or combined, exploring synergies. Additionally, by keeping core scientific areas, the Program allows challenges beyond those reflected on its missions to be tackled through its research projects (bottom-up approach).

- Explore challenges common to Portugal and the U.S. Administration and high on global development agendas (e.g. UN SDGs) through S&T: from Energy Transition (or Clean Energy) to Digital Transition or Making Communities more resilient;
- Provide a framework for the community's research activity through mission-based statements;
- Focus on adjacent scientific areas to maximize synergies and cross-fertilization and avoid silo areas;
- Act as a cross-cutting platform that leverages, energizes and brings to the market and society the innovations resulting from all of its investments in research;
- Set an impactful and unique goal for the Program (value depth instead of breadth).

2. What have we created to advance this future focus?

- A community of minds: Long-standing relationships built on trust, unique expertise and willingness to collaborate;
- Capability to shorten the gap between research and innovation, capitalizing on the Program's former entrepreneurship initiative, the University-Technology-Enterprise Network (UTEN);
- Human capital and resources (e.g.: research infrastructures) in scientific areas are vital in addressing grand societal challenges (see next page). These areas could be reinforced with a new addition that would place the Program among a constellation of scientific actors deeply committed to research and innovation for a cleaner and more sustainable energy future: Clean Energy.

3. What balance of activities will maximise success in the future?

One that ensures the reinstatement of the links between research, educational and innovation activities, broken in Phase 3 for budgeting reasons.

2023 will be a decisive year for the Partnership. Its Leadership is confident that the route they have been planning can be equally, if not, more exciting.

Ideating the Future through the Program

What have we created to advance this future focus?

Science-based knowledge across research areas deemed essential to tap into major challenges.

Energy Transition /Clean Energy

Nanotechnologies

Enables cleaner, more economical, more efficient, and reliable ways to capture and store renewable energy sources

Advanced Computing

HPC systems can lead to improvements in the exploitation of energy sources, energy distribution, modelling of scale-up and multi-source grids, modelling of systemic integration of RES, and design of advanced materials of energy interest

Space-Earth Interactions

Enables monitoring of energy corridors, offshore wind planning and solar power forecasting

Digital Transition

Enables advancements in device engineering, extends the limits of microelectronics and makes it possible to build very precise circuits at an atomic level

Is vital to powering the connected digital economy in computationally, numerically, or data-intensive tasks

Enables monitoring and surveillance of critical digital infrastructures and provides EO data, whose potential can be unlocked by Advanced Computing

Resilient Communities

Have been revolutionising the prevention, diagnosis and treatment of diseases towards healthier societies and are enablers of digital and greener communities

Turns data into knowledge that can be used to anticipate geo and bio threats through modelling of land and sea ecosystems in particular in coastal areas, contribute to model, design and exploit smartcities, develop new techniques targeting smart agriculture and treatments based on personalised medicine

Supports climate change objectives by helping to inform actions that protect the carbon sink and promote more effective resilience to climate-induced disasters

Ideating the Future through the Program

Reflecting Back and Projecting Forward

The UT Austin Portugal Annual Conference 2022 reflected on the progress and impact this collaboration has had on education, research and innovation. The conference looked to a clean energy and sustainable future. Fitting themes as we position to embark on the next phase of our partnership in the years ahead. The UT Austin Portugal Program has worked from the beginning in partnership with the Portuguese Foundation of Science and Technology (FCT) and the Minister of Science, Technology and Higher Education to address pressing societal problems. There can be little doubt achieving energy security that is clean and sustainable is one of these problems, and it is best tackled in an international setting that leverages and amplifies the physical and natural assets, and intellectual capital of the partners.

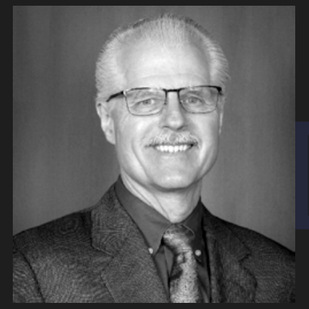
Both partners have much in common – an abundance of sunshine and wind, an independent energy grid, capacity to store energy to overcome the intermittency of renewable sources, markets for green hydrogen, and a commitment to transition our economies and industries from a fossil fuel dependence.

The Azores and Madeira islands and the University of Texas lands can afford testbeds for innovative solutions. Importantly, the Portuguese Universities and Institutes and the University of Texas at Austin have the subject matter experts to discover and integrate the technologies needed in a clean energy future and a track record of working with translation partners to implement them.

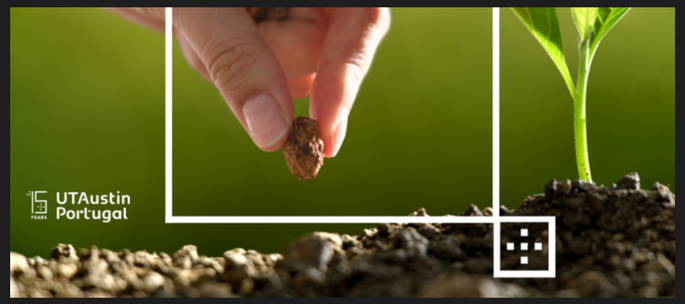
Doing this will build upon the core elements of the Program: advanced computing, nanotechnology, space-earth interactions and technology commercialization. The nature of the work will also train and prepare the next generation of scientists and engineers to lead this clean and sustainable energy future.

I write this as the month of January, named for Janus – the Roman deity for beginnings and transitions – is approaching. So is the need to address, embrace and lead in the clean and sustainable energy future.

Originally published in Newsletter#81 - Everything Starts with a Seed



This text was written by John Ekerdt, Principal Investigator of the Program at UT Austin, after being invited by the Program's Executive Team to author the editorial of the last newsletter of 2022.



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KEY PEOPLE IN 2022: BACKING UP THE PROGRAM EVERY DAY

Key People in 2022:
Backing up the Program Every Day

Madalena Alves
Chair of the Board
Representative of FCT

Robert A. Peterson
Representative of the
University of Texas at Austin

José Manuel Mendonça
Representative of
Portuguese Universities

Célia Reis
Representative of the
Industrial Advisory Board

António Vidigal
Representative of the
Industrial Advisory Board

Governing Board

Peter Arzberger
Chair of the Committee
Area of Advanced Computing

Oliver Jäkel
Area of Medical Physics

Alfred Ng
Area of Space-Earth Interactions

Marie-Paule Pileni
Area of Nanotechnologies

External Review Comittee

José Manuel Mendonça
Director in Portugal

Rui Oliveira
Co-Director in Portugal

John G. Ekerdt
Principal Investigator at
UT Austin

Marco Bravo
Co-Principal Investigator and
Executive Director at UT Austin

Andreia Passos
Executive Director
in Portugal

Board of Directors

Key People in 2022:
Backing up the Program Every Day

Area Directors

Area Director for
Advanced Computing
at UT Austin

Nuno Castro
Area Director for Advanced
Computing in Portugal

Miguel Avillez
Area Director for Advanced
Computing in Portugal

Carla Silva
Area Director for
Nanotechnologies in Portugal

Paulo Ferreira
Area Director for
Nanotechnologies in Portugal

Brian Korgel
Area Director for Nanotechnologies
at UT Austin

Afzal Suleman
Area Director for Space-Earth
Interactions in Portugal

Luísa Bastos
Area Director for Space-Earth
Interactions in Portugal

Patrick Heimbach
Area Director for Space-
Earth Interactions at UT
Austin

Maria Filomena Botelho
Area Director for Medical
Physics in Portugal

Rui Henrique
Area Director for Medical
Physics in Portugal

João Claro
Area Director for
Technology Innovation
and Entrepreneurship
in Portugal

Marco Bravo
Area Director for Technology
Innovation and
Entrepreneurship
at UT Austin

Key People in 2022:
Backing up the Program Every Day

Andreia Passos
Executive Director
in Portugal

Marco Bravo
Co-Principal Investigator
and Executive Director at UT
Austin

Sofia Maciel
Head of Communications
in Portugal

Rita Costa
Head of Design and
Multimedia
in Portugal

Vera Pinto
Mobility Officer | Monitoring
and Reporting Officer in
Portugal

Adriana Costa
Communications
Officer in Portugal

Raquel Abreu
Media Advisory
in Portugal (Until May 2022)

Elsa Carvalho
Media Advisory
in Portugal (As of July 2022)

Sheila Habib
International Relations Officer
in Portugal (Until July 2022)

Mara Correia
International Relations Officer in
Portugal (As of September 2022)

Executive Team

Including Supporting Staff from INESC TEC, the Program's Host Organization in Portugal

Key People in 2022:
Backing up the Program Every Day

Cristiana Barros
Administrative Assistant
in Portugal

Kelcie Tisher
Senior Program Associate,
Research Relations at UT
Austin

Mariana Gomes
Financial Controller
in Portugal

Fábio Alves
IT Support in Portugal

Executive Team

Including Supporting Staff from INESC TEC, the Program's Host Organization in Portugal

Observation: The photographs in this report were collected from free-to-use image databases such as Pexels and Unsplash, also paid photos from Canva and requested to members of the Program.

2022 ANNUAL REPORT

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