

# RANDY RUCH

Doctoral Candidate, Georgia Institute of Technology  
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## EDUCATION

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### Georgia Institute of Technology

Doctor of Philosophy (Ph.D.), Planetary and Space Physics  
Advisor: Dr. Sven Simon

*August 2023 - Present*

Expected Graduation: May 2028  
GPA: 4.0

### Georgia Institute of Technology

B.S., Physics, Concentration: Astrophysics

*August 2018 - May 2023*

GPA: 3.94

## POSITIONS HELD

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**Georgia Institute of Technology, School of Earth and Atmospheric Sciences** Atlanta, GA  
*Graduate Research Assistant, Center for Relativistic Astrophysics* *August 2023 - Present*

- Developed a parallelized computational model (Python) for studying energetic heliospheric ion dynamics through regions of non-uniform electromagnetic fields
- Implemented this model at Pluto to investigate the influence of its nearby electromagnetic environment on the distribution of energetic heliospheric ions
- Applied a hybrid plasma simulation tool to model Pluto's induced magnetosphere, resulting from the interaction of the impinging solar wind with Pluto's neutral atmosphere

**Georgia Institute of Technology, School of Earth and Atmospheric Sciences** Atlanta, GA  
*Undergraduate Research Assistant, Center for Relativistic Astrophysics* *Spring 2023*

- Studied computational methods in space plasma physics with Dr. Sven Simon
- Applied studies to the Jovian magnetosphere to simulate ion dynamics in different magnetic field configurations

## PUBLICATIONS

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### Dynamics of Energetic Heliospheric Ions in Pluto's Induced Magnetosphere

[R. Ruch](#), S. Simon, and C. M. Haynes, *J.Geophys. Res. (Space Physics)*, 130, e2024JA033548, doi: 10.1029/2024JA033548, 2025

## PRESENTATIONS

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\*[R. Ruch](#), C. M. Haynes, and S. Simon. **Energetic Ion Dynamics in Pluto's Induced Magnetosphere.** *AGU Fall Meeting*, Washington, D.C., USA, 9-13 December, 2024.

\*[R. Ruch](#), S. Simon, and C. M. Haynes. **Energetic Ion Dynamics in Pluto's Induced Magnetosphere.** *EuroPlanet Science Congress*, Berlin, Germany, 8-13 September, 2024.

[R. Ruch](#), P. Addison, T. Tippens, C. M. Haynes, P. Kollmann, S. Simon, and A. Stahl. **Model of Pluto's Induced Magnetosphere and its Interaction with Energetic Heliospheric Ions.** *AGU Fall Meeting*, San Francisco, USA, 11-15 December, 2023.

(\*): Oral presentation

## HONORS AND AWARDS

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**Best Paper Award: School of Earth and Atmospheric Sciences:** *March 2025*

Awarded to a student for the best refereed paper or series of refereed papers, published or accepted for publication by the time of selection, for which the student is the first author. Includes a \$1500 award

**President's Undergraduate Research Award (PURA):** *January 2023*

Awarded to competitive research prospects within their first two years as undergraduates at Georgia Tech. Includes a \$1500 salary award to fund a semester of original research

**Dean's List:** *Fall 2019 - May 2023*

Awarded to any undergraduate student with a GPA greater than 3.0

**Highest Honors:** *Fall 2019 - May 2023*

Awarded to undergraduate students with a GPA greater than 3.55

## TEACHING

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**Advanced Space Plasma Physics** *Atlanta, GA*

*Graduate Teaching Assistant* *Spring 2024*

- Graduate-level course on the theoretical framework of advanced plasma physics
- Topics include kinetic plasma theory, multi-fluid and magnetohydrodynamic treatments, cold plasma waves, shocks and discontinuities, planetary plasma interactions, and magnetospheric topology

## PROFESSIONAL REFERENCES

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**Sven Simon, Professor**

Ph.D. Advisor

School of Earth and Atmospheric Sciences, Georgia Institute of Technology

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