

Academic Posts & Education:

Since 03/2017: Senior Research Associate, Lancaster University, UK;
Line Manager: Dr. Adrian Grocott

Undertaking of original research on the NERC-funded projects “SD-WACCM: Predicting the Upper Atmospheric Response to Extremes of Space Weather Forcing” (2020-2023) and “Time Variability of the ionospheric electric field: solar wind driving and atmospheric feedback” (2017-2020):

- Processing and archiving of **22 years of raw data** (> 30 TB) from the Super Dual Auroral Radar Network (SuperDARN)
- Co-author of **23 papers** and **10 open-source software packages**
- **Winner** of the British Science Association **Early Career Lectureship Prize 2022**
- **PGR teaching:** Co-supervisor of two **Masters students** in Statistics (with Dr A. Gibberd); Co-supervisor of **PhD student** in Physics (with Dr A. Grocott)
- **Seminar coordinator** for the Space and Planetary Physics Group until 2018 (organisation of external speakers and management of **~£1k budget**)
- Convener of the **Autumn MIST meeting** (Nov. 2020, 2021, 2022), Co-organiser of the **RAS Discussion meetings** on “Global Monitoring of Geospace”, “The Global Response of the Terrestrial Magnetosphere during Storms and Substorms” (Feb. 2019)
- **LOC member** for National Astronomy Meeting 2019 and STFC Advanced Summer School in Space Plasma Physics (Sept. 2019)
- **Leader** of widening-participation project with **10 A-Level students from rural Lancashire**
- Participant in national outreach competition **I’m a Scientist Get me out of here** and active participant in Physics department **outreach programme**

2013–2017: PhD studying **Solar wind-magnetosphere driving at Earth**, University of Leicester, UK; Supervisors: Prof. S. E. Milan & Dr. T. K. Yeoman

- **Analysis** using **spacecraft data, magnetometers, radars** and **numerical modelling**
- **3 first author papers:** Using physics-based model to test understanding of ionospheric flows with spacecraft and radar data [Walach et al., 2017a]; Comparative studies of magnetospheric responses [Walach and Milan 2015, Walach et al., 2017b]
- Active participation of group’s **outreach programme**
- **Undergraduate teaching:** Laboratory supervision and marking of lab notebooks

2009–2013: **1st class Honors** from the **MPhys course in Physics**, University of Leicester, UK.

- Masters dissertation on auroral observations of substorms

Summer 2010: **Research Assistant** with Prof. J. Remedios & Dr. H. Sembhi in the **Earth Observation Group**, University of Leicester, UK.

- **Developing improved cloud flagging procedures** for Envisat data above water to estimate sea surface temperatures

Grants & Prizes:

2022: • **Winner** of the **British Science Association’s Early Career Lectureship Prize**

2019: • **NERC Standard Grant (£704k FEC):** Researcher Co-Investigator
• **Royal Astronomical Society Small Grant Scheme (£1.4k):** Funding for discussion meeting
• Runner-up in the *Seaborgium zone* of **I’m a Scientist Get me out of here**

2016: • **Shortlisted** for the University of Leicester Research Images Competition

2015: • **Royal Astronomical Society Small Grant Scheme (~£1k):** Conference Travel AGU Fall Meeting (San Francisco, US)
• **Best Student Talk: Rishbeth Prize** at the National Astronomy Meeting

2014: • **Joint First Place: 3-Minute Wonder Competition**, Institute of Physics, Midlands Division

Publication Highlights:

- **9 first author publications** in **Journal of Geophys. Res.**, **Space Weather** and **A&G**, e.g.:
 - **M.-T. Walach**, A. Grocott, F. Staples, ... (2022), *Super Dual Auroral Radar Network Expansion and its Influence on the Derived Ionospheric Convection Pattern*, **J. Geophys. Res.: Space Physics**, 127, e2021JA029559, doi:10.1029/2021JA029559; **1 citation**
 - **M.-T. Walach**, A. Grocott, and S. E. Milan (2021), *Average Ionospheric Electric Field Morphologies during Geomagnetic Storm Phases*, **J. Geophys. Res.: Space Physics**, doi:10.1029/2021JA029337; **4 citations**
 - **M.-T. Walach**, and A. Grocott (2019), *SuperDARN scatter during geomagnetic storms and geomagnetically active times*, **J. Geophys. Res.: Space Physics**, doi: 10.1029/2019JA026816; **27 citations**
 - **M.-T. Walach**, S. E. Milan, K. R. Murphy,... (2017), *Comparative study of large-scale auroral signatures of substorms, steady magnetospheric convection events, and sawtooth events*, **J. Geophys. Res.: Space Physics**, 122, 6357–6373, doi: 10.1002/2017JA023991; **13 citations**
 - **M.-T. Walach**, and S. E. Milan (2015), *Are Steady Magnetospheric Convection Events Prolonged Substorms?*, **J. Geophys. Res.: Space Physics**, doi: 10.1002/2014JA020631; **29 citations**
- **14 co-author publications** in **Space Sc. Rev.**, **J. of Geophys. Res.**, **Space Weather**, **A&G**.
- **Co-author of 10 software packages** published on **Zenodo/Github**.

Invited Talks:

Conference talks: **National Astronomy Meeting** 15/07/2022, University of Warwick, UK.

Canadian Division of Atmospheric and Space Physics Workshop, 24/02/2022, Canada, virtual.

14th International Conference on Substorms, 03/10/2019, Tromsø, Norway.

Seminar talks: **MIST Online Seminar Series**, 07/06/2022, UK, *virtual*.

Magnetospheres Online Seminar Series, 21/03/2022, US, *virtual*.

Mars Week, 16/03/2022, UK Space Education Office, *virtual*.

University of Saskatchewan, 28/06/2022, Canada, *virtual*.

Dartmouth College 02/03/2021, US, *virtual*.

Ground Induced Currents & Machine Learning Group, 05/05/2020, US, *virtual*.

University of Southampton, 30/04/2019, Southampton, UK.

Mullard Space Science Laboratory (UCL), 19/03/2019, Surrey, UK.

University of Leicester, 16/01/2019, Leicester, UK.

Lancaster University, 18/03/2017, Lancaster, UK.

Swedish Institute of Space Physics Uppsala, 03/02/2016, Uppsala, Sweden.

Community Leadership:

- **Panel member** of Royal Astronomical Society Grants, Awards and Prize Review (2020/21).
- **Chair** of the **MIST Awards Taskforce Team** (since 2019).
- **Elected member** of the **MIST** (Magnetosphere, Ionosphere and Solar-Terrestrial) **Community Council** since August 2019 (www.mist.ac.uk).
- **Session convener** at the SuperDARN workshops in 2015 and 2018, the National Astronomy Meeting in 2019, 2021 and 2022, and the 14th International Conference on Substorms in 2019.
- **Organiser** of the 2021 and 2020 Annual **Autumn MIST** meeting
- **Reviewer** for **Frontiers in Astronomy and Space Science** (since 2022); **Nature Astronomy** (since 2020); **Annales Geophysicae** (since 2019); **Journal of Geophysical Research - Space Physics** (since 2014).
- Member of **SuperDARN Data Standards Working Group** and **Spacecraft Scheduling Working Group** and **Data Analysis Working Group**.
- Member of the **Solar wind Magnetosphere Ionospheric Link Explorer (SMILE)** ESA/CAS mission consortium and member of **Ground-based support mission team**.
- **External examiner** for the University of KwaZulu-Natal in **South Africa**.

Public Engagement:

- Invited Talk at **Mars Week 2022**: *How the Aurora Lights Up Space*, **2022**, UK Space Education Office, *virtual*.
- Presenting *Journey across the Solar System*, **Light Up Lancaster, 2017**.
- Outreach talk, explaining research to the public, **Pub-hD talk**, Leicester, UK: **2015**.
- Setting up & talking to visitors at the **Stargazing Live Event**, Leicester, UK.
- **2015**: ionospheric & magnetospheric phenomena; **2014**: Space Weather; **2013**: Supernovae, Gamma Ray Bursts & SWIFT.
- Outreach talk, explaining research to the public, **Pub-hD talk**, Leicester, UK: **2015**.
- 3 Minute Presentation to a non-specialist audience explaining my research, **3 Minute Wonder Competition**, Institute of Physics: **2014 & 2015**.