# RAMAN MUKUNDAN

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U.S. Citizen
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## INTERESTS

I am a physicist with the mind of an engineer, or sometimes the other way around. I am interested in technologies that assure the safety of instrumentation and human life in space and on other worlds.

## EDUCATION

**Doctor of Philosophy in Physics**, University of New Hampshire 2020 - Present

**Bachelor of Arts in Physics**, University of Colorado Boulder 2016 - 2019

## RESEARCH

**Geomagnetic Disturbance Modeling** Aug 2020 - Present
University of New Hampshire - Research advisor: Dr. Amy Keesee

Developing space weather forecasting models to predict geomagnetically induced currents (GICs). Implemented neural networks and other machine learning algorithms for high-cadence timeseries analysis.

**Frontier Development Lab** Jun 2023 - Aug 2023
Trillium Technologies in partnership with NASA, Google Cloud, and NVIDIA

Elevated the DAGGER geomagnetic perturbation forecasting model to higher Technology Readiness Level. Used multiple cloud platforms to train and integrate machine learning components in operational pipeline.

## PEER-REVIEWED PUBLICATIONS

- **Mukundan, R.**, Keesee, A., Marchezi, J. P., Pinto, V. A., Coughlan, M., and Hampton, D. (2025) Localized geomagnetic disturbances: a statistical analysis of spatial scale. *Frontiers in Astronomy and Space Sciences*. 12:1610276. https://doi.org/10.3389/fspas.2025.1610276
- Pinto, V.A., *et al.* (2022) "Revisiting the Ground Magnetic Field Perturbations Challenge: A Machine Learning Perspective." *Frontiers in Astronomy and Space Sciences*, 9:869740. https://doi.org/10.3389/fspas.2022.869740

## PROJECTS

**CU Boulder Honors Thesis** 2019
Research advisors: Dr. Daniel Baker and Dr. Thomas Berger

Independently studied theoretical ground-level enhancement precursor signals in neutron monitor data. Applied solar physics, time series analysis, and machine learning techniques. Wrote a final paper and defended a thesis before a committee. Awarded *summa cum laude*.

## SKILLS

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|---|---|
| **Computer Languages** | Python, C/C++, Java |
| **Human Languages** | English, French |
| **ML Tools** | scikit-learn, TensorFlow, Keras, PyTorch, PyTorch Lightning, JAX |
| **Data Analysis** | Spacecraft data, predictive analytics |
| **Other** | Third degree black belt in karate |