

IAN M. BROOKS

School of Earth & Environment, University of Leeds, Leeds, UK

Phone: +44(0)113 343 6743 | email: i.brooks@see.leeds.ac.uk

EMPLOYMENT

- 2014–Present: University of Leeds, Leeds, UK
Professor of Boundary Layer Processes
- 2010–2014: University of Leeds, Leeds, UK
Senior Lecturer in Atmospheric Science
- 2008–2010: University of Leeds, Leeds, UK
Lecturer in Atmospheric Science
- 2002–2008: University of Leeds, Leeds, UK
University Research Fellow
- 1998–2002: Scripps Institution of Oceanography, University of California, San Diego, USA
Assistant Project Scientist
- 1994–1998: Scripps Institution of Oceanography, University of California, San Diego, USA
Post-doctoral Research Assistant
- 1993–1994: University of Manchester Institute of Science and Technology, UK
Post-doctoral Research Assistant
- 1990–1993: University of Manchester Institute of Science and Technology, UK
Graduate Research Assistant

EDUCATION

- 1990–1993: University of Manchester Institute of Science and Technology, UK
Ph.D. in Atmospheric Physics – Laboratory Studies of Thunderstorm Electrification Processes
- 1987–1990: University of Manchester Institute of Science and Technology, UK
B.Sc. Pure and Applied Physics (Hons, 1st class)
(course prize 1988, 1989, 1990; Henry Lipson Prize for best final year research project)

GRANTS FUNDED

- O3-SML (CoI)
Contribution to project at University of York (PI Lucy Carpenter)
ERC, £42,750 (to Leeds), 1/1/2020 – 31/12/2021
- Characterising and Interpreting Fluxes Over Sea Ice (CANDIFLOS)(PI)
Joint project with UEA and NOC
NERC, £392,500 (to Leeds), £755,680 (total), 1/1/2019–31/12/2021
- The Integrated Characterization of Energy, Clouds, Atmospheric state, and Precipitation at Summit, Aerosol-Cloud Experiment (ICECAPS-ACE) (CoI)
Collaboration with Washington State Univ, Univ of Colorado, Boulder, Univ of Wisconsin, Madison.
NERC/NSF, £299,500, 1/7/2018–31/8/2020
- MOSAIC Boundary Layer (PI)
Collaboration with University of Colorado CIRES/NOAA & University of Trier
NERC, £370,000, 01/04/2019–31/03/2022
- MOCCHA Analysis of Dynamics, Cloud, and Aerosol Processes (PI)
Collaboration with Stockholm University
NERC, £798,525, 01/04/2018 – 31/03/2021

Tethered balloon turbulence measurements (PI).
 US Department of Energy ARM programme, £21,500, 1/6/2016 – 31/1/2017

Improved surface exchange in marginal-ice-zones for weather and climate models (CoI)
 Joint proposal with UEA to implement results from ACCACIA in MetOffice Unified Model
 NERC Knowledge Exchange grant, £13,000, 01/06/2015 – 31/08/2015

Arctic Cloud Surface Response Experiment, December 2012 (PI). A Collaboration with Stockholm University and University of Colorado CIRES/NOAA Earth System Research Laboratory.
 NERC, £822,000, 01/08/2013 – 31/01/2017

Turbulent Exchange: Aerosols, Bubbles And Gases, August 2012 (PI).
 Joint proposal with NOC and the University of Southampton. A contribution to a US air-sea gas exchange study with partners at University of Hawai'i, NOAA Earth System Research Laboratory (Boulder, CO), UC Irvine, University at Albany SUNY.
 NERC, £475,500 (to Leeds), £1.3M (total), 01/06/2012 – 31/07/2014

Blowing snow and sea ice surfaces as a source of polar sea salt aerosol (BLOWSEA), June 2012, (CoI).
 Joint proposal with BAS and University of Cambridge.
 NERC, £93,600, 01/12/2012 – 30/05/2015

Aerosol-Cloud Coupling And Climate Interactions in the Arctic (ACCACIA)(PI). Consortium proposal with: University of Manchester, University of York, UEA, British Antarctic Survey, and the Met Office + international partners at NOAA Earth System Research Laboratory (Boulder, CO), University of Oslo (Norway), and Max Planck Institute for Meteorology (Hamburg).
 NERC, £313,500 (to Leeds), £3M (total), 01/04/2012 – 31/3/2016

Arctic Summer Cloud-Ocean Study (ASCOS) Analysis, July 2010, (PI). Collaboration with University of Stockholm, NOAA Earth System Research Laboratory, and UK Met Office
 NERC, £388,700, 01/09/2010 – 31/08/2013

Air-Sea Interaction and Sea-spray in Typhoons (ASIST), January 2010, (PI) Collaborative project with Rosenstiel School of Marine and Atmospheric Science, University of Miami
 NERC, £488,500, 01/02/2010 – 30/9/2013

Waves, Aerosol and Gas Exchange Study (WAGES), Dec 2008, (PI) Joint with National Oceanography Centre, Southampton (CoIs: M. Srokosz, M. Yelland, C. Gommenginger)
 NERC, £539,000 (to Leeds), £1.2M (total), 01/08/2009 – 31/3/2013

Physical Exchange at the Air-Sea Interface: Synthesis and Dissemination, April 2008, (PI)
 NERC, £35,400, 01/09/2008 – 31/05/2010

Modelling Studies of Arctic Stratus, February 2008, (PI)
 NERC CASE PhD Studentship with Met Office, £74,000, 01/10/2008 – 31/3/2012

Southern Ocean Sea-spray Aerosol Flux Experiment (SO-SAFE), December 2007, (PI) Collaborative project with Rosenstiel School of Marine and Atmospheric Science, University of Miami
 NERC, £53,126, 01/01/2008 – 31/12/2009

Turbulent Exchange in the Arctic Boundary Layer, December 2006, (PI). Contribution to a major International Polar Year project (ASCOS) with 14 international partners.
 NERC, £97,600, 01/08/2007 – 31/12/2010

T-REX : Turbulence and Surface Energy Budget, February 2006, (PI)
 NCAS, £37,700, 01/03/2006 – 28/02/2007,

Atmosphere-canopy interaction over complex terrain, June 2005, (CoI with A. Ross (PI) & S. Mobbs)
 NERC, £235,500, 01/10/2005 – 30/09/2008

Field Observations of Sea Spray, Gas Fluxes and Whitecaps (SEASAW), May 2005, (PI)
 NERC, £217,500, 01/07/2006 – 31/12/2009

FAAM: Turbulence Probe Development, August 2003, (PI), Joint project with Met Office UMIST Ventures (NERC Subcontract), £40,000, 1/9/2003 – 31/3/2005

Initial feasibility study of the use of spray turbines to increase rain in drought-stricken regions, October 2002, (CoI, with S. Salter (Edinburgh University, PI) and S. D. Mobbs)
 EPSRC, £51,900, 1/3/2003 – 28/2/2004

Entrainment Processes at the top of the stable marine atmospheric boundary layer, March 2001, (PI)
US National Science Foundation, \$69,900
Turbulence Processes in the Stable Marine Atmospheric Boundary Layer, Nov 2000, (PI)
US Office of Naval Research, \$118,500

PROFESSIONAL AFFILIATIONS & ACTIVITIES

SERVICE

Grant proposal reviewer for: UK Natural Environment Research Council (NERC), The Leverhulme Trust, US National Science Foundation (NSF), US National Oceanographic and Atmospheric Administration (NOAA), Deutsche Forschungsgemeinschaft (German Research Foundation), Swiss Super Computer Centre (atmospheric science), Research Council of Norway, Swedish Research Council; Knut & Alice Wallenberg Foundation, Sweden; Austrian Science Fund (FWF).

Member of NERC Peer Review College (2014-present)

Member of review committee for the Natural Science and Engineering Research Council of Canada's Climate Change and Atmospheric Research initiative (Aug 2012 – Aug 2013)

Member of peer review panel for the Research Council of Norway (2015-2017)

Member of Leeds University internal review panel for NERC proposals (2015 – current)

Journal peer reviewer for: Geophysical Research Letters, Journal of Geophysical Research (Atmospheres, Oceans, Earth Surface), Quarterly Journal of the Royal Meteorological Society, Journal of Applied Meteorology, Journal of the Atmospheric Sciences, Journal of Atmospheric and Oceanic Technology, Journal of Physical Oceanography, Boundary-Layer Meteorology, Atmospheric Research, Atmospheric Science Letters, Applied Optics, Journal of Operational Oceanography, Atmospheric Chemistry & Physics, Polar Record, Advances in Meteorology, Atmospheric Measurement Techniques, Earth System Science Data, Journal of Advances in Modelling Earth Systems, Polar Research.

Member of the American Meteorological Society's Committee on Boundary Layers and Turbulence (2013-2019)

Member of the UK Arctic-Antarctic Partnership (UKAAP) steering committee (2017-current)

Invited participant in Norwegian-British Workshop on Arctic Marine Science, Tromsø, 17-18 June 2014.

UK Atmospheric science representative on the Science User Group to develop specification of requirements for new NERC polar research vessel RRS *Sir David Attenborough* (2014-current).

Member of meteorological instrumentation working group for the UK Facility for Airborne Atmospheric Measurements (FAAM) (2014-current)

Associate Editor, Atmospheric Chemistry and Physics/Ocean Science/Atmospheric Measurement Techniques joint ASCOS project special issue (2010-2013)

Member of the Surface Observations Working Group of the NERC/MetOffice Joint Weather & Climate Research Programme (JWCRP) Joint Facilities Group.

Organiser and Co-Chair, American Meteorological Society's 21st Conference on Boundary Layers and Turbulence, Leeds, June 9-13, 2014.

Organiser & Co-Chair, UK Arctic Science Conference, Leeds, September 14-16, 2011.

Joint Organiser and Chair, EU-COST SOLAS Workshop on Primary Marine Aerosol Fluxes, NUI Galway, May 10-11, 2010

Conference Session Chair: AMS 15th Conference on Air-Sea Interaction, Portland, Oregon, August 2007; AMS 21st Conference on Boundary Layers and Turbulence, Leeds, June 2014; AMS 19th Conference on Air-Sea Interaction, Phoenix, AZ, USA, January 2015.

AGU 2020 Editors' Citation for Excellence in refereeing – Geophysical Research Letters

OUTREACH & PUBLIC ENGAGEMENT

Invited speaker, AGM of the Climatological Observers Link, *Nov 2021*

Guest on *Atmospheric Tales* podcast, *August 2020*.

Invited talk for Royal Meteorological Society on MOSAiC project, *online, April 2021*.

Discussion panel member, Cheltenham Science Festival, 2020 – panel on MOSAiC Arctic research programme.

Interviewed for BBC Radio 4 *Costing The Earth* programme about the 2018 Arctic research cruise on icebreaker Oden.

Contributions to Swedish Polar Research Secretariat blog during Arctic Ocean 2016 expedition.

Interviewed for *Audible Structures: Expedition to the Icebergs* – a commissioned audio artwork to coincide with the British Art Show 8, Leeds City Gallery, October 2015.

Invited talk for Royal Meteorological Society Yorkshire Local Group on meteorological measurements in extreme environments. Apr 22, 2015.

Talk to 6th form students for Leeds Festival of Science, March 18, 2015.

Invited public talk for Leeds Cafe Scientifique on Arctic climate science. Feb 10, 2015.

Public talk on undertaking Arctic fieldwork for the “Real Science for Real Life” programme strand at the *Saltire Festival 2013*.

Participant in live online question and answer session for the Guardian Science Blog, undertaken from the field while on an oceanographic research cruise in Antarctic waters:

<http://www.guardian.co.uk/science/blog/2012/apr/23/antarctic-researchers-live-q-a>

Blogging field campaigns at <http://frictionvelocity.wordpress.com/> and via twitter @IanMBrooks

‘Weather Weekend’ – 2-day course on meteorology, weather forecasting, and climate run for the YHA, 2002-2005. 2005 course jointly sponsored by the Royal Meteorological Society.

‘Wild Weather’ – short talks to groups of school children as part of university of Leeds activities for National Science Week 2004.

INVITED SEMINARS & TALKS

Centre for Geography & Environmental Science, University of Exeter, UK, *March 2021*.

Leibniz Institute for Tropospheric Research, Leipzig, Germany, *August 2019*.

Royal Society / Italian National Research Council bilateral workshop – Science of the Polar Regions – *Venice, Italy, June 20-21, 2019*

Royal Meteorological Society National Meeting on Arctic Prediction in a Changing Climate, London, UK, *November 2018*

School of Earth and Environmental Sciences, University of Manchester, UK, *November 2016*

Meteorological Institute, Stockholm University, Sweden, *March 2016*

British Antarctic Survey, Cambridge, UK, *May 2015*

Naval Research Laboratory, Monterey (Meteorology Division), CA, USA. *January 2015*.

School of Environmental Sciences, University of East Anglia, UK, *February 2014*

Department of Meteorology, University of Reading, UK, *November 2011*

Royal Meteorological Society meeting on Physical Processes in Polar Regions, University of Leeds, *Sept 16 2011*

Invited speaker, UK Polar Network Workshop – Investigating Variability in Polar Climates: Past, Present and Future, *April 2010* – meeting for PhD students and early career researchers in polar science

School of Environmental Science, University of East Anglia, UK, *February 2008*

Rosenstiel School of Marine & Atmospheric Science, University of Miami, Florida, USA, *January 2008*

National Oceanography Centre, Southampton, *November 2007*

Department of Meteorology, University of Stockholm, Sweden, *December 2004*

Department of Physics, University of Aberystwyth, *May 2004*

FIELD EXPERIENCE

- Sept-Dec 2019: MOSAiC – installation and operation of meteorological measurement systems on board icebreaker Polarstern, and on the sea ice in central Arctic Ocean. Measurements continued over a full 12 months.
- June 2019: ICECAPS-ACE – Summit station, Greenland.
- Aug-Sept 2018: AO2018 – surface meteorology and cloud remote sensing on 8-week measurement campaign on icebreaker Oden, including 4 weeks of measurements on sea ice.
- Aug-Sept 2016: AO2016 – meteorology team leader on 6 week cruise in central Arctic Ocean. Installed and ran surface flux system, radiosounding system, and maintained additional instruments from Stockholm University and FMI.
- July-Oct. 2014: ACSE – first 7 weeks of a 3 month research cruise in Arctic Ocean. Installed & operated motion-stabilised Doppler lidar, scanning microwave radiometer, full surface turbulent flux system on foremast, IR surface temperature measurement, and radiosounding system. Collaboration with Stockholm and Univ. Boulder Colorado/NOAA-CIRES.
- Oct.-Nov. 2013: HiWinGS – 6 week cruise to study high wind air-sea exchange. Installed CLASP aerosol flux system, whitecap imaging cameras; deployed waverider buoy and in collaboration with NOC their 11-m spar buoy.
- Mar-Apr. 2013: ACCACIA – aircraft mission scientist – directing science in flight, planning & forecasting for aircraft based measurement campaign of Arctic boundary layer, clouds and aerosol. Coordination of multiple platforms (2 aircraft + ship)
- 2009-2013: WAGES – continuous direct measurement of air-sea fluxes from RRS James Clark Ross. 2-3 manned cruises each year; deployment of waverider & spar buoys.
- Jul.-Aug. 2010: ASIST/ITOP – deployment of aerosol flux measurement systems on autonomous buoys in Pacific Ocean; joint with University of Miami.
- Jul.-Sept. 2008: ASCOS – lead scientist for surface meteorology component of multidisciplinary field campaign in central Arctic Ocean. Installed turbulent flux masts, SODAR, and tethered balloon profiling system on sea ice.
- Apr. 2008: balloon-borne in-situ measurements of turbulence dissipation rate and aerosol spectra for calibration of lidar retrievals.
- Jan. 2008: Integration of high rate aerosol instrument into flux measurement system on University of Miami's Air-Sea Interaction Spar (ASIS) buoys for deployment Apr. 2008 in Southern Ocean.
- Mar.-Apr. 2007: SEASAW project, 4-week air-sea interaction cruise on RRS Discovery – eddy covariance measurements of CO₂ and sea-spray aerosol fluxes and bubble spectra, Principal Science Officer for cruise.
- Nov.-Dec. 2006: SEASAW project, 6-week air-sea interaction cruise on RRS Discovery – eddy covariance measurements of CO₂ and sea-spray aerosol fluxes. Planning of campaign, design of measurement systems, liaison with other projects sharing ship time.
- 2006-2007: Canopy Flow Experiment, 2006 – eddy covariance flux measurements in flow over a forested hill, Isle of Arran. Planning of field programme, design of measurement systems.
- Mar., Apr. 2006: Terrain-induced Rotor Experiment (TREX) – Design, fabrication and installation of turbulent & radiative flux measurement sites in Owens Valley, California.
- Jun.-Jul. 1996: Coastal Waves '96 – member of science team, and flight planning on NCAR C-130
- Apr. 1996: SHAREM-115 – member of science team on Meteorological Research Flight C-130
- Jun.-Jul. 1994: Monterey Area Ship Tracks (MAST) experiment – member of science team & instrument operator on Meteorological Research Flight C-130

GRADUATE STUDENT SUPERVISION

PhD STUDENTS

Vania López García, 01/10/2019 – Current
MOSAIC boundary layer dynamics

Heather Guy, 01/01/2019 – Current (co-supervisor)
Energy balance of Greenland Summit (lead supervisor R. Neely)

Ruth Price, 01/10/2018 – current (co-supervisor)
Aerosol-cloud interactions in Arctic (lead supervisor K. Carslaw)

Jonathan Pennells, 01/10/2013 – 2017 (co-supervisor)
Wind farm impacts on local down-wind meteorology (lead supervisor Andrew Ross)

Rebecca Jansen, 01/10/2012 – 18/3/2019
Arctic boundary layer structure, aircraft measurements and large eddy simulations

Rhiannon Davis, 01/10/2012 – 2018 (external supervisor on PhD at UEA, with Ian Renfrew)
Evaluation of a new total turbulent energy boundary layer scheme for the Arctic

Dominic Salisbury, 01/9/2010 – 30/3/2014
Air-sea flux estimates from satellite remote sensing products, funded via ASIST project grant.

David Tupman, 01/09/2009 – 30/09/2013
Air-sea gas exchange, funded via WAGES project grant.

Matthew Hobby, 01/10/2007 – 30/09/2013 (co-supervisor)
Development of a balloon-borne tethersonde for turbulence measurement (part time student & member of technical support staff, lead supervisor S. Mobbs)

Thomas Pleavin, 01/10/2008 – 18/6/2013
Large eddy simulation of arctic stratus cloud, funded via NERC Open CASE studentship with Met Office

Cathryn Birch, 01/10/2006 – 30/10/2009
Surface-atmosphere coupling over the central arctic ocean. NERC quota studentship + CASE award from Met Office

Member of PhD advisory group for: Sarah Norris (2003-2006), Paul Smith (2005-2009), Rosey Grant (2006-2010), Tom Breider (2006-2010), Lawrence Jackson (2007-2011), Bradley Jemmet-Smith (2009-2013)

External PhD thesis reviewer, University of Helsinki, Finland, 2019 – “Meteorological conditions affecting renewable energy” – Minttu Tuononen

External PhD examiner, University of Southampton, December 2009 – “Measurements of Sub-Surface Bubble Populations and the Modelling of Air-Sea Gas Flux” – David Coles

Internal PhD Examiner, University of Leeds, January 2021 – “Response of the Patagonian Glaciers to Present and Future Atmospheric Changes” – Claudio Bravo Lechuga

Internal PhD Examiner, University of Leeds, November 2020 – “Measuring and identifying ice nucleating particles in the atmosphere” – Alberto Sánchez Marroquín

Internal PhD Examiner, University of Leeds, November 2012 – “Quantifying the impact of natural and anthropogenic aerosol in the Arctic” – Jo Browse

Internal PhD Examiner, University of Leeds, March 2012 – “Predictability and dynamics of potential vorticity streamers and connections to high impact weather” – Arwen Twitchett

Internal PhD examiner, University of Leeds, December 2009 – “Turbulence as a Mediator of Processes in a Macrotidal Estuary” – William Thurston

MASTERS PROJECT STUDENTS

Lindsay Hogan, 2020-2021: a satellite based drag parameterization over sea ice

Samuel Hall, 2020-2021: Large Eddy Simulation of Arctic clouds

Zhongwei Liu, 2017-2018: Surface flux parameterization over Arctic sea ice
Zixuan Jia, 2017-2018: The turbulent structure of the Arctic boundary layer
Rebecca Jansen, 2010 – 2011: Analysis of aircraft measurements of surface fluxes over inhomogeneous Antarctic sea ice.
Ruth Loughrey, 2009 – 2010: Sodar retrievals of Arctic boundary layer structure.
Andrew Fish, 2008 – 2009: Sodar measurements of surface mixed layer depth in the Arctic boundary layer. (Poster presented at AMS Conference on Polar Meteorology & Oceanography, 2009)
Anthony Bloom, 2006 – 2007: Measurement and modelling of air-sea CO₂ exchange (Poster presented at AMS Conference on Air-Sea Interaction, 2007)
Alison Fowler, 2005 – 2006: Large eddy simulation of entrainment processes (poster presented at AMS Conference on Boundary Layers and Turbulence, awarded student poster prize; work published in Geophysical Research Letters 2007)

MISCELLANEOUS

Supervised NERC Research Experience Placement student (competitively funded), Samantha Clarke, summer 2010 – analysis of large eddy simulations of entrainment processes.
Supervised and funded undergraduate students for summer research internships:
2021 – Chalissar Baines – analysis of Doppler lidar data from Arctic field campaign
2014 – Joshua Talib – processing of cruise whitecap imagery & analysis of camera exposure biases in results.
2012 – Emma Simpson – set up of WRF model for operational forecasts for ACCACIA field campaigns and analysis of ASCOS cloud radar data.
2010 – Tim Baker – processing and quality control of digital ocean whitecap imagery from SOLAS research cruises
2009 – Ruth Loughrey – processing of bubble spectra data from ASCOS project

TEACHING

MANAGEMENT

Programme manager, M.Res. Physics of the Earth & Atmosphere, School of Earth & Environment, University of Leeds, 2006-2010

UNDERGRADUATE TEACHING

Ocean and Atmosphere Climate Change Processes – level 3 lecture course – 2005-present. Developed and teach 2/3 of module. Module manager.
Oceanography in the Earth System – level 3 lecture course – 2009-2011, 2015-present. Developed and teach 1/3 of module: physical oceanography.
Introduction to Meteorology and Weather Forecasting – level 1 lecture course – 2004-2006. Developed whole module, taught and managed module.
Introduction to Oceanography – level 1 lecture course – 2003-2005. Developed and taught 20% of module : air-sea interaction.
Advance Field Course – level 2 4-day field course – 2002-2006, 2010-2012. Teach/lead 50% of course: atmospheric science, developed 20% of exercises. Managed module 2004-2006.
Atmospheric Science Field Course – level 3 6-day field course – 2002-2006. Jointly developed exercises in surface energy balance measurement and turbulent flux analysis; measurement of wind profiles from pilot balloon tracking.
Environmental Science Skills – level 2 module – 2002-2005.
Final year dissertation project supervision – 2003-present.
Undergraduate personal tutor 2003-2006

GRADUATE TEACHING

Invited lecturer, MOSAiC graduate school on Arctic science, on board the RV Akademik Fedorov, Sept 20 – Oct 26

Member of organising committee, and lecturer on WMO/WCRP ‘Polar Prediction School’, Abisko, Sweden, April 17-27, 2018.

Invited lecturer, WWRP/WCRP/Bolin Centre for Climate Research ‘Polar Prediction School’, Abisko, Sweden, April 5-15 2016.

Introduction to MATLAB programming – short course for PhD students from faculties of Environment and Maths and Physical Sciences. 2004-2007, 2009-2011.

Personal tutor for MRes students 2006-2010

2021

73. Guy, H., **I. M. Brooks**, K. S. Carslaw, B. J. Murray, V. P. Walden, M. D. Shupe, C. Pettersen, D. D. Turner, C. J. Cox, W. D. Neff, R. Bennartz., and R. R. Neely III., 2021: Controls on surface aerosol number concentrations and aerosol limited cloud regimes over the central Greenland Ice Sheet, *Atmos. Chem. Phys.*, 21, 15351–15374, doi:10.5194/acp-21-15351-2021
72. Elvidge, A. D., I. A. Renfrew, **I. M. Brooks**, P. Srivastava, M. J. Yelland, J. Prytherch, 2021: Surface heat and moisture exchange in the marginal ice zone: Observations and a new parameterization scheme for weather and climate models, *J. Geophys. Res.*, 126, e2021JD034827, doi:10.1029/2021JD034827
71. Zinka, J., M. Salter, C. Leck, M. J. Lawler, G. C. E. Porter, M. P. Adams, **I. M. Brooks**, B. J. Murray, P. Zieger, 2021: The development of a miniaturised balloon-borne cloud water sampler and its first deployment in the high Arctic, *Tellus B*, 73, 1915614, doi:10.1080/16000889.2021.1915614
70. Tjernström, M., G. Svensson, L. Magnusson, **I. M. Brooks**, J. Prytherch, J. Vüllers, G. Young, 2021: Central Arctic Weather Forecasting: Confronting the ECMWF IFS with observations from the Arctic Ocean 2018 expedition, *Quart. J. Roy. Meteorol. Soc.* doi:10.1002/qj.3971
69. Vüllers, J., P. Achtert, **I. M. Brooks**, M. Tjernström, J. Prytherch, A. Burzik, R. Neely III, 2021: Meteorological and cloud conditions during the Arctic Ocean 2018 Expedition. *Atmos. Chem. Phys.* 21, 289–314, doi:10.5194/acp-21-289-2021, 2021.

2020

68. Achtert, P., E. O'Connor, **I. M. Brooks**, G. Sotiropoulou, M. D. Shupe, P. O. G. Persson, B. Pospichal, B. J. Brooks, M. Tjernström, 2020: Properties of Arctic mixed phase clouds from ship-borne Cloudnet observations during ACSE 2014, *Atmos. Chem. Phys.* 20, 14983–15002, doi:10.5194/acp-2020-56.
67. Baccarini, A., L. Larksson, J. Dommen, P. Duplessis, J. Vüllers, **I. M. Brooks**, A. Saiz-Lopez, M. Salter, M. Tjernström, U. Baltensperger, P. Zieger, J. Schmale, 2020: Frequent new particle formation over the high Arctic pack ice by enhanced iodine emissions, *Nature Comms.* 11, 4924 (2020). doi:10.1038/s41467-020-18551-0
66. Porter, G. C. E., S. N. F. Sikora, M. P. Adams, U. Proske, A. D. Harrison, M. D. Tarn, **I. M. Brooks**, B. J. Murray, 2020: Resolving the size of ice-nucleating particles with a balloon deployable sampler: the SHARK, *Atmos. Meas. Tech.*, 13, 2905–2921 doi:10.5194/amt-13-2905-2020.
65. Frey, M. M., S. J. Norris, **I. M. Brooks**, P. S. Anderson, K. Nishimura, X. Yang, A. E. Jones, S. Palm, M. Nerentorp Mastromonaco, D. H. Jones, E. Wolff, 2020: First direct observations of sea salt aerosol production from blowing snow above sea ice, *Atmos. Chem. Phys.* 20, 2549–2578, doi: 10.5194/acp-20-2549-2020
64. Thornton, B. F., J. Prytherch, K. Andersson, **I. M. Brooks**, D. Salisbury, M. Tjernström, P. M. Crill, 2020: Shipborne eddy covariance observations of methane fluxes constrain Arctic sea emissions, *Science Advances.* 6, eaay7934, doi:10.1126/sciadv.aay7934

2019

63. Yang, M. S. J. Norris, T. G. Bell, **I. M. Brooks**. 2019: Sources of Aerosols on the Southwest Coast of the United Kingdom Part I: Total and Size-Distributed Sea Spray Number Fluxes, *Atmos. Chem. Phys.*, 19, 15271-15284, doi:10.5194/acp-19-15271-2019.
62. Renfrew, I. A., R. S. Pickart, K. Våge, G. W. K. Moore, T. Bracegirdle, A. Elvidge, E. Jeansson, T. Lachlan-Cope, L. T. McRaven, L. Papritz, J. Reuder, H. Sodemann, A. Terpstra, S. Waterman, H. Valdimarsson, A. Weiss, M. Almansí, F. Bahr, A. Brakstad, C. Barrell, J. K. Brooke, B. J. Brooks, **I. M. Brooks**, M. E. Brooks, E. M. Bruvik, C. Duschka, I. Fer, H. M. Golid, M. Hallerstig, I. Hessevik, J. Huang, L. Houghton, S. Jónsson, M. Jonassen, K. Jackson, K. Kvalsund, E. Kolstad, K. Konstali, J. Kristiansen, R. Ladkin, P. Lin, A. Macrander, A. Mitchell, H. Olafsson, A. Pacini, C. Payne, B. Palmason, M. D. Pérez-Hernández. A. K. Petersen, G. N. Petersen, M. N. Pisareva, J. Pope, A. Seidl, S. Semper, D. Sergeev, S. Skjelsvik, H. Soiland, D.

Smith, M. Spall, T. Spengler, A. Touzeau, G. Tupper, Y. Weng, K. D. Williams, X. Yang, S. Zhou, 2019: The Iceland Greenland Seas Project, *Bull. Amer. Meteorol. Soc.*, 100, 1795-1817, doi:10.1175/BAMS-D-18-0217.1

61. Naakka T., T. Nygård, M. Tjernström, T. Vihma, R. Pirazzini, **I. M. Brooks**, 2019: The importance of Arctic sounding observations, *Geophys. Res. Letts.* 46, GRL59351, doi:10.1029/2019GL083332.
60. X. Yang, M. M. Frey, R. H. Rhodes, S. J. Norris, **I. M. Brooks**, P. S. Anderson, K. Nishimura, A. E. Jones, E. W. Wolff, 2019: Sea salt aerosol production via sublimating wind-blown saline snow particles over sea ice: parameterizations and relevant microphysical mechanisms, *Atmos. Chem. Phys.*, 19, 8407-8424, doi: 10.5194/acp-2018-1080.
59. Tjernström, M., M. D. Shupe, **I. M. Brooks**, P. Achtert, J. Prytherch, J. Sedlar, 2019: Arctic summer air-mass transformation, surface inversions and the surface energy budget, *J. Clim.*, 32, 3, 769-789, doi:10.1175/JCLI-D-18-0216.1

2018

58. Benedetti, A., J. S. Reid, A. Baklanov, S. Basart, O. Boucher, **I. M. Brooks**, M. Brooks, P. R. Colarco, E. Cuevas, A. da Silva, F. Di Giuseppe, J. Escribano, J. Flamming, N. Huneeus, O. Jorba, S. Kazadzis, S. Kinne, P. Knippertz, P. Laj, J. H. Marsham, L. Menut, L. Mona, T. Popp, P. K. Quinn, S. Rémy, T. S. Sekiyama, T. Y. Tanaka, E. Terradellas, A. Wiedensohler, 2018: Status and future of Numerical Atmospheric Aerosol Prediction with a focus on data requirements. *Atmos. Chem. Phys.* 18, 10615–10643, doi:10.5194/acp-18-10615-2018.
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225. Young, G., J. Vüllers, **I. M. Brooks**, M. Tjernström, J. Prytherch, P. Achtert, R. Neely III, G. Porter, B. Murray, 2019: Linking Clouds, Ocean, and Sea Ice in the Arctic: the MOCCHA/ACAS Field Campaign 2018, *Arctic Science Summit Week, May 22-30, Arkhngelsk, Russia.*
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221. Price, R., K. Carslaw, **I. M. Brooks**, P. Field, 2019: Clouds and Arctic Climate Change, *QuIESCENT Arctic workshop, Apr 4-5, Cambridge, UK.*
220. Guy, H., R. Neely III, **I. M. Brooks**, K. Carslaw, B. J. Murray, V. P. Walden, M. D. Shupe, D. D. Turner, R. Bennartz, 2019: Summit Aerosol Cloud Experiment (S-ACE), *QuIESCENT Arctic workshop, Apr 4-5, Cambridge, UK.*
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215. Thornton, B. T., J. Prytherch, M. C. Geibel, K. Andersson, **I. M. Brooks**, M. Tjernström, C. Humborg, D. J. Salisbury, and P. M. Crill, 2018: What can measurements near the sea surface tell us about subsea permafrost methane emissions? *Fall Meeting of the AGU, Dec 10-14, Washington, DC, USA*.
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213. P. O. G. Persson, B.J. Brooks, A. Solomon, G. deBoer, J. Intrieri, M. D. Shupe, **I. M. Brooks**, M. Tjernström, J. Inoue, B. Blomquist, and A. Gasiewski, 2018: Mesoscale Structure of Arctic Cyclones and Their Impacts on Sea Ice: Observations From Past Field Campaigns, *Fall Meeting of the AGU, Dec 10-14, Washington, DC, USA*
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211. Prytherch, J., **I. M. Brooks**, M. J. Yelland, D. J. Salisbury, B. I. Moat, M. Tjernström, 2018: Surface drag over Arctic sea ice: direct observations from an icebreaker, *Polar 2018, Jun 15-26, Davos, Switzerland*.
210. Prytherch, J. B. F. Thornton, **I. M. Brooks**, K. Andersson, M. Geibel, D. J. Salisbury, P. Crill, M. Tjernström, C. Humborg, 2018: Sea-air flux and transfer velocity of CH₄ / CO₂ measured on the Siberian shelf, *Polar 2018, Jun 15-26, Davos, Switzerland*.
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207. Tjernström, M., P. Achtert, M. D. Shupe, J. Prytherch, J. Sedlar, B. J. Brooks, **I. M. Brooks**, P. O. G. Persson, D. J. Salisbury, G. Sotiropoulou, 2017: Interactions between summer warm-air advection, melting sea ice and low clouds, *Fall meeting of the AGU, Dec 11-15, New Orleans, USA*.
206. Bell, T. G., M. Yang, F. E. Hopkins, S. J. Norris, **I. M. Brooks**, T. Smyth, 2017: Quantifying ship emissions of sulfur dioxide (SO₂) and aerosols in the English Channel. *Shipping and the environment - from regional to global perspectives, Oct. 24-25, Gothenburg, Sweden*.
205. Yang, X., M. M. Frey, R. H. Rhodes, S. J. Norris, **I. M. Brooks**, P. S. Anderson, K. Nishimura, A. E. Jones, E. W. Wolff, 2017: A missed sea salt aerosol (SSA) CCN source from the sea ice covered zone, *Joint LAPSO-IAMAS-LAGA Assembly, Aug 27 – Sept 1, Cape Town, South Africa*

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203. Prytherch, J., **I. M. Brooks**, P. Crill, B. Thornton, D. J. Salisbury, M. Tjernström, L. Anderson, M. C. Geibel, C. Humborg, 2017: Air-sea CO₂ and CH₄ gas transfer velocity in Arctic sea-ice regions from eddy covariance flux measurements onboard Icebreaker Oden, *EGU General Assembly, Apr. 23-28, Vienna, Austria*.
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201. Shupe, M. D., S. Matrosov, C. Schmitt, **I. M. Brooks**, G. de Boer, D. Dexheimer, H. Telg, M. Maahn, D. Turner, C. Williams, 2017: Enhanced measurements with the ARM tethered balloon system at Oliktok Point, *Atmospheric Radiation Measurement (ARM)/Atmospheric System Research (ASR) Joint User Facility and Principal Investigator meeting, March 13-17, Tysons, Virginia, USA*.
200. Persson, P. O. G., B. Blomquist, P. Guest, **I. M. Brooks**, M. Tjernström, A. Grachev, M. D. Shupe, C. W. Fairall, 2017: Interactions Between the Atmospheric Boundary Layer and the Advancing Autumn Sea Ice, *14th AMS Conference on Polar Meteorology and Oceanography, Jan 22-26, Seattle, USA*.
199. Tjernström, M, **I. M. Brooks**, J. Sedlar, M. D. Shupe, P. O. G. Persson, J. Prytherch, D. J. Salisbury, P. Achtert, B. J. Brooks, G. Sotiropoulou, 2017: Summer atmospheric boundary-layer structure downwind of the ice edge in on-ice advection. *14th AMS Conference on Polar Meteorology and Oceanography, Jan 22-26, Seattle, USA*.
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196. Prytherch J., **I. M. Brooks**, P. M. Crill, B. F. Thornton, D. J. Salisbury, M. Tjernström, M. C. Geibel, C. Humborg, L. G. Anderson, 2016: Direct Measurement of Air-Sea CO₂ Exchange from an Icebreaker in Arctic Sea Ice Regions. *Fall Meeting of the AGU, Dec. 12-16, San Francisco, USA*.
195. Yang, X., M. Frey, R. Rhodes, S. J. Norris, **I. M. Brooks**, P. Anderson, K. Nishimura, A. Jones, E. Wolff, 2016: A newly identified sea salt aerosol source over sea ice and its indications to climate, *Fall Meeting of the AGU, Dec. 12-16, San Francisco, USA*.
194. Blomquist, B., et al. Effects of Sea State and Wind Speed on Air-Sea Gas Exchange: Results from the 2013 HiWinGS Project, *Fall Meeting of the AGU, Dec. 12-16, San Francisco, USA*.
193. Persson, P. O. G., B. W. Blomquist, P. S. Guest, C. W. Fairall, **I. M. Brooks**, J. Sedlar, J. Prytherch, D. J. Salisbury, G. Bjork, S. Stammerjohn, G. Sotiropoulou, M. Tjernstrom, and J. Inoue, 2016: Surface Energy Fluxes During Arctic Freeze-Up, *AMS Conf. On Air-Sea Interaction, August 15-19, Madison, Wisconsin, USA*.
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188. Jansen, R. A., **I. M. Brooks**, and J. S. Dobbie, 2016: Radiatively driven in-cloud turbulence and cloud-surface turbulent coupling in Arctic Stratocumulus, *International Conference on Clouds and Precipitation, 25-29 July, Manchester.*
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186. Brumer, S. E., C. Zappa, C. W. Fairall, B. Blomquist, **I. M. Brooks**, and M. Yang, 2016: Gas transfer under high wind and its dependence on wave breaking and sea state, *EGU General Assembly, April 17-22, Vienna, Austria.*
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182. Wilson, T.W., L.A. Ladino, P.A. Alpert, R. Chance M.N. Breckels, **I.M. Brooks**, J. Browse, S. Burrows, K. Carslaw, L. Carpenter, J. Hamilton, J.A. Huffman, C. Judd, W.P. Kilhau, R.H. Mason, G. McFiggans, L.A. Miller, J. Najera, E. Polishchuk, S. Rae, C.L. Schiller, M. Si, J. Vergara Temprado, T.F. Whale, J.P.S. Wong, O. Wurl, J.D. Yakobi-Hancock, J.P.D. Abbatt, J.Y. Aller, A.K. Bertram, D.A. Knopf and B.J. Murray, 2016: A marine biogenic source of atmospherically relevant ice nucleating particles, *EGU General Assembly, April 17-22, Vienna, Austria.*
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179. Salisbury, D. J., **I. M. Brooks**, J. Prytherch, B. I. Moat, B. J. Brooks, P. Achtert, J. Sedlar, M. Tjernström, G. Sotiropoulou, P. O. G. Persson, M. D. Shupe, P. Johnston, D. Wolfe, 2016: In Situ Measurement of Surface Turbulent Exchange Over Arctic Sea Ice , *AGU Ocean Sciences Meeting, 21-26 February, New Orleans, Louisiana, USA.*
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177. Brumer, S. E., C. J. Zappa, C. W. Fairall, B. Blomquist, **I. M. Brooks**, H. Tamura, M. Yang, B. J. Huebert, 2016: Observations of whitecaps during HiWinGS, their dependence on wave field, and relation to gas transfer velocities, *AGU Ocean Sciences Meeting, 21-26 February, New Orleans, Louisiana, USA.*

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170. **Brooks, I. M.**, S. J. Norris, M. J. Yelland, R. W. Pascal, J. Prytherch, 2015: Eddy covariance measurements of the sea-spray aerosol flux. *Fall Meeting of the AGU, Dec. 14-18, San Francisco, USA. (Invited talk)*
169. Wilson, T. W., L. A. Ladino, P. A. Alpert, M. N. Breckels, **I. M. Brooks**, J. Browse, S. M. Burrows, K. S. Carslaw, J. A. Huffman, C. Judd, W. P. Kilitau, R. H. Mason, G. McFiggans, L. A. Miller, J. Najera, E. Polishchuk, S. Rae, C. L. Schiller, M. Si, J. Vergara Temprado, T.F. Whale, J.P.S. Wong, O. Wurl, J. D. Yakobi-Hancock, J. P. D. Abbatt, J. Y. Aller, A. K. Bertram, D. A. Knopf, and B. J. Murray, 2015: A marine biogenic source of atmospherically relevant ice nucleating particles, 2015: *The Aerosol Society Annual Conference, 12 November, Birmingham, UK*.
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