

# PETER ADDISON

Doctoral Candidate, Georgia Institute of Technology  
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## EXPERIENCE

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**Graduate Research Assistant, School of Earth and Atmospheric Sciences** Atlanta, GA  
*Georgia Institute of Technology, Supervisor: Sven Simon* August 2020 - Present

- Developed comprehensive, highly-parallelized, three-dimensional computational models/algorithms in C++ to study fluid and plasma dynamics as well as map surface radiation in space environments
- Developed models of space-surface interactions as well as predictive models of spacecraft observations
- Worked as lead scientist on a NASA-funded (\$400k over 4 years) research project, involving extensive collaboration with research institutions in the U.S. and Europe
- Analyzed large, technical datasets from in-situ spacecraft including NASA's Galileo and Juno missions
- Published findings in seven peer-reviewed scientific publications, and delivered award-winning presentations at international scientific conferences
- Implemented data analysis and modeling techniques with C++, Python, MATLAB, and IDL, as well as MPI parallelization
- Full time, 40-50 hours per week

**Undergraduate Research Assistant** Atlanta, GA  
*Georgia Institute of Technology, Supervisor: Sven Simon* Jan 2019-July 2020

- Worked with the group of Dr. Sven Simon (Magnetospheres of the Outer Solar System Group)
- Duties included modeling plasma interactions near the moons of Saturn and Jupiter, using C++, Python and MATLAB programming
- Part time, 10-20 hours per week

## EDUCATION

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**Georgia Institute of Technology** August 2020 - Present  
Doctor of Philosophy (Ph.D.), Planetary and Space Physics Expected Graduation: May 2024  
Advisor: Sven Simon GPA: 4.00

**Georgia Institute of Technology** August 2016 - May 2020  
B.S., Physics, Concentration: Astrophysics Highest Honors  
Minor, Spanish Language GPA: 3.73

## SKILLS

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**Physics:** Electrodynamics | Fluid Dynamics | Plasma Physics | Magnetohydrodynamics (MHD) | Radiation Processes | Orbital Mechanics | Relativity | Thermodynamics | Quantum Mechanics | Mechanics

**Computational:** Numerical simulations | Modeling | Algorithms | Data Analysis | Parallel Computing | High Performance Computing | Three-Dimensional Visualization | Software Development | C++ | Python | MATLAB | IDL | VisIt | HTML/CSS | MPI | OpenMP | Linux | LaTeX | Git

**Mathematical:** Linear Algebra | Statistics | Calculus | Differential Equations | Numerical Methods | Curvilinear Coordinate Systems | Coordinate Transformations | Nonlinear Dynamics

**Communication:** Technical/Scientific Writing | Peer-Reviewed Publication | Technical Presentation | Teaching | Public Speaking

## PUBLICATIONS

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### 4 First-Authored Publications (11 Total). Citations: 67 (G. Scholar)

#### Constraining the Influence of Callisto's Perturbed Electromagnetic Environment on Energetic Particle Observations

Lucas Liuzzo, Andrew Poppe, Quentin Nénon, Sven Simon, [Peter Addison](#) (2024), *J. Geophys. Res. (Space Physics)*, doi:10.1029/2023JA032189

#### Magnetic Signatures of the Interaction Between Europa and Jupiter's Magnetosphere During the Juno Flyby

[Peter Addison](#), C. Michael Haynes, Aaron Stahl, Lucas Liuzzo, Sven Simon (2024), *Geophysical Research Letters*, doi:10.1029/2023GL106810

#### A Model of Ganymede's Magnetic and Plasma Environment During the Juno PJ34 Flyby

A. Stahl, [Peter Addison](#), Lucas Liuzzo, Sven Simon (2023), *J. Geophys. Res. (Space Physics)*, doi:10.1029/2023JA032113

#### Emission of Energetic Neutral Atoms from the Magnetosphere-Atmosphere Interactions at Callisto and Europa

C. Michael Haynes, Tyler Tippens, [Peter Addison](#), Lucas Liuzzo, Andrew Poppe, Sven Simon (2023), *J. Geophys. Res. (Space Physics)*, doi:10.1029/2023JA031931

#### Surface-plasma Interactions at Europa in Draped Magnetospheric Fields: the Contribution of Energetic Electrons to Energy Deposition and Sputtering

[Peter Addison](#), Lucas Liuzzo, Sven Simon, (2023), *J. Geophys. Res. (Space Physics)*, doi:10.1029/2023JA031734

#### Energetic Magnetospheric Particle Fluxes onto Callisto's Atmosphere

Lucas Liuzzo, Andrew Poppe, [Peter Addison](#), Sven Simon, Quentin Nénon, Christopher Paranicas (2022), *J. Geophys. Res. (Space Physics)*, doi: 10.1029/2022JA030915.

#### Effect of the Magnetospheric Plasma Interaction and Solar Illumination on Ion Sputtering of Europa's Surface Ice

[Peter Addison](#), Lucas Liuzzo, Sven Simon, (2022), *J. Geophys. Res. (Space Physics)*, doi: 10.1029/2021JA030136.

#### Formation of a Displaced Plasma Wake at Neptune's Moon Triton

Sven Simon, [Peter Addison](#), Lucas Liuzzo, (2022), *J. Geophys. Res. (Space Physics)*, doi: 10.1029/2021JA029958.

#### Triton's Variable Interaction with Neptune's Magnetospheric Plasma

Lucas Liuzzo, Carol Paty, Corey Cochrane, Tom Nordheim, Adrienn Luspay-Kuti, Julie Castillo-Rogez, Kathleen Mandt, Karl Mitchell, Mats Holmström, [Peter Addison](#), Sven Simon, Andrew Poppe, Steven Vance, Louise Prockter, (2021), *J. Geophys. Res. (Space Physics)*, doi: 10.1029/2021JA029740.

#### Role of the Ionospheric Conductance Profile in Sub-Alfvenic Moon-Magnetosphere Interactions: an Analytical Model

Sven Simon, Lucas Liuzzo, [Peter Addison](#), (2021), *J. Geophys. Res. (Space Physics)*, doi: 10.1029/2021JA029191.

#### Influence of Europa's Time-Varying Electromagnetic Environment on Magnetospheric Ion Precipitation and Surface Weathering

[Peter Addison](#), Lucas Liuzzo, Hannes Arnold, Sven Simon (2021), *J. Geophys. Res. (Space Physics)*, doi: 10.1029/2020JA029087.

## PRESENTATIONS

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[P. Addison](#), L. Liuzzo, and S. Simon. **Surface-Plasma Interaction at Europa in Draped Magnetospheric Fields: the Contribution of Energetic Electrons to Energy Deposition and Sputtering.** *AGU Fall Meeting*, San Francisco, USA, 11-15 December, 2023. **Surface-Plasma Interaction at Europa in Draped Magnetospheric Fields: the Contribution of Energetic Electrons to Energy Deposition and Sputtering.** *DPS Meeting*, San Antonio, USA, 1-6 October, 2023.

**P. Addison**, L. Liuzzo, and S. Simon. **Ion Sputtering at Europa: Feedback between the Space Environment and the Surface (invited talk)**. *AGU Fall Meeting*, Chicago, USA, 12-16 December, 2022. Selected for Outstanding Student Presentation Award (OSPA).

**P. Addison**, L. Liuzzo, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Magnetospheric Ion Precipitation and Surface Weathering**. *AGU Fall Meeting*, Chicago, USA, 12-16 December, 2022.

**P. Addison**, L. Liuzzo, and S. Simon. **Effect of the Magnetospheric Plasma Interaction and Solar Illumination on Ion Sputtering of Europa's Surface Ice**. *Europlanet Science Congress*, Granada, Spain, 19-23 September, 2022.

**P. Addison**, L. Liuzzo, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Magnetospheric Ion Precipitation and Surface Weathering**. *Europlanet Science Congress*, Granada, Spain, 19-23 September, 2022.

**P. Addison**, L. Liuzzo, and S. Simon. **Effect of the Magnetospheric Plasma Interaction and Solar Illumination on Ion Sputtering of Europa's Surface Ice**. *Magnetospheres of the Outer Planets Meeting*, Liège, Belgium, 11-15 July, 2022.

**P. Addison**, L. Liuzzo, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Magnetospheric Ion Precipitation and Surface Weathering**. *Magnetospheres of the Outer Planets Meeting*, Liège, Belgium, 11-15 July, 2022.

**P. Addison**, L. Liuzzo, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Magnetospheric Ion Precipitation and Surface Weathering**. *European Geophysical Union Fall Meeting*, virtual meeting, 23-27 May, 2022.

**P. Addison**, L. Liuzzo, and S. Simon. **Processing of Europa's Surface by its Perturbed Space Environment**. *American Geophysical Union Fall Meeting*, virtual meeting, 12-17 December, 2021.

**P. Addison**, L. Liuzzo, and S. Simon. **Influence of Europa's Non-Uniform Electromagnetic Environment on Surface Weathering**. *American Geophysical Union Fall Meeting*, virtual meeting, 12-17 December, 2021.

**P. Addison**, L. Liuzzo, H. Arnold, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Magnetospheric Ion Precipitation**. *American Geophysical Union Fall Meeting*, virtual meeting, 12-17 December, 2021.

**P. Addison**, L. Liuzzo, H. Arnold, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Magnetospheric Ion Precipitation and Surface Weathering**. *Magnetospheres of the Outer Planets Meeting*, virtual meeting, 12-16 July, 2021.

**P. Addison**, L. Liuzzo, H. Arnold, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Magnetospheric Ion Precipitation and Surface Weathering (invited seminar talk)**. *Space Sciences Laboratory, University of California, Berkeley*, Berkeley, CA, 9 March 2021.

**P. Addison**, L. Liuzzo, H. Arnold, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Energetic Ion Precipitation**. *American Geophysical Union Fall Meeting*, virtual meeting, 1-17 December, 2020.

**P. Addison**, L. Liuzzo, H. Arnold, and S. Simon. **Influence of Europa's Time-Varying Electromagnetic Environment on Energetic Ion Precipitation**. *Europlanet Science Congress*, virtual meeting, 21 September – 9 October, 2020.

## SELECTED HONORS AND AWARDS

### Georgia Tech Presidential Fellowship

August 2020-Present

Awarded annually to the top 5% of the incoming class of graduate students at Georgia Tech. Fellowship includes an additional \$5500 salary award per year on top of the typical graduate student salary.

<b>Research Excellence Award</b>	April 2023
Awarded annually by the GT School of Earth and Atmospheric Sciences for “excellence in research, as judged primarily on the basis of the creativity and independence exhibited by the student in conduct of the research.”	
<b>Graduate Student Service Award</b>	April 2023
Awarded annually by the GT School of Earth and Atmospheric Sciences for “the contributions of graduate students who demonstrate excellence in service internally or externally to Earth and Atmospheric Sciences.”	
<b>Outstanding Student Presentation Award, AGU Fall Meeting 2022</b>	December 2022
Awarded for the <b>invited talk</b> at the American Geophysical Union (AGU) Fall meeting 2022 titled: “Ion Sputtering at Europa: Feedback between the Space Environment and the Surface.” The OSPA award is given to the top 2%-5% of student presenters at the meeting, determined by senior scientists in their respective field.	
<b>Best Paper Award</b>	April 2022
Awarded annually by the GT School of Earth and Atmospheric Sciences “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.”	
<b>Presidential Undergraduate Research Salary Award (PURA):</b>	Spring 2020
Awarded to competitive research proposals submitted by undergraduates at Georgia Tech. Includes a \$1500 salary award to fund a semester of original research.	
<b>College of Sciences Dean’s Scholarship:</b>	August 2016-May 2020
Awarded to top prospective undergraduate students in the College of Sciences at Georgia Tech. Includes approximately \$23,000 yearly to mitigate the cost of tuition.	
<b>Dean’s List:</b>	Fall 2017-May 2020
Awarded to undergraduate students with a GPA greater than 3.0.	
<b>Highest Honors:</b>	Fall 2018-May 2020
Awarded to undergraduate students with a GPA greater than 3.55.	

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## PROFESSIONAL INVOLVEMENT

<b>Georgia Tech Planetary Science Faculty Search</b>	January 2023
Student Committee Chair; organized student committee to interview and evaluate candidates for an open professor position in planetary science at Georgia Tech	
<b>NASA New Frontiers Data Analysis Program</b>	January 2023
External Reviewer	
<b>NASA New Frontiers Data Analysis Program Panel</b>	January 2023
Executive Secretary, participating in the review of proposals for multi-hundred thousand dollar scientific proposals.	
<b>American Geophysical Union</b>	January 2020-Present
Member	
<b>European Geophysical Union</b>	March 2023-Present
Member	

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## PROFESSIONAL REFERENCES

<b>Sven Simon, Professor</b>	Ph.D. Advisor
School of Earth and Atmospheric Sciences, Georgia Institute of Technology	
Email: sven.simon@eas.gatech.edu	
Phone: (404) 385-1509	
Website: <a href="https://svensimon.gatech.edu/">https://svensimon.gatech.edu/</a>	

**Lucas Liuzzo, Research Scientist**

Space Sciences Laboratory, University of California, Berkeley

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Website: <https://lukeliuzzo.github.io/>

Collaborator