

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

- Processing and archiving of **22 years of raw data** (> 30 TB) from the Super Dual Auroral Radar Network (SuperDARN)
- Co-author of **17 papers** and **8 open-source software packages**.
- 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), Co-organiser of the **RAS Discussion meeting** on “The Global Response of the Terrestrial Magnetosphere during Storms and Substorms” (Feb. 2019) and **LOC member** for National Astronomy Meeting 2019 and STFC Advanced Summer School in Space Plasma Physics (Sept. 2019)
- Participant in national outreach competition **I’m a Scientist Get me out of here** and active participant in Physics department **outreach programme**
- **Leader** of widening-participation project with **10 A-Level students from rural Lancashire**

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:

- 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):** Funding to attend 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 Record (Highlights):

- **7 first author publications in Journal of Geophys. Res., Space Weather and A&G:**
 - **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.
 - **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.
 - **M.-T. Walach**, S. E. Milan, K. R. Murphy, J. A. Carter, B. A. Hubert, and A. Grocott (2017), *Comparative study of large-scale auroral signatures of substorms, steady magnetospheric convection events, and sawtooth events*, **J. Geophys. Res.: Space Physics**, doi: 10.1002/2017JA023991.
 - **M.-T. Walach**, S. E. Milan, T. K. Yeoman, B. A. Hubert, and M. R. Hairston (2017), *Testing nowcasts of the ionospheric convection from the expanding and contracting polar cap model*, **Space Weather**, doi:10.1002/2017SW001615.
 - **M.-T. Walach**, S. E. Milan (2016), *The Irregular Pulse of the Magnetosphere*, **Astronomy & Geophysics**, doi: 10.1093/astrogeo/atw041.
 - **M.-T. Walach**, and S. E. Milan (2015), *Are Steady Magnetospheric Convection Events Prolonged Substorms?*, **J. Geophys. Res.: Space Physics**, doi: 10.1002/2014JA020631.
- **14 co-author publications in Space Sc. Rev., J. of Geophys. Res., Space Weather, A&G.**
- **Co-author of 8 software packages published on Zenodo/Github.**

Invited Talks:

- **Invited talk: 14th International Conference on Substorms**, 03/10/2019, Tromsø, Norway.
- **Invited seminar talks:**
 - Ground Induced Currents & Machine Learning Group (US)**, 05/05/2020, *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 (see www.mist.ac.uk).
- **Session convener** at the SuperDARN workshops in 2015 and 2018, the National Astronomy Meeting in 2019, and the 14th International Conference on Substorms in 2019.
- **Reviewer** for **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 **Whole Atmospheric Modelling Extension** led by Prof. D. Jackson (Met Office).
- 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:

- 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**.