Dr. Seán Blake

Space Weather Researcher

Mail
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Web & Git
seanblake.ie
github.com/terminusest

Programming
Python ★★★★★
Matlab ★★★☆☆

Interests
Computers
Poker
Running
Piano

About

I am a motivated astro/geophysics researcher with 6 years of experience in data analysis and scientific research, currently working at NASA Goddard Space Flight Center. The focus of my research is **Space Weather**, or how the Sun causes geomagnetic storms that can damage grounded infrastructure. I am experienced with geophysical modeling, analysing large datasets, machine learning, data visualisation and historical research.

Work Experience

2018-now **Postdoctoral Researcher at NASA GSFC**
Based in the NASA Goddard Space Flight Center in Maryland, USA. Currently researching extreme geomagnetic storm dynamics, historical superstorms, the extent of the auroral oval and localized geoelectric field enhancements.

2017-2018 **Postdoctoral Researcher at Trinity College Dublin**
Gathered and processed magnetotelluric data around Ireland as part of SWEMDI: the Space Weather Electromagnetic Database for Ireland.

2016-2018 **Director of CodifyDublin.com**
Founded Codify Ltd. which provided data science and computer programming workshops in Dublin. Designed curriculum, organised classes and taught approximately 150 students.

2014-2016 **Workshop Leader with Student2Scientist.org**
Ran computer science and physics workshops for secondary level students and teachers.

2013 **Intern with DIAS Geophysics Section**
Surveyed various locations in Ireland and analysed geomagnetic data as part of the IRETHERM magnetotelluric geothermal energy project.

Education

2013-2017 **Ph.D. in Astrophysics.** **Trinity College Dublin, Ireland**
• Co-funded by EirGrid to research the effects of space weather on the Irish power network.
• Thesis entitled *Monitoring and Modelling Geomagnetic Storms and Their Effects in Ireland* was the first detailed study of the Irish power network and its vulnerability to space weather events.

2014-2015 **Postgraduate Certificate in Statistics** **Trinity College Dublin, Ireland**
35 ECTS course on frequentist statistics

2009-2013 **B.A. Mod. in Astrophysics, II.I** **Trinity College Dublin, Ireland**
Thesis entitled: *Simulating a Convective Cell in the Solar Interior*

Skills

Scientific Computing

- Extensive experience with **Python** both in developing code for scientific applications and teaching. Also familiar with **Matlab** and **C++**.
- Experienced with analysing large datasets, **machine learning** and numerical physics simulations.
- Developed software for magnetic observatories in Ireland which provides real-time analysis of geomagnetic data (e.g., **Magie.ie**).

Academic Research

- Experienced with space weather and geophysics research, including GICs, power network modelling and magnetotellurics.
- Experienced with analysing geomagnetic and geoelectric time series.
- Practical experience with installing and maintaining geomagnetic observatories, as well as undertaking magnetotelluric surveys around Ireland.

Communication

- Presented novel scientific research at a number of international conferences.
- Strong teaching experience with students of all levels. Designed and taught curriculum for CodifyDublin programming courses, as well as computing courses for students.

Publications

- **Blake, S.P.**, Pulkkinen, A., et al. (2020). *Estimating Maximum Extent of Auroral Equatorward Boundary using Historical and Simulated Surface Magnetic Field Data*, Journal of Geophysical Research: Space Physics
- Hayakawa, H., **Blake, S.P.**, et al. (2020). *The Extreme Space Weather Event in February/March 1941* The Astrophysical Journal,
- Bhaskar, A., **Blake, S. P.**, et al. (2020). *An analysis of the Trouvelot's Auroral Drawing on 1/2 March 1872: Plausible Evidence for Recurrent Geomagnetic Storms.* Journal of Geophysical Research: Space Physics, 125,
- Marsal, S., **Blake, S. P.**, et al. (2020). *Including the Temporal Dimension in the SECS Technique*, Space Weather, 0–2
- **Blake, S. P.**, Pulkkinen, A., et al., (2020). *Magnetic Field Measurements from Rome during the August-September 1859 Storms*, Journal of Geophysical Research: Space Physics, (September), 1–54.
- Campanyà, J., **Blake, S. P.**, et al. (2019). *Modeling Geoelectric Fields in Ireland and the UK for Space Weather Applications.* Space Weather, 17(2), 216–237.
- **Blake, S. P.**, Gallagher, P.T., et al. (2018). *A Detailed Model of the Irish High Voltage Power Network for Simulating GICs.* Space Weather, 16(11), 1770–1783.
- **Blake, S. P.** (2017). *Modelling and Monitoring Geomagnetically Induced Currents in Ireland.* PhD Thesis, University of Dublin, Trinity College,
- **Blake, S. P.**, Gallagher, P. T., et al. (2016). *Geomagnetically induced currents in the Irish power network during geomagnetic storms.* Space Weather, 14(12), 1136–1154.