cost
EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

COST in **2016**

Helping people and **ideas grow**

Contents

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About us

About us

COST is an EU funded programme that enables researchers to set up their interdisciplinary research networks in Europe and beyond. We provide funds for organising conferences, meetings, training schools, short scientific exchanges or other networking activities in a wide range of scientific topics. By creating open spaces where people and ideas can grow, we unlock the full potential of science.

Who can participate?

Researchers, engineers and scholars from universities, public and private institutions, NGOs, industry and SMEs. Particular emphasis is placed on activities involving researchers from less research-intensive Member States with a view to increase their participation.

Researchers from Near Neighbour Countries and International Partner Countries can also take part in a COST Action on the basis of mutual benefit.

For more information on international cooperation, please visit: http://www.cost.eu/about_cost/strategy/international cooperation

How?

COST does not fund research, but provides support for networking activities carried out within COST Actions. In this way, it coordinates nationally funded research. COST invites researchers across Europe to submit proposals for Actions through a continuous open call, no matter what their field of interest.

COST Action yearly funding

The average funding totals **€129,000** in 2016 for a network of 25 countries. The funds are provided via an annual grant agreement over a four-year period.

Networking tools

Meetings, workshops and conferences – They are organised by COST Action Management committees in any COST Member State participating in the network and are open to the whole scientific community.

Short-term scientific missions (STSM) – They are exchange visits between researchers in the network and allow scientist to visit an institution or laboratory in another COST Member State.

Training schools – They offer training in a relevant or new subject at one of the Action's laboratories that has unique equipment or know-how.

Dissemination activities – COST encourages and supports Actions participants to disseminate the outcome of their research to other COST science and technology networks, the wider scientific community, policymakers, the media and society at large, through publications, electronic media, news releases, events, success story releases, etc.

Global reach

36 COST Member States:

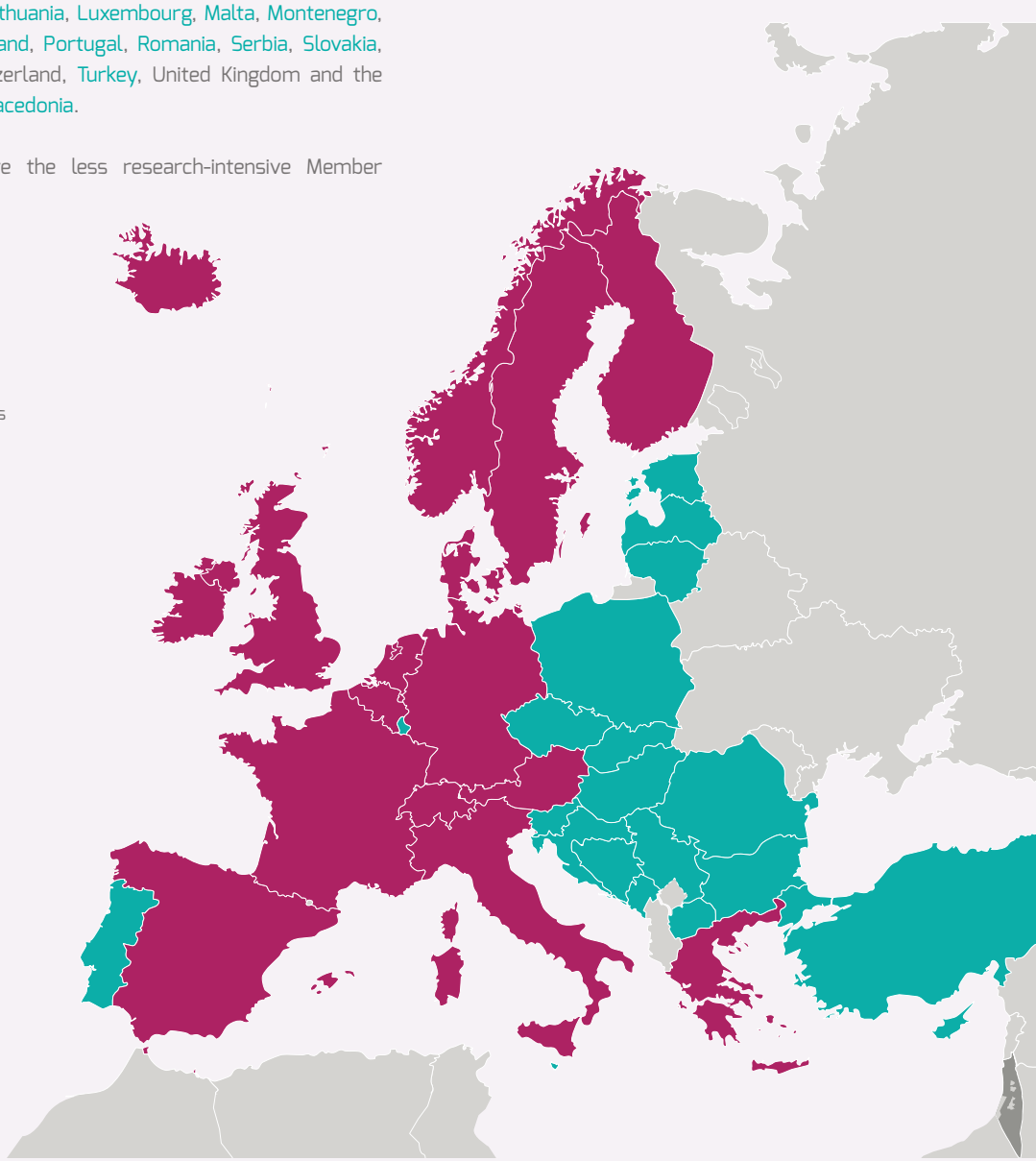
Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, The Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and the former Yugoslav Republic of Macedonia.

Those countries in green are the less research-intensive Member States (ITCs*)

1 Cooperating state:

Israel.

*ITCs stands for Inclusiveness target countries



Excellence and inclusiveness policy

The policy is tailored to foster scientific excellence throughout Europe by providing cooperation opportunities for researchers, engineers and scholars in 20 less research-intensive COST Member States. They are also known as Inclusiveness Target Countries, which COST helps connect to the knowledge hubs of the European Research Area.

COST Near Neighbour Countries

Albania, Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Jordan, Lebanon, Lybia, Morocco, the Palestinian Authority, Moldova, Russia, Syria, Tunisia and Ukraine.

COST International Partner Countries

Argentina, Australia, Bangladesh, Brazil, Canada, Chile, China, Colombia, Costa Rica, Hong Kong, India, Indonesia, Iraq, Japan, Kazakhstan, Kuwait, Mauritius, Mexico, Namibia, New Zealand, Pakistan, Peru, Republic of Korea, Saudi Arabia, Singapore, South Africa, Sudan, Thailand, United States of America and Uruguay.

A talk with Dr Ángeles Rodríguez-Peña, President of the COST Association from June 2010 to June 2017

Define COST in 2016

COST celebrated its 45th anniversary in 2016. It was a year where we reformed our governance based on new statutes, and we revised our internal rules. We have also looked to the future by developing a vision for COST's strategic developments beyond 2020. Furthermore, at the Ministerial Conference last September, high-level representatives from the 36 COST Member States and Israel, COST's Cooperating State, re-committed to the longest running framework programme in Europe.

How does COST make ideas grow?

COST helps ideas grow in an environment that offers freedom, cross-fertilisation and stakeholder interaction.

Freedom is vital in allowing researchers to propose the kind of new ideas and innovative solutions that are needed to tackle the challenges society faces today. COST gives researchers an open, non-hierarchical forum where they can harness the power of hybrid thinking, new perspectives and wide understanding. Cross-fertilisation means that COST allows collaboration across different disciplines and scientific areas as well as with stakeholders outside the scientific ecosystem, which we feel is an essential part of achieving real scientific breakthroughs. The kind of transdisciplinary research projects that COST is involved with have enormous value because they bring different skillsets, knowledge bases and cultures together for results that have a real impact. And finally, good ideas rarely emerge in isolation. COST encourages the kind of interaction between stakeholders from inside and outside the scientific community that we feel is vitally important.

How can people grow through COST?

Collaboration, knowledge and development are key to how we can help people. COST offers researchers a space where they can meet and collaborate to help advance science

onwards. We give them the chance to tackle the challenges their work poses by establishing research networks that promote inclusivity, drawing on knowledge and expertise from all over Europe. This helps improve shared learning and offers new research opportunities from an array of different research projects.

Knowledge is also key to making people grow. The increasing need for transdisciplinary approaches to solve current and future challenges encourages researchers to learn from other disciplines besides their own field of expertise. This is helping to put the idea of cross-fertilising research domains into practice.

COST also helps researchers develop extra skills to help complement their core competences. COST participants can access training that will help develop the kind of interpersonal, organisational and entrepreneurial skills which will help them tackle topical societal questions. Given the fast pace of the digital revolution and the era of big data, we feel this can only help with their personal growth.

What are COST's main achievements throughout Horizon 2020?

We now have an evaluation process in place that is suitable for the transdisciplinary proposals. Any idea that is proposed goes through a peer-review process that we feel is transparent and fair regardless of where it was originated. We are also making great strides into fully integrating all the COST Member States across Europe. Everyone involved with COST will benefit from our greater diversity.

In June 2017 you are leaving the Presidency of the COST Association after seven years. What lessons did you learn and what will you take from the experience?

The main lesson I have learnt is how to thrive in a complex institutional setting, given that you have to deal with so many different organisations and institutions. You have to know that this is not purely a science-led organisation, but one where you are working with different governments and differing political objectives. Timing is a key factor because of this: you need to find the balance between engaging with everybody to share common goals, as well as implementing processes or solutions in a timely manner. When setting an objective, it's easy to miss out how you are actually going to implement it.

To keep your ultimate goal in sight you need to keep revising your project's focus as it progresses. You have to believe in what you are doing, and have a clear idea of who you are and what you are working for.

What were the challenges of the intergovernmental collaboration with the European Commission?

There were no challenges as such, but there were a lot of opportunities because there are many common goals. However, it is very important that in this kind of collaboration everyone knows what the limits around the project are, and that they respect them. Otherwise opportunities can be missed or the implementation of some objectives may become a challenge.

Looking to the future how do you see COST in FP9? Where would you set the highlights?

Nothing can be done without the right budget. You can set yourself very important goals but if you don't have the right financial input to make it happen then it will only be wishful thinking. Regarding FP9, COST must work in areas where it excels, and providing opportunities to benefit the future of Europe in the shape of its young researchers is where we shine. COST has to offer an equal and fair 'playground' for Europe's young generation of researchers, as well as keeping its relevance by being a seeding ground for the new ideas that will allow us to face future challenges.

What are your wishes for COST in the coming years?

I hope that COST will always be forward-looking, will constantly challenge itself and will always strive to improve.

Dr Ángeles Rodríguez-Peña,
Former President of the COST Association

Serving COST Actions

This has been my first year as Director of the COST Association. Not only have I developed a deep understanding of the Association, I have also introduced a new leadership perspective that fosters a culture of service and contribution to COST, and ultimately, how science contributes to the future of Europe.

First and foremost, our role is to act as stewards of COST Actions. By giving the Actions financial and administrative support, as well as scientific and communications guidance, we empower them to perform at their best so that people and ideas can grow without limits. Such empowerment should maximise opportunities for both scientific breakthroughs and knowledge pooling that then feed into scientific policy advice.

One of the many benefits of COST is that it allows young researchers to gain experience within European collaborations and interdisciplinary research, thereby enhancing their skills and boosting their careers. In addition, COST Actions are open for researchers who did not submit a proposal or were unsuccessful in doing so, allowing the spreading of excellence throughout all parts of Europe. This is truly unique!

We have gone a long way in making COST and its Actions more visible. A good example of this is the impact assessment that was published this year, which highlights COST's role as an effective networking tool that enables both industry and SMEs to connect with researchers across Europe, as well as Near Neighbour Countries who wouldn't otherwise have the opportunity.

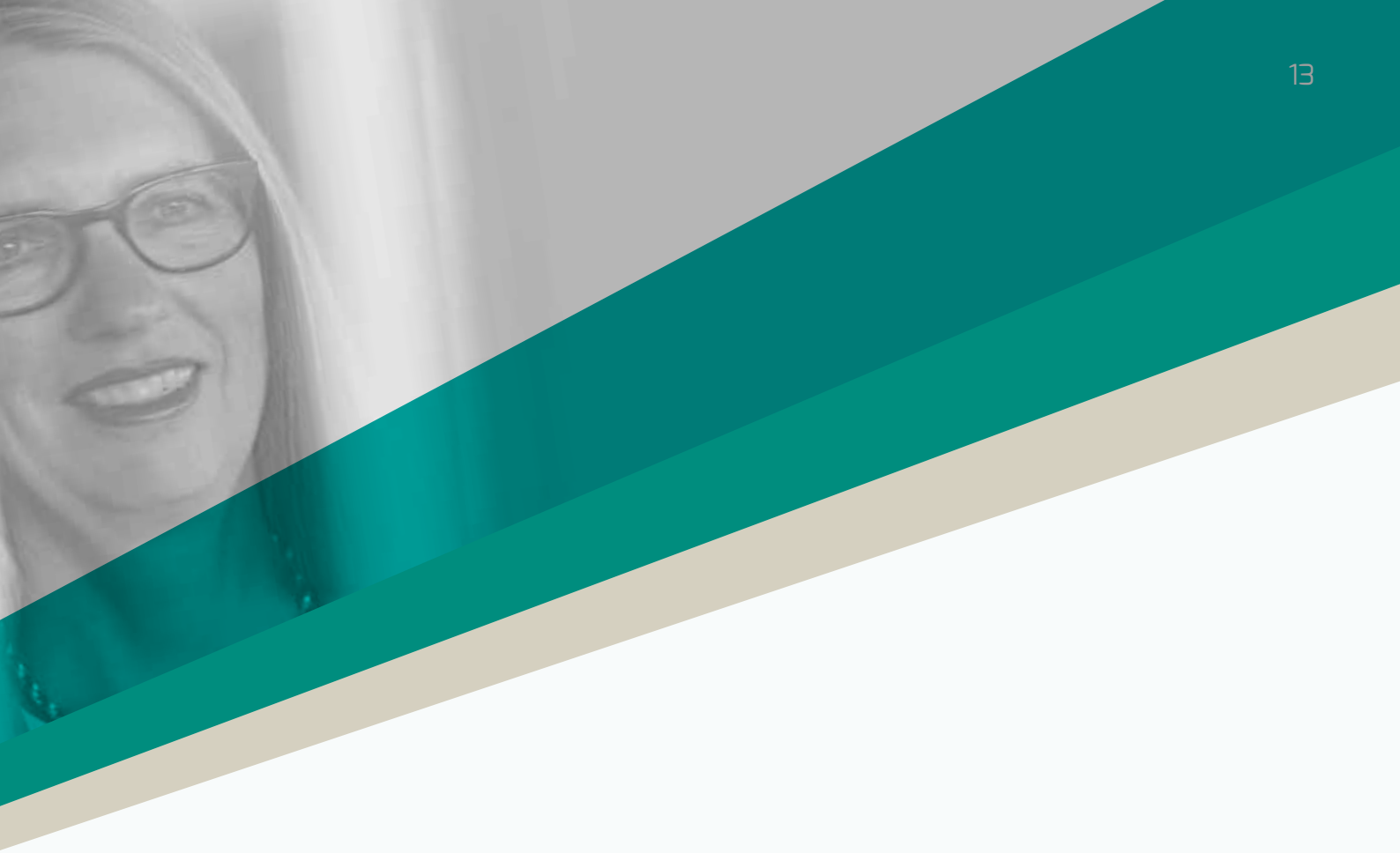
This past year particular emphasis has also been placed on improving the visibility of COST in the EU environment. The COST Association believes in the importance of strengthening communications to our key audiences. Therefore, a new brand strategy with a consistent corporate identity has been developed and put in place over the course of 2016.

A culture of service and contribution can only be sustained if it lives inside the organisation. That is why in October 2016 I launched an organisational development initiative with the COST Administration. It aims at fostering a culture in which our team feels heard and understood, encouraged to take responsibility, use their initiative and apply their talents, so they can develop and become leaders in serving COST. This complemented with sound financial management based on annual activity plans with clear targets, a streamlined organisational structure and business processes, as well as performance measurement is what makes us a fit-for-purpose organisation. It is exactly this that underpins our ambition to make COST the leading networking tool in the European Research Area.

Dr Ronald de Bruin,
Director of the COST Association.

Maximising our contribution to the Horizon 2020 'Widening Pillar'

COST is one of the very few instruments for research policy in Europe that is truly open and inclusive. COST strengthens Europe's research and innovation capacity through its collaborative and multidisciplinary research networks.



Since 2014, half of the EU contribution to COST has come from the "Widening Participation and Spreading Excellence" programme, making COST an important instrument for the EU's widening policy. In recent years, COST has made great efforts to focus on enhancing the participation of researchers from less research-intensive countries. This has built upon the key features that have made COST's networks such a great success: excellence, openness and inclusiveness. These principles have not only created success, but they have also enhanced COST's reputation across Europe. They give COST a unique identity in the European Research Area (ERA) that we must preserve.

In 2016, encouraged by COST's achievements in providing career springboards for young researchers, the Committee of Senior Officials (CSO) launched a series of additional measures to increase the participation of researchers from the so-called "Inclusiveness Target Countries" (ITC).

These measures, developed by a dedicated taskforce comprised of members of the COST Scientific Committee, the European Commission and the COST Association, are to leverage COST's full potential and maximise its contribution to the Horizon 2020 'Widening Pillar'.

Examples of these measures include conference grants to help PhD students and young researchers from ITCs and improving payment methods for participants from ITCs on short-term scientific missions and at training schools.

The measures will also ensure that researchers from ITCs hold at least one leadership position within the Action's leading positions - Chair, Vice Chair and working group leaders. Another measure already implemented is that COST Action proposals must have a minimum of seven countries on board, with an obligation that a minimum of three of these countries must be an ITC.

Good results have been achieved so far, and the CSO is keeping focus on the impact of these measures. We are also looking at further improvements to ensure that we reach our target, which is that 50% of COST's expenditures should benefit ITC researchers. Results from 2016 show that over one-third of researchers participating in the COST Programme were from ITCs, even if only about 20% of European researchers come from ITCs.

I firmly believe that COST will continue to play a key role in fostering inclusiveness in Europe, closing the innovation gap and spreading excellence.

I thank all those who have contributed to helping COST become the bridge builder that it is today, and I encourage you to continue to work towards an inclusive Europe.

Annette Borchsenius,
Vice-President of the COST Association.

02

The highlight of the year: The Ministerial Conference

By endorsing the Ministerial Declaration, the COST country representatives committed to offering ongoing and increased national support beyond Horizon 2020.

On 22 September 2016, high-level representatives of the 36 COST Member States and the Cooperating State, the President, Vice-President and the Director of the COST Association together with high-level officials from the European Commission met in Bratislava to reconfirm their commitment to the COST Programme. The conference, which is usually organised every five years, was held under the auspices of the Slovak EU Presidency.

During the conference country delegates acknowledged the progress that COST has made since the last Ministerial Conference in Palma de Mallorca in 2010, particularly the creation of an independent COST Association, a new scientific organisation and evaluation process. Government representatives also discussed challenges in science and the opportunities for COST, in view of the next framework programme and acknowledged the strong benefits for researchers and the impact on capacity building.

The COST Association organised the event together with the Ministry of Education, Science, Research and Sports and the Ministry of Foreign Affairs of the Slovak Republic.

The Slovak Minister of Education, Science and Sport, Peter Plavčan, highlighted that the COST Programme is a very important tool for Slovak young researchers, because it gives them the opportunity for international collaboration, which is a priority of the Slovak Presidency of the Council of the European Union.

The COST corporate video

In context of the Ministerial Conference, a corporate video was produced to present the benefits and added value of the COST Programme. The video features COST Action participants' testimonials on the professional and personal benefits of participating in COST Actions. The interviews were carried out in Slovenia, Cyprus, Switzerland, the UK, Belgium and Serbia. However, many of the interviewees originally come from less research-intensive Member States.

The video had a great success and since its presentation at the Ministerial Conference it has been used for other corporate means such as the COST website, the social networks and other conferences and presentations.

You can find the video on our homepage: www.cost.eu

Our researchers' messages at the Conference

"Industry needs to cooperate with academia just like in COST networks. Over there, knowledge transfer and getting results to industry happens in real time."

Mark de Boevere, Managing Director, Pulsemaster (SME), The Netherlands

"All COST Actions are about getting people together. I collaborated with many excellent scholars, which I believe is one of the strongest points of COST."

Dr Ana Milojevic, Assistant Professor, Faculty of Political Sciences, Belgrade University, Serbia

"Excellence is kind of contagious. It really helps if you work with someone who is good and you see how other people in the field work."

Dr Julius Georgiou, Associate Professor, Faculty of Engineering, University of Cyprus

“I always say that I have learnt more in these 3 years in COST than I would have in 10 years of my career.”

Dr Lara Pajewski, Researcher, Engineering Department, “Roma Tre” University, Italy

“Innovative ideas will only come if we have a diverse culture. And if we join forces, we will be making bigger progress and deliver something to society.”

Dr Andreja Kutnar, Associate Professor, Department of Technology, University of Primorska, Slovenia

“COST brought a new dimension to my career and to my research project. Instead of working in one university, I am working at a European scale.”

Dr Maxime Hervo, E-Profile Network Manager, Federal Office of Meteorology and Climatology MeteoSwiss, Switzerland

03

Key figures of 2016

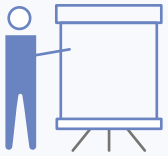
Key figures of 2016

352

Running Actions

258

Training schools



2,705

Short-term scientific missions

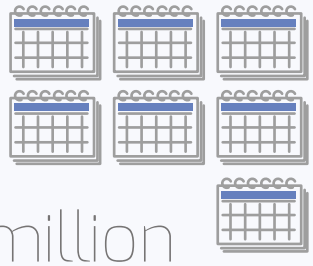
48,000

Researchers involved

€129,000

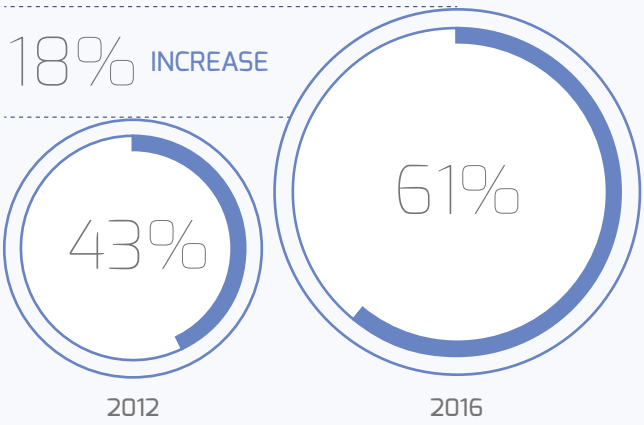
Average annual budget of a COST Action

COST budget (from Horizon 2020 for a 7-year period)



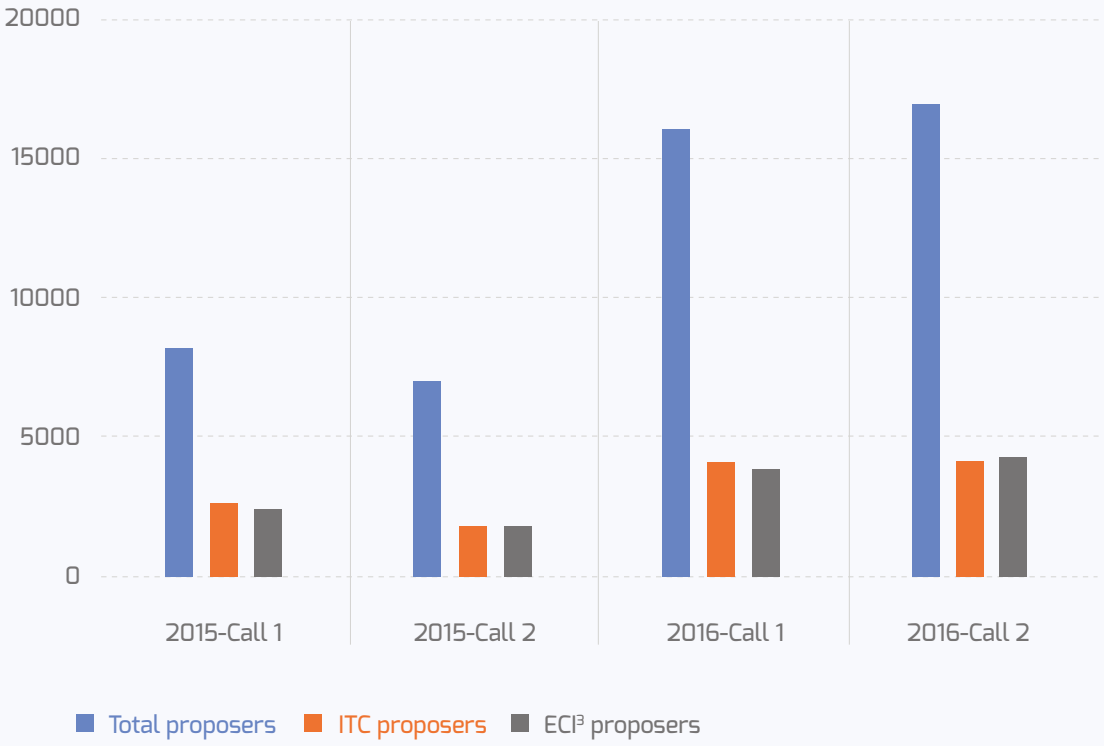
€300 million

Less research-intensive Member States (ITCs[1]) representation in the Action's Management Committee[2]



Constant efforts are devoted to increasing the participation of less research intensive Member State researchers.

Number of COST Proposals over the past two years



[1] ITCs stands for Inclusiveness Targeted Countries.

[2] The Management Committee is the decision making body in an Action.

[3] ECI stands for early career investigators.

Female participation in networking activities in all COST Member States

TOTAL PARTICIPANTS 48375

FEMALE 19912

2016	41%
2015	40%
2014	39%
2013	38%
2012	36%

Female participation from less research-intensive Member States (ITCs) in networking activities

TOTAL PARTICIPANTS 13289

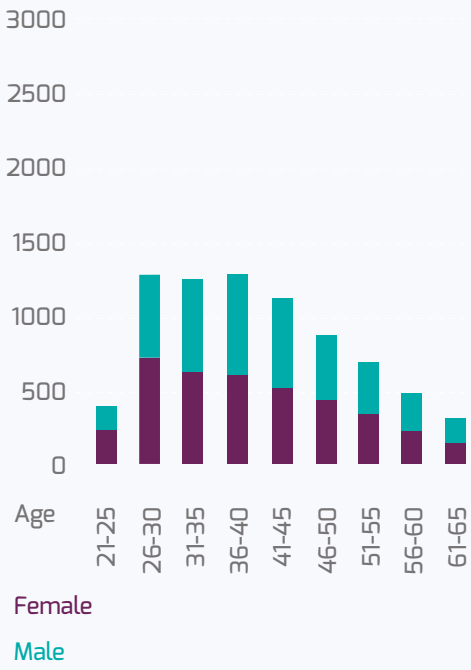
FEMALE 6435

2016	48%
2015	46%
2014	43%
2013	44%
2012	42%

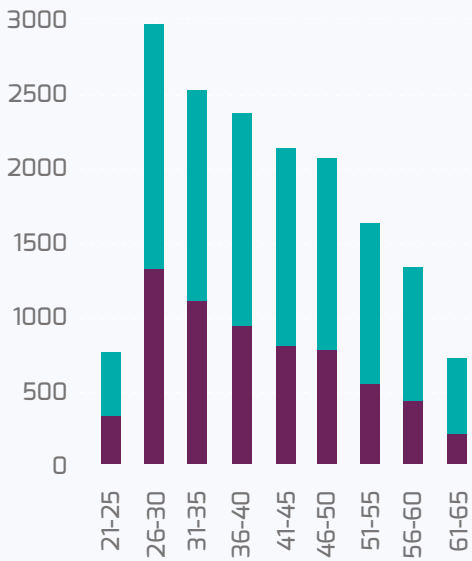
Female participation in COST Actions has gradually increased over the past four years. Particularly, in the less research-intensive Member States.

Participation in COST activities by age group and gender in 2016

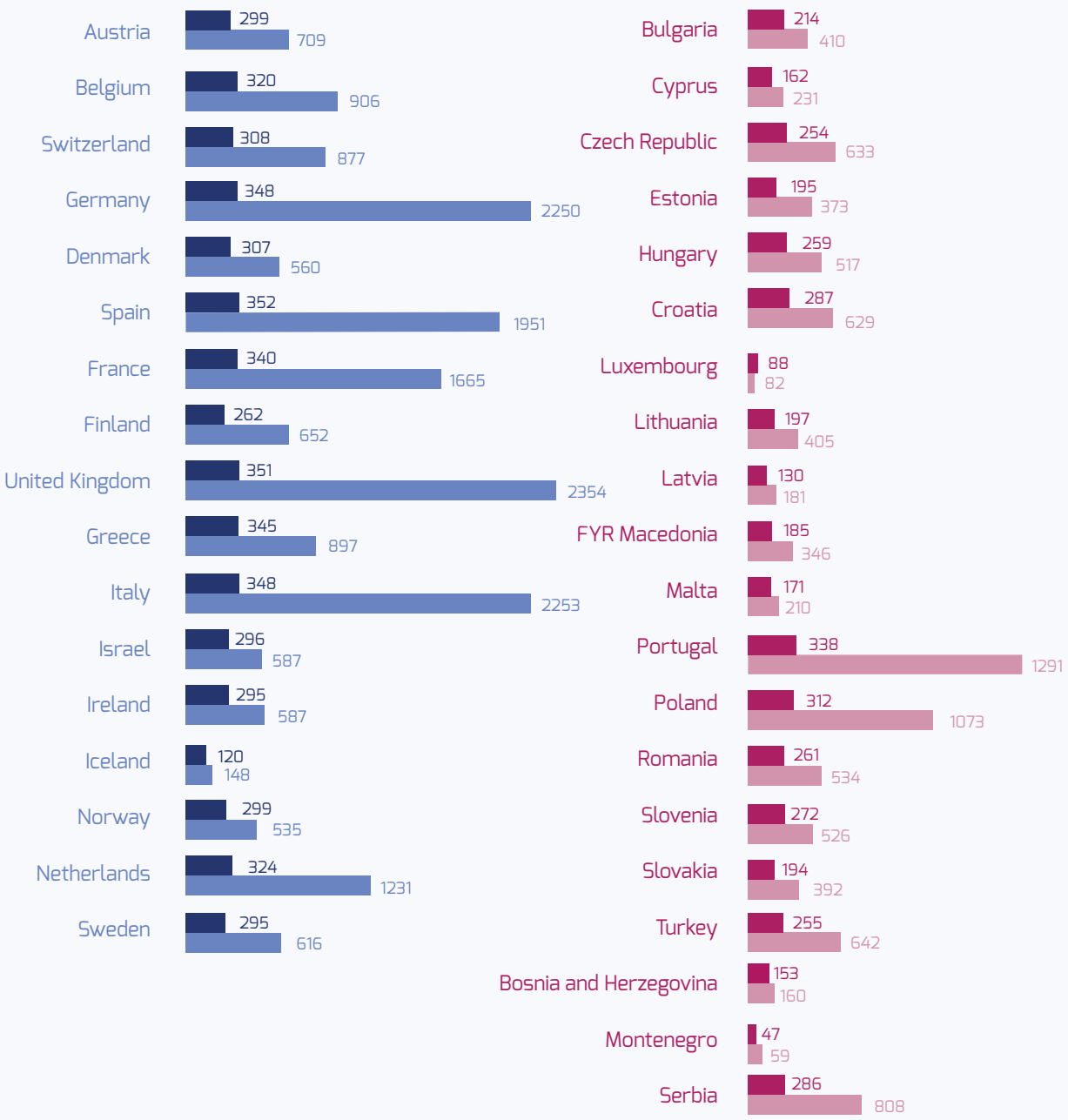
COST less research-intensive Member States (ITCs)



COST research-intensive Member States



Participation in COST Actions



Number of times someone participated in an activity

Science and technology areas of the COST Actions

Natural Sciences 26%

Earth/environmental sciences	30%
Computer/information sciences	23%
Physical sciences	16%
Biological Sciences	11%
Chemical sciences	11%
Mathematics	9%

Engineering/Technology 25%

Materials engineering	19%
Nanotechnology	16%
Electrical engineering	13%
Civil engineering	12%
Medical engineering	12%
Environmental engineering	11%
Chemical engineering	8%
Mechanical engineering	3%
Biotechnology	4%

Medical and Health Sciences 18%

Health sciences	40%
Clinical medicine	27%
Basic medicine	18%
Medical biotechnology	15%

Agricultural Sciences 15%

Agriculture, forestry, fisheries	52%
Agricultural biotechnology	18%
Animal and dairy science	16%
Veterinary science	14%

Social Sciences 13%

Sociology	32%
Political science	19%
Social and economic geography	19%
Educational sciences	11%
Media/communications	9%
Economics and Business	6%
Law	2%
Psychology	2%

Humanities 3%

History/archaeology	36%
Languages/literature	36%
Philosophy/religion	18%
Arts	10%

Participants expertise in COST Actions by science and technology areas

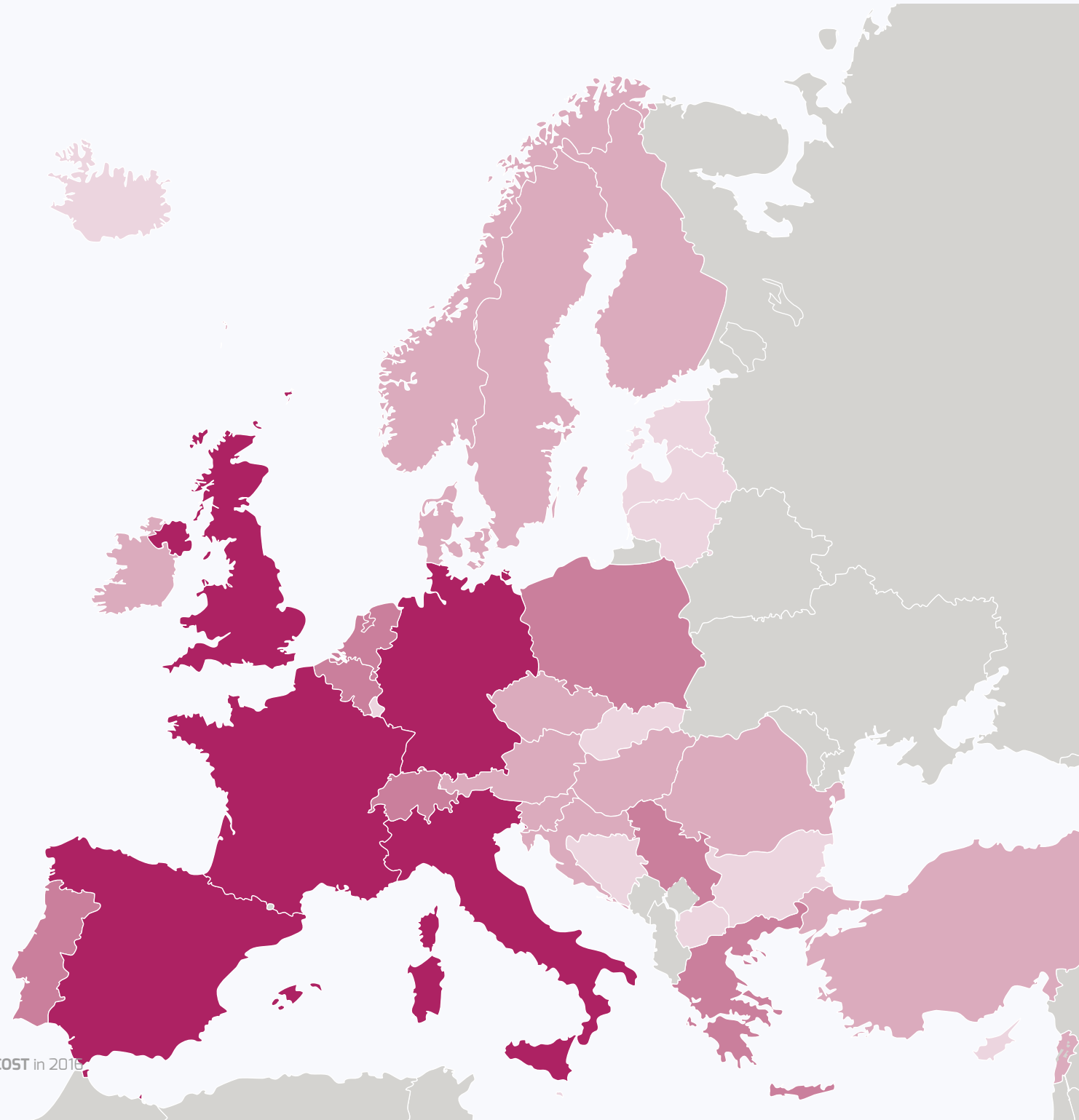
Action	Natural sciences	Engineering	Medical sciences	Agricultural sciences	Social sciences	Humanities
Natural sciences	69%	19%	1%	5%	4%	1%
Engineering	51%	42%	4%	2%	2%	0%
Medical sciences	38%	11%	38%	4%	7%	2%
Agricultural sciences	40%	4%	4%	48%	3%	1%
Social sciences	13%	14%	3%	1%	57%	12%
Humanities	17%	9%	3%	1%	9%	61%

This table shows the number of participants classified by their expertise profile and their participation to each Action. Actions are also classified by science and technology areas. This shows that, for example, not all the experts on natural sciences are in natural sciences' Actions, but also in engineering, medical sciences and agricultural sciences Actions.

COST Actions are characterised by their high interdisciplinarity.

Participations in COST networking activities (2016)

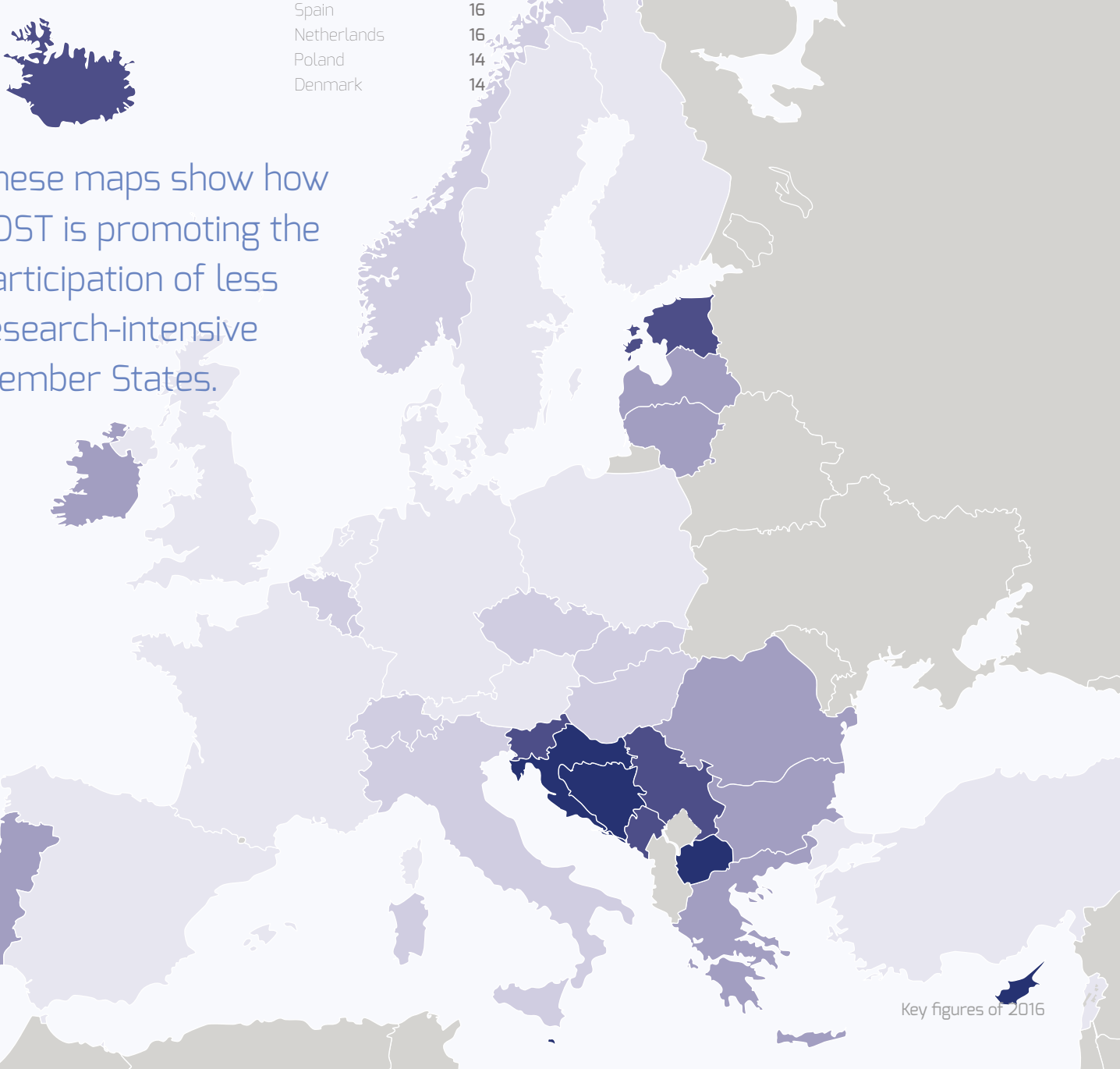
United Kingdom	2354
Italy	2253
Germany	2250
Spain	1951
France	1665
Portugal	1291
Netherlands	1231
Poland	1073
Belgium	906
Greece	897
Switzerland	877
Serbia	808
Austria	709
Finland	652
Turkey	642
Czech Republic	633
Croatia	629
Sweden	616
Israel	587
Ireland	587
Denmark	560
Norway	535
Romania	534
Slovenia	526
Hungary	517
Bulgaria	410
Lithuania	405
Slovakia	392
Estonia	373
FYR Macedonia	346
Cyprus	231
Malta	210
Latvia	181
Bosnia & Herzegovina	160
Iceland	148
Luxembourg	82
Montenegro	59



Participation relative to research capacity*

Cyprus	231
Malta	210
FYR Macedonia	173
Bosnia & Herzegovina	160
Croatia	105
Estonia	93
Iceland	74
Serbia	62
Montenegro	59
Slovenia	58
Lithuania	45
Latvia	45
Ireland	35
Portugal	34
Bulgaria	32
Romania	30
Greece	30
Luxembourg	27
Slovakia	26
Switzerland	24
Belgium	20
Hungary	20
Italy	19
Norway	18
Czech Republic	18
Austria	17
Finland	17
Spain	16
Netherlands	16
Poland	14
Denmark	14
United Kingdom	9
Sweden	9
Israel	8
Turkey	7
France	6
Germany	6

*Full-time equivalent in people working in R&D.



These maps show how COST is promoting the participation of less research-intensive Member States.

04

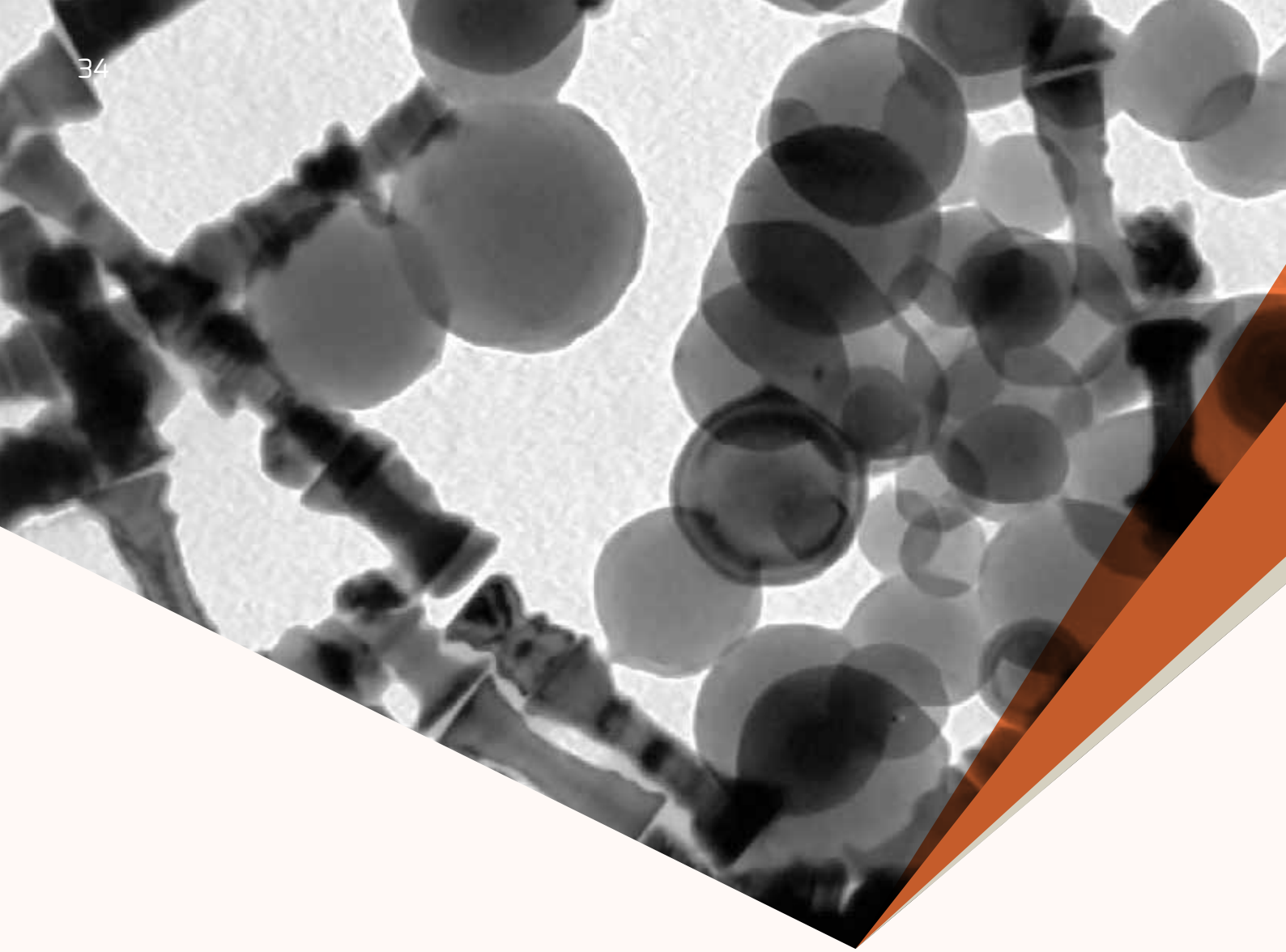
Making an impact: success stories

Helping people and ideas grow

The 10 success stories presented in this chapter belong to COST Actions that ended in 2016. Following the concept of this year's Annual Report, they all feature stories of researchers that grew professionally throughout their participation in the Actions as well as ideas that were developed during the four years of a COST network.

The success stories include examples of people that boosted their careers after taking part in a COST Action. They encountered new opportunities in their professional field while being given the chance to improve and establish their careers in Europe. There are also success stories that focus on how an idea came up, evolved or had a great impact in society thanks to the encounters that take place in the COST networks.

These are COST networks in a nutshell, which could not happen without the people that participate in them.



Tiny but toxic: understanding the potential toxicity of nanoparticles

Nanotechnology is one of the most exciting fields of scientific research, but there are concerns about the safety of engineered nanoscale particles. Scientists from different disciplines have come together to shed light on the potential toxicity of these tiny particles – and their integrated expertise has led to some surprising findings that could benefit both the nanosafety community and society at large.

View the Action:
http://bit.ly/2s5o2Tn

View the network website:
http://bit.ly/2sizvwD

> “The MODENA project has brought together scientists from different disciplines – like toxicology, material science and mathematics – to develop mathematical models that describe the relationship between the ‘structure’ and the activities of engineered nanoparticles.”

Professor Lang Tran, Principal Scientist, Computational Toxicology, Institute of Occupational Medicine, UK

Nanoparticles are far too small to see with an ordinary microscope. But, although they’re tiny, the scale of their potential applications is huge – in fields as diverse as medicine, electronics, food, fashion and energy.

Because of this, the production and use of nanoparticles has spiked in recent years. But the benefits and risks of these tiny particles are hotly debated in the scientific community and wider society. On the one hand, engineered nanoparticles could bring significant technological developments and increase the wellbeing of society. But there are also real concerns that exposure to some of these particles could cause environmental problems and harm to human health.

Unsurprisingly, nanosafety is a key area of research, with research groups across Europe working to shed new light on this field. One such group, working together as part of the MODENA (Modelling Nanomaterial Toxicity) COST Action, has made key insights into the toxicity of engineered nanoparticles. Their findings are crucial for the development of safe, new-generation engineered nanoparticles.

“The MODENA project has brought together scientists from different disciplines – like toxicology, material science and mathematics – to develop mathematical models that describe the relationship between the ‘structure’ and the activities of engineered nanoparticles,” explains Professor Lang Tran, the Chair of the project.

By bringing together interdisciplinary experts, MODENA has raised awareness about the importance of an invaluable tool in nanosafety research: namely, mathematical modelling. This is particularly significant given that the nanosafety community typically consists of biologists and material scientists, not mathematicians.

“The MODENA COST network has demonstrated how quantitative tools extend experimental data into useful tools for regulations,” Professor Lang Tran points out. “The mathematical models created by MODENA and other project supported by MODENA help us predict the toxic effects of nanomaterials.”

These models have now become standard regulatory tools in industries across Europe – and they have also reduced the need for animal testing.

But that’s not all. MODENA has also spawned several multidisciplinary research groups on nanosafety, as part of the Horizon 2020 Programme. Plus, it has fed into the development of a new generation of young scientists, who are planning to continue working on modelling the toxicity of nanoparticles.

Most importantly, though, the MODENA initiative has resulted in new ways of looking at some of the most challenging diseases in the 21st Century. For instance, by analysing the toxic nanoparticles associated with serious lung diseases, scientists now have a better understanding of the metrics of toxicity. These findings have contributed to the ‘Safer-by-Design’ concept for a safe and sustainable nanotechnology industry.

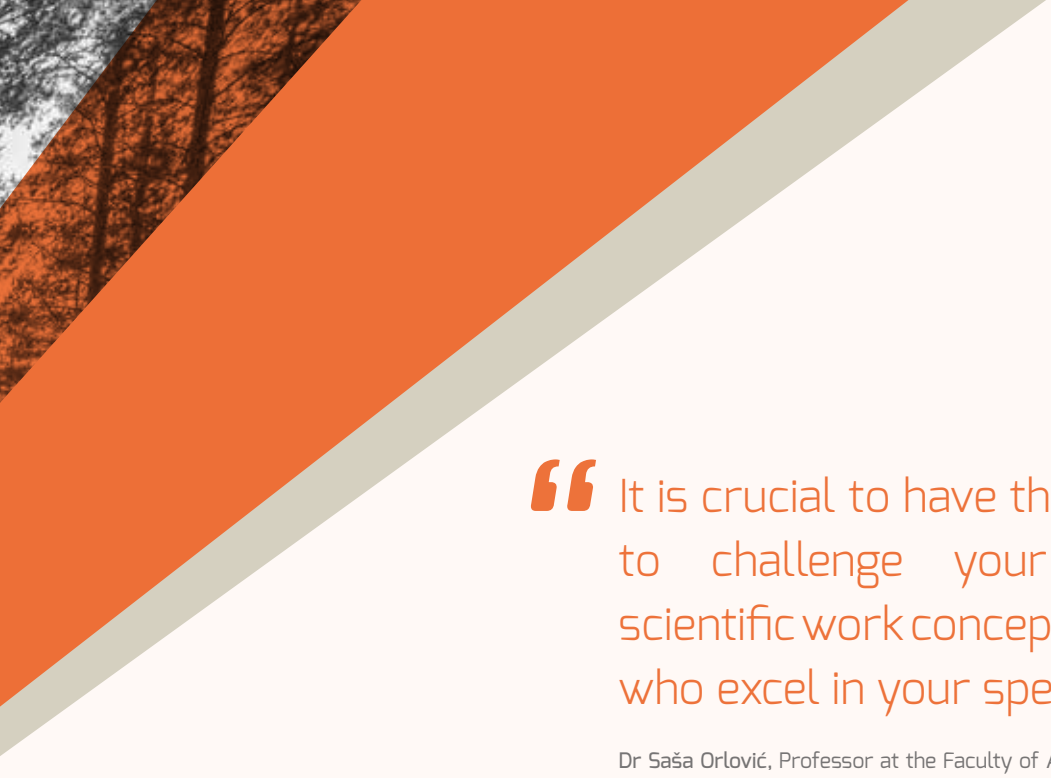
The MODENA scientists have also shown that seemingly unrelated diseases – such as Alzheimer’s and atherosclerosis – are in fact driven by similar mechanisms at the nanoscale level. In the future, this could lead to new preventive measures and help reduce the healthcare burden.

Doors opening across Europe thanks to tree talk

Cross border collaboration is helping scientists in Serbia, like researchers Dr Saša Orlović and Dr Dejan Stojanović, to open the doors of cooperation with their colleagues around Europe.

View the Action:
http://bit.ly/2siwHjq

View the network website:
http://bit.ly/2s36fpE



> “It is crucial to have the opportunity to challenge your ideas and scientific work concepts with people who excel in your specific field.”

Dr Saša Orlović, Professor at the Faculty of Agriculture and Head of the Institute of Lowland Forestry and Environment at the University of Novi Sad, Serbia

Scientists in Serbia are starting to see an improvement in their situation thanks to cooperation and collaboration with their counterparts across Europe. Dr Saša Orlović and Dr Dejan Stojanović are two researchers who are reaping the rewards of more contact with academics like them from beyond their borders, thanks to help from COST.

Events in their country’s recent history have meant that opportunities for improvement and knowledge exchange for Serbian scientists have been limited at times. Serbia is not a member of the European Union, meaning that aspects of scientific life possibly taken for granted elsewhere, like studying in and travelling to other countries, can be more difficult.

But becoming part of several COST networks in recent years has opened doors to Dr Orlović and Dr Stojanović. “Since Serbia is still not part of the EU, we have fewer scientific and travel opportunities compared to colleagues from EU countries,” says Dr Orlović.

“Valuable international contacts are the key benefit of our participation in COST Actions,” adds Dr Orlović, a Professor at the Faculty of Agriculture and Head of the Institute of Lowland Forestry and Environment at the University of Novi Sad. “Especially contacts with scientific institutions in the forestry sector which we would never have been able to get any other way.”

The Institute has taken part in different COST networks over the last decade, with the most prized fruit of their endeavours being Serbia’s first Dendrolab at the university. It’s a laboratory for tree ring research based around a system called ATRICS that scans tree cores in very high resolution. The lab possesses several tree core borers, including a unique one-metre long device for extraordinarily old and thick trees. It was inspired by Dr Stojanović’s first short-term scientific mission to the Slovenian Forestry Institute in Ljubljana in 2013 as part of the COST Action ‘Climate Change and Forest Mitigation and Adaptation in a Polluted Environment’.

“We took the rich experience gained from Dr Tom Levanič, the senior researcher at the Slovenian Forestry Institute who is also a professor at the University of Ljubljana, and an expert in the field of dendrochronology – the science of dating events and environmental change through studying tree rings. We started going to the field intensively to acquire as many tree samples as we could,” says Dr Stojanović, a graduate and researcher at the Institute since 2012. “We would never have established this successful cooperation without the COST funding. We have also introduced colleagues from abroad to our Institute and our country, and our discussions with European researchers from the top of their field have helped us focus our research goals.”

Dr Orlović is a big believer in empowering young researchers to take part in training schools and scientific missions to mature in the industry, and learn from new cultures and individuals. COST supported the Institute through working group meetings, training schools and short term missions as well as financing a training school and one of the Management Committee meetings in the Institute at Novi Sad.

“It is crucial to have the opportunity to challenge your ideas and scientific work concepts with people who excel in your specific field,” he says. “It can save months if not years of hard work.” Much like the tree rings studies, time will inevitably reveal just how important that collaboration has been.

The big chill: how freezing food may help the battle with cancer

Successfully freezing and thawing fruits, vegetables and spices allows food to be moved around the world and helps to reduce food waste. Now the technology used in this process may help in freezing human stem cells used in newly developed cell-based therapies including cancer treatment, thanks to the initiative of a group of scientists from across Europe who were able to cooperate and achieve results after coming together in a COST network.

View the Action:
http://bit.ly/2ujg6Zb

View the network website:
http://bit.ly/2sSugCH

> “Applying for funding from COST is easy and straight forward, and there is not much paperwork. Gaining knowledge and experience, meeting new people, discovering new countries and cultures - there are no drawbacks to this project, only benefits!”

Dr Katarzyna Dymek, Food technology, engineering and nutrition, Lund University, Sweden

Technology and ideas used in the food industry could have a positive impact on research into cancer following research helped by a COST network. Experts from across Europe have realised that methods used to freeze and thaw plants, like spinach or rocket, while preserving their cells alive could be used on human stem cells, without the need to use potentially harmful substances.

The realisation sprang from COST Action ‘EP4Bio2Med’ – the European network for development of electroporation-based technologies and treatments. Its aim was to increase pan-European understanding of electroporation – increasing permeability of cell membranes by exposing them to electrical fields. And that goal was successfully reached by one member, with many beneficial results.

Dr Dymek was studying for a PhD at Lund University in Sweden, but discovered that methods used by a group in Slovenia could be useful to her. With funding from COST, she visited the University of Ljubljana to look at mathematical modelling that helped continue with her research.

“Essentially, without the funding, I would not have been able to travel,” says Dr Dymek. “Visiting the research group at University of Ljubljana, Faculty of Electrical Engineering allowed me to meet very experienced scientists, who shared their knowledge with me. They helped me to look at the plant tissue, and the processes taking place in it, from a different perspective.

“I also saw a new laboratory, learned new techniques and explored a new city and its culture.”

Having built a theoretical model of a leaf structure thanks to her trip to Ljubljana, Dr Dymek’s understanding of electroporation increased. She could continue with her PhD project, and devise a method of freezing spinach or rocket leaves without killing them.

This has also helped her in work at Optifreeze, a company founded at Lund University, that uses an innovative method to freeze fruits and vegetables without losing their structure after the freezing and thawing process. Plus, scientists from Ljubljana from the Laboratory of Biocybernetics who worked with Dr Dymek realised that technology she uses in Optifreeze could help in their work on stem cells. They are now working with a Slovenian biotech company Educell on analysing how human stem cells can be frozen without using toxic cryoprotectants.

The results of her visit to Ljubljana continues to help Dr Dymek, whose network of contacts expanded thanks to COST’s funding.

“Now, when I have a scientific problem or I am looking for a collaboration, I can easily find experts in a specific field and direct the question to them,” she adds. “I learned many things during my COST trip, and I use this knowledge every day working at Optifreeze.”

“Applying for funding from COST is easy and straight forward, and there is not much paperwork. Gaining knowledge and experience, meeting new people, discovering new countries and cultures – there are no drawbacks to this project, only benefits!”

Defying disease through scientific collaboration

Discovering new drugs is vital for fighting disease and improving health. One recent COST network, focused on developing new metal-based drugs, highlights the power of transnational collaboration to both advance vital scientific knowledge and foster the growth of individual researchers.

View the Action:
http://bit.ly/2tpZlPE

View the network website:
http://bit.ly/2tlGK6o

> “The Action has fostered the careers of many early-career scientists by increasing their mobility, enhancing their training and providing a framework for highly interdisciplinary research.”

Professor Angela Casini, Chair of Medicinal and Bioinorganic Chemistry, Cardiff University, Wales

New medicines have the potential to offer patients improved quality of life, fewer side effects and, perhaps most importantly, longer life. And, while discovering new drug compounds is a complex process, recent scientific and technological advances have enabled a deeper understanding of cancer, infectious, and virus-related diseases at the molecular level.

Tapping into these advances, a transnational and multidisciplinary group of European scientists have made exciting progress in the field of drug discovery. Working as part of COST Action ‘Functional metal complexes that bind to biomolecules’, they focused on developing metal-based drugs interacting with different biomolecular ‘targets’. Divided into five working groups, the scientists sought to identify and validate new ways of designing molecules for therapy and imaging, as well as designing chemical probes to study the role of target proteins in health and disease mechanisms.

Professor Angela Casini was the project representative from the Netherlands, and a member of the working group that focused on the study of interactions between metal-based compounds with proteins, for applications in chemical biology and medicine.

As she explains, the funding she received from this COST Action greatly enhanced her scientific career. “It allowed me to consolidate my network of international collaborations in Europe, which is a fundamental requisite for an independent academic career,” she says. “It also allowed me to substantially increase my scientific output and contributed to several of my recent achievements.”

These achievements include being listed by Thomson Reuters as “one of the world’s most influential scientific minds” in Pharmacology and being nominated as an ‘Honorary Fellow’ at the prestigious Technical University of Munich. She believes these achievements helped her to secure her full professorship position at Cardiff University – a remarkable accomplishment, particularly as she was only awarded her PhD in 2004.

But this COST Action has not only benefited Professor Casini. As she explains: “More than 360 papers have been published acknowledging the Action, at least 150 of which are co-authored by at least two Action participants. The Action has fostered the careers of many early-career scientists by increasing their mobility, enhancing their training and providing a framework for highly interdisciplinary research.”

Plus, this network endorsed the ‘1st International Symposium on Clinical and Experimental Metallodrugs in Medicine: Cancer Chemotherapy’, held in Honolulu in December 2015. Professor Casini was the co-Chair of this event, and several other members of the COST Action also participated by giving important scientific contributions at the meeting. “So, the topics of our COST Action were fully represented in this high-profile event!” Professor Casini enthuses.

Having witnessed first-hand what can be achieved when researchers from different backgrounds and different countries come together to share knowledge and expertise, Professor Casini fervently encourages other academics – at all levels and across all disciplines – to engage in the COST Programme.

Linking lakes with an eye on the future

The fragile nature of Europe's lakes and reservoirs has seen an increase in the level of monitoring of their current state. COST's role in linking up scientists across the continent has been crucial, with one researcher being inspired to raise awareness on a local level.

View the Action:
http://bit.ly/2t1JIec

View the network website:
http://bit.ly/2tlNtxx

> “COST can help you meet those that are leading state-of-the-art science, and directly lead you onto even bigger projects.”

Dr Meryem Beklioglu, Middle East Technical University (METU), Turkey

A COST Action has helped link experts using cutting-edge technology to monitor and protect Europe’s lakes and reservoirs. And for one scientist, COST’s help played a major part in her winning more funding for an important project that could have long-term benefits in her home country.

Dr Beklioglu is a shallow lake ecologist at Middle East Technical University (METU) in Turkey. She joined COST Action NETLAKE - Networking Lake Observatories in Europe - which links up stakeholders with an interest in Europe’s natural and man-made bodies of water.

Increasing the frequency that lakes are monitored helps scientists to understand and protect these precious resources. Sensors placed in the water provide data on water quality issues, and NETLAKE has helped build a network where this data can be shared more easily than before.

Dr Beklioglu had been assessing how climate change and other environmental issues were affecting lakes, so NETLAKE’S network helped with her work. “I had been leading research for about 20 years by doing long-term monitoring research on lakes. But I was aware of the benefits of high-frequency monitoring in terms of data-intense research,” she says.

“NETLAKE gave me a chance to apply to a Turkish funding agency called TÜBİTAK to help start a nationally-funded project with the same goals of high-frequency monitoring. NETLAKE’s funding allowed me to attend meetings for this national project, learn from them and benefit from the experience.”

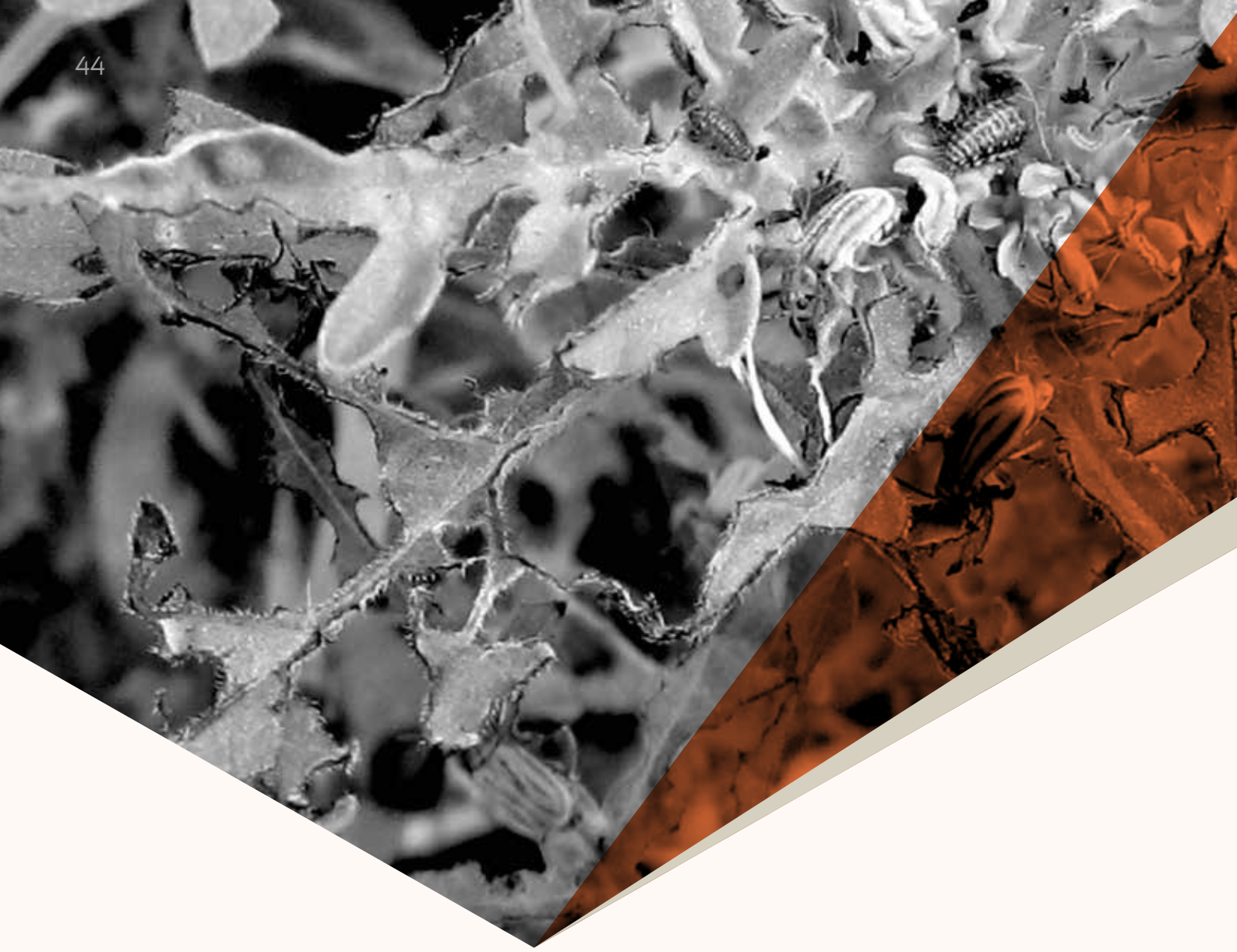
That led to Dr Beklioglu establishing more high-frequency monitoring of a lake at METU campus that she had been studying many years. A new sensor, attached to a buoy, was placed in the lake thanks to funding she received from TÜBİTAK. This kind of move is, she says, “the future of lake monitoring”, and with an eye on the future she has also engaged with students from schools and colleges.

“We have developed a programme for sixth and seventh grade students called ‘Science Applications’. It’s an eight-week long programme of inquiry, with problem-based theoretical and practical aspects using an approach similar to citizen science activities in NETLAKE.

“We’re also filming our class activities as well as practical works to reach out to more schools in a programme we’ve called ‘Lake Ambassadors’”.

Dr Beklioglu declares that COST has helped connect technology for better monitoring with the concept of ‘citizen science’. It’s helping to increase awareness in younger generations of the fragile state of Europe’s water supply to protect it.

“In the long term this can only help to better preserve our ecosystems. I now know the people who can help in different fields so that we can work together on future projects. COST can help you meet those that are leading state-of-the-art science, and directly lead you onto even bigger projects.”



New bug helps in annual hay fever battle

Hay fever sufferers in parts of Europe will welcome a new ally in their annual bout with the allergy. An insect never previously found in Europe has arrived with the taste for a weed that spreads pollen, but it may also affect plants that we like to have around. The COST Programme has funded a research network that has highlighted the issues around this new development. Their findings indicate clear benefits over risks.

View the Action:
http://bit.ly/2ujh7jV

View the network website:
http://bit.ly/2uWPam4

> “Running such a large and international network was new to me, but I learned how to deal with finances, about project and data management. It was a great experience.”

Dr Suzanne Lommen, University of Fribourg, Switzerland

A commonly-found weed that helps spread hay fever around Europe could be controlled by a new natural enemy.

The pollen from common ragweed - Ambrosia artemisiifolia – causes pollinosis, also known as hay fever and respiratory diseases. The dominance of this exotic and invasive ragweed in parts of central Europe ensures that many people have tablets and tissues at the ready when summer comes around. And climate change makes it likely that ragweed, which originates from the USA, will spread even further.

But the unexpected arrival of an insect from outside the continent may be reducing the misery of hay fever sufferers, and saving money at the same time. Ophraella communa, known as the North American ragweed leaf beetle, loves eating ragweed and has been indulging itself since it was unexpectedly found to be in Europe in 2013. It was first discovered near Milano Malpensa airport, where it may have been accidentally released from flights from the USA and China.

The COST network SMARTER, Sustainable management of Ambrosia artemisiifolia in Europe, has not only helped spread knowledge of the beetle’s great usefulness in reducing pollen production and limiting growth of ragweed populations, but also that risks for other plants, like sunflowers, are small.

SMARTER was led by Professor Heinz Müller-Schärer from the University of Fribourg in Switzerland. “Thanks to COST, we have been successful in getting together experts from weed science and invasion science, as well as from health, economy and social sciences,” says Professor Müller-Schärer.

“This unique combination allowed setting up interdisciplinary international collaborative projects, and the problem was discussed at a European scale. Ragweed is an issue in so many European countries. There were a lot of people involved in researching it, but it was not coordinated at all. Using natural enemies of invasive plants was also appealing, because this is quite new in Europe.”

The 250 researchers from 35 countries involved helped SMARTER to a series of achievements. These included highlighting the benefits and risks of using the beetle, including the economic benefits. They estimate that control of ragweed pollen thanks to the beetle alone in the Rhone-Alpes region of France could save 10m euros of health costs annually. Another was a forward-thinking increase in knowledge about understanding and managing weeds and plant invaders by training young experts from this field, especially focusing on new methods such as biological control and sophisticated vegetation management.

And SMARTER also had a positive impact for Dr Suzanne Lommen, a young colleague of the professor in Fribourg. She was researching the demography of ragweed and the effect of the leaf beetle, but helping to coordinate SMARTER and the people involved boosted her own work.

“Thanks to COST I involved researchers from 17 countries in what has now become the world’s largest demographic study of ragweed,” Dr Lommen declares. “Running such a large and international network was new to me, but I learned how to deal with finances, about project and data management. It was a great experience.”

Game Theory in a transnational world

When Hungarian Cambridge graduate Dr László Á. Kóczy was approached to take part in a COST Action, he was sceptical. Little did he know, the Computational Social Choice networking initiative he was about to engage in would flower into a research project that would bolster the very foundations of democracy in his country.

> "One must not underestimate the benefits of putting active researchers together for a few days, magic happens."

Dr László Á. Kóczy, Senior Research Fellow, Hungarian Academy of Sciences, Hungary

View the Action:
http://bit.ly/2snlkSe

View the network website:
http://bit.ly/2tlal0o

> “I can only imagine what such an Action might mean to people with less fortunate backgrounds, it’s almost like becoming a faculty member at a top university.”

Dr László Á. Kóczy, Senior Research Fellow, Hungarian Academy of Sciences, Hungary

The field of computational social choice may be relatively new, but the issues it addresses are centuries old. With roots going back to the 13th century, social choice theory studies the problems of making joint decisions when the individuals involved in the decision-making process have their own conflicting ideas on how things should pan out. Dr László Á. Kóczy’s work investigates the areas where social choice theory, economics and computer science intersect. It is a complex world of research, inhabited by a variety of protagonists from differing disciplines.

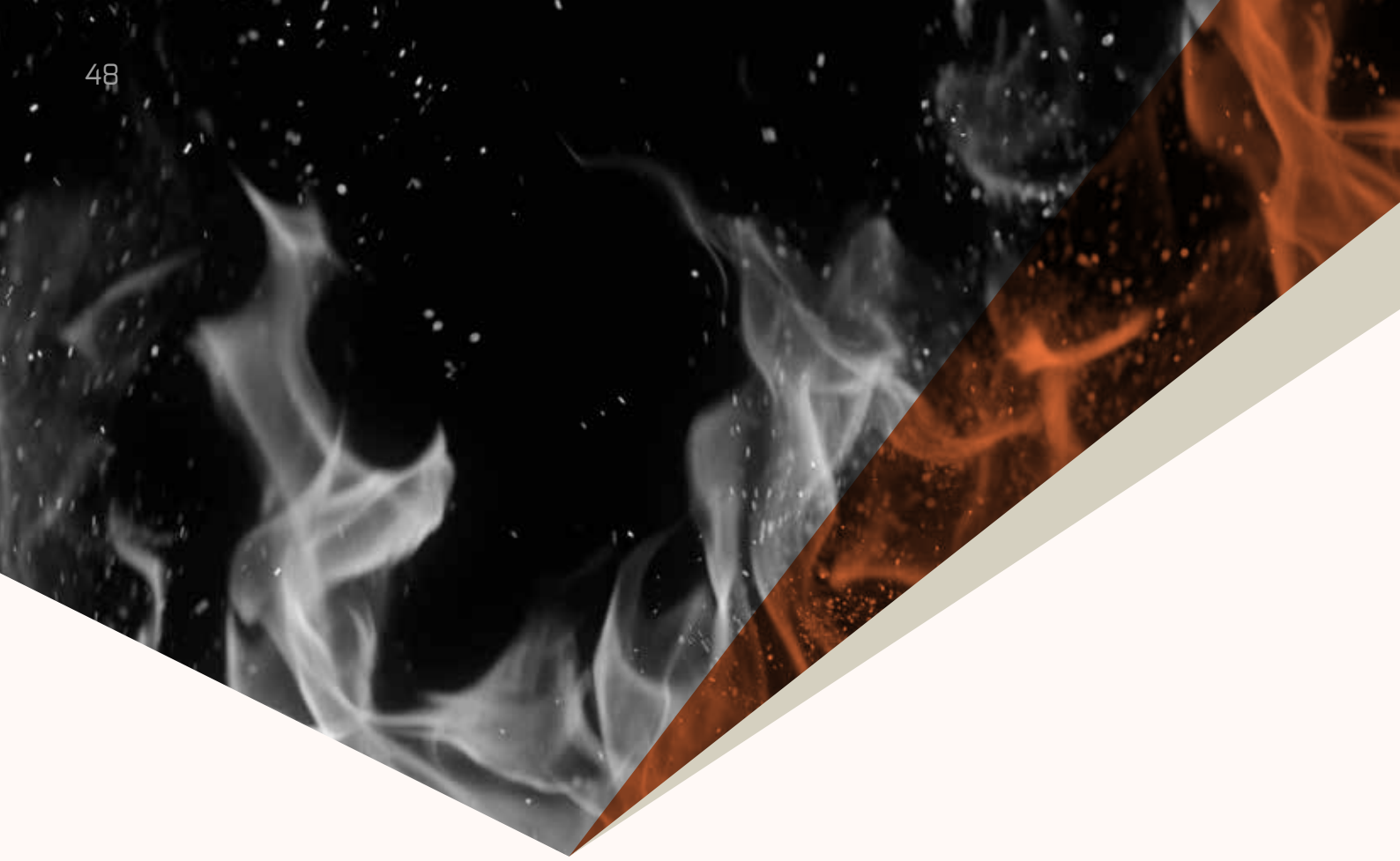
Kóczy is Senior Research Fellow of Game Theory Research Group at the Hungarian Academy of Sciences, Hungary’s most prestigious academic society. He was approached to take part in COST Action Computational Social Choice, but was initially wary of a project he imagined would lead to an administrative headache. He soon realised his fears were overblown. “One must not underestimate the benefits of putting active researchers together for a few days,” he says. “Magic happens.”

In recent years Budapest has become a European powerhouse in the world of Game Theory, the mathematical study of human conflict and cooperation. However for Dr Kóczy, it was a world that was limited by the reach of his academic contacts. The COST network he took part in, chaired by Dr Ulle Endriss of the University of Amsterdam, was a pioneering attempt to bring together researchers from different fields, countries and backgrounds. It employed four groups of researchers to tackle the four main areas of Computational Social Choice theory: Voting, Fair Division, Information Merging and Matching.

“It was a great success,” he says. As a game theorist with a background in mathematics and economics, Dr Kóczy was up to date with literature on the subject, however was surprised to discover a wide degree of scientists were working on the same problems, but with different approaches and goals. “I was very happy getting to know people working beyond my discipline.”

The project lead to the group working on a draft of a change to electoral law. Dr Kóczy, with colleagues Péter Biró and Balázs Sziklai, investigated district apportionment among counties. “The draft of Hungarian law they were inspecting did not explicitly specify how districts should be allocated,” says Dr Kóczy, “but instead described what an acceptable apportionment should be like.” The group concluded that no allocation of districts meet these requirements, and wrote a paper devising a new method to find the closest one. Eventually the law was updated, and a new system was implemented that was “almost identical” to the one they’d proposed in the paper.

“Being part of such a cutting-edge Action allowed me to discuss ideas with many excellent researchers.” says Dr Kóczy. “I can only imagine what such an Action might mean to people with less fortunate backgrounds, it’s almost like becoming a faculty member at a top university.” His time working with COST has left him certain of one thing. In an emerging world of transnational collaboration, the age of research in isolation is over.



Toxic flame retardants are a burning issue

Flame retardants are an integral part of creating products from plastics to textiles that are fire friendly. However, many of the flame retardants in use are toxic and damaging for the environment. Dr Giulio Malucelli has built a group that is 'greening-up' flame retardant chemicals.

View the Action:
http://bit.ly/2tZdvEm

View the network website:
http://bit.ly/2sigURr

> “The scientific and technological network that we created during the COST Action included several people with high competencies, straddling different ‘areas’ within the textile world. The obtained results clearly demonstrate the high level of competency within the network.”

Dr Giulio Malucelli, Associate Professor of Materials Science and Technology, Politecnico di Torino, Italy

The use of flame retardants is growing by a rate of nearly 5% a year, and by 2018 the market is expected to be worth USD $7 billion. They are a vital part of modern life, but they pose problems around health, safety and the environment. So one researcher reached out to the COST Programme to help in his quest to address these issues by sharing knowledge and ideas with experts in this field.

There are dozens of materials that various industries have used as flame retardants historically. However, the ones receiving the most attention from Dr Giulio Malucelli, Associate Professor of Materials Science and Technology at Polytechnic University of Turin, are those used by the textile industry.

Dr Malucelli’s interest in flame retardants grew out of his activities in chemistry and chemical engineering. Drawn to the field through his investigations into polymers, Dr Malucelli noticed that while extremely useful to society from an industrial and construction perspective, using flame retardant chemicals presented concerns over meeting fire safety requirements. The use of biomacromolecules instead of chemicals in flame retardants could be a safer option.

Furthermore, he also discovered that many of the flame retardants used by the textile industry can cause grave damage to the environment. “Some of the standard flame retardants can have a high environmental impact and usually require complex and expensive technologies for their application to textiles,” he notes.

In 2014, Dr Malucelli approached the COST Programme with the goal of building an international, multidisciplinary group dedicated to solving the issues currently plaguing industry’s use of flame retardant chemicals. The result was the COST Action FLARETEX - Sustainable flame retardancy for textiles and related materials based on nanoparticles substituting conventional chemicals.

“The objective of FLARETEX was to create a network dedicated to fire retardant issues related to textiles – both natural and synthetic – and develop new innovative flame retardants with low fire toxicity and environmental impacts that were also halogen-free,” shares Dr Malucelli.

His own activities within FLARETEX have zeroed in on designing and developing biomacromolecules (namely, proteins and nucleic acids) as flame retardant systems for textiles. “We succeeded in proposing and publishing papers on biomacromolecules as low impact, sustainable and effective flame retardants for cotton fabrics, PET and their blends,” he states.

“The COST Action has also helped disseminate the research carried out by my group. Some of the results are being acted up in a H2020 project on the recovery and use of biomacromolecules from wastes for conferring flame retardant properties to bio-polymers.”

Dr Malucelli and his team also worked with production finishing company INOTEX, successfully testing a new eco-friendly, water-based halogen and antimony-free flame retardant. It performed well when compared to conventional flame retardant coating systems, and the advantages of its more eco-friendly nature has led to a significant uptake within the industry.

According to Dr Malucelli, the COST FLARETEX Action was also created with the intention of encouraging researchers to propose and discuss new solutions to tackle the problems emerging from the use of standard flame retardants – a goal it has succeeded in achieving.

“The scientific and technological network that we created during the COST Action included several people with high competencies, straddling different ‘areas’ within the textile world,” he shares. “The obtained results clearly demonstrate the high level of competency within the network.”

Trans Canadian-Europe express

Antioxidants are big business. An arsenal of preventative magic bullets that claim to prevent everything from hangovers to dementia. But could they be creating disease, not preventing it? One COST researcher has moved from one side of the world while trying to find out.

View the Action:
http://bit.ly/2tqaoYW

View the network website:
http://bit.ly/2tZ7vLR

> “I established new collaborations that will help me advance my research here even beyond the COST Action.”

Dr Lars-Oliver Klotz, Professor in Nutrigenomics at the University of Jena (Friedrich Schiller University), Germany

The vitamin pill has become one of modern life’s greatest medicinal shields. It promises to prevent hangovers, boost our immune system, protect us from Alzheimer’s, and aid fertility. The list of applications is endless. And highly profitable as well. But what if vitamins caused more problems than they solved? A growing body of science argues that the overuse of anti-oxidants is actually creating disease, not preventing it.

COST Action EU-ROS was set in place to cast a light onto this fascinating and controversial area of science. Its aim: to shed a pan European set of perspectives on redox signalling, the process of removing or delivering electrons that happens in every natural chemical reaction that is the trigger-point for disease.

Dr Lars-Oliver Klotz was a Professor in Pharmaceutical Sciences at the University of Alberta, Canada, and moved to Germany to take his current position as a Professor in Nutrigenomics at the University of Jena (Friedrich Schiller University) in late 2013. Working on EU-ROS helped him transition from one side of the world to the other with ease. “Whenever you start out in a new place, a major issue is of course to get connected and to find collaboration partners,” he says. “This COST Action was a life-saver in that respect.”

Taking part in this COST Action enabled him to present his research to the members of the Action, and get to know researchers from his field of interest, the research on reactive oxygen species/free radicals and their impact on different aspects of metabolism.

The Action was chaired by Dr Andreas Daiber, a Professor in Molecular Cardiology at Mainz University. “The objective of our COST Action EU-ROS was to bring together a European consortium of multi-disciplinary experts for the research on reactive oxygen and nitrogen species in health (redox signalling) and disease (oxidative stress),” says Dr Daiber. “Our working groups’ objective was to identify sources and targets of reactive oxygen and nitrogen species, and exploit these identified structures for the development and application of new drugs.”

Multiple meetings and summer schools culminated in their findings being published in an array of top scientific journals. For Dr Klotz, coming to Germany and getting to know colleagues not only from the region but from all of Europe was the greatest benefit of his involvement. “I established new collaborations that will help me advance my research here even beyond the COST Action,” he says.

Networks clear the path to scientific success

What do you do when you've got a PhD under your belt, a passion for research, enough knowledge to fill a textbook or two... and no job? Short-term research funding opportunities, such as those available through the COST Programme, are worth their weight in gold, and one young researcher's career has taken off following his involvement with a COST network.

View the Action:
http://bit.ly/2sRNSaa

View the network website:
http://bit.ly/2silcHl

> “I feel more a part of a wider European research community than I ever did before. I would highly recommend other early-career scientists to apply for participation to COST!”

Dr Andrew Speak, Teaching Fellow, Manchester University

Early-career scientists face big challenges. Competition for research jobs is tough. Getting papers published in reputable journals is not easy. And securing a university teaching job is no walk in the park.

All of these hurdles are familiar to Dr Andrew Speak, based at Manchester University. Back in 2014, he was struggling to make the next step after his PhD. He’d had four papers published and his teaching job had just come to an end. “I was feeling a bit concerned that the PhD had been a waste of time because I was finding it hard to get a research job,” he reminisces.

So when he came across a funding opportunity for early-career scientists to spend a month in another country, doing research under the COST Programme, he jumped at the opportunity. “There were loads of different projects available, but the one that caught my eye was the COST network called ‘Urban Allotments Gardens in European Cities’,” he says. “I wrote a four-page research proposal, which was eventually refined to focus on biodiversity and land use within allotment gardens, and to quantify ecosystem services based on this data.”

Dr Speak spent a month at Adam Mickiewicz University in Poznan, Poland, where he collected a large amount of data under the supervision of Professor Andrzej Mizgajski. He also carried out fieldwork in allotments in Manchester when back in the UK to make a comparative study.

“The research gave me a chance to become a stronger urban ecologist by becoming more familiar with urban plant species,” he reflects. “I also learned new spatial and data analysis techniques while analysing the data.”

Not only did Dr Speak’s research project in Poland give his confidence a huge boost, but he also got two papers published out of it – one in which he was the main author and the other in which he was the secondary author. Plus, he was able to add international research experience to his CV, which was something he had lacked beforehand.

When comparing allotments in Poznan and Manchester, it was found that Manchester’s are dominated by vegetable growing, reflecting a traditional British fondness for a self-managed food supply. Poznan’s allotments have more trees than Manchester’s, but allotments in both cities have a more diverse range of species than in parks.

The project also expanded Dr Speak’s network of contacts. He has twice been invited back to Adam Mickiewicz University to teach a week-long English geographical and geological language skills programme to undergraduates. But as well as his Polish connections, he has also developed wider European contacts through attending the COST Action meetings and a summer school.

05 Financial overview

Financial overview

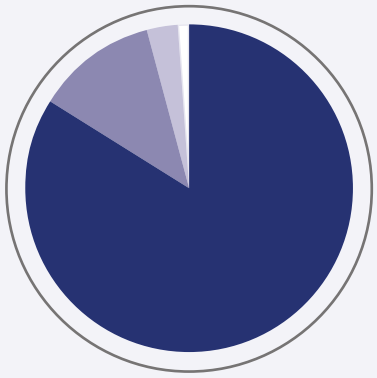
COST is financed as a Coordinated and Support Action (CSA) in the form of yearly renewed Specific Grant Agreements in the frame of a seven year Framework Partnership Agreement (FPA) under Horizon 2020.

The budget dedicated to COST is coming from two of Horizon 2020 Work Programmes, namely Work Programme Part 13 (Europe in a changing world – inclusive, innovative and reflective Societies) and Part 15 (Spreading Excellence and widening participation). COST is a global framework whose core activity is networking of researchers, engineers and scholars; it is performing its activities on a multiannual basis, meaning the networks funded by the COST Association, the COST Actions, run for four years and are implemented under a decentralised management, namely the COST Grant System.

Concerning 2016 calendar year, the COST Association's budget was of EUR €48,7 million, including the budget received from two periods of the Specific Grant Agreements 2 and the funds provided by the Members of the COST Association covering governance matters (COST fund).

Out of those €48.7 million more than 84% was allocated to the networking activities financed by the COST Association.

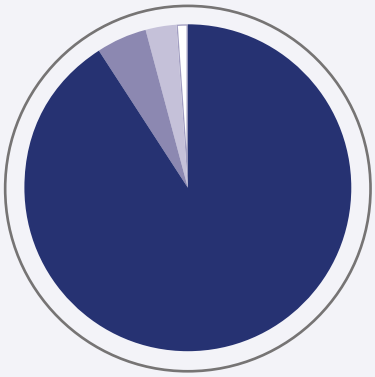
Budget allocation per budget category



Networking expenses	**84%**
Personnel costs	**12%**
Other costs	**3%**
COST fund	**1%**

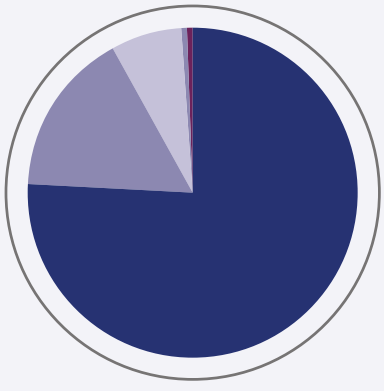
About 84% of the COST Association's budget was allocated to networking activities.

Repartition of scientific costs



Actions decentralised mngt	**91%**
Communications, strategic and other activites	**5%**
First MC meetings	**3%**
Open Cal	**1%**

Repartition of activities per networking tools



Meeting	**76%**
Training School	**15%**
STSM	**7%**
Dissemination	**1%**
Other expenses	**1%**

From January 2016 to December 2016 the COST Association implemented more than 300 COST Action Grant Agreements, which in turn allowed around 40,000 participations in networking activities (meetings, training schools, STSMs etc.).

06

Our events in a nutshell

Our events in a nutshell

February – November

Inclusiveness target countries COST roadshow

Poland, Bosnia & Herzegovina, Montenegro, Latvia, Slovenia, Croatia, Romania and Slovakia.

The COST ITCs roadshow addresses research communities in less research-intensive Member States to promote their participation to the COST Programme. It enables researchers to personally interact with COST representatives and to get first-hand information and guidance. It consists of a series of half-day events where national research communities are informed by personnel of the COST Association about the COST framework's policies, activities and funding opportunities. Emphasis is placed on the open call for new COST Actions proposals, and COST Action representatives from the specific countries showcase the results of their participation in the Programme and share their experiences and best practices.

Attendance is open to national and local research communities, as well as industry, SMEs, private labs, academia and other interested groups.

4 February

The role of city regions in the achievement of a low carbon economy

(COST-JRC joint workshop)

COST Association's premises, Brussels.

The COST Association and the European Commission's Joint Research Centre (JRC) hosted a joint workshop which aimed at revisiting the importance of both bottom-up and top-down solutions in accelerating the penetration of low carbon policies into practice. The event focused on city-regions as their initiatives and contributions are crucial in the achievement of a low carbon economy: city-regions are the first to experience the negative externalities of CO_2 emissions and are often front-runners charged with the implementation of innovative solutions, especially in environmental standards for buildings.

Participants represented front-runner regions or cities (Wales, Karlsruhe, and Vienna) as well as the EU Institutions and other stakeholders from academia and industry.

Fabio Taucer and Dr Ales Gnamus, both from the JRC, during the workshop.

18-20 April

18th Mediterranean electrotechnical conference – MELECON

Limassol, Cyprus.

COST participated in MELECON 2016, an IEEE region and flagship conference with a longstanding history of excellence both in electrotechnology and, in recent years, in information and communication technologies. MELECON 2016 covered complementary thematic areas that hold great promise for the advancement of research and technological development in the solution of complex engineering systems. In this context, MELECON 2016 attracted high quality papers and provided a platform for the cross-fertilisation of new ideas and know-how under the special theme of the conference that was intelligent and efficient technologies and services for the citizen.

The COST Programme was presented during a plenary session.

Dr Julius Georgiou from COST Action MemoCiS speaking at MELECON.

24 May

How to strengthen the links between the EU widening initiatives: pathways for connecting excellence by twinning, teaming, ERA-Chairs and COST networking Actions

(COST-EC joint exploratory workshop)

COST Association's premises, Brussels.

Integrating and empowering researchers and scientists from less connected academic, public or private institutions is currently one of the biggest challenges for European knowledge communities. Today, multiple instruments provide opportunities to connect excellent researchers, teams and institutions across Europe, building on different approaches ranging from far reaching and flexible pan-European networks (COST Programme) to focused and intense partnerships between institutions (twinning) and the development of new centres of excellence in less research performing countries (teaming) or the integration of outstanding research leaders and their teams (ERA Chairs).

The objective of this workshop was to strengthen the existing initiatives under the Widening Pillar of Horizon 2020 and to analyse the potential for increased interaction and collaboration by gathering all relevant stakeholders and by creating a common understanding of the instruments and strategies in place. The workshop explored different pathways on how to combine these instruments in an upstream, downstream and/or parallel configuration in order to maximise impact. The workshop combined plenary and breakout sessions allowing for information sharing, exchange of ideas and debate.

27-30 June

European conference on networks and communications – EUCNC

Athens, Greece.

EUCNC 2016 was the 25th edition of a successful series of a high level technical and scientific conferences sponsored by the EU Commission and industry partners. The objective of this conference is to showcase results of the consecutive programmes on R&D and projects co-financed by EU programmes, presenting the latest developments in this area. It therefore offers a good opportunity to present successful COST Actions and position COST in the European research area (ERA).

Besides from running a booth, COST hosted a special session, inclusive radio communications for 5G and beyond – IoT and MTC, organised by the COST network IRACON ("Inclusive radio communication networks for 5G and beyond") and the "Cooperative radio communications for green smart environments"; as well as a tutorial, Fundamentals of coding for network coding and applications, by the COST Action "Random network coding and designs over GF (q)". Other Actions such as ACROSS ("Autonomous control for a reliable internet of services") participated in the workshop Big data for reliable 5G networking.

24 July

EuroScience Open Forum – ESOF

Manchester, UK.

COST was a supporting partner at ESOF, a biennial, inter-disciplinary, pan-European conference bringing together over 4.000 scientists, innovators, policy makers, business leaders, journalists from more than 80 countries, to debate scientific research, research policy as well as breakthroughs in contemporary science.

COST hosted an information booth where attendees and participants had the opportunity to meet and experience a showcase by two COST Actions Actions (LUDI – Play for children with disabilities and OPTIMISE – Innovative optical Tools for proximal sensing of ecophysiological processes), and, and learn first-hand from their experience in joining or setting up a COST network.

The Chair of the COST network NEOH – Network for evaluation of one health, participated at the Science Central conference on working together to promote better health for humans, animals and the environment. SciGeneration, one of our policy-driven networks, held a session on the challenges that young researchers are facing nowadays and ways they can better collaborate via joint initiatives.

Dr Ben Robins and Dr Angharad Beckett, both from the COST Action Play for Children with Disabilities (LUDI), at the ESOF COST stand.

15 November

8th European innovation summit: 'future now!', plenary session with COST

European Parliament, Brussels.

The 8th European innovation summit was marked by an unprecedented sense of urgency requiring new innovation approaches that provide short-term, demonstrable impact and tangible benefits for EU citizens. All participants agreed on the need to improve communication between citizens and science, in order to better connect the two.

Participants discussed the future of innovation in Europe, as debates touched on topics like urgency and speed, education and talent, disruption and breakthroughs, communication and citizens, cities and innovation hubs, privacy and security, innovation policies and regulation, public and private funding, infrastructure and in particular transport, sustainability and responsibility, cross-sector collaboration and breaking silos, investor confidence and scale-up, the Horizon 2020 mid-term review and EU funding impact.

The latter two topics were addressed in a plenary session that brought MEPs, representatives of the European Commission, universities, and funding organisations (like the COST Programme) together to exchange ideas and practices to better define and measure the impact of EU research funding, especially given the current Horizon 2020 mid-term review. Dr Ronald de Bruin, Director of the COST Association, explained how EU or national research initiatives should not follow a linear development, but should be considered circular processes, where impact is considered throughout the entire cycle, at every stage of the project.

Supporting partner:

European Parliament

22-23 November

Intelligent transport systems (ITS): a tool or a toy?

Žilina, Slovak Republic.

The ITS conference was co-organised between COST and the University of Žilina, the latter as ERA Chair (ERAdiate project) on intelligent transport systems (ITS), and ERTICO as supporting partner. The event was held under the auspices of the Slovak Presidency of the Council of the European Union.

The two-day conference took place in context of the implementation of the legal framework (Directive 2010/40/EU) adopted by the European Union on 7 July 2010. According to the European Commission's White Paper on Transport, new forms of mobility have to be proposed for overcoming reliability, environmental safety and affordability issues towards sustainable solutions for the transport of people and goods.

The conference brought special attention to the role of research organisations in providing evidence to the policy makers for shaping the right ecosystem in ITS, and highlighted the role of the industry, and in particular small and medium enterprises (SMEs), in delivering innovative, sustainable and interoperable solutions. Particular attention was given to two important pillars of future mobility: autonomous driving and mobility as a service (MaaS).

Supporting partners:

ERTICO ITS EUROPE

ERAdiate

07

Media & engagement

Making the news

LA VANGUARDIA

Tecnología

Actualidad Cultura binaria Aplicaciones Electrónica Innovación Internet Móviles y Dispositivos Redes sociales Más

CYL-INNOVACIÓN PATRIMONIO

Investigadores de 9 países se formarán en Aguilar en innovación en Patrimonio

Comparte en Facebook Comparte en Twitter 0

22/01/2016 12:32

Palencia, 22 ene (EFE).- Investigadores de nueve países participarán en Aguilar de Campoo (Palencia) en una escuela de formación sobre innovación en el patrimonio para conocer nuevas técnicas en la gestión del Patrimonio y generar líneas de investigación y redes de contactos especializados.

Las jornadas formativas, promovidas por el grupo europeo COST (Cooperación Europea en Ciencia y Tecnología), se desarrollarán entre el 27 y el 29 de enero en la sede de la Fundación Santa María la Real del Patrimonio Histórico en Aguilar de Campoo (Palencia), según ha adelantado hoy la entidad.

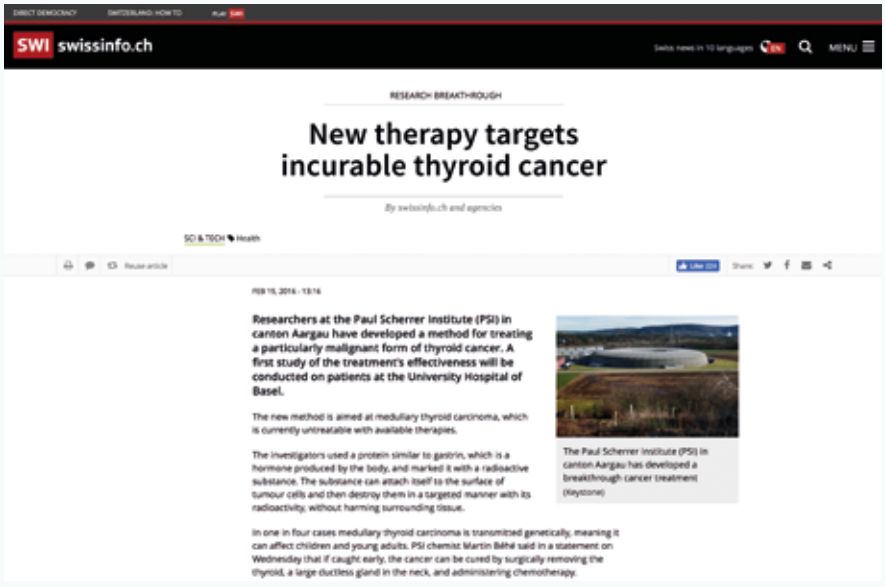
En total 26 investigadores de España, Portugal, Croacia, Israel, Letonia, Lituania, Malta, Eslovenia, e Italia, participarán en esta escuela de formación sobre innovación en el ámbito del Patrimonio, becados por la Agrupación europea COST.

Investigadores de 9 países se formarán en Aguilar en innovación en Patrimonio (La Vanguardia, 22 January 2016)

View the full story here: http://bit.ly/2tpAU4N

New therapy targets incurable thyroid cancer (SWI swissinfo.ch – the international service of the Swiss Broadcasting Corporation, 19 February 2016)

View the full story here: http://bit.ly/2tm3eol



SWI swissinfo.ch

RESEARCH BREAKTHROUGH

New therapy targets incurable thyroid cancer

By swissinfo.ch and agencies

SCI & TECH Health

Researchers at the Paul Scherrer Institute (PSI) in canton Aargau have developed a method for treating a particularly malignant form of thyroid cancer. A first study of the treatment's effectiveness will be conducted on patients at the University Hospital of Basel.

The new method is aimed at medullary thyroid carcinoma, which is currently untreatable with available therapies.

The investigators used a protein similar to gastrin, which is a hormone produced by the body, and marked it with a radioactive substance. The substance can attach itself to the surface of tumour cells and then destroy them in a targeted manner with its radioactivity, without harming surrounding tissue.

In one in four cases medullary thyroid carcinoma is transmitted genetically, meaning it can affect children and young adults. PSI chemist Martin Béhé said in a statement on Wednesday that if caught early, the cancer can be cured by surgically removing the thyroid, a large ductless gland in the neck, and administering chemotherapy.

The Paul Scherrer Institute (PSI) in canton Aargau has developed a breakthrough cancer treatment (Keystone)

Experts discussing digitalization of reading
(The Slovenia Times, 9 April 2016)

View the full story here: http://bit.ly/2snqVb8

Malta in European wastewater reuse Action
(Times of Malta, 24 April 2016)

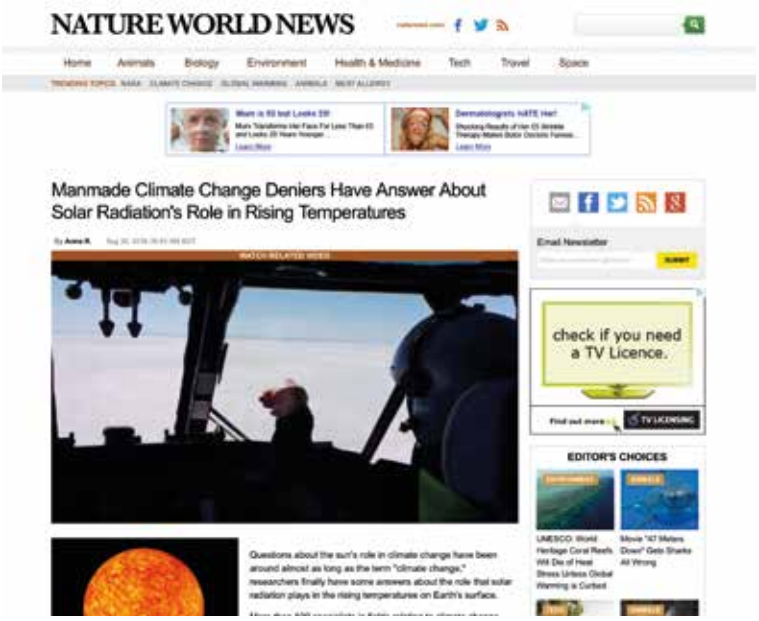
View the full story here: http://bit.ly/2tlRul9

Interactive, open source visualizations of nocturnal bird migrations in near real-time
(Science magazine, 24 August 2016)

View the full story here:
http://bit.ly/2sRTYay

Manmade Climate Change Deniers Have Answer About Solar Radiation's Role in Rising Temperatures (Nature World News, 30 August 2016)

View the full story here: http://bit.ly/2tlQMok



Twenty-Nine Countries Join Forces To Prevent Healthcare Associated Infectious Diseases (Europa Press, 15 November 2016)

View the full story here: http://bit.ly/2tZbqs3

Európski experti diskutujú v Žiline o inteligentných dopravných systémoch (SME Ekonomika, 22 November 2016)

View the full story here: http://bit.ly/2ujeoag

Media collaborations

PAN EUROPEAN NETWORKS

Science & Technology:
Action on pancreatic cancer – March 2016
http://www.paneuropeannetworkspublications.com/ST18/files/assets/basic-html/page-188.html
Enabling the SSH – June 2016
http://www.paneuropeannetworkspublications.com/ST19/#74
ITS: A tool or a toy – September 2016
http://www.paneuropeannetworkspublications.com/ST20/#80
One health – September 2016
http://www.paneuropeannetworkspublications.com/ST20/#134/z
Action on gasotransmiters – September 2016
http://www.paneuropeannetworkspublications.com/ST20/#168/z
Achieving nanoscale precision – December 2016
http://www.paneuropeannetworkspublications.com/ST21/#84/z

Governance:
ITS: A tool or a toy? – November 2016
http://www.paneuropeannetworkspublications.com/GOV20/#192/z
Slovakia in the driving seat – February 2017
http://www.paneuropeannetworkspublications.com/GOV21/#78
Getting into position – February 2017
http://www.paneuropeannetworkspublications.com/GOV21/#80
Transport for all – February 2017
http://www.paneuropeannetworkspublications.com/GOV21/#84
COST benefit analysis – February 2017
http://www.paneuropeannetworkspublications.com/GOV21/#88

EUROPEAN ENERGY INNOVATION MAGAZINE

GABI, a COST Action for the development of shallow geothermal energy – Summer 2016
http://www.europeanenergyinnovation.eu/OnlinePublication/Summer2016/index.html#p=64
(Advertisement of event): 'Intelligent Transport Systems: a Tool or a Toy?' – Autumn 2016
http://www.europeanenergyinnovation.eu/OnlinePublication/Autumn2016/index.html#p=4
Intelligent Transport Systems: a Tool or a Toy? – Message from the organisers – Autumn 2016
http://www.europeanenergyinnovation.eu/OnlinePublication/Autumn2016/index.html#p=38
COST Action TU0905 Structural Glass Novel design methods and next generation products – A success stories – Winter 2016
http://www.europeanenergyinnovation.eu/OnlinePublication/Winter2016/index.html#p=26
The StableNextSol COST Action Project: Towards Stable Organic Perovskite Solar Cell Technologies – Winter 2016
http://www.europeanenergyinnovation.eu/OnlinePublication/Winter2016/index.html#p=35
Valorisation of lignocellulosic biomass side streams for sustainable production of chemicals, materials & fuels using low environmental impact technologies – A COST network – Spring 2017
http://www.europeanenergyinnovation.eu/OnlinePublication/Spring2017/index.html#p=56

@COSTprogramme in 2016

December

ESCI @SciComms 14 Dec 2016

'Uncommon gathering for people passionate about cities' urbanite.people-friendly-cities.eu Nice @COSTprogramme conf #publicparticipation & #SmartCities

90 personas de 32 paises europeos en una habitacion trabajando en #cienciaciudadana #CostCS www.cs-net.eu pbs.twimg.com/media/CzjWRCIWEAUDC0i...
13 Dec 16 **@ferminserrano** ferminserrano retweeted by **@COSTprogramme**

November

Keele University @KeeleUniversity 20 Nov 2016

New European @COSTprogramme Action will bring together academia, business & work from @ESAGaia @ESO @CERN and more http://bit.ly/2ghu4bH

October

Interdisciplinary work @COSTprogramme http://cosch.info , many countries, many techniques, better science http://coschromancoins.wordpress.com
10 Oct 16 **@omurphy16** Orla Murphy retweeted by **@COSTprogramme**

Mona Hess @Mona3Dimaging @SciComms 10 Oct 2016

Happy and sad! Am at the final conference of @COSTprogramme COSCH network at @HS_Mainz http://www.cosch.info

COST @COSTprogramme 6 Oct 2016

#COSTAction member, Bernard L. Feringa, awarded the #NobelPrize in #Chemistry 2016! http://bit.ly/2dxAwrz

September

Congratulations to our MC member, Prof Peregrina Quintela Esteves, who was awarded the María Wonenburger prize! www.gciencia.com/ciencia/a-matemat...
22 Sep 16 **@Maths4Industry** MI-NET retweeted by **@COSTprogramme**

COST @COSTprogramme 21 Sep 2016

Two-time Pulitzer-winning journalist Sheri Fink to keynote at #Disaster #Bioethics COST Action conference @sherifink http://bit.ly/2djy4pY

August

The @COSTprogramme is one of longest running in #EU and aims to encourage science collaborations. This workshop will be live streamed. 3/n

23 Aug 16 **@ruth_mottram** Ruth Mottram retweeted by **@COSTprogramme**

In MI-NET via @COSTprogramme we're pleased to bring together communities of industrial mathematicians across Europe

24 Aug 16 **@Maths4Industry** MI-NET retweeted by **@COSTprogramme**

July

#ESOF16 underlines the role of orgs connecting science communities. @COSTprogramme supports pan-European cooperation

25 Jul 16 **@BTBusiness** BT Business retweeted by **@COSTprogramme**

June

@leeselab @COSTprogramme so proud to be part of it! Great things to come for DNA based #monitoring in Europe! #metabarcoding #metagenomics

21 Jun 16 **@luckylionde** Vasco Elbrecht retweeted by **@COSTprogramme**

Panel discussion on young researchers #YRC2016 @eu2016sk @ERC_Research @COSTprogramme @innovationunion
13 Jun 16 **@da79niel** Daniel Straka retweeted by **@COSTprogramme**

May

We were delighted to sponsor @ICMS_Edinburgh's hugely successful maths modelling week for ECIs! @COSTprogramme
12 May 16 **@Maths4Industry** MI-NET retweeted by **@COSTprogramme**

April

@Mona3Dimaging presentation @COSTprogramme on a test object for 3D documentation in CH - great device, lots of potential #COSTaction
18 Apr 16 **@omurphy16** Orla Murphy retweeted by **@COSTprogramme**

Great kickoff meeting for hCOMET today, so excited to represent Ireland and meet Prof. Andrew Collins in person! @COSTprogramme
18 Apr 16 **@BlanaidWhiteDCU** Blánaid White retweeted by **@COSTprogramme**

Great to finally meet @MVanholsbeeck at the launch of the new @costprogramme action on evaluating social scis & humanities research!
8 Apr 16 **@heravalue** Paul Benneworth retweeted by **@COSTprogramme**

Looking forward to #MouseAge workshop on animal models of frailty and multimorbidity @COSTprogramme
9 Apr 16 **@IBellantuono** Ilaria Bellantuono retweeted by **@COSTprogramme**

Nobel Prize winner Brian Kobilka opens COST Action conference on innovative techniques for drug de... http://bit.ly/1oNpQr2 #innovation
8 Apr 16 **@COSTprogramme** COST

March

Pls RT BBC reports COST Action's work on offender supervision http://www.offendersupervision.eu/blog-post/bbc-reports-cost-actions-work-on-offender-supervision ... via @COST_OSE
24 Mar 16 **@fergus_mcneill** Fergus McNeill

Christine Morgenstern discusses our final report on German radio #offendersupervision Die Profis | radioeins http://www.radioeins.de/programm/sendungen/die_profis/
28 Mar 16 **@COST_OSE** Offender Supervision retweeted by **@COST_programme**

Investigadores de 9 países se formarán en innovación en Patrimonio gracias a @COSTprogramme @esHorizonte2020
1 Mar 16 **@estherrodriguez** Esther Rodriguez retweeted by **@COST_programme**

February

#Networking in Europe is called @COSTprogramme: http://bit.ly/1mZqnFw @fafarsevilla researcher leads a #COSTaction
25 Feb 16 **@STCUES** STC US retweeted by **@COST_programme**

COST Action event Urban #Agriculture #Europe: #urbanagriculture might be central tool for #circulareconomy . Great #workshop @COSTprogramme
24 Feb 16 **@EmphasisProject** Emphasis Project retweeted by **@COST_programme**

Cuenta atrás @COSTprogramme #Malaga 90 científicos. 30 países. Mejora de la protección y producción de cultivos.
8 Feb 16 **@SDciencia** Sombradoble retweeted by **@COST_programme**

Followed by @COSTprogramme, thank you! We are proud of a member of many COST Actions, including the recent CA15104. http://www.cost.eu/COST_Actions/ca/CA15104 ...
16 Feb 16 **@RFMW_Aalto** RF&MW @ Aalto retweeted by **@COST_programme**

January

@COSTprogramme @KNOWeSCAPE @europacad meetings tick boxes: high quality, local outreach, societal impact, ITC+young
27 Jan 16 **@ScharnhorstA** Andrea Scharnhorst retweeted by **@COST_programme**

Social media stats of 2016

5431 followers ↑ **29% UPLIFT**
Dec, 2016

5020 followers ↑ **27% UPLIFT**
Dec, 2016

3034 followers ↑ **6% UPLIFT**
March, 2017

77 subscribers ↑ **13% UPLIFT**
Dec, 2016

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