Dr. Pete Irvine – Curriculum Vitae

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Summary

- Climate scientist and interdisciplinary scholar with over 12 years' research experience.
- Author of 44 peer-reviewed articles with an h-index of 23 across Earth system science and other fields, including two articles in Nature Climate Change.
- Experienced at leading interdisciplinary research projects, synthesizing complex issues, and communicating with different audiences across a range of media.

Research Interests

I am interested in how human actions transform the Earth and how humanity can learn to manage this transformation. My research focuses on stratospheric climate intervention, a proposal to add reflective particles to the upper atmosphere to offset the warming effect of greenhouse gases. I work primarily with Earth system models to understand the potential impacts of climate change and solar geoengineering, e.g., on the terrestrial hydrological cycle and on sea-level rise. I also collaborate extensively with researchers from a range of disciplines to explore the implications of solar geoengineering in their fields.

Career

04/01/20 – Present: UCL Earth Sciences – Lecturer (Assistant Professor)

A research and teaching position focused on the topics of climate change and stratospheric climate intervention.

04/01/16 – 31/12/19: Harvard School of Engineering and Applied Sciences (SEAS) – Postdoctoral Fellow (3 years) then Research Associate (1 year)

A research position focused on evaluating the climate consequences of stratospheric climate intervention.

18/06/12 – 31/12/15: Research Fellow – Institute for Advanced Sustainability Studies (IASS)

A research position focused on interdisciplinary evaluation and synthesis of the science of stratospheric climate intervention.

Education

Ph.D. "Climate Effects of Geoengineering", University of Bristol **awarded 13/01/13**

MSci Physics (1st Class), University of Durham **awarded 13/01/09**

Experience and Skills

World-leading climate intervention expert

- One of the top 5 most published climate intervention researchers, according to web of knowledge, with 44 peer-reviewed articles on climate intervention.
- Author of several review articles, reports and blog posts synthesizing the science of climate intervention for a range of audiences.
- Peer reviewed 55 academic articles and was awarded the 2017 Editor's Citation for Excellence in Refereeing by the journal Earth's Future, and a 2018 Outstanding Reviewer Award from ERL.
- Contributing author on the IPCC's 5th Assessment report and a lead author on a European report on geoengineering (EuTRACE).
- A strong interdisciplinary network of colleagues, with collaborations spanning the USA, UK, Germany, China and developing world.

Broad Earth system science experience

- Broad expertise of climate and Earth system science, with a publication record spanning large-scale climate, hydrology, vegetation, ice-sheet and sea-level change.
- Expert at running and analysing a range of climate and other environmental models.
- Experienced analyst of multi-model climate datasets and climate uncertainty.

Communication skills and Interdisciplinary research experience

- Over 9 years of experience working in multi-disciplinary research groups with responsibilities for communicating scientific and technical concepts to non-scientists.
- Accomplished interdisciplinary researcher with 12 published articles which have a strong social science or humanities component.
- Excellent writing skills with experience writing academic articles, white papers and reports.
- Excellent public speaker with extensive experience delivering lectures for a range of audiences, also experienced at giving radio and video interviews, and chairing discussions.

Project management skills

- Experienced at managing research projects with a virtual team of colleagues from different countries, tight deadlines, and complex trade-offs.
- Lead organiser of 4 workshops and 2 conference sessions, co-organiser of 3 conference sessions and 3 more workshops.
- Experience supervising student projects.

Other skills and interests

- Experienced user of several programming languages, including: Python, Bash, CDO and R.
- Native English speaker, intermediate German skills (B1) and beginner Spanish skills (A2).

Teaching and Supervision Experience

Undergraduate teaching at UCL, Earth Sciences

Awarded Higher Education Authority Fellowship (D2) in July 2022.

GEOL0013, Principles of Climate, 2nd Year Undergraduate, 2020 – Present, Module organizer and lead lecturer with mean student satisfaction scores of 3.7, 3.9 and 4.3 out of 5 over 3 years.

GEOL0035, Sustainable Management of the Environment, Master's level, 2022, Module organizer for module focused on synthesizing environmental issues for policymakers.

GEOL0067, Science, Policy and Ethics of Climate Intervention, Master's level, 2023 – Present, Module organizer for module focused on developing research and scientific communication skills.

Supervision

Currently supervising 1 PhD student as primary supervisor and 4 as a secondary supervisor, as well as 4 Master's students and a number of undergraduate literature review projects. Have supervised 15 master's theses since starting at UCL, Earth Sciences in 2020.

Funding Awards

Horizon Europe, Conditions for Responsible Research of SRM – Analysis, Co-Creation, and Ethos (Co-CREATE), **€1,974,914** **2024 – 2027**

- Co-PI and work package lead, awarded £208,241.

Harvard University, Understanding the limits to reducing sea-level rise through solar geoengineering, $98,000 **2016 – 2017**

- Co-I, drafted proposal.

DFG SPP (Germany), Contextualizing Climate Engineering and Mitigation: Complement, Substitute or Illusion? (CEMICS), **€428,700** **2013 – 2015**

- Co-I, contributed to proposal text.

World Universities Network, PhD travel scholarship to Penn State **2010 – 2010**

Peer-Reviewed Publications

ORCiD: 0000-0002-5469-1543, ResearcherID: E-4799-2012, Google Scholar: 7asLSCEAAAAJ

Analysis of citation record on Web of Science on the 17th October 2023

Publications: 44; Citations: 2197; h-index: 23

Articles under review (1)

Futerman et al. (preprint), The interaction of Solar Radiation Modification and Earth System Tipping Elements, ESDD, DOI:10.5194/egusphere-2023-1753

Bonou et al. (under review), Stratospheric Sulfate Aerosols impacts on West African monsoon precipitation using GeoMIP Models, Earth's Future

Articles in press (1)

Duffey et al. (preprint), ESD Ideas: Arctic Amplification's Contribution to Breaches of the Paris Agreement, ESDD, DOI:10.5194/egusphere-2023-810

Peer-reviewed articles (38)

Duffey et al. (2023), Solar geoengineering in the polar regions: A review, *Earth's Future, 11 (6), e2023EF003679*

Visioni et al. (2023), Opinion: The scientific and community-building roles of the Geoengineering Model Intercomparison Project (GeoMIP)–past, present, and future, ACP 23 (9), 5149-5176

Alamou et al. (2022), 'Impact of Stratospheric Aerosol Geoengineering on Extreme Precipitation and Temperature indices in West Africa using GLENS simulations', *Journal of Geophysical Research: Atmospheres,* 10.1029/2021JD035855

Alamou et al. (2022), 'Impact of stratospheric aerosol geoengineering on meteorological droughts in West Africa', *Atmosphere*, *13(2), 234*

Dai et al. (2021), 'US and Chinese climate experts share judgements on solar geoengineering', *Humanities and Social Science Communications 8 (1), 1-9*

Da-Allada C.Y. et al. (2020), 'Changes in West African Summer Monsoon Precipitation under Stratospheric Aerosol Geoengineering', Earth's Future, TBD

Irvine P.J. and Keith, D.W. (2020), 'Halving warming with stratospheric aerosol geoengineering moderates policy-relevant climate hazards', *Environmental Research Letters, 15, 044011*

Macmartin, D.G. et al. (2019), 'Technical characteristics of solar geoengineering deployment and implications for governance', *Climate Policy, 19 (10), 1325-1339*

Irvine P.J. et al. (2019), 'Halving warming with idealized solar geoengineering moderates key climate hazards in all regions', *Nature Climate Change, 9, 295-299*

Svoboda, T. et al. (2019), 'The potential for climate engineering with stratospheric sulfate aerosol injections to ameliorate climate injustice', *Journal of Global Ethics*

Irvine P.J. et al. (2018), 'Brief communication: Understanding solar geoengineering's potential to limit sea level rise requires attention from cryosphere experts', The Cryosphere, 12 (7), 2501-2513

Parker, A. and Irvine, P.J. (2018), 'The risk of Termination Shock from solar geoengineering', Earth's Future, 6 (3), 456-467

Irvine, P.J. et al. (2017), 'Towards a comprehensive climate impacts assessment of solar geoengineering', Earth's Future, 5 (1), 93-106

Keith D.W. and P.J. Irvine (2016), 'Solar geoengineering could substantially reduce climate risks – A research hypothesis for the next decade', Earth's Future, 4 (11), 549-559

Irvine, P.J. et al. (2016), 'An overview of the Earth system science of solar geoengineering', *Wiley Interdisciplinary Reviews: Climate Change*, 7 (6), 815-833

Reynolds, J.L. et al. (2016), 'Five solar geoengineering tropes that have outstayed their welcome', *Earth's Future*, 4 (12), 562-568

McCormack, C.G. et al. (2016), 'Key impacts of climate engineering on biodiversity and ecosystems, with priorities for future research', *Journal of Integrative Environmental Sciences, 13 (2-4), 103-128*

Glienke, S. et al. (2015), 'The impact of geoengineering on vegetation in experiment G1 of the Geoengineering Model Intercomparison Project (GeoMIP)', *Journal of Geophysical Research: Atmospheres,* 120 (19), 10196-10213

Kravitz, B. et al. (2015), 'The Geoengineering Model Intercomparison Project Phase 6 (GeoMIP6): Simulation Design and Preliminary Results", *Geoscientific Model Development,* 8, 3379-3392

Reichwein, D. et al. (2015), 'State responsibility for climate engineering under international law', *Climate Law,* 5 (2-4), 142-181

Heyen, D. et al. (2015), 'Regional disparities in SRM impacts: the challenge of diverging preferences', *Climatic Change,* 133 (4), 557-563

Svoboda, T., and P.J. Irvine (2015), 'Response to comments on "Compensation for climate engineering: ethical and technical difficulties"', *Environmental Policy and Ethics,* 18 (1), 103-105

Kravitz, B. et al. (2014), 'A Multi-Model Assessment of Regional Climate Disparities Caused by Solar Geoengineering', Environmental Research Letters 9 (7), 074013

Svoboda, T., and P.J. Irvine (2014), 'Compensation for climate engineering: ethical and technical difficulties', *Environmental Policy and Ethics* 17 (2), 157-174

Irvine, P.J. et al. (2014), 'Key factors governing uncertainty in the response to sunshade geoengineering from a comparison of the GeoMIP ensemble and a perturbed parameter ensemble', *Journal of Geophysical Research: Atmospheres* 119 (13), 7946-7962

Schäfer, S., A. Maas, P.J. Irvine, (2013), 'Bridging the Gaps in Interdisciplinary Research on Solar Radiation Management', *GAIA-Ecological Perspectives for Science and Society* 22 (4), 242-247

Kravitz, B., et al. (2013), 'An energetic perspective on hydrologic cycle changes in the Geoengineering Model Intercomparison Project', *Journal of Geophysical Research: Atmospheres* 118 (23), 13,087-13,102

Tilmes, S., et al. (2013), 'The hydrological impact of geoengineering in the Geoengineering Model Intercomparison Project (GeoMIP)', *Journal of Geophysical Research: Atmospheres* 118 (19), 11,036-11,058

Jones, A., et al. (2013), 'The impact of abrupt suspension of solar radiation management (termination effect) in experiment G2 of the Geoengineering Model Intercomparison Project (GeoMIP)', *Journal of Geophysical Research: Atmospheres* 118 (17), 9743-9752

Kravitz, B., et al. (2013), 'Climate model response from the Geoengineering Model Intercomparison Project (GeoMIP)', *Journal of Geophysical Research: Atmospheres* 118 (15), 8320-8332

Couce, E., et al. (2013), 'Tropical coral reef habitat in a geoengineered, high-CO_2 world', *Geophysical Research Letters* 40 (9), 1799-1805

Irvine, P. J., et al. (2013), 'An efficient method to generate a perturbed parameter ensemble of a fully coupled AOGCM without flux-adjustment', *Geosci. Model Dev.* 6, 1447-1462

Tuana, N., et al. (2012), 'Towards Integrated Ethical and Scientific Analysis of Geoengineering: A Research Agenda', *Environmental Policy and Ethics* 15 (2), 136-157

Irvine, P.J., R.L. Sriver, and K. Keller (2012), 'Tension between reducing sea-level rise and global warming through solar radiation management', *Nature Climate Change* 2, 97-100

Irvine, P.J., A. Ridgwell, and D.J. Lunt (2011), 'Climatic effects of surface albedo geoengineering', *Journal of Geophysical Research: Atmospheres* 116, D24112

Irvine, P.J., A. Ridgwell, and D.J. Lunt (2010), 'Assessing the regional disparities in geoengineering impacts', *Geophysical Research Letters 37*, L18702

Irvine, P.J., et al. (2009), 'The fate of the Greenland Ice Sheet in a geoengineered, high CO_2 world', *Environmental Research Letters* 4, 045109

Singarayer, J. S., A. Ridgwell, and P.J. Irvine (2009), 'Assessing the benefits of crop albedo bio-geoengineering', *Environmental Research Letters* 4, 045110

Comments and other publications (10)

Irvine et al. (2021, preprint), 'Research priorities for solar geoengineering derived from a broad community survey and discussion,' *EarthArxiv, DOI:10.31223/X5BG8C*

Irvine, P.J. and Keith, D.W. (2021), 'The US can't go it alone on solar geoengineering, Policy Exchange

Burns, E. et al. (2019), 'Technology Factsheet: Solar Geoengineering', Belfer Center for Science and International Affairs, Harvard Kennedy School

Irvine, P.J. and D.W. Keith (2019), 'The Science and Technology of Solar Geoengineering: A Compact Summary', Governance of the Deployment of Solar Geoengineering, Harvard Project on Climate Agreements, 19-25

Burns E. et al. (2019), 'Solar geoengineering research Zotero library', Harvard's Solar Geoengineering Research Blog

Irvine, P.J. (2018), 'An alternative view: Could Geoengineering Cause a Climate War? by Clive Hamilton', BBC Focus, 320, 70-77

Irvine, P.J. (2018), 'Less rain but still wetter and greener?', Harvard's Solar Geoengineering Research Blog

Irvine, P.J. et al. (2014), 'CORRESPONDENCE: Solar radiation management could be a game changer', Nature Climate Change 4, 10, 842-842

Kravitz, B. et al. (2013), 'Robust Results from Climate Model Simulations of Geoengineering', EOS 94, 33

Schäfer, S. et al. (2013), 'Field tests of solar climate engineering', Nature Climate Change 3, 9, 766-766

Reports

Schäfer, S. et al. (2015), The EuTRACE Project Assessment Report. Funded by the European Union's Seventh Framework Programme under Grant Agreement 306993. Contribution as a lead author

Clarke, L. et al. (2014), 'Assessing Transformation Pathways' In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

PhD Thesis

Irvine, P.J. (2012), 'Climatic effects of solar radiation management geoengineering', University of Bristol PhD

Media Appearances and engagement work

Selected media coverage

My research has had 437 online mentions, including 163 mentions in news articles (see ImpactStory). My 2019 Nature Climate Change article was covered in 99 news outlets including The Guardian, The Independent, The Mirror, Carbon Brief, The Economist, Wired, Vox, and others.

Podcast

I am a co-host of the Challenging Climate podcast which launched on the 11th of January 2022 and has had over **18,000 downloads.** Guests including sci-fi writer Neal Stephenson, Pulitzer Prize winner Elizabeth Kolbert and climate scientist Dr. Gavin Schmidt.

Substack

I run the Plan A Plus substack which launched on the 9th of August 2022 and has 130 subscribers and a total of 2,000 reads.

Radio Interviews

Can geoengineering help in the fight against climate change?, Newstalk FM, Futureproof, 13th February, 2022

KCBS Radio San Francisco, 12th March 2019

'A very large hole in the Sahara', BBC Radio 4, costing the earth, 22nd September 2011

Public lectures and other appearances

'Could an artificial dust layer help fight climate change?', Harris Westminster 6th Form, 27th September 2022

'How an Artificial Dust Layer Could Help Fight Climate Change', Pint of Science, 11th May 2022

'Can tech cool the planet?' Panel discussion, CODEX TV, 16th March 2022

'Could an artificial dust layer help fight climate change?', UCL Science Centre Lectures, 25th February 2022

'Could solar geoengineering have a role in future climate policy', Cross-Government Climate Hub, 17th February 2022

'Geoengineering: in case of emergency break glass' public debate with Dr. Rupert Read, Institute of Engineering and Technology, 25th October 2021

'How an artificial dust layer could help fight climate change' public lecture, Bloomsbury Festival, 23rd October 2021

Other

Reddit IAMA, 2.7K upvotes, 880K views, 14th July 2022

Advisory roles and Policy engagement

2022 – Present, advisory board member for the American Geophysical Union's Ethical Framework for Climate Engineering Research

2022 – Present, scientific advisor to The Degrees Initiative, an NGO funding developing world research on solar geoengineering

25th October 2022, Contributed to GESDA's science breakthrough radar (link)

18th July 2023, Expert review for Quadrature Climate Foundation

9th-10th March 2023, Invited as an expert to Norway-Royal Soc meeting on deep-sea mining and solar geoengineering law.

22nd May 2023, Briefed civil servant at Department of Energy Security and Net-zero on solar geoengineering.

2022 – 2023, advisor to developers of the 'Daybreak' board game and drafted website text on geoengineering technologies.

2015 – 2019, advisor to Chinese research project: Mechanisms and impacts of geoengineering

2014 – 2017, advisor to Norwegian research project: Exploring the Potential and Side-Effects of Climate Engineering (EXPECT)

Presentations and panels

Panels

'The Human Rights Conundrum: Climate Change Interventions as Both Problem and Solution' (Panelist), 31st March 2023

'Solar Geoengineering Futures', 'Biophysical impacts: climatic and non-climatic risks and benefits' (Chair), Resources for the Future, 28th September 2022

'Global Governance of Large-scale Climate Change Mitigation Technologies' (Panelist), World Government Summit, 13th February 2022

Invited talks

'The state of SRM science and key questions', Norwegian Royal Society, 9th March 2023

'Stratospheric Aerosol Geoengineering: Hypotheses and Uncertainties' (Webinar), Anant Climate Fellowship Seminar, Ahmedabad, Gujarat, India, 14th December 2021

'Stratospheric Aerosol Geoengineering: Hypotheses and Uncertainties' (Webinar), Atmospheric, Oceanic and Planetary Physics Department, Oxford University, UK, 18th June 2020

'The biodiversity impacts of solar geoengineering', Ecosystem Response to Sulfate Geoengineering Symposium, University of Minnesota, USA, 31st October 2019

'Could solar geoengineering moderate the impacts of climate change?', Max Planck Institute for Meteorology, Hamburg, Germany, 15th May 2018

3 Lectures for the Princeton Climate Engineering Symposium, Princeton University, Princeton, USA, 28th-30th August 2017

'Could solar geoengineering reduce the risks of climate change?', Santa Fe Climate Conference, Santa Fe, USA, 6th February 2017

'Assessing solar geoengineering: sea-level rise and climate impacts', Beijing Normal University, Beijing, China, 28th July 2016

'What role should SRM have in climate policy?', Integrated Assessment Model Conference, Potsdam, Germany, 17th November 2015

'Introduction to geoengineering' (guest lecture), Institute for Biodiversity and Ecosystem Dynamics (IBED), University of Amsterdam, Amsterdam, Netherlands, 11th November 2015

'Towards a comprehensive climate risk assessment of solar radiation management', Beijing Normal University, Beijing, China, 26th August 2015

'The role of climate science in the geoengineering debate', Paris International Workshop on Geoengineering, Paris, France, 11th October 2013

Conference presentations

'Identifying which regions would be worse off under stratospheric aerosol geoengineering' (Webinar), Climate Engineering Conference '21, 15th September 2021

'Solar geoengineering moderates effects of climate change', Climate Engineering Conference '17, Berlin, Germany, 13th October 2017

'Precipitation response to solar geoengineering in a hi-res tropical-cyclone permitting coupled GCM', American Geophysical Union, San Francisco, USA, 13th December 2016

'Detection, Attribution and Climate Control (A Purely Technical Perspective)', Climate Engineering Conference '14, Berlin, Germany, 20th August 2014

'Assessing the regional disparities in geoengineering impacts' American Geophysical Union, San Francisco, USA, 10th December 2010

Presentations and lectures

'The biodiversity impacts of solar geoengineering', Centre for Biodiversity and Environment Research, UCL, London, UK, 17th April 2020

'Could halving warming with solar geoengineering reduce climate risks?', School of Engineering and Applied Sciences, Harvard University, Cambridge, USA, 28th October 2019

'A general analysis framework for evaluating solar geoengineering performance', GeoMIP Meeting, Beijing, China, 12th August 2019

'Solar Geoengineering: Could we cool the climate and what would happen if we did?', Harvard Graduate School of Design, Cambridge, USA, 12th March 2019

'Evaluating the risks and benefits of solar geoengineering', Geography department, University of Bristol, UK, 29th September 2017

'Evaluating the risks and benefits of solar geoengineering', School of Earth and the environment, University of Leeds, 26th September 2017

'Could solar geoengineering reduce the risks of climate change?', SRMGI workshop, Manila, Philippines, 6th March 2017

'Solar geoengineering Vs. temperature targets', Academic working group meeting, Forum for Climate Engineering, New York, USA, 24th September 2016

'Sea-level rise response to solar geoengineering: a research agenda', Institute for Advanced Sustainability Studies, Potsdam, Germany, 26th June 2016

'Outlook on solar geoengineering impacts', Institute for Advanced Sustainability Studies, Potsdam, Germany, 17th June 2016

'Climate impacts of solar radiation management climate engineering', Potsdam Institute for Climate Research (PIK), Potsdam, Germany, 15th June 2016

'Towards a comprehensive climate risk assessment of solar radiation management', School of Engineering and Applied Sciences, Harvard University, Cambridge, USA, 20th August 2015

'Risks, Benefits and trade-offs of Stratospheric Aerosol Injection CE: A contribution to the CEMICS project', Hamburg University, Hamburg, 8th May 2015

'The impacts of SRM: the good, the bad and the uncertain', Heidelberg Climate Engineering Summer School, Heidelberg, Germany, 3rd August 2014

'The response of vegetation in the G1 experiment', GeoMIP meeting, Paris, France, 6th March 2014

'Effects of Solar Radiation Management Climate engineering on the climate' (guest lecture), University of Potsdam, Potsdam, Germany, 13th January 2014

'The Limits to Climate Control' **(x4)**, IASS Potsdam, University of Reading, London School of Economics and University of Leeds, November and December 2013,

'Exploring the consequences of geoengineering', World Universities Network Meeting, Bristol, UK, 30th January 2012

'Three problems with geoengineering', University of Leeds, Leeds, UK, 14th December 2011

'GeoMIP experiments with a perturbed physics ensemble of HadCM3', GeoMIP meeting, Rutgers University, New Jersey, USA, 8th December 2011

'The world in crisis? Geoengineering our future climate' (guest lecture), School of Geography, University of Bristol, Bristol, UK, 14th October 2011

'Geoengineering to mitigate sea-level rise and the rate of temperature change: incompatible goals?', University of Bristol, Bristol, UK, 28th April 2011

'Should we geoengineer the Earth's climate?', Carnegie Mellon University, Pittsburgh, USA, 26th November 2010

'Should we geoengineer our future climate?', BRIDGE seminar, University of Bristol, Bristol, UK, 10th May 2009

Posters

‘Isolating the effects of stratospheric heating from stratospheric geoengineering: The experimental design for a multi-model comparison and previous results’, GeoMIP Meeting, Beijing, China, 12th August 2019

‘Halving warming with stratospheric aerosol geoengineering (also) moderates key climate hazards’, American Geophysical Union, San Francisco, USA, 9th December 2019

‘Moderate Solar Geoengineering Could Significantly Reduce Key Climate Hazards’, American Geophysical Union, New Orleans, USA, 13th December 2017

‘Benefits of solar geoengineering large, consistent and widespread’, Gordon Research Conference, Maine, USA, 25th July 2017

‘How effectively would Solar Radiation Management reduce sea-level rise?’, American Geophysical Union, San Francisco, USA, 9th December 2016

‘How effectively would Solar Radiation Management reduce sea-level rise?’, GeoMIP Meeting, University of Oslo, Oslo, Norway, 21st June 2016

‘Impact of SRM geoengineering on vegetation in experiment G1 of GeoMIP’, European Geophysical Union, Vienna, Austria, 15th April 2015

‘Initial climate response to a termination shock’, Climate Engineering Conference ’14, Berlin, Germany, 20th August 2014

‘Parametric uncertainty in SRM geoengineering’, 3rd International Conference of Earth System Modelling, Hamburg, Germany, 19th September 2012

‘What is the optimal level of solar radiation management?’, European Geophysical Union, Vienna, Austria, 5th May 2010

‘Geoengineering – can a sunshade in space offset global warming?’, NCAS summer school, Oxford, UK, 5th July 2009