Samuel W. Albert, PhD

📍 Washington, DC   ✉ samuelalbert21@gmail.com   📞 (615) 260-6341   🔒 TS/SCI clearance

Education

PhD	**University of Colorado Boulder**, Aerospace Engineering Sciences		Boulder, CO
	Advisor: Dr. Hanspeter Schaub, Dr. Robert D. Braun		May 2020 – Sept 2023

- *Aerocapture, Entry, and Co-Delivery in Uncertain Planetary Atmospheres* ↗
- NASA Space Technology Research Fellow
- Five first-author papers in peer-reviewed journals
- John A. Vise Award ↗

MS	**University of Colorado Boulder**, Aerospace Engineering Sciences		Boulder, CO
			Aug 2018 – May 2020

- Graduate Certificate in Astrodynamics and Satellite Navigation Systems
- Matthew Isakowitz Fellow ↗

BS	**Purdue University**, Aeronautical and Astronautical Engineering		West Lafayette, IN
	Honors College Graduate		Aug 2014 – May 2018

- Minor: Global Engineering Studies
- Exchange semester at Universidad de Carlos III, Madrid, Spain
- Stamps Scholar ↗ (full-ride scholarship)

Experience

Johns Hopkins University Applied Physics Laboratory, Senior Aerospace Engineer — Laurel, MD — Sept 2023 – present

Director's Special Achievement Award, Sept. 2025

- Flight Performance Analyst on NASA Dragonfly Mobility Team – performs Monte Carlo analyses, sensitivity studies, and flight envelope sweeps for rotorcraft on Titan
- Co-PI of 2-year joint IRAD with UMD – leads team in using neural radiance fields to render high-fidelity multi-spectral dynamic spacecraft scenes
- Applies mission design, orbit estimation, and mission concept development to a variety of national security space missions/projects

NASA, Visiting Technologist/Intern (multiple) — Remote / Pasadena, CA — 2019-2022 (various)

Research collaboration with NASA Langley and NASA JPL; Summer 2019 intern at JPL

- Co-developed novel guidance algorithm for drag-modulated aerocapture and implemented in C++ for use in DSENDS aerocapture simulation
- Performed flight-mechanics analysis and trajectory design for the Small High Impact Energy Landing Device (SHIELD) concept
- Designed aerocapture trajectories for Uranus orbiter "A Team" pre-decadal study

Journal Articles

Dimensionality Reduction for Onboard Modeling of Uncertain Atmospheres — 2025

Samuel W. Albert, Alireza Doostan, Hanspeter Schaub

10.2514/1.A35839 ↗ (AIAA Journal of Spacecraft and Rockets)

Energy Reference Guidance for Drag-Modulated Aerocapture — 2023

Samuel W. Albert, Ethan Burnett, Hanspeter Schaub, P. Daniel Burkhart, Alex Austin

10.1016/j.asr.2023.09.034 ↗ (Advances in Space Research)

Co-Delivery of a Martian Probe Network — 2023

Samuel W. Albert, Hanspeter Schaub

10.2514/1.A35560 ↗ (AIAA Journal of Spacecraft and Rockets)

Relative Motion in the Velocity Frame for Atmospheric Entry Trajectories   2023

Samuel W. Albert, Hanspeter Schaub

10.2514/1.A35753 ⧉ (AIAA Journal of Spacecraft and Rockets)

Flight Mechanics Feasibility Assessment for Co-Delivery of Direct-Entry Probe and Aerocapture Orbiter   2022

Samuel W. Albert, Hanspeter Schaub, Robert D. Braun

10.2514/1.A34953 ⧉ (AIAA Journal of Spacecraft and Rockets)

Conference Papers

Onboard Density Modeling for Planetary Entry via Karhunen-Loève Expansion   March 2023

Samuel W. Albert, Alireza Doostan, Hanspeter Schaub

10.1109/AERO55745.2023.10115794 ⧉ (IEEE Aerospace Conference, Big Sky, MT)

Relative Motion on Highly-Eccentric Atmospheric Entry Trajectories   January 2023

Samuel W. Albert, Hanspeter Schaub

hanspeterschaub.info/Papers/Albert2023.pdf ⧉ (AAS/AIAA Space Flight Mechanics Meeting, Austin, TX)

Maneuver Design and Flight Control for a Martian Probe Network   August 2022

Samuel W. Albert, Hanspeter Schaub

hanspeterschaub.info/Papers/Albert2022b.pdf ⧉ (AAS/AIAA Astrodynamics Specialist Conference, Charlotte, NC)

A New Guidance Technique for Discrete-Event Drag Modulation for Aerocapture Missions   February 2022

Ethan R. Burnett, Samuel W. Albert, Hanspeter Schaub

10.1007/978-3-031-51928-4_50 ⧉ (AAS Guidance, Navigation, and Control Conference, Breckenridge, CO)

Co-Delivery of Multiple Small Probes to the Martian Surface   January 2022

Samuel W. Albert, Hanspeter Schaub

10.2514/6.2022-1653 ⧉ (AIAA SciTech, San Diego, CA)

Linear Covariance Analysis of Entry and Aerocapture Trajectories in an Uncertain Atmosphere   January 2022

Jack Ridderhof, Samuel W. Albert, Panagiotis Tsiotras, Hanspeter Schaub

10.2514/6.2022-1216 ⧉ (AIAA SciTech, San Diego, CA)

Finite-Dimensional Density Representation for Aerocapture Uncertainty Quantification   January 2021

Samuel W. Albert, Alireza Doostan, Hanspeter Schaub

10.2514/6.2021-0932 ⧉ (AIAA SciTech, Nashville, TN)

AeroDrop: Prospects and Challenges for Co-Delivery of Probe and Orbiter via Aerocapture   August 2020

Samuel W. Albert, Robert D. Braun, Hanspeter Schaub

hanspeterschaub.info/Papers/Albert2020.pdf ⧉ (AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, CA)

Comparative Study of Lift- and Drag-Modulation Control Strategies for Aerocapture   February 2020

Casey R. Heidrich, Evan Roelke, Samuel W. Albert, Robert D. Braun

AAS Guidance, Navigation, and Control Conference, Breckenridge, CO

Conceptual Development of AeroDrop: Aerocapture and Direct Entry for Two Spacecraft on a Common Approach Trajectory   January 2020

Samuel W. Albert, Robert D. Braun

10.2514/6.2020-1737 ⧉ (AIAA SciTech, Orlando, FL)

Aerodynamic Breakup and Secondary Drop Formation for a Liquid Metal Column in a Shock-Induced Cross-Flow   January 2017

Yi Chen, Edward P. DeMauro, ustin L. Wagner, Marco Arienti, Daniel R. Guildenbecher, Paul Farias, Thomas W. Grasser, Patrick Sanderson, Samuel W. Albert, Aaron Turpin, William Sealy, Remington S. Ketchum

10.2514/6.2017-1892 ☒ (AIAA Aerospace Sciences, Grapevine, TX)

Measurements of the Initial Transient of a Dense Particle Curtain Following Shock Wave Impingement   January 2017

Edward P. DeMauro, Justin L. Wagner, Lawrence J. DeChant, Steven J. Beresh, Paul Farias, Aaron Turpin, William Sealy, Samuel W. Albert, Patrick Sanderson

10.2514/6.2017-1466 ☒ (AIAA Aerospace Sciences, Grapevine, TX)

Other Papers/Presentations

Relative Motion About Aerocapture and Entry Trajectories   August 2023

Samuel W. Albert, Hanspeter Schaub

International Planetary Probe Workshop, Marseille, France. Oral Presentation

(*Best Student Presentation Award*) Entry Flight Mechanics Analysis for SHIELD: Small High Impact Energy Landing Device   August 2022

Samuel W. Albert, Hanspeter Schaub

hanspeterschaub.info/Papers/IPPW22_AlbertSchaub.pdf ☒ (International Planetary Probe Workshop, Silicon Valley, CA. Oral Presentation.)

Aerocapture Simulation in Basilisk, an Open-Source Astrodynamics Framework   August 2022

Mikaela Felix, Samuel W. Albert, Hanspeter Schaub

hanspeterschaub.info/Papers/IPPW22_MikaelaFelix.pdf ☒ (International Planetary Probe Workshop, Silicon Valley, CA. Poster Presentation.)

Efficient Delivery of a Network of Small Probes to the Martian Surface   March 2022

Samuel W. Albert, Hanspeter Schaub

hanspeterschaub.info/Papers/AlbertSchaub_poster_2022.pdf ☒ (Low-Cost Science Mission Concepts for Mars Exploration workshop, Pasadena, CA. Poster Presentation.)

Revolutionizing Access to the Mars Surface   March 2022

Christopher J. Culbert, Bethany L. Ehlmann, Abigail A. Fraeman, Samuel W. Albert, Don Banfield, Jonathan Bapst, Dave Bearden, Kevin Bonnet, Joel Burdick, Wendy Calvin, Barbara Cohen, Tim Crain, Charles Edwards, Giusy Falcone, Elizabeth Frank, Andrew Horchler, Mark Johnson, Brett Kennedy, Laura Kerber, Rob Manning, David Masten, Larry Matthies, Michelle Munk, David Murrow, Paul Niles, Mark Panning, Zachary Putnam, Eva Scheller, Rachel Sheppard, Nathan Stein, Skylar Wei, Ryan Woolley, Paul Wooster

10.7907/d1sm-mj77 ☒ (Final Workshop Report for the W.M. Keck Institute for Space Studies)

Designing Probe and Orbiter for a Single Entry Trajectory   September 2021

Samuel W. Albert, Hanspeter Schaub

10.7907/d1sm-mj77 ☒ (AIAA Rocky Mountain Annual Technical Symposium, Boulder, CO. Oral Presentation.)

Co-Delivery of Probe and Orbiter via Aerocapture for Interplanetary Missions   July 2021

Samuel W. Albert, Robert D. Braun, Hanspeter Schaub

hanspeterschaub.info/Papers/Albert2021c.pdf ☒ (International Plentary Probe Workshop, Virtual. Oral Presentation.)

One Approach Trajectory, Multiple Vehicles   March 2021

Samuel W. Albert, Robert D. Braun, Hanspeter Schaub

hanspeterschaub.info/Papers/Albert2021c.pdf ☒ (Revolutionizing Access to the Martian Surface Workshop, W. M. Keck Institute for Space Studies. Poster Presentation.)

Enabling and Enhancing Science Exploration Across the Solar System: Aerocapture Technology for SmallSat to Flagship Missions   March 2021

Alex Austin et al.

https://doi.org/10.3847/25c2cfeb.4b23741d ☒ (White Paper for the Planetary Science Decadal Survey, 2023-2032)

Aerocapture as an Enhancing Option for Ice Giants Missions   July 2020

Soumyo Dutta et al.

ntrs.nasa.gov/citations/20205002647 ↗ (White Paper for the Planetary Science Decadal Survey, 2023-2032)

AeroDrop: Dual Aerocapture-Entry Architecture for Multiple Spacecraft Missions   July 2019

Samuel W. Albert, Robert D. Braun

International Planetary Probe Workshop, Oxford, UK. Poster Presentation

Survey of Microbial Environment for Crew Health at the Mars Desert Research Station   April 2018

Samuel W. Albert, D. Marshall Porterfield

aiaa.org/awards/regional-student-paper-conferences ↗ (AIAA Region III Student Conference, West Lafayette, IN)