

The European Research Council (ERC)
at the Annual meeting of the World Economic Forum

21 - 24 January 2020 - Davos, Switzerland

PROGRAMME & SPEAKERS

The ERC will participate in 8 sessions (some open to the press) and one press conference, represented by the new ERC President and 7 ERC-funded top scientists:

- ❖ **Prof. Mauro Ferrari**, President of the European Research Council
- ❖ **Prof. Conny Aerts**, Professor of Astrophysics, KU Leuven
- ❖ **Prof. Flemming Besenbacher**, Aarhus University; Chairman of the Supervisory Board, Carlsberg A/S
- ❖ **Prof. Ewine van Dishoek**, Professor at University of Leiden
- ❖ **Prof. Johan Rockström**, Director, Potsdam Institute for Climate Impact Research
- ❖ **Prof. Prof. Molly Stevens**, Professor of Biomedical Materials & Regenerative Medicine; Research Director at Imperial College
- ❖ **Prof. Emma Teeling**, Founding Director of the Centre for Irish Bat Research at University College Dublin
- ❖ **Prof. Martin Vetterli**, President, Swiss Federal Institute of Technology of Lausanne

As the programme may still change, please also consult the WEF official [programme](#).

ERC speakers are available for interviews

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Tuesday 21 January

09.00 – 10.15

ERC Ideas Lab Session

“The destiny of our solar system with the European Research Council”

The Lab

ERC Speakers: **Conny Aerts, Ewine van Dishoeck**

Moderator: **Brian Schmidt, Nobel Laureate**

From the life and death of the Sun to the origins of all water on Earth, international scientific collaborations are bringing space closer to humankind. Explore the forces that shape the evolution and destiny of our solar system and the universe. This session was designed in collaboration with the ERC.

Presentation available on demand on the Forum YouTube channel and TopLink after the meeting.

13.30 – 14.00

Ask About: Astrochemistry

Dome D, Ice Village

ERC Speaker: **Ewine van Dishoeck**

Humans and everything else in the universe share a common cosmological origin. Join this session to learn how cosmic ingredients intermix to form structure in the universe, ultimately revealing the origin of all stars, planets and life itself.

The Ice Village is a short walk from the Congress Centre; take the Promenade exit.

16.00 – 16.30

Ask About: the Life and Death of Stars

Dome D, Ice Village

ERC Speaker: **Conny Aerts**

The interior of stars is among the most difficult parts of the universe to study but "starquakes" offer a way to see inside. Come to this session to explore how asteroseismology is shaking up our understanding of stellar evolution.

The Ice Village is a short walk from the Congress Centre; take the Promenade exit.

Wednesday 22 January

9.00 – 9.30

PRESS CONFERENCE

Europe – leading the response to the climate emergency

Press Conference Room, Media Village

Speakers:

- **Mariya Gabriel**, European Commissioner for Innovation, Research, Culture, Education & Youth
- **Mauro Ferrari**, ERC President
- **Johan Rockström**, ERC grantee; climate change scientist

A climate crisis is unfolding before our eyes. Disruptive action is needed in the 2020s to drive the fastest economic transformation in history. The new European Commission has kick-started its mandate by putting climate at the top of the agenda, taking decisive action e.g. through its Green Deal and striving to be the first climate-neutral continent. This is the first continent-wide strategy to transform economies on the scale required by the crisis. With the right policies, this transformation has the potential to spur jobs and investment, create new markets and drive innovation. However, this change will require a colossal shift in financial flows and greater investment in pioneering science and innovation. This press briefing is about how it will be achieved.

[Livestreamed session](#)

09.15 – 09.45

Bats and the Secret of Everlasting Youth

Hub B

ERC speaker: **Emma Teeling**

Delaying the effects of ageing by two years could save the US economy alone \$7 trillion over 50 years. Join this session to discover the unlikely ways in which studying bats could reveal the secrets to longer, healthier lives.

Located on Level -1 of the Congress Centre Please arrive early; seating limited.

10.00 – 10.30

Ask About: Biosensors

Dome D, Ice Village

ERC Speaker: **Molly Stevens**

From cancer-diagnosing urine tests to smartphone Ebola surveillance, biosensors are changing the way we diagnose disease. Join this session to learn how cutting-edge research and mobile health are democratizing healthcare.

The Ice Village is a short walk from the Congress Centre; take the Promenade exit.

16.00 – 16.30

Biosensors and the Future of Diagnostics

Spotlight, Congress Centre

ERC Speaker: **Molly Stevens**

From cancer-diagnosing urine tests to smartphone Ebola surveillance, biotechnology is improving patient access to treatment and advice worldwide. Join leading biomaterials expert Molly Stevens to discover how cutting-edge research and mobile health are democratizing healthcare. This session was designed in collaboration with Imperial College London.

[Livestreamed session](#)

17.15 – 18.00

Feeding the Planet for the Future

Situation Room, Congress Centre

ERC Speaker: **Johan Rockström**

The global food system will need to meet an expected 35% rise in demand by 2030. What steps are needed to create food systems that nourish both people and the planet in the face of climate change? On the Forum Agenda: - Developing a shared agenda for the 2021 Food Summit - Unlocking investment and finance for food system innovation at scale - Transitioning from quantity of calories to the quality of diet Access the Platforms for Shaping the Future of Global Public Goods, Shaping the Future of Health and Healthcare, and Shaping the Future of Consumption via TopLink.

[Livestreamed session](#)

17.30 – 18.15

Global Science Outlook

Aspen 2, Congress Centre

ERC Speaker: **Mauro Ferrari**

with Magdalena Skipper and Stefan Oschmann

From the identity of dark matter to the source of consciousness, solving the world's biggest science challenges requires collaboration across borders. In the wake of rising nationalism, how can scientific collaboration continue to thrive?

[Livestreamed session](#)

ERC SPEAKERS' BIOGRAPHIES



Mauro Ferrari

President of the European Research Council

Professor Mauro Ferrari took office as ERC President on 1 January 2020.

Trained in mathematics, engineering, and medicine, he served in faculty positions and executive leadership roles in these fields at the University of Udine, the University of California, Berkeley, the Ohio State University, the National Cancer Institute of the United States, the University of Texas Medical School and M.D. Anderson Cancer Center, the Houston Methodist Hospital, and the University of St Thomas. Throughout his career, Mauro Ferrari has always maintained very tight and productive collaborations with many European institutions. Originally from Italy, Mauro Ferrari is credited as one of the pioneering founders of nanomedicine, has published extensively, and has received numerous international awards and academic recognitions worldwide.

Ferrari is credited as **one of the founders of nanomedicine**. In 2016, his research team made headlines with a new cancer treatment that uses nanoparticles loaded with a chemotherapeutic to target metastatic cells directly, thereby minimising collateral damage to healthy tissue and allowing more sustained and aggressive treatment.

Ferrari has around 480 publications to his name, with over 20,000 citations. He also holds dozens of patents for inventions including different varieties of nanoparticles for drug delivery.

Originally from northern Italy, Ferrari studied mathematics at the University of Padua before moving to University of California, Berkeley, where he studied for a masters and a PhD in mechanical engineering. He went on to become an associate professor at Berkeley and moved into medicine when he became a professor of bioengineering and mechanical engineering at Ohio State University. Ferrari later moved to the MD Anderson Center and the University of Texas Health Science Center in Houston. In 2010 he became president and CEO of the Houston Methodist Research Institute.



Conny Aerts

Professor of Astrophysics, KU Leuven (BE); Chair in Asteroseismology, Radboud University Nijmegen (NL); External Scientific Member of the Max Planck Society (DE)

ERC Advanced Grant

Conny Aerts' research covers stellar **astrophysics**, including stellar structure & evolution and variable stars. She is a pioneer of **asteroseismology**, which received a major boost thanks to the CoRoT (2006), Kepler (2009), and TESS (2018) space missions. Prior to high-precision space photometry, Aerts developed rigorous mathematical methods to detect and identify non-radial stellar oscillations. Her team designed and applied statistical classification methods in a machine-learning context, and discovered numerous gravity-mode pulsators in space photometry. As Chair in Asteroseismology at the Radboud University Nijmegen, Aerts introduced herself into the topic of subdwarf stars, their binarity and pulsations.

In 2008, Aerts was awarded an ERC Advanced Grant for project PROSPERITY to evaluate stellar models from CoRoT and Kepler space asteroseismology. Her PhD students made major contributions, such as the discovery of non-radial pulsation modes, of dipole mixed modes, and of non-rigid rotation in red giants, following her earlier detections of core overshooting and core rotation in massive stars. This culminated in the 2012 Francqui Prize, also termed Belgian Nobel Prize, where Aerts was the first woman to receive this prestigious award, option Science & Technology, since its creation in 1933. The ERC offered her a 2nd Advanced Grant to bridge stellar physics and 3D hydrodynamics to remedy shortcomings in stellar evolution theory.

Aerts graduated as mathematician from Antwerp University in 1988 and defended her PhD thesis in astrophysics at KU Leuven in 1993. Competitive personal grants allowed her to continue her career as postdoctoral fellow of the Research Foundation Flanders from 1993 until 2001, performing numerous stays in Europe, Chile and the USA. She was appointed as Lecturer (2001), Associate Professor (2004), and Full professor (2007) at KU Leuven. She also leads the Chair in Asteroseismology at the Radboud University Nijmegen (NL, 2004+) and is External Scientific Member of the Max Planck Society (Heidelberg, 2019+). Aerts is member of numerous international committees and boards. As Belgian Principal Investigator, she is heavily involved in the ESA M3 space mission PLATO (launch 2026).



Flemming Besenbacher

**Chairman of the Supervisory Board, Carlsberg A/S,
Aarhus University (DK)**

ERC Advanced Grant

Flemming Besenbacher is a professor of nanoscience at Aarhus University, and he was the founding director of the Interdisciplinary Nanoscience Center (iNANO) from 2002-2012. Prof. Besenbacher is a chairman of the Carlsberg Group, the Carlsberg Foundation, and Aarhus Water A/S. Prof. Besenbacher is also deputy chairman of Innovation Fund Denmark and board member of Unisense A/S. In 2016, Prof. Besenbacher was appointed both chairman of the Danish government's Advisory Board for Circular Economy, member of the Danish government's Digital Growth Panel, and member of the Danish Ministry of Taxation's advisory panel for succession planning in commercial foundations. In 2019, he was also appointed chairman of the Danish Think Tank on Food Loss and Food Waste. Prof. Besenbacher sits on several advisory boards related to the UN Sustainable Development Goals and he is chairman of the non-profit organisation UNLEASH.

Prof. Besenbacher is an international leading scientist within the field of nanoscience, and he has published more than 700 scientific articles in international journals such as Science and nature. He is one of the most cited Danish scientists with more than 37,000 citations and an H-factor of 100. Furthermore, Prof. Besenbacher is honorary doctor at 17 Chinese universities, and he has received several distinctions in Denmark and abroad for his research, for instance "The Chinese Government Highest International Scientific and Technological Cooperation Award" of the People's Republic of China.

He is foreign member of the Chinese Academy of Sciences (Academician) and holds the title of Commander of the Order of Dannebrog.



Ewine van Dishoeck

Professor, University of Leiden (NL)

ERC Advanced Grant

Ewine van Dishoeck conducts research into tenuous, ice-cold clouds of gas and dust that are found between the stars like the Orion Nebula, of which the Hubble telescope has made such breath-taking images. To do so, she helped develop the most powerful telescopes in the world. Her work innovatively unites the world of physics and astronomy with that of chemistry. These clouds contain all sorts of molecules that are interesting in themselves: due to the unusual conditions in space, molecules are found that are not present on earth, or only very rarely. But another fascinating thing also occurs in many of these clouds: new stars and planets are born. Van Dishoeck looks at the formation process of these celestial bodies, and studies which molecules in these clouds will end up on one of these new planets, including those that are building blocks for life elsewhere in the universe: water and complex organic molecules.

Prof. van Dishoeck has been awarded many prizes and honours, including the Kavli Prize for Astrophysics in 2018, the highest scientific award in this field worldwide. She also received the Spinoza Prize in 2000, which the highest academic award in the Netherlands. Prof. van Dishoeck is also known for her work on the development of different telescopes. These are always large international collaboration projects in which Prof. van Dishoeck assumes the role of developing the science case and setting specifications as well as bringing together people, resources and organisations. Prof. van Dishoeck obtained an ERC grant in 2012 to create an integrated observational-modelling-laboratory program to survey protostars and disks on the relevant scales of 1-50 AU where planet formation takes place using the newly built Atacama Large Millimeter Array (ALMA) in Chile. As of 2018, Prof. van Dishoeck serves as the president of the International Astronomical Union (IAU), the worldwide organization of professional astronomers with 13500 members from more than 100 countries.

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Johan Rockström

Director, Potsdam Institute for Climate Impact Research,
Professor in Earth System Science at the University of
Potsdam (DE)

ERC Advanced Grant

Johan Rockström's research focuses on **global sustainability, the concept of the Planetary Boundaries and Earth resilience**. His work on global sustainability issues has gained him international recognition and, in 2009, he led an international team of academics, who advanced the planetary boundaries framework for sustainable development in the Anthropocene. He is one of the leading scientists behind the Global Carbon Law and the Hothouse Earth research, and a principle of the **Global Commons Initiative**.

After completing a PhD at Stockholm University's Systems Ecology Department in 1997, Rockström spent nearly two decades working on applied water research in tropical regions. From 2004 to 2012 he was Executive Director of the Stockholm Environment Institute, and up until 2018 he was the founding Director of the Stockholm Resilience Centre. He chairs the Earth Commission, the EAT-Initiative on healthy and sustainable food, the Earth League, and is co-chair of the advisory board of Future Earth. He is the Editor-in-Chief of Global Sustainability.

He also acts as an advisor to several governments and business networks and meetings, including the United Nations General Assemblies, the World Economic Forum, and the UN Framework Convention on Climate Change Conferences.

He has published over 150 research articles, including papers in Science and Nature, as well as 20 book chapters and four books. In recognition for his work communicating climate science to decision-makers, in 2009, Focus magazine named him Swede of the year. For his scientific contributions towards the Paris Climate Agreement he was given the French distinction as Knight of the Legion of Honour. He is the 2017 Hillary Laureate, and recipient of the Cosmos Prize and the German Environment Prize.

Johan Rockström is, together with Ottmar Edenhofer, Director of the Potsdam Institute for Climate Impact Research and holds an ERC Advanced Grant based at the Stockholm Resilient Centre, Stockholm University.



Molly Stevens

Professor of Biomedical Materials & Regenerative Medicine and Research Director for Biomedical Material Sciences, Institute of Biomedical Engineering at Imperial College (UK)

ERC Starting Grant & Consolidator Grant

Molly Stevens is currently Professor of **Biomedical Materials and Regenerative Medicine** and the Research Director for Biomedical Material Sciences in the Institute of Biomedical Engineering at Imperial College. She joined Imperial in 2004 after a Postdoctoral training in the laboratory of Professor Robert Langer in the Chemical Engineering Department at the Massachusetts Institute of Technology (MIT). Prior to this she was awarded a PhD in biophysical investigations of specific biomolecular interactions and single biomolecule mechanics from the Laboratory of Biophysics and Surface Analysis at the University of Nottingham (2000).

In 2010 Prof. Stevens was recognised by The Times as one of the top ten scientists under the age of 40 and also received the Polymer International-IUPAC award for creativity in polymer science, the Rosenhain medal and the Norman Heatley Prize for Interdisciplinary research from the Royal Society of Chemistry. In 2009 she was awarded the Jean Leray Award from the European Society for Biomaterials, in 2007 the prestigious Conference Science Medal from the Royal Pharmaceutical Society and in 2005 the Philip Leverhulme Prize for Engineering. She has also recently been recognised by the TR100, a compilation of the top innovators, under the age of 35, who are transforming technology - and the world with their work. Her previous awards include the Ronald Belcher Memorial Lecture Award from the Royal Society of Chemistry (2000) and both the Janssen Prize and the UpJohn Prize for academic excellence and research. In 2012 Prof. Stevens presented the Royal Society Clifford Patterson Lecture and in 2013 she was elected Fellow of the Royal Academy of Engineering.

Prof. Stevens runs a research group at Imperial College London. Research in **regenerative medicine** within the group includes the directed differentiation of stem cells, the design of novel bioactive scaffolds and new approaches towards tissue regeneration. They have developed novel approaches to tissue engineering that are likely to prove very powerful in the engineering of large quantities of human mature bone for autologous transplantation as well as other vital organs such as liver and pancreas, which have proven elusive with other approaches. This has led to moves to commercialise the technology (Prof. Stevens is the co-founder of spin-out companies) and set-up a clinical trial for bone regeneration in humans. She has been awarded both an ERC Starting and Consolidator Grant for her work in the biomedical sphere.



Emma Teeling

Founding Director, Centre for Irish Bat Research at University College Dublin and the Laboratory of Molecular Evolution and Mammalian Phylogenetics (IE)

ERC Starting Grant

For the past 20 years Emma Teeling has investigated the **evolutionary relationships among mammals** both at the nucleotide and genomic level. Mammals are one of the most diverse groups of vertebrates, with large differences in body size, life span, ecological adaptation, metabolic rate, behaviour, reproduction and locomotion. She examines this variation using comparative genomics to understand the molecular mechanisms underlying morphological and physiological adaptation and to help innovate and explain our own genome. Furthermore, she uses evolutionary analyses of whole genomes and targeted genes sequenced in divergent species, particularly bats, to uncover the molecular basis of extended longevity, extraordinary immunity and mammalian flight. Finally, she investigates how species and populations transform in response to recent environmental changes and use genetic data to inform conservation management plans.

Prof. Teeling established the Laboratory of Molecular Evolution and Mammalian Phylogenetics in 2005, is the Founding Director of the Centre for Irish Bat Research and is the Head of Zoology, at University College Dublin, Ireland. She is a Founding Director of Bat1K, a global consortium of individuals united to sequence the genome of every living bat species to chromosome level assembly, to uncover the molecular basis of bats' adaptations (e.g., extended health span and disease tolerance).

In 2006 she won a Science Foundation Ireland, President of Ireland Young Researcher Award. In 2013 Prof. Teeling obtained an ERC Starting Grant for her project AGELESS, which she uncovered the molecular mechanisms of halted ageing in a unique model system, the bats. She currently holds an Irish Research Council Laureate Award, AGEIMMUNE to further establish the molecular basis of extended health span in bats. Her integrative research in the fields of zoology, phylogenetics, genomics and conservation biology uncovers the genetic signatures of survival that enables species to adapt to an ever-changing environment. She successfully leads a prolific, internationally renowned research team of typically 10 people and has secured over 5.2M in research funding. She is listed in top 100 female Irish scientists (2014); has given a Ted Talk with >535,280 views; is a member of Royal Irish Academy since 2016 and has been awarded Chevalier des Palmes Académiques, 2017 by the French Government for her research.



Martin Vetterli

President, Ecole Polytechnique Fédérale de Lausanne (CH)

ERC Advanced Grant

Martin Vetterli works in the areas of **electrical engineering, computer sciences and applied mathematics**. Supported by the ERC, he developed a theory and framework for signal processing and communications with wide ranging applications. He showed that we can “hear” the shape of a room, using a microphone and algorithms that make sense of echoes. This could have applications for indoor location devices or assistive devices for both the visually and hearing impaired people.

Prof. Vetterli received a *Diplome d'Ingénieur* from *Eidgenössische Technische Hochschule* (ETHZ) in 1981, a Master of Science from Stanford University in 1982, and a Doctorate in Sciences from the Ecole Polytechnique Fédérale de Lausanne (EPFL) in 1986. After his dissertation, he was an Assistant and Associate Professor in Electrical Engineering at Columbia University in New York, and in 1993, he became an Associate and then Full Professor at the Department of Electrical Engineering and Computer Sciences at the University of California at Berkeley. In 1995, he joined the EPFL as a Full Professor. He held several positions at EPFL, including Chair of Communication Systems and founding director of the National Competence Center in Research on Mobile Information and Communication systems (NCCR-MICS). From 2004 to 2011, he was Vice President of EPFL for international affairs, and from 2011 to 2012, he was the Dean of the School of Computer and Communications Sciences. From 2013 to 2016 he was President of the National Research Council of the Swiss National Science Foundation. He is the current president of *École Polytechnique Fédérale de Lausanne* (EPFL) in Switzerland."

His work won him numerous prizes, like best paper awards from EURASIP in 1984 and of the IEEE Signal Processing Society in 1991, 1996 and 2006, the Swiss National Latsis Prize in 1996, the SPIE Presidential award in 1999, the IEEE Signal Processing Technical Achievement Award in 2001 and the IEEE Signal Processing Society Award in 2010. He is a Fellow of IEEE, ACM and EURASIP, was a member of the Swiss Council on Science and Technology (2000-2004), and is an ISI highly cited researcher in engineering.

INTERVIEW OPPORTUNITY

Members of the ERC delegation are available for interviews.

For scheduling, please contact:

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PRESS CONFERENCE

Europe – leading the response to the climate emergency

Wednesday 22 January

9.00 – 9.30

Press Conference Room, Media Village

with

Mariya GABRIEL, European Commissioner

Mauro FERRARI, ERC President

Johan ROCKSTRÖM, ERC grantee

[Live-steamed](#)

Background

The European Research Council, set up by the EU in 2007, funds the very best, creative scientists and their boldest ideas. The ERC helps to make Europe more competitive and more attractive to scientific talent from anywhere in the world. To date, over 9,500 top researchers, both young and more senior, have been backed via ERC grants. ERC-funded research has led to over 70% breakthroughs/major scientific advances, according to a recent independent study. It has also been shown that, since the ERC's launch, Europe upped its game in terms of highest impact research.

The ERC is led by an independent governing body, the Scientific Council, chaired by ERC President Mauro Ferrari, who took office on 1 January 2020. The overall ERC budget from 2014 to 2020 is over €13 billion, as part of the EU's Horizon 2020 programme, for which European Commissioner for Innovation, Research, Culture, Education and Youth [Mariya Gabriel](#) is responsible.

Follow the ERC at the Davos summit on [Twitter](#) (@ERC_research)