

ALEX B. AKINS

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Education

Georgia Institute of Technology

Ph.D. in Electrical and Computer Engineering May 2020
Dissertation: Millimeter-Wavelength Remote Sensing of the Atmospheric Structure and Composition of Venus
Advisor: Dr. Paul Steffes
Fellowships and Scholarships
Aleksander and Halina Szlam Scholarship
Sam Nunn Security Program Fellowship

Master of Science in Electrical and Computer Engineering May 2018

Bachelor of Science in Electrical Engineering May 2016

Employment and Affiliations

NASA Jet Propulsion Laboratory

Technologist - Microwave Instrument Science Group 2020-Present

California Institute of Technology

Division of Geological and Planetary Sciences
Visiting Researcher 2021-Present

Georgia Institute of Technology

School of Electrical and Computer Engineering
Graduate Research Assistant - Planetary Atmospheres Laboratory 2016-2020
Undergraduate Researcher - Space Systems and Design Laboratory, Butera Lab 2014-2016

NFANT, LLC

Research and Quality Engineering Intern 2015-2016

Los Alamos National Laboratory

Digital Design Intern 2015

Peer-Reviewed Journal Articles

M. Parisi, A. J. Friedson, C. Mankovich, M. Hofstadter, **A. Akins**, "Uranus Orbiter and Probe: A Radio Science Investigation to Determine the Planet's Gravity Field, Depth of the Winds, and Tidal Deformations," *Planetary Science Journal*, in review

F. Said, Z. Jelenak, P. S. Chang, A. Fore, W. Tang, **A. Akins**, S. Yueh, "Exploring the impact of sea surface temperature and salinity on SMAP excess surface emissivity," *IEEE Transactions on Geoscience and Remote Sensing*, in review.

A. E. Thelen, K. de Kleer, M. Camarca, **A. Akins**, M. Gurwell, B. Butler, I de Pater, "Subsurface Thermophysical Properties of Europa's Leading and Trailing Hemisphere as Revealed by ALMA," *Planetary Science Journal*, accepted.

L. I. Gurvits, G. Cimò, D. Dirkx, V. Pallichadath, **A. Akins**, N. Altobelli, T. M. Bocanegra-Bahamon, S. M. Cazaux, P. Charlot, D. A. Duev, S. M. Fayolle, J. Fogasy, S. Frey, V. Lainez, G. Molera Calvés, K. Perger, S. V. Pogrebenko, N. M. Md Said, C. Vallat, B. L. A. Vermeersen, P. N. A. M. Visser, K.-N. Wang, K. Willner, "Planetary Radio Interferometry and Doppler Experiment (PRIDE) of the JUICE Mission," *Space Science Reviews*, 219, 79, 2023

S. Dahal, M. K. Brewer, **A. B. Akins**, J. W. Appel, C. L. Bennett, R. Bustos, J. Cleary, J. D. Couto, T. Essinger-Hileman, J. Iuliano, Y. Li, T. A. Marriage, C. Nunez, M. A. Petroff, R. Reeves, K. Rostem, R. Shi, D. A. N. Valle, D. J. Watts, E. J. Wollack, Z. Xu, "Microwave Observations of Venus with CLASS," *Planetary Science Journal*, 4, 2023

M. Camarca, K. de Kleer, B. Butler **A. B. Akins**, A. Thelen, I. de Pater, M. A. Gurwell, A. Moullet, "Thermal Properties of the Leading Hemisphere of Callisto Inferred from ALMA Observations," *Planetary Science Journal*, 4, 2023

J. Grandidier, **A. Akins**, D. Crisp, Y. J. Lee, J. Schwartz, R. Bugga, J. L. Hall, S. Limaye, E. J. Brandon, "Feasibility of Power Beaming through the Venus atmosphere," *Acta Astronautica*, 211, 2023

A. Akins, M. Hofstadter, B. Butler, A. J. Friedson, E. Molter, I. de Pater, M. Parisi "Evidence for a Polar Cyclone on Uranus from VLA Observations", *Geophysical Research Letters*, 50, 2023

A. B. Akins, T. M. Bocanegra-Bahamon, P. Vergados, C. O. Ao, S. W. Asmar, R. A. Preston, K.-N. Wang, "Approaches for Retrieving Sulfur Species Abundances from Dual X/Ka Band Radio Occultations of Venus with EnVision and VERITAS," *The*

- A. Akins**, S. Brown, T. Lee, S. Misra, S. Yueh “Simulation Framework and Case Studies for the Design of Sea Surface Salinity Remote Sensing Missions,” *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 16, 2023
- W. Tang, S. Yueh, A. Fore, J. Vasquez-Cuervo, C. Gentemann, A. Hayashi, **A. Akins**, M. Garcia Reyes, “Using Saildrones to Assess the SMAP Sea Surface Salinity Retrieval in the Coastal Region,” *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 15, 2022
- A. P. Lincowski, V. S. Meadows, D. Crisp, **A. B. Akins**, E. W. Schwieterman, G. N. Arney, M. L. Wong, P. G. Steffes, M. N. Parentau, S. Domagal-Goldman, “Phosphine Detection at Venus Fully Explained by Mesospheric SO₂,” *Astrophysical Journal Letters*, vol. 908, 2021
- A. B. Akins**, A. P. Lincowski, V. S. Meadows, P. G. Steffes, “Complications in the ALMA Detection of Phosphine at Venus’,” *Astrophysical Journal Letters*, vol. 907, 2021
- A. B. Akins**, P. G. Steffes, “Measurements of the Ka Band Opacity of Sulfuric Acid Vapor with Application towards Radio Occultations of Venus,” *Icarus*, vol. 351, 2020
- S. Jarmak, E. Leonard, **A. Akins**, L. Schurmeier, E. Dahl, D. Cremons, S. Cofield, A. Curtis, C. Dong, E. Dunham, B. Journaux, D. Murakami, W. Ng, M. Piquette, A. Pradeepkumar Girija, K. Rink, N. Stein, N. Tallarida, M. Telus, L. Lowes, C. Budney, K. Mitchell, “QUEST: A New Frontiers Uranus Orbiter Mission Concept Study,” *Acta Astronautica*, vol. 170, 2020
- A. B. Akins**, P. G. Steffes, “The Millimeter-Wavelength Absorption of Sulfuric Acid Vapor Measured Under Simulated Venus Conditions,” *Icarus*, vol. 326, 2019
- J. Mendez-Harper, P. Steffes, J. Dufek, **A. Akins**, “The Effect of Electrostatic Charge on the Propagation of GPS (L-Band) Signals Through Volcanic Plumes,” *Journal of Geophysical Research: Atmospheres*, vol. 124, no. 4, 2019

Invited Talks

- “Enhancement of L band SSS retrieval with C-Ka band radiometry” presented at the Science of 10 Kilometer L Band Radiometry Workshop, Jet Propulsion Laboratory, Pasadena, CA, October 2023
- “Microwave Radiometry as a Tool to Study Solar System Ices” presented at the Icy Worlds Collaboration and Exchange Seminar, Jet Propulsion Laboratory, Pasadena, CA, August 2022
- “Preparing for the Next Decade of Venus Exploration” presented at the Dix Planetary Science Seminar, California Institute of Technology, Pasadena, CA, November 2021
- “The Future of Space Security: Deterrence and Anti-Satellite Weapons” presented at the Joint Special Operations University Global Competition Symposia, MacDill AFB, FL, May 2019

Conference Presentations

- I. Ganesh, I. T. W. Flynn, **A. Akins**, P. K. Byrne, L. M. Carter, “On the detectability of young lava flows on Venus using orbital microwave radiometry”, Presented at the AGU Fall Meeting, December 14, 2023, San Francisco, CA.
- S. Bolton, **A. Akins**, S. Atreya, S. Brown, C. Elachi, A. Ermakov, K. Hand, P. Hartogh, R. Hodges, J. Keane, S. Levin, S. Misra, D. Stevenson, P. Steffes, Z. Zhang, “Investigating the Icy Moons of Ice Giants with Microwave Radiometry and Spectrometry”, Presented at the Uranus Flagship Workshop, July 27th, 2022, Pasadena, CA,
- M. Parisi, A. Friedson, M. Hofstadter, **A. Akins**, “The Investigation of Uranus’ Atmosphere and Interior Structure with Gravity Science”, Presented at the Uranus Flagship Workshop, July 26th, 2022, Pasadena, CA,
- C. Moeckel, A. Ermakov, E. Molter, **A. Akins**, T. Bocanegra-Bahamon, K. -N. Wang, M. Parisi, H. Ge, B. Idini, C. Li, “The Case for SmallSats: Enhancing the Uranus Mission”, Presented at the Uranus Flagship Workshop, July 25th, 2022, Pasadena, CA,
- S. Levin, **A. Akins**, S. Atreya, S. Bolton, S. Brown, T. Guillot, R. Hodges, A. Ingersoll, Y. Kaspi, C. Li, S. Misra, D. Stevenson, P. Steffes, M. Wong, Z. Zhang, “Exploring the Atmospheres of the Ice Giants with the next-generation MWR”, Presented at the Uranus Flagship Workshop, July 25th, 2022, Pasadena, CA,
- A. Akins**, T. Bocanegra-Bahamon, K. -N. Wang, P. Vergados, C. Ao, S. Asmar, R. Preston, M Parisi, D. Buccino, “Considerations for Radio Occultation Studies of Uranus’ Atmosphere, Ionosphere, and Rings with a Flagship Mission”, Presented at the Uranus Flagship Workshop, July 25th, 2022, Pasadena, CA,
- A. Akins**, M. Hofstadter, A. J. Friedson, M. Parisi, E. Molter, I. de Pater, C. Moeckel, B. Butler, K. de Kleer, A. Thelen, “Microwave Radiometry of the Uranus System: Priority Science, Lessons from the Ground, and Instrument Design Trade Space”, Presented at the Uranus Flagship Workshop, July 25th, 2022, Pasadena, CA
- F. Said, Z. Jelenak, P. Chang, W. Tang, A. Fore, **A. Akins**, S. Yueh, “Exploring SMAP Wind Speed Potential Sea Surface Salinity and Sea Surface Temperature Residual Dependencies”, Presented at the 2023 International Geoscience and Remote Sensing Symposium, July 19th, 2023, Pasadena, CA.
- C. O. Ao, K.-N. Wang, G. A. Hajj, **A. Akins**, “PBL Profiling with Multi-Frequency Radio Occultation between Low Earth Orbiters”, Presented at the 2023 International Geoscience and Remote Sensing Symposium, July 19th, 2023, Pasadena, CA.
- A. Tanner, **A. Akins**, N. Schlegel, A. Collianger, I. Yanovsky, S. Misra, S. Brown, “Synthetic Aperture Radiometers for Polar Ice Sheet Mapping - Instrument Design Study”, Presented at the 2023 International Geoscience and Remote Sensing Symposium, July 19th, 2023, Pasadena, CA.
- I. Yanovsky, A. Tanner, **A. Akins**, “Reconstruction of Ice Sheet Temperature Maps using a Sparsity-based Image Deconvolution Method”, Presented at the 2023 International Geoscience and Remote Sensing Symposium, July 18th, 2023, Pasadena, CA.

- A. Akins**, A. Tanner, N. Schlegel, A. Collianger, I. Yanovsky, S. Misra, S. Brown, "Building Seasonal Maps of Antarctica's Temperature with Repeat Pass Microwave Interferometry", Presented at the 2023 International Geoscience and Remote Sensing Symposium, July 17th, 2023, Pasadena, CA.
- C. O. Ao, K.-N. Wang, G. A. Hajj, **A. Akins**, "PBL Profiling with Active Microwave Crosslink Occultations" Presented at the Earth Science Technology Forum, June 2023, Pasadena, CA.
- A. Akins**, T. Bocanegra-Bahamon, B. Butler, S. Dahal, I. Ganesh, M. Siegler "Revisiting Venus' Microwave Emission Spectrum: Implications for VenSAR", Presented at the 2023 Envision Workshop, May 10th, 2023, Berlin, Germany.
- A. Akins**, T. Bocanegra-Bahamon, K. -N. Wang, P. Vergados, C. Ao, S. Asmar, R. Preston, "Simulated Retrievals of H₂SO₄ and SO₂ from EnVision RSE Measurements", Presented at the 2023 Envision Workshop, May 10th, 2023, Berlin, Germany.
- A. Akins**, M. Hofstadter, I. de Pater, "Uranus' Deep Atmosphere: Seasonal Changes and Motivation for a Flagship Microwave Radiometer", Presented at the Outer Planets Assessment Group Meeting, May 2023, Laurel MD.
- C. Moeckel, E. Molter, I. de Pater, **A. Akins**, B. Butler, R. Sault, "Resolving out a planet: High-resolution observations of the giant planets as a preview for ngVLA solar system science", Presented at the New Eyes on the Universe: SKA and ngVLA, May 2023, Vancouver, BC.
- T. Bocanegra-Bahamon, **A. Akins**, K. -N. Wang, P. Vergados, C. Ao, S. Asmar, R. Preston, T. Ely, E. Burt "New Retrieval Methods and Observing Techniques for Planetary Radio Occultation Experiments", Presented at the AGU Fall Meeting, Dec 15th, 2022, Chicago, IL.
- A. Akins**, T. Bocanegra-Bahamon, P. Vergados, C. Ao, S. Asmar, R. Preston, K. -N. Wang "X and Ka Band Radio Occultation Sounding of Planetary Atmospheric Composition with Future Spacecraft Missions" (**Invited**), Presented at the AGU Fall Meeting, Dec 14th, 2022, Chicago, IL.
- M. Parisi, A. Friedson, M. Hofstadter, **A. Akins**, "Probing the Atmosphere and Interior Structure of Uranus with Gravity Sounding", Presented at the AGU Fall Meeting, Dec 13th, 2022, Chicago, IL.
- A. Akins**, M. Hofstadter, B. Butler, A. Friedson, E. Molter, M. Parisi, I. de Pater "Detailed Polar Structure in Microwave Images of Uranus", Presented at the AGU Fall Meeting, Dec 13th, 2022, Chicago, IL.
- A. Akins**, S. Yueh, S. Brown, T. Lee, S. Misra, A. Fore, W. Tang "Challenges and Opportunities for Future Sea Surface Salinity Remote Sensing from Space", Presented at the Oceans from Space 5th Meeting, October 25th, 2022, Venice, Italy.
- W. Tang, S. Yueh, A. Fore, A. Hayashi, M. Steele, **A. Akins** "Update of JPL's SMAP Sea Surface Salinity Product - Retrieval with Sa Ice Correction and Validation with in situ Measurements in the Arctic Ocean", Presented at the Oceans from Space 5th Meeting, October 25th, 2022, Venice, Italy.
- M. D. Hofstadter, B. J. Butler, **A. B. Akins**, A. J. Friedson, M. A. Gurwell, "Seasonal Changes in the Deep Troposphere of Uranus as Seen at Radio Wavelengths," Presented at the 2022 Division of Planetary Sciences (DPS) Meeting, October 4, 2022, London, Canada.
- M. Camarca, K. de Kleer, **A. Akins**, B. Butler, I. de Pater, M. Gurwell, A. Moullet, S. Trumbo, J. Spencer, "A Thermal Millimeter Map of Callisto's Leading Hemisphere Obtained with ALMA," Presented at the 2022 Division of Planetary Sciences (DPS) Meeting, October 3, 2022, London, Canada.
- M. Hofstadter, B. Butler, **A. Akins**, M. Gurwell, A. Friedson, "Radio Observations of Uranus: Implications for the Structure and Dynamics of the Deep Troposphere," Presented at the 2022 Europlanet Science Congress (EPSC), September 19, 2022, Granada, Spain.
- A. Akins**, A. Fore, W. Tang, S. Yueh, F. Said, Z. Jelenak, "Uncertainty in SMAP Retrievals of Ocean Wind Speed and Connection to Model Functions", Presented at the 2022 International Geoscience and Remote Sensing Symposium, July 18th, 2022, Kuala Lumpur, Malaysia.
- A. Akins**, S. Brown, S. Misra, T. Lee, S. Yueh, "The FOAM Python Package and Applications to Ocean Salinity Mission Architecture Studies", Presented at the 2022 International Geoscience and Remote Sensing Symposium, July 18th, 2022, Kuala Lumpur, Malaysia.
- A. Akins**, T. M. Bocanegra-Bahamon, P. Vergados, C. Ao, S. Asmar, R. Preston, K. -N. Wang, "Profiling H₂SO₄ aerosol and SO₂ Abundances in Venus' Atmosphere with dual X/Ka Band Radio Occultations", Presented at the 44th Assembly of the Committee on Space Research (COSPAR) July 18, 2022, Athens, Greece.
- S. Brown, **A. Akins**, S. Misra, T. Lee, S. Yueh, "SMOS, SMAP, Aquarius... What's Next?", Presented at the Ocean Salinity Conference, June 9th, 2022, New York, NY.
- A. Akins**, M. Hofstadter, B. Butler, E. Molter, I. de Pater, "Seasonal Change in the Deep Atmosphere of Uranus, 1981 to 2021", Presented at the EGU General Assembly 2022, Vienna, Austria, 23-27 May 2022.
- A. B. Akins**, P. Vergados, T. M. Bocanegra-Bahamon, C. Ao, R. Preston, S. Asmar, "Preparing for X/Ka Band radio occultations of Venus with VERITAS and EnVision: Retrieving Sulfur Species Abundances," Presented at the AGU Fall Meeting 2021, December 13, 2021, New Orleans, LA.
- A. B. Akins**, T. M. Bocanegra-Bahamon, P. Vergados, C. Ao, S. Asmar, R. Preston, "Ground and Space-Based Microwave Remote Sensing of the Venus Atmosphere in Support of the Decade of Venus," Presented at the 19th VEXAG Meeting, November 8, 2021, Laurel, MD
- M. Hofstadter, **A. Akins**, B. Butler, "Seasonal Change in the Deep Atmosphere of Uranus: 1982-2012," Presented at the EGU General Assembly 2021, July 2021, Vienna, Austria
- K. H. Baines, J. A. Cutts, L. Dorsky, J. Hall, D. Dyar, J. O'Rourke, S. Seager, C. Wilson, **A. Akins**, A. Davis, K. L. Jessup, A. Komjathy, S. Krishnamoorthy, D. Nikolic, J. B. Renard, P. Vergados, S. Atreya, M. Bullock, G. Hunter, S. Lebonnois, D. Mimoun, P. Lognonne, O. Mousis "New Frontiers Class Venus In-Situ Exploration: The Venus Climate and Geophysics Mission Concept," Presented at the 18th Meeting of the Venus Exploration and Analysis Group, November 16, 2020, Pasadena, CA
- P. G. Steffes, **A. B. Akins**, "The Potential for Ka-Band Radio Occultation Measurements in the Study of the Venus Atmosphere," Presented at the AGU Fall Meeting 2019, December 11, 2019, San Francisco, CA
- A. B. Akins**, P. G. Steffes "Progress on Laboratory Studies of Sulfuric Acid Vapor Opacity with Application to Ka Band Radio Occultations of Venus," Presented at the 17th VEXAG Meeting, November 6, 2019, Boulder, CO

A. Akins, K. Devaraj, S. Luszcz-Cook, I. de Pater, P. Steffes, “CARMA Observations of Venus: 3-millimeter Images of Lower Cloud Continuum Emission,” Presented at the EPSC-DPS Joint Meeting, September 19, 2019, Geneva, Switzerland

A. B. Akins and P. G. Steffes, “Ka Band Opacity of Sulfuric Acid Vapor at Venus: Initial Results” Presented at the International Venus Conference, June 1, 2019, Niseko, Hokkaido, Japan

S. Jarmak, E. J. Leonard, L. Schurmeier, **A. Akins**, S. Cofield, D. R. Cremons, A. Curtis, E. Dahl, C. Dong, E. T. Dunham, B. Journaux, D. Murakami, W. Ng, M. Piquette, A. Pradeepkumar Girija, K. Rink, N. Stein, N. Tallarida, M. Telus, L. Lowes, C. Budney, K. Mitchell, “QUEST: A New Frontiers Orbiter Concept Study,” LPI Contrib. No. 2132 Presented at the 50th Lunar and Planetary Science Conference, March 19, 2019, The Woodlands, TX

A. Akins, S. Jarmak, E. J. Leonard, L. Schurmeier, S. Cofield, D. R. Cremons, A. Curtis, E. Dahl, C. Dong, E. T. Dunham, B. Journaux, D. Murakami, W. Ng, M. Piquette, A. Pradeepkumar Girija, K. Rink, N. Stein, N. Tallarida, M. Telus, L. Lowes, C. Budney, K. Mitchell, “The QUEST Mission: Exploring the Magnetic, Atmospheric, and Interior Environments of Uranus under New Frontiers Constraints” Presented at the Symposium on Space Innovations, November 13, 2018, Atlanta, GA

A. B. Akins and P. G. Steffes, “Millimeter-Wavelength Remote Sensing of the Tropospheric Structure of Venus: Exploratory Simulations” Presented at VEXAG 2018, November 7, 2018, Laurel, MD

A. B. Akins and P. G. Steffes, “Reconciling Models for the Centimeter-Wavelength and Millimeter-Wavelength Sulfuric Acid Vapor Absorption for Future Radio Sounding at Venus” Bulletin of the American Astronomical Society, vol. 50, no. 5, 2018 Presented at the 50th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Knoxville, TN, October 22, 2018.

S. Jarmak, E. J. Leonard, L. Schurmeier, **A. Akins**, S. Cofield, D. R. Cremons, A. Curtis, E. Dahl, C. Dong, E. T. Dunham, B. Journaux, D. Murakami, W. Ng, M. Piquette, A. Pradeepkumar Girija, K. Rink, N. Stein, N. Tallarida, M. Telus, L. Lowes, C. Budney, K. Mitchell, “QUEST: A New Frontiers Uranus Orbiter Concept Study from the 30th Annual NASA/JPL Planetary Science Summer Seminar” Presented at OPAG 2018, September 12, 2018, Pasadena, CA

A. Akins and P. Steffes, “Sulfuric Acid Vapor Absorption at Millimeter Wavelengths: Implications for Venus Observations,” 42nd COSPAR Scientific Assembly Abstracts, C3.1-0029-18 (FS-202), p. 906. Presented at the 42nd Assembly of the Committee on Space Research (COSPAR) July 20, 2018, Pasadena, CA.

A. B. Akins and P. G. Steffes, “Millimeter Wavelength Opacity of H₂SO₄ Vapor at Venus: Initial Results” LPI Contribution No. 2083, p.2306 Presented at the 49th Annual Meeting of the Lunar and Planetary Science Conference, The Woodlands, TX, March 21, 2018.

A. B. Akins and P. G. Steffes, “Laboratory Measurements of Sulfuric Acid Vapor at Millimeter-Wavelengths under Venus Conditions” Bulletin of the American Astronomical Society, vol. 49, no. 5, 2017, p. 139 (paper # 417.04). Presented at the 49th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Provo, UT, October 19, 2017.

A. B. Akins, A. Bellotti, and P. G. Steffes. “Simulation of the Atmospheric Microwave and Millimeter Wave Emission from Venus Using a Radiative Transfer Model Based on Laboratory Measurements” LPI Contribution No. 2022, 2017. Presented at the Venus Modeling Workshop, Cleveland, OH, May 11, 2017.

Awards and Honors

Sam Nunn Security Program Fellow 2018-2019
Georgia Tech Sam Nunn School of International Affairs

Funding History

Research Grants

The Golden Era for Radio Occultation Experiments in Solar System Exploration 2021-2023
Co-Investigator (PI Panagiotis Vergados), JPL Topical R&TD (\$871,870)

Tracing Surface Modification Processes on the Icy Galilean Satellites with Radio Observations 2023-2026
Principal Investigator, NASA Solar System Observations Program (\$388,635)

Exploration of the Deep Atmosphere and Surface of Venus at Radio Wavelengths 2022-2025
Principal Investigator, NASA Solar System Observations Program (\$305,773)

High Resolution PBL Profiling with LEO-LEO Occultation 2022-2023
Co-Investigator (PI Chi Ao), NASA Decadal Survey Incubation (approx. \$500,000)

Separated Thinned Array for Sensing of Ice Sheets (STASIS) 2022-2023
Principal Investigator, NASA Instrument Incubator Program (\$699,285)

ALMA Observations and Radiative Transfer Modeling of the Uranian Satellites 2021-2022
Principal Investigator, JPL Researchers on Campus (\$25,000)

Determining Atmospheric Species Abundances Using Multi-Frequency Radio Signal Absorption 2021-2023
Co-Investigator (PI Panagiotis Vergados), JPL Topical R&TD (\$413,450)

Novel Radio Occultation Experiments to Study Venus’ Sulfur Cycle Chemistry and Potential Volcanism 2021
Co-Investigator (PI Panagiotis Vergados), JPL Spontaneous R&TD (\$40,000)

Using Microwave Radiometers and Gravity Science to Probe Uranus’ Deep Atmospheric Circulation 2020-2023

Co-Investigator (PI Mark Hofstadter), JPL Strategic R&TD (\$650,000)

Concept Exploration and Uncertainty Quantification for a Future Ocean Surface State Measurement Mission 2020-2022
Co-Investigator (unnamed, PI Shannon Brown), NASA Physical Oceanography (\$354,756)

Laboratory Evaluation and Application of the Millimeter-Wavelength Absorption Properties of Gaseous Sulfuric Acid
under Simulated Venus Conditions 2017-2020

Graduate Research Assistant (PI Paul Steffes), NASA Solar System Workings

Travel Grants

Grant to attend the Outer Planets Assessment Group Meeting in Laurel, MD 2023

Grant to attend the International Venus Conference/74th Fujihara Seminar in Niseko, Japan 2019

Grant to attend the 16th VEXAG meeting in Laurel, Maryland 2018

Telescope Time Allocations

Giant Meterwave Radio Telescope

Wideand GMRT Mapping of Venus' Subsurface Emissivity Anomaly, Cycle 44 (32 hours, Priority A)

Water in the Deep Atmosphere of Uranus, Cycle 43 (9 hours, Priority A)

Very Large Array

VLA Mapping of Venus Surface Emissivity: Aphrodite Terra, Semester 2022A (12 hours, Priority A)

Seasonal Variations in the Microwave Emission of Uranus, Semester 2021B, 2022A (26 hours, Priority A)

Microwave Sounding of the Deep Atmosphere of Venus, Semester 2021A (8 hours, Priority B)

Atacama Large Millimeter Array

Dynamics in Venus' Sub-cloud Atmosphere, Cycle 9 (6.4 hours, Priority C, partially observed)

Searching for Phosphine in the Atmospheres of the Ice Giants, Cycle 8 (4.7 hours, Priority C, partially observed)

Submillimeter Array

Dynamics in Uranus' Troposphere, Semester 2023A (11 hours, Priority B, partially observed)

Dynamics in Uranus' Troposphere, Semester 2022A (11 hours, Priority B, unobserved)

Service

Reviewer

NASA ROSES; JGR Planets; Earth and Space Science;

Earth, Moon, and Planets; IEEE JSTARS, ALMA

Organizer

Session chair, IGARSS 2022; LOC assistant, IGARSS 2023

Teaching Activity

ECE 3710: Circuits and Electronics

2016

Graduate Teaching Assistant, Georgia Institute of Technology

Software Tools

Programming languages: Python (and Python scientific and geophysics computing stacks, including Jupyter, (Geo)Pandas, Xarray, Dask, Scikit-Learn, PyTorch, Cartopy), MATLAB, shell scripting (including cluster computing), C/C++, Fortran

Other: Comsol, AutoCAD, Ansys EM, Keysight ADS, SPICE (both circuit simulation and space mission geometry), NRAO Common Astronomy Software Applications (CASA), Adobe CC, Logic Pro, Microsoft Office/365, Oracle BI, \LaTeX