Curriculum Vitae: Frazer D.W. Christie, MA, PhD

Contact Information

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Personal Information

Nationality	British
Birth	23rd September 1992
Languages	English

Research Interests

Glaciology; glacier and ice sheet dynamics; polar remote sensing and geophysics; SAR interferometry; polar oceanography; meteorology; hydrography & geomorphology; near-real time/operational remote sensing.

Employment

2021-*present*	Postdoctoral Associate, Jesus College, Cambridge, UK.
2018-*present*	Postdoctoral Research Associate in Glaciology, Scott Polar Research Institute, University of Cambridge, UK.
2014-2018	Academic Tutor and Demonstrator, School of GeoSciences, University of Edinburgh, UK.
2013-2014	Summer Placement Student, Department of Geomatics & Remote Sensing, Shell UK Ltd.
2009-2019	Pilot (Reserve), No.2 Flying Training School, Royal Air Force, UK.

Education

2014-2018	PhD in Glaciology & Earth Observation, University of Edinburgh, UK.
2017-2018	Visiting Scholar, Dept. of Earth & Space Sciences, University of Washington, Seattle, USA.
2016-2016	European Space Agency's 1st Advanced Training Course on Remote Sensing of the Cryosphere, University of Leeds, UK.
2015-2015	AG-825 Intensive Field Course in Glaciology, University Centre in Svalbard, Norway.
2010-2014	MA in Geography (First Class Hons.), University of Aberdeen, UK.

Publications (*** denotes student works supervised; §§§ denotes potential REF26 contribution)

Published

1. §§§ Batchelor, C.L., **Christie, F.D.W.**, Ottesen, D., Montelli, A., Evans, J., Dowdeswell, E.K., Bjarnadóttir, L.R., & Dowdeswell, J.A. (2023). Rapid, buoyancy-driven ice-sheet retreat of hundreds of metres per day, ***Nature***. (*IF=69.5*).
2. Batchelor, C.L., & **Christie, F.D.W.** (2023). How rapidly can ice sheets retreat? ***Nature***. (*IF=69.5*).
3. §§§ **Christie, F.D.W.**, Steig, E.J., Gourmelen, N., Tett, S.F.B., & Bingham, R.G. (2023a). Inter-decadal climate variability induces differential ice response along Pacific-facing West Antarctica, ***Nature Communications***, 14(93), 1–11. (*IF=17.7*).
4. Frinault, A.V., **Christie, F.D.W.**, Fawcett, S.E., Flynn, R. F., Hutchinson, K.A., Montes Strevens, C.M.J., Taylor, M.L., Woodall, L.C. & Barnes, D.K.A. (2022). Antarctic Seabed Assemblages in an Ice-Shelf-Adjacent Polynya, Western Weddell Sea, ***Biology***, 11(1705), 1–28. (*IF=5.2*).
5. ***§§§ Boxall, K., **Christie., F.D.W.**, Willis, I.C., Wuite, J., & Nagler, T. (2022a), Seasonal land ice-flow variability in the Antarctic Peninsula, ***Cryosphere***, 16, 3907–3932. (*IF=5.8*).
6. Batchelor, C.L., Frinault, B.A.V., **Christie, F.D.W.**, Montelli, A., & Dowdeswell, J. A. (2022). The morphology of pockmarks on the northeast Antarctic Peninsula continental shelf, ***Antarctic Science***, 34(4), 313–324. (*IF=1.4*).
7. §§§ **Christie, F.D.W.**, Benham, T.J., Batchelor, C.L., Rack, W., Montelli, A., & Dowdeswell, J. A. (2022a). Antarctic ice-shelf advance driven by anomalous atmospheric and sea-ice circulation, ***Nature Geoscience***, 15, 356–362. (*IF=21.5*).

8. Batchelor, C.L., Montelli, A., Ottesen, D., Dowdeswell, E.K., Evans, J., **Christie, F.D.W.** & Dowdeswell, J.A. (2020). New insights into the formation of submarine glacial landforms from high resolution geophysical data acquired from Autonomous Underwater Vehicles. ***Geomorphology***, 370, 107396. (*IF=3.8*).

9. Dowdeswell, J.A, Batchelor, C.L., Montelli, A., Ottesen, D., **Christie, F.D.W.**, Dowdeswell, E.K., & Evans, J. (2020b). Delicate seafloor landforms reveal past Antarctic grounding-line retreat of kilometers per year, ***Science***, 368(6494), 1020–1024. (*IF=63.7*).

10. Dowdeswell, J.A, Batchelor, C.L., Dorschel, B., Benham, T.J., **Christie, F.D.W.**, Dowdeswell, E.K., Arndt, J.E., & Gebhardt, C. (2020a). Sea-floor and sea-ice conditions in the western Weddell Sea, Antarctica, around the wreck of Sir Ernest Shackleton's Endurance, ***Antarctic Science***, 32(4), 301–313. (*IF=1.4*).

11. **Christie, F.D.W.**, Bingham, R.G., Gourmelen, N., Steig, E.J., Bisset, R.R., Pritchard, H., Snow, K., & Tett, S.F.B. (2018). Glacier change along West Antarctica's Marie Byrd Land Sector and links to inter-decadal atmosphere–ocean variability, ***Cryosphere***, 12, 2461–2479. (*IF=5.8*).

12. **Christie, F.D.W.**, Bingham, R.G., Gourmelen, N., Tett, S.F.B. & Muto, A. (2016). Four-decade record of pervasive grounding line retreat along the Bellingshausen margin of West Antarctica, ***Geophysical Research Letters***, 43, 5741–5749. (*IF=5.6*).

Forthcoming

13. **§§§** Hanna, E., **Christie, F.D.W.**, & 27 others. (2023). Ice Sheets: Weather versus Climate. Under review for ***Nature Reviews Earth & Environment*** (invited contribution). (*IF=37.2*).

14. ******* Deakin, K.A., ***Christie, F.D.W.***, Boxall, K., & Willis, I.C. (2023). Oscillatory response of Larsen C Ice Shelf flow to the calving of iceberg A-68, under minor revisions for ***Journal of Glaciology***. (*IF=4.3*).

15. ******* Boxall, K., **Christie, F.D.W.**, Willis, I.C., Wuite, J., & Nagler, T. Surface and oceanic drivers of seasonal land-ice-flow variability in the Antarctic Peninsula, final prep. for ***Journal of Geophysical Research***. (*IF=4.4*).

16. Benham, T.J., **Christie, F.D.W.**, & Dowdeswell, J.A. (2023). A new sea ice classification algorithm based on moderate-resolution optical and thermal satellite imagery, final prep. for ***Remote Sensing of Environment***. (*IF=13.6*).

Published datasets currently in use by the scientific community

17. **Christie, F.D.W.**, Steig, E.J., Gourmelen, N., Tett, S.F.B., & Bingham, R.G. (2023b). *Grounding-line and ice-flow change observations along West Antarctica's Pacific-facing margin, 2003-2015*, supporting 'Inter-decadal climate variability induces differential ice response along Pacific-facing West Antarctica'. *Cambridge Apollo Data Repository.*

18. ******* Boxall, K., **Christie., F.D.W.**, Willis, I.C., Wuite, J., & Nagler, T. (2022b). *West Antarctic Peninsula grounding line location datasets* supporting 'Seasonal land ice-flow variability in the Antarctic Peninsula'. *Cambridge Apollo Data Repository.*

19. ******* Boxall, K., **Christie., F.D.W.**, Willis, I.C., Wuite, J., & Nagler, T. (2022c). *West Antarctic Peninsula seasonal ice velocity products* supporting 'Seasonal land ice-flow variability in the Antarctic Peninsula'. *Cambridge Apollo Data Repository*.

20. **Christie, F.D.W.**, Benham, T.J., Batchelor, C.L., Rack, W., Montelli, A., & Dowdeswell, J. A. (2022b). *Antarctic Grounding Line Location from Sentinel-1a/b double-difference interferometry, 2019*, supporting 'Antarctic ice-shelf advance driven by anomalous atmospheric and sea-ice circulation'. *Cambridge Apollo Data Repository*.

21. **Christie, F.D.W.**, Benham, T.J., Batchelor, C.L., Rack, W., Montelli, A., & Dowdeswell, J. A. (2022c). *Antarctic Ice Front positions, 1979-2021,* supporting 'Antarctic ice-shelf advance driven by anomalous atmospheric and sea-ice circulation'. *Cambridge Apollo Data Repository*.

22. **Christie, F.D.W.**, Bingham, R.G., & Bisset, R.R. (2018). *Grounding line, ice frontal position and coastal ice masks for the Marie Byrd Land Sector of West Antarctica, 2003-2015*. PANGAEA.

Research funding obtained

2020-2023 'Grounding-zone flux observations at a continental scale: the Antarctic Ice Sheet'. Conceived, co-wrote and co-managed research grant (PI Prof. Julian Dowdeswell) funded by The Prince Albert II of Monaco Foundation, €237,048 (competitively funded).

2016 SAGES+ Postdoctoral & Early Career Researcher Exchange Research Grant. Wrote successful application to fund an extended research visit to the Department of Earth & Space Sciences, University of Washington, Seattle, to work with Prof. Eric Steig, £3,668 (competitively funded).

2014-2018	Carnegie Trust for the Universities of Scotland Carnegie PhD Scholarship. Co-conceived and wrote a successful application to fund PhD research (PI. Prof. Rob Bingham), £63,288 (competitively funded; 2014 success rate 6.9%).

Smaller Research Grants, Awards & Scholarships

2019	*SAGES+ award for best 2017/2018* publication in the field *of Atmosphere, Oceans and Climate*.
2019	University of Edinburgh Professional Development Scholarship. Additional funding to support doctoral studies, £3,750 (competitively funded).
2017	E^3 Doctoral Training Partnership Overseas Research Visit Fund to facilitate continued research collaboration with the University of Washington, Seattle, £900 (competitively funded).
2017	*SAGES+ award for best 2016/2017* publication in the field *of Atmosphere, Oceans and Climate*.
2017	SAGES+ Small Grant to attend the International Glaciological Society Annual International Symposium, Boulder, Colorado, £750.00 (competitively funded).
2017	Trans-Antarctic Association Small Grant to attend the International Glaciological Society Annual International Symposium, Boulder, Colorado, £1,500 (competitively funded).
2016	European Commission award to attend the 2016 ESA Living Planet Symposium, Prague, €300 (competitively funded).
2015	NASA/NSF Early Career Researcher Grant to attend West Antarctic Ice Sheet Initiative Meeting, Loveland, Colorado, $1500 (competitively funded).
2014	University of Edinburgh Professional Development Scholarship. Additional funding to support Carnegie Trust PhD Scholarship (competitively funded).
2014	NERC E^3 Doctoral Training Partnership PhD scholarship. Fully funded, competitively awarded PhD scholarship (later declined upon award of prestigious Carnegie Trust PhD scholarship).
2014	Scottish Funding Council Highly Skilled Workforce Scholarship. Competitive scholarship to waive tuition fees associated with the MSc in GIS course offered by UoE (course place and funding later declined upon award of Carnegie Trust PhD scholarship).
2014	Royal Scottish Geographical Society's Silver Medal (now University medal). Awarded to the highest achieving Honours-level Geography student in each of the Scottish universities.
2014	O'Dell Memorial Prize in Geography (Aberd.). Awarded to the student who attains the highest standard of dissertation presented as part of the requirements for the degree of MA with Honours in Geography.
2014	Royal Scottish Geographical Society's Walton Prize. Awarded to the author of the best thesis in the field of Physical Geography in Scotland for academic year 2013/2014.

Teaching & Lecturing Experience (Course, Level)

2019-*present*	*Polar Remote Sensing* (successful course design, practical delivery, lecturing & assessment in support of the MPhil in Polar Studies programme)	Postgraduate (Cantab. MPhil)
2019-*present*	*The Cryosphere* (led small group teaching & assessment in support of Part 1A: Paper 2: Environmental Processes & Change)	Undergraduate (Cantab. BA)
2016-2017	*Principles & Practice in Remote Sensing* (lecturing and contribution to lab-based practical delivery)	Postgraduate (Edin. MSc(R))
2016-2017	*Fundamental Methods in Geography* (contribution to lab-based practical delivery)	Postgraduate (Edin. MSc(R))
2016-2017	*Geomorphology* (led small group tutorials)	Undergraduate (Edin. MA/BSc)
2016-2017	*Geophysical Techniques* (contribution to field- and lab-based practical delivery)	Postgraduate (Edin. MSc(R))
2016-2017	*Ice & Climate* (lecturing and contribution to lab-based practical delivery)	Undergraduate (Edin. MA/BSc)
2016-2017	*Fundamentals for Remote Sensing* (contribution to lab-based practical delivery)	Postgraduate (Edin. MSc(R))
2016	*Near-ground Earth Observation* (contribution to lab-based practical delivery)	Postgraduate (Edin. MSc(R))
2015-2017	*Glacial Processes & Geomorphology* (contribution to field- and lab-based practical delivery)	Undergraduate (Edin. MA/BSc)

2015-2017	*Quantitative Methods in Earth Science* (course administrator & contribution to lab-based practical delivery)	Undergraduate (Edin. MA/BSc)
2015-2017	*Principles of Geographic Information Systems* (contribution to lab-based practical delivery)	Postgraduate (Edin. MSc(R))

Students Supervised (*** denotes my current students)

2020-*present*	Miss Karla Boxall***	MPhil (Cantab.), now PhD candidate (NERC DTP)
2020-*present*	Mr. Nicholas Homer***	MPhil (Cantab.), now PhD candidate (SENSE DTP)
2022-2023	Miss. Anna Kelly***	BA (Cantab.)
2020-2022	Miss. Katherine Deakin	BA, MPhil (Cantab.)
2016-2022	Dr. Rosie Bisset	BSc, PhD (Edin.)
2016-2017	Miss. Kyrah McKensie	MScR (Edin.)
2015-2016	Miss Catriona Knott	MEarthSci (Edin.)

Academic Service & Adminstration

2021-*present*	University of Cambridge 'Data Champion', advising members of the university community on proper handling of research data, good research data management and FAIR principles.
2018-*present*	Assistant and (lately) lead Geographical Tripos Admissions Interviewer (Physical Geography) for Jesus College, Cambridge, UK.
2014-*present*	Reviewer for numerous journals including *Nature Communications, Geophysical Research Letters*, *The Cryosphere*, *Journal of Geophysical Research* and *Remote Sensing of Environment*.
2022	Session convenor, International Glaciological Society's British Branch Annual General Meeting. Convened a successful session on cutting-edge Antarctic & Greenlandic glaciology attended by over 100 predominantly UK-based scientists.
2020	Session convenor, European Geosciences Union General Assembly 2020. Co-organised and convened a successful session on ice sheet ice-ocean-climate interactions attended by over 200 leading international scientists, journalists and policy makers.
2019-2020	Expert Reviewer (solicited). First and Second Order Draft of the Working Group II contribution to the IPCC Sixth Assessment Report: *Climate Change 2021: Impacts, Adaptation and vulnerability*.

Fieldwork Experience

2019	Weddell Sea Expedition 2019. Glaciologist and on-board satellite remote sensing expert assisting with safe vessel navigation and geophysical mission planning in the dense sea ice of the Weddell Sea, Antarctica.
2015	Geomorphological survey of the Horgardalur Valley, Iceland, for paleo-environmental reconstruction. Field-assistant.
2015	Ice-penetrating radar traverses across numerous sea-ice and glacier settings, Svalbard. Field assistant.

Outreach

Science communication – selected invited presentations

2019	*Climate Change and the Antarctic Ice Sheet*. Invited lecture at the inaugural Scott Polar Research Institute/Polar Museum '*Climate Curation Project*' for A-level students, Cambridge, England.
2018	*Graham Land, Antarctica: Recent research, and a view to the future.* Invited lecture at the 6th Progeny reunion of the British Graham Land Expedition,1934-1937.
2017	*Glacier change along West Antarctica's Marie Byrd Land Sector and links to atmosphere–ocean variability*. Invited lecture at the Applied Physics Laboratory, University of Washington, Seattle.
2015	*Constraining Ice, Ocean and Climate Interactions in the Bellingshausen Sea Sector of West Antarctica*. Invited lecture at the Royal Scottish Geographical Society.

Science communication – example public engagement

2023	*Ice from above: Exploring our icy world from the sky and space*. Consultation and production of display materials for SPRI's newest exhibit on Earth Observation of the polar regions.
2020	*Scott Polar Research Institute: A Century of Polar Research*. Creation of various graphics, animations, and other materials in support of SPRI's centenary celebration exhibition. (Approximate exposure ~50,000 visitors).

2019 *Walking on Thin Ice: Co-operation in the face of a changing climate*. Contribution to the A-level student-led exhibition resulting from the 'Climate Curation Project' listed below. (Approximate exposure ~25,000 visitors).

Other diversity, inclusion and widening participation efforts

2022 Provision of several Geography Tripos 'taster supervisions' as part of Jesus College's '*HE+ Residential programme*' for Year 12 A-level students from the Tyne & Wear region (Jesus' target link area).

Skills & Technical Abilities

General

Proficient in the use of numerous geospatial software packages (ESRI ArcMap, QGIS, GMT, ENVI, GDAL etc.) and programming languages (e.g. MATLAB, Python, Java) for the processing, reduction and visualisation of data.

In-depth knowledge of Earth Observation data repositories and access protocols (e.g. USGS Earth Explorer; ESA EO-CAT; ESA EOLI-SA, ASF etc.).

Technical

Extensive experience in the automated processing and analysis of a wide array of satellite datasets (including e.g., Landsat, ERS-1/2, Sentinel-1/2, MODIS, ENVISAT and Worldview imagery).

Extensive knowledge and experience of SAR processing (GAMMA, GMTSAR, SNAP, snaphu) for a range of applications including the generation of interferograms, DEMs and motion maps.

Experience using Google Earth Engine for cloud-based processing of very large datasets.

Experience with Agisoft Photoscan for the creation of Photogrammetry/Structure from Motion (SfM)-derived DEMs/DSMs.

Field experience utilising a range of in-situ geophysical survey techniques (including Seismic, GPR, sonar, HiSAS).

Experienced in the acquisition, processing and critical interpretation of climate and ocean model and reanalysis datasets.

References

1. **Prof. Julian Dowdeswell** (Line manager and former Director of Scott Polar Research Institute; Buckley Fellow in Polar Sciences, Jesus College, Cambridge); jd16@cam.ac.uk.
2. **Prof. Robert Bingham** (PhD supervisor and Personal Chair of Glaciology & Geophysics, School of GeoSciences, University of Edinburgh); r.bingham@ed.ac.uk
3. **Prof. Eric Steig** (Professor of Glaciology and Isotope Geochemistry and Chair of the Department of Earth & Space Sciences, University of Washington, Seattle); steig@uw.edu