Short Curriculum Vitae

Professor Bryan N. Lawrence

Citizenship: United Kingdom, New Zealand (Dual Citizenship)

University of Reading: Professor of Weather and Climate Computing; **STFC:** Visiting Scientist

Employment and Qualifications

Brief Description of Current Role

University of Reading: Professor of Weather and Climate Computing (2011-now).

I am primarily funded by the UK NERC National Centre for Atmospheric Science. My role is to:

- **Foster research into and carry out next generation weather and climate computing**, utilising a range of tools, including, but not limited to large ensembles, high resolution climate simulation, and the necessary component models and parameterisations. This involves coding for simulation on future architectures, tools for managing storage, access, and workflows for petascale and exascale data, cloud computing and machine learning techniques applicable to environmental science, understanding/developing/improving big data analysis techniques in environmental science, and developing and implementing environmental information management systems.
- Deliver the NCAS Computational Modelling Services (CMS) unit which provides user support, software engineering, training and future computing research (day-to-day management is delivered by Dr Grenville Lister, my role is to set strategic directions, acquire funding, direct specific projects, and line-manage Grenville himself).
- Contribute to major community activities, including serving on advisory groups, and taking part in, and where necessary, leading relevant national and European activities and supporting the JASMIN management team.

Previously (often in a range of overlapping joint positions)

- 2005-2022: **Director** of Models and Data, U.K. National Centre for Atmospheric Science, STFC, UK.
- 2011-2022: JASMIN supercomputer **Director**, STFC, UK.
- 2005-2017: **Director** of the UK Centre for Environmental Data Archival, STFC, UK.
- 2000-2005: **Head** of the British Atmospheric Data Centre, STFC, UK.
- 1996-2000: Lecturer than **Senior Lecturer** in Physics at the University of Canterbury, NZ.
- 1990-1996: Post-Doc University of Oxford, U.K. then **Joint Research Fellow** with University of Oxford, Lady Margaret Hall, and the Rutherford Appleton Laboratory.

Education

- PhD University of Canterbury, NZ, 1990 (The Southern Hemisphere Middle Atmosphere: Climatology and Waves)
- BSc (First Class Honours), University of Canterbury, NZ, 1986.

Awards and Highlights

- Received the Royal Meteorological Society's 2022 Award for Innovation in Development of Computational Models, Tools or Visualisation.
- Impact case for the 2021 UKRI Research Excellence Framework included a letter form the Met Office which stated that "It is no understatement to conclude that your work has played a significant role in underpinning the science carried out globally which has led to the Paris Agreement and will lead to future global policy actions."
- Expert team member for supercomputer procurements: ARCHER (2012/13), ARCHER2 (2021/2022), UK Exascale platform (2023/2024).
- Awarded the Leptoukh Lecture by the American Geophysical Union for significant contributions to informatics, computational, or data sciences (2014)

Five Selected Research Grants

- EXPECT: Towards an integrated capability to explain and predict regional climate changes (European Commission; role: local coordinator, leading multiple tasks; four years from March 2024).
- ExcaliData: workflow and I/O technologies in support of the UK Excascale Software Programme, Excalibur – Principal Investigator on each of two projects (ExcaliWork and ExcaliStore) bid into the cross-cutting theme.
- IS-ENES3: Infrastructure for the European Network for Earth System Modelling – Project Lead Scientist (European Commission, from January 2019 – 2023) and predecessor, ISENES2.
- ESIWACE2: European Centre of Excellence in Weather and Climate Computing – Work Package Leader (European Commission, from January 2019 – 2023) and predecessor, ESIWACE .
- GRAPE: Global retrieval of ATSR cloud parameters and evaluation (completed 2007) – Co-Investigator

Community Service

Currently:

- Committee Member: NERC Digital Research Infrastructure Investment Board
- Committee Member: UKRI Excalibur: Steering Committee and EPSRC first round review panel
- Science Advisory Board: Barcelona Supercomputer Centre
- Advisory Panel: Computational and Information Systems Laboratory, NCAR, USA (Chair from 2019).
- Independent Advisory Panel: Deep South National Science Challenge NZ.
- Board Member & member of HPC and Data Task forces for European Network for Earth System Modelling (ENES).
- Governance Committee member of the Climate-Forecasts Conventions (https://cfconventions.org).

Previously

- Chair: JASMIN/CEDA Board.
- Chair: NERC High Performance Computing (HPC) Strategy Committee.
- Member of the World Climate Research Programme (WCRP) Working Group on Coupled Climate Modelling (WGCM) Information Panel (WIP).
- Committee member and Deputy Chair of the NERC Information Strategy Group.
- Institutional reviewer for Helmholtz Association Germany.
- Editorial Board of the *International Journal of Digital Curation* (Publisher: UK Digital Curation Centre).
- Editorial Board of *Scientific Data* (Publisher: Nature).
- Member of the Programme Development Group for the NERC Centre for Ecology and Hydrology (CEH).
- Member of the UK Engineering and Physical Sciences (EPSRC) Strategic Advisory Team on infrastructure.
- One of eight principal investigators of the Global Organisation for Earth System Science Portals (GO-ESSP, predecessor to, and instigator of, the Earth System Grid Federation, ESGF).

Ten Selected Publications

A full publication list is available at https://www.bnlawrence.net/publications/.
See also my google scholar profile.

Wordle word cloud generated from the titles of all my publications recorded at Google Scholar.

1. Senior, C.A., C.G Jones, R.A. Wood, A. Sellar, S. Belcher, A Klein-Tank, R. Sutton, J. Walton, **B.N. Lawrenc**e, T. Andrews, and J.P. Mulcahy (2020). UK Community Earth System Modelling for CMIP6. *J. Adv. Mod. Earth. Sys*, 12, e2019MS002004. doi:10.1029/2019MS002004.

2. Pascoe, C., **B.N. Lawrence**, E. Gjuilyardi, M. Juckes and K.E. Taylor (2020). Documenting numerical experiments in support of CMIP6. *Geosci. Mod. Dev*. 13, 2149–2167, doi: 10.5194/gmd-13-2149-2020

3. **Lawrence, B. N**., Rezny, M., Budich, R., Bauer, P., Behrens, J., Carter, M., … Wilson, S. (2018). Crossing the Chasm: How to Develop Weather and Climate Models for next Generation Computers? *Geosci. Mod. Dev.*, *11*(5), 1799–1821. doi:10.5194/gmd-11-1799-2018

4. Balaji, V., Taylor, K. E., Juckes, M., **Lawrence, B. N**., Durack, P. J., Lautenschlager, M., Blanton, C., Cinquini, L., Denvil, S., Elkington, M., Guglielmo, F., Guilyardi, E., Hassell, D., Kharin, S., Kindermann, S., Nikonov, S., Radhakrishnan, A., Stockhause, M., Weigel, T., & Williams, D. (2018). Requirements for a global data infrastructure in support of CMIP6. *Geoscientific Model Development*, *11*, 3659–3680. doi:10.5194/gmd-11-3659-2018

5. Hassell, D., J. Gregory, J. Blower, **B.N. Lawrence**, and K.E. Taylor (2017). A Data Model of the Climate and Forecast Metadata Conventions (CF-1.6) with a Software Implementation (Cf-Python v2.1). *Geosci. Mod. Dev.*, *10*(12), 4619–4646. doi:10.5194/gmd-10-4619-2017

6. Balaji, V., E. Maisonnave, N. Zadeh, **B. Lawrence**, J. Biercamp, U. Fladrich, G. Aloisio, R. Benson, A. Caubel, J. Durachta, M.-A. Foujols, G. Lister, S. Mocavero, S. Underwood, and G. Wright (2017). CPMIP: Measurements of Real Computational Performance of Earth System Models. *Geosci. Mod. Dev.*, 10, 19-34, doi:10.5194/gmd-10-19-2017

7. **Lawrence, B.N**. , V.L. Bennett, J. Churchill, M. Juckes, P. Kershaw, S. Pascoe, S. Pepler, M. Pritchard, and A. Stephens (2013). Storing and manipulating environmental big data with JASMIN. *Proceedings of IEEE Big Data, 2013,* doi:10.1109/BigData.2013.6691556

8. **B. Lawrence**, S. Pepler, C. Jones, B. Matthews, and Callaghan, S. (2011). Citation and Peer Review of Data: Moving Towards Formal Data Publication. *International Journal of Digital Curation*, vol. 6, no. 2. doi:10.2218/ijdc.v6i2.205

9. **B.N. Lawrence**, R. Lowry, P. Miller, H. Snaith, and A. Woolf (2009): Information in environmental data grids. *Phil. Trans. R. Soc. A,* 367, 1003 – 1014. doi:10.1098/rsta.2008.0237

10. Dean, S.M., and J. Flowerdew, **B.N. Lawrence** and S.D. Eckermann (2006): Parameterisation of Orographic Cloud Dynamics in a GCM. *Climate Dynamics*, 28, pp581-597. doi:10.1007/s00382-006-0202-0