



Inspiring
researchers,
strengthening
Europe



Portugal
in the spotlight.

Table of contents

Message from the President of the COST Association and the President of the FCT	3
Inspiring researchers, strengthening Europe.....	5
COST today.....	5
COST's vision.....	6
Portugal in the spotlight	7
Science is about people.....	7
Industry-academia: strength in cooperation	10
Improving our world through science and technology	13
European leadership: working with our neighbours and beyond.....	15
Interdisciplinarity to promote the understanding of ourselves	16
A stepping stone into the European Research Area (ERA).....	18
Facts and figures	20

Message from the President of the COST Association

Portugal has a history of global vision, from its earliest days as a maritime power to its modern-day profile as a committed European and a worldwide player. Portugal has always recognised that its prosperity and strength as a nation would depend on reaching beyond its borders.

Portugal was among the founding members of COST in 1971 and has actively contributed ever since. Its participation has grown exponentially over the years, both in terms of leadership shown by Portuguese researchers in proposing and chairing Actions and in the COST support for Portuguese researchers whose expertise has been a key contribution to the COST networks.

The progress is evident. Portugal is now the strongest among the group of countries that were identified as starting from a less research-intensive base (Inclusiveness Target Countries) - which positions Portuguese researchers well in competing for H2020 grants.

COST offers the contacts and experience that lead to cross-fertilisation between disciplines, countries, and the cultures of academic and industrial peers. Those are the very ingredients that lead to breakthrough discoveries and produce innovation.

A priority of Portuguese policy is to expand the knowledge-intensive sector and favour high-tech exporting companies that tend to invest in R&D. COST is determined to help to achieve this goal by supporting researchers, companies and their leading-edge projects.

The international linkages, knowledge exchange, confidence and mutual trust that Portuguese participants gain through COST will certainly continue to expand a thriving scientific and engineering community and contribute to a richer society and economy in Portugal.



Dr Ángeles Rodríguez-Peña
President of the COST Association

Message from the President of the Portuguese Foundation for Science and Technology

For the past four decades, COST has been inspiring researchers, fostering the process of building advanced human capital, widening the science base in Europe, and promoting breakthrough ideas.

We have been benefiting from COST's openness and inclusiveness culture, and through the participation in multidisciplinary knowledge networks, COST has facilitated the co-evolution of human capital formation and institutional capacity building. These networks have also allowed Portuguese research organisations, higher education institutions and corporations to foster alliances at a global level and in all domains of science.

We acknowledge the importance of these collaborative activities. In particular, we value COST's efforts in promoting a greater culture of science and technology throughout society, by encouraging citizens to share a sense of ownership of research achievements.

The Portuguese Foundation for Science and Technology (FCT) recognises the unique involvement of Portuguese researchers in COST: more than 1000 researchers were supported by COST in 2016, and Portugal currently has a participation level of more than 90% in the running COST Actions. Furthermore, COST has had an impact in the career of young generations of scientists and in their internationalisation process.

This allows us to share and endorse the ambition of COST: "To continue, now and in the future, to create spaces where ideas and people can grow without limits".



Prof Paulo Ferrão
President of the Board of Directors
of the Portuguese Foundation
for Science and Technology



Inspiring researchers, strengthening Europe

COST today

COST - European Cooperation in Science and Technology – has been a building block of Europe's research world for nearly 50 years. It is an intergovernmental organisation, with 36 Member States spanning the European continent. It funds networks across borders and often across scientific disciplines, interlinking nationally funded researchers and innovators. It has long been, and remains, the largest framework for transnational coordination in science and technology across Europe. In all, nearly half a million researchers have participated in COST over the years.

As of 2016, there are more than 300 different COST Actions going on, involving about 45,000 researchers. The topics are hugely diverse and very targeted. Any imaginable research area – either established, such as

history, biology, ecology, astronomy, criminal justice, or newly emerging such as systems biology, renewable energy, sustainable architecture or behavioural economics – can be covered in a COST Action.

The core funding comes from the European Union; within the Horizon 2020 research and innovation programme, about EUR300 million has been set aside from 2014-2020 to support COST and its Actions. But the research itself is funded by COST Member States. This makes every COST Action a coalition of willing participants – a genuine tool for bringing interested parties together who want to advance a domain of science, cross disciplinary boundaries, fulfill their professional goals, and promote international collaboration.

COST's vision

COST has evolved over the years. At the start, it was the pioneer of European research collaboration, an exciting new tool to knit a growing Europe together. As it matured, it became a well-proven and efficient instrument of research collaboration, in a growing and variegated network of new programmes and ideas. Now, it has established a unique place in the ERA (European Research Area) landscape.

Our vision for the next decade is optimistic. As our social, economic and environmental challenges mount, science is our best hope for answers. European science, in particular, has long been a core part of mankind's scientific capability. To continue that position, Europe must get even better at sharing knowledge, networking its researchers, increasing diversity, pooling resources for action. Already, through COST, the Framework Programmes, Eureka and other instruments, Europe has already proven itself good at collaborative research. By 2030 our vision is for Europe as pre-eminent in these new ways of cross-border, cross-disciplinary research – and as such, a force for science across the globe to work better and smarter with and for society.

But the vision goes beyond this. Science is people. Always, the real breakthroughs come down to individuals and their freedom to think, work, collaborate and share. We want the researchers themselves to tell us what's important, what's cutting-edge, what needs action now. We want to see an unlimited space where crossovers between ideas and people can change the world for the better.

COST's mission is clear: make that vision a reality. We have laid out four prime goals needed to achieve that vision:

- Enhance collaborative, bottom-up research. The openness and freedom of COST Actions make them ideal tools to pioneer new digital methods of networking and collaborating.
- Become the leading open networking tool in ERA. COST can forge a place for itself as an indispensable tool to build the ERA, network old and new Member States, and pioneer new ways of networking.
- Build on COST's open, inclusive culture to empower researchers all over Europe, pioneering new tools for networking more effectively.
- Provide evidence-based information to member countries on emerging scientific and societal challenges. COST Actions can assemble expertise for difficult policy problems, and concretely help Europe coordinate better its national research agendas through Joint Programming Initiatives and other means.

COST empowers researchers, from every background, discipline and country in Europe. It maintains its core values of openness, bottom-up direction, diversity and collaboration.

As we move towards 2020, the COST Association will embrace change. It will build on its internal strengths, extended networks, and nearly 50 years of experience. It will, through new means and strategies, continue creating spaces for people to connect, to share knowledge, to organise research and to grow without limits.

Portugal in the spotlight

Scientists and innovators are among the most precious assets for the future of Europe. They are hugely productive, accounting for nearly a third of the world's ideas, as measured by scientific publications or patents. Their work is changing the world, with discoveries from the structure of DNA, to the birth of mobile telephony, from understanding the science of climate change, to the expansion of wind and solar energy. European scientists, engineers and entrepreneurs have made profound contributions to all these life-changing innovations and thousands more. With ever-increasing social and economic challenges ahead, European researchers offer huge hope for solutions.

COST connects Europe's researchers in all fields of science and technology so that they can jointly develop their ideas and initiatives by networking together their

nationally-funded research activities. International cooperation leverages funding, creates relationships and brings together science, society, policy-making, and industry.

In Portugal, science, research and innovation are thriving through professional collaboration across Europe and beyond. Both the Portuguese and the European research communities benefit from COST.

Young Portuguese scientists have established brilliant careers by connecting with their European peers through COST, and decades-old companies have introduced profitable efficiency by working in cross-national, industry-academic networks. Here are some of their stories:



Science is about people

Preventing brain drain through international collaboration

Raquel Conceição, University of Lisbon

COST has certainly been good for young researcher Raquel Conceição. She says that the opportunity to chair a COST Action has been a factor in achieving a tenure-track position as Assistant Professor just five years after completing her PhD, which allowed her to return to Portugal after 2 years as a post-doctoral researcher at the University of Oxford, UK.

But even more important, Raquel's COST connection meant that Portugal was involved in a new area of research on breast cancer detection using radar UWB (ultra-wideband). She and her team received several awards for their application-oriented research and scientific work as young scientists.

The COST network collaborates on research, and also actively promotes dissemination of knowledge. Breast

tumour phantoms developed in Portugal are now being used by Satimo (a French SME), which in turn is using the evidence and knowledge to cooperate with a European Research Council 'starting grant' project in Ireland.

Through her international connections, Raquel is able to initiate national and international projects with her institution - as proven by its participation in two Horizon 2020 proposals for 2017.

COST Action TD1301 - Development of a European-based Collaborative Network to Accelerate Technological, Clinical and Commercialisation Progress in the Area of Medical Microwave Imaging

High-level research needs high-level administration

Claudia Oliveira, University of Lisbon

Claudia participates in a COST policy-driven network focusing on excellence in research administration.

Through the COST network, Claudia learned new practices in Iceland that she went on to implement in her home institution. As she became more involved in the Action, she worked on the definition of job profiles for research administration. The networking that emerged from this COST Action led to the submission of three H2020 proposals, including one Twinning proposal that received funding.

Claudia has come to be regarded as an expert at national level, and she is known for her efforts in disseminating knowledge and promoting opportunities for others. She is responsible for hosting the next meeting of the network in Lisbon (spring, 2017) which will provide an opportunity for national research administrators to attend and share their experiences.

COST Targeted Network BESTPRAC - to advance the state of the art in excellent administration of transnational research projects by creating a network of research administrators

Keeping young talent at home

Romana Lopes Almeida Santos, University of Lisbon

Romana Santos works on nature-inspired adhesives and was recently awarded a 5-year position as Principal Investigator by the Fundação para a Ciência e Tecnologia (FCT).

She says that, thanks to her position as Vice Chair of a COST Action, she has been able to finally achieve the working conditions and stability to consolidate her research, with an international dimension. The role in the COST Action, she says, has been helping her to accomplish her dream of progressing beyond basic research to translate her results into useful

concrete products that will benefit both people and the environment.

Romana says the link between her personal progress and the COST work was explicitly identified in the evaluation of her candidacy by the FCT, who specifically praised her 'great network' and 'international collaborations'.

COST Actions CA15216 - European Network of Bioadhesion Expertise: Fundamental Knowledge to Inspire Advanced Bonding Technologies and TD0906 - Biological adhesives: from biology to biomimetics

“ The feedback received from FCT also highlighted my good internationalisation, great network, clear independence and good past track record. ”

Romana Santos

Cancer research: interdisciplinary collaboration can produce breakthroughs

Wolfgang Link, University of Algarve

For Wolfgang Link, COST Actions are a perfect instrument for coordinating research around Europe. Among chemists, biologists and physicians, he says, there was always a very keen interest to explore the therapeutic potential of chemical compounds that were sitting idle on chemists' shelves. COST offered the opportunity for important collaboration.

That openness to share and collaborate has already produced breakthrough discoveries for the network. It identified several chemical compounds with therapeutic potential against cancer and it has characterised a new and clinically relevant mechanism of resistance to anti-cancer drugs.

COST Action CM1106 - Chemical Approaches to Targeting Drug Resistance in Cancer Stem Cells

“ I have never encountered such an open and collaborative environment in a scientific context before ”

Wolfgang Link

Portuguese expert is a world leader on transportation systems

Carlos Lima Azevedo, ITS Lab, Massachusetts Institute of Technology, USA

Carlos Lima Azevedo did his PhD in Transportation Systems at the National Laboratory of Civil Engineering (LNEC) in Lisbon. Today, he works at the Intelligent Transportation Systems Lab at the Massachusetts Institute of Technology. COST Actions have given him international exposure and contacts that helped him during his first assignments to the Singapore MIT

Alliance for Research and Technology. Today, COST partners continue to be his natural collaborators in his leading research.

COST Action TU0903 - Methods and tools for supporting the use, calibration and validation of traffic simulation models (MULTITUDE)

“ ...my research on smart mobility solutions and mobility simulation keeps getting more and more interesting. Now with a large set of research and educational projects in the US and abroad, I have no doubt of the benefits of having participated in the COST Action regarding not only the gained skillset (...), but also regarding the collaborations that were formed and keep evolving amongst the COST team. ”

Carlos Lima Azevedo

Synthetic Biology for Renewable Energy

Paula Tamagnini, *Institut for Molecular and Cell Biology, Porto*

Paula Tamagnini joined a COST Action in 1996, when she was still a PhD student at Universidade do Porto. In 1999, she obtained her PhD and joined another COST Action as an early career investigator.

Paula considers that COST was her springboard to establishing an independent scientific career that evolved towards the emerging scientific field of synthetic biology. Through COST, she was able to build a solid network of contacts and gain visibility. As a result, she has been successful in obtaining EU funding and has been able

to provide opportunities for internationalisation to the young researchers in her group.

Today Paula is group leader, working on tools to use bacteria as cell-factories for the production of value-added compounds and biomaterials at one of the most recognised institutions in Portugal.

COST Action 841 - Biological and Biochemical diversity of hydrogen metabolism - research on hydrogen as a clean alternative fuel



Industry-academia: strength in cooperation

Driving Portugal's entrepreneurship culture

Pedro Almeida, *University of Lisbon*

Pedro's early work with COST led to a close relationship with CERN, the European organisation for nuclear research. He reinforced his links with CERN's Crystal Clear Collaboration on scintillating materials and novel ionising radiation detecting devices - which includes medical imaging and Pedro's own area of positron emission tomography.

Pedro and other Portuguese researchers joined with leading scientists in CERN to found a start-up company - PETsys Electronics that develops state-of-the art detectors for medical imaging used in cancer detection and management.

So with the help of that opportunity through COST, Pedro is now on the management team of a research start-up. He is not only helping to accelerate early cancer detection with breakthrough research and commercialisation; but he is a model for fostering a culture of entrepreneurship in Portugal's scientific community.

COST Actions TD1401 - Fast advanced Scintillator Timing (FAST) and TD1007 - Bimodal PET-MRI molecular imaging technologies and applications for in vivo monitoring of disease and biological processes

Growing the business through international collaboration

Luis Redondo, EnergyPulse Systems

Luis is the scientific know-how behind EPS, a Portuguese company that researches, develops, produces and sells pulsed power modulators based on state-of-the-art, highly efficient semi-conductors. The technology optimises production and energy efficiency in industries as diverse as food, feed, microbiology, clean tech, oil and gas, automotive, and health.

The company spotted a COST Action to create a network in their field and wrote the network chair asking to

become involved. That took EPS, as a sponsor company, to a workshop in Zaragoza in 2014, where the company developed valuable contacts with R&D institutions and customers, and gave them ideas for delivering greater value-added to clients. And it was there that EPS met the partners who eventually joined together in submitting a successful proposal for funding through Horizon 2020.

COST Action TD1104 - Network for Development of Electroporation-Based Technologies and Treatments

“Probably the most effective tool to foster new EU-wide collaborations and to get under one umbrella the involvement of all relevant stakeholders in a specific research topic.”

Bruno Ferreira,
Biotrend SA.

Excellence in inclusiveness countries – a cooperation project with a Hungarian SME **Pedro Assunção and Caroline Conti, Telecommunications Institute**

'Hungary Holografika' is an SME in Hungary that actively participated in a COST Action chaired by Pedro Assuncao, and went on to make important connections with Portuguese institutions. This SME is a research-oriented company producing light field displays, using advanced 3D technology that is still being evolved and is still too expensive to launch in the consumer market. Several participants in the Action became interested in different aspects of the light field technology because of the great future potential of this non-usual technology.

A young Portuguese researcher, Caroline Conti, was invited to spend a whole month on Short Term Scientific Mission hosted by the Hungarian SME that allowed her to study coding solutions for efficient compression of the light field video content. She says that the experience

enhanced her own work and gave her a real opportunity as a young researcher.

Light field technology has become more relevant in recent years, due to new cameras that have appeared on the market, and also due to a new ISO/IEC standardisation work that started one year ago for light field images (JPEG PLENO). Pedro's leadership and the COST Action will have an important impact on developments in this field in the near future.

COST Action IC1105 - 3D content creation, coding and transmission over future media networks (3D-ConTourNet)

“My involvement in these activities has given me a wider understanding of my research area, and has allowed me to improve the quality of my work as a young researcher.”

Caroline Conti

Concrete results: Towards a better understanding of concrete and cement-based materials and structures and their sustainability

Miguel Azenha, University of Minho

The drive for innovation in the cement sector challenges researchers to look for more sustainable approaches to producing cement, by reducing energy consumption and reusing waste materials.

Miguel Azenha leads a COST network that aims to enhance standardisation. It has close links with standardisation bodies that are responsible for establishing uniform practices in regard to service behaviour of cement-based materials and structures. The network also fosters close ties between research and industry.

Industry plays a critical role in the COST network by providing testing materials and applying research results in their ongoing projects (for example, Electricite de France); by participating in inter-laboratory testing (e.g. Teixeira Duarte, Engenharia e Construcoes, etc.); or simply by supporting the network (e.g. OBB infra).

COST Action TU1404 - Towards the next generation of standards for service life of cement-based materials and structures

“*COST allows the creation of new synergies among scientists and research groups across Europe, leading to a huge potential with regard to establishing new and multidisciplinary networks, sharing resources, and after all, to deliver scientific value into the economy.*”

Jose Coutinho,
University of Aveiro.

Doing the math on science in industry

Adérito Araújo, University of Coimbra

Since 2007, Adérito Araújo has been personally invested in the dialogue between academia and industry. He has long promoted one-week meetings between mathematicians and industry to tackle the real life cases that corporations encounter.

For example, he reached out to Margarida Pina from Nors, a Portuguese company that has reduced order processing times by 70% since it began collaborating with mathematicians. From its founding 85 years ago, Nors never had a mathematician on staff; but now, Nors

employs a full-time mathematician and has another mathematician working as an intern.

Since 2015, Adérito and Margarida have both been members of a COST Action that supports this kind of initiative all over Europe. The Portuguese team has successfully transferred best practice to other countries.

COST Action TD1409 - Mathematics for industry network (MI-NET)



Improving our world through science and technology

Excellent research value for money

Rune Matthiesen, NOVA Medical School, University of Lisbon

Upstarting cooperation within the COST Action in the field of "Proteostasis", Rune could combine his background in mass spectrometry technologies and computational methodologies with state of art proteostasis research methodologies and establish contacts with leading laboratories that are following in the footsteps of the Nobel Prize winner Aaron Ciechanover. Rune and his team developed a method that significantly simplifies the workflow involved in drug profiling and, crucially, allows better characterisation of the impact of drugs in different compartments of the cell. Their findings have been published in journal Nature Scientific Reports and are further discussed with the international partners as well as pharmaceutical companies. Together with an ERC grantee, he now develops a collaboration on the stratification of potential lung cancer patients. And

together with companies such as Mission Therapeutics and GlaxoSmithKline, health problems in areas such as cancer drug resistance, influenza virus and malaria infections are being addressed. Several books would not have been published without the COST network and Rune was able to bring experts and know-how to Lisbon in the main Proteostasis meeting of 2016. He calls the results obtained exceptional, expects a continuous positive impact on the laboratory for further years to come and stresses in particular the efficient use of taxpayers' money through COST.

COST Action BM1307 - European network to integrate research on intracellular proteolysis pathways in health and disease (PROTEOSTASIS)

“ *COST is not a cost but an investment with long term results that span well beyond the duration of the Actions.* ”

Pedro Assunção,
Telecommunications Institute.

Managing the forest and the trees

Susana Barreiro, Forest Research Centre, University of Lisbon

Thanks to COST Actions in forestry, Susana Barreiro broadened her international networks while developing a simulation tool for wood availability scenarios in her PhD. She produced publications and her simulation tool was used for a national level policy study providing scientific advice for policy-makers and Portuguese government authorities. Research has continued and the tool is being improved and adapted for local community level applications, with positive response from stakeholders.

COST Actions FP1001 - Improving Data and Information on the Potential Supply of Wood Resources: A European Approach from Multisource National Forest Inventories (USEWOOD) and FP1206 - European mixed forests - Integrating Scientific Knowledge in Sustainable Forest Management (EuMIXFOR)

Beyond batteries: working on a wireless world free of batteries

Nuno Borges Carvalho, University of Aveiro

Nuno Borges Carvalho is involved in a COST network devoted to Wireless Power Transmission. Their vision is to be able to charge electric cars without any physical contact, energise streets in order to reduce the batteries inside electric cars, and remove batteries from all our everyday low-power gadgets. With innovative tools of communication, such as cartoons translated into several languages, the network reaches out to adults

and children to sensitise them to goal of a world free of batteries.

COST Action IC1301 - Wireless Power Transmission for Sustainable Electronics (WiPE) - for efficient Wireless Power Transmission (WPT) circuits, systems and strategies specially tailored for battery-less systems

“*COST is a real network of researchers joining R&D institutions and companies in emerging technologies.*”

Nuno Carvalho

Diagnosing a rare disease to help Portuguese patients

Susana S. Lopes, NOVA University of Lisbon, NOVA Medical School, CEDOC

Primary Ciliary Dyskinesia (PCD) is a rare disease that was not being properly diagnosed in Portugal because it requires a number of different techniques not available in the same hospital. The COST network “Beat PCD” enabled Susana Lopes to learn and consolidate the diagnostic guidelines for PCD with the people that built them. Based on a structured cooperation within Portugal involving centres from the two major Lisbon faculties of medicine and the Hospital Santa Maria, it is now possible to provide a robust diagnosis that reflects the recent guidelines for PCD.

This is a good example how COST fosters cooperation between clinicians and basic scientists to allow new

knowledge to develop. Portuguese PhD students learn how to perform gene editing and constantly discuss new techniques and software with other COST members through short term scientific missions (STSMs) and during workshops.

COST Action BM1407 - BEAT-PCD - Translational research in primary ciliary dyskinesia - PCD is a rare genetic disease where cilia that line the respiratory tract are dysfunctional and cannot clear mucus properly leading to progressive upper and lower airway disease, including bronchiectasis, hearing impairment and chronic sinusitis.



European leadership: working with our neighbours and beyond

Teaching and learning with Europe's near neighbours

Maria José dos Santos, ISCTE, University Institute of Lisbon

Maria researches socio-economic impacts of aquaponics -combining the concepts of conventional aquaculture with cultivating plants on water-. Through a COST Action, she is part of an effort to introduce organic certification of aquaponics products under EU regulations. Organic certification would accelerate the commercial development of aquaponics start-ups in Portugal, across Europe and beyond.

The COST Action has helped Maria to establish rewarding collaborations with strategically important Near Neighbour Countries. A student in Aquaponics at the

Tunisian Institut National d'Agronomie is collaborating with the network and with Portugal to write her PhD. In Iceland, a student at the University of Iceland is working with Maria's Institute on his thesis in aquaponics, looking at the multiplier effect that the scientific and commercial development of aquaponics will have on European and Near Neighbour Countries.

COST Action FA1305 - The EU Aquaponics Hub - Realising Sustainable Integrated Fish and Vegetable Production for the EU

Through the grapevine: sharing technology for grape ripening and disease resistance

Ana Margarida Fortes, University of Lisbon

In the frame of the COST Action, Ana Margarida Fortes worked closely with world renowned researchers at the University of Stellenbosch in South Africa to produce some widely recognised work on grapevine biotechnology. Their work not only advanced knowledge on disease resistance of grapevines, but it also gave Ana Margarida's career a boost.

She went on to work in Spain, learning advanced techniques such as fruit agroinjection and CRISPR/Cas technology, which will be soon implemented in her group.

She was awarded a Development Grant (2016-21) as Principal Investigator by FCT (the Portuguese funding agency for scientific research). She has become an expert evaluator for funding agencies in France, Germany and South Africa and she has been invited as a speaker to several international meetings.

COST Action FA1106 - An integrated systems approach to determine the developmental mechanisms controlling fleshy fruit quality in tomato and grapevine

“ The STSM are a great help to promote mobility for the young researchers/students providing a valuable opportunity to visit top institutions and carry out cutting edge research. ”

Luisa Valente,
University of Porto.

Portugal and Europe's leadership in mobile communications

Luis M. Correia, *University of Lisbon*

Luis M. Correia has been a part of several COST Actions, all focusing on the central question of how to effectively send and receive a radio signal between a mobile phone and a base station.

This is the community that proposed a new standard for radio communications in the 1980s. Today, the "COST 231 model" is common knowledge for every radio communication engineer and it became one of the foundations for the GSM standard. This model was later refined, rethought and expanded through further Actions that have fed into the most recent generations of mobile phones. Currently, the COST Action is addressing the research challenges for the forthcoming 5G (5th generation), and beyond.

This community has attracted researchers beyond Europe, from the USA and Canada to Japan and China, and has drawn together industry and academia. The field of mobile radio signals has attracted several billion Euros of funding from the EU, and national and private sources. However, the community continues to see the COST framework as critical for capacity- and community-building.

Luis says that his research group has established a number of very fruitful collaborations with colleagues from around the world, with a very positive impact on the PhD students who are developing their work in his group.

COST Action CA15104 - Inclusive Radio Communication Networks for 5G and beyond (IRACON)

“ These COST Actions have had real impact on the development of mobile communications as we know them today! ”

Luis M. Correia



Interdisciplinarity to promote the understanding of ourselves

Digitising the past

João Martins, *NOVA University of Lisbon*

Joao Martins participates in a COST network on management of heritage buildings that is involved in discussions on the future of Digital Heritage in Europe - including the European Commission, ESFRI infrastructures and other stakeholders. Sharing information and experiences has been crucial to developing a sound strategic research agenda in this important area of the humanities.

COST Action TD1406 - Innovation in Intelligent Management of Heritage Buildings

Opening the dialogue on prostitution in Portugal

Alexandra Oliveira, University of Porto

Prostitution is a not legalized activity in Portugal, a social problem and it is not often part of the public debate. That context posed constraints for Alexandra Oliveira who is part of a small scientific community studying prostitution and the sex industry. But through the international collaboration of COST, she found a perfect opportunity to break the isolation and establish a multi-disciplinary research effort with leading European academic institutions.

Her research findings have important social and political relevance in Portugal and when she presented her results in the framework of a network meeting, she received good media coverage that sparked more discussions on a national and international level.

COST Action IS1209 - Comparing European Prostitution Policies: Understanding Scales and Cultures of Governance (ProsPol)

Shrinking cities

Ana Paula Barreira, University of Algarve

Ana Paula Barreira has focused on cities and the negative impact on society and the economy when cities stop growing. She joined a COST Action on shrinking cities and gained much knowledge from countries such as the Netherlands and Germany. Through that experience, she successfully applied for national funding to develop

policy guidelines that will help Portuguese policy-makers in the regeneration of shrinking cities.

COST Action TU0803 - Cities Regrowing Smaller - Fostering Knowledge on Regeneration Strategies in Shrinking Cities across Europe

“COST is one of the great success stories of the European integration process!”

Paulo Costa,
Researcher, INSA.

Seafaring Portugal shares cultural, historical and economic importance of oceans

Cristina Brito, CHAM, FCSH - NOVA University of Lisbon

Through the COST Action “Oceans Past Platform”, Cristina Brito has been active in the dialogue with international partners and the public, exploring such questions as: “Are grey whales climate change’s big winners?” or “How did perceptions and practices regarding whales change?”

She is closely involved with the team of Prof Poul Holm, Trinity College Dublin, an internationally renowned researcher on Environmental History and a 2015 recipient of an ERC Advanced Grant. She contributes to the ERC project (“North Atlantic Fisheries Revolution 1400-1700”)

with the compilation and analysis of Portuguese written and cartographic sources for Atlantic fisheries in the early modern period. She presently holds a position as FCT Researcher which will allow her to contribute to the scientific research from within Portugal.

COST Action IS1403 - Oceans Past Platform - to measure and understand the significance and value European societies of living marine resource extraction and production to help shape the future of coasts and oceans

Redefining literacy in a digital world

Rui A. Alves and Teresa Limpo, University of Porto

Rui and Teresa are part of the European Literacy Network (ELN), which brings together researchers in reading and writing across 38 European countries, aligning their research agendas, training the next generation of literacy researchers, redefining literacy, and aiming to bridge the gap between the science of literacy and education.

Literacy is a specialist area of expertise that studies competence with a written language. Today, the development of this competence is ever more critical, in an environment of complex digital societies where literacy underpins a myriad of adaptive behaviours -- especially the full realisation of human potential and allowing effective participation in community progress. Participation in the community requires people to achieve a threshold level of literacy. The main responsibility of universal, compulsory education is to provide optimal conditions for all children to reach and surpass this threshold.

They are thriving in the ELN network, exchanging with its 288 researchers who study wide-ranging aspects of literacy development from basic, foundational features in emergent literacy to the highly intertwined skills of academic writing. The network is addressing burgeoning topics across Europe such as multilingualism, dyslexia, handwriting, spelling, digital literacy, deep reading, literacies in higher education, and development of digital tools for researching or supporting literacy attainments. Collectively this network is coordinating literacy research across Europe and redefining literacy in a digital world. ELN is deeply engaged in research that ultimately promotes literacy attainment for all.

COST Action IS1401 - Strengthening Europeans' Capabilities by Establishing the European Literacy Network (ELN)

“*COST Actions have the potential to generate important think tanks and critical knowledge, bringing together scientific, industrial and policy making entities.*”

*Celia Manaia,
UCP.*



A stepping stone into the European Research Area (ERA)

The bridge to European funding

Jose Campos E Matos, University of Minho

Jose Campos E Matos leads a network on quality control of road bridges involving participants both from academia and the road operator industry. The network has led to the support of several important international sector associations. In Portugal, the knowledge developed by the COST network is already incorporated into undergraduate studies and there has been growing interest in the field by international PhD students. Thanks to the COST network,

Jose's university has participated in joint applications for Horizon 2020 funding for further work in the field, through several H2020 pillars.

COST Action TU1406 - Quality specifications for roadway bridges, standardization at a European level (BridgeSpec)

Seed funding

Sílvia Coimbra, University of Porto

Sílvia Coimbra is a biologist who was involved in a COST Action to understand the mechanisms of sexual and asexual plant reproduction that would lead to new approaches in biotechnology, agriculture and food industry through improved crops. Through COST, Sílvia found partners for a successful funding proposal for a RISE (Research and Innovation Staff Exchange) project,

which belongs to the Marie Skłodowska-Curie actions, on "SexSeed - Sexual Plant Reproduction – Seed formation" which runs from 2016-2020.

COST Action FA0903 - Harnessing plant reproduction for crop improvement

Intelligent decisions for managing our forests

Alexandra Sofia Marques, INESC TEC

Alexandra Sofia Marques participated in a COST network while working on her PhD. After this she went on to coordinate herself a large European project on forest control and automation systems in Europe (FOCUS, funded in FP7). The same collaboration continues today, as Alexandra and some of her COST colleagues apply to H2020 for funding to take the FOCUS prototypes to the market. To continue the collaboration of the COST

Action after its conclusion, she and her COST colleagues formed a Community of Practice which provides support to a "Semantic Wiki" that collects dozen of Forest Management Tools developed world-wide and continues to offer networking and training activities.

COST Action FP0804 - Forest Management Decision Support Systems (FORSYS)

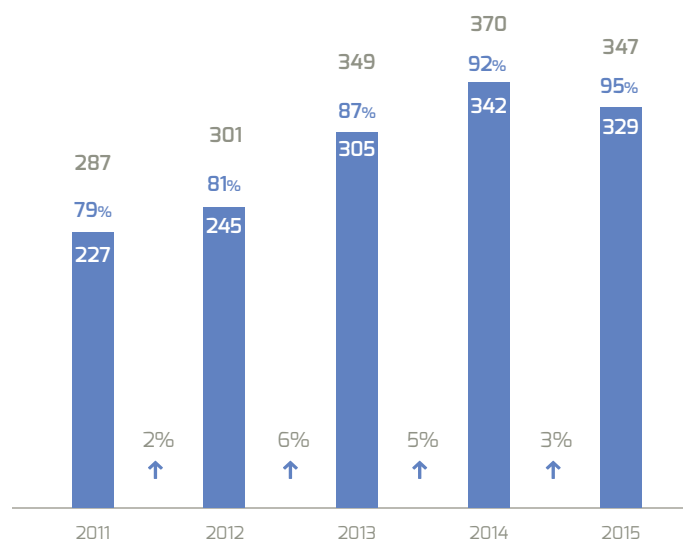
“ Being part of this COST Action was a gigantic step forward in my research career. It also gave me the possibility to create new friendships, learn about new realities and ultimately made me a better European citizen and a better person. ”

Alexandra Sofia Marques

Facts and figures

PARTICIPATION IN RUNNING COST ACTIONS

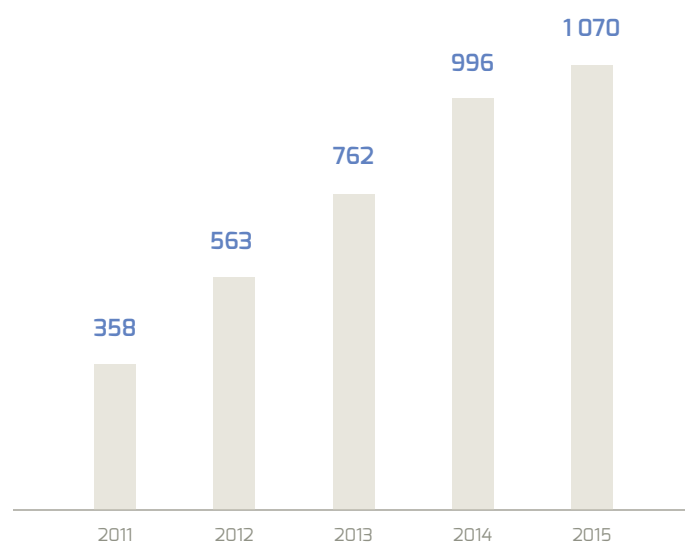
■ Participation ■ Total of Actions yearly increment



> Portugal has participated in an increasing proportion of COST Actions.

PARTICIPATION IN NETWORKING ACTIVITIES

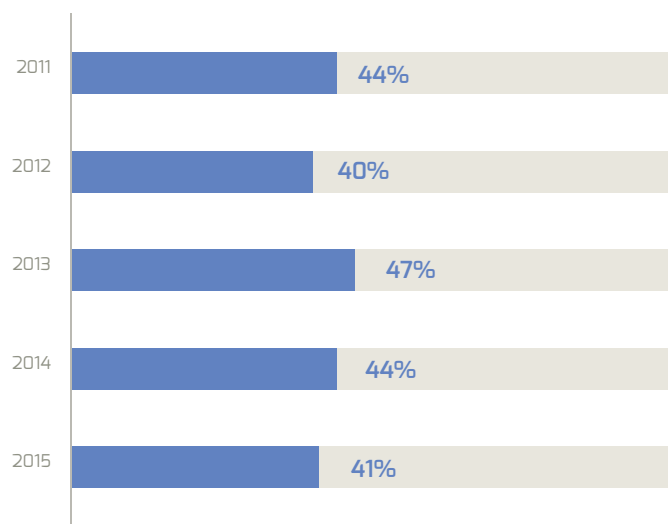
Meetings, workshops, short-term scientific missions, training schools and conferences.



> Portugal's participation in COST networking has increased steadily over the past five years.

PARTICIPATION IN NETWORKING ACTIVITIES BY

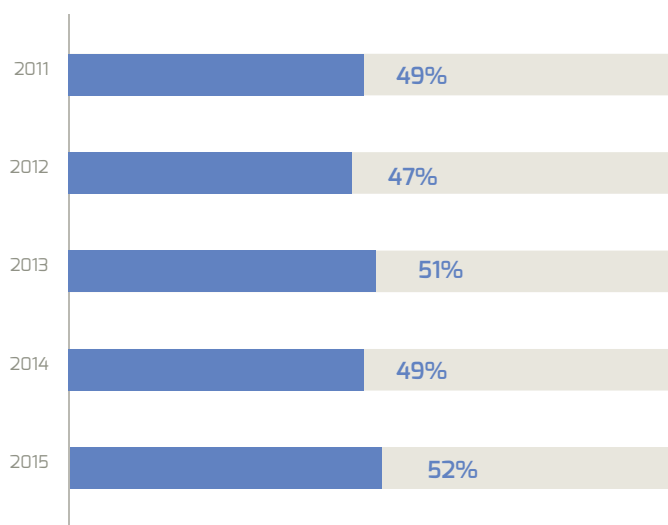
Early career investigators



> Young researchers in Portugal participate across all COST Activities. Early Career Investigators (less than PhD + eight years) benefit from meetings, workshops, short-term scientific missions and training schools to meet the right partners to progress in their careers.

PARTICIPATION IN NETWORKING ACTIVITIES BY

Women



> Portugal has close to equal numbers of women and men in the COST programme.

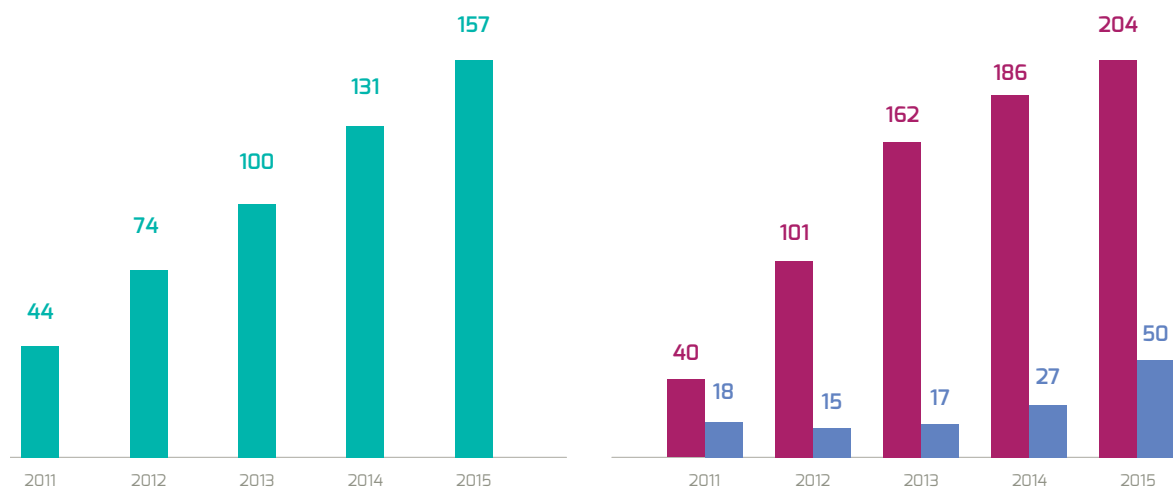
“The short-term scientific missions are of great help in promoting young researchers’ and students’ mobility, giving them a valuable opportunity to visit top institutions and carry out cutting-edge research.”

Luisa Valente,
University of Porto

PORTUGUESE RESEARCHERS BENEFITING FROM COST

Visits to foreign institutions
■ Short-term scientific missions

Training schools
■ Trainees ■ Trainers



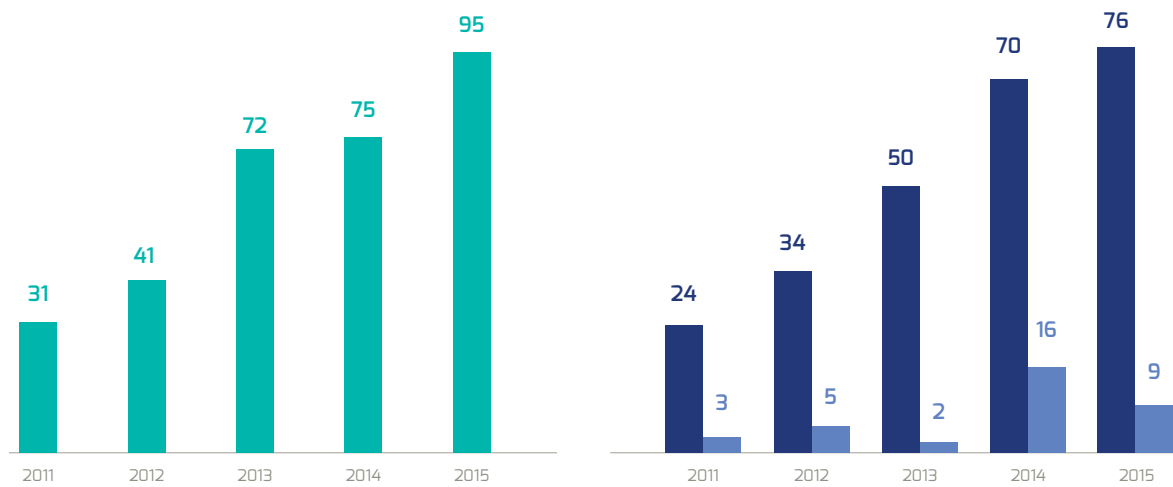
> Stronger international collaboration: Portuguese researchers are involved in an increasing number of short stays and trainings in foreign institutions, either being trained or providing training.

NETWORKING ACTIVITIES IN PORTUGAL

Foreign researchers visiting Portuguese institutions

■ Short-term scientific missions

■ Meetings ■ Training schools



➤ Portugal is receiving a steadily growing number of foreign researchers at Portuguese institutions.

“ COST Association is key for enabling European collaborations and for boosting scientific research. ”

Ricardo Capote,
University of Lisbon



COST National Coordinator

Country representative for Portugal - Maria Teresa Martins

FCT - Fundação para a Ciência e a Tecnologia

Tel. +35 121 391 1540

cost@fct.pt

www.cost.eu



COST is supported by the
EU Framework Programme Horizon 2020