

White Paper

The Future of European Research



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CONTENTS

04 Outlook on FP10

06 Enabling International Co-operation

08 Committing to Excellence

10 Catalysing the Fundamental Energy Transition

12 Spurring Disruptive Innovation

14 Nurturing Effective Public Policies

16 Strengthening Research Infrastructures

Appendix

20 Participants

34 Imprint

The Future of European Research



Facing a wide range of geopolitical, socioeconomic, and environmental challenges, Europe finds itself in a world of increasingly fierce competition between regions and sociopolitical paradigms. More than ever before, science, innovation, and international co-operation are crucial assets in this state of affairs. How can Europe position itself as a driving force for breakthrough innovation in challenging research fields? How well is European science organised, and what is required to train and to attract the brightest minds worldwide? How can we, as scientists and innovators, best contribute to the wealth and well-being of Europe and of humankind as a whole?

The future of European research was at the heart of a high-level symposium held at Castle Ringberg in Bavaria on April 17 and 18, 2023.

Upon the invitation of six major European research organisations – the G6 –, members of the scientific community and distinguished representatives from the national governments of France, Germany, Italy, and Spain as well as from the European Commission for the first time reflected together on the strategic imperatives for the European research landscape and, in particular, for the next EU Framework Programme (FP10).

Mirroring six thematic sessions on crucial aspects of European competitiveness, this booklet brings together some of the main ideas and proposals explored at the Ringberg symposium, as well as providing an outlook with key recommendations for the process of shaping FP10 in the years to come.

The G6 Presidents



The G6 network's outlook on the next EU Framework Programme on Research and Innovation (FP10)

- 1** The EU should embrace research as a top priority to reach its objectives in tackling today's grand challenges and become a global leader in disruptive innovation for the benefit of society. This ambition has to be reflected in a strong and future-oriented EU budget for R&I with balanced support of both frontier basic research and targeted research while further promoting the transformation towards Open Science.
- 2** Europe should reinforce its commitment to excellence throughout the continuum of research and innovation as an imperative to drive Europe's wealth, competitiveness, and autonomy. FP10 has to be built around the most creative minds, bringing together the best researchers, networks, and institutions in Europe and attracting talent worldwide. Nuclei of excellence integrating less research-intensive regions are required to strengthen the European Research Area as a whole.
- 3** Geopolitical tensions and fierce global competition require Europe to be bold in setting up new efficient tools to create alliances of excellent partners around strategic topics. Stable networks between powerhouses of research inside and outside the EU, including the United Kingdom and Switzerland, are a must to solve global complex challenges.
- 4** Europe is home to highly competitive research infrastructures. As the backbone of excellence, European research infrastructures are real magnets for talent and co-operation worldwide. Ambitious efforts are needed to align national and European roadmaps as well as international agreements. The EU should take further responsibility in this regard and provide a sustainable budget.
- 5** To put Europe at the forefront of the fundamental energy transition, the EU needs to exploit its full potential in cutting-edge energy research by scaling-up its innovation in crucial technological areas. The G6 strongly advocates for comprehensive and aligned agendas on national and European levels as well as for new formats to promote entrepreneurial spirit and public-private partnerships in strategic sectors, such as energy.
- 6** Europe's risk-averse structures are hindering talents from capitalising on their outstanding research results. The G6 recommends that the Commission develops interfaces to strengthen the culture of bold research in Europe and further empower its pool of talents to achieve disruptive innovation.
- 7** In times of multiple crises and rapid technological transition, the role of researchers as scientific advisers for public policy-making has become indispensable. Building on Europe's capacity in social sciences and interdisciplinary research, FP10 should develop tools further promoting the input of scientific expertise into policy-making.

Enabling International Co-operation

Facing increasingly fierce competition in a world of rising geopolitical tensions, Europe needs to unleash its full potential in research and innovation in order to meet the grand challenges of the future. This requires more ambitious and more efficient co-operation both within the ERA and on a global scale.

» Europe needs to be bold in setting up international networks of excellence involving the best scientists worldwide.

On one level, the EU needs to strengthen research networks and infrastructures in the ERA with a focus on excellence while at the same time reinforcing interfaces with industry and SMEs, thus generating additional synergies. More scientific lighthouses should be created, especially in less research-intensive regions, in order to overcome the existing performance gap and to strengthen the ERA as a whole.

On another level, the EU needs to reach out to international partners beyond the ERA: new tools are required to establish long-term stable networks in key areas such as artificial intelligence and quantum science. In this respect, the highly successful model of EMBL may serve as an inspiration. Such initiatives should involve, most notably, the United Kingdom, Switzerland, and Israel as powerhouses of the European research landscape.

Beyond this, the EU needs to be open to the world: the best European scientists and institutions should team up with the

best partners worldwide, especially to meet joint challenges, such as the green and digital transitions. Above all, this applies to countries that share our core values. More broadly, Europe should open up towards the Global South as well as redefine modalities for collaboration with China, which will remain an important partner as well as a competitor. Openness must go along with safeguarding European interests and with developing a strategy to achieve technological sovereignty.

CHAIR

Martin Stratmann

President, Max Planck Society (MPG), Germany



Committing to Excellence

Research excellence is a long-proven enabler of economic wealth, competitiveness, and autonomy. It is an essential driver of technological innovations that change our lives and protect people. It also serves the interests of citizens by providing high-quality scientific knowledge for decision-making. In a world of rapid evolution and fierce competition, Europe should keep setting its research standards high by strengthening its commitment to excellence.

» *Research excellence is not a luxury; it is an absolute necessity to address pressing global, social, and industrial challenges, for the benefit of all European citizens.*

By funding curiosity-driven frontier research, the European Research Council is a unique driver of research excellence in Europe. Yet the diversity of European talent needs to be further leveraged. It is absolutely necessary to ensure the continued strength of the ERC by preserving its values and empowering it with greater funding capacities. The ERC should be a reference model to promote excellence beyond fundamental science, transcending the whole European Framework Programmes.

Against the backdrop of pressing global challenges and future crises, excellence requires to team up with the best talent. It is essential that Europe fosters co-operation between cutting-edge research partners that commit to excellence. Strong partnerships with historic and emerging powerhouses of research inside and outside Europe, including the United Kingdom and Switzerland, are indispensable.

Sustaining critical masses and ensuring the balance of talent global mobility is also crucial to ensure the future of European research. Europe should promote agile networks of excellence to attract and aggregate competences, including interdisciplinary competences. Europe should also invest in schools of

excellence for PhD students and post-docs to train next generations of creative scientists on emerging topics.

Overall, research excellence is a vision that G6 institutions strongly support by conforming to high standards of research practices like freedom of research, peer review and teaming capacity. We urge policy-makers at both European and national levels to empower European research stakeholders and design policies setting research excellence as their main guiding principle.

CHAIR

Antoine Petit

President, Centre national de la recherche scientifique (CNRS), France



Catalysing the Fundamental Energy Transition

Europe is well positioned in many fields of cutting-edge research, and the continent has a lot to offer in terms of green technologies. However, there is an urgent need for Europe to position itself as driving force for the fundamental energy transition and address the challenges posed by geopolitical changes and by climate change.

» Europe needs to position itself as a key player in the fundamental energy transition.

Europe can play a key role at a global scale to develop a new generation of green, fossil-free technologies. This will also help international partners, including African countries, to meet their energy needs, and enable them to export green energy to Europe. The potential of the EU photovoltaic and hydrogen systems should be strengthened through international partnerships.

In addition, there is a need to develop rules for licensing power plants and highlight the importance of public-private partnerships. Fusion is a prime example of European collaboration, where 25 member states work jointly to develop key technologies and exploit European research infrastructures to demonstrate that energy can be obtained through fusion-based technologies.

Transformational energy research has to be promoted at the European level. The creation of a European Institute of Energy Research with freedom and autonomy would attract talent from all over the world and help to unite research at the European level. In order to master the energy transition, Europe

also needs to reorganise its processes for transfer, implementation, and innovation. The G6 institutions urge Europe to develop comprehensive agendas to integrate and unite an ecosystem that fosters collaboration between industry and academia, as well as between different regions and countries. Only in such a setting will Europe take a leadership role in the energy transition to secure our future.

CHAIR

Otmar D. Wiestler

President, Helmholtz Association (HGF), Germany



HELMHOLTZ

Spurring Disruptive Innovation

Disruptive innovation depends on fundamental research, which is the seed of tomorrow's innovation. This is why scientists must feel free to be driven by their own curiosity, the courage to explore unusual ideas and even unusual paths. In this landscape, a balanced combination of bottom-up and top-down approaches is recommended to strengthen fundamental research. In parallel, project evaluation, to stimulate innovation, should focus more on process than on impact, as focusing on the latter reduces creativity.

»» What we call science is our ability to imagine the future, shaping possibilities, in a responsible and sustainable way. European research should drive this challenging ability.

In 'blue sky' thinking, small teams can often be more effective, so a proper balance between small and large teams should be considered essential for a flourishing S&T ecology. However, it is frequently an innovative business model that enables the application of a new technology in a disruptive way, and this is what we really need in Europe. Here, greater flexibility and a smarter legal framework for innovation are needed to facilitate the quick scalability of innovative ideas.

A stronger hybrid research and innovation ecosystem needs to be built to protect and support new start-ups and companies when they leave the protected scientific environment. The transition from the laboratory to the market is often very difficult due to the scarcity of European funds and sometimes a complex and fragmented regulatory framework. The risk is to hand over excellent innovative ideas to markets outside Europe.

The EIC and the ERC represent an excellent system for innovation based on free fundamental research. While preserving their distinction of roles and independence, their interface should be strengthened. It is also necessary to continue developing collaboration with non-European countries and to continue working for academic freedom and independence.

CHAIR

Maria Chiara Carrozza

President, Consiglio Nazionale delle Ricerche (CNR), Italy



 **Consiglio Nazionale
delle Ricerche**

Nurturing Effective Public Policies

Recent crises remind us that many fundamental scientific challenges are simultaneously central policy issues, important enough for citizens to consider that public administrations must address them through public policies.

»» The difficulty to combine the need for long-term strategies, inherent to research, with short-term political agendas highlights the complex equation of science for policy. The need for interfaces between science and policy-making should be emphasised at the EU level.

There appears to be a growing consensus among those who believe that policies need to be informed by scientific evidence. Citizens' confidence in science as an input to solve problems is progressively increasing, while politicians in many countries have called for the help of scientists. Advisory mechanisms have proliferated, and many scientists have been willing to contribute with their work to respond to social and policy problems.

However, the relationship between Science and Policy is complex. The difficulty to combine the need for long-term strategies, inherent to research, with short-term political agendas highlights the complex equation of science for policy. Science and policy-making processes operate according to different logics, values, and languages. Their effective connection and dialogue require institutionalised transparent structures and procedures to establish on which issues evidence is required, what kind of evidence

and advice are admissible, or how evidence might be incorporated into decisions.

Adequate knowledge brokerage skills and training are thus essential for effective exchange across communities and for the functioning of science for policy interfaces. The need for these interfaces capable of supporting mutual trust and knowledge brokerage should be emphasised at the EU level.

CHAIR

Eloísa del Pino Matute

President, Consejo Superior de Investigaciones Científicas (CSIC), Spain



 **CSIC**
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

Strengthening Research Infrastructures

The EU is looking back on 20 years of strategic development of a European research infrastructure (RI) landscape. RIs enable researchers to conduct excellent research that goes beyond the state of the art, they are a successful means of attracting talent to Europe and sought-after partners at international level. The G6 is convinced that Europe should strengthen its strategically important role in this area even more in the future.

» Sustainable EU funding for excellent research infrastructures is essential to promote outstanding science, foster collaboration across disciplines and countries, and advance the European Research Area.

Essential RIs include large-scale infrastructures as well as information infrastructures, such as computer systems, archives, data infrastructures, or scientific collections. The latter's importance and the need for a skilled workforce have increased considerably over the last 20 years with the digital transformation and the establishment of open science principles. Also, increasing cyberattacks, including on research organisations, have illustrated the importance of vigilance and qualified staff, such as IT security experts.

One of the priorities should be to better coordinate funding mechanisms at national and EU levels to ensure sustainable funding and planning security for RI. To underpin their importance for the European Research Area, special consideration should be given to the provision for transnational access to RI as well as to the alignment of the general framework conditions for access. An integrated system would bring together national roadmaps, the ESFRI roadmap as well as international agreements.

Public perception and acknowledgment of RI is crucial as it helps to demonstrate their value particularly in times of crises. By showcasing their contributions to society, RI can build trust and support from the public, which in turn can lead to increased funding and investment. This ultimately strengthens their capacity to tackle challenges and drive progress in science and technology.

CHAIR

Martina Brockmeier

President, Leibniz Association, Germany







In the inspiring setting of Castle Ringberg, scientists and decision-makers reflected on the future of European research.

Jens Brandenburg

Parliamentary State Secretary, Federal Ministry of Education and Research, Germany



Dr Jens Brandenburg has been a Member of the German Bundestag representing the Rhine-Neckar region since 2017. In the Parliamentary Group of the Free Democratic Party, he was spokesperson on study, vocational training and lifelong learning as well as spokesperson on the Study Commission „Vocational Training in the Digital Work Environment“ until 2021. In December 2021, he was appointed

Parliamentary State Secretary to the Federal Minister of Education and Research.

He studied political science and economics at the University of Mannheim and completed his PhD at the Graduate School of Economic and Social Sciences. Prior to becoming a Member of the German Bundestag, he worked for a global management consulting firm.

Martina Brockmeier

President, Leibniz Association, Germany



Martina Brockmeier is president of the Leibniz Association since July 1, 2022. She was Chairperson of the German Council of Science and Humanities from 2017 to 2020.

She has served as member of the DFG Review Board (2008-2016), the Senate Evaluation Committee of the Leibniz Association (2001-2009), the National Academy of Science and Engineering (Acatech, since 2018), the Academic Advisory Council (AAC, since 2020) of the University of Heidelberg and the Senate Strategic Committee of the Leibniz Association (2020-2021). Since 1999 Martina Brockmeier has been a member of the Global Trade Analysis Project (GTAP) Advisory Board of Purdue University (USA). As Dean she headed the Faculty of Agricultural Sciences at the University of Hohenheim from 2012 to 2014.

Brockmeier studied Agricultural and Food Economics and was awarded her doctorate

in Giessen (Germany), spent time abroad in the USA (Purdue University) and Australia (University of Adelaide) as part of a DFG habilitation fellowship and completed her habilitation (2002). She was Director of the Institute for Market Analysis and Agricultural Trade Policy at the Thuenen Institute, Braunschweig (1999–2009).

Holder of the W3 professorship for International Agricultural Trade and Food Security at University of Hohenheim (2009). She is currently on leave of absence to assume the presidency of the Leibniz Association.

Her main research interests are agricultural economics and policy, international trade in agricultural products and food. She focuses on regional and multilateral trade agreements and their impact on developing countries and global food security.



Maria Chiara Carrozza

President, Consiglio Nazionale delle Ricerche (CNR), Italy

Maria Chiara Carrozza graduated in Physics and obtained her Ph.D. in Engineering at Scuola Superiore Sant'Anna (Pisa) in 1994.

She is the President of the National Research Council since 2021.

She is Full Professor of Industrial Bioengineering at the BioRobotics Institute of Scuola Superiore Sant'Anna, where she was Rector from 2007 to 2013.

Member of the Italian Parliament from 2013 to 2018, she served as Minister of Education, University and Research.

From 2018 to 2021 she was Scientific Director of Don Carlo Gnocchi Foundation. From 2015 to 2021 she was independent director in the Board of Directors of the Piaggio SpA (2015-2021) and Partner of the start-up IUVO Srl since 2015. She was founder and President of the Italian Scientific Association of Biomedical Engineers.

She was member of the Steering Committee of Quantum Tech FET Flagship, DG Communication Networks, Content and Technology and Chair of the Expert Group responsible for the interim evaluation of FET Flagship.

From 2019 to 2022 she was Chair of the European Commission Expert Group for the development of impact evaluation methodologies of Partnerships in Research and Innovation.

She is author of several scientific publications and 15 international patents, and involved in research and academic projects with Japan, Korea, and China.

Research interests: Neurorobotics, Bionics, Biorobotics, Rehabilitation Bioengineering, Exoskeletons, Robotic Prostheses, Microengineering, Sensing for Biorobotics.



Gianluigi Consoli

Director-General, Direction General for Internationalization and Communication, Ministry of Universities and Research, Italy

Gianluigi Consoli was born in 1979.

He studied law at the University of Rome „Sapienza“ and completed his doctoral studies in History and Doctrine of Institutions at the University of Insubria in Como.

After previous experiences as a Technologist at ENEA, since 2014 he has been a manager of the Ministry of University and Research, following attendance of the specific management course at the National School of Administration and after having carried out an internship at the Scientific Office of the Permanent Representation to the International Organizations in Geneva, dealing mainly with CERN and other international scientific organizations.

Appointed in 2015 as Head of the Office for the planning and the promotion of international research and coordination of aerospace research, in 2021 Consoli became Director General for Internationalization and Communication of the Ministry of Universities and Research.

He deals with activities such as the national position in the scientific programmes of the European Union, international relationships – bilateral and multilateral – in the field of scientific research, and the Italian participation in international organizations such as OECD, CERN, ECMWF, EMBL and IAEA. Furthermore, he coordinates the Italian participation in the main European research partnerships.



Patrick Cramer

Director, Max Planck Institute for Multidisciplinary Sciences, President elect Max Planck Society, Germany



Born on February 3, 1969 in Stuttgart. Study of chemistry at the Universities of Stuttgart and Heidelberg. Research student at the University of Bristol (UK) and Cambridge (UK). Diploma in chemistry in 1995 at the University of Heidelberg, doctorate at the University of Heidelberg/EMBL Grenoble (France) in 1998. Predoctoral fellow in Grenoble (France) from 1995 to 1998, postdoctoral fellow at Stanford

University (USA) from 1999 to 2001. Tenure-track professor of biochemistry at the University of Munich from 2001 to 2003. Professor of biochemistry at the University of Munich from 2004 to 2014. Director of the Gene Center of the University of Munich (LMU) from 2004 to 2013. Director at the Max Planck Institute of Biophysical Chemistry, since 2022 Max Planck Institute for Multidisciplinary Sciences.



MAX PLANCK INSTITUTE
FOR MULTIDISCIPLINARY SCIENCES

Eloísa del Pino Matute

President, Consejo Superior de Investigaciones Científicas (CSIC), Spain



PhD in Political Science, Instituto Universitario de Investigación Ortega y Gasset (IUIOG), Universidad Complutense de Madrid (UCM). B. A. Degree in Political Sciences and Public Administration (UCM) and B. A. Degree in Law (UNED). Master's Degree in Human Resources and Organization (ESIC). She has held teaching positions at the Universidad Rey Juan Carlos (URJC, 1995-2007) and at the Universidad Autónoma de Madrid (2007-2008). She has been the Chief of Staff of the Minister of Healthcare, Consume Affairs and Social Welfare (2018-2020), and she is the President of the Spanish National Research Council (CSIC) since June 2022.

She has been visiting researcher or fellow at the Latin American Centre, University of Oxford, (2016-2017); at the Centre d'Études et de la Recherche sur la Vie Locale (CNRS), Institut d'Études Politiques in Bordeaux (2004); at the School of Social Policy and Social Research at the University of Kent (2008), and at the School of Political Studies at the University of Ottawa (2014).

Much of her recent research has dealt with the political conditions for reform of the welfare state and social policies in comparative perspective.



Bérendère Dubrulle

Director, Research in Turbulence Flow Physics, CNRS, France

Bérendère Dubrulle is currently director of research at CNRS. Former student at École Normale Supérieure, she holds a PhD degree in astrophysics from the University of Toulouse. After her postdoc at the Tsukuba Meteorological Research Institute in Japan, she became a research fellow at the CNRS. In 2000, she became a CNRS director of research at the Condensed Matter Physics laboratory in Saclay.

Throughout her career, Bérendère Dubrulle developed research excellence across various fields of turbulence flow physics, ranging from quantum turbulence to astrophysics. Along a visiting fellowship in 1999 at the National Center for Atmospheric Research in Boulder (Colorado, USA) she became acutely aware of climate issues and initiated research on

atmospheric physics and climate change related issues.

Since 2020, Bérendère Dubrulle is the director of the international School of Physics in Les Houches. Acting as an incubator of Nobel physics Prizes and Field medalists over 70 years, this school is a flagship of research training excellence in Europe.

Bérendère Dubrulle has received several awards including the Prize Madame Victor Noury from the French Academy of science in 2008, the CNRS silver medal in 2017 and the Lewis Fry Richardson medal from the European Geosciences Union in 2021. In 2022, Bérendère Dubrulle was named French "Female scientist of the year", receiving the Irène Joliot-Curie award from the French Academy of sciences.



Giuseppe Gigli

Director, CNR Institute of Nanotechnology, Italy

Giuseppe Gigli took the Degree in Physics at the University of Rome (IT) "La Sapienza" in 1996 and the PhD in Physics in 1999 at the University of Lecce (IT). In 1999 he joined the Optoelectronics group in the Cavendish Laboratory of the University of Cambridge (UK), working on Polymer Optoelectronic Devices. In 2000 he joined the Organic and Biomolecular electronics group in the Department of Physics, Chemistry and Biology of the University of Linköping (Sweden), working on Nanotechnology of molecular materials. Since 2001 he is Lecturer in Physics in the Engineering Dep. of the University of Salento, where he is full Professor since 2010. GG is founder and Director of the CNR Institute of Nanotechnology, where he is also coordinator of the Molecular Nanotechnology group. GG is President of the Puglia High-Tech District (DHI-TECH), coordinator of the Precision Medicine Technopole in Lecce and Director of the CNR Interdepartmental Research Center in Taranto. GG has been member of the European Laboratory of

Nonlinear Spectroscopy (LENS) Scientific Board, coordinator of the National Energy Platform of the Italian Institute of Technology (IIT) and of the CNR National Project EFOR on Renewable Energies.

His main research activities involve: organic/hybrid photonic devices, microfluidic laboratories on chip, liquid biopsy and drug delivery systems for advanced Theranostics, 3D in vitro models on chips.

He is author of more than 450 publications (h-index=71) with more than 19000 citations, 20 patents and more than 60 Invited talks in International Conferences. GG is and has been coordinator of several research projects funded by the Italian Ministry of Research (MIUR) and European Community (EU), as well as responsible of several industrial projects with Italian and international companies. Giuseppe Gigli is co-founder of spin off and start-up aiming at the developing of new organic systems for optoelectronic and medical applications.



Claire Giry

Director-General, Research and Innovation, Ministry of Higher Education, Research and Innovation, France



Claire Giry has been appointed Director General of Research and Innovation at the Ministry of Higher Education, Research and Innovation in June 2021.

A doctor in molecular and cellular biology, trained at the Ecole Normale Supérieure in Lyon, Claire Giry was responsible for developing national, European and international partnerships at the French Alternative Energies and Atomic Energy Commission (CEA) and the French National Institute for Health and Medical Research (Inserm).

She was also technical advisor to the Prime Minister for higher education and research

between 2007 and 2009. She then became head of the joint department of the General Directorate for Higher Education and Professional Integration (Dgesip) and the General Directorate for Research and Innovation (DGRI) of the Ministry of Higher Education and Research. She was in charge of territorial issues and the implementation of the first Programme d'investissements d'avenir (PIA).

Claire Giry then directed the „Centers of Excellence“ program of the French General Commission for Investment, before joining Inserm in 2012 where she held various positions before being appointed Vice-CEO.



Sibylle Günter

Scientific Director, Max Planck Institute for Plasma Physics (IPP), Germany



Sibylle Günter graduated in physics from the University of Rostock in 1987. Three years later she completed her PhD at the Department of Theoretical Physics. From 1990 to 1996 she was a research assistant at the chair „Theoretical Physics I“. Her research at the University of Rostock was deepened by stays abroad at the University of Maryland and as a visiting scientist at the National Institute of Standards and Technology (NIST). In 1996, Sibylle Günter habilitated at the University of Rostock with a thesis on „Optical Properties of Dense Plasmas“. In February 1996, she went to the Max Planck Institute for Plasma Physics. In 2000, at the age of 36, she became the youngest woman in the history of the Max Planck Society to be appointed Scientific Member and Director of the Institute. At IPP,

she headed the „Tokamak Theory“ department until 2011. Her research focuses on the stability of magnetically confined fusion plasmas. Since February 2011, she has been Scientific Director and Chair of the Directorate of the Max Planck Institute for Plasma Physics. She has been an adjunct professor at the University of Rostock since 2001 and an honorary professor at the Technical University of Munich since 2006. She is an elected member of the National Academy of Sciences Leopoldina, the German Academy of Science and Engineering (Acatech), the Academia Europaea and the Swiss Academy of Science and Engineering (SATW). Since 2014, Sibylle Günter has been a member of the Senate of the Max Planck Society.



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Maria Leptin

President, European Research Council

Professor Maria Leptin is the President of the European Research Council (took office from 1 November 2021).

Prior to that, Professor Leptin served as Director of EMBO from 2010. She also established a research group in Heidelberg at the European Molecular Biology Laboratory (EMBL). The group studies the mechanics of shape determination during development.

After completing her studies in mathematics and biology at the University of Bonn and the University of Heidelberg, Professor Leptin obtained her PhD at the Basel Institute for Immunology, Switzerland (1979-1983) studying B-lymphocyte activation under the supervision of Fritz Melchers.

In 1984, she became a post-doctoral fellow (1984-1987) at the Laboratory of Molecular Biology (LMB), Cambridge, UK, where she started

her research on the embryonic development of *Drosophila*. This laid the foundations for her future work in the field of molecular morphogenesis. As visiting scientists at the University of California, San Francisco (UCSF), Professor Leptin began her work on gastrulation which became the core of her research interests at the Max Planck Institute for Developmental Biology in Tübingen, Germany, where she worked as group leader (1989-1994).

In 1994, Maria Leptin became Professor at the Institute of Genetics, University of Cologne, Germany, where she still leads a research group.

Professor Leptin is an elected member of EMBO, the Academia Europaea and the German National Academy of Sciences (Leopoldina), and an Honorary Fellow of the Academy of Medical Sciences. She is also Foreign Member of the Royal Society since May 2022.



Francisco Javier Moreno-Fuentes

Vicepresident, International Affairs CSIC, Spain

Francisco Javier Moreno-Fuentes is Senior Researcher at the Institute of Public Goods and Policies of the Spanish National Research Council (IPP-CSIC). BA in Sociology from the Universidad Complutense, Master in Social Sciences from the Juan March Institute, MSc in Social Policy from the LSE, and PhD in Political Science from the Universidad Autónoma of Madrid. Between July 2018 and September 2019 he was Deputy Director of the Spanish High Commission against child poverty.

He has been a researcher for the European Social Policy Network (ESPN) of independent experts on social protection and inclusion of the Directorate-General for Employment, Social Affairs and Inclusion of the European

Commission since 2014. He led a significant number of research projects on welfare policies and immigration in Spain and in the EU based on a combination of quantitative and qualitative methods, the last one of which was "Deep dive analysis of policies, programmes, services, budgets, and mechanisms addressing child poverty and social exclusion in Spain", funded by UNICEF on behalf of the European Commission.

He is the author or co-author of 10 books, 40 articles in peer-reviewed journals, 37 chapters in edited books, and more than 50 Reports related to his areas of specialisation. Since July 2022, he is the Vicepresident for International Affairs of CSIC.



Graziano Pesole

Full professor of Molecular Biology and Former director, CNR Institute of "Biomembranes, Bioenergetics and Molecular Biotechnologies", Italy



Graziano Pesole is full professor of Molecular Biology in the University of Bari A. Moro and Associate Researcher of CNR-IBIOM, Director of Consorzio Interuniversitario Biotecnologie (Trieste), Head of the Italian Node of ELIXIR, the European Research Infrastructure for Life Science, Director of Consorzio Interuniversitario Biotecnologie.

Bibliometric facts: h-index: 78 (Google scholar), 72 (ResearchGate), 64 (Scopus); peer-reviewed publications: >360; sum of Times Cited without self-citations: >25,000.

Graziano Pesole has since long carried out research activity in the fields of bioinformatics, comparative genomics and molecular evolution. His current research interests are focused on bioinformatics application for the management and analysis of next generation sequencing data, also at single-cell resolution.

He has developed several specialized databases and widely used analysis software and

algorithms which are available as standalone software or through the web.

He leads a large interdisciplinary research group including molecular biologists, bioinformaticians and computer scientists.

He has been PI for several research projects funded by national (MIUR, CNR, Telethon, AIRC, AISM, ARISLA) and international (EU, NIH) agencies and currently leading several research projects funded by the Italian PNRR including the leadership of the Biocomputing spoke of the National Center for Gene Therapy and Drugs based on RNA technology (Total budget of the last 10 years: >10M€). He also filed several international patents.

He is member of the Editorial Board of several high-profile journals, and co-author of books on Bioinformatics, Genomics and Molecular Biology published by Italian (Zanichelli, Ambrosiana, Gnocchi) and international (Wiley) editors.



Antoine Petit

President, Centre national de la recherche scientifique (CNRS), France



Antoine Petit is Chairman and CEO of the Centre National de la Recherche Scientifique (CNRS) since 2018.

Holding a PhD in computer science from Université Paris Diderot, he specialized in formal methods, mostly based on transition systems, for the specification and verification of parallel systems in real time. An academic from 1984 to 2004, he consecutively served as assistant professor at Université d'Orléans, lecturer at Université Paris-Sud and professor at Ecole Normale Supérieure in Cachan from 1994 where he headed the department of computer science.

From 2001 to 2003, Antoine Petit was appointed deputy director of the Research Department at the French ministry of research, in charge of mathematics, information and communication sciences and technologies. In 2004, he joined CNRS as scientific director of the Information and communication science and technologies department and as inter-regional director for southwestern France. In 2006, Antoine Petit joined the French National Institute for Computer Science and Applied Mathematics (INRIA) as head of the Paris-Rocquencourt research center and further as deputy CEO of the institute. In 2014, he became Chairman and CEO of INRIA where he served until 2018.



Covadonga Pevida García

Group Leader, Instituto de Ciencia y Tecnología del Carbono, INCAR-CSIC, Spain

Dr Covadonga Pevida is a Research Scientist at the Institute of Carbon Science and Technology, INCAR-CSIC (Spain), where she leads the Energy Processes and Emission Reduction (PrEM) Group. MEng and PhD in Chemical Engineering from the University of Oviedo, she received the Young PhD Researcher Award from the Spanish Carbon Group in 2005. She was a postdoc fellow at IRCELYon (CNRS-Université de Lyon 1) and the University of Nottingham. In 2017 she was a visiting researcher at the Research Centre for Carbon Solutions (RCCS), Heriot-Watt University (Edinburgh). She has co-authored more than 130 publications, an invention patent (ES252625) about the production of CO₂ adsorbents from biowastes, has supervised 11 PhDs to successful completion (5 have received awards), and has led and participated in more than 25 research projects at the national and European level in the Energy theme. Her

current research interests focus on biomass utilization for energy and value-added products. In particular, the production of H₂ from renewable bioresources and the development of adsorption processes and materials for gas separation (e.g., CO₂ capture).

Covadonga is a member of the Technical Group of Experts on 'Environmental, technical and economic issues related to coal treatment and use' (TGK2) of the Research Fund for Coal and Steel (RFCS) at the European Commission, member of the Board of Directors of the Spanish Carbon Group (GEC), and the leader of the Capture Group at the Spanish CO₂ Technology Platform (PTECO2). She is a member of the Editorial Advisory Board of several JCR Journals (e.g., Chemical Engineering Journal) and Specialty Chief Editor of Advanced Clean Fuel Technologies-Frontiers in Energy Research. She is also Chief Editor of the Spanish Carbon Group Bulletin.



Signe Ratso

Deputy Director-General, Directorate-General for Research and Innovation, European Commission

Signe Ratso is Deputy Director-General and a member of the Management Board of the Directorate-General for Research and Innovation of the European Commission. She is Chief negotiator, responsible for negotiations of association agreements with third countries associated and future potential associated countries to the EU R&I programmes Horizon Europe and Euratom, association policy and its interlinkages with EU R&I international cooperation strategy.

She is also responsible for Open Innovation and for citizens' engagement and social innovation in research and innovation policy.

As a member of the Management Board she oversees some of the priority areas of the Commission in DG R&I.

Before joining DG R&I she worked in different senior management positions in DG TRADE since 2006.

Signe Ratso has always been involved in international affairs. Before joining the Commission she worked as Deputy Secretary General (from 1994 to 2005) at the Ministry of Economic Affairs and Communications of the Republic of Estonia.

She has two University degrees from Tartu University in Estonia.



Bernd Rech

Scientific Director, Helmholtz Zentrum Berlin, Germany



Bernd Rech is the Scientific Director of Helmholtz-Zentrum Berlin für Materialien und Energie (HZB) and professor in the Photovoltaics Department of the Faculty of Electrical Engineering and Computer Science at Technische Universität Berlin.

He was co-initiator of the Energy Materials in-situ Laboratory EMIL at the Berlin storage ring BESSY II. Together with Prof. Robert Schlögl (Fritz Haber Institute) he leads the joint project CatLab, which uses BESSY II specifically for applications in catalysis and green hydrogen technologies.

Previously, he headed the Silicon Photovoltaics Institute at HZB from 2006 to 2017. The focus of his research has been on the development of both high-efficiency and low-cost thin-film silicon solar cells and new material

combinations for tandem solar cells. From 2008 to 2020, he was the spokesperson for the Helmholtz Association's Renewable Energies program. Bernd Rech studied physics at Heidelberg University and RWTH Aachen and received his doctorate from RWTH Aachen.

Bernd Rech also serves on numerous committees, such as the supervisory board of the Institute for Solar Energy Research in Hameln and the board of trustees of the Baden-Württemberg Center for Solar Energy and Hydrogen Research. He is a member of the board of the Energy Working Group of the German Physical Society, and since 2017 he has been an elected member of the German Academy of Science and Engineering (acatech). In 2018, he received the Apple of Inspiration, an award of the President of Slovenia.



Georg Schütte

Secretary General, VolkswagenStiftung, Germany



Since 1 January 2020 Dr. Georg Schütte has been Secretary General of the Volkswagen Foundation. Prior to this, he served as State Secretary in the German Federal Ministry of Education and Research for ten years.

Dr. Schütte was born in Rheine, Germany, in 1962 and holds a doctoral degree in media and communication research from the Technical

University of Dortmund, Germany, as well as a Masters Degree of the City University of New York, USA. He conducted research at Harvard University and at the University of Siegen. Before he entered government service, Georg Schütte was Secretary General of the Alexander von Humboldt Foundation. He has worked in research and foundation management for more than 30 years.



Simone Schwanitz

Secretary General, Max Planck Society, Germany

Dr. Simone Schwanitz, born 1968, studied political science and economics at the universities of Marburg and Hamburg. She completed her doctorate in the field of research on Eastern Europe at the Free University of Berlin. For the last 20 years she held various positions in research and science management at federal and state level – last in Baden-Württemberg as Head of the Department

„Research, Technology Transfer, Digitalisation, European Union“ in the Ministry of Science, Research and the Arts of the State. She was member of the Board of Trustees of several Max Planck Institutes. Dr. Schwanitz has been Secretary General of the Max Planck Society since February 2022.



Martin Stratmann

President, Max Planck Society (MPG), Germany

Martin Stratmann was born in 1954 in Essen and grew up in Traben-Trarbach. He studied chemistry at Ruhr-Universität Bochum and completed his doctoral studies at the Max-Planck-Institut für Eisenforschung in Düsseldorf in 1982.

From 1994 to 1999, Stratmann took over the chair for Corrosion and Surface Engineering at the Friedrich-Alexander-Universität Erlangen-Nürnberg. In 2000, he returned to the MPI as Director of the Department of Interface

Chemistry and Surface Engineering. From 2006 to 2008, Stratmann took over the Chair of the Chemistry, Physics and Technology Section of the Max Planck Society, becoming Vice President in 2008.

In 2014, he assumed the office of President of the Max Planck Society.

The Senate re-elected him for a second term of office as President in June 2020. He received an honorary doctor of the University of Buenos Aires in March 2023.



Jean-Marie Tarascon

Professor, Solid-State Chemistry and Energy, Collège de France, France



Jean-Marie Tarascon is Professor at Collège de France, holding the permanent chair of Chemistry of Solids and Energy since 2013. A specialist in materials and electrochemical energy storage, Jean-Marie Tarascon began his career in the United States, first at Cornell University (1980), then at Bell Laboratory and Bellcore until 1994, where he discovered numerous materials with varied functionalities; he then developed the lithium-ion battery based on a new all-plastic system, which is currently on the market. In 1995, he was appointed professor at the University of Picardie-Jules Verne and became director of the Laboratory of Reactivity and Solid-State Chemistry until 2009. He created in 2003 the still existing European battery Research Institute (ALISTORE-ERI) and in 2011, he founded the French Network on Electrochemical Energy Storage.



Along his career, Jean-Marie Tarascon has cultivated research excellence, initiating important international networks devoted to electrochemistry and materials for renewable energy storage, as well as training a large number of students and researchers.

Member of the French Academy of sciences since 2004, Jean-Marie Tarascon received many prestigious prizes for his scientific contributions including the Centenary prize of the Royal Chemical Society in 2015, the CNRS innovation medal in 2017 and the Balzan prize for environmental challenges in 2020. In 2022, Jean-Marie Tarascon was awarded the CNRS gold medal for his pioneering research on understanding and discovering new lithium reactivity concepts, synthesizing new electrode materials and electrolytes for batteries, and developing new battery chemistries.

Klaus Tochtermann

Director, Leibniz Information Centre for Economics, Germany



Klaus Tochtermann studied computer science in Kiel, Dortmund (Germany) and at Texas A&M (USA). From 2004 to 2010 Klaus Tochtermann was full professor for knowledge management and knowledge technologies at the Graz University of Technology (Austria). Since 2010, Klaus Tochtermann has been Director of the ZBW - Leibniz Information Centre for Economics in Kiel and Hamburg and holds a professorship for Digital Information Infrastructures at Kiel University. The ZBW is the world's largest information infrastructure for scientific information in economics, both online and offline.

Klaus Tochtermann is involved in national and European committees and initiatives on the topic of Open Science and research data management. These include the GO FAIR initiative, which Germany launched together with the Netherlands and France to establish the FAIR principles for research data. Among others, he is also a member of the scientific senate of the National Research Data Infrastructure in Germany and a member of the Board of Directors of the European Open Science Cloud Association.



Klement Tockner

Director-General, Senckenberg Gesellschaft für Naturforschung, Germany

Klement Tockner is the Director General of the Senckenberg Gesellschaft für Naturforschung (www.senckenberg.de) and a Professor of Ecosystem Sciences at Goethe University, Frankfurt am Main (since 2021). He served as President of the Austrian Science Fund FWF (2016–2020), Professor of Aquatic Ecology at the Free University of Berlin (2007–2020), and Director of the Leibniz Institute for Freshwater Ecology and Inland Fisheries (IGB), Berlin (2007–2016). He received his PhD from the University of Vienna (1993) and a titular professorship at ETH Zurich (2005).

Klement Tockner is an internationally renowned freshwater scientist, particularly in the research fields of biodiversity, ecosystem science, and environmental management. He was editor-in-chief of the journal *Aquatic*

Sciences (2005–2014) and is a technical editor of the journal *Ecosystems*. He has published about 250 scientific papers, including more than 180 ISI articles. In 2009, he published a comprehensive book on European rivers (*Rivers of Europe*, Elsevier; 2nd edition in 2022).

Klement Tockner successfully led large inter- and transdisciplinary projects such as the “BioFresh” project funded by the European Commission. He is a member of several scientific committees and advisory boards, including the National Institute of Environmental Studies, Japan (NIES), and the Biology Centre, Czech Republic. He is an elected member of the Austrian Academy of Sciences, the German Academy of Sciences Leopoldina - National Academy of Sciences, and the Mainz Academy of Sciences and Literature.



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Luis Valdés Santurio

Director, Centro Oceanográfico de Santander, IEO-CSIC, Spain

Professor Dr. Luis Valdés Santurio is the current Director of the Centro Oceanográfico de Santander (Centro Nacional Instituto Español de Oceanografía-SCIC); before he was the Head of Ocean Sciences at the Intergovernmental Oceanographic Commission of UNESCO during seven years (from 2009-2015), and formerly (2000-2008) he was the Director of the Centro Oceanográfico de Gijón (IEO-CSIC). With almost 40 years of experience in marine research and field studies related with marine ecology and climate change, he established in 1990 the time series programme based on ocean sampling sites and marine

observatories which is maintained by Spain in the North Atlantic. He has a long experience in science management and has advised various governmental, intergovernmental and international organizations as well as research funding agencies. He also served as Spanish Delegate at the IOC-UNESCO and ICES (International Council for the Exploration of the Sea) where he chaired different Working Groups and Committees including the Oceanographic Committee. At the IOC he has launched and coordinated the Global Ocean Science Report „The current status of Ocean Science around the World“.



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Peter Wasserscheid

Director, Forschungszentrum Jülich GmbH, Germany



Peter Wasserscheid is head of the Institute of Chemical Reaction Engineering at the Friedrich-Alexander-University Erlangen-Nuremberg (FAU) and director of the Helmholtz Institute Erlangen-Nuremberg for Renewable Energy, a part of Forschungszentrum Jülich. Peter studied chemistry at the RWTH Aachen and finished his PhD in 1998. After a six-month industrial postdoc with BP Chemicals in Sunbury (UK) he returned to the RWTH Aachen where he completed his habilitation in 2002. In 2003, Peter took up his current position at the FAU, the director position for the Helmholtz Institute added in 2014 to his duties. Since 11/2021, Peter acts in addition as founding director of the new Institute for a Sustainable Hydrogen Economy (INW) at Forschungszentrum Jülich.



The key research interests of the Wasserscheid research group centre on catalyst material development and reaction engineering aspects of multiphase catalytic processes. Worldwide, the team belongs to the top research teams in developing chemical hydrogen storage using Liquid Organic Hydrogen Carrier (LOHC) systems. The group develops this technology for stationary and mobile applications. These efforts include catalyst and reactor developments, systems design and engineering as well as the development of larger scale demonstrators.

His research efforts have earned him a number of awards including the Leibniz Award of the German Science Foundation and two Advanced Investigator Grants of the European Research Council in 2010 and 2018.

Otmar D. Wiestler

President, Helmholtz Association (HGF), Germany



After completing his medical studies at the University of Freiburg, he obtained his Doctorate in Medicine in 1984 (summa cum laude). Between 1984 and 1987 he was a postdoctoral researcher at the Department of Pathology at the University of California, San Diego, USA. He then changed to the University Hospital Zurich in Switzerland, where he qualified as University Lecturer in Pathology. In 1992 the University of Bonn appointed him as Professor for Neuropathology and Director of the Institute for Neuropathology where he helped to establish a large neuroscientific research centre. Between January 2004 and August 2015 Professor Wiestler led, as Chairman of the Executive Board and Scientific Director, the German Cancer Research Center in Heidelberg (DKFZ), which is one of the leading institutions in cancer Research in the world. Since September 2015 he serves as the President of the Helmholtz Association in Berlin.

Otmar D. Wiestler has served on many scientific and professional boards, as Head of the German Brain Tumor Reference Center in Bonn, Chairman of the BONFOR research committee at the University of Bonn, President of the German Society of Neuropathology and Neuroanatomy, Head of the Review Board Theoretical Medicine of the Deutsche Forschungsgemeinschaft (DFG), and as CEO of the Life & Brain Neuroscience platform in Bonn.

Since 2001 he is an elected member of the German Life Science Academy LEOPOLDINA. In 2004, he received the German Federal Cross of Merit (Bundesverdienstkreuz). The honorary doctoral degrees (Dr. h. c.) were awarded to him in 2012 by the University of Tuebingen, in 2014 by the Ludwig-Maximilians-University of Munich, in 2016 by the University of Duisburg-Essen, in 2017 by the University of Wuerzburg and in 2021 by the Weizmann Institute of Science in Israel.

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Raquel Yotti

Secretary General, Research, Ministry of Science and Innovation, Spain

Raquel Yotti is the Secretary General for Research at the Spanish Ministry of Science and Innovation. Until her appointment, during the period 2018-2021, she has been Director General at the Spanish Institute of Health "Carlos III", the main public funding organization for biomedical research in Spain. She is a clinical cardiologist and her research

interest focuses on cardiac imaging inherited heart diseases. Among previous positions, she was the head of the Clinical Cardiology Department at the Gregorio Marañón General University Hospital, and associated professor of the Department of Bioengineering at the Carlos III University of Madrid.

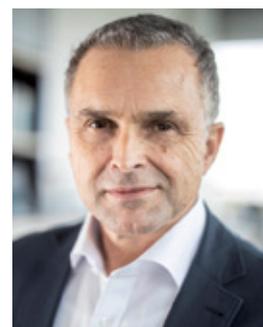


Anton Zensus

Director, Max Planck Institute for Radio Astronomy, Germany

Anton Zensus is Director of the Max Planck Institute for Radio Astronomy in Bonn and Professor at the University of Cologne. His research focus as an astrophysicist is on the active central regions of galaxies in the Universe, which he investigates with unprecedented angular resolution. This requires combining radio telescopes and other infrastructures around the World. The pioneering technical developments of Anton Zensus' group have paved the way for the international Event Horizon Telescope

(EHT) collaboration, of which he served as its founding Chair of the Board. This EHT collaboration, in 2019, presented the first image of a Black Hole, in the Galaxy Messier 87. Prof. Zensus has led several EC Infrastructure Projects (RADIONET) and helped found the JIV-ERIC in the Netherlands. He currently holds an Advanced Grant of the European Research Council and he is the scientific coordinator of the infrastructure pilot program ORP in Horizon Europe. He also serves as a member of the G6 Task Force on Research Infrastructures.



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