ANDREW STYLES

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Atmospheric, Oceanic and Planetary Physics
University of Oxford
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EDUCATION

2019 - present
University of Oxford, UK
DPhil (PhD) in Physical Oceanography

2015 - 2019
University of Oxford, UK
Master's degree in Physics (MPhys)
Physics of the Atmospheres and Oceans major option
Theoretical Physics major option
First Class Honours (75%)

RESEARCH EXPERIENCE

2019 - present
DPhil Project
Ocean Physics group, University of Oxford

'The dynamics of the Weddell Gyre'
Supervisors: Prof. David Marshall and Dr. Mike Bell

Project Aim: To study the leading order dynamics of the Weddell Gyre. Vorticity budgets, idealized models, and Lagrangian trajectory analyses are used to identify internal forces and surface boundary conditions that constrain the horizontal circulation.

October 2018 - April 2019
MPhys Project
Geophysical Fluid Dynamics group, University of Oxford

'A laboratory model of the oceanic meridional overturning circulation'
Supervisor: Prof. Peter Read

Project Aim: To study the dynamical processes in a laboratory annulus experiment acting as an analogue to the North Atlantic basin. Infrared imaging and particle imaging velocimetry are used to study the development and stability of western boundary currents.

July 2018 – September 2018
Undergraduate Research Project
National Centre for Earth Observation, University of Leicester

'Investigating trace gas concentrations during the 2017 Boreal wildfire season'
Supervisors: Dr. Jeremy Harrison and Dr. David Moore

Project Aim: To estimate trace gas concentrations during the 2017 Boreal wildfire seasons using the Reference Forward Model (RFM) and spectra collected by the Infrared Atmospheric Sounding Intrerferometer (IASI).

PUBLICATIONS

Sallée, J. B., and co-authors including **Styles, A. F.** (2023). Southern Ocean Carbon and Heat Impact on Climate. *Philosophical Transactions of the Royal Society A, 381*(2249), 20220056. http://doi.org/10.1098/rsta.2022.0056

Styles, A. F., Bell, M. J., Marshall, D. P., & Storkey, D. (2022). Spurious forces can dominate the vorticity budget of ocean gyres on the C-grid. *Journal of Advances in Modeling Earth Systems*, 14, e2021MS002884. https://doi.org/10.1029/2021MS002884

Styles, A. F., Marshall, D. P., Bell, M. J. The Sensitivity of an Idealized Weddell Gyre to Horizontal Resolution. *Journal of Geophysical Research: Oceans* (Submitted)
Preprint: https://doi.org/10.22541/essoar.167591042.21189159/v1

AWARDS

2023 — **Elsevier Presentation Award**
Received award for an exceptional presentation at the NERC DTP student conference, sponsored by Elsevier.

2023 — **Outstanding Student Presentation Award (OSPA)**
Received outstanding presentation prize at the AGU 2022 Fall meeting.

2022 — **Outstanding Presentation Award**
Received best talk prize at the Challenger Society Ocean Modelling annual meeting.

2019 - 2023 — **NERC Studentship**
Awarded a fully funded place on the NERC Environmental Research DTP at the University of Oxford covering tuition, stipend, and research grant (Approx. £100,000).

2019 - 2023 — **Met Office CASE Studentship**
Awarded a minimum of £1000 per year towards my DPhil project. Access granted to Met Office computational resources and expertise.

July 2018 – September 2018 — **SURE Summer Studentship**
Awarded funding to carry out summer research project at the University of Leicester (approx £1500).

2015 – 2019 — **Undergraduate Awards**
Received the Met Office Academic Partnership prize (2019) for MPhys research project.
Awarded a Lincoln College Exhibitioner prize (2016), a Scholarship prize (2017), and a Lord Crewe Scholarship prize (2018) for exceptional performance in examinations.

RELEVANT RESEARCH SKILLS

- Numerical modelling of geophysical flows using the *NEMO Community Ocean Model* and *MITgcm.*
- Data analysis and visualization in *Python*, including the use of *Dask* when handling large datasets.
- Deploying and analyzing Lagrangian particle trajectories with *TRACMASS.*
- Open-source software development, including the use of *git* and automated testing.
- Created a diagnostic software package, *VCAN*, which is being actively developed.
- Experienced user of: *Python, Fortran, MATLAB, Julia, RStudio,* and *IDL.*

- Experienced user of Linux HPC systems such as *ARCHER2* and *Monsoon2*.
- Award-winning public speaker and finalist at Nottingham University's national debating competition.

INVITED TALKS

May 2023 (upcoming)	British Antarctic Survey, Cambridge, UK
April 2023	Met Office, Exeter, UK
March 2023	University of Liverpool, Liverpool, UK
November 2022	Sorbonne Université, Paris, France
October 2022	University of Exeter, Exeter, UK
May 2021	Met Office, Exeter, UK

TEACHING

2020 – 2022 **Tutor at the University of Oxford**

Conducted tutorials and classes for undergraduate students.

Taught third-year fluid dynamics course for physicists and third-year vector calculus course for earth scientists.

Responsible for the setting and marking of exams.

2020 – 2022 **Demonstrator at the University of Oxford**

Demonstrated for the postgraduate *Advanced Quantitative Methods* course. The course explores numerical methods used in contemporary and historic climate models.

February 2017 – March 2017 **Teaching Physics in Schools**

Participated in a six week programme to research student misconceptions in physics at a local state school.

Taught A-level, GCSE, and Key Stage 3 classes.

OUTREACH

March 2023 **Super Science Saturday: "Connected Planet"**

Organised an outreach activity at the Oxford University Museum of Natural History.

Introduced primary school students to the idea of a connected ocean – focusing on coral reef connectivity and ocean plastics.

2017 – 2019 **UNIQ Summer School**

Academic and pastoral responsibility for prospective physics students from disadvantaged backgrounds.

Lead workshops on university applications and interview skills.

SERVICE

2022 – Present **Peer Review**

Reviewer for the *Journal of Advances in Modeling Earth Systems* and *Ocean Dynamics*.

2022 – Present **DPhil Student Representative**

Representing student interests on the Atmospheric, Oceanic and Planetary Physics sub-department committee.

2022 – Present **Working Group on EDI**

Leading efforts to monitor and improve EDI within the Atmospheric, Oceanic and Planetary Physics sub-department.

2022 – Present **Computing Committee**

Working to improve the computational resources available to the Atmospheric, Oceanic and Planetary Physics sub-department.

GRADUATE COURSES

- *Ocean Circulation*, University of Oxford (2020)
- *Geophysical Fluid Dynamics,* University of Oxford (2020)
- *Continuous Integration in Software Development*, University of Oxford (2020)
- *HPC: Introduction to Advanced Research Computing and Effective Cluster Use*, University of Oxford (2020)
- *Advanced Quantitative Methods*, University of Oxford (2019)
- *Scientific Writing and Presentations*, University of Oxford (2019)

PRESENTATIONS (*** talk // * poster)

December 2022	AGU General Assembly 2022 ***, *
September 2022	Challenger Society Ocean Modelling meeting ***
May 2022	EGU General Assembly 2022 ***
September 2021	Challenger Society Ocean Modelling meeting ***
April 2021	EGU General Assembly 2021 ***

HOBBIES AND INTERESTS

- Self-taught pianist, with a speciality in jazz and blues.
- Member of my local cricket team
- Organise fortnightly social events for my sub-department.

REFEREES

Prof. David Marshall
University of Oxford
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david.marshall@physics.ox.ac.uk

Dr. Mike Bell
Met Office,
Fitzroy Road, Exeter, EX1 3PB
mike.bell@metoffice.gov.uk