Dr Claire Ryder

Associate Professor

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Expertise

Dr Ryder's expertise lies in microphysical and optical properties of mineral dust. She has exploited airborne measurements to demonstrate the evidence and impact of coarse dust particles on climate, and has also worked with international teams to extrapolate links with weather and climate models as well as satellite retrievals and the impact of dust on aviation.

Publications Summary

Dr Ryder has published 45 peer-reviewed articles with an H-index of 21. She has over 1,500 citations averaging 33 citations/paper, with publications cited in the IPCC 2007, 2013 and 2021 policy documents and 9 highly cited papers with >50 citations. Selected publications are listed below.

Research Funding

Dr Ryder has been PI and Co-I on a variety of externally funded projects since 2012 totalling >£2,000k

- **Dust-DN**: EU MSCA Doctoral Network for 17 European Institute PhD students; 3 based at Reading
- **AMCCA**: Airborne Measurements of Charged Cloud and Aerosol, FAAM Research Runway Project
- **DAZSAL**: Diurnal vAriation of the vertically resolved siZe distribution in the Saharan Air Layer, EU ATMO-ACCESS TNA in collaboration with ASKOS 2022
- **MAPP**: Metrology for Aerosol Optical Properties (EU H2020), Reading PI, £90k
- **DAHLIA**: Dust-AtmospHere-Land Interactions in East Asia (Newton Fund), PI, £283k
- **Independent Research Fellowship**, 'The Role of Coarse Mineral Dust in the Climate System,' (NERC), PI, £468k, 2015-2022
- **SAVEX, SAVEX-D, Fennec 2012:** Additional flying hours/EUFAR Transnational Access for aircraft fieldwork

Conference Presentations:

- **Recent Invitations:** National Observatory Athens (2023); NASA Lidar Working Group (2023); Finnish Meteorological Institute seminar (2021); InDust COST Action webinar (2021); American Meteorological Society (2021); Royal Meteorological Society (2020); American Geophysical Union Fall Meeting (2019); Staubtag 'dust day' (Nov 2018); UK Met Office (2018)
- **Oral Contributions:** Dr Ryder has given >15 contributed oral presentations over the last 15 years at venues including EGU, AGU, AMS, AeroCom, DUST conferences, Dust Workshops and International Aerosol and Radiation Conferences

Supervision

Dr Ryder currently supervises Natalie Ratcliffe (fully funded 4th year PhD student: Using Aircraft Observations and Modelling to Improve Understanding of Mineral Dust Transport and Deposition Processes with UK Met Office CASE support) and Sakina Alblooshi (2nd year student: Effects of charged dust on meteorological processes). She has supervised 16 BSc, MSc and summer student research projects. She has acted as external PhD examiner at the University of Leeds (2018). Dr Ryder has recently supervised 2 PDRAs Dr Alcide Zhao and

Dr Dhirendra Kumar, both working on the DAHLIA project (Dust in East Asia), and Dr Jon Elsey (MAPP project, radiative effect of aerosols).

Employment/Education

2020-	**Associate Professor** in the Meteorology Department, University of Reading, UK
2015 – 2022	**NERC Independent Research Fellowship** The Role of Coarse Mineral Dust Particle in the Climate System
2010-2015	**Junior/Senior PDRA roles, Department of Meteorology, University of Reading, UK** Semi-direct effect of Amazonian Biomass Burning, SAMBBA (South American Biomass Burning Analysis) Project; Aircraft Measurements of Saharan Dust, Fennec Project
2009-2010	**PDRA, Imperial College London, UK** Atmospheric aerosols and their radiative effect in London
2005-2009	**PhD: Optical, microphysical and radiative properties of Saharan dust using aircraft measurements** Department of Meteorology, University of Reading, UK CN Davies Award for PhD from UK Aerosol Society

Research Leadership

- Invited member of the Scientific Advisory Group for the FAAM UK Research aircraft Mid-life Upgrade
- Co-chair of InDust (EU COST Action Network) Observations Working Group, 2019-2021
- Co-convenor of EGU dust sessions in 2024, 2023, 2020, 2019, 2013; AGU dust session 2020, DUST2021 session; Royal Meteorological Society Conference 2021 committee and lead for 'Adaption and Mitigation.'
- Guest editor for Special Issue with ACP/AMT for SALTRACE (Saharan Aerosol Long-range Transport Aerosol-Cloud Interaction Experiment) (2015-present) and InDUST Special Issue (2020-2022)
- Peer reviewer for Nature, JGR, ACP, AMT, Atmos. Env., ASL, Sci. Advances, Env. Res Lett.
- Mission Scientist role during 5 FAAM airborne research field campaigns (2008-2015, Europe, Africa, Canaries, Cape Verde)
- Community contributions: EGU/AGU poster judge (2014-2023); AGU/EGU Mentor 2019/2023

Selected Publications

Full up-to-date publications available at www.researcherid.com/rid/K-5969-2014, including name changes

Ryder, C.L., Bézier, C., Dacre, H., Clarkson, R., Amiridis, V., Marinou, E., Proestakis, E., Kipling, Z., Benedetti, A., Parrington, M., Rémy, S., Vaughan, M., Aircraft Engine Dust Ingestion at Global Airports, https://doi.org/10.5194/nhess-24-2263-2024, Natural Hazards and Earth System Science, 2024.

Adebiyi, A., Kok, J., Murray, B., **Ryder, C.L.,** Stuut, J-B.W., Kahn, R., Knippertz, P., Formenti, P., Mahowald, N.M., Garcia-Pando, C.P. Klose, M., Ansmann, A., Samset, B.H., Ito, A., Balkanski, Y., Di Biagio, C., et al., A review of coarse mineral dust in the Earth system, Aeolian Research, doi:10.1016/j.aeolia.2022.100849, 2023

Drakaki, E., Amiridis, V., Gkikas, A., Proestakis, E., Mallios, S., Solomos, S., Spyrou, S., Marinou, E., **Ryder, C.L.,** et al. Modelling coarse and giant desert dust particles, ACP, doi:10.5194/acp-22-12727-2022, 2022.

Ryder, C.L., Highwood, E.J., Walser, A., Seibert P., Philipp, A., Weinzierl, B., Coarse and giant particles are ubiquitous in Saharan dust export regions and are radiatively significant over the Sahara, *Atmos. Chem. Phys.*, 19, 15353–15376, https://doi.org/10.5194/acp-19-15353-2019, 2019

Harrison, R.G., Nicoll, K.A., Marlton, G.J., **Ryder, C.L.,** Bennett, A.J., Saharan dust plume charging observed over the UK, *Environmental Research Letters,* https://doi.org/10.1088/1748-9326/aabcd9, 2018.