

IMPERIAL

Grantham Institute



Climate change and the environment

Research
Policy
Education
Innovation
Communication

The Grantham Institute is Imperial College London's hub for climate change and the environment.

Established in 2007 under the directorship of our current chair, Professor Sir Brian Hopkins, we bring together world-leading research, education and innovation to drive effective action on the climate and nature crises. From supporting academics to develop pioneering research, to nurturing early-stage climate tech startups; from informing policy at the highest level, to training the next generation of environmental leaders, we are dedicated to shaping a cleaner, greener, more resilient future.

We work across five pillars: Research, Policy, Education, Innovation and Communications. In this brochure, you'll discover more about our work, the people behind it and the impact we're making. To explore further please visit our website, where you can sign up to our newsletter to stay up-to-date with our latest news, events and opportunities: imperial.ac.uk/grantham.

Ralf Toumi

Professor of Atmospheric Physics,
Director of the Grantham Institute



Cover image: Dr Gary Konstantinoudis, Dr Clair Barnes, Dr Emily Theokritoff and Professor Joeri Rogelj © Dave Guttridge

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The Grantham Institute leadership team: Alyssa Gilbert, Anne Houston, Professor Joeri Rogelj, Professor Ralf Toumi, Dr Caterina Brandmayr and Dr Laila Read © Dave Guttridge

Research

We initiate, develop and support world-class, multidisciplinary research on climate and the environment. Through fellowships, lectureships and tailored support, we nurture diverse talent and help exceptional researchers become leaders in their field.

Right: Roseline O'Kelly, Research Postgraduate at the Grantham Institute, researches how pesticides and climate change impact freshwater ecosystems at Silwood Park's mesocosms facility © Thomas Angus





Dr Gbemi Oluleye joined the Grantham Institute as an Assistant Professor in 2023 and was promoted to Associate Professor in Sustainable Market Mechanisms in 2025. Using data-driven computational models, Dr Oluleye develops tools to evaluate and design market-based mechanisms that can accelerate the adoption and commercialisation of clean innovations. Her work offers rigorous, real-world mechanisms and pathways to making clean technologies more viable.

“The Grantham Institute has a genuinely inspiring interdisciplinary environment, which was a huge support to my professional journey. It provided the intellectual freedom, collaborative networks and opportunities I needed to transform my research into a convergent programme with real-world impact.”

Dr Gbemi Oluleye

Above: Gbemi (right) with students Jingyi Chen and Harry Hartowo © Nadia Lavelle Photography

Dr Bonnie Waring joined the Grantham Institute as a lecturer from 2020 to 2024, then becoming an Associate Professor in Ecosystems Ecology at Imperial's Department of Life Sciences. She leads the Waring Ecology Lab, which investigates how the ecology of plant and soil microbial communities influences the carbon cycle and its feedback on climate change.

“For me, the Grantham Institute was instrumental in establishing better links with policymakers, giving me support to communicate my research findings with representatives from Government and Parliament. This engagement was hugely valuable to me and my lab, helping determine our research priorities and how our work could inform future climate mitigation strategies.”

Dr Bonnie Waring



Find out more about our research activities: imperial.ac.uk/grantham/research

Left: Bonnie leading undergraduate fieldwork at Silwood Park Campus © Thomas Angus

Driving progress on the Paris Agreement

Through high-impact publications and major contributions to global assessments, the Grantham Institute plays a leading role in advancing scientific, legal and policy understanding of how the world can meet the goals of the Paris Agreement and deliver a safe climate future.

- Imperial researchers rigorously assessed countries' net-zero targets, revealing a substantial credibility gap between stated ambitions and policy implementation. By examining real-world action rather than promises, the analysis showed current policies miss global climate targets by a large margin. [Published in *Science*]



Above: Professor Joeri Rogelj, Director of Research, at Countdown to COP30
© Leo Cinicolo

- Limiting global warming to 1.5°C was shown to remain a legal and ethical imperative under the Paris Agreement, even as global warming rapidly approaches this threshold. The findings reinforce the urgent need to accelerate near-term emission reductions and scale-up effective adaptation to ensure a safe and liveable climate for present and future generations. [Published in *Science*]
- Researchers also established an evidence-based framework to evaluate whether national climate pledges, known as Nationally Determined Contributions (NDCs), meet the Paris Agreement's requirement for "highest possible ambition". By strengthening both the design and assessment of NDCs, the approach provides a clear foundation for accountability when government action falls short. [Published in *Environmental Research Letters*]



- Through leading contributions to the annual UNEP Emissions Gap Reports, Imperial helps define the world's most authoritative assessment of progress towards limiting warming well below 2°C and pursuing 1.5°C in line with the Paris Agreement. Specifically, Grantham Institute researchers assess how today's pledges and policies translate in tomorrow's climate outcomes, informing action and accountability worldwide.

Above right: Professor Fredi Otto and Dr Noah Walker-Crawford © Dave Guttridge

Below: Dr Clair Barnes and Dr Emily Theokritoff © Dave Guttridge



Policy

We engage policymakers and relevant stakeholders with the best available evidence on climate science and solutions, and equip the academic community with a better understanding of the emerging questions faced by decision-makers and practitioners.

Right: As part of our Countdown to COP event series, Dr Caterina Brandmayr, Director of Policy, chairs a discussion about how to strengthen climate action amid heightened geopolitical tensions © Leo Cinicolo



Responsive to the needs of policymakers and the wider policy community, the Grantham Institute not only mobilises academic expertise to contribute to government consultations and calls for evidence, but also engages closely with policy stakeholders and produces tailored outputs to support informed decision-making. Our background briefings distil the latest policy-relevant scientific evidence on climate change, its solutions, and associated co-benefits of climate action. Our closed-door roundtable discussions and public-facing events provide a forum to explore and spotlight emerging challenges and opportunities for climate action. Topics covered range from *Delivering for climate and health* and *Growth in a changing climate*, to *The energy transition in low- and middle-income countries* and *Priorities for the UN climate negotiations*. All publications and public events are available to explore online: imperial.ac.uk/grantham/policy.

We also convene networks and dialogues that foster cross-disciplinary collaboration and promote policy awareness across the academic community. Alongside Imperial networks focused on specific topics – such as *Climate adaptation* and *The health benefits of climate action* – we co-ordinate the UK Universities Climate Network (UUCN), which brings together academics from more than 90 UK institutions to amplify research impact and strengthen collective engagement towards ambitious climate action.

Below: Members of the policy team:
Nicole Kuchapski and Dr Caterina Brandmayr
© Dave Guttridge



Former Prime Minister Theresa May visited Imperial in 2019 to announce that the UK would be the first major economy to enshrine in law a commitment to net zero emissions by 2050. She returned in 2025 to film a Grantham Institute documentary about the UK's pioneering climate target, and why taking ambitious climate action is critical for the future of the planet.

“I thought it was important to make this announcement at Imperial, which is a centre of research and scientific innovation, because it is innovation and research that will take us forward and enable us to do what we need to do to maintain the future of our planet.”

Baroness Theresa May

Climate action: Delivering a cleaner, healthier, fairer future

Action to tackle climate change can deliver immediate benefits for our health, economy and communities.

- Cleaner air reduces respiratory and heart disease;
- well-insulated homes cut cold-related illnesses and lower energy bills;
- shifting to active travel and low-carbon lifestyles improves wellbeing and reduces pressure on the NHS;
- investment in green infrastructure creates jobs, stimulates innovation and boosts energy security.

The Grantham Institute has gathered, analysed and shared robust evidence showing how these 'co-benefits' can offer immediate benefits for people today. We have convened a network of researchers with expertise in this field and engage with councils around the country to highlight how co-benefits make climate policy not just an environmental priority, but a practical solution to everyday local challenges, such as rising living costs, inequality and poor health.

We have run engagement activities and training sessions with civil servants, council leaders, council officers, community groups and members of the public. We have also carried out research into how the public perceive these co-benefits, and how decision-making can be improved in order to maximise these co-benefits.

“Climate action provides an opportunity to tackle day-to-day issues that people are worried about, such as breathing unclean air or living in a cold home. Our work has raised the profile of these co-benefits, provided decision-makers with advice on how to make these benefits a reality, and how to communicate them with local citizens.”

Dr Neil Jennings, who leads the Grantham Institute's policy engagement work on co-benefits



Education and training

We are committed to developing the next generation of environmental leaders. We run a suite of educational programmes and specialist training that covers the science behind climate and environmental change, the challenges they pose and the solutions they demand.

Right: Ulah Hasan, Dr Reshma Rao, Dr Oisin Shaw and Janarthanan Venkatachalam work in the lab as part of the MSc Cleantech Innovation © Dave Guttridge



Our programmes span from undergraduate modules to postgraduate taught programmes and postgraduate research, through to specialist training and professional development courses. We work with colleagues across Imperial to educate and upskill students in fundamental climate science, as well as focused areas including green finance and management, cleantech innovation and sustainable energy. Our core postgraduate taught programmes include the *MSc Climate Change Management and Finance*, *MSc Cleantech Innovation* and *MSc Sustainable Energy Futures*, while undergraduates can access our I-Explore module *Climate Change: Science and Solutions*.

We host an interdisciplinary learning community that covers science, engineering, policy and business. This enables our students to network and learn from each other, deepen their awareness of the multifaceted approach needed to tackle climate change, and

unlock new collaborations. Our students also benefit from the institute's expertise in communicating climate science, and are given support to run outreach activities at major public events like the Great Exhibition Road Festival, or to create their own impactful initiatives.

Whether you're a student, researcher or professional, our programmes offer the knowledge and skills needed to tackle climate and environmental challenges. Find out more and explore opportunities on our website: imperial.ac.uk/grantham/education

Below: Members of the education team: Christiane Morgan, Alex Gibbs, Gavin Eves, Anne Houston and Muna Ali © Dave Guttridge



Clea Kolster, an expert in energy systems and industrial decarbonisation, advises startups on commercial strategy and strategic financing. Since completing her PhD in Chemical Engineering in 2018, she has led technical studies at E3 that informed landmark decarbonisation policies in California, New York, and Washington, and has spent five years leading the technical investment strategy at Lowercarbon Capital, a \$2 billion venture capital fund.

“Choosing the Grantham Institute for my PhD was one of the most impactful decisions of my career. The institute provided the platform to attend COP21 in Paris, where I engaged with country delegations and corporate leaders to build a network that still resonates today. It also supported a research visit to Stanford University, which catalysed my long-term move to Silicon Valley. I remain deeply grateful for the inspiring leadership there.”

Clea Kolster



© Dave Guttridge

Janarthanan Venkatachalam is Co-founder and Chief Executive of Kinowave, and joined the MSc Cleantech Innovation on the Chevening Scholarship in 2025. Kinowave is a startup working on a free-floating wave energy system that also protects against coastal erosion. The company was named the UK winner of the 2025 James Dyson Awards.

“This course is very unique. It aligns all the different stages of developing a successful startup: how to get a problem statement for your startup, to convert the idea to a product, to pitch it and to scale it up. It also connects you with a global network of leaders in the cleantech space. It is practical and inspiring, and I’m excited for the journey ahead!”

Janarthanan Venkatachalam

Online course: Introduction to Climate Change

Climate change affects everyone – shaping our environment, economies, health, and future. Its consequences cut across disciplines, backgrounds, and career paths. Recognising this shared challenge, the Grantham Institute, in partnership with the Centre for Environmental Policy, Physics and the Interdisciplinary EdTech Lab, developed a free, flexible, online course open to all Imperial students and staff, regardless of their field of study or role.

Introduction to Climate Change helps learners understand why climate change is happening, how it impacts society, nature and broader sustainability challenges, what mitigation and adaptation options exist, and the reliability of climate change information. Developed by a team of leading climate scientists and experts, it incorporates a mix of recorded materials, readings, expert interviews, and interactive e-tivities.

“Each of us can contribute to addressing the climate crisis, be it by reducing our carbon footprint or by helping make society more resilient to climate impacts. This programme has been designed to support the beginning of that journey,” says Anne Houston, Director of Training at the Grantham Institute. “It gives learners the knowledge base they need to make informed, climate-conscious decisions in their personal life, academic work and future career”.



© Ross Wilson



© 10:10 / CC BY 2.0



Fieldwork in a Changing Landscape

Rhys Preston-Allen, Research Postgraduate at the Grantham Institute, surveys a tropical forest restoration plantation near Uruará, Pará, in the Brazilian Amazon. His research examines how ecological communities recover over time following restoration, and identifies the mechanisms that shape these pathways.

“Fieldwork often involves hours of trekking across challenging terrain in intense heat and humidity to deploy equipment that quietly records who is returning,” says Rhys. “When sensitive, forest-specialist species begin to use these landscapes, it can signal recovery – but we desperately need to understand how whole communities and ecosystems change over time, so we can help steer degraded areas toward resilient, biodiverse systems long into the future.”

Innovation

Undaunted is on a mission to nurture a thriving climate innovation ecosystem, enabling diverse innovators to deliver significant emissions reductions and climate resilience sustainably and at scale.

Undaunted 



A partnership between Imperial's Grantham Institute and the Royal Institution, Undaunted embraces high-quality deeptech solutions and tackles harder-to-change sectors, keeping climate and public good at the core.

Our programmes are designed to build a well-supported pipeline of talented innovators by creating new routes into green entrepreneurship, helping them to scale and commercialise. We also draw together a strategic network of climate innovation supporters across Imperial, London, the UK and beyond, via our alumni, EarthScale and Global Network activities.

Whether you're a founder, funder, investor, policymaker, student or other climate innovation supporter, find your place in the ecosystem: undaunted-hq.org

Across all industries, the survival rate of new startups is **10 per cent**. For startups graduating from Undaunted, the survival rate is

88%

Below: Members of the innovation team: Kate Field, Claudia Cannon, David Contreras Diaz, Nicole Alhadeff, Clare Lowe and Larissa Kunstel-Tabet © Dave Guttridge



ISONIK has developed a unique ice-prevention technology that enables wind power to work reliably when it's needed most during peak winter months, potentially unlocking new geographies with higher wind potential that were previously inaccessible due to icing. Ice build-up on the blades of wind turbines is an issue for 65% of the world's wind farms, decreasing annual energy generation by up to 20% and resulting in revenue loss for wind farms globally.

ISONIK's technology can be retrofitted inside the blades and uses ultrasonic soundwaves to prevent ice build-up. It is ten times more energy efficient than competitors and uses no toxic chemicals, unlike other ice prevention coatings.

Its founding team, Mara Köhne and Hal Good, met on the MSc Cleantech Innovation, delivered by the Grantham Institute and the Dyson School of Design Engineering, in 2024. After winning the 2025 UK final of ClimateLaunchpad, the world's largest green business ideas competition, they progressed onto Undaunted's Greenhouse accelerator. This 12-month programme supports talented early-stage startups developing cleantech solutions to tackle climate change.

“Imperial's entrepreneurial network gave us the confidence to take the leap and start ISONIK. We had access to world-leading experts, prototyping facilities and industry contacts, and were coached onto programmes like Climate Launchpad and The Greenhouse, which have given us vital support navigating the entrepreneurship process.”

Mara Köhne, Co-Founder of ISONIK

Notpla, winners of the Prince of Wales' Earthshot Prize, use seaweed as a sustainable packaging alternative, directly replacing millions of single-use plastic items and reducing pollution around the world. The Notpla team met while studying at Imperial, receiving support from Imperial Enterprise Lab, Undaunted's accelerator programme, now known as The Greenhouse, and the Imperial White City Incubator.

In 2024, Notpla returned to its Imperial roots to help reduce single-use plastic across the university's catering operations. "It's a proud moment to see Notpla come full circle from students with big ideas,

to entrepreneurs scaling their business in our ecosystem, to being suppliers in our own sustainability efforts on campus," said Imperial President, Professor Hugh Brady.

"Notpla wouldn't exist without the support of Undaunted. They were the first ones to believe in us and the idea, and provided the guidance and connections to start the journey."

Rodrigo García González, Co-Founder of Notpla



Working with partners to scale solutions

Many of the biggest sustainability opportunities now sit in deep, disruptive technologies. They offer the potential for step changes in energy, industry, the built environment and natural systems. But they also face real barriers: markets designed for yesterday, first-of-a-kind risk, and the need for credible evidence before decisions can be made at scale. For many leaders, the ambition to act is there – but the pathway is not always clear.

This is where deeper collaboration makes the difference. Through Undaunted and the Grantham Institute, Imperial brings together industry, universities and entrepreneurs to reduce technical and commercial risk earlier, improve learning through real-world testing, and accelerate promising ideas into mainstream adoption. Our goal is to strengthen the connection

between discovery, development and deployment, so innovation investment delivers more value, more reliably. If you're a leader facing a hard sustainability challenge and want to explore a robust, evidence-led path forward, let's start a conversation. Visit undaunted-hq.org/join-us

"Startups bring focus and speed. Industry brings operational reality and routes to scale. Universities absorb technical uncertainty and provide neutral ground. Together they can generate independent evidence that investors, regulators and boards can trust. In some cases, this shared evidence can shape how markets and systems evolve."

Matt Lipson, Deputy Director of Undaunted

Communications and outreach

Robust scientific research is at the heart of all our communications. We tell stories that demonstrate the impacts of climate and environmental change on the world around us and showcase the breadth of solutions available, to inspire audiences to take ambitious science-based action towards a sustainable, resilient, zero-carbon society.

Right: Andrew Grieve presents real-time air quality displays at the Grantham Research Showcase © Dan Weill





© Quarrie Photography / CC BY-NC-ND 2.0

Communicating the cost of climate inaction

Scientists at Imperial's World Weather Attribution initiative have led efforts to develop global methodologies to identify the influence of climate change on extreme weather events. This work is helping answer questions about how heatwaves, droughts, floods and wildfires are made more likely or more intense because of climate change. Published in the immediate aftermath of the event – ensuring widespread media coverage – these studies have reshaped how extreme weather is reported. They draw clear links between individual events and the realities of a warming world, prompting more informed public conversations about climate change and how to build resilience to its impacts.

Inspired by this model, the Climate Damage Tracker determines the extent to which climate change is responsible for

the damages caused by a given extreme event. This novel and fast-developing field of attribution science, pioneered by a multidisciplinary team at the Grantham Institute, is known as impact attribution. In 2025, a rapid analysis conducted in collaboration with the London School of Hygiene & Tropical Medicine found that climate change tripled heat-related deaths during the early summer European heatwave. A few months later, analysis of the devastating Hurricane Melissa that swept through Jamaica found that climate change increased the economic damage by 35%.

These studies help to communicate the cost of climate inaction in a way that is relatable to people's experiences of a warming world, and do so at a time when the public conversation is still focused on the disaster. Researchers hope that such attribution could inform discussions on responding to the losses and damages endured by the most vulnerable communities, and help bring the world's biggest polluters to justice for the impacts of their activities.



© Bilanol

Events and Outreach

We deliver a lively events programme, from flagship special lectures and research showcases to seminars and workshops. These events bring together distinguished figures from across research, government and culture to share their insights on pressing global challenges and spark informed discussion that motivates impactful action. Previous speakers at our Annual Lecture include former Prime Minister of Norway Dr Gro Harlem Brundtland, trailblazing politician and author Caroline Lucas, His Serene Highness Prince Albert II of Monaco, former Vice President of the United States Al Gore and former Executive Secretary of the United Nations Framework Convention on Climate Change Christiane Figueres.

We actively engage young people with climate and environment research, running practical, creative initiatives that foster constructive engagement with themes related to the climate crisis. The Grantham Climate Art Prize, launched in 2018, invites young people to design murals drawing attention to the climate crisis and the need for action to create a more sustainable world. We now have over 13 murals across Great Britain, from Brighton to Glasgow.

“Through this project I’ve learned the value of art and how it complements science – topics I spent months studying can be captured in a visually striking way that speaks to all.”

Mahamood Mubarak, Art Prize participant



We also support students and academics to step into public engagement, giving them the confidence to take part in public events like the Great Exhibition Road Festival. Our award-winning Climate Friendly Pop-Up Kitchen, launched in 2022, offers visitors samples of planet-friendly meals prepared by professional caterers to kickstart conversations about the environmental impact of everyday food choices. Other exhibits include Eco Pawprints, where visitors play interactive games to discover the ‘environmental pawprint’ of Britain’s 22 million dogs and cats, and how owners can minimise their impact.

Left: Former MP and Green Party leader Caroline Lucas delivers the Grantham Institute Annual Lecture © Dan Weill

Right: A Grantham Art Prize mural in Glasgow © Conzo Throb and Ciaran Glöbel

Below: The Climate Friendly Pop-Up kitchen at the Great Exhibition Road Festival © Thomas Angus





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Submit your questions via mentimeter



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Fireside chat

Dr Gro Harlem Brundtland
First woman Prime Minister of Norway,
former Director-General of the WHO &
member of The Elders

Justin Rowlett
Climate Editor at BBC News

IMPERIAL
Grantham Institute
**Reclaiming
Our Common Future**
The pursuit of shared purpose in an age of division
Keynote from
Gro Harlem Brundtland
First woman Prime Minister of Norway, former
Director-General of the WHO & member of The Elders
MAIN LECTURE | Wednesday 29 October 2020



BBC Climate Editor Justin Rowlett chairs a discussion with Dr Gro Harlem Brundtland, former Prime Minister of Norway, at the Grantham Institute Annual Lecture © Dan Weill

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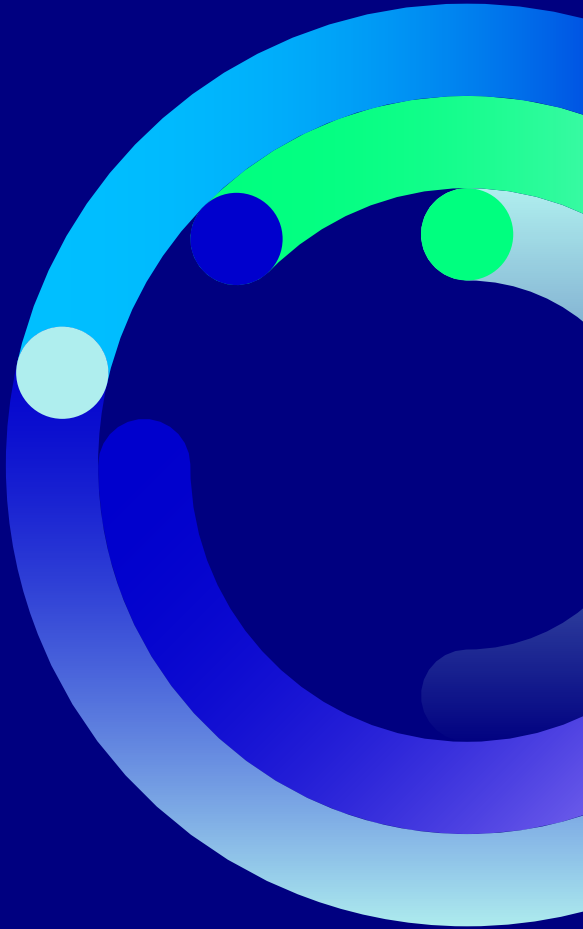
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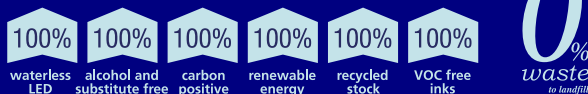
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