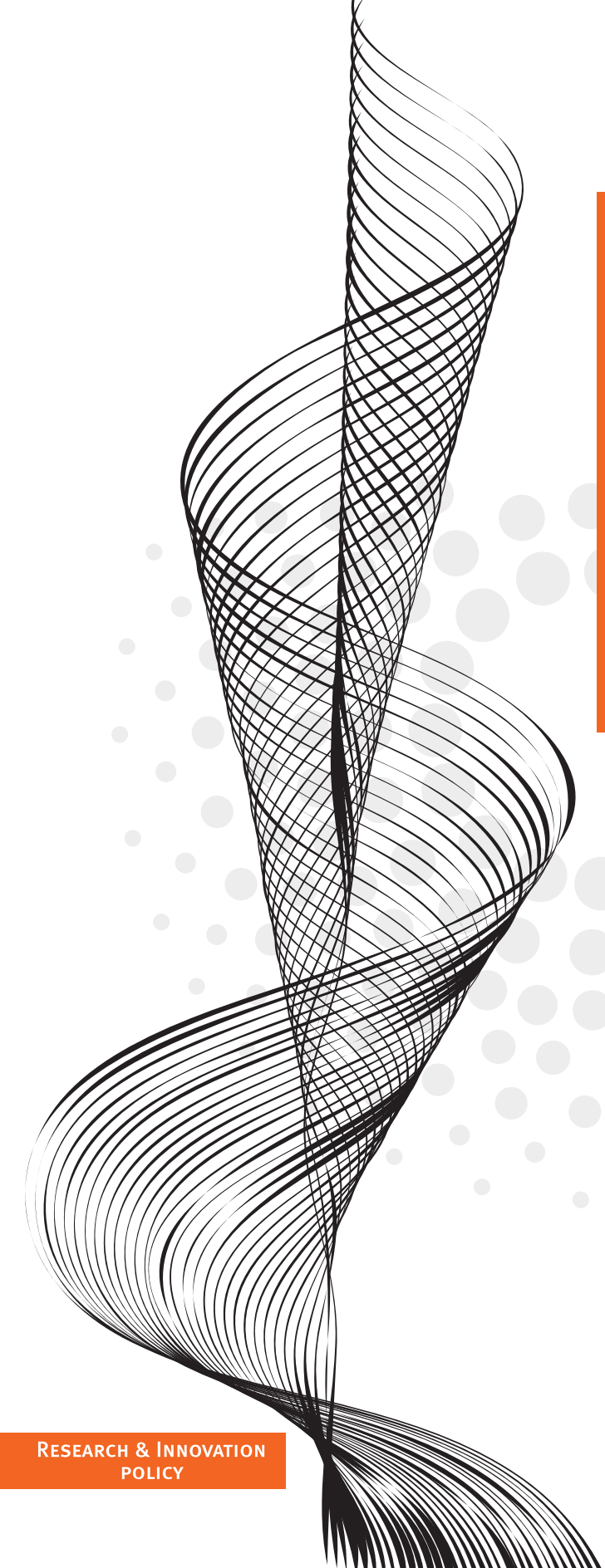


Annual Report on the ERC activities and achievements in 2018

Prepared under the authority of the ERC Scientific Council

RESEARCH & INNOVATION POLICY

European Commission

European Research Council

Established by the European Commission

EUROPEAN COMMISSION

Annual Report on the ERC activities and achievements in 2018

European Research Council

Established by the European Commission

chapter one

Foreword

Commissioner's message

> *By the end of 2018, the ERC had funded over 9,000 projects. More than 9,000 incredible stories, all worth telling. That is why I often urge scientists and scholars to tell the story of their research to the public*

In just over ten years, the ERC has become a powerhouse of science. It is recognised as the best in the world in the way it supports fundamental research and I am delighted to be presenting once again the Annual Report on the ERC's activities and achievements of the year. As it was with the last few years, these achievements continue to be remarkable.

Towards the end of 2018 I was invited to the opening of the new evaluation centre commemorating the founding ERC President Fotis Kafatos. He once said: "*Investing in research, an integral part of the European cultural tradition, is no longer a choice. The only way to make sure that investment pays back is excellence*". These words and President Kafatos' sentiment have endured. Most recently when 60 Nobel laureates and business leaders called for a minimum investment of EUR 120 billion in Horizon Europe - the next EU research and innovation framework programme.

This important and timely call emphasises the role of EU funding, in particular via the ERC, in generously supporting researchers who work at the frontiers of scientific knowledge and, while following their curiosity, often lay the foundation for the technologies of the future. It concluded that when the EU budget funds excellent scientific research, it is the economy and European citizens that benefit.

By the end of 2018, the ERC had funded over 9,000 projects. More than 9,000 incredible stories, all worth telling. That is why I often urge scientists and scholars to tell the story of their research to the public. As Commissioner for research, science and innovation, I have been lucky to meet many researchers throughout my mandate and I have noticed three traits that are never in short supply: commitment, passion and meaning.

This Annual Report represents not only the work and achievements of ERC researchers in the past year, but also the culmination of these three traits. As such, I am convinced that the future of excellence in research in Europe is bright.

Let's not stop here. Let's encourage our scientists to tell everyone about the ERC as a success story of Europe. Let's create a brand of scientific excellence known globally by everyone. Let's remain united in defending an open, excellence-based vision of science with the ERC as a spearhead, and let's continue to believe in the potential of science.

Carlos Moedas
European Commissioner for Research, Science and Innovation

Personal message from the President

2018 has been very fruitful. It is highly rewarding to come to the end of the year and see that the ERC fulfilled its core mission to support the ambitious projects proposed by scientists

Looking back, 2018 has been another very busy year for the ERC with more than 1,100 grants awarded. This required once again full engagement from all people involved: the scientists (for the first time in Horizon 2020 more than 9,000!) who put a lot of thought into preparing their applications; more than 1,000 evaluators, who came to the ERC headquarters in Brussels to discuss their merits; another 10,000 scientists, who contributed to the evaluation through remote referee reports; the staff of the Executive Agency (ERCEA) who ran a great variety of operations from submission to granting, from evaluation to communication and, last but not least, members of the ERC Scientific Council who engaged in intense discussions to monitor how the programme develops and how the ERC will be positioned in Horizon Europe, the next EU framework programme for research and innovation.

The preparation of Horizon Europe has indeed occupied many minds this year: last Spring within the European Commission, with unexpected challenges to the ERC continuity, fortunately overcome, thanks to the great support from Commissioner Carlos Moedas and DG Research and Innovation, and later on, within the European Parliament and at the level of the EU Council. It remains crucial to make the case for what has made the ERC become in a short time a worldwide reference for research funding, as proven by several independent studies.

It was surprising to see some of the cornerstones of the ERC challenged, when they clearly are the very basis of its success. As soon as scientific quality is not the only criterion to evaluate applications, the very concept on which the edifice of ERC evaluation was built by the Scientific Council, with the support of the European Commission, is under threat. Indeed, the only way to convince high-level scientists to take part in the evaluation is to guarantee them that one calls only on their scientific expertise.

We were happy to see that, in the end, the three keywords put forward by the ERC Scientific Council in its Padua declaration, namely "continuity", "agility" and "scale-up" have been taken up in the European Commission's proposal for Horizon Europe.

So much for the future perspectives. Concretely, 2018 brought many great projects that the ERC is honoured to support, with the frustration that some excellent ones could not be funded as the budget was exhausted. It was also another year where the success rate of women in the ERC calls was better than that of men, showing that steady efforts do pay off. However this does not mean that we can relax our attention and reduce our engagement on this matter.

The relaunch of the Synergy Grant call was done with great care to avoid the situation that occured in 2012 when there was a massive oversubscription. The number of applications received was exactly the one hoped for: large enough to be a good test of the new evaluation system introduced to guarantee a fairer treatment of interdisciplinary projects but small enough to make the operations feasible. At the end, 27 projects were selected, representing a great variety of objectives and forms of organisation of the ERC Synergy groups.

The Scientific Council held three plenary sessions outside Brussels: in Heidelberg (Germany) in March, in Leuven (Belgium) in July and in Heraklion (Greece) in October. On each of these occasions, very successful events promoting the ERC were arranged by the local organisers with the direct involvement of members of the ERC Scientific Council. These were great opportunities to interact with local scientists and, in particular, ERC grantees.

In 2018 new international agreements with foreign funding agencies were signed, allowing scientists based outside Europe to come and visit ERC teams. The country that joined this year is Australia, but a second agreement was also reached with Japan, this time with the Japan Science and Technology Agency. Efforts were also made to broaden the contacts and to make the agreements already in place more efficient. These exchanges improve without doubt the visibility of the ERC. This is one of the contributions of the ERC to put Europe at the centre of the world map for research.

The ERCEA has been actively engaged in the promotion of the ERC, through its presence in numerous events, in particular in relation to two projects to reach a wider public: ERC=Science^2, that made the ERC visible in a number of science museums across Europe and ERCcOMICS, which exemplified how successful the interaction between scientists and artists can be, in this case graphic artists.

From these many points of view, 2018 has been very fruitful. It is highly rewarding to come to the end of the year and to see that the ERC fulfilled its core mission to support the ambitious projects proposed by scientists. Some of these will certainly result in ground-breaking research pushing ahead the frontiers of human knowledge, but possibly also contributing to radical innovations.

Prof. Jean-Pierre Bourguignon
President of the ERC
and Chair of its Scientific Council

chapter two

Strategy and Governance

ERC Mission

Pushing forward the frontiers of knowledge

Reinforcing the excellence, dynamism and creativity of European research.

Research funded by the ERC is expected to lead to advances at the frontier of knowledge and to set a clear and inspirational target for frontier research across Europe.

ERC Strategy

Excellence

Providing attractive long-term funding, awarded on the sole criterion of excellence, to support excellent investigators and their research teams to pursue ground-breaking, high-risk/ high-gain research.

The ERC operates on a "bottom-up" basis without predetermined priorities and its grants are open to individual researchers of any age, gender or nationality, and from any country in the world, working in Europe. Particular priority is given to assisting the best starting researchers with excellent ideas to make the transition to independence by providing adequate support at the critical stage when they are setting up or consolidating their own research team or programme.

The ERC aims to foster healthy competition across Europe based on robust, transparent and impartial evaluation procedures which address, in particular, potential gender bias.

ERC Grants

Starting Grants (StG) support researchers at the early stage of their careers to become independent research leaders.

Consolidator Grants (CoG) support researchers who are at the early stage of their careers but are often already working with their own group.

Advanced Grants (AdG) support outstanding and established research leaders to continue their work in expanding the frontiers of scientific knowledge.

Synergy Grants (SyG) enable small groups of researchers to bring together complementary skills, knowledge and resources to address ambitious research problems.

Proof of Concept Grants (PoC) support ERC grantees by helping them bridge the gap between their research ideas and social or commercial innovation.

ERC Scientific Council

The Scientific Council has the responsibility to establish the ERC's overall scientific strategy, the Work Programme and, from a scientific perspective, positions on the implementation and management of calls for proposals, evaluation criteria, peer-review processes and proposal evaluation.

It is made up of members of the scientific community at the highest level, knowledgeable about the European scene, acting in their personal capacity and independently of political or other interests.

The Scientific Council's composition allows it to be independent, combining wisdom and experience with vision and imagination and reflecting the broad disciplinary scope of research.

The 22 individual members are selected, based on their undisputed reputation as leaders and for their independence and commitment to research, following a transparent procedure by an independent committee of seven highly respected personalities in European research.

They are appointed by the European Commission for a term of office limited to four years, renewable once, on the basis of a rotating system which shall ensure the continuity of the work of the Scientific Council.

Prof. Jean-Pierre BOURGUIGNON
(Mathematics)
ERC President

Prof. Eva KONDOROSI
(Plant Biology and Microbiology)
ERC Vice-President

Prof. Klaus BOCK
(Chemistry)
ERC Vice-President

Prof. Martin STOKHOF
(Philosophy)
ERC Vice-President

Prof. Paola BOVOLENTA
(Neurobiology)

Prof. Margaret BUCKINGHAM
(Biology)

Prof. Christopher CLARK
(History)

Prof. Eveline CRONE
(Psychology)

Prof. Athene DONALD
(Soft Matter and Biological Physics)

Prof. Andrzej JAJSZCZYK
(Electronics and Communication Engineering)

Prof. Tomas JUNGWIRTH
(Condensed Matter Physics)

Prof. Michael KRAMER
(Astrophysics)

Prof. Kurt MEHLHORN
(Computer Science)

Prof. Barbara ROMANOWICZ
(Geophysics)

Prof. Nils Christian STENSETH
(Ecology and Evolution)

Prof. Giulio SUPERTI-FURGA
(Medical Systems Biology)

Prof. Nektarios TAVERNARAKIS
(Molecular Systems Biology)

Prof. Janet THORNTON
(Bioinformatics and Structural Biology)

Prof. Isabelle VERNOS
(Molecular and Cell Biology)

Prof. Reinhilde VEUGELERS
(Economics)

Prof. Michel WIEVIORKA
(Sociology)

Prof. Fabio ZWIRNER
(Theoretical and High-Energy Physics)

ERC President

The role of the President is to chair the Scientific Council and ensure its leadership, to work closely with the ERC Executive Agency (ERCEA) and to act as an ambassador for the ERC in the world of science.

The President is appointed by the European Commission following a transparent recruitment process based on the recommendations of an independent, dedicated search committee and with the approval of the Scientific Council.
Jean-Pierre Bourguignon, an internationally respected mathematician, took office as President of the ERC on 1 January 2014 for a four-year term, renewed until the end of 2019.

Steering Committee

The Steering Committee of the ERCEA is the body that supervises the operations of the Agency. Among others, it adopts the annual Work Programme of the Agency, its Annual Activity Report as well as decisions related to the Staff Regulations, organisational structure, administrative budget and annual accounts.

The Steering Committee meets four times a year and is composed of five members appointed by the European Commission for a (renewable) period of two years.

The Steering Committee in office in 2018 was chaired consecutively by Robert-Jan Smits, Director-General of the Directorate-General for Research and Innovation, and by Jean-Eric Paquet further to his appointment to this position in April 2018. The other members were Kurt Vandenberghe, Director for Policy Development and Coordination in the same Directorate-General (and vice-chair of the Steering Committee); Henk Post, Director for Talent Management and Diversity - Executive Staff in the Directorate-General for Human Resources and Security as well as Tomas Jungwirth and Janet Thornton, both members of the ERC Scientific Council.

Jean-Pierre Bourguignon (President of the European Research Council)
and Jean-Eric Paquet (Director-General, Research and Innovation, European Commission)

ERC Executive Agency

The ERCEA is the dedicated implementation structure that supports the Scientific Council in the conduct of all of its tasks.

It operates on the basis of the powers delegated to it by the European Commission, which has the ultimate political responsibility for the specific programme, implementing the framework programme Horizon 2020.

The organisational structure of the Agency follows its operational and horizontal objectives. It consists of two operational departments (the Scientific Management Department and the Grant Management Department) and a Resources and Support Department. The Accounting Officer, the Communication Unit and the Support to the Scientific Council Unit report directly to the Director.

ERCEA management team

From left to right:

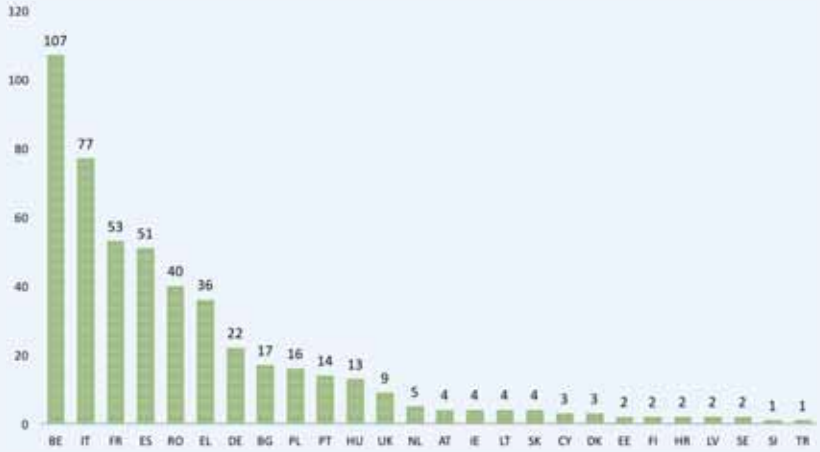
Anthony Lockett, Anisoara Ulceluse-Pirvan, Athanasia Papathanasiou, Carmen Garcia Fernandez, Dirk Costens, Richard Frizon, Katja Meinke, Thierry Prost, Vittorio Morelli, Claire Levacher, Laurence Moreau, Georges-Eric te Kolsté, Mechtild May, Martin Penny, Pablo Amor, Alejandro Martin Hobdey, Jose Labastida, Nikola Car, Bruno Wastin, Theodore Papazoglou, Niki Atzoulatou

Absent: Angela Liberatore, Michel Vanbiervliet

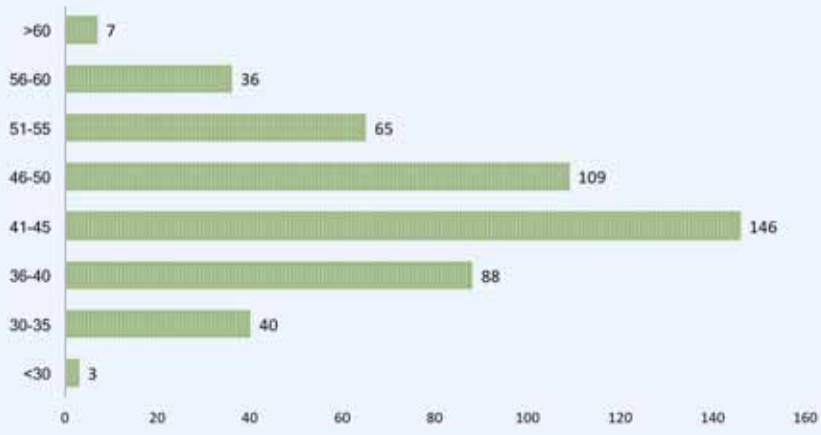
ERCEA Staff

Number of staff

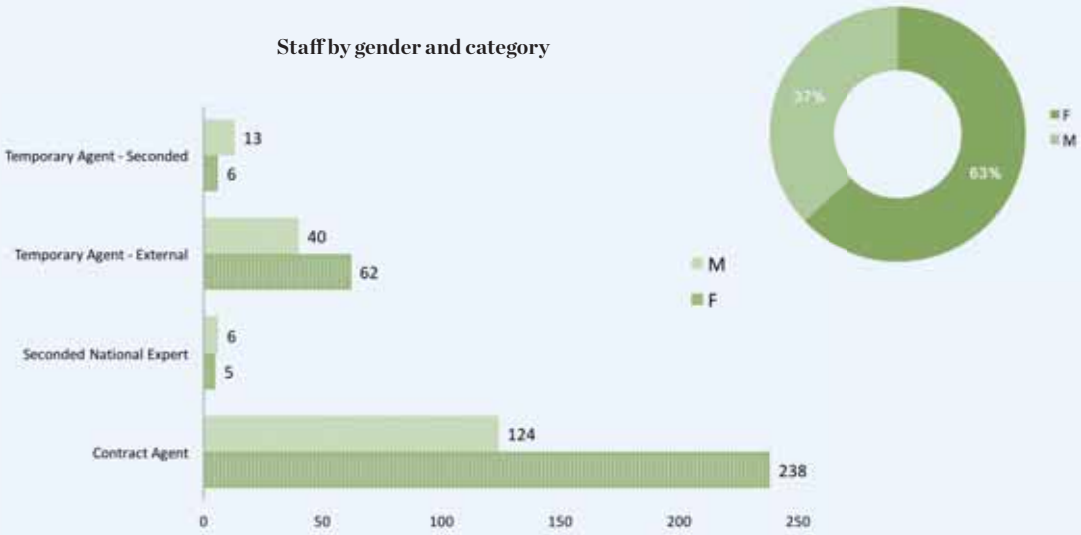
Staff nationalities



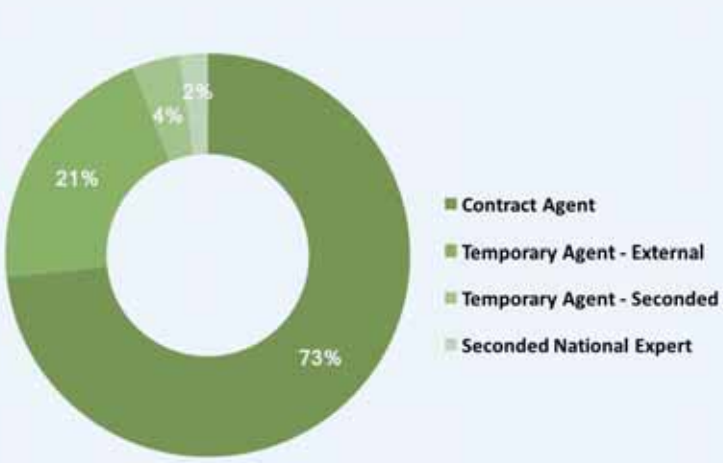
Staff by age category (average = 45 years)



Staff by gender and category



Distribution of staff by category



chapter three

Performance

ERC in figures

EUR 13 billion

ERC budget in Horizon 2020

17 %

of the entire Horizon 2020 budget

EUR 1.9 billion

ERC 2018 budget,
fully committed

EUR 1.7 billion

payment credits fully executed in 2018
(EUR 281 million for FP7 and
EUR 1,430 million for Horizon 2020)

> 9,700

projects of all types funded
by the ERC since 2007

77

nationalities
(ERC grantees)

34

EU and Associated Countries
hosting ERC projects

> 116,000

publications reported
by ERC projects

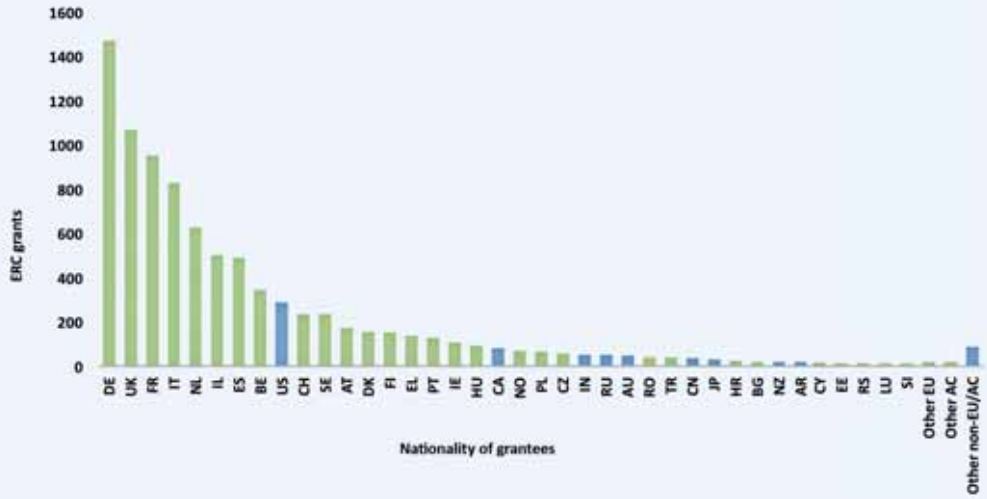
> 1,300

prestigious prizes
awarded to ERC grantees

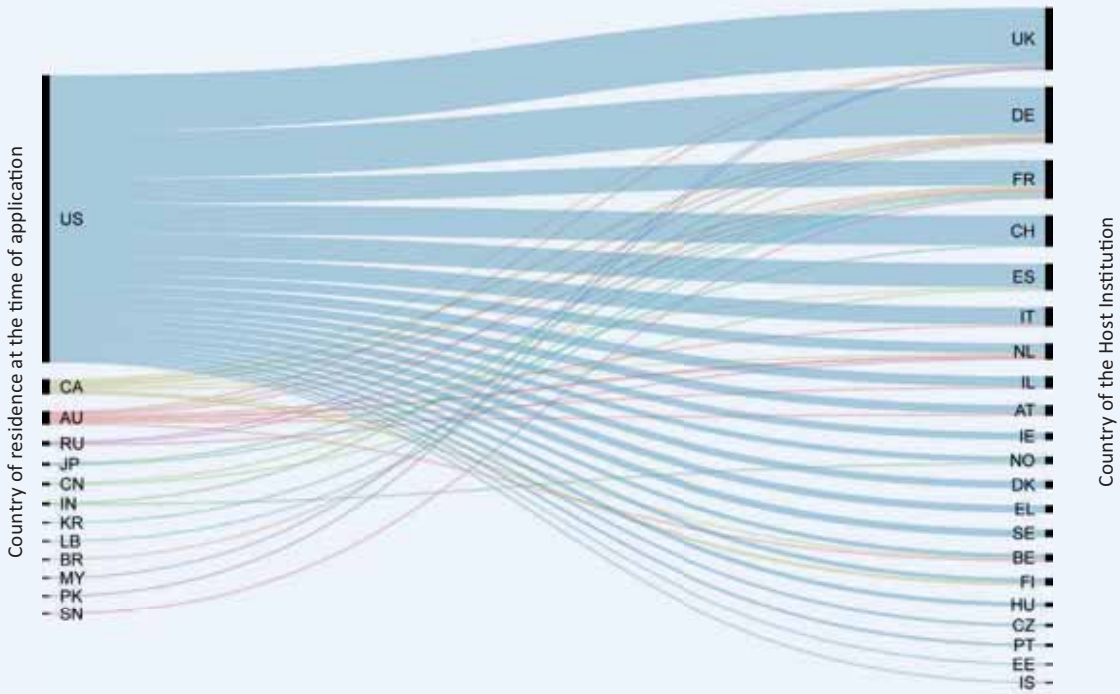
> 60,000

researchers and other professionals
hired in ERC teams

77 nationalities of the ERC grantees (ERC main calls 2007-2018, without AdG2018)

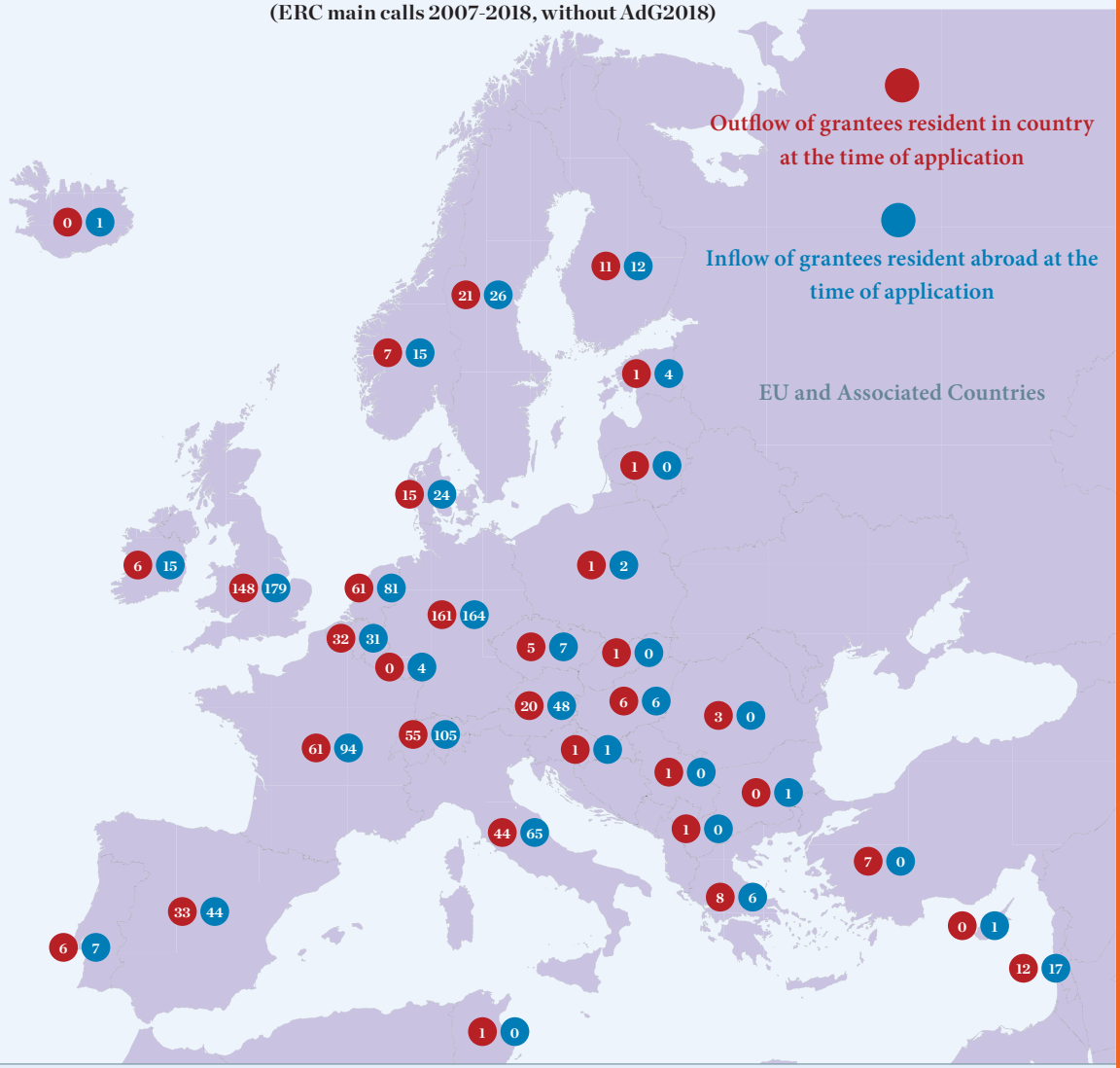


Residence outside the EU and Associated Countries (ERC main calls 2007-2018, without AdG2018)



Origin of ERC grantees

(ERC main calls 2007-2018, without AdG2018)



Residence

94%

of the ERC grantees were already resident in the country of the Host Institution at the time of application

3%

of the ERC grantees were resident outside the EU and the Associated Countries and moved to Europe with the ERC grant

Non-EU/AC nationals

8%

of the ERC grantees are nationals of countries other than the EU Member States and the Associated Countries

40% from USA (288 grantees)
12% from Canada (83)
7% from Russia (52)
7% from India (52)
7% from Australia (48)
27% from other countries (193)

Top organisations hosting ERC Principal Investigators

Host Institution	Country	FP7 2007-2013			Horizon 2020 Calls			SyG PIs
		StG	CoG	AdG	StG	CoG	AdG	
National Centre for Scientific Research	FR	130	15	65	105	109	43	4
University of Cambridge	UK	61	8	57	42	40	25	6
University of Oxford	UK	55	12	61	30	40	33	4
Max Planck Society	DE	41	5	51	64	31	36	14
University College London	UK	54	7	29	26	33	20	
Swiss Federal Institute of Technology Zurich	CH	30	3	46	24	19	29	2
Weizmann Institute	IL	43	10	28	24	31	14	2
Swiss Federal Institute of Technology Lausanne	CH	44	2	37	19	21	18	1
Helmholtz Association of German Research Centres	DE	34	5	16	35	30	15	6
Hebrew University of Jerusalem	IL	39	3	30	26	18	10	2
National Institute of Health and Medical Research	FR	30	9	18	22	18	10	1
University of Edinburgh	UK	20	1	24	25	16	17	
Imperial College	UK	35	3	21	18	17	7	5
University of Munich (LMU)	DE	13		27	31	10	10	
University of Copenhagen	DK	18	3	13	25	22	8	2
University of Amsterdam	NL	16	3	17	32	13	7	
Tel Aviv University	IL	14	1	14	36	16	4	
University of Leuven	BE	26	5	15	14	9	11	
Delft University of Technology	NL	13	3	10	27	14	8	3
University of Zurich	CH	17	3	17	14	13	9	2
Utrecht University	NL	15	3	11	15	21	7	1
University of Helsinki	FI	16		12	18	15	10	
Spanish National Research Council	ES	21	3	10	12	17	8	4
Radboud University Nijmegen	NL	23	3	12	13	14	5	1
French Alternative Energies and Atomic Energy Commission	FR	33	2	10	10	7	7	4
Leiden University	NL	18	1	13	17	13	6	3
University of Bristol	UK	14	2	20	12	7	12	
Technion	IL	22	2	8	17	9	6	1
Technical University of Munich	DE	16	3	9	11	14	8	2
University of Manchester	UK	16	1	13	5	13	11	1
Lund University	SE	13	1	11	13	15	5	
King's College London	UK	23		10	10	9	6	2

The data are as of December 2018 - The ranking is done based on the total number of main grants (StG, CoG, AdG). The Synergy PIs from all SyG calls are presented in the last column. The grants distribution is according to Participant Identification Code (PIC) of the current Host Institution, as appears in CORDA, the European Commission's database of projects. Please note that prior to the compilation of the table, the Helmholtz Association had requested the grouping of the PICs that corresponded to its research centres, providing the appropriate information to the ERC. The ERC may accept similar requests while compiling the list of the institutions that host the ERC-supported PIs and their teams.

Closing the gap between research and innovation

ERC Proof of Concept Grant (2011 – 2018)

Continuous call
3 cut-off dates per year
EUR 150,000 grant

Only for ERC grantees
Innovative ideas and start-ups
from all areas of research

Simple & efficient
7 page proposal;
results in 100 days

Clear selection criteria
Focused on innovation potential,
socio-economic benefits,
quality of the PoC plan

Competent evaluators
Expert in technology and
knowledge transfer, providing
constructive feedback

Competitive process
36% average success rate;
2,606 proposals received;
938 funded

High inherent risk
Majority of PoC projects at
idea stage; high uncertainty
and development costs

Matching with investors
Several pitching events
and initiatives linking PoC
ventures with investors
and corporates

Additionality effect
50% of applicants would have
not gone into innovation
without the PoC

chapter four

2018 in Review

ERC Conference on Frontier Research and Artificial Intelligence

One of the ERC highlights in 2018 was a conference on Frontier Research and Artificial Intelligence. The event took place on 25 and 26 October on the premises of the ERC in Brussels. The entirely web-streamed one-and-a-half day event attracted around 150 participants and featured great ERC funded science and interesting speakers. The Deputy Director-General for Research and Innovation, Signe Ratso, opened the conference explaining the EU's role in Artificial Intelligence (AI), preparing the ground for 20 exciting presentations of cutting-edge ERC research projects related to AI. A special lecture by French parliamentarian Cédric Villani (Fields-medal winner) marked one of the highpoints in the programme. His lecture was introduced by Eva Kaili, European Parliament member and president of the European Parliament's Science and Technology Options Assessment (STOA) Panel.

The conference provided a networking forum for Principal Investigators leading ERC funded projects, representatives of EU-wide and national research organisations, colleagues from various EU institutions as well as industry stakeholders. The event also positioned the ERC as a contributor to an important scientific area – AI in this case – through its "bottom-up" approach.

In lively presentations researchers from very different fields explored the AI state of the art from diverse angles. Sessions examined the ethical challenges connected to ever improving AI capabilities and also its societal impact e.g. on the political process or public health. The intriguing relationship between AI and the workings of the human brain was highlighted and many new applications of AI and machine learning, e.g. in robotics, were explained. In frequent interactive sessions the conference participants discussed likely benefits and potential threats of increased AI usage.

In connection with the conference a new communication format, called "ERC Talks", brought together three ERC grantees in a TV roundtable discussion hosted by a professional moderator which was recorded in the TV studios of the Berlaymont building in Brussels. This conversation was web-streamed via various social media platforms and viewers had the opportunity to ask these top-level scientists questions on AI. The success of this event encouraged the ERC to further develop the conference format in 2019.

Deputy Director-General for Research and Innovation Signe Ratso describes the EU's role in AI.

European Parliamentarian and AI advocate Eva Kaili introduces the special lecture.

Fields-medal winning French Parliamentarian Cédric Villani gives a special lecture on the AI strategy for France and Europe.

ERC Grantee Emily Cross discusses socialness in artificial agents.

Highlights

In January, the ERC participated in the **World Economic Forum (WEF)** in Davos for the sixth time, continuing to shine a light on the pivotal role of European frontier research in innovation, in the economy and in European competitiveness. With the 2018 summit theme being "Creating a shared future in a fractured world", ERC President Bourguignon and 11 remarkable scientists and scholars fed into the debate, via 14 sessions. Two Nobel laureates were also amongst the ERC speakers: Prof. Ben Feringa and Prof. Christopher Pissarides. The climate change theme took centre stage, with the presence of ERC grantee Prof. Johan Rockström, a leading climate researcher.
The ERC also held an "Ideas Lab" session, "Safeguarding our Planet's Assets", involving three ERC- funded scientists: Professors Anne Magurran, Yadvinder Malhi and Maja Schlüter, delivering insights on biodiversity. Distinguished economist and ERC grantee Prof. Hélène Rey also spoke at Davos. The ERC speakers again generated much interest from the press and gave a boost to the ERC social media engagement.

For the seventh time, the ERC took part in the **Annual Meeting of the New Champions (AMNC), organised by the World Economic Forum**. The meeting, also known as "Summer Davos", was held in Tianjin, China, in September. ERC President Jean-Pierre Bourguignon attended with 11 ERC grantees, all leaders in their respective fields. An ERC press conference took place with Commissioner Moedas, ERC President Bourguignon and 3 grantees - Katrien de Bock, Aoife Gowen and Laura Nyström - on the topic "Through Food Research to Healthier Lives".
The ERC speakers took part in nine sessions on a variety of topics. In particular, there was a dedicated ERC Ideas Lab, "The Science of Language and Music". The ERC presence also generated much media coverage, as well as a very wide social media reach.
The AMNC is one of the foremost global summits on science, technology and innovation, gathering young leaders from academia, fast growing enterprises, government and civil society, as well as the media, from over 90 countries. The 2018 edition addressed the topic of "Shaping Innovative Societies in the Fourth Industrial Revolution".

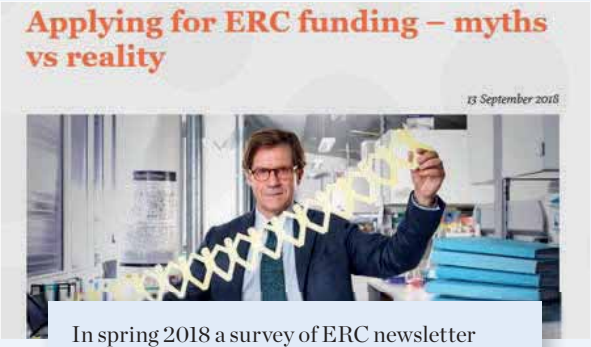
In February, ERC President Jean- Pierre Bourguignon addressed the EU **Research Ministers at the EU Informal Competitiveness meeting in Sofia (Bulgaria)**, ahead of important decisions to be made about the place of European research in the next EU budget. President Bourguignon emphasised that now more than ever the research community needs to make the strongest possible case for increased support based on facts. There is a need to explain in the clearest terms the value and impact that comes from funding research and innovation, in particular at the European level, its European added value, and this should be done on the basis of results. He finally told the Ministers that the research community counted on them to ensure a significant growth of the EU budget for research and innovation in the next framework programme.

In May, ERC funded researchers were invited to Strasbourg as part of an event bringing together the worlds of policy-making and academia. Co-organised by the **ERC and the Science and Technology Options Assessment panel (STOA) of the European Parliament**, the event offered a face-to-face encounter between two groups that are usually not exposed to each other: scientists and politicians.
Workshops on modern energy solutions, eco-efficient transport, sustainable management of natural resources, the digital revolution, health research and science policy took place. European Parliament President Antonio Tajani, European Commission Vice-President Andrus Ansip, Commissioner Carlos Moedas and around 20 MEPs, including STOA Chair Eva Kaili and First STOA Vice-Chair Paul Rübig, were joined by ERC President Jean-Pierre Bourguignon, Nobel Laureates, members of the ERC Scientific Council and numerous young ERC grantees.

In May, Commissioner Carlos Moedas appointed seven experts to conduct **the search for the next president of the ERC**. The committee, chaired by Mario Monti, President of Bocconi University in Milan and former European Commissioner and Prime Minister of Italy, invited applications for the post, with the aim to conduct the search process up to a shortlist of potential candidates to be submitted to the European Commission. The ERC President should be an internationally renowned and respected scientist; he will chair the ERC Scientific Council and will be the voice and public face of the ERC. The selected candidate is expected to be a prominent advocate of frontier research and an ambassador of European science within and beyond Europe, with the aim of strengthening further the ERC's performance and prestige and Europe's science base in frontier research. The committee will make recommendations to the European Commission in time for the next ERC President to take up duties on 1 January 2020.

This year saw the awarding of four new **Fields Medals at the International Congress of Mathematicians** (ICM) in Rio de Janeiro, Brazil. For the fourth time, one of the medallists was an ERC grantee.
Alessio Figalli, an Italian mathematician currently at ETH Zurich after returning from the United States, works with optimal transport theory - a study of the ideal allocation of resources transported from one place to another, that has interested mathematicians since Napoleonic times. Mathematicians from all over the world gather every four years to reward outstanding achievements in mathematics by researchers younger than 40 years of age. ERC grantees Artur Avila and Martin Hairer received the award, in 2014, as well as Stanislav Smirnov, in 2010. ERC grantees Simon K. Donaldson and Elon Lindenstrauss were also awarded the Medal in 1986 and 2010 respectively, before receiving ERC funding. In 2018, the ERC was also present at the ICM in Rio, introducing its funding opportunities for mathematicians and visiting some universities.

A new independent study on the output of frontier research funded by the ERC confirms that 79% projects had a major impact: 19% led to a breakthrough and 60% to a major scientific advance. Almost half of the projects have already left their mark on the economy, society and policy-making, whilst around three quarters are foreseen to do so in the medium and long-term. Published in May, the analysis confirms the results announced in 2016 and 2017, with an upward trend in the overall impact in the latest study. It also demonstrates the top quality of the research supported by the ERC. The study was conducted on a random sample of 223 Starting and Advanced Grant projects from a pool of 470 completed projects. It found that, in accordance with its mission, the ERC indeed funds high-risk/high-gain research. Taking risks pays off: scientifically daring projects are more prone to lead to higher impacts, according to the study. The analysis was carried out by 25 panels consisting of three to four independent high-level scientists each. The evaluators addressed questions related to, for example, scientific and other impacts, the development of new methodologies and interdisciplinarity.



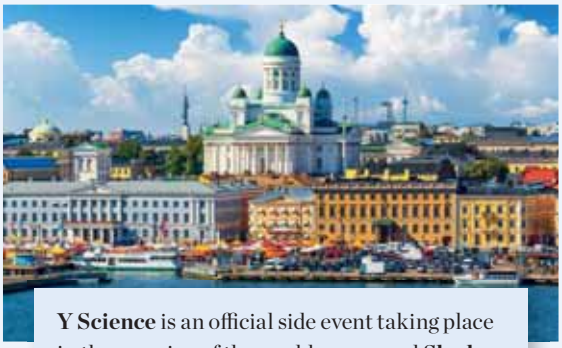
In spring 2018 a survey of ERC newsletter readers indicated an interest in receiving the publication online in new formats, more often than quarterly and with a larger focus on tips for successful grant applications. As a result, the **"ERC Magazine" was launched in July 2018 in a new online format**. Articles are issued in various ways – photostory, video, podcast and text - on a weekly basis and distributed via social media, as well as via email digest once a month. The online magazine has allowed for a coverage that goes beyond scientific research topics, exploring views and opinions from the scientific community, European policymakers and the Scientific Council, as well as features on topical themes.

The **EuroScience Open Forum (ESOF)**, held once every two years, is the largest interdisciplinary science event in Europe. It brings together leading thinkers, scientists, innovators and policy makers from all over the world to discuss current and future breakthroughs in science. **The 8th edition of ESOF - "Sharing science: towards new horizons"** - took place in Toulouse, France, in July 2018. The ERC organised seven scientific sessions featuring around 20 grantees as well as a research career session. ERC President Jean-Pierre Bourguignon spoke in several policy sessions and debates. The ERC was also present at the EU booth in the main exhibition area. This strong presence led to much media interest from specialised and mainstream press, as well as to a wide social media reach.

The EU and Japan concluded a new agreement to **encourage top Japanese researchers to join teams in Europe that are funded by the ERC**. The initiative is a collaboration with the Japan Science and Technology Agency (JST) and is the second of its kind for the ERC with a Japanese funding body. A similar deal was signed between the EU and Australia **to provide opportunities for top Australian researchers to carry out research visits with teams funded by the ERC in Europe**. The National Health and Medical Research Council (NHMRC), Australia's leading government investor in health and medical research, is the twelfth research agency to take part in such an initiative, within the ERC's international strategy. These initiatives aim to encourage high-calibre researchers to make research visits to Europe, where they will temporarily join ERC funded research teams, enabling the exchange of ideas and experiences in order to perform cutting-edge science together.

A new initiative to accelerate the transition to full and immediate open access to scientific publications was announced by Science Europe under the name of **Plan S**. Launched by the Open Access Envoy of the European Commission, Robert-Jan Smits, it was further endorsed by a group of Science Europe member organisations and other external funding organisations. The plan puts forward a number of fundamental principles for developing open access to publications more fully. The principles published drew on input from the ERC Scientific Council which supported the initiative.

The ERC participated in the 7th edition of **TriesteNext Scientific Research Festival**, one of the main science festivals in Europe that takes place in Trieste, Italy. Talks and debates, round tables and workshops were organised in September under the theme "Natura Tech: the thin line between biology and biotechnology", with a focus on the relation between man, nature and technology. The ERC organised two sessions: one on how Europe invests in scientific excellence and another on funding opportunities for young researchers, both of them with the presence of three grantees as testimonials. TriesteNext was attended by more than 45,000 people and benefitted from a wide media coverage at local, regional and national level.



Y Science is an official side event taking place in the margins of the world-renowned **Slush Conference**, bringing together founders, investors and start-ups in Helsinki, Finland. Y Science brings together those involved in curiosity driven science and the business world. In December, ERC grantees were among the speakers in the first section of Y Science "It all comes back to Science – Science is the basis" giving timely and easily understandable basic science pitches, where also business people could follow the general outlay and topic of the talk. There was then a Life Science Pitching Competition for pre- and early phase start-ups. During the previous month, around 30 competitors were evaluated by a committee of experts who selected the eight finalists who pitched at the event. The winner of the competition was MAKNEE, a start-up company that develops novel non-invasive technology for the detection of joint disorders. The Lead Researcher in the company is ERC Starting Grantee Simo Jaakko Saarakkala, from the University of Oulu.

ERC Monitoring and Evaluation Strategy 2018

Since its creation in 2007 the ERC Scientific Council has been mindful of the high impacts expected from the first pan-European research funding agency operating on a competitive basis, both in the scientific communities and in the science policy circles. Long before the first calls were published and the first projects selected and funded, the Scientific Council started reflecting on the most appropriate ways to assess and report on the impact of the ERC funding activities. In 2009, the Scientific Council established its first Monitoring and Evaluation Strategy with the overall aim to generate a broad and integrated understanding of the ERC's performance and impact. The monitoring and evaluation activities serve a double role. They provide the evidence needed to report on results and achievements and they drive the strategic decisions of the Scientific Council.

In 2018 the Monitoring and Evaluation Strategy was revised and further elaborated to include the accumulated experience as well as best practices in monitoring and evaluation. The revision consisted mainly of refining objectives and indicators, listing explicitly the key principles of ERC monitoring and evaluation and in broadening the perspective of understanding and measuring the ERC impact.

The Monitoring and Evaluation Strategy has five objectives:

- the core objective "Knowledge", corresponding to the ERC mission as defined by legislation, is to evaluate the contribution of the ERC to the advancement of the frontiers of knowledge and the scientific and technological impact of new ideas in the short and long term;
- the second objective "Researchers" is to evaluate the ERC contribution to improving the career prospects of European researchers, to training the new generation of researchers and to attracting the world's best scientists to Europe;
- "Research Systems" concerns the structural impact of ERC to reform, strengthen and unlock the full potential and attractiveness of the European Research Area;
- under "Impact Beyond Science" the economic and societal benefits of ERC funded-discoveries and their influences on policy making are traced over long periods of time;
- "Operations" concerns the continuous monitoring of the ERC's operations and the assessment of its operational performance.

The key principles of ERC monitoring and evaluation

- Independence and Objectivity
- High-quality and Relevance
- Causality and Attribution
- Focus and Proportionality
- Priority and Resources
- Transparency and Accountability

Bearing in mind the limitations of measuring and analysing evidence (e.g. failure to identify complex issues like "quality of knowledge", causal relationships and attribution), the Monitoring and Evaluation Strategy requires for each of its objectives one or more key indicators that can accurately reflect the objectives of the programme and take into account availability of data and the activities needed to collect the necessary information. Distinction is made between core indicators, which follow from the core objective "Knowledge" and feed into the monitoring and evaluation of the ERC achievement of its mission, and non-core indicators that mainly support the monitoring of ERC performance and impact.

Examples of ERC key indicators:

Core

> Top 1% highly cited ERC publications

> Percentage of ERC funded projects creating scientific breakthroughs

> List of ERC grantees who are laureates of prestigious awards or (elected) members of prestigious learned societies

Non-core

> Number of PhD students and postdoctoral researchers trained in research as members of ERC funded teams

> Percentage of Principal Investigators/team members coming to Europe from outside EU and Associated Countries

> Number and quality of patent applications and patents granted

> Number of start-up companies created from ERC projects

According to the survey of ERC StG/CoG PIs*:

62%
had their group become more visible internationally

61%
gained academic independence

59%
improved their status in the scientific community

27%
were nominated for membership of scientific academies, learned societies or editorial boards

According to the survey, of ERC AdG PIs*:

52%
had their group pushed to world-leader status

52%
could focus more on research activities

25%
were nominated for membership of scientific academies, learned societies or editorial boards

*) The percentages indicate the share of respondents who reported that the impact was achieved to a large extent.

Study on the Career Impacts of ERC Funding

Although career development is not the core objective of ERC funding, it is implicitly assumed that researchers who achieve outstanding results will consequently benefit from career advancement. Support to the careers of researchers is an explicit goal of the ERC and with over 4,000 projects led by individual Principal Investigators (PIs) and more than 35,000 team members funded by the ERC during the 7th Framework Programme (2007-2013), the Scientific Council decided it was time for a thorough investigation of the impacts of the programme on careers[1]. The consulting company ICF was commissioned by the ERC to carry out a study (in collaboration with the Center for Higher Education Policy Studies at the University of Twente CHEPS, Vitae and Elsevier) which started in 2017 and finished in early 2019.

The contractor was tasked with exploring career impacts at three levels: i) researchers (PIs and team members); ii) research teams; and iii) ERC Host Institutions and their policies and practices related to the career development of their researchers[2]. The final results are expected to be published on the ERC website during 2019.

- **71%** of StG/CoG PIs from completed ERC projects experienced upward career mobility between just before the start of their ERC project and just before its end (**78%** of the female PIs and **69%** of the male PIs).
- **50%** of StG/CoG PIs reached full professorship or equivalent during or after their ERC project, with **11%** already in a senior position at the beginning of the project.
- **18%** of AdG PIs reported upwards career mobility during their ERC project, while **68%** of them were already full professors or similar at the start.

The study compared the speed of ERC PIs to attain full professorship or equivalent to that of a control group of PIs of similar scientific quality, which had been carefully paired by research area, academic age, gender and academic career system of their host country. ERC StG/CoG PIs on average became full professors earlier in their careers than control PIs. This also remains true when disaggregating by gender and by the three ERC scientific domains (LS, PE, SH).

1) The first attempts to look into ERC impact on research careers started in 2008, but the early studies could focus only on the direct and indirect effects of the first ERC calls: https://repository.fteval.at/11/, https://erc.europa.eu/content/understanding-and-assessing-impact-and-outcomes-erc-and-its-funding-schemes-eurecia-final, https://erc.europa.eu/sites/default/files/document/file/ERCAREER_final_report.pdf.
2) A series of surveys were run with the following numbers of respondents: PIs (856 StG/CoG, 534 AdG and 26 SyG), team members (2,715), control group PIs (2,124), research offices (178) and human resources departments (75).

Team members' motivations to join an ERC team were shaped to some extent by their career stage. The opportunity to start working with the PI was a key motivation for graduates / PhD candidates and post-docs, while for more senior individuals, continuity seems to have been key. Analysis of team members' motivations points towards the frequent pre-existence of the research teams before the start of the ERC project (or at least collaborations of senior staff). For team members, involvement in an ERC project typically seems to have had positive career-related outcomes. These include the development of new research areas, of new networks (which literature suggests are key to future development of research careers) and development as autonomous researchers. Outcomes were more significant amongst more junior team members, most likely because senior team members had often already achieved them.

Team members, especially the juniors, also acquired various career-enabling skills and experiences during their involvement in the ERC project, including expert knowledge of their chosen research area and technical skills (e.g. novel research methods and approaches). Transferable skills, including the ability to work in multinational teams, communication skills, data-analysis skills etc. were also commonly acquired by team members, though to a slightly lesser extent than research-related skills.

Junior team members were also the ones predominantly reporting upward career change. After their project involvement had ended:

- **35%** of post-docs continued to move upwards, typically to become (emerging) established researchers leading teams of their own;
- **36%** of PhD candidates became post-docs working on other projects.

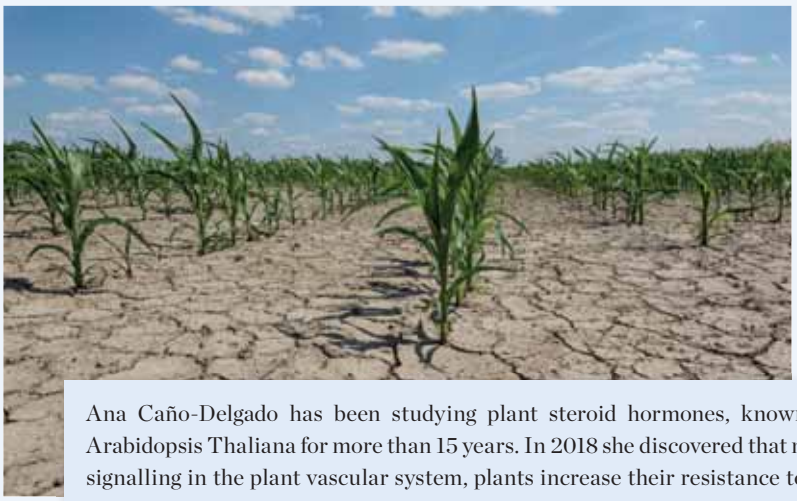
14% of the more senior team members became full professor or equivalent during or after their project involvement, while **26%** reported that they had already attained full professorship before their project involvement and **10%** did not specify when.

Policies and practices affecting researchers' recruitment and career advancement were the same in almost all ERC Host Institutions, regardless of whether an individual was working on an ERC project or was part of a different research team. Within the small number of institutions that did report differences, these included: the use of special incentives to attract and retain ERC grant holders (e.g. better salary packages, funding to 'fast-track' career advancement), and/or greater autonomy and control for ERC PIs over staff recruitment. About 40% of PIs reported that their ERC team displayed greater diversity, internationality and/or interdisciplinarity than their previous teams. Most PIs reported that after the end of the grant they continued working with some of the ERC team members, although most of the team moved away to new institutions. About 40% of the PIs from the SH domain reported that their team had dissolved after the grant ended (about 11% in LS and around 20% in PE domain).

By far the most commonly identified impact of the ERC grant on the research environment was on the reputation of the Host Institution: a "positive" or "strong positive" impact on reputation at 93% of institutions.

chapter five

Research Highlights



Engineered crop plants to fight drought

Ana Caño-Delgado has been studying plant steroid hormones, known as brassinosteroids, in Arabidopsis Thaliana for more than 15 years. In 2018 she discovered that modifying brassinosteroid signalling in the plant vascular system, plants increase their resistance to water scarcity and grow normally. In the past, her team succeeded to enhance plant drought tolerance, but due to the complex action of brassinosteroids, these plants were much smaller than those not modified. Her strategy is the first to improve hydric stress resistance in plants without interfering with their development and growth. Researchers have started trials on cereals and tomatoes in order to find solutions to increase the tolerance of crops to drought, one of the most important threats to agriculture today.

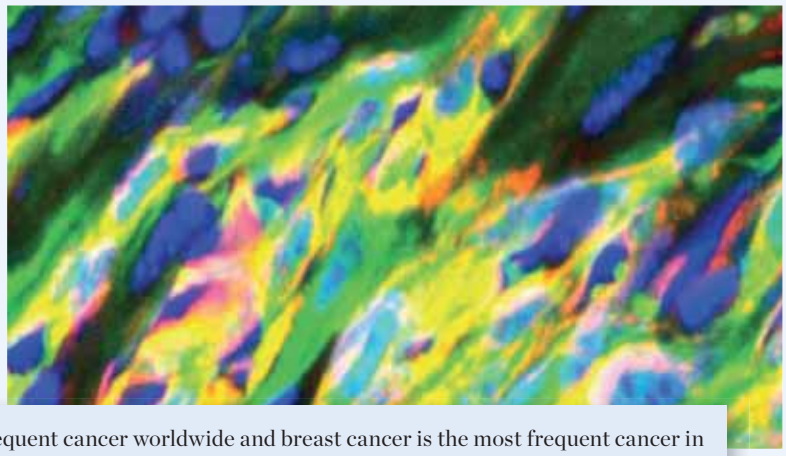
IDRICA, Ana Caño-Delgado, Center for Research in Agricultural Genomics (CRAG), Spain

A new twist in the history of the evolution of human species

Collaboration between three ERC grantees led to a major breakthrough in palaeontology. Analysing the genome of a bone fragment found in Russia, scientists discovered that it belonged to a hominid, who lived roughly 90,000 years ago and had a Neanderthal mother and a Denisovan father. Neanderthals and Denisovans are two extinct human groups that were replaced by modern humans around 40,000 years ago. Neanderthals are traditionally thought to have inhabited western Eurasia whereas Denisovans settled in eastern Eurasia. Finding a first-generation Neanderthal–Denisovan offspring in south Siberia suggests that their geographic distributions were much wider than previously understood and that crossing between Late Pleistocene hominids was probably quite frequent.

100 Archaic Genomes, Svante Pääbo, Max Planck Society for the Advancement of Science, Germany
FINDER, Katerina Douka, Max Planck Society for the Advancement of Science, Germany
PALAEOCHRON, Tom Higham, Oxford University, United Kingdom

Cancer – know your enemy



© C. Blanpain, ULB

Skin cancer is the most frequent cancer worldwide and breast cancer is the most frequent cancer in women. The research team led by Cédric Blanpain defined for the first time tumour growth phases during cancer progression and identified the types of tumour cells causing metastases in skin and breast cancer. Supported by the ERC, Blanpain was able to identify at least seven different types of tumour cells and demonstrated that they are not all functionally equivalent and equally metastatic. This discovery will have major implications for the diagnosis, prognosis and therapy of cancer patients.

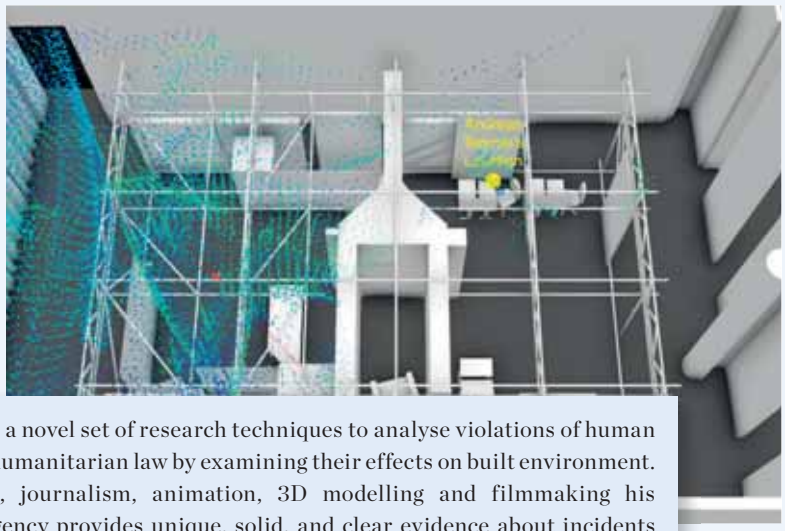
EXPAND, Cédric Blanpain, Université Libre de Bruxelles, Belgium

A new theory aims to get a grip on the multiverse

ERC grantee Thomas Hertog co-authored the last paper on cosmology by the late Prof. Stephen Hawking in which they propose a new theory for the origin of the universe. Their study deals with the old multiverse hypothesis, which predicts that the Big Bang created an infinite number of universes, each with its own set of physical laws. The new theory puts the multiverse hypothesis on a more rigorous theoretical (mathematical) footing. Hawking and Hertog found that this limits the number of possible universes, hence making an observational test of the theory more feasible. In their work they make use of the holographic principle in string theory which says that, fundamentally, the physical properties of certain 3D spaces can be mathematically completely described in terms of a projection on a 2D surface.

HoloQosmos, Thomas Hertog, Catholic University Leuven, Belgium

Forensic architecture methods to visualise evidence related to crimes



© Forensic Architecture and Anderson Acoustics, 2017

Eyal Weizman developed a novel set of research techniques to analyse violations of human rights and international humanitarian law by examining their effects on built environment. Combining architecture, journalism, animation, 3D modelling and filmmaking his Forensic Architecture agency provides unique, solid, and clear evidence about incidents that other methods of investigation cannot engage with. His team focused on violent events around the world, including the UK, the Mediterranean area, Indonesia, Syria, Palestine and Amazonia. Results of these works were exhibited at the Museum of Contemporary Arts in Barcelona, the Victoria and Albert Museum and Tate Britain in London. The project received the European Cultural Foundation Award for Culture and was nominated to the prestigious Turner Prize 2018.

FAMEC, Eyal Weizman, Goldsmiths' College, United Kingdom

How do colour patterns in birds develop?

The eyes in peacock feathers dazzle us, spots and stripes help us identify different species of birds and often the shapes and patterns on these animals wow us as much as their colours. ERC Starting grantee Marie Manceau published a paper this year explaining how birds get their colouring patterns, a process made more complicated by the fact that it can change in time. She and her team discovered that the process is two-stepped, dependent both on the genetic peculiarities of the animal and on the structural landmarks of the bird's body, such as the muscles and bones.

COLOUR PATTERN, Marie Manceau, Collège de France, France

© Graham Knott & Melanie Blokesch, EPFL, Switzerland

Vibrio cholerae: a very versatile pathogen

In the 1800s, cholera was the subject of one of science's most riveting investigative cases. But ever since John Snow understood the important link between cholera and dirty water, scientists have continued to find ways in which *Vibrio cholerae*, a species of bacteria commonly found in aquatic habitats, infects humans. One of these researchers, Melanie Blokesch, who studies the ecology and evolution of this bacterium, has found that *Vibrio cholerae* resists digestion by predators in its natural environment, while continuing to replicate, making it a dangerous inhabitant of its ecosystem. These insights could shed light on the transmission of cholera, which remains one of the world's most debilitating pandemic diseases.

VIR4ENV & CholeraIndex, Melanie Blokesch, École Politechnique Fédérale de Lausanne, Switzerland

Microplastic pollution: a global threat for seas and soils

In the last few years, the scientific community has become aware of the damaging effects of pollution from small plastic pieces – less than a millimetre long. Two studies by ERC grantees warn about the long-term negative impact of microplastics on marine and terrestrial ecosystems throughout the world. According to a study, to which Erik van Sebille has contributed, the level of pollution in the Mediterranean Sea compairs to the highest ever measured in the South China sea.

Microplastic pollution, however, is not only a threat for seas and oceans. Matthias Rillig found evidence that land-based pollution may strongly impact the terrestrial geochemical and biophysical environment.

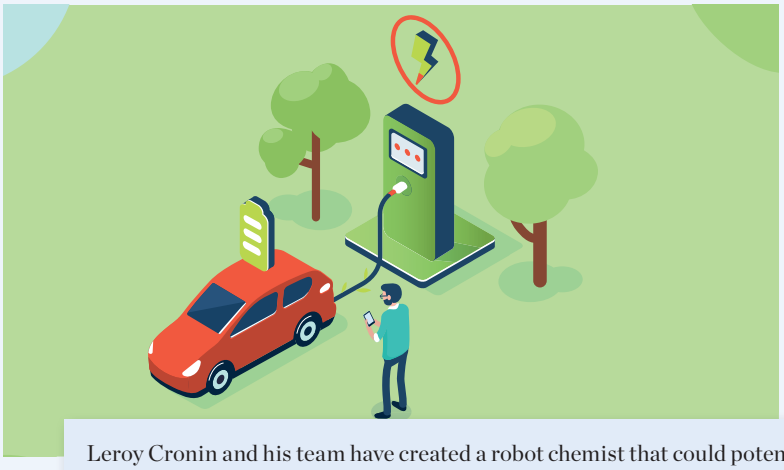
Gradual_Change, Matthias Rillig, Free University of Berlin, Germany

TOPIOS, Erik van Sebille, Utrecht University, Netherlands

Differential rotation of stars

Stars can rotate faster at the equator than at the poles – as the Sun does. This is known as differential rotation and can be seen in the motion of sunspots. Studying the seismic properties of the Sun, researchers found that the effect might extend into its core. Jørgen Christensen-Dalsgaard and his group used the Kepler space telescope to investigate a group of Sun-like stars. They have concluded that several stars do indeed seem to have equators that spin faster than their poles - usually twice as fast - and none of them indicated the opposite pattern.

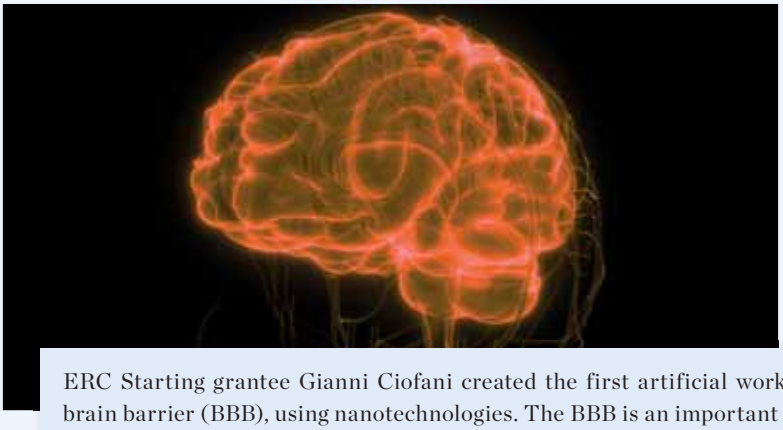
ASTERISK, Jørgen Christensen-Dalsgaard, Aarhus University, Denmark



Robot chemists and a new fast charging battery

Leroy Cronin and his team have created a robot chemist that could potentially revolutionise the way molecules are discovered, thanks to machine-learning techniques. This could lead to lower costs for synthesising new molecules for drugs and new materials and polymers for high-tech applications. But this was not the only breakthrough the team realised in 2018. They also discovered a new type of liquid battery that is ten times more energy-dense than existing models. Refuelling electric cars could be reduced to a few minutes, by literally pouring new charged electrolytes into the tank, as for petrol cars. The battery's higher energy density allows it to store more power in less liquid, making the commercial application to cars viable.

SMART-POM, Leroy Cronin, University of Glasgow, United Kingdom

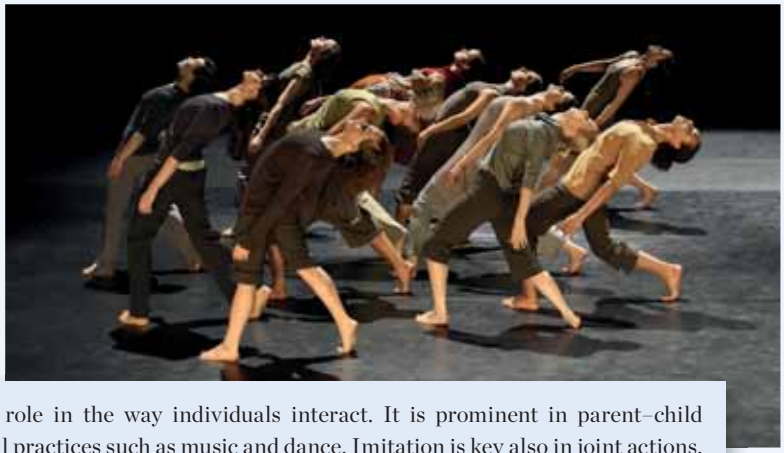


Defying the Blood Brain Barrier

ERC Starting grantee Gianni Ciofani created the first artificial working model of the blood brain barrier (BBB), using nanotechnologies. The BBB is an important line of defence the body uses to protect its thinking organ, the brain, against contamination from toxins that may flow in other parts of the body. The model will allow researchers to understand how to cross this natural barrier with specific drugs in order to treat tumours and conditions like Parkinson's disease and Multiple Sclerosis.

SLaMM, Gianni Ciofani, Fondazione Italiana Istituto di Tecnologia (IIT), Italy

Imitation at the basis of teamwork



Imitation plays a central role in the way individuals interact. It is prominent in parent–child interactions and in cultural practices such as music and dance. Imitation is key also in joint actions, where two or more individuals – for example, fellow sport team members - coordinate their actions in space and time in order to achieve a shared goal. Collaboration between two ERC grantees led to a better understanding of this phenomenon. They showed that imitation occurs not only between individuals, but also between teams. This demonstrates that joint action goals can override close links between perception and action that normally form the basis of imitation and yield new insights into teaching and innovation.

SOMICS, Günther Knoblich, Central European University, Hungary

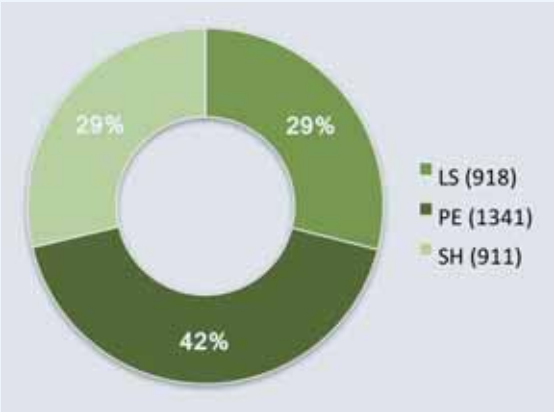
JAXPERTISE, Natalie Sebanz, Central European University, Hungary

chapter six

Advancing Frontier Research

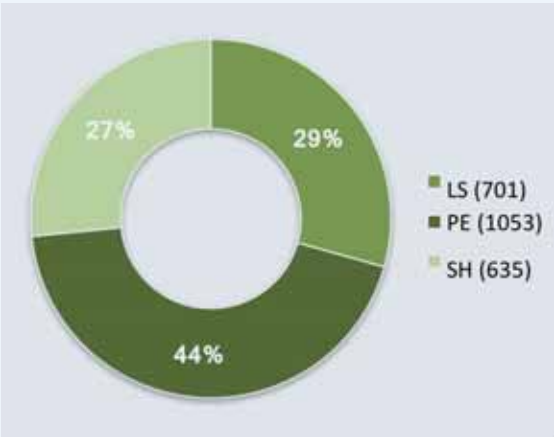
ERC calls 2018

Starting Grant 2018 - Submitted proposals

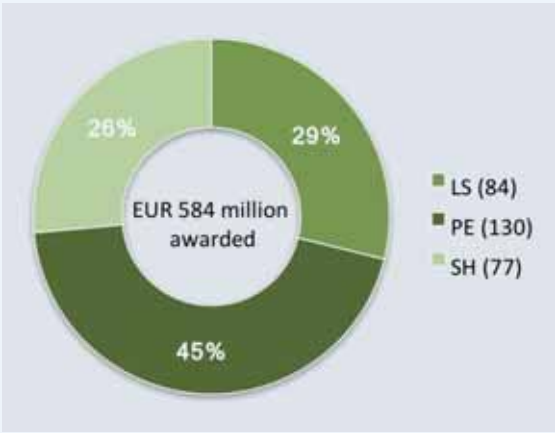


Starting Grant 2018 - Funded projects

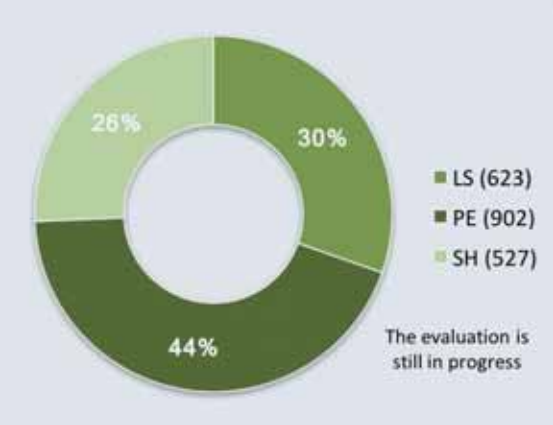
Consolidator Grant 2018 - Submitted proposals



Consolidator Grant 2018 - Funded projects



Advanced Grant 2018 - Submitted proposals



Synergy Grant 2018

Proof of Concept Grant 2018 - Submitted proposals

Proof of Concept Grant 2018 - Funded projects

7,611

proposals submitted in 2018 to ERC core schemes

300

proposals submitted to SyG 2018

721

projects selected for funding in StG, CoG and SyG 2018 *

441

proposals submitted in 2018 to the PoC scheme

- 17%

decrease in submissions compared to 2017, which was exceptional in terms of submissions

160

projects selected for funding in PoC 2018

2,333

proposals submitted in 2018 by female applicants

+ 2%

more female StG applicants compared to 2017

+ 5%

more female AdG applicants compared to 2017

> 3,000

panel members in 2014-2018 calls

56

European and non-European countries hosting ERC panel members

> 30,000

external reviewers in 2014-2018 calls

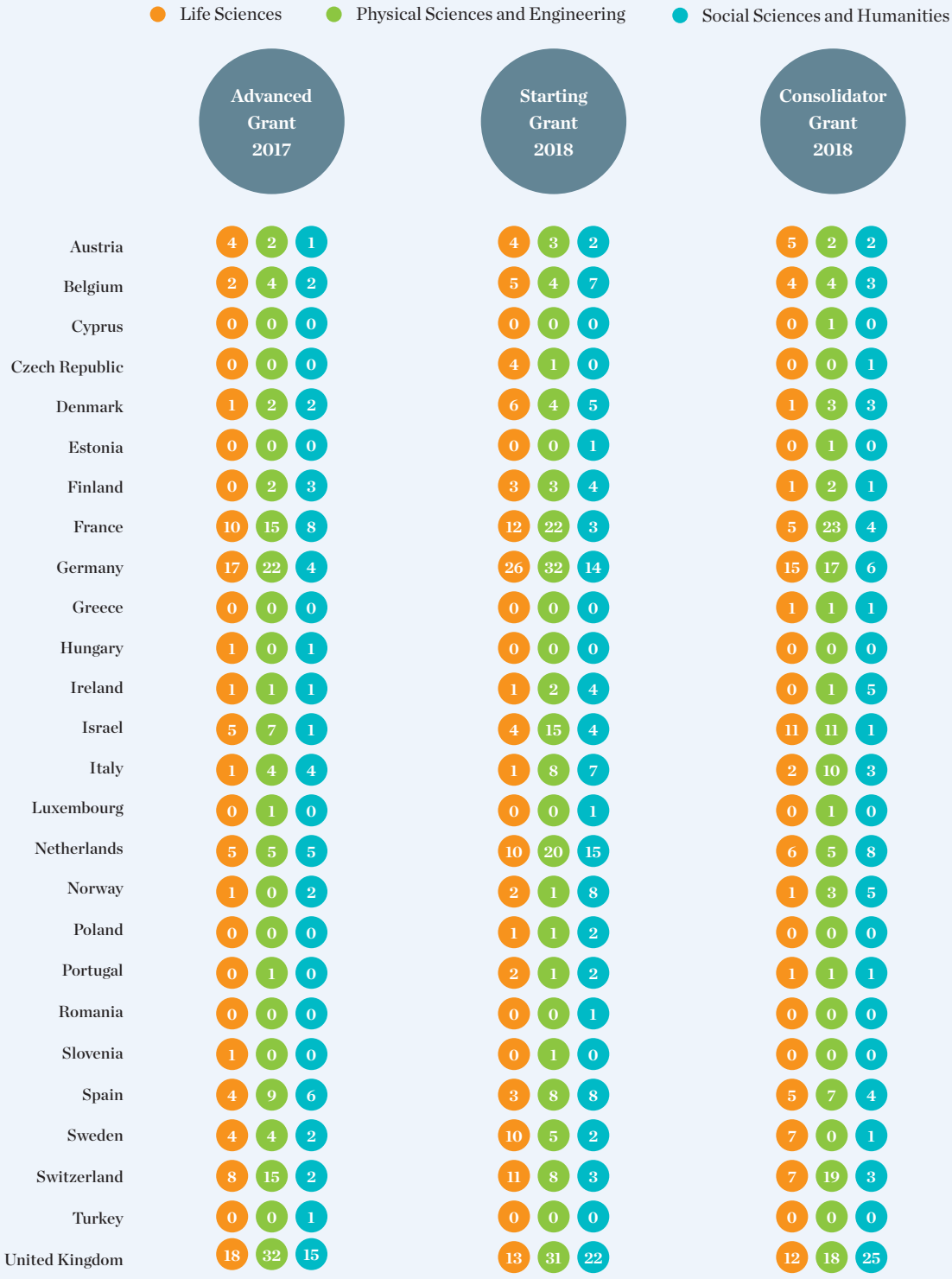
* The Advanced Grant 2018 proposals were still under evaluation at the moment of printing this report

ERC calls in Horizon 2020

	Total number of applications	of which		
		Evaluated*	Funded	Success rates**
Starting Grant 2014	3,273	3,204	375	11.7
Starting Grant 2015	2,920	2,862	349	12.2
Starting Grant 2016	2,935	2,881	391	13.6
Starting Grant 2017	3,082	3,032	407	13.4
Starting Grant 2018	3,170	3,123	403	12.9
Starting Grant	15,380	15,102	1,925	12.8
Consolidator Grant 2014	2,528	2,485	371	14.9
Consolidator Grant 2015	2,051	2,023	303	15.0
Consolidator Grant 2016	2,305	2,274	314	13.8
Consolidator Grant 2017	2,539	2,498	328	13.1
Consolidator Grant 2018	2,389	2,356	291	12.4
Consolidator Grant	11,812	11,636	1,607	13.8
Advanced Grant 2014	2,287	2,250	192	8.5
Advanced Grant 2015	1,953	1,927	277	14.4
Advanced Grant 2016	2,404	2,373	231	9.7
Advanced Grant 2017	2,167	2,137	269	12.6
Advanced Grant	8,811	8,687	969	11.3
Proof of Concept 2014	442	426	121	28.4
Proof of Concept 2015	339	323	160	49.5
Proof of Concept 2016	437	405	159	39.3
Proof of Concept 2017	532	497	160	32.2
Proof of Concept 2018	441	417	160	38.4
Proof of Concept	2,191	2,068	760	37.6
Synergy Grant 2018	300	295	27	9.2

* withdrawn and ineligible proposals not taken into account
** percentage of funded proposals in relation to evaluated proposals
Data as of December 2018

Geographical distribution of grantees for each call



Data as of December 2018

Chairs of ERC evaluation panels 2018

Panel	Starting Grant 2018	Consolidator Grant 2018	Advanced Grant 2018
Life Sciences			
LS1 Molecular Biology, Biochemistry, Structural Biology and Molecular Biophysics	Prof. Tomi P. Makela	Prof. Laszlo Tora	Prof. Robert Tampé
LS2 Genetics, 'Omics', Bioinformatics and Systems Biology	Prof. Frank Grosveld	Prof. Uwe Sauer	Prof. Yitzhak Pilpel
LS3 Cellular and Developmental Biology	Prof. Anna Akhmanova	Prof. Arshad Desai	Prof. Freddy Radtke
LS4 Physiology, Pathophysiology and Endocrinology	Prof. Eli Pikarsky	Prof. Stefan Schulte-Merker	Prof. Karin Sipido
LS5 Neuroscience and Neural Disorders	Prof. Michael Brecht	Prof. Gábor Tamás	Prof. Marie-France Bader
LS6 Immunity and Infection	Prof. Soren Riis Paludan	Prof. Caetano Reis e Sousa	Prof. Steffen Jung
LS7 Applied Medical Technologies, Diagnostics, Therapies, and Public Health	Prof. Agnieszka Dobrzyn	Prof. Patrick Couvreur	Prof. Peter Frey
LS8 Ecology, Evolution and Environmental Biology	Prof. John N. Thompson	Prof. Hanna Kokko	Prof. Jacobus J. Boomsma
LS9 Applied Life Sciences, Biotechnology and Molecular and Biosystems engineering	Prof. Leonor Cancela	Prof. Birte Svensson	Prof. Daniel Tomé
Physical Sciences and Engineering			
PE1 Mathematics	Prof. Francois Loeser	Prof. Alfio Quarteroni	Prof. Jan Philip Solovej
PE2 Fundamental Constituents of Matter	Prof. Maciej Lewenstein	Prof. Jean-Paul Blaizot	Prof. Olaf Scholten
PE3 Condensed Matter Physics	Prof. Gerrit Bauer	Prof. Margarida Telo da Gama	Prof. Cait MacPhee
PE4 Physical and Analytical Chemical Sciences	Prof. Marco Daturi	Prof. Jan M.L. Martin	Prof. Giulietta Smulevich
PE5 Synthetic Chemistry and Materials	Prof. Horst Weller	Prof. Luis Liz-Marzan	Prof. Subodh Mhaisalkar
PE6 Computer Science and Informatics	Prof. Marlon Dumas	Prof. Mogens Nielsen	Prof. Daphna Weinshall
PE7 Systems and Communication Engineering	Prof. Adrian Ionescu	Prof. Mary O'Neill	Prof. Stephen McLaughlin
PE8 Products and Process Engineering	Prof. Gabor Stepan	Prof. Aristide Massardo	Prof. Tanya Monro
PE9 Universe Sciences	Prof. Isabelle Grenier	Prof. Conny Aerts	Prof. Tsvi Piran
PE10 Earth System Science	Prof. Dorthe Dahl-Jensen	Prof. Paul Andriessen	Prof. Ingeborg Levin
Social Sciences and Humanities			
SH1 Individuals, Markets and Organisations	Prof. Philip Hans B.F. Franses	Prof. Thierry Mayer	Prof. Rachel Griffith
SH2 Institutions, Values, Environment and Space	Prof. Petter Pilesjo	Prof. Neil Adger	Prof. Jan Klabbers
SH3 The Social World, Diversity, Population	Prof. Arnstein Aassve	Prof. Peter K. Smith	Prof. Elizabeth Thomson
SH4 The Human Mind and Its Complexity	Prof. James Douglas Saddy	Prof. Ron (George) Mangun	Prof. Ruth Byrne
SH5 Cultures and Cultural Production	Prof. Andrea Pinotti	Prof. Angela Esterhammer	Prof. Alessandro Schiesaro
SH6 The Study of the Human Past	Prof. Maria Todorova	Prof. Susan Pfeiffer	Prof. Martin Kenneth Jones

Synergy Grant 2018				
Prof. Ole Petter Ottersen	Prof. Rudolf Amann	Prof. Sonja Anette Kotz	Prof. Bengt Nordén	Prof. Alan Green

chapter seven

Strategy Support

For the ERC President

34

presentations

26

briefings

5

data analyses

For members of the Scientific Council

17

presentations

4

briefings

10

data analyses

Documents and in-depth analysis for:

Scientific Council
Standing Committees
Working Groups
Task Forces

Support to the Scientific Council

Strategy support consists of activities undertaken by the ERCEA to support the Scientific Council with the task of setting the scientific strategy, of establishing positions on scientific management, monitoring and quality control and of undertaking communication and dissemination efforts. These activities cover:

> policy analysis and advice
> programme design and review
> management of Standing Committees and Working Groups
> programme monitoring and evaluation
> communication and dissemination.

The whole staff of the ERCEA contributes to a greater or lesser extent to the development of the Scientific Council's strategy for the ERC, but two units in particular are dedicated to providing strategic support to the Scientific Council:

- **Support to the Scientific Council:** The unit supports the Scientific Council to establish the overall research funding and management strategy of the ERC, including the ERC annual work programme, and leads on the assessment, monitoring, evaluation, reporting and statistical analysis of the ERC's activities. In response to relevant requests by the Scientific Council the unit continuously advises them in their activities by providing analysis and intellectual input through the drafting of various documents that reflect the Scientific Council's main orientations. Due to the specific governance model, the Scientific Council's plenary meetings are also prepared with the organisational and administrative support of this unit.

- **Communication Unit:** The unit assists the Scientific Council and the ERCEA in their communication strategy towards the scientific community, public authorities, media and the public at large. It also advises and assists the President in terms of communication activities, including media interviews.

Meetings

The Scientific Council (ScC) held regular plenary meetings in 2018 both in Brussels and across Europe, usually at the invitation of national authorities. Meeting in different countries, either EU Member States or Associated Countries, is a way of making the ERC more visible.

@ World Economic Forum

January

- 22-26: World Economic Forum Annual Meeting 2018 (Davos)
- 31: ICSU Workshop "Open Data in Science: Challenges and Opportunities for Europe" (Brussels)

April

- 10: XI European Geosciences Union General Assembly 2018 (Vienna)
- 16-18: XXIV Annual EARMA Conference 2018 (Brussels)
- 19-20: ScC Plenary (Brussels)

February

- 1: ALLEA Workshop "Ethical aspects of Open Access: A Windy Road" (Brussels)
- 2: Informal Meeting of Ministers for Competitiveness – Research (Sofia)
- 7-9: "Transparency, Recognition, and Innovation in Peer Review in the Life Sciences" (Chevy Chase, US)
- 14: First Gago Conference "Policy Perspectives for Cancer Research in Europe" (Porto)

May

- 15-16: Global Research Council (Moscow)
- 23-24: European Business Summit (Brussels)
- 30-31: STOA-ERC event "Investing in Young Researchers, Shaping Europe's Future" (Strasbourg)

@ RO Ministry of Research and Innovation

June

- 15: Conference "Horizon Europe" (Bucharest)
- 19: Plant Biology Europe 2018 (Copenhagen)
- 19-20: Meeting of the ERC National Contact Points (Brussels)
- 23-26: First European Society of Patology Academy (Waterloo)

March

- 1-2: ScC Plenary (EMBL - Heidelberg)
- 26-28: Next Einstein Forum (Kigali)

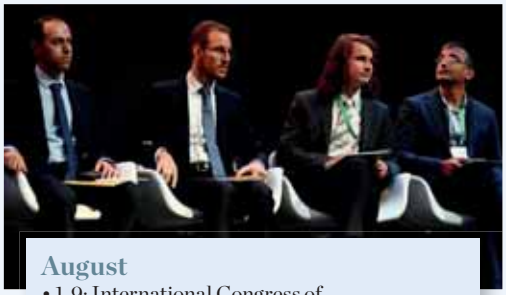
The meetings are also considered important events both by the national authorities as well as the local scientific and research community. In addition, in 2018 members of the Scientific Council participated in meetings and events around the world representing the ERC, including scientific conferences.

July

- 5-6: ScC Plenary (Leuven)
- 9-14: EuroScience Open Forum ESOF 2018 (Toulouse)

October

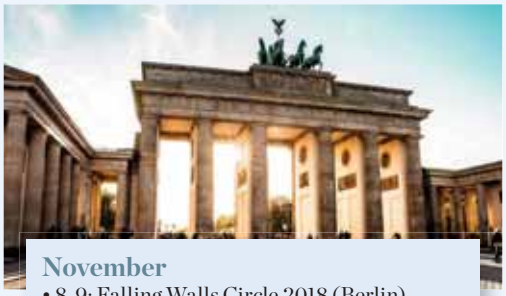
- 1-5: International Astronautical Congress (Bremen)
- 16-17: ScC Plenary (Heraklion)
- 22: AT Presidency Conference "The Role of Competitive Research Funding in Science" (Klosterneuburg)
- 25-26: ERC Conference "Frontier Research and Artificial Intelligence"



@ICM2018, Rio de Janeiro

August

- 1-9: International Congress of Mathematicians ICM 2018 (Rio de Janeiro)
- 21: Europe-Korea Conference on Science and Technology EKC 2018 (Glasgow)
- 23-25: European Forum Alpbach 2018 Technology Symposium
- 24: Association for Computing Machinery Annual Conference 2018 (Budapest)



November

- 8-9: Falling Walls Circle 2018 (Berlin)
- 28-29: Annual Conference of Academia Europaea (Barcelona)

September

- 10: XVII European Conference on Computational Biology 2018 (Athens)
- 12: BE OPEN - Science & Society Festival – FWF 50th anniversary (Vienna)
- 18-20: WEF Annual Meeting of the New Champions 2018 (Tianjin)
- 24: Academia Europaea 30th anniversary (London)

December

- 10-14: American Geophysical Union Fall Meeting 2018 (Washington)
- 12-13: ScC Plenary (Brussels)

Standing Committees

The Standing Committee on Panels deals with the selection of evaluation panellists.

The Committee met four times in 2018.

The Standing Committee on Conflict of Interest, Scientific Misconduct and Ethical Issues (CoIME) provides guidance on conflicts of interest, scientific misconduct and ethical issues.

In 2018 the CoIME gave its advice on 21 cases of alleged scientific misconduct of which four were still ongoing at the end of 2018. An anonymised reporting of these cases can be found on the ERC website.

The Committee met once in 2018.

Working Groups

The members of the Scientific Council also meet in Working Groups (WGs) that carry out analyses and contribute to the ERC's scientific strategy through proposals to be adopted by the Scientific Council in plenary in areas addressing specific issues.

There are currently seven Working Groups dedicated to the following topics, which are of particular interest to the ERC:

Innovation and relations with industry, to examine ERC's relationship with the industrial/business sector and the impact of ERC funded research on innovation.

The WG met twice in 2018.

Strengthening international participation, to explore suitable mechanisms to increase the participation of researchers in ERC calls from countries outside the EU.

Gender balance, to ensure that the ERC is at the forefront of best practices with regard to gender balance in research.

The WG met twice in 2018.

Widening European participation, to encourage low performing countries and, in particular, Central and Eastern European countries to better nurture their scientific talent and invest more in research.

The WG met twice in 2018.

Key performance indicators, to evaluate the ERC's accomplishment of its mission, using qualitative and quantitative methods to support the short, medium and long-term policies of the Scientific Council.

The WG met twice in 2018.

Open access, to develop an ERC position on issues related to open access to publications, research data management and sharing and open science more broadly.

The WG met twice in 2018.

Science behind the projects, to perform an ex-ante content analysis of the ERC funded projects, using expert judgment that will enable ERC to systematically report on the research areas, topics and fields that it funds, including on funding trends.

The WG met once in 2018.

Task Forces

In addition to the Working Groups the Scientific Council can also appoint members to take part in time-limited Task Forces to look into specific issues and make recommendations to the Scientific Council in plenary.

ERC Ethics Review

At the plenary meeting of 13 – 15 December 2017 in Brussels the Scientific Council took the decision to set up a Task Force (TF) to look into the ERC's ethics review process. The TF produced a set of concrete recommendations which were endorsed by the plenary meeting in Heidelberg in March 2018 to extend a trust based approach, ensure sufficient resources for the ethics review team and for the Agency to regularly inform the Scientific Council of the number, proportion and trend rate of applications cleared at the ethics prescreening, screening and assessment stages by call and domain.

ERC Budget Allocation Principles

At the plenary meeting of 1 - 2 March 2018 in Heidelberg the Scientific Council took the decision to set up a Task Force (TF) to look into the ERC's budget allocation principles. The TF produced a set of concrete recommendations which were endorsed by the plenary meeting in Brussels in December 2018 including a recommendation to increase the funding available for projects with high non-personnel costs.

Communication

The ERC has a mandate to communicate to the scientific community, key stakeholders and the general public on its news and achievements. Its communication activities, in 2018, followed three main objectives set by the ERC Scientific Council.

Attracting the best ideas and the brightest minds

The ERC continued to target excellent researchers in Europe, but also around the world, to raise awareness of the ERC funding schemes and international agreements. To do so, the ERC took part in scientific gatherings in Europe and beyond, and organised international campaigns in the USA and Brazil. It also promoted content related to career opportunities across many of its own media, collaborating with partners outside Europe such as the EU Delegations, theEuraxess offices, the National Contact Points and other key stakeholders.

Sharing the passion for frontier science

The variety of research covered by the ERC provides a rich source of content to communicate beyond the research community. In 2018 the ERC continued to use this communication potential to reach press and media, as well as to create its own news stories with a focus on research results. These stories were told as videos, podcasts and articles, and spread through the website, the recently created online magazine, as well as social media channels, including the ERC's new YouTube channel. The ongoing projects ERCcOMICS and ERC=Science^2 kept using different tools, such as comics and exhibitions in science museums, to reach new audiences with the ERC's success stories. In addition, efforts were made to create a network with the Host Institutions' communication offices – a useful partner in spreading the stories and results of ERC grantees.

Positioning the ERC as a success story for Europe

To demonstrate the relevance and the value of its mission for Europe and its citizens the ERC took part in, and organised, several communication activities targeting decision-makers at EU and national levels, key influencers and members of the public who have an interest in research-related topics. These included the first joint ERC event with the European Parliament's STOA and the ERC's annual participation in the World Economic Forum meetings in Davos and Tianjin. Collaborations with potential multipliers such as the EU Representations across Europe and other Directorates General of the European Commission were fostered. The ERC President and the members of the Scientific Council took part in numerous communication and media occasions to promote this message. Press activities were organised to enhance the ERC's visibility and reputation for excellence and to support its broader narrative within the EU.

ERC press in figures

> 30

press announcements released by the ERC

> 14,700

print and online media mentions of the ERC

> 200

articles published by the ERC

1,200

media articles on ERC competition results/ new ERC winners

56,000

Twitter followers

25,000

Facebook followers

406 million

potential reach on ERC social media

47,000

ERC Magazine and news update subscribers

100,000

social media mentions of the ERC

612,000

website unique visitors, + 4% since 2017

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"The European Research Council has, in a short time, achieved world-class status as a funding body for excellent curiosity-driven frontier research. With its special emphasis on allowing top young talent to thrive, the ERC Scientific Council is committed to keeping to this course. The ERC will continue to help make Europe a power house for science and a place where innovation is fuelled by a new generation."

Jean-Pierre Bourguignon
ERC President and Chair of its Scientific Council

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