

Dr. Lucas Liuzzo, Ph.D.

SPACE SCIENCES LABORATORY

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Positions Held

University of California, Berkeley

Berkeley, CA

ASSISTANT RESEARCH SCIENTIST, SPACE SCIENCES LABORATORY

June 2022 – Present

- Applying a combination of hybrid plasma modeling and test-particle simulations to study the interaction between outer-planet moons and their local plasma environments.
- Using data analysis techniques to understand particle signatures observed during near-moon encounters from missions including THEMIS-ARTEMIS, Juno, Cassini, Galileo, and Voyager 2.
- Modeling the plasma environments of various solar system objects to forecast conditions during future spacecraft missions to moons throughout the solar system.
- Advising the future generation of planetary and space scientists in modeling and data analysis techniques.

POSTDOCTORAL SCHOLAR, SPACE SCIENCES LABORATORY

August 2019 – June 2022

- Applied various modeling techniques to constrain the electromagnetic environments near the Galilean moons of Jupiter.
- Constrained the high- and low-energy particle environments of select Galilean moons as well as Earth's Moon, based on measurements from multiple spacecraft missions.
- Advised undergraduate and graduate students in applying numerical models to understand moon-plasma interactions.

Georgia Institute of Technology

Atlanta, GA

POSTDOCTORAL SCHOLAR, SCHOOL OF EARTH AND ATMOSPHERIC SCIENCES

January 2019 – July 2019

- Applied numerical modeling and data analysis techniques to investigate energetic particle dynamics near Callisto and compared results to magnetic field and energetic particle data from the Galileo mission.
- Used a combination of a hybrid model and test-particle simulation framework to study the influence of plume activity at Europa on energetic particle dynamics near the moon.
- Advised undergraduate and graduate students in studying Europa's interaction with Jupiter's magnetospheric plasma.

GRADUATE RESEARCH ASSISTANT, SCHOOL OF EARTH AND ATMOSPHERIC SCIENCES

August 2014 – December 2018

- Modeled and investigated the plasma interaction of Jupiter's moon Callisto through the use of the established *Adaptive Ion-Kinetic Electron-Fluid* hybrid simulation model and data analysis techniques. Results were compared to data from the Galileo mission, and applied to the future JUICE mission to Jupiter.

University of Michigan

Ann Arbor, MI

UNDERGRADUATE RESEARCH ASSISTANT, DEPARTMENT OF ATMOSPHERIC, OCEANIC AND SPACE SCIENCES

January 2013 – August 2014

- Modeled and analyzed ionospheric disturbances at Earth, studied their effects on atmospheric conditions using the established *Global Ionosphere-Thermosphere Model*, and compared model output with multiple observational data sets of the high-latitude ionosphere.

Education

Georgia Institute of Technology

Atlanta, GA

DOCTOR OF PHILOSOPHY (PH.D.), PLANETARY AND SPACE PHYSICS

December 2018

School of Earth and Atmospheric Sciences

Dissertation: *Callisto: Signatures of plasma interaction, induction, and energetic particle dynamics at the Galilean moon*

Advisor: Sven Simon

University of Michigan

Ann Arbor, MI

BACHELOR OF SCIENCE IN ENGINEERING (B.S.E.), EARTH SYSTEM SCIENCE AND ENGINEERING, *magna cum laude*

May 2014

Department of Atmospheric, Oceanic and Space Sciences

Area of Concentration: Space Weather

Academic Minors: Mathematics, Physics

Peer-reviewed Publications

15 first-authored, peer-reviewed publications (44 in total) | 559 citations | h-index 15

SYMBOLS INDICATE ADVISED [§]POSTDOCTORAL SCHOLARS, [†]GRADUATE STUDENTS, AND [‡]UNDERGRADUATE STUDENTS

2024

On the formation of trapped electron radiation belts at Ganymede

LUCAS LIUZZO, QUENTIN NÉNON, ANDREW POPPE, AARON STAHL, SVEN SIMON, AND SHAHAB FATEMI, *Geophysical Research Letters*, 51, E2024GL109058, DOI:10.1029/2024GL109058.

Constraining the influence of Callisto's perturbed electromagnetic environment on energetic particle observations

LUCAS LIUZZO, ANDREW R. POPPE, QUENTIN NÉNON, SVEN SIMON, AND PETER ADDISON[†] (2024), *Journal of Geophysical Research (Space Physics)*, 129, E2023JA032189, DOI:10.1029/2023JA032189.

Backscattering of ions impacting Ganymede's surface as a source for energetic neutral atoms

PAUL SZABO, ANDREW R. POPPE, ANDREAS MUTZKE, LUCAS LIUZZO, AND SHANE R. CARBERRY MOGAN[§] (2024), *Astrophysical Journal Letters*, 963, L32, DOI:10.3847/2041-8213/AD2701.

Science return of probing magnetospheric systems of ice giants

XIN CAO, XIANGNING CHU, SEAN HSU, HAO CAO, WEIJIE SUN, LUCAS LIUZZO, ..., AND FERDINAND PLASCHKE (2024), *Front. Astron. Space Sci. Sec. Space Physics*, 11, DOI:10.3389/FSPAS.2024.1203705.

A novel backtracing model to study the emission of energetic neutral atoms at Titan

TYLER TIPPENS, ELIAS ROUSSOS, SVEN SIMON, AND LUCAS LIUZZO (2024), *Journal of Geophysical Research (Space Physics)*, 129, E2023JA032083, DOI:10.1029/2023JA032083.

Magnetic signatures of the interaction between Europa and Jupiter's magnetosphere during the Juno flyby

PETER ADDISON[†], C. MICHAEL HAYNES[†], AARON STAHL, LUCAS LIUZZO, AND SVEN SIMON (2024), *Geophysical Research Letters*, 51, E2023GL106810, DOI:10.1029/2023GL106810.

3D Monte-Carlo simulation of Ganymede's atmosphere

AUDREY VORBURGER, SHAHAB FATEMI, SHANE R. CARBERRY MOGAN[§], ANDRÉ GALLI, LUCAS LIUZZO, ANDREW R. POPPE, LORENZ ROTH, AND PETER WURZ (2024), *Icarus*, 409, 115847, DOI:10.1016/J.ICARUS.2023.115847.

2023

A model of Ganymede's magnetic and plasma environment during the Juno PJ34 flyby

AARON STAHL, PETER ADDISON[†], SVEN SIMON, AND LUCAS LIUZZO (2023), *Journal of Geophysical Research (Space Physics)*, 128, E2023JA032113, DOI:10.1029/2023JA032113.

Emission of energetic neutral atoms from the magnetosphere-atmosphere interactions at Callisto and Europa

CHARLES HAYNES[†], TYLER TIPPENS, PETER ADDISON[†], LUCAS LIUZZO, ANDREW POPPE, AND SVEN SIMON (2023), *Journal of Geophysical Research (Space Physics)*, 128, E2023JA031931, DOI:10.1029/2023JA031931.

Callisto's atmosphere: The oxygen enigma

SHANE CARBERRY MOGAN[§], LUCAS LIUZZO, ANDREW R. POPPE, SVEN SIMON, JAMEY R. SZALAY, ORENTHAL J. TUCKER, AND ROBERT E. JOHNSON (2023), *Journal of Geophysical Research (Planets)*, 128, E2023JE007894, DOI:10.1029/E2023JE007894.

Surface-plasma interactions at Europa in draped magnetospheric fields: The contribution of energetic electrons to energy deposition and sputtering

PETER ADDISON[†], LUCAS LIUZZO, AND SVEN SIMON (2023), *Journal of Geophysical Research (Space Physics)*, 128, E2023JA031734, DOI:10.1029/2023JA031734.

Unrestricted solar energetic particle access to the Moon while within the terrestrial magnetotail

LUCAS LIUZZO, ANDREW R. POPPE, CHRISTINA O. LEE, SHAOSUI XU, AND VASSILIS ANGELOPOULOS (2023), *Geophysical Research Letters*, 50, E2023GL103990, DOI:10.1029/2023GL103990.

2022

Energetic magnetospheric particle fluxes onto Callisto's atmosphere

LUCAS LIUZZO, ANDREW R. POPPE, PETER ADDISON[†], SVEN SIMON, QUENTIN NÉNON, AND CHRISTOPHER PARANICAS (2022), *Journal of Geophysical Research (Space Physics)*, E2022JA030915, DOI:10.1029/2022JA030915.

Influence of Titan's variable electromagnetic environment on the global distribution of energetic neutral atoms

TYLER TIPPENS, LUCAS LIUZZO, AND SVEN SIMON (2022), *Journal of Geophysical Research (Space Physics)*, 127, E2022JA030722, DOI:10.1029/2022JA030722.

Pitch angle distribution of MeV electrons in the magnetosphere of Jupiter

QUENTIN NÉNON, LUCAS MILLER, PETER KOLLMANN, LUCAS LIUZZO, MARCO PINTO, AND OLIVIER WITASSE (2022), *Journal of Geophysical Research (Space Physics)*, 127, E2022JA030627, DOI:10.1029/2022JA030627.

Energetic charged particle fluxes relevant to Ganymede's polar region

CHRISTOPHER PARANICAS, BARRY H. MAUK, PETER KOLLMANN, GEORGE CLARK, ..., LUCAS LIUZZO, ..., AND SCOTT BOLTON (2022), *Geophysical Research Letters*, 49, E2022GL098077, DOI:10.1029/2022GL098077.

Callisto's atmosphere and its space environment: Prospects for the Particle Environment Package on board JUICE

ANDRE GALLI, AUDREY VORBURGER, SHANE R. CARBERRY MOGAN[§], ELIAS ROUSSOS, ..., AND LUCAS LIUZZO (2022), *Earth and Space Science*, 9, E2021EA002172, DOI:10.1029/2021EA002172.

A statistical study of the Moon's magnetotail plasma environment

LUCAS LIUZZO, ANDREW R. POPPE, AND JASPER S. HALEKAS (2022), *Journal of Geophysical Research (Space Physics)*, 127, E2022JA030260, DOI:10.1029/2022JA030260.

Effect of the magnetospheric plasma interaction and solar illumination on ion sputtering of Europa's surface ice

PETER ADDISON[†], LUCAS LIUZZO, AND SVEN SIMON (2022), *Journal of Geophysical Research (Space Physics)*, 127, E2021JA030136, DOI:10.1029/2021JA030136.

Single- and multi-pass magnetometric subsurface ocean detection and characterization in icy worlds using principal component analysis (PCA): Application to Triton

COREY COCHRANE, RUSSELL PERSIGNER, STEVEN VANCE, EVERETT MIDKIFF, ..., LUCAS LIUZZO, ..., AND LOUISE PROCKTER (2022), *Earth and Space Science*, 9, E2021EA002034, DOI:10.1029/2021EA002034. *Published as an Editor's Highlight.*

Formation of a displaced plasma wake at Neptune's moon Triton

SVEN SIMON, PETER ADDISON[†], AND LUCAS LIUZZO (2022), *Journal of Geophysical Research (Space Physics)*, 127, E2021JA029958, DOI:10.1029/2021JA029958.

2021

3D Monte-Carlo simulation of Ganymede's water exosphere

AUDREY VORBURGER, SHAHAB FATEMI, ANDRÉ GALLI, LUCAS LIUZZO, ANDREW R. POPPE, AND PETER WURZ (2021), *Icarus*, 114810, DOI:10.1016/J.ICARUS.2021.114810.

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 L. MITCHELL, MATS HOLMSTRÖM, PETER ADDISON[†], SVEN SIMON, ANDREW R. POPPE, STEVEN D. VANCE, AND LOUISE PROCKTER (2021), *Journal of Geophysical Research (Space Physics)*, 126, E2021JA029740, DOI:10.1029/2021JA029740.

ARTEMIS observations of lunar nightside surface potentials in the magnetotail lobes: Evidence for micrometeoroid impact charging

ANDREW R. POPPE, SHAOSUI XU, LUCAS LIUZZO, JASPER S. HALEKAS, AND YUKI HARADA (2021), *Geophysical Research Letters*, 48, E2021GL094585, DOI:10.1029/2021GL094585.

Role of the ionospheric conductance profile in sub-Alfvénic moon-magnetosphere interactions: An analytical model

SVEN SIMON, LUCAS LIUZZO, AND PETER ADDISON[†] (2021), *Journal of Geophysical Research (Space Physics)*, 126, E2021JA029191, DOI:10.1029/2021JA029191.

Investigating the Moon's interaction with the terrestrial magnetotail lobe plasma

LUCAS LIUZZO, ANDREW R. POPPE, JASPER S. HALEKAS, SVEN SIMON, AND XIN CAO (2021), *Geophysical Research Letters*, 48, E2021GL093566, DOI:10.1029/2021GL093566.

Influence of Europa's time-varying electromagnetic environment on magnetospheric ion precipitation and surface weathering

PETER ADDISON[†], **LUCAS LIUZZO**, HANNES ARNOLD[†], AND SVEN SIMON (2021), *Journal of Geophysical Research (Space Physics)*, 126, E2020JA029087, DOI:10.1029/2020JA029087.

Modeling transmission windows in Titan's lower troposphere: Implications for infrared spectrometers aboard future aerial and surface missions

PAUL CORLIES, GEORGE McDONALD, ALEXANDER HAYES, JAMES WRAY, ..., **LUCAS LIUZZO**, ..., AND ELIZABETH TURTLE (2021), *Icarus*, 357, 114228, DOI:10.1016/J.ICARUS.2020.114228.

2020

Applying ion energy spectrograms to search for plumes at Europa

HANNES ARNOLD[†], SVEN SIMON, AND **LUCAS LIUZZO** (2020), *Journal of Geophysical Research (Space Physics)*, 125, E2020JA028376, DOI:10.1029/2020JA028376.

Variability in the energetic electron bombardment of Ganymede

LUCAS LIUZZO, ANDREW R. POPPE, CHRISTOPHER PARANICAS, QUENTIN NÉNON, SHAHAB FATEMI, AND SVEN SIMON (2020), *Journal of Geophysical Research (Space Physics)*, 125, E2020JA028347, DOI:10.1029/2020JA028347.

Magnetospheric interactions of Saturn's moon Dione (2005–2015)

NORBERT KRUPP, ANNA KOTOVA, ELIAS ROUSSOS, SVEN SIMON, **LUCAS LIUZZO**, CHRIS PARANICAS, KRISHAN KHURANA, AND GERAINT H. JONES (2020), *Journal of Geophysical Research (Space Physics)*, 125, E2019JA027688, DOI:10.1029/2019JA027688.

Plasma interaction signatures of plumes at Europa

HANNES ARNOLD[†], **LUCAS LIUZZO**, AND SVEN SIMON (2020), *Journal of Geophysical Research (Space Physics)*, 125, E2019JA027346, DOI:10.1029/2019JA027346.

2019

Energetic electron dynamics near Callisto

LUCAS LIUZZO, SVEN SIMON, AND LEONARDO REGOLI (2019), *Planetary and Space Science*, 179, 104726, DOI:10.1016/J.PSS.2019.104726.

Energetic ion dynamics in the perturbed electromagnetic fields near Europa

BENJAMIN BREER[†], **LUCAS LIUZZO**, HANNES ARNOLD[†], PETER ANDERSSON[†], AND SVEN SIMON (2019), *Journal of Geophysical Research (Space Physics)*, 124, 7592–7613, DOI:10.1029/2019JA027147.

Magnetic signatures of a plume at Europa during the Galileo E26 Flyby

HANNES ARNOLD[†], **LUCAS LIUZZO**, AND SVEN SIMON (2019), *Geophysical Research Letters*, 46, 1149–1157, DOI:10.1029/2018GL081544. *Published as a Featured Article.*

Energetic ion dynamics near Callisto

LUCAS LIUZZO, SVEN SIMON, AND LEONARDO REGOLI (2019), *Planetary and Space Science*, 166, 23–53, DOI:10.1016/J.PSS.2018.07.014.

2018

Observability of Callisto's inductive signature during the JUPiter ICy moons Explorer mission

LUCAS LIUZZO, SVEN SIMON, AND MORITZ FEYERABEND (2018), *Journal of Geophysical Research (Space Physics)*, 123, 9045–9054, DOI:10.1029/2018JA025951.

Coronal mass ejection hits Mercury: A.I.K.E.F. hybrid-code results compared to MESSENGER data

WILLI EXNER, DANIEL HEYNER, **LUCAS LIUZZO**, UWE MOTSCHMANN, DAIKOU SHIOTA, KANYA KUSANO, AND TAKYUA SHIBAYAMA (2018), *Planetary and Space Sciences*, 153, 89–99, DOI:10.1016/J.PSS.2017.12.016.

2017

A three-dimensional model of Pluto's interaction with the solar wind during the New Horizons encounter

MORITZ FEYERABEND, **LUCAS LIUZZO**, SVEN SIMON, AND UWE MOTSCHMANN (2017), *Journal of Geophysical Research (Space Physics)*, 122, 10,356–10,368, DOI:10.1002/2017JA024456.

Magnetic signatures of plasma interaction and induction at Callisto: The Galileo C21, C22, C23, and C30 flybys

LUCAS LIUZZO, SVEN SIMON, MORITZ FEYERABEND, AND UWE MOTSCHMANN (2017), *Journal of Geophysical Research (Space Physics)*, 122, 7364–7386, DOI:10.1002/2017JA024303.

2016

Disentangling plasma interaction and induction at Callisto: The Galileo C10 flyby

LUCAS LIUZZO, SVEN SIMON, MORITZ FEYERABEND, AND UWE MOTSCHMANN (2016), *Journal of Geophysical Research (Space Physics)*, 121, 8677–8694, DOI:10.1002/2016JA023236.

2015

The impact of Callisto's atmosphere on its plasma interaction with the Jovian magnetosphere

LUCAS LIUZZO, MORITZ FEYERABEND, SVEN SIMON, AND UWE MOTSCHMANN (2015), *Journal of Geophysical Research (Space Physics)*, 120, 9401–9427, DOI:10.1002/2015JA021792.

Filamented ion tail structures at Titan: A hybrid simulation study

MORITZ FEYERABEND, SVEN SIMON, UWE MOTSCHMANN, AND LUCAS LIUZZO (2015), *Planetary and Space Science*, 117, 362–376, DOI:10.1016/J.PSS.2015.07.008.

High-latitude ionospheric drivers and their effects on wind patterns in the thermosphere

LUCAS LIUZZO, AARON RIDLEY, NICHOLAS PERLONGO, ELIZABETH MITCHELL, MARK CONDE, DONALD HAMPTON, WILLIAM BRISTOW, AND MICHAEL NICOLLS (2015), *Journal of Geophysical Research (Space Physics)*, 120, 715–735, DOI:10.1002/2014JA020553.

Submitted Publications

Solar energetic electron access to the Moon within the terrestrial magnetotail and shadowing by the lunar surface

LUCAS LIUZZO, ANDREW R. POPPE, CHRISTINA O. LEE, AND VASSILIS ANGELOPOULOS *Geophysical Research Letters*.

The influence of non-thermal collisions in Europa's atmosphere

SHANE R. CARBERRY MOGAN, ANDREW R. POPPE, AND LUCAS LIUZZO, *Geophysical Research Letters*.

Stronger evidence of a subsurface ocean within Callisto from a multifrequency investigation of its induced magnetic field

COREY COCHRANE, STEVEN VANCE, MARSHALL STYCZINSKI, LUCAS LIUZZO, AND JULIE CASTILLO-ROGEZ, *AGU Advances*.

Funded Proposals

Characterizing the Solar Energetic Particle Environment near the Moon

PRINCIPAL INVESTIGATOR

Budgeted for 14 months over 3 years from the total of \$478,104.

PI: Lucas Liuzzo (SSL)

2022 NASA Lunar DAP

Paving the Road to Jupiter's Icy Moons

FUNDED SCIENCE TEAM MEMBER

Provides \$12,000 in travel funds for active collaborations between Berkeley scientists and their French colleagues.

PIs: A. Poppe and Q. Nénon

2023 France-Berkeley Fund

Emission of Energetic Neutral Atoms at Callisto and Europa

CO-INVESTIGATOR

Budgeted for 12 months over 3 years from the total of \$499,674.

PI: S. Simon (Georgia Tech)

2020 NASA Solar System Workings

Anisotropy of the radiation belts of Jupiter in the Europa-Ganymede region

FUNDED SCIENCE TEAM MEMBER

Budgeted for 4 months over 3 years from the total of \$352,055.

Science PI: Q. Nénon (SSL)

2020 NASA New Frontiers DAP

Energetic Particle Bombardment of Callisto

SCIENCE PRINCIPAL INVESTIGATOR

Budgeted for 24 months over 3 years from the total of \$349,981.

Science PI: Lucas Liuzzo (SSL)

2019 NASA Solar System Workings

Energetic Ion Dynamics at Europa

FUNDED SCIENCE TEAM MEMBER

Budgeted for 3 months over 3 years from the total of \$328,469.

PI: S. Simon (Georgia Tech)

2018 NASA Solar System Workings

First-Authored Presentations

Invited Talks and Colloquia

- ON THE MOON'S INTERACTION WITH THE TERRESTRIAL MAGNETOSPHERE.** TAIWAN SPACE UNION, MINI-MOON-SEMINAR SERIES, REMOTE, 01/2022.
- TRITON'S VARIABLE INTERACTION WITH NEPTUNE'S MAGNETOSPHERE.** TRIDENT/NEPTUNE-ODYSSEY WORKSHOP, REMOTE, 07/2021.
- STUDYING THE PLASMA INTERACTIONS OF THE ICY OUTER PLANET MOONS.** NASA JET PROPULSION LABORATORY, REMOTE, 01/2021.
- MODELING THE PLASMA ENVIRONMENTS OF JUPITER'S ICY MOONS: A GATEWAY TO UNDERSTANDING THEIR ATMOSPHERES, SURFACES, AND INTERIORS.** ILLINOIS STATE UNIVERSITY, DEPARTMENT OF PHYSICS, NORMAL, IL, USA, 02/2020.
- CALLISTO: SIGNATURES OF PLASMA INTERACTION, INDUCTION, AND ENERGETIC PARTICLE DYNAMICS.** UNIVERSITY OF CALIFORNIA, BERKELEY, SPACE SCIENCES LABORATORY, BERKELEY, CA, USA, 03/2019.
- CALLISTO: SIGNATURES OF PLASMA INTERACTION, INDUCTION, AND ENERGETIC PARTICLE DYNAMICS.** JOHNS HOPKINS UNIVERSITY, APPLIED PHYSICS LABORATORY, LAUREL, MD, USA, 01/2019.
- A COMPREHENSIVE PICTURE OF CALLISTO'S MAGNETIC AND COLD PLASMA ENVIRONMENT DURING THE GALILEO ERA: IMPLICATIONS FOR JUICE.** AMERICAN GEOPHYSICAL UNION FALL MEETING, NEW ORLEANS, LA, USA, 12/2017.
- CALLISTO'S MAGNETIC ENVIRONMENT DURING THE GALILEO ERA.** UNIVERSITY OF BRAUNSCHWEIG INSTITUTE FOR THEORETICAL PHYSICS, BRAUNSCHWEIG, GERMANY, 06/2017.
- CALLISTO'S INTERACTION WITH JUPITER'S MAGNETOSPHERIC PLASMA.** GERMAN AEROSPACE CENTER, BERLIN, GERMANY, 05/2016.
- MODELING CALLISTO'S INTERACTION WITH THE JOVIAN MAGNETOSPHERE (WORKSHOP).** UNIVERSITY OF BRAUNSCHWEIG, INSTITUTE OF GEOPHYSICS AND EXTRATERRESTRIAL PHYSICS, BRAUNSCHWEIG, GERMANY, 04/2016.
- THE INTERACTION OF CALLISTO'S ATMOSPHERE WITH THE JOVIAN MAGNETOSPHERE.** INTERNATIONAL SCHOOL/SYMPOSIUM FOR SPACE SIMULATIONS, PRAGUE, CZECH REPUBLIC, 07/2015.

Contributed Presentations

^T INDICATES A CONTRIBUTED TALK | ^P INDICATES A CONTRIBUTED POSTER

- UNRESTRICTED SOLAR ENERGETIC PARTICLE ACCESS TO THE MOON WHILE WITHIN THE TERRESTRIAL MAGNETOTAIL.** ^T THEMIS-ARTEMIS SWT, SAN FRANCISCO, CA, USA, 12/2023.
- MODELING GALILEO EPD MEASUREMENTS NEAR CALLISTO.** ^P AGU FALL MEETING, SAN FRANCISCO, CA, USA, 12/2023.
- UNRESTRICTED SOLAR ENERGETIC PARTICLE ACCESS TO THE MOON WHILE WITHIN THE TERRESTRIAL MAGNETOTAIL.** ^T AGU FALL MEETING, SAN FRANCISCO, CA, USA, 12/2023.
- THE IMPORTANCE OF PLASMA MEASUREMENTS FOR ICE GIANT MOON SCIENCE.** ^P URANUS FLAGSHIP WORKSHOP, PASADENA, CA, USA, 07/2023.
- UNRESTRICTED SOLAR ENERGETIC PARTICLE ACCESS TO THE MOON WHILE WITHIN THE TERRESTRIAL MAGNETOTAIL.** ^T DUST, ATMOSPHERE, AND PLASMA ENVIRONMENT OF THE MOON AND SMALL BODIES WORKSHOP, BOULDER, CO, USA, 06/2023.
- A STATISTICAL STUDY OF THE MOON'S MAGNETOTAIL PLASMA ENVIRONMENT.** ^T THEMIS/ARTEMIS SWT MEETING, CHICAGO, IL, USA, 12/2022.
- A STATISTICAL STUDY OF THE MOON'S MAGNETOTAIL PLASMA ENVIRONMENT.** ^P AMERICAN GEOPHYSICAL UNION FALL MEETING, CHICAGO, IL, USA, 12/2022.
- A STATISTICAL STUDY OF THE MOON'S MAGNETOTAIL PLASMA ENVIRONMENT.** ^P EUROPLANET SCIENCE CONGRESS, GRANADA, SPAIN, 09/2022.
- ENERGETIC PARTICLE FLUXES ONTO CALLISTO'S ATMOSPHERE.** ^T EUROPLANET SCIENCE CONGRESS, GRANADA, SPAIN, 09/2022.
- ENERGETIC PARTICLE FLUXES ONTO CALLISTO'S ATMOSPHERE.** ^T MAGNETOSPHERES OF THE OUTER PLANETS MEETING, LIÈGE, BELGIUM, 07/2022.
- FORMATION OF A TILTED PLASMA WAKE AT NEPTUNE'S MOON, TRITON.** ^P MAGNETOSPHERES OF THE OUTER PLANETS MEETING, LIÈGE, BELGIUM, 07/2022.
- ENERGETIC PARTICLE DEPOSITION ONTO CALLISTO'S ATMOSPHERE.** ^P AMERICAN GEOPHYSICAL FALL MEETING, VIRTUAL, 12/2021.
- INVESTIGATING THE MOON'S INTERACTION WITH THE TERRESTRIAL MAGNETOTAIL LOBE PLASMA.** ^P AMERICAN GEOPHYSICAL FALL MEETING, VIRTUAL, 12/2021.
- TRITON'S VARIABLE INTERACTION WITH NEPTUNE'S MAGNETOSPHERE.** ^P AMERICAN GEOPHYSICAL UNION FALL MEETING, VIRTUAL, 12/2021.
- INVESTIGATING THE MOON'S INTERACTION WITH THE TERRESTRIAL MAGNETOTAIL LOBE PLASMA.** ^P NASA EXPLORATION SCIENCE FORUM, VIRTUAL, 07/2021.
- TRITON'S VARIABLE INTERACTION WITH NEPTUNE'S MAGNETOSPHERE.** ^P MAGNETOSPHERES OF THE OUTER PLANETS MEETING, VIRTUAL, 07/2021.
- VARIABILITY IN THE ENERGETIC ELECTRON BOMBARDMENT OF GANYMEDE.** ^P AMERICAN GEOPHYSICAL UNION FALL MEETING, VIRTUAL, 12/2020.
- VARIABILITY IN THE ENERGETIC ELECTRON BOMBARDMENT OF GANYMEDE.** ^P OUTER PLANET MOON-MAGNETOSPHERE INTERACTIONS WORKSHOP, VIRTUAL, 11/2020.
- VARIABILITY IN THE ENERGETIC ELECTRON BOMBARDMENT OF GANYMEDE.** ^P EUROPLANET SCIENCE CONGRESS, VIRTUAL, 09/2020.

THE DYNAMICS OF ENERGETIC IONS AND ELECTRONS WHILE EMBEDDED IN CALLISTO'S PERTURBED ELECTROMAGNETIC ENVIRONMENT.^T AMERICAN GEOPHYSICAL UNION FALL MEETING, SAN FRANCISCO, CA, USA, 12/2019.

ENERGETIC ELECTRON DYNAMICS NEAR CALLISTO.^P AMERICAN GEOPHYSICAL UNION FALL MEETING, SAN FRANCISCO, CA, USA, 12/2019.

ENERGETIC ION DYNAMICS NEAR CALLISTO.^P AMERICAN GEOPHYSICAL UNION FALL MEETING, WASHINGTON, D.C., USA, 12/2018.

UNDERSTANDING CALLISTO'S INTERACTION WITH THE JOVIAN MAGNETOSPHERE: A CASE STUDY OF THE GALILEO C10 FLYBY.^T COMMITTEE ON SPACE RESEARCH PROCEEDINGS, PASADENA, CA, USA, 07/2018.

THE IMPACT OF CALLISTO'S ATMOSPHERE ON ITS PLASMA INTERACTION WITH THE JOVIAN MAGNETOSPHERE.^P COMMITTEE ON SPACE RESEARCH PROCEEDINGS, PASADENA, CA, USA, 07/2018.

A COMPREHENSIVE PICTURE OF CALLISTO'S MAGNETIC ENVIRONMENT DURING THE GALILEO ERA: IMPLICATIONS FOR JUICE.^P COMMITTEE ON SPACE RESEARCH PROCEEDINGS, PASADENA, CA, USA, 07/2018.

ENERGETIC ION DYNAMICS NEAR CALLISTO.^P COMMITTEE ON SPACE RESEARCH PROCEEDINGS, PASADENA, CA, USA, 07/2018.

ENERGETIC ION DYNAMICS NEAR CALLISTO.^T MAGNETOSPHERES OF THE OUTER PLANETS MEETING, BOULDER, CO, USA, 07/2018.

ENERGETIC ION DYNAMICS NEAR CALLISTO.^P MAGNETOSPHERES OF THE OUTER PLANETS MEETING, BOULDER, CO, USA, 07/2018.

A COMPREHENSIVE PICTURE OF CALLISTO'S MAGNETIC ENVIRONMENT DURING THE GALILEO ERA: IMPLICATIONS FOR JUICE.^P MAGNETOSPHERES OF THE OUTER PLANETS MEETING, BOULDER, CO, USA, 07/2018.

ENERGETIC ION DYNAMICS NEAR CALLISTO.^T ASIA OCEANIA GEOSCIENCES SOCIETY MEETING, HONOLULU, HI, USA, 06/2018.

A COMPREHENSIVE PICTURE OF CALLISTO'S MAGNETIC ENVIRONMENT DURING THE GALILEO ERA.^P ASIA OCEANIA GEOSCIENCES SOCIETY MEETING, HONOLULU, HI, USA, 06/2018.

PLASMA INTERACTION AND ENERGETIC PARTICLE DYNAMICS NEAR CALLISTO.^P AMERICAN GEOPHYSICAL UNION FALL MEETING, NEW ORLEANS, LA, USA, 12/2017.

A COMPREHENSIVE PICTURE OF CALLISTO'S MAGNETIC ENVIRONMENT DURING THE GALILEO ERA: IMPLICATIONS FOR JUICE^T, JUPITER ICY MOONS EXPLORER RADIO AND PLASMA WAVE INSTRUMENT TEAM MEETING, VIRTUAL, 09/2017.

A COMPREHENSIVE PICTURE OF CALLISTO'S MAGNETIC ENVIRONMENT DURING THE GALILEO ERA.^T MAGNETOSPHERES OF THE OUTER PLANETS MEETING, UPPSALA, SWEDEN, 06/2017.

PLASMA INTERACTION AND ENERGETIC PARTICLE DYNAMICS NEAR CALLISTO: A CASE STUDY OF THE GALILEO C10, C21, AND C23 FLYBYS.^P MAGNETOSPHERES OF THE OUTER PLANETS MEETING, UPPSALA, SWEDEN, 06/2017.

PLASMA INTERACTION AND INDUCTION AT CALLISTO: HYBRID SIMULATION STUDY OF THE GALILEO C10 FLYBY.^T AMERICAN GEOPHYSICAL UNION FALL MEETING, SAN FRANCISCO, CA, USA, 12/2016.

PLASMA INTERACTION AND INDUCTION AT CALLISTO: CASE STUDIES OF GALILEO MAGNETIC FIELD DATA.^P AMERICAN GEOPHYSICAL UNION FALL MEETING, SAN FRANCISCO, CA, USA, 12/2016.

PLASMA INTERACTION AND INDUCTION SIGNATURES AT CALLISTO: PREPARATIONS FOR JUICE.^T EUROPEAN GEOPHYSICAL UNION GENERAL ASSEMBLY, VIENNA, AUSTRIA, 04/2016.

MODELING CALLISTO'S INTERACTION WITH THE JOVIAN MAGNETOSPHERIC ENVIRONMENT.^P AMERICAN GEOPHYSICAL UNION FALL MEETING, SAN FRANCISCO, CA, USA, 12/2015.

STUDYING THE EFFECT OF ATMOSPHERIC CONFIGURATION ON PLASMA INTERACTION AT CALLISTO.^P INTERNATIONAL SCHOOL/SYMPOSIUM FOR SPACE SIMULATIONS, PRAGUE, CZECH REPUBLIC, 07/2015.

STUDYING MOON-MAGNETOSPHERE INTERACTIONS AT CALLISTO AND TITAN.^P INTERNATIONAL SCHOOL/SYMPOSIUM FOR SPACE SIMULATIONS, PRAGUE, CZECH REPUBLIC, 07/2015.

STUDYING THE EFFECT OF ATMOSPHERIC CONFIGURATION ON PLASMA INTERACTION AT CALLISTO.^P MAGNETOSPHERES OF OUTER PLANETS MEETING, ATLANTA, GA, USA, 06/2015.

A STATISTICAL COMPARISON OF COUPLED THERMOSPHERE-IONOSPHERE MODELS.^T AMERICAN GEOPHYSICAL UNION FALL MEETING, SAN FRANCISCO, CA, USA, 12/2014.

HIGH-LATITUDE IONOSPHERIC DRIVERS AND THEIR EFFECTS ON WIND PATTERNS IN THE THERMOSPHERE.^P COUPLING, ENERGETICS AND DYNAMICS OF ATMOSPHERIC REGIONS ANNUAL CONFERENCE, SEATTLE, WA, USA, 06/2014.

A STATISTICAL COMPARISON OF THERMOSPHERE-IONOSPHERE MODELS.^P COUPLING, ENERGETICS AND DYNAMICS OF ATMOSPHERIC REGIONS ANNUAL CONFERENCE, SEATTLE, WA, USA, 06/2014.

HIGH-LATITUDE IONOSPHERIC DRIVERS AND THEIR EFFECTS ON WIND PATTERNS IN THE THERMOSPHERE.^P AMERICAN GEOPHYSICAL UNION FALL MEETING, SAN FRANCISCO, CA, USA, 12/2013.

HIGH-LATITUDE IONOSPHERIC DRIVERS AND THEIR EFFECTS ON WIND PATTERNS IN THE THERMOSPHERE.^T JOINT GEOSPACE ENVIRONMENT MODELING AND COUPLING, ENERGISTICS, AND DYNAMICS OF ATMOSPHERIC REGIONS (GEM-CEDAR) WORKSHOP, SAN FRANCISCO, CA, USA, 12/2013.

Awards, Honors, and Recognition

Jun. 2018	Asia Oceania Geosciences Society Annual Conference, Best Poster Contest, 1 st prize	Honolulu, HI
May. 2018	Georgia Institute of Technology School of Earth and Atmospheric Sciences, Best Paper Award	Atlanta, GA
May. 2017	Georgia Institute of Technology School of Earth and Atmospheric Sciences, Research Excellence Award	Atlanta, GA
Dec. 2015	Georgia Institute of Technology School of Earth and Atmospheric Sciences, Student of the Month	Atlanta, GA
Jul. 2015	International School/Symposium for Space Simulations, Best Poster Contest, 1 st prize	Prague, CZ
Jun. 2014	Community Coordinated Modeling Center, Student Research Contest, 1 st prize ionospheric category	Seattle, WA
2010–2014	University of Michigan College of Engineering, Paul B. and Ruth A. Hayes Scholarship Recipient	Ann Arbor, MI

Teaching Experience

Advanced Space Plasma Physics (Co-Instructor)

LECTURED STUDENTS, HELD OFFICE HOURS, DESIGNED AND GRADED WEEKLY HOMEWORK SETS AND TWO EXAMS.

Georgia Institute of Technology

Spring 2018

Earth System Modeling (Teaching Assistant)

A COURSE FOCUSED ON SOLVING ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS THROUGH NUMERICAL TECHNIQUES.

Georgia Institute of Technology

Fall 2018, Fall 2017, Spring 2017

Advanced Space Plasma Physics (Teaching Assistant)

A COURSE STUDYING NON-LINEAR PROCESSES IN PLASMA PHYSICS (E.G., WAVES, INSTABILITIES, SHOCKS, AND DISCONTINUITIES).

Georgia Institute of Technology

Fall 2016

Introduction to Space Plasma Physics (Teaching Assistant)

A COURSE FOCUSED ON INTRODUCING STUDENTS TO CONCEPTS IN SPACE PLASMAS INCLUDING PARTICLE DYNAMICS IN ELECTROMAGNETIC FIELDS, PLANETARY MAGNETOSPHERES, AND SOLAR PHYSICS.

Georgia Institute of Technology

Fall 2015

Habitable Planets (Teaching Assistant)

A COURSE INTRODUCING STUDENTS TO THE CONCEPT OF HABITABILITY IN THE SOLAR SYSTEM AND BEYOND.

Georgia Institute of Technology

Spring 2015

Advising Experience

Shane Carberry Mogan

POSTDOCTORAL SCHOLAR (CO-ADVISED)

Space Sciences Laboratory

Fall 2022 – Present

Charles Michael Haynes

PH.D. STUDENT (CO-ADVISED)

Georgia Institute of Technology

Fall 2022 – Present

Peter Addison

UNDERGRADUATE STUDENT; PH.D. CANDIDATE (CO-ADVISED), SUCCESSFULLY DEFENDED IN SPRING 2024

Georgia Institute of Technology

Spring 2019 – Spring 2024

Hannes Arnold

PH.D. CANDIDATE (CO-ADVISED), SUCCESSFULLY DEFENDED IN FALL 2020

Georgia Institute of Technology

Fall 2017 – Fall 2020

Benjamin Breer

UNDERGRADUATE STUDENT

Georgia Institute of Technology

Fall 2018 – Spring 2020

Peter Andersson

UNDERGRADUATE STUDENT

Georgia Institute of Technology

Fall 2018 – Spring 2020

Professional and Community Involvement

HERMES Suite on NASA's Lunar Gateway

WORKING WITH THE TEAM AT UC BERKELEY TO DEVELOP DATA PRODUCTS FROM THE SPAN-I INSTRUMENT

2023 – Present

NASA Panel and Proposal Reviewer

HELPING REVIEW THE NEXT GENERATION OF PROPOSALS FROM STUDENTS AND RESEARCHERS IN PLANETARY AND SPACE SCIENCES.

2018 – Present

Convener: Moon-Plasma Interactions Throughout the Solar System

SESSION AT THE ANNUAL FALL MEETING OF THE AMERICAN GEOPHYSICAL UNION.

2017 – Present

Member: American Geophysical Union

2013 – Present

Convener: Planetary Chemistry: Origins and the Search for Life

SESSION AT GOLDSCHMIDT2024.

2024

NASA's Trident Mission to Neptune's moon Triton

PROVIDED MODELING SUPPORT AS A SCIENCE TEAM MEMBER TO FACILITATE DETECTION OF TRITON'S SUBSURFACE OCEAN DURING PHASE A.

2020 – 2021

Reviewer: President's Undergraduate Research Award Proposals

GEORGIA INSTITUTE OF TECHNOLOGY.

2018 – 2019

Student Member: The Planetary Society

GEORGIA INSTITUTE OF TECHNOLOGY CHAPTER.

2014 – 2018

Student Member: Geophysics Faculty Search Committee

SCHOOL OF EARTH AND ATMOSPHERIC SCIENCES, GEORGIA INSTITUTE OF TECHNOLOGY.

Spring 2017

Graduates in Earth and Atmospheric Sciences (GEAS)

SCHOOL OF EARTH AND ATMOSPHERIC SCIENCES, GEORGIA INSTITUTE OF TECHNOLOGY.

Social Committee Chair (2016 – 2017)

President (2015 – 2016)

Treasurer (2014 – 2015)

Planetary Science Representative (2014 – 2015)

Local Organizing Committee: Magnetospheres of the Outer Planets Meeting

HOSTED IN ATLANTA, GA ON THE CAMPUS OF THE GEORGIA INSTITUTE OF TECHNOLOGY.

Jun. 2015

Student Representative: Undergraduate Curriculum Committee

DEPARTMENT OF ATMOSPHERIC, OCEANIC AND SPACE SCIENCES, UNIVERSITY OF MICHIGAN.

2013 – 2014