Jeremy Rigney PhD.

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Summary

Data-driven researcher with a PhD in solar and stellar astrophysics. Extensive experience in analysing and visualising large-scale datasets. Proficient in Python and high-performance computing, with a strong background in data processing and statistical analysis. Experienced in leading collaborative projects, problem-solving with computational techniques, and effectively communicating insights through reports, presentations, and publications. In-depth understanding of solar physics, particularly in the context of space weather monitoring and prediction.

Experience

PhD Researcher, Queen's University Belfast – Northern Ireland Sept. 2020 – Nov. 2024

- Designed and implemented data analysis pipelines in Python to process and visualise terabyte-scale astronomical datasets.
- Utilized high performance computing clusters resources via command line interfacing to execute complex computational workflows.
- Applied statistical methods to analyse time-series and spatial data, improving pattern recognition and insight generation.
- Developed clear and concise data visualisations for research presentations and publications.
- Published peer-reviewed research in leading international journals (Nature Astronomy and Astronomy & Astrophysics).
- Led cross-institutional research collaborations, managing data acquisition and interpretation.
- Authored technical reports, funding proposals, and documentation for reproducible research.
- Chief Observer of the Irish radio telescope (LOFAR.ie), overseeing data collection and instrumentation.

Research and Education Intern, Trinity College Dublin – Ireland June – Sept. 2019

- Conducted data analysis on radio telescope observations to test pulsar period detection software.
- Assisted in developing educational outreach programs focused on data visualisation and scientific concepts.
- Led guided telescope tours and public engagement events, distilling complex topics for general audiences.

Research Intern, University College Dublin – Ireland June – Aug. 2018

- Analysed low-frequency radio data to assess feasibility of astronomical source monitoring.
- Worked independently and within teams to execute research projects, collaborative problem-solving when testing new hardware and software.

Research Intern, Technological University of the Shannon – Ireland June – Nov. 2015

- Developed an Android-based Augmented Reality (AR) tool for visualising network security threats.
- Integrated real-time system alerts to enhance security monitoring.

Technical Skills

- *Programming Languages:* Python (Pandas, Scipy, NumPy, Matplotlib), SQL, Bash, HTML, CSS, JavaScript, C#
- *Data Analysis and Visualisation:* Python-based data processing, time-series analysis, Matplotlib, Seaborn
- *Computational Tools:* High-Performance Computing (HPC), Git, Docker, Singularity
- *Software Development:* Agile methodologies, software documentation, UI/UX design
- *Technical Writing:* Highly skilled in Report, Documentation, Proposal, peer reviewed publication, and Thesis writing

Education

Queen's University Belfast, PhD.   Sept. 2020 – Dec. 2024
- 2020 Eric Lindsay Scholar jointly hosted by the Dublin Institute for Advanced Studies and Armagh Observatory and Planetarium, graduate of QUB School of Mathematics and Physics
- Thesis Title: Multiwavelength observations of flares on the Sun and M Dwarf stars
- **Skills:** Data Science, Independent Research, Teamwork, Public Speaking, Project Management, Proposal Writing, Plasma Physics

University College Dublin, BSc.(Honours)   Sept. 2016 – Sept. 2020
- Physics with Astronomy and Space Science
- **Coursework:** Data Science, Statistics, Databases and Information Systems, Astronomy, Fundamental Physics, Quantum Mechanics

Projects

Large-Scale Data Processing for Radio Astronomy
- Built a Python-based pipeline to analyse and visualise multi-terabyte radio telescope datasets.

Augmented Reality Network Security Monitor
- Designed a real-time visualisation tool for security alerts using C# and Unity.

Presentations and Awards

Notable Presentations
- CoolStars21 Stellar Astronomy Conference, France (Jul. 2022)
- Irish National Astronomy Meeting (Aug. 2022, Aug. 2023)
- Planetary, Solar, and Heliospheric Radio Emissions Conference, Dublin (Sept.2022)
- TESS Science Team Meeting, Cambridge Massachusetts, USA (Oct. 2022)
- STELLAR Science School and Space Weather Workshop, Bulgaria (May and Jul. 23)
- IAU Symposium 388: Solar and Stellar Coronal Mass Ejections, Poland (May 2024)

Awards
- IOP Three-Minute Wonder UK and Ireland Audience Award 2024 (Royal Institution, London)
- IOP Rosse Medal for Best Postgraduate Presentation 2024 (Dublin, Ireland)
- Peter Curran Award for Best Postgraduate Presentation (Irish National Astronomy Meeting 2022, Dublin Ireland)

Additional Information

- Dual Citizenship: Irish and American
- Public Engagement: Experienced award winning science communicator with public outreach and educational event experience.
- Publications (Google Scholar profile): https://scholar.google.com/citations?user=49Jj6VoAAAAJ&hl=en