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Outline

1. GMU Demographics
2. Space Weather Lab Demographics
3. Space Weather Courses
4. My research activities related to research at GSFC and collaborations with GSFC scientists
5. My existing collaborations with GSFC employees on projects
6. General opportunities for GSFC scientists

2024 NASA/GSFC PHaSER Open House, September 18th, 2024

1. GMU Demographics

GMU

- ~ 25,000 undergraduate
- ~ 11,000 graduate
- Total enrollment increase of ~20% in past 10 years

Department of Physics and Astronomy

- Faculty: 28 tenure-line, 7 term
- BS: ~90 Physics, ~40 Astronomy
- MS: ~10
- PhD: ~70

Space Weather Lab

- Faculty: 4 tenure-line, 5 research, 1 post-doc, ~20 cooperative agreement
- PhD: 12 Active, 20 since 2004

2. Space Weather Lab Demographics

Research Faculty:

- Bob Meier – Ionosphere/Solar
- Art Poland – Solar
- Dieter Bilitza –Thermosphere/Ionosphere
- Dusan Odstrcil – Solar Wind
- John Shebalin – MHD Simulation
- Suman Dhakal – CMEs and Flares

Tenure-Line Faculty:

- Jie Zhang - Solar
- Erdal Yiğit – Thermosphere/Ionosphere/Planetary
- Bob Weigel – Magnetosphere
- Mike Summers – Planetary/Upper Atmosphere

3. Space Weather Courses

Regular and Semi-Courses

- Space Plasma Physics
- Space Weather
- Atmospheric Physics
- Planetary Sciences
- Stellar Astrophysics
- Exoplanets

Other (ad-hoc or indiv. study)

- Atmosphere/Ionosphere System
- Magnetospheric Physics
- Radiation Belt Physics
- MHD Simulation
- Solar Data Analysis

4. Related Research

- Modeling Large-Scale Current Systems during Extreme Space Weather Events (with graduate student Dean Thomas and group led by Antti Pulkkinen @ NASA/GSFC)
- Solving MHD equations using Physics Informed Neural Networks (PINNs; with recent PhD student Eric Winter, now at JHU/APL)
- Data Mining-Derived Magnetic Field Modeling (with part time graduate student Grant Stephens @ JHU/APL, Misha Sitnov and Nikolai Tsyganenko)
- Geomagnetically Induced Current and Magnetotelluric Transfer Function Modeling and Prediction (with Antti Pulkkinen and Peter Schuck @ NASA/GSFC and Dan Welling at U. Michigan)

5. Related Projects

- Lead on Space Time Coordinate Transform specification (with Brian Thomas, Lan Jian, Bobby Candey, Albert Shih, and Rebecca Ringuette @ NASA/GSFC)
- Co-Lead on Heliophyiscs API (HAPI; initiated by Aaron Roberts @ NASA/GSFC)
- Contributor to SPASE 3.0 development (with Brian Thomas and Rebecca Ringuette @ NASA/GSFC)
- Contributor to Python in Heliophysics Community (PyHC) software and summer school (NASA sponsored)
- Participant in COSPAR International Space Weather Action Teams (lead by Masha Kuznetsova @NASA/GSFC)

6. Opportunities

At GMU, we have had many PhD students who

- Worked on summer projects with NASA scientists and continued on project for PhD at GMU with NASA scientist as the research advisor.
- Are full-time employees in government working on a Space Weather related field and work on a MS or PhD part time.

Feel free to contact us if you

- have a talented undergraduate or employee who is interested in an advanced degree and wants to continue working with you;
- have a project that needs PhD-level students - long-term support more attractive to students, but limited support for 1st and 2nd year graduate students often works;
- have a project that needs undergraduate-level students; I typically ask the instructor of the computational physics courses for recommendations of productive students;
- are interested in teaching a course.