

Dr Corwin Wright

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Research Positions

2013-date: University of Bath, Bath, UK

(2017-date) Royal Society University Research Fellow

Independent full-time research appointment, funded by the Royal Society and the Global Challenges Research Fund. I study wave processes in the whole terrestrial atmosphere (i.e. from the surface to the ionosphere), with the goals of (i) improving atmospheric weather and climate models and (ii) enhancing the accuracy of the geophysical corrections used in GPS and radio systems. I use a wide variety of observational and modelling approaches, with a primary focus on new satellite observational techniques.

(2016-2017) Research Officer [in Travelling Ionospheric Disturbances]

Postdoctoral researcher using ground-based data to study the terrestrial thermosphere and ionosphere. Direct experience of working with a broad range of ionospheric datasets, including ionosondes, airglow imagers, HF radars and Fabry-Perot interferometers. Experience supervising research students and working as part of an international collaboration (with Johns Hopkins University, USA).

(2013-2016) Research Officer [in Gravity Wave Physics]

Postdoctoral researcher and leader of two field campaigns to South Georgia Island. Direct experience of working with an extremely broad range of model, reanalysis and observational (satellite, in-situ and radar) datasets, including deploying radiosondes and characterising a newly-deployed large-scale atmospheric radar system. Experience supervising research students and working as part of a national collaboration (with the British Antarctic Survey, Leeds University and the UK Met Office).

2012-2013, 2010-2011: National Center for Atmospheric Research, Boulder, CO, USA

(2010-2011) Postdoctoral Scientist (2012-2013) Contract Researcher

Analysed data from the High Resolution Dynamics Limb Sounder (HIRDLS) on NASA's Aura satellite to investigate the terrestrial stratosphere and mesosphere. Direct experience of working with large geophysical datasets, including a wide range of satellite-mounted, terrestrial and in-situ instruments and offline model output. Experience of contributing to a major international project. Experience modifying and running the HadGEM climate model using Puma, ARCHER and MONSooN.

2011-2012: Laboratoire de Physique des Océans, Brest, France

Postdoctoral Scientist

Exploited GMACMD, a collection of ~50 000 ocean current meter time series records, to investigate the mesoscale dynamics of the terrestrial deep ocean. Direct experience of working with large-scale irregularly-formatted datasets, offline data from ocean general circulation models, and using statistical methods to draw connections between the two.

Visiting Positions

2012-date: Atmospheric, Oceanic and Planetary Physics, University of Oxford, Oxford, UK

2011-2015: National Center for Atmospheric Research, Boulder, Colorado, USA

2012-2013: Laboratoire de Physique des Océans, Brest, France

Education

2006–2010: University of Oxford

PhD (DPhil) in Atmospheric Physics

Supervisor: Dr John J. Barnett (deceased)

Thesis title: “Detection of Stratospheric Gravity Waves Using HIRDLS Data”

2005–2006: University of St. Andrews and Heriot-Watt University

MSc in Photonics and Optoelectronic Devices

Industrial Placement: CST Global Semiconductors, Ltd., Glasgow, UK

Dissertation title: “Characterisation of 1310nm Semiconductor Laser Diodes”

2001–2005: University of Durham

MSci in Physics

Dissertation supervisor: Prof. Gordon D. Love

Dissertation title: “Atmospheric Turbulence Measurements Using SLODAR”

Grants and Funding Awarded

Individual sources of funding greater than £10 000 are listed below, ordered chronologically by date of initial award. I also gratefully acknowledge receipt of grant and travel funding from the **American Geophysical Union**, **Bath University**, the **Institute of Physics**, the **International Space Science Institute**, the **National Centre for Earth Observation**, the **Royal Meteorological Society**, **Trinity College Oxford** and the **World Climate Research Programme**.

2018-2021: The Royal Society

Research Grants for Research Fellows, £98k

Satellite Exploration of the Quasi-Biennial Oscillation (SEQUOIA)

2018-2021: The Royal Society

Research Fellow’s Enhancement Award, £95k

Measuring And Tracking Atmospheric Disturbances Using Observations and Ray-Tracing (MATADOR)

2017-2020: Natural Environment Research Council

Co-Investigator, Discovery Science Research Grant, £625k (*fEC*; £501k awarded)

The Drake Passage and Southern Ocean Wave Experiment (DRAGON-WEX)

2017-2022: The Royal Society

University Research Fellowship, £560k (*fEC*; £448k awarded)

Gravity Waves as Drivers of the Global Atmospheric Circulation

(*co-supported by the Global Challenges Research Fund*)

2017-2022: Natural Environment Research Council

[offered]

Independent Research Fellowship, £570k (*fEC*; £456k awarded)

Atmospheric Waves in 3D, from the Surface to the Edge of Space

Declined due to incompatibility with Royal Society URF, above

2012-2013: National Center for Atmospheric Research

Principal Investigator, Research Subcontract, US\$75k (~£50k)

Research contract supporting blue-skies scientific exploitation of HIRDLS data

2006-2010: Natural Environment Research Council

Studentship, ~£70k

Fees, maintenance and travel funds for DPhil (PhD) in Atmospheric Physics

2005-2006: Engineering and Physical Sciences Research Council

Studentship, ~£18k

Fees and maintenance for MSc in Photonics and Optoelectronic Devices

fEC annotations refer to the UK Full Economic Costing funding model, where typically 80% of the total estimated cost of a project, including all applicable overheads, is awarded by the funding body.

Research Staff and Research Student Supervision

Postdoctoral Research Staff:

2017-date: Dr NP Hindley (NERC-funded; co-supervised with Prof. N Mitchell)

Postgraduate Research Students:

2017-date: J Bruno (co-supervisor, PhD, Univ.Bath; lead supervisor Prof C Mitchell)

2015-date: CA Cooper (research mentor*, PhD, Univ. Bath; lead supervisor Prof C Mitchell)

2013-2016: AC Moss (research mentor*, PhD, Univ. Bath; lead supervisor Prof N Mitchell)

2013-2015: NP Hindley (research mentor*, PhD, Univ. Bath; lead supervisor Prof N Mitchell)

(* Bath University regulations at this time prohibited formal PhD student supervision by staff on fixed-term contracts – my role and contribution were equivalent to co-supervisor at other institutions and under post-2016 Bath regulations. I was a member of the committee which led this change.)

Teaching Experience (and related activities)

2018: Transfer of Status Examiner, Department of Mathematics, University of Bath

Examiner

Responsible for assessing performance of a research student, in order to determine appropriateness of transfer from MPhil to PhD student status.

2018: Electronic and Electrical Engineering Admissions, University of Bath

Admissions Interviewer

Responsible for interviewing applicants with non-standard entry qualifications for entry to first degrees in the Department, including assessing academic commitment, adaptability to degree-level study, and mathematical/engineering ability.

2018: Second Year Structured Programming, University of Bath

2012–2013, 2007–2009: Third Year Atmospheric Physics Laboratory, University of Oxford

2007–2010: Second Year Computational Physics Laboratory, University of Oxford

2006–2007: First Year Optical Physics Laboratory, University of Oxford

Laboratory Demonstrator

Responsible for assisting with lab-based teaching to undergraduate students, including assisting understanding of experiments, troubleshooting, and marking.

Scientific Review Activities

Journal Reviewer for Advances in Space Research, Annales Geophysicæ, Annals of Geophysics, Atmospheric Chemistry and Physics, Atmospheric Measurement Techniques, Geophysical Research Letters, Icarus, Journal of the Atmospheric Sciences, Journal of Atmospheric and Solar-Terrestrial Physics, Journal of Geophysical Research: Atmospheres, Journal of Geophysical Research: Oceans, Ocean Modelling, Proceedings of the National Academy of Science, Quarterly Journal of the Royal Meteorological Society, Remote Sensing of Environment.

Grant Reviewer for British Council (UK), Horizon 2020 (EU), National Science Foundation (USA).

Scientific Working Group Memberships

2013-date: SPARC Reanalysis/Analysis Intercomparison Project

2010-date: SPARC Gravity Waves Activity

2013-2016: South Georgia Wave Experiment Project Team

2013-2016: High-Resolution Gravity Wave Modelling Group

2006-2013: NASA-Aura Science Team

2010-2011: ISSI Group on Observational Constraints for Gravity Wave Parameterisations

University Administrative Roles

As staff member:

2017-date: Bath University Researcher Induction Working Group (*lead*)

2017-date: Bath University Electrical Engineering Department Research Committee (*member*)

2014-date: Bath University Research Staff Working Group (*member*)

As student representative:

2003-2005: Collingwood College Durham Council

2003-2005: Durham University IT Strategy Committee

2003-2005: Durham University Honorary Degrees Committee

2001-2005: Durham University Physics Dept. Board of Studies

2001-2005: Durham University Physics Dept. Staff/Student Committee

References

Prof. John Gille
(*previous employer*)
Foothills Laboratory
NCAR
Mitchell Lane
Boulder, CO 80301
United States

Prof. Lesley Gray
(*collaborator since 2009*)
AOPP, Dept. of Physics
University of Oxford
Parks Road
Oxford, OX1 3PU
United Kingdom

Prof. Nick Mitchell
(*previous employer*)
CSAOS, Elec Eng
University of Bath
Claverton Down
Bath, BA2 7AY
United Kingdom

Additional references available upon request.

Dr Corwin Wright – Publications and Presentations

Peer-Reviewed Journal Publications

26. Measurement of ionospheric total electron content using single frequency geostationary satellite observations

CA Cooper, CN Mitchell, CJ Wright, DR Jackson and B Witvliet
Submitted to Radio Science, February 2018

25. SG-WEX – a platform for improved analysis of gravity waves and low-level wind impacts generated from mountainous islands

DR Jackson, A Gadian, L Hoffmann, J Hughes, J King, T Moffat-Griffin, AC Moss, AN Ross, SB Vosper, CJ Wright and NJ Mitchell
Accepted by Bulletin of the American Meteorological Society, in press

24. The South Georgia Wave Experiment (SG-WEX): Radiosonde observations of gravity waves in the lower stratosphere. Part 1: Energy density, momentum flux and wave propagation direction

T Moffat-Griffin, CJ Wright, AC Moss, JC King, SR Colwell and NJ Mitchell
Quarterly Journal of the Royal Meteorological Society (2017), doi:10.1002/qj.3181

23. Climatology and Interannual Variability of Dynamic Variables in Multiple Reanalyses Evaluated by the SPARC Reanalysis Intercomparison Project (S-RIP)

C Long, M Fujiwara, S Davis, DM Mitchell and CJ Wright
Atmospheric Chemistry and Physics (2017), doi:10.5194/acp-17-14593-2017

22. Exploring gravity wave characteristics in 3-D using a novel S-transform technique: AIRS/Aqua measurements over the Southern Andes and Drake Passage

CJ Wright, NP Hindley, L Hoffmann, MJ Alexander and NJ Mitchell
Atmospheric Chemistry and Physics (2017), doi:10.5194/acp-17-8553-2017
(Selected by editor as a Journal Highlight)

21. A two-dimensional Stockwell Transform method for gravity wave analysis of AIRS temperatures

NP Hindley, ND Smith, CJ Wright, AS Rees and NJ Mitchell
Atmospheric Measurement Techniques (2016), doi:10.5194/amt-9-2545-2016

20. Does The Madden-Julian Oscillation Modulate Stratospheric Gravity Waves?

AC Moss, CJ Wright, and NJ Mitchell
Geophysical Research Letters, doi:10.1002/2016GL068498 (2016)

19. Gravity wave momentum fluxes in the mesosphere over Ascension Island (8S, 14W) and the anomalous zonal winds of the Semi-Annual Oscillation in 2002

AC Moss, CJ Wright, RN Davis, and NJ Mitchell
Annales Geophysicae, doi:10.5194/angeo-34-323-2016 (2016)

18. Multi-instrument gravity-wave measurements over Tierra del Fuego and the Drake Passage – Part 1: Potential energies and vertical wavelengths from AIRS, COSMIC, HIRDLS, MLS-Aura, SAAMER, SABER and radiosondes

CJ Wright, NP Hindley, AC Moss, DC Fritts, D Janches and NJ Mitchell
Atmospheric Measurement Techniques (2016), doi:10.5194/amt-9-877-2016
(Selected by editor as a Journal Highlight)

17. Combining AIRS and MLS Observations for Three-Dimensional Gravity Wave Measurement

CJ Wright, NP Hindley and NJ Mitchell
Geophysical Research Letters, doi:10.1002/2015GL067233 (2016)
(Profiled by NASA's Sensing Our Planet: <https://earthdata.nasa.gov/user-resources/sensing-our-planet/the-case-of-the-missing-waves>)

16. The Southern Stratospheric Gravity Wave Hotspot: Individual Waves and Momentum Flux Estimates from COSMIC GPS-RO

NP Hindley, CJ Wright and NJ Mitchell

Atmospheric Chemistry and Physics, doi:10.5194/acp-15-7797-2015 (2015)

(Associated poster received Outstanding Student Poster Award at AGU Fall Meeting 2014)

15. Global distributions of overlapping gravity waves in HIRDLS data

CJ Wright, SM Osprey and JC Gille

Atmospheric Chemistry and Physics, doi:10.5194/acp-15-8459-2015 (2015)

14. Lee wave generation rates in the deep ocean

CJ Wright, RB Scott, P Ailliot and D Furnival

Geophysical Research Letters, doi:10.1002/2013GL059087 (2014)

13. Global observations of gravity wave intermittency and its impact on the observed momentum flux morphology

CJ Wright, SM Osprey and JC Gille

Journal of Geophysical Research (Atmospheres), doi:10.1002/jgrd.50869 (2013)

12. Detecting overlapping gravity waves using the S-Transform

CJ Wright and JC Gille

Geophysical Research Letters, doi:10.1002/grl.50378 (2013)

11. Global observations of ocean-bottom subinertial current dissipation

CJ Wright, RB Scott, D Furnival, P Ailliot and F Vermet

Journal of Physical Oceanography, doi:10.1175/JPO-D-12-082.1 (2013)

10. A one-year seasonal analysis of martian gravity waves using MCS Data

CJ Wright

Icarus, doi:10.1016/j.icarus.2012.03.004 (2012)

9. Bottom dissipation of subinertial currents at the Atlantic zonal boundaries

CJ Wright, RB Scott, BK Arbic and D Furnival

Journal of Geophysical Research (Oceans), doi:10.1029/2011JC007702 (2012)

8. HIRDLS observations of gravity wave momentum fluxes over the monsoon regions

CJ Wright and JC Gille

Journal of Geophysical Research (Atmospheres), doi:10.1029/2011JD015725 (2011)

7. Intercomparisons of HIRDLS, COSMIC and SABER for the detection of stratospheric gravity waves

CJ Wright, M Belmonte Rivas and JC Gille

Atmospheric Measurement Techniques, doi:10.5194/amt-4-1581-2011 (2011)

6. HIRDLS Measurements of gravity wave activity in the 2006 Arctic stratosphere

CJ Wright, SM Osprey, JJ Barnett, LJ Gray and JC Gille

Journal of Geophysical Research (Atmospheres), doi:10.1029/2009JD011858 (2010)

Technical Documents

5. SPARC Reanalysis Intercomparison Project (S-RIP), Chapter 3: Climatology and Interannual Variability of Dynamical Variables

C Long, M Fujiwara, S Davis, D Mitchell and CJ Wright (working paper completed December 2016, final publication of report expected May 2018)

4. High Resolution Dynamics Limb Sounder Data Description and Quality, Version 7

JC Gille et al (15 authors, 2013)

3. High Resolution Dynamics Limb Sounder Data Description and Quality, Version 6

JC Gille et al (16 authors, 2011)

Published Conference Proceedings

2. SLODAR as turbulence monitor for free space optical communications

GD Love, CN Dunlop, S Patrick, CD Saunter, RW Wilson, and CJ Wright.

Proceedings of the SPIE, doi:10.1117/12.669279 (2006)

1. Horizontal turbulence measurements using SLODAR

GD Love, CN Dunlop, S Patrick, CD Saunter, RW Wilson, and CJ Wright.

Proceedings of the SPIE, doi:10.1117/12.620599 (2005)

Conference, Workshop and Seminar Presentations

Invited presentations and seminars are indicated in **bold**. Talks in home department at time of presentation are *italicised*. List does not include presentations where I was not lead author/presenter.

Forthcoming:

April 2018: EGU General Assembly, Vienna, Austria (oral)

Past:

February 2018: Electronic Engineering Seminar, Bath University, UK (oral)

February 2018: BRIDGE Seminar, Bristol University, UK (oral)

February 2018: Stratospheric Science Institute Seminar, Fz. Juelich, Germany (oral)

February 2018: Atmosphere, Ice and Climate Seminar, BAS, Cambridge, UK (oral)

December 2017: Atmosphere, Oceans and Climate Seminar, UEA, Norwich, UK (oral)

December 2017: Joint RAS/RMetS Dynamical Coupling Meeting, London, UK (oral)

November 2017: AOPP Departmental Seminar, Oxford, UK (oral)

October 2017: Joint SRIP/SPARC DA Workshop, Reading, UK (oral)

October 2017: SPARC Joint Workshop on Observations and Dynamics, Kyoto, Japan (oral)

July 2017: National Climate Dynamics Workshop, Exeter, UK (oral)

September 2016: Met Office Seminar, Exeter, UK (oral)

May 2016: SPARC Gravity Wave Symposium, State College, Pennsylvania, USA (oral)

April 2016: ANGIN Meeting, Cambridge, UK (oral)

March 2015: SG-WEX Project Meeting, Exeter, UK (oral)

December 2014: AGU Fall Meeting, San Francisco, California, USA (2x oral, 1 invited)

December 2014: Nonlinear Mathematics Seminar, Bath, UK (oral)

December 2014: Electronic Engineering Seminar, Bath, UK (oral)

May 2014: NCAS Early Career Forum, York, UK (oral)

March 2014: SG-WEX Project Meeting, Cambridge, UK (oral)

March 2014: Royal Meteorological Society UTLS meeting, Reading, UK (poster)

August 2012: Aura Science Team, Pasadena, California, USA (poster)

July 2012: Laboratoire de Physique des Océans Seminar, Brest, France (oral)

January 2012: Journées LPO, Landernau, France (oral)

April 2012: EGU General Assembly, Vienna, Austria (oral)

January 2012: Laboratoire de Physique des Océans Seminar, Brest, France (oral)

May 2011: NCAR Satellite Data Group, Boulder, Colorado, USA (oral)

April 2011: International Space Science Institute, Bern, Switzerland (oral)

April 2011: EGU General Assembly, Vienna, Austria (poster)

February 2011: Chapman Gravity Wave Conference, Honolulu, Hawaii, USA (poster)

September 2010: NCEO Annual Science Meeting, Leicester, UK (oral)

September 2010: Aura Science Team, Boulder, Colorado, USA (poster)

April 2010: NCEO Atmospheric Composition Meeting, Cambridge, UK (oral)

February 2010: International Space Science Institute, Bern, Switzerland (oral)

December 2009: NCAS Conference, Bristol, UK (poster)

September 2009: AOPP Annual Retreat, Oxford, UK (oral)

September 2009: Aura Science Team, Columbia, Maryland, USA (poster)

Conference, Workshop and Seminar Presentations (continued)

Invited presentations are indicated in **bold**. Talks in home department at time of presentation are *italicised*. List does not include presentations where I was not lead author and presenter.

- April 2009: EGU General Assembly, Vienna, Austria (poster)
 March 2009: Institute of Physics Environmental Physics Day, London, UK (oral)
December 2008: Trinity College Oxford Seminar Series, Oxford, UK (oral)
 November 2008: NERC Science Communication Course, Swindon, UK (oral)
 October 2008: Aura Science Team, Leiden, The Netherlands (poster)
September 2008: AOPP Annual Retreat, Oxford, UK (oral)
 September 2008: Royal Meteorological Society Student Conference, Manchester, UK (oral)
 August 2008: International Conference of Physics Students, Krakow, Poland (oral)
 June 2008: HIRDLS Science Team Meeting, Oxford, UK (oral)
 June 2008: HIRDLS Core Team Meeting, Oxford, UK (oral)
April 2008: AOPP Departmental Seminar, Oxford, UK (oral)
 January 2008: HIRDLS Science Team, Boulder, Colorado, USA (oral)
September 2007: AOPP Annual Retreat, Oxford, UK (oral)
 September 2007: Royal Meteorological Society Student Conference, Edinburgh, UK (poster)