Hanspeter Schaub, Ph.D.

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Education

May 1998		Ph.D., "Novel Coordinates for Nonlinear Multibody Motion with Applications to Spacecraft Dynamics and Control," Aerospace Engineering, Texas A&M University (GPA 4.0, Advisor Dr. J. L. Junkins)
August 1994		M.S., "Real-Time Stereo Vision using Laser Scanning and Position Sensitive Photodetectors: Analytical and Experimental Results," Aerospace Engineering,Texas A&M University (GPA 4.0, Advisor Dr. J. L. Junkins)
May 1992		B.S. in Aerospace Engineering, Texas A&M University (Magna Cum Laude with GPA 3.87)

Work Experience

11/2024 – 

University of Colorado, H. J. and Ann Smead Aerospace Engineering Sciences Department, Boulder, Colorado
Distinguished Professor, Glenn L. Murphy Endowed Chair

Developing an active research program in the areas of spacecraft proximity flying, charged relative spacecraft motion, spacecraft charge sensing, spacecraft interactions with the space environment, space debris, autonomous spacecraft commanding using neural networks, spacecraft simulation frameworks and visualizations, as well as mission support. Leads the Autonomous Vehicle Systems (AVS) Lab and provides deep space mission support for spacecraft dynamics and simulation.

7/2022 – 

University of Colorado, H. J. and Ann Smead Aerospace Engineering Sciences Department, Boulder, Colorado
Department Chair, Schaden Leadership Chair

Leading a world-class aerospace engineering sciences department with over 50 faculty, educators and researchers. The department is known for both leading theoretical work as well as experimental and in-field research. Over a hundred small and large satellite missions have been developed and supported by the department's faculty, researchers and students.

8/2013 –11/2024 

University of Colorado, H. J. and Ann Smead Aerospace Engineering Sciences Department, Boulder, Colorado
Professor, Glenn L. Murphy Endowed Chair

8/2013 – 2019 

Applied Defense Solutions, Columbia, Maryland
Consultant

6/2011 – 12/2016 

Wacari Group, Boulder, Colorado
Chief Technologist

8/2007 – 7/2013 **University of Colorado**, Aerospace Engineering Sciences Department, Boulder, Colorado
Associate Professor

8/2003 – 7/2007 **Virginia Tech**, Aerospace and Ocean Engineering Department Blacksburg, Virginia
Assistant Professor

Developed a strong externally funded research program in spacecraft proximity flying and relative motion sensing and control research. Graduated 8 M.S. students and 1 Ph.D. student. Developed the Autonomous Vehicle Systems laboratory with Sandia Nat. Lab. support.

9/1999 – 8/2003 **Orion International Technologies**, (Contract Labor for Sandia National Laboratories)
Research Engineer

Performed GN&C research for distributed, collaborative robotic systems, developed and implemented the dynamics and control strategy of a swing-free Navy crane control system, and developed and installed a visual servoing system on a remote manipulator.

5/1998 – 9/1999 **Texas A&M University**, Aerospace Engineering Department, College Station, Texas
Post-Doctoral Research Assistant

Researched adaptive control systems that enforce the actual closed-loop dynamics to be of a prescribed linear form. Helped develop propellant-free relative orbits for spacecraft formation flying missions which are invariant to the Earth oblateness gravitational perturbation.

Projects and Grants

10/1/25– 5/31/26
Title: Satellite Fault Identification
Lead Organization: Trusted Space
CU-PI: Dr. H. Schaub
CU-Co-PI: Dr. N. Ahmed
Sponsor: Air Force STTR Phase II
Research: Research additional Basilisk sub-system development including associated fault modeling capabilities.
Funds: $209,998.50

11/10/25– 1/94/26
Title: Basilisk Build and Messaging Updates
PI: Dr. H. Schaub
Sponsor: Ten One Aerospace
Research: Expand support for building Basilisk with an external folder with non-core modules and messages.
Funds: $16,000

8/15/24– 8/14/28
Title: Rapid Modular Simulation Methods for Capture and Post-Capture Spacecraft Dynamics
PI: Dr. H. Schaub
Sponsor: NASA NSTGRO fellowship award
Research: Research modeling spacecraft docking using the back-substitution method.
Funds: $165,824

8/15/24–
2/14/25

Title: Trusted Automated Satellite Operations for Mission Life
PI: Dr. H. Schaub
Sponsor: Stottler Henke Associates
Research: Space Force STTR Phase I to study trusted satellite operations exploring the use of the Basilisk simulation software to enable this.
Funds: $30,000

8/15/24–
2/14/25

Title: DR. LEGS: Deep Reinforcement Learning Ecosystem for Guaranteed Safety
PI: Dr. M. Lahijanian
Co-PI: Dr. H. Schaub
Sponsor: Rhea Space
Research: Space Force STTR Phase I with the objective to develop a safe-by-design Deep Reinforcement Learning (DRL) framework for spacecraft control. The DRL training environment is setup in the Basilisk software.
Funds: $54,000

4/1/24–
3/31/25

Title: MAX Mission Support: Phase C
PI: Dr. H. Schaub
Sponsor: LASP
Research: Continuing support of EMA multi-asteroid mission ADCS development and spacecraft simulation and analysis development through CDR.
Funds: $354,678

2/5/24–
11/2/25

Title: Electroadhesive Docking for Satellite Servicing and Refueling
PI: In Orbit Space.
Co-PI: Dr. H. Schaub
Sponsor: Space Force, STTR Phase II
Research: Feasibility study concept of using electroadhesion to dock small cargo payloads. Simulate electroadhesion docking in Basilisk. Do basic electroadhesion docking experiments.
Funds: $550,498

11/8/24–
11/7/25

Title: Satellite Fault Identification
Lead Organization: Trusted Space
CU-PI: Dr. H. Schaub
CU-Co-PI: Dr. N. Ahmed
Sponsor: Air Force STTR Phase II
Research: Research advanced spacecraft fault identification by generating synthetic spacecraft telemetry using Basilisk. Research associated time series classifications and data compression and reduction techniques.
Funds: $300,000

1/1/24–
12/31/24

Title: Model Based Satellite Fault Identification
PI: Verus Research
Co-PI: Dr. M. Lahijanian
Co-PI: Dr. H. Schaub
Sponsor: Air Force STTR Phase II
Research: Research runtime spacecraft fault identification methods and test on synthetic Basilisk Simulation telemetry streams.
Funds: $300,000

8/15/23–
8/14/26

Title: Using Space Weather to Detect Cislunar Objects with Wide Field of View X-Ray Sensing
PI: Dr. H. Schaub
Sponsor: NASA FINESST fellowship award
Research: Study how to use X-ray signals to sense relative motion of space objects.
Funds: $150,000

8/15/23–
8/14/26

Title: Touchless Charge Control of Neighboring Spacecraft in Geostationary and Cislunar Space
PI: Dr. H. Schaub
Sponsor: AFOSR
Research: This research project studies methods to impart a charge beam at a neighboring space object and either maintain a near-natural charging level for sensing purposes, or control the charge level to desired values for electrostatic forcing, or minimize differential charging between the craft prior to docking.
Funds: $814,224

8/15/23–
8/14/27

Title: Autonomous Multiagent Search-and-Image Tasking for Satellite Constellations
PI: Dr. H. Schaub
Sponsor: NASA NSTGRO fellowship award
Research: Research autonomous spacecraft scheduling to observe multiple ground locations.
Funds: $247,702

8/15/23–
11/5/24

Title: Uncertainty Visualization in Virtual Reality for ISAM Human-in-the-Loop Mission Training using High Fidelity Simulations
PI: GridRaster Inc.
Co-PI: Dr. A. Anderson
Co-PI: Dr. H. Schaub
Sponsor: SpaceWERX Orbital Prime, STTR Phase II
Research: Spacecraft rendezvous uncertainty visualization using virtual reality.
Funds: $599,804

8/1/2023–
8/1/20/25

Title: ElectrxGEO Robust and Adaptive space Domain AwaReness (xRADAR).
PI: Dr. Shane Ross, Virginia Tech.
CU Co-PIs: Dr. Allison Anderson and Dr. H. Schaub
Sponsor: Space Force
Research: Create a VR training/learning environment whose primary purpose is to help people who are not familiar with orbital mechanics to understand orbital trajectories. Ultimately, we would like these individuals to also understand orbit selection and mission design. As such, two primary dimensions we will focus on is selecting from families of orbits with given Jacobi constants and transitioning between the inertial and rotating reference frames.
Funds: $1,400,000 (my share $52,360)

5/15/23–
8/6/23

Title: Electroadhesive Docking for Satellite Servicing and Refueling
PI: In Orbit Space.
Co-PI: Dr. H. Schaub
Sponsor: Space Force, STTR Phase I
Research: Study concept of using electroadhesion to dock small cargo payloads.
Funds: $34,970

8/22/22–
12/15/22

Title: Vizard Visualization Improvements
PI: Dr. H. Schaub
Sponsor: Lockheed Martin
Research: Improve Vizard's ability to import custom shape models, use Unity camera parameters and and provide support for multiple instrument cameras.
Funds: $32,466

8/15/22–
8/14/25

Title: AFRL-University of Colorado Cooperative Agreement
PI: Dr. M. Holzinger
Sub-PI: Dr. H. Schaub
Sub-PI: Dr. M. Lahijanian
Sponsor: AFRL
Research: Broad agreement with University of Colorado to support multiple faculty research project. Our sub-project is studying the use of shielded neural networks to control multiple satellites imaging multiple ground locations.
Total Project Funds: $5,540,000
Sub-Project Funds: $618,000

8/15/22–
8/14/23

Title: Impact of Space Weather Related Charging on Cislunar Rendezvous Approach and Safety
PI: Dr. H. Schaub
Sponsor: NASA FINESST fellowship award
Research: Study how cislunar space weather impact charged relative motion.
Funds: $100,000

7/5/22–
12/5/22

Title: The Otter Pup – A Platform for Rapid Testing of Rendezvous, Proximity Operations and Docking (RPOD) Technology
PI: Starfish Space.
Co-PI: Dr. H. Schaub
Sponsor: SpaceWERX Orbital Prime, STTR Phase I
Research: Research Basilisk based on-orbit spacecraft docking dynamics.
Funds: $83,823

7/5/22–
12/5/22

Title: Demonstrate the effectiveness of Virtual Reality (VR) in uncertainty visualization in on-orbit servicing and maintenance using high-fidelity simulations
PI: GridRaster Inc.
Co-PI: Dr. A. Anderson
Co-PI: Dr. H. Schaub
Sponsor: SpaceWERX Orbital Prime, STTR Phase I
Research: Spacecraft rendezvous uncertainty visualization using virtual reality.
Funds: $125,038

7/5/22–
12/5/22

Title: Rendezvous with Charged LEO Satellite
PI: Atomos Space
Co-PI: Dr. H. Schaub
Sponsor: SpaceWERX Orbital Prime, STTR Phase I
Research: Model spacecraft charging in polar orbits and evaluate preliminary spacecraft charging mitigation strategies.
Funds: $116,390

9/5/22–
3/5/23

Title: A Comprehensive Study and Down Selection of Autonomous Satellite Fault Identification Techniques
PI: Trusted Space
Co-PI: Dr. H. Schaub
Sponsor: Air Force STTR Phase I
Research: Research spacecraft fault identification by generating synthetic spacecraft telemetry using Basilisk.
Funds: $54,967

9/5/22–
3/5/23

Title: Model Based Satellite Fault Identification
PI: Verus Research
Co-PI: Dr. M. Lahijanian
Co-PI: Dr. H. Schaub
Sponsor: Air Force STTR Phase I
Research: Research model based spacecraft fault identification.
Funds: $61,643

4/1/22–
3/31/24

Title: MAX Mission Support: Phase B
PI: Dr. H. Schaub
Sponsor: LASP
Research: Support EMA multi-asteroid mission ADCS development and spacecraft simulation and analysis development.
Funds: $665,071

1/1/22–
4/30/23

Title: Towards Higher Levels of Autonomy and Robustness in Space Operations trough Uncertainty Management and Quantification
PI: Dr. H. Schaub
Sponsor: University of Seville / Marie Curie Postdoctoral Fellowship
Research: Support funds for research about autonomous spacecraft operations about an asteroid.
Funds: $22,801

8/15/22–
8/14/23

Title: Touchless Charge Sensing of Neighboring Spacecraft in Cislunar Space
PI: Dr. H. Schaub
Sponsor: NASA NSTGRO fellowship award
Research: Research touchless means to measure the electrostatic potential of nearby space objects. Regions of interest are within the cislunar region.
Funds: $260,268

3/11/22–
3/31/23

Title: STTR Phase 2: Streamlined Data-Driven Anomaly Monitoring and Causation Analysis
PI: Versus Research
Co-PI: Dr. M. Lahijanian
Co-PI: Dr. H. Schaub
Sponsor: Air Force, Sub-contract to STTR Phase 2
Research: Support the detection of faults by using AI to monitor the spacecraft telemetry stream.
Funds: $240,000

3/11/22–
3/31/23

Title: STTR Phase 2: Collaborative Mission Autonomy with Shielded Deep Reinforcement Learning (CMA-SHIELD)
PI: Versus Research
Co-PI: Dr. H. Schaub
Co-PI: Dr. M. Lahijanian
Sponsor: Air Force, Sub-contract to STTR Phase 2
Research: Create shielded neural network tasking solution for an Earth pointing mission scheduling problem.
Funds: $210,000

Jan. 1, 2022 – March. 31, 2024

Title: Air Force SBIR Phase 2: Spacecraft Fault Detection Identification and Causation using Machine Learning
PI: Versus Research
Co-PI: Dr. H. Schaub
Co-PI: Dr. M. Lahijanian
Sponsor: Air Force, Sub-contract to SBIR Phase 2
Research: Support the detection of faults by using AI to monitor the spacecraft telemetry stream.
Funds: $199,911

1/1/21– 12/28/22

Title: MAX Mission Support: Phase A
PI: Dr. H. Schaub
Co-PI: Dr. J. McMahon
Sponsor: LASP
Research: Support visualizing the spacecraft motion departing Earth, doing Venus and Earth fly-by's, and flying by various asteroids.
Funds: $61,902.

Nov. 2021 – Jan. 2022

Title: Spacecraft Visualization Support Stage 1
PI: Dr. H. Schaub
Sponsor: Atomos
Research: Enhance the Vizard simulation with new features for visualizing relative motion.
Funds: $3,831

May 2021 – May 2022

Title: On-board Swarm Control for Autonomy and Responsiveness (OSCAR)
PI: Orbit Logic
Co-PI: Dr. H. Schaub
Sponsor: NASA, Sub-contract to STTR Phase 1
Research: Simulate formation of satellites imaging an icy-moon using autonomous tasking.
Funds: $56,249

Jan – July 2021

Title: Autonomous Spacecraft Fault Detection
PI: Versus Research
Co-PI: Dr. H. Schaub
Sponsor: Air Force, Sub-contract to STTR Phase 1
Research: Support the study of machine learning based autonomous fault detection. The Basilisk astrodynamics simulation framework is employed to create simulation ADCS failures and corresponding telemetry streams.
Funds: $60,972

2/1/21 - 6/1/21

Title: Trusted, AI-Driven Constellation Management
PI: Scientific Systems
Co-PI: Dr. H. Schaub
Sponsor: Air Force, Sub-contract to STTR Phase 1
Research: Study the use of shielded deep reinforcement learning for single-ground target observations using multiple spacecraft. The Basilisk astrodynamics environment is employed to provide a high fidelity simulation of the spacecraft behavior during the learning process, as well as tasking performance validation.
Funds: $67,434

12/22/20 – 3/31/21

Title: Spacecraft Attitude Path Planner Integration with the Basilisk Framework
PI: Dr. H. Schaub
Sponsor: Jet Propolusion Lab (JPL) Seed Grant
Research: Develop Basilisk modules to perform comparative constrained attitude guidance studies.
Funds: $15,000

6/1/20– 6/25/20

Title: EMX Launch Visualization
PI: Dr. H. Schaub
Sponsor: LASP
Research: Make a 3D Visualization of the EMM Launch from the 2nd stage.
Funds: $6,340

8/1/20– 12/31/23

Title: Learning Agent for Autonomous Spacecraft Activity Planning and Orbit Selection
PI: Dr. H. Schaub
Sponsor: NASA NSTGRO fellowship award
Research: Using machine learning and schedule optimization techniques to schedule tasking and predict resource usage.
Funds: $238,091

8/1/19– 7/31/23

Title: Aerocapture Drop-Off: Study of Direct Atmospheric Entry for Secondary Payloads on Aerocapture Missions
PI: Dr. H. Schaub
Sponsor: NASA NSTGRO fellowship award
Research: Investigate a mother/daughter spacecraft pair separating during Aerocapture and having the daughter land.
Funds: $273,914

3/1/20– 5/1/20

Title: VAMPIRES – Virtual Agent Mission-Predictive Intelligent Response Engine for Space
PI: Scientific Systems
Co-PI: Dr. H. Schaub
Sponsor: Air Force, Sub-contract to SBIR Phase 1
Research: Study use of shield deep reinforcement learning or relative proximity operations.
Funds: $4,700

2/1/20– 1/31/23

Title: Touchless Sensing of Electrostatic Potential and Material Characterization Using Neighboring Spacecraft
PI: Dr. H. Schaub
Sponsor: AFOSR
Research: Research methods to sense neighboring space object charge levels without physical touch. This investigates analyzing the environments electron and Brehmstrahlung features.
Funds: $777,667

07/01/19– 12/31/20

Title: Electrostatic Control in Low-Earth Orbit Plasma Wakes
PI: Dr. H. Schaub
Sponsor: University of Colorado Seed Grant
Research: Investigate electrostatic control in a spacecraft LEO plasma wake through experimental modeling and analysis.
Funds: $50,000

3/20/18–
8/20/20

Title: EMX ADCS Development and Support (Phases D)
PI: Dr. H. Schaub
Sponsor: LASP
Research: Provide ADCS development, analysis, and validation support.
Funds: $803,428

1/8/18–
12/20/18

Title: EMX Softsim Development
PI: Dr. H. Schaub
Sponsor: LASP
Research: Support the development of the Black Lion simulation framework.
Funds: $47,000

8/1/18–
7/31/19

PI: Dr. H. Schaub
Sponsor: Draper graduate fellowship award
Research: Researching the modular modeling of the spacecraft thermal system to create simulated thermal sensors and visual relative motion control solutions.
Funds: $97,312

8/1/18–
7/31/21

Title: System Effects Of Non-Catastrophic Debris Strikes
PI: Dr. H. Schaub
Sponsor: NASA NSTR fellowship award
Research: Investigating the impact of small non-lethal debris strikes on spacecraft operations, and studying how this can be autonomously detected.
Funds: $303,874

8/1/17–
7/31/20

Title: Dynamics Analysis of Origami-Folded Deployable Space Structures with Elastic Hinges
PI: Dr. H. Schaub
Sponsor: NASA NSTR fellowship award
Research: Modeling and simulation of hinged deployable structures considering general three-dimensional motion of a rigid hub.
Funds: $214,540

8/1/16–
7/31/17

Title: Space Object Charging and Electrostatic Forcing Testbed in a Space-like Environment
PI: Dr. H. Schaub
Sponsor: DURIP (AFOSR)
Research: Equipment grant to setup a vacuum chamber to test active charging and charged actuation.
Funds: $158,987

6/1/16–
3/20/18

Title: EMX ADCS Development and Support (Phases C)
PI: Dr. H. Schaub
Sponsor: LASP
Research: Provide ADCS development and CDR analysis support.
Funds: $572,071

9/1/15–
8/31/18

Title: Faster-than-Realtime Electrostatic Force and Torque Modeling for SSA Applications
PI: Dr. H. Schaub
Sponsor: AFOSR
Research: Develop numerical methods to quickly evaluate the electrostatic torques and forces on a space object.
Funds: $617,292

6/1/15–
5/31/16

Title: EMX ADCS Development and Support (Phases B)
PI: Dr. H. Schaub
Sponsor: LASP
Research: Provide ADCS development and PDR analysis support.
Funds: $266,804

1/1/15–
5/31/15

Title: EMX ADCS Development and Support (Phases A)
PI: Dr. H. Schaub
Sponsor: LASP
Research: Update ADCS simulation software to include EMX capabilities. Provide ADCS development and analysis support.
Funds: $24,390

8/1/14–
7/31/17

Title: Electrostatic Detumble of Space Objects
PI: Dr. H. Schaub
Sponsor: NASA NSTR fellowship award
Research: Study electrostatic attitude dynamics and control of general space bodies.
Funds: $214,848

4/1/14–
5/1/14

Title: LMB Flatsat support
PI: Dr. H. Schaub
Sponsor: LASP
Research: Help integrate ADCS realtime simulation and visualization with flatsat.
Funds: $3,863

8/15/12–
8/14/15

Title: Proposal for Graduate Assistantships in Areas of National Need (GAANN)
PI: Dr. Schaub
Sponsor: Department of Education
Research: Proposal to provide graduate fellowships to Ph.D. students in the Aerospace Engineering department.
Funds: $666,330

6/1/12–
8/15/13

Title: Sub-Contract to: Community Initiative for Cellular Earth Remote Observations (CICERO) Pathfinder Mission
PI: Dr. Schaub
Co-PI: Dr. Axelrad
Sponsor: GeoOptics
Research: Develop ADCS system for CICERO.
Funds: $329,991

8/15/11–
8/14/15

Title: Reduced Order Electrostatic Force Field Modeling of 3D Spacecraft Shapes
PI: Dr. H. Schaub
Sponsor: NASA NSTR fellowship award
Research: Investigate numerically fast electrostatic force field modeling techniques about general body shapes.
Funds: $258,000

6/1/11–
6/1/12

Title: Space-Based Search-Detect-Track
PI: Dr. G. Born
Co-PI's: Dr. Schaub, Dr. Axelrad
Sponsor: Air Force Research Laboratory
Research: Investigate methods to improve space object tracking.
Funds: $42,000 (total award was $300,000)

06/1/11–
7/1/12

Title: Electrostatic Charge Deflection Experiment
PI: Dr. H. Schaub
Sponsor: NASA Langley
Research: Perform electrostatic Gossamer structure experiments in plasma chamber with charge deflection.
Funds: $52,758

06/16/10–
12/16/10

Title: SBIR, N093-223 Low Cost Orbital Debris Removal System
PI: Dr. H. Schaub
Sponsor: Wacari Group for DARPA SBIR
Research: Assist with a Phase I study of a geostationary space debris reorbiting method.
Funds: $21,642

02/01/10–
10/31/10

Title: Tethered Coulomb Satellite
PI: Dr. H. Schaub
Co-PI: Dr. K. Maute
Co-PI: Dr. D. Moorer (Wacari Group)
Sponsor: NRO Director's Innovation Initiative (DII)
Research: Concept study of the tethered Coulomb satellite concept.
Funds: $355,551

09/14/09–
06/1/11

Title: Crane Pendulation Control Technology Transition Support (TI-79)
PI: Dr. H. Schaub
Sponsor: Naval Surface Warfare Center (BMT Designer & Planners)
Research: Assist NSWC with the industry transition of the pendulation control system developed for ship mounted cranes. Includes two travels to Sweden to discuss control solution with the crane manufacturer.
Funds: $50,243

09/01/09–
12/31/09

Title: UMBRA Software Application Advising
PI: Dr. H. Schaub
Sponsor: Sandia National Labs)
Research: Assist Sandia with academic uses of the Sandia developed UMBRA software framework.
Funds: $4,000

09/01/08–
09/30/09

Title: Crane Pendulation Control Demo and Technology Support
PI: Dr. H. Schaub
Sponsor: Naval Surface Warfare Center (BMT Designer & Planners)
Research: Assist with PCS control developments to perform ship-to-ship cargo transfer. Numerically model the new scenario including the relative motion sensors, and modify the control to perform the new cargo landing on the target ship.
Funds: $118,400

09/01/08–
04/30/09

Title: Crane Pendulation Control System Specification Development
PI: Dr. H. Schaub
Sponsor: Naval Surface Warfare Center (BMT Designer & Planners)
Research: Assist with the PCS specification document development.
Funds: $9,713.42

07/01/08–
06/30/09

Title: Tethered Coulomb Structure Concept Study
PI: Dr. H. Schaub
Sponsor: University of Colorado Seed Grant
Research: Investigate a novel hybrid concept where the spacecraft are inter-connected by conducting tethers. With the tethered Coulomb structure the craft's electrostatic repulsion is exploited to keep the tether net tight, thus controlling the cluster size and shape. Study will investigate dynamical modeling, control and power issues.
Funds: $42,000

01/01/08–
04/31/08

Title: Relative Pose Estimation Using Visual Snakes in Variable Lighting Conditions
PI: Dr. H. Schaub
Sponsor: Sandia National Laboratories
Research: Investigate new sphere tracking algorithm using visual snakes. The spherical target is assumed to be only partially tracked.
Funds: $24,500

05/01/06–
09/31/08

Title: Cargo Throughput Improvement System Development
PI: Dr. H. Schaub
Sponsor: Naval Surface Warfare Center (Jorge Scientific Corporation)
Research: Implement a new rate-based pendulation control system on 2 crane ships. A new ship motion sensor is used in this 2nd generation PCS implementation. Further, a new twin-crane mode is developed and tested. The new control algorithm is tested in an upgraded virtual crane simulation environment. Implement control strategy on a redundant degree of freedom rider-block-tagline crane system.
Funds: $267,563

01/20/06–
02/20/07

Title: ASPIRE: Spacecraft Collision Avoidance using Coulomb Forces
PI: Dr. H. Schaub
Sponsor: Virginia Tech
Research: Investigate using Coulomb forces to achieve spacecraft collision avoidance. The spacecraft are considered to be either in deep space (inertial frame) or in GEO (rotating frame). The feedback strategies attempt to perform the collision avoidance using only separation distance measurements, and avoid excessive escape velocities of the craft.
Funds: $43,386

05/01/05–
09/15/05

Title: UGV Battery modeling using UMBRA
PI: Dr. H. Schaub
Sponsor: Sandia National Laboratories
Research: Develop an UMBRA based model of UGV batteries. This enables the virtual vehicles to simulate power consumption by careful motor torque computation, and integration of this module with the dynamic UGV modules.
Funds: $4,312

04/28/05–
03/28/06

Title: Space-Based Distributed Radar Aperture Study Exploiting Spacecraft Charging
PI: Dr. H. Schaub
Co-PI: Dr. B. King (Michigan Tech)
Co-PI: Dr. G. Parker (Michigan Tech)
Sponsor: DARPA, Special Projects Office
Research: Investigate how Coulomb forces can be exploited to perform spacecraft relative motion control. In particular, this research investigates different charged spacecraft cluster concepts, the magnitude of the differential perturbations and what the associated required maintenance charge will be, as well as how a spacecraft charge servo system could be designed.
Funds: $190,495

06/15/04–
09/1/05

Title: Technical Support For Visual Snake Based Servoing Of Unmanned Vehicles
PI: Dr. H. Schaub
Sponsor: Sandia National Laboratories
Research: Investigate using color visual snakes (active deformable contours) in unmanned ground vehicle visual servo applications. The simulation test bed is to be developed using the UMBRA software framework and investigate how UMBRA can be used to interact between software and hardware simulation components.
Funds: $35,232

05/16/04–
05/06/05

Title: Velocity-based Swing- Free Control Investigation For A Ship Mounted Boom Crane
PI: Dr. H. Schaub
Sponsor: Naval Surface Warfare Center, Carderock Division
Research: Develop a new ship mounted crane control strategy which reduces the ship motion sensing requirements of the current Pendulation Control System (PCS). An augmented position-based PCS strategy is developed along with a new velocity-based PCS solution.
Funds: $93,036

HONORS AND AWARDS

April 2025	Selected to attend the Secretary of Defense's Joint Civilian Orientation Conference
Fe. 2025	***National Academy of Engineering (NAE)***
Nov. 2024	***Distinguished Professor***
August 2023	***AAS Dirk Brouwer Award***
June 2023	Smart Sat Visiting Research Fellow, Australia
May 2023	***Hazel Barnes Prize Award***, the most prestigious faculty award given by the University of Colorado Boulder, recognizing excellence in teaching, research and service.
July 2022	Schaden Leadership Chair
Aug. 2020	Collegiate Educator of the Year for the AIAA Rocky Mountain section
May 2019	***AIAA Fellow***
Dec. 2018	College of Engineering and Applied Science Research Award
June 2018	College of Engineering and Applied Science Textbook Recognition Award
Jan. 2018	AIAA Mechanics and Control Flight Award
July 2017 –	***Glenn L. Murphy Endowed Chair***
June 2017	ASEE John Leland Atwood Award
May 2017	College of Engineering Top 20 faculty in research
May 2017	Department of Aerospace Engineering Sciences Faculty Distinguished Performance Award
April 2017	Graduate School Outstanding Faculty Mentor Award
April 2016	Distinguished Alumni Award - Outstanding Aerospace Engineer, from the Texas A&M University aero. eng. department
July 2015	***Al and Betty Look Professorship in Engineering***
April 2015	Department of Aerospace Engineering Sciences Faculty Award for Outstanding Graduate Teaching and Mentoring
Jan. 2014	**Fellow of AAS**
Jan. 2013	***Summerfield Book Award***, AIAA
Sept 2012	***Dean's Award for Outstanding Teaching***, University of Colorado
April 2012	***Boulder Faculty Assembly Excellence in Teaching Award***, University of Colorado
April 2011	***Outstanding Faculty Advisor Award***, College of Engineering and Applied Sciences, University of Colorado
2010	**Provost's Faculty Achievement Award**, University of Colorado
2007 – 2013	***H. Joseph Smead Fellow***, University of Colorado
July 2002	*Exemplary Performance Award*, ORION International Technologies
April 1998	***Distinguished Graduate Student Doctoral Research Award***, Texas A&M University
1992 – 1993	Regents Graduate Fellowship for graduate study at Texas A&M University
May 1992	Graduated with Magna Cum Laude (B.S. in Aerospace Engineering)
1991 – 1992	Engineering Scholars Program
1988 – 1992	Deans Honor List for 7 out of 8 undergraduate semesters

PROFESSIONAL SERVICE

Positions Held

Feb. 2023	AAS GNC conference national session chair on multi-satellite autonomy
Sept. 2022	IAC Session chair
Feb. 2022	AAS GNC conference national session chair on multi-satellite autonomy
Jan. 2022	AIAA SciTech session chair on artificial intelligence in astrodynamics
2021	AIAA Fellow Aerospace Flight Sciences Program Area Group
2019 – 2025	Member of Astrodynamics Committee of the International Astronautical Federation
Oct. 2019	Served as rapporteur at 2019 IAC
2019	Served on JAS EiC search committee
July 2019 -	Session chair for IWSCFF conference
Feb. 2019 -	National Chair for Mars Mission Session at AAS GNC Conference
May 2018 – 2019	Technical chair of AAS John L. Junkins Dynamical Systems Symposium
Mar. 2018 –	AIAA/ASEE Atwood Educator Award Selection Committee
Sept. 2017 –	Guest Editor for Acta Astronautica Special Edition
Jan 2017 – Jan. 2022	**Editor in Chief** for AIAA Journal of Spacecraft and Rockets
June 2016 –	Session chair for 4th International Workshop on Space Debris Modeling and Remediation, CNES, Paris, June 6–8, 2016.
2016 –	**Associate Editor** of IEEE Transactions on Aerospace and Electronic Systems
2015 –	**AAS Fellow Committee**
Aug. 2015	Session chair for 2 sessions at the Astrodynamics Specialist Conference in Vail, Colorado
June 2015	Session chair for 8th International Workshop Satellite Constellations and Formation Flying (IWSCFF-2015)
May 2014	Session chair for 1st Stardust Global Virtual Workshop (SGVW-1) on Asteroids and Space Debris
2012 - 2014	**Chair**, AAS Space Flight Mechanics Web Administration
Dec. 2011 -	**Advisory Board Member**, AIAA Education Series Editorial Board
August 2011	**Technical Chair** of AAS Astrodynamics Specialist Conference
5/10 – 5/11	**Co-Editor** for the JAS special edition of the George Born Astrodynamics Symposium
May 2010	**Technical Chair** of AAS George Born Astrodynamics Symposium
2010 – 2014	AAS Space Flight Mechanics Technical Administration Sub-Committee member
2010 – 2014	AAS Space Flight Mechanics Web Administration Sub-Committee member
Feb. 2009	Session chair for AAS Spaceflight Mechanics Meeting
9/08 – 2010	**Section editor** for the Encyclopedia of Aerospace Engineering to be published by Wiley
9/08 – 3/09	Guest editor for the Landis Markley special edition of the Journal of Astronautical Sciences
Aug. 2008	Topics in Spacecraft Dynamics and Control Session chair for AIAA/AAS Astrodynamics Specialist Conference
Jan. 2008	Attitude Dynamics and Control Session chair for AAS Spaceflight Mechanics Meeting
2007 – 2013	**Associate Editor** for AIAA Journal of Guidance, Control and Dynamics
Aug. 2007	Formation Flying Session chair for AAS Astrodynamics Specialist Conference
2007 – 2008	**AAS Technical Chair Sub-Committee member**
Jan. 2007	Formation Flying II Session chair for AAS Spaceflight Mechanics Meeting
Jan. 2006	Formation Flying II Session chair for AAS Spaceflight Mechanics Meeting
Aug. 2005	Attitude Dynamics and Control Session Chair for AAS Astrodynamics Specialist Conference
Aug. 2005	Visual Control Special-Session Organizer for AIAA Guidance, Navigation and Control Conference
June 2005	Session Chair for the Malcolm D. Shuster Astronautics Symposium
Jan. 2005	Formation Flying Session Chair for AAS Spaceflight Mechanics Conference
Aug. 2004	Attitude Dynamics and Control Session Chair for AIAA Guidance, Navigation and Control Conference
2/04 – 7/08	**AAS Committee chair** of the John V. Breakwell Student Travel Award

1/04 – 7/98	**Technical Committee Member** of the American Astronautical Society
10/03–12/07	Member of the International Association of Geodesy: Working Group T2.2 Satellite Group
May 2003	Session Chair for the AAS Junkins Astrodynamics Symposium
Aug. 2002	Space Robotics Session Chair for the AIAA Guidance, Navigation and Control Conference
Aug. 2002	Technical Area Chair for the AIAA Guidance, Navigation and Control Conference (Robotics, Space Automation, and Control of Robots)
1/01 – 1/02	Adjunct Professor at Michigan Technological University (Honorary appointment to serve on student's Thesis committee)
1998	Session Chair, AIAA/AAS Astrodynamics Specialist Conference

External Reviewer Assignment

- AAS Conference Submissions (15 papers)
- AAS Journal of the Astronautical Sciences (32 papers)
- Acta Astronautica (57 papers)
- Advances in Mechanical Engineering (1 paper)
- Advances in Space Research (35 papers)
- Aerospace Science and Technology (AST) (27 papers)
- AIAA GNC Conference Submissions (19 papers)
- AIAA Infotech@Aerospace Conference and Exhibit (6 papers)
- AIAA Journal (2 papers)
- AIAA Journal of Aerospace Information Systems (2 papers)
- AIAA Journal of Guidance, Control and Dynamics (135 papers)
- AIAA Journal of Spacecraft and Rockets (22 papers)
- Air Force Office of Scientific Research (2 submissions)
- Aircraft Engineering and Aerospace Technology (1 paper)
- American Control Conference Submissions (26 papers)
- American Society Of Mechanical Engineers (1 paper)
- Applied Soft Computing Journal (2 paper)
- ASCE Journal of Aerospace Engineering (5 papers)
- ASME Journal of Dynamic Systems, Measurement and Control (6 papers)
- ASME Journal of Vibration and Acoustics (1 paper)
- Astrodynamics Journal (6 papers)
- Automatica (5 papers)
- Chinese Journal of Aeronautics (2 papers)
- Computers and Operations Research (1 paper)
- Control Systems Magazine (1 paper)
- European Control Conference Submission (6 papers)
- European Journal of Mechanics (2 papers)
- IEEE Conference on Decision and Control (6 papers)
- IEEE Control Systems Magazine (3 papers)
- IEEE Control Systems Society Conference (2 paper)
- IEEE International Conference on Control & Automation (1 paper)
- IEEE International Conference on Industrial Technology - ICIT (1 paper)
- IEEE Multi-conference on Systems and Control (1 paper)
- IEEE Transactions on Aerospace and Electronic Systems (22 papers)
- IEEE Transactions on Automatic Control (2 papers)
- IEEE Transactions on Control Systems Technology (15 papers)
- IEEE Transactions on Education (2 papers)
- IEEE Transactions on Systems, Man, and Cybernetics (1 paper)

- IEEE Transactions on Plasma Science (1 paper)
- IEEE TRANSACTIONS ON ROBOTICS (3 papers)
- IET Control Theory & Applications (1 paper)
- Indian Control Conference (2 papers)
- International Conference of Numerical Analysis and Applied Mathematics (3 papers)
- International Conference on Intelligent Robots and Systems (IROS) (1 paper)
- International Conference on Technology and Automation (1 paper)
- International Federation of Automatic Control (2 papers)
- International Journal of Aerospace Engineering (1 paper)
- International Journal of Control, Automation, and Systems (1 paper)
- International Journal of Digital Earth (3 papers)
- International Journal of Non-Linear Mechanics (1 paper)
- International Symposium on Systems and Control in Aeronautics and Astronautics (ISSCAA) (1 paper)
- JION Navigation (2 papers)
- Journal of Aerospace Engineering (3 papers)
- Journal of Celestial Mechanics and Dynamical Astronomy(22 papers)
- Journal of Electrostatics (3 papers)
- Journal of Mathematical and Computer Modeling of Dynamical Systems (1 paper)
- Journal of Mechanical Engineering Science (3 paper)
- Journal of Multi-Body Dynamics (Proceedings of the Institution of Mechanical Engineers Park K) (2 paper)
- Journal of Nonlinear Dynamics (5 papers)
- Journal of Optimization Theory and Applications (1 paper)
- Journal of the Franklin Institute (1 paper)
- Journal of the Institute of Navigation (1 paper)
- Journal of Vibration and Control (1 paper)
- Journal of Zhejiang University (1 paper)
- Mathematical Methods in the Applied Sciences (1 paper)
- Measurements (2 papers)
- MECCANICA – International Journal of the Italian Association of Theoretical and Applied Mechanics (2 papers)
- Mechatronics, The Science of Intelligent Machines (4 papers)
- Mediterranean Conference on Control and Automation (1 paper)
- NSTGRO review (1 submission)
- Optical Engineering (2 papers)
- Proceeding of the iMechE Part G: Journal of Aerospace Engineering (3 papers)
- Progress in Aerospace Sciences (3 papers)
- Progress in Electromagnetics Research (1 papers)
- Robotica (1 paper)
- The Royal Society (Proceedings of Mathematical, Physical and Engineering Sciences) (6 papers)
- Sensors & Actuators: A. Physical (1 paper)
- 2005 Space Flight Mechanics Best Paper Award

University Service

9/2025 –	Chair of Hazel Barnes Search Committee
5/2025 –	Western Colorado University aerospace degree program committee
1/2025 –	University of Colorado Distinguished Professor Selection Committee
9/2024 –	Search Committee Chair for Smead Space Technology Chair Faculty Search
4/2024 –	Hazel Barnes Selection Committee
7/2022 –	**Smead Aerospace Engineering Sciences Department Chair**
2021	PUEC committee for Prof. Matsuo
2021	Reappointment committee for Prof. Lahijanian
2021 – 2022	Associate Chair for Leadership Development (chair elect)
2020 – 2021	College Research award committee
2019 –	University of Colorado at Boulder's Standing Committee on Restricted, Proprietary and Classified Research (SCRPCR)
2017 – 2018	AES Strategic Vision Committee
2017 –	**LASP Senior Associate for Engineering Research and Education**
2016 – 2019	New ASEN Building Committee
2016 - 2017	Department Graduation Ceremony Committee
2016 - 2017	Faculty Performance Review Committee
2016 –	Faculty Mentor (Francisco Lopez Jimenez)
2016 –	Smead Selection Committee
2015 - 2017	Astrodynamics Faculty Search Committee Chair
2015 – 2018	**Associate Chair of Graduate Affairs**
2015 – 2016	Undergraduate Education Committee
2015 – 2018	Executive Committee
2015 –	Faculty Mentor (Robert Marshall)
2015 – 2018	Graduate Education Council (GEC)
2015 – 2018	BBA Working Group
2015 – 2016	Distinguished Professor Nomination Sub-Committee
2014 – 2015	ABET Coordinator's List
2014 – 2015	Undergraduate Assessment Committee
2014 – 2017	University of Colorado at Boulder's Standing Committee on Restricted, Proprietary and Classified Research (SCRPCR)
2014 – 2015	Graduating student committee
2014 – 2015	Undergraduate Education Council
2014 – 2015	Chair of course 1400 review Committee
2014 – 2016	Faculty Advisor to ASEN Lead TA
2014 – 2015	Member of Graduate Committee
2014 – 2015	**Associate Chair of Undergraduate Affairs**
2014 – 2015	**Astrodynamics and Satellite Navigation Focus Area Lead**
2014 –	ASEN Executive Committee Member
2012 – 2014	Dean's FLAG Committee
2012 – 2013	Faculty Search Committee Member (Astro Position)
2012 – 2013	Faculty Advisor for Lead TA
2011 – 2015	CAETE Technology Advisory Committee
May 2011	Provost Faculty Research Award Committee
Spring 2011	IGP Seed Grant Committee
2010 –2013	ASEN Executive Committee Member
2010 –2013	Graduate Education Council (GEC) Member
Fall 2010	PUEC chair for Diana Dimeff re-appointment
8/10 – 7/13	**Associate Chair of Graduate Affairs**
2009 – 2013	Member of the ASEN graduate committee
2009 – 2013	Member of the ASEN undergraduate committee
2009	IGP Seed Grant review committee
2008 – 2009	Member of Undergraduate fellowship opportunities

2008 – 2009	Member of UROP (undergraduate research opportunities
2008 – 2009	Member of external advisory board meeting for ColdQuanta
2007 – 2008	Member of Undergraduate Teaching Curriculum Committee
Fall 2007	Chair of graduate astrodynamics and navigation seminar series
2006 – 2007	Member of the aerospace and ocean engineering faculty search committee
Fall 2005	Chair of department seminar series
2005 – 2007	Chair of AOE Display Cabinet committee
2004 – 2006	Graduate Applications Committee Member
2004	Member of the ocean engineering faculty search committee
2004 – 2007	Department representative of undergraduate computing requirements committee
2003 – 2007	Member of the Student Opportunity Committee for the AOE department

Society Affiliations

2019 –	**Fellow** of American Institute of Aeronautics and
2003	Member of the American Society of Engineering Education (ASEE)
1998 –	**Fellow** of the American Astronautical Society (AAS)
March 1998	Full Member of Sigma Xi (The Scientific Research Society)
1996 – 2019	Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA)
1991 –	Member of Sigma Gamma Tau, National Aerospace Engineering Honor Society
1991 – 1992	Member of Tau Beta Pi, National Engineering Honor Society
1990 – 1992	Member of Phi Kappa Phi, Engineering Honor Society

Journal Articles

J-1. **H. Schaub**, P. Tsiotras, and J. L. Junkins. "Principal Rotation Representations of Proper NxN Orthogonal Matrices." *International Journal of Engineering Science*, Vol. 33, No. 15, Elsevier Science Ltd., Great Britain, 1995, pp. 2277–2295.
doi:10.1016/0020-7225(95)00070-E

J-2. **H. Schaub** and J.L. Junkins. "Stereographic Orientation Parameters for Attitude Dynamics: A Generalization of the Rodrigues Parameters." *AAS Journal of the Astronautical Sciences*, Vol. 44, No. 1, Jan.–Mar. 1996, pp. 1–19.

J-3. **H. Schaub**, R. D. Robinett, and J. L. Junkins. "Adaptive External Torque Estimation by Means of Tracking a Lyapunov Function." *AAS Journal of the Astronautical Sciences*, Vol. 44, No. 3, July–Sept. 1996.

J-4. **H. Schaub**, R. D. Robinett, and J. L. Junkins. "Globally Stable Feedback Laws for Near-Minimum-Fuel and Near-Minimum-Time Pointing Maneuvers for a Landmark-Tracking Spacecraft." *AAS Journal of the Astronautical Sciences*, Vol. 44, No. 4, Oct.–Dec. 1996, pp. 443–466.

J-5. **H. Schaub**, R. D. Robinett, and J. L. Junkins. "New Penalty Functions For Optimal Control Formulation for Spacecraft Attitude Control Problems." *AIAA Journal of Guidance, Control and Dynamics*, Vol. 20, No. 3, May–June, 1997, pp. 428–434.
doi:10.2514/2.4093

J-6. P. Tsiotras, J. L. Junkins, and **H. Schaub**. "Higher Order Cayley Transforms with Applications to Attitude Representations." *AIAA Journal of Guidance, Control and Dynamics*, Vol. 20, No. 3, May–June, 1997, pp. 528–534.
doi:10.2514/2.4072

J-7. J. L. Junkins and **H. Schaub**. "An Instantaneous Eigenstructure Quasivelocity Formulation for Nonlinear Multibody Dynamics." *AAS Journal of the Astronautical Sciences*, Vol. 45, No. 3, July–Sept. 1997, pp. 279–295.

J-8. R. D. Robinett, G. G. Parker, **H. Schaub**, and J. L. Junkins. "Lyapunov Optimal Saturated Control for Nonlinear Systems." *AIAA Journal of Guidance, Control and Dynamics*, Vol. 20, No. 6, Nov.–Dec., 1997, pp. 1083–1088.
doi:10.2514/2.4189

J-9. J. L. Junkins and **H. Schaub**. "Orthogonal Square Root Eigenfactor Parameterization of Mass Matrices." *AIAA Journal of Guidance, Control and Dynamics*, Vol. 20, No. 6, Nov.–Dec., 1997, pp. 1118–1124.
doi:10.2514/2.4166

J-10. **H. Schaub** and J. L. Junkins. "Feedback Control Law Using the Eigenfactor Quasi-Coordinate Velocity Vector." *Journal of the Chinese Society of Mechanical Engineers*, Vol. 19, No. 1, 1997, pp. 51–59.

J-11. **H. Schaub**, S. R. Vadali, and J. L. Junkins. "Feedback Control Law for Variable Speed Control Moment Gyroscopes." *AAS Journal of Astronautical Sciences*, Vol. 46, No. 3, July–Sept., 1998, pp. 307–328.

J-12. **H. Schaub**, S. R. Vadali, J. L. Junkins and K. T. Alfriend, "Spacecraft Formation Flying Control Using Mean Orbit Elements." *AAS Journal of Astronautical Sciences*, Vol. 48, No. 1, Jan.–March, 2000, pp. 69–87.

J-13. **H. Schaub** and J. L. Junkins. "Singularity Avoidance Using Null Motion and Variable-Speed Control Moment Gyros." *AIAA Journal of Guidance, Control and Dynamics*, Vol. 23, No. 1, Jan.–Feb., 2000, pp. 11–16.
doi:10.2514/2.4514

J-14. K. T. Alfriend and **H. Schaub**, "Dynamics and Control of Spacecraft Formations: Challenges and Some Solutions." *AAS Journal of the Astronautical Sciences*, Vol. 48, Nos. 2 and 3, April–Sept. 2000, pp. 249–267.

J-15. **H. Schaub**, M. Akella and J. L. Junkins, "Adaptive Realization of Linear Closed-Loop Tracking Dynamics in the Presence of Large System Model Errors." *AAS Journal of Astronautical Sciences*, Vol. 48, No. 4, Oct.–Dec., 2000, pp. 537–551.

J-16. **H. Schaub**, M. Akella and J. L. Junkins, "Adaptive Control of Nonlinear Attitude Motions Realizing Linear Closed-Loop Dynamics." *AIAA Journal of Guidance, Control and Dynamics*, Vol. 24, No. 1, Jan.–Feb., 2001, pp. 95–100.
doi:10.2514/2.4680

J-17. **H. Schaub** and K. T. Alfriend, "Impulsive Feedback Control to Establish Specific Mean Orbit Elements of Spacecraft Formations", *AIAA Journal of Guidance, Control and Dynamics*, Vol. 24, No. 4, July–Aug., 2001, pp. 739–745.
doi:10.2514/2.4774

J-18. **H. Schaub**, K. T. Alfriend, "J_2 Invariant Relative Orbits for Spacecraft Formations." *Celestial Mechanics and Dynamical Astronomy*, Vol. 79, 2001, pp. 77–95.
doi:10.1023/A:1011161811472

J-19. K. T. Alfriend, S. R. Vadali and **H. Schaub**, "Formation Flying Satellites: Control By an Astrodynamicist" Celestial Mechanics and Dynamical Astronomy, Vol. 81, Nos. 1–2, 2001, pp. 57–62.
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J-20. **H. Schaub** and K. T. Alfriend, "Hybrid Cartesian and Orbit Element Feedback Law for Formation Flying Spacecraft", *AIAA Journal of Guidance, Control and Dynamics*, Vol. 25, No. 2, March–Apr., 2002, pp. 387–393.
doi:10.2514/2.4893

J-21. G. G. Parker, M. J. Agostini, **H. Schaub**, K. Groom and R. D. Robinett, "Generating Swing-Suppressed Maneuvers for Crane Systems with Rate Saturation," *IEEE Transactions on Control Systems Technology*, Vol. 11, No. 4, July 2003, pp. 471–481.
doi:10.1109/TCST.2003.813402

J-22. **H. Schaub**, G. G. Parker and L. B. King,"Challenges and Prospects of Coulomb Spacecraft Formations," *AAS Journal of Astronautical Sciences*, Vol. 52, Nos. 1–2, Jan.–June., 2004, pp. 169–193.

J-23. **H. Schaub**, "Relative Orbit Geometry Through Classical Orbit Element Differences." *AIAA Journal of Guidance, Control and Dynamics*, Vol. 27, No. 7, Sept.–Oct., 2004, pp. 839–848. doi:10.2514/1.12595

J-24. **H. Schaub**, "Stabilization of Satellite Motion Relative to a Coulomb Spacecraft Formation," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 28, No. 6, Nov.–Dec. 2005, pp. 1231–1239.
doi:10.2514/1.8577

J-25. A. Natarajan and **H. Schaub**, "Linear Dynamics and Stability Analysis of a Two-Craft Coulomb Tether Formation," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 29, No. 4, July–Aug. 2006, pp. 831–839.
doi:10.2514/1.16480

J-26. **H. Schaub**, C. D. Hall, and J. Berryman, "Necessary Conditions for Circularly-Restricted Static Coulomb Formations," *AAS Journal of Astronautical Sciences*, Vol 54, No. 3–4, July–Dec 2006, pp 525–541.
doi:10.1007/BF03256504

J-27. G. G. Parker, **H. Schaub**, A. Natarajan and L. B. King, "Coulomb Force Virtual Space Structures," *Acta Futura*, Vol. 2, No. ACT-PUB-AFO502, 2006, pp. 39–44.
doi:10.2420/ACT-BOK-AF02

J-28. I. I. Hussein and **H. Schaub**, "Invariant Shape Solutions of the Spinning Three Craft Coulomb Tether Problem," *Journal of Celestial Mechanics and Dynamical Astronomy*, Vol. 96, No. 2, Oct. 2006, pp. 137–157.
doi:10.1007/s10569-006-9043-8

J-29. M. Kim and **H. Schaub**, "Coulomb Formation Conservation Laws Using Differential Orbit Elements," *Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering*, Vol. 220, No. 5, 2006, pp. 463–474.
doi:10.1243/09544100JAERO39

J-30. A. Natarajan, **H. Schaub**, and G. G. Parker, "Reconfiguration of a Nadir-Pointing 2-Craft Coulomb Tether," *Journal of the British Interplanetary Society*, Vol. 60, No. 6, June 2007, pp. 209–218..

J-31. C. D. Karlgaard and **H. Schaub**, "Huber-Based Divided Difference Filtering," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 30, No. 3, May–June 2007, pp. 885–891.
doi:10.2514/1.27968

J-32. C. M. Saaj, V. Lappas, D. Richie, **H. Schaub**, and D. Izzo, "Hybrid Propulsion System for Spacecraft Swarm Aggregation using Coulomb Force," *Journal of British Interplanetary Society*, July 2007.

J-33. C. M. Southward, J. Ellis and **H. Schaub**, "Spacecraft Attitude Control Using Symmetric Stereographic Orientation Parameters", *Journal of Astronautical Sciences*, Vol. 55, No. 3, July–Sept., 2007, pp. 389–405.
doi:10.1007/BF03256531

J-34. J. Berryman and **H. Schaub**, "Analytical Charge Analysis for 2- and 3-Craft Coulomb Formations," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 30, No. 6, Nov.–Dec. 2007, pp. 1701–1710.
doi:10.2514/1.23785

J-35. James Doebbler, Theresa Spaeth, John Valasek, Mark J. Monda, and **H. Schaub**, "Boom and Receptacle Autonomous Air Refueling Using Visual Pressure Snake Optical Sensor," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 30, No. 6, Nov.–Dec. 2007, pp. 1753–1769. doi:10.2514/1.28305

J-36. **H. Schaub** "Rate-Based Ship-Mounted Crane Payload Pendulation Control System," *IFAC Control Engineering Practice*, Vol. 16, No. 1, 2008, pp. 132–145. doi:10.1016/j.conengprac.2007.04.011

J-37. H. Vasavada and **H. Schaub**, "Analytic Solutions for Equal Mass 4-Craft Static Coulomb Formation," *Journal of Astronautical Sciences*, Vol. 56, No. 1, January–March 2008, pp. 7–40. doi:10.1007/BF03256540

J-38. S. Wang and **H. Schaub**, "Spacecraft Collision Avoidance using Coulomb Forces with Separation Distance Feedback," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 31, No. 3, May–June, 2008, pp. 740–750. doi:10.2514/1.29634

J-39. A. Natarajan and **H. Schaub**, "Orbit-Nadir Aligned Coulomb Tether Reconfiguration Analysis," *Journal of Astronautical Sciences*, Vol. 56, No. 4, Oct.–Dec. 2008, pp. 573–592. doi:10.1007/BF03256566

J-40. C. R. Seubert and **H. Schaub**, "Tethered Coulomb Structures: Prospects and Challenges," *Journal of Astronautical Sciences* , Vol. 57, Nos. 1–2, Jan. – June, 2009. doi:10.1007/BF03321508

J-41. **H. Schaub** and V. J. Lappas, "Redundant Reaction Wheel Torque Distribution Yielding Instantaneous L_2 Power-Optimal Attitude Control," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 32, No. 4, July–Aug. 2009, pp. 1269–1276. doi:10.2514/1.41070

J-42. A. Natarajan and **H. Schaub**, "Hybrid Control of Orbit Normal and Along-Track Two-Craft Coulomb Tethers," *Aerospace Science and Technology*, Vol. 13, Nos. 4–5, 2009, pp. 183–191. doi:10.1016/j.ast.2008.10.002

J-43. I. Hussein and **H. Schaub**, "Stability and Control of Relative Equilibria for the Three-Spacecraft Coulomb Tether Problem", *Acta Astronautica*, Vol. 65, Nos. 5-6, 2009, pp. 738–754. doi:10.1016/j.actaastro.2009.03.035

J-44. J. McMahon and **H. Schaub**, "Simplified Singularity Cost Function for VSCMG Nullmotion Steering Laws," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 32, No. 6, Nov.–Dec. 2009, pp. 1938–1943. doi:10.2514/1.45433

J-45. C. M. Saaj, V. Lappas, **H. Schaub**, and D. Izzo, "Hybrid Propulsion System for Formation Flying using Electrostatic Forces," *Aerospace Science and Technology*, Vol. 14, No. 5, 2010, pp. 348–355. doi:10.1016/j.ast.2010.02.009

J-46. J. Mullen and **H. Schaub**, "Hypersphere Stereographic Orientation Parameters," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 33, No. 1, Jan.–Feb. 2010, pp. 249–254. doi:10.2514/1.46783

J-47. S. Wang and **H. Schaub**, "Electrostatic Spacecraft Collision Avoidance Using Piece-Wise Constant Charges," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 33, No. 2., March–April 2010, pp. 510–520. doi:10.2514/1.44397

J-48. **H. Schaub** and I. Hussein, "Stability and Reconfiguration Analysis of a Circularly Spinning 2-Craft Coulomb Tether," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 46, No. 4, October 2010, pp. 1675–1686.
doi:10.1109/TAES.2010.5595587

J-49. C. R. Seubert and **H. Schaub**, "Closed-Loop Charged Relative Motion Experiments Simulating Constrained Orbital Motion," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 33, No. 6, 2010, pp. 1856–1865.
doi:10.2514/1.48274

J-50. C. D. Karlgaard and **H. Schaub**, "Comment on 'Huber-Based Unscented Filtering and its Application to Vision-Based Relative Navigation,"' *IET Radar, Sonar & Navigation*, Vol. 4, No. 5, 2010, pp. 744-745.
doi:10.1049/iet-rsn.2010.0156

J-51. C. Karlgaard and **H. Schaub**, "Nonsingular Attitude Filtering Using Modified Rodrigues Parameters," *Journal of the Astronautical Sciences*, Vol. 57, No. 4, 2010, pp. 777–791.
doi:10.1007/BF03321529

J-52. C. D. Karlgaard, and **H. Schaub**, "Adaptive Nonlinear Huber-Based Navigation For Rendezvous in Elliptical Orbit," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 34, No. 2, March–April 2011, pp. 388–402.
doi:10.2514/1.51939

J-53. S. Wang and **H. Schaub**, "Nonlinear Charge Control for a Collinear Fixed Shape Three-Craft Equilibrium," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 34, No. 2, March–April 2011, pp. 356–366.
doi:10.2514/1.52117

J-54. C.R. Seubert, S. A. Panosian, and **H. Schaub**, "Rotational Stiffness Study of Two-Element Tethered Coulomb Structures," *AIAA Journal of Spacecraft and Rockets*, Vol. 48, No. 3, May–June, 2011, pp. 488–497.
doi:10.2514/1.49772

J-55. S. Wang and **H. Schaub**, "Nonlinear Coulomb Feedback Control of a Spinning Two Spacecraft Virtual Structure," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 47, No. 3, July 2011, pp. 2055–2067.
doi:10.1109/TAES.2011.5937282

J-56. S. Wang and **H. Schaub**, "Coulomb Control of Nonequilibrium Fixed Shape Triangular Three-Vehicle Cluster," *AIAA Journal of Guidance, Control and Dynamics* for publication, Vol. 34, No. 1,January–February 2011, pp 259–270.
doi:10.2514/1.47835

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INVITED LECTURES AND SEMINARS

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I-69. **H. Schaub**, “Imagining The Fundamentals of Space Exploration,” 1st CU Boulder NEXT event, Los Angeles, CA, February 24, 2018.

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I-90. **H. Schaub**, "How to Write a Journal Paper," AGSO Seminar, Aerospace Engineering Sciences Department, University of Colorado, Jan. 27, 2021.

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I-101. **H. Schaub**, "Using Machine Learning for Astrodynamics Applications," University of South Australia, Australia, June 6, 2023.

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C-10. J. L. Junkins and **H. Schaub**. "An Instantaneous Eigenstructure Quasi-Coordinate Formulation for Nonlinear Multibody Dynamics." In 7th AAS/AIAA Space Flight Meeting, Huntsville, AL, Feb. 10–12 1997. Paper No. 97-119.

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C-26. M. Agostini, G. G. Parker, K. Groom, **H. Schaub** and R. D. Robinett, "Command Shaping and Closed-Loop Control Interactions for a Ship Crane," Proceedings of the 2002 American Control Conference, Anchorage, AK, May 8–10, 2002, pp. 2298–2304.

C-27. **H. Schaub**, "Spacecraft Relative Orbit Description Through Orbit Element Differences." 14th U.S. National Congress of Theoretical and Applied Mechanics, Blacksburg, Virginia, June 23–28, 2002.

C-28. **H. Schaub**, "Including Secular Drifts into the Orbit Element Difference Description of Relative Orbits," Space Flight Mechanics Meeting, Ponce, Puerto Rico, Feb. 9–13, 2003, Paper No. AAS-03-115.

C-29. **H. Schaub**, G. G. Parker and L. B. King,"Challenges and Prospects of Coulomb Spacecraft Formations," AAS John L. Junkins Astrodynamics Symposium, College Station, TX, May 23–24, 2003, Paper No. AAS-03-278.

C-30. **H. Schaub** and C. E. Smith, "Color Snakes for Dynamic Lighting Conditions on Mobile Manipulation Platforms," IEEE/RJS International Conference on Intelligent Robots and Systems, Las Vegas, NV, Oct. 27–31, 2003.

C-31. **H. Schaub**, "Relative Motion Stabilization of a Coulomb Spacecraft Cluster," AAS Spaceflight Mechanics Meeting, Maui, Hawaii, Feb. 8–12, 2004, Paper No. AAS-04-259.

C-32. H. Joe, **H. Schaub**, and G. G. Parker "Formation Dynamics of Coulomb Satellites," 6th International Conference on Dynamics and Control of Systems and Structures in Space, Cinque Terre, Liguria, Italy, July 18–22, 2004.

C-33. **H. Schaub** and M. Kim, "Orbit Element Difference Constraints for Coulomb Satellite Formation," AAS Astrodynamics Specialist Conference, Providence, Rhode Island, Aug. 16–19, 2004.

C-34. N. Sneeuw, and **H. Schaub**, "Satellite Clusters for Next Generation Gravity Field Missions," IAG International Symposium on Gravity, Geoid and Space Missions, Porto, Portugal, Aug. 30 – Sept. 3, 2004.

C-35. G. G. Parker, C. Passerello, and **H. Schaub**, "Static Formation Control Using Interspacecraft Coulomb Forces," 2nd International Symposium on Formation Flying, Washington, D.C., Sept. 14–16, 2004.

C-36. John Berryman and **H. Schaub**, "Static Equilibrium Configurations in GEO Coulomb Spacecraft Formations," AAS Spaceflight Mechanics Meeting, Copper Mountain, CO, Jan. 23–27, 2005. Paper No. 05-104.

C-37. Arun Natarajan and **H. Schaub**, "Linear Dynamics and Stability Analysis of a Coulomb Tether Formation," AAS Spaceflight Mechanics Meeting, Copper Mountain, CO, Jan. 23–27, 2005. Paper No. 05-204.

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C-41. M. Monda and **H. Schaub**, "Hardware Simulation of Relative Navigation using Visual Sensor Information," AIAA Guidance, Navigation, and Control Conference and Exhibit, San Francisco, CA, Aug. 15–18, 2005.

C-42. M. Monda and **H. Schaub**, "Spacecraft Relative Motion Estimation using Visual Sensing Techniques," AIAA Infotech@Aerospace Conference, Arlington, VA, Sep. 26–29, 2005.

C-43. I. I. Hussein and **H. Schaub**, "Invariant Shape Solutions of the Spinning Three Craft Coulomb Tether Problem," AAS Space Flight Mechanics Meeting, Tampa Florida, January 22–26, 2006. Paper No. AAS 06-228.

C-44. C. C. Romanelli, A. Natarajan, **H. Schaub**, G. G. Parker, and L. B. King, "Coulomb Spacecraft Voltage Study Due to Differential Orbital Perturbations," AAS Space Flight Mechanics Meeting, Tampa Florida, January 22–26, 2006. Paper No. AAS 06-123.

C-45. A. Natarajan, **H. Schaub**, and G. G. Parker, "Reconfiguration of a 2-Craft Coulomb Tether," AAS Space Flight Mechanics Meeting, Tampa Florida, January 22–26, 2006. Paper No. AAS 06-229.

C-46. G. G. Parker, **H. Schaub**, A. Natarajan and L. B. King "Coulomb Force Virtual Space Structures," Workshop on Innovative Systems Concepts, ESTEC, Noordwjik, The Netherlands, Feb. 21, 2006, pp. 39–44.

C-47. G. G. Parker, L. B. King, and **H. Schaub**, "Charge Determination for Specified Shape Coulomb Force Virtual Structures," 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Newport, Rhode Island, May 1–4, 2006. Paper No. AIAA-06-1891.

C-48. G. G. Parker, L. B. King, and **H. Schaub**, "Steered Spacecraft Deployment Using Interspacecraft Coulomb Forces," American Controls Conference, Minneapolis, Minnesota, June 14–16, 2006.

C-49. S. Wang and **H. Schaub**, "One-Dimensional 3-Craft Coulomb Structure Control," 7th International Conference on Dynamics and Control of Systems and Structures in Space, Greenwich, England, July 16–20, 2006.

C-50. J. Doebbler, J. Valasek, M. J. Monda and **H. Schaub**, "Boom and Receptacle Autonomous Air Refueling Using a Visual Pressure Snake Optical Sensor," AIAA Atmospheric Flight Mechanics Conference, Keystone, CO, August 21–24, 2006. Paper No. AIAA 06-6504.

C-51. C. D. Karlgaard and **H. Schaub**, "Comparison of Several Nonlinear Filters for a Benchmark Tracking Problem," AIAA Guidance, Navigation and Control Conference and Exhibit, Keystone, CO, August 21–24, 2006. Paper No. AIAA 06-6243.

C-52. A. Natarajan and **H. Schaub**, "Hybrid Control of Orbit Normal and Along-Track 2-Craft Coulomb Tethers," AAS Space Flight Mechanics Meeting, Sedona, Arizona, January 28–February 1, 2007. Paper No. AAS 07-193.

C-53. C. M. Southward, J. Ellis, and **H. Schaub**, "Spacecraft Attitude Control Using Symmetric Stereographic Orientation Parameters," AAS Space Flight Mechanics Meeting, Sedona, Arizona, January 28–February 1, 2007. Paper No. AAS 07-182.

C-54. S. Wang and **H. Schaub**, "Spacecraft Collision Avoidance Using Coulomb Forces With Separation Distance Feedback," AAS Space Flight Mechanics Meeting, Sedona, Arizona, January 28–February 1, 2007. Paper No. AAS 07-112.

C-55. V. Lappas, C. M. Saaj, D. Richie, M. Peck, B. Streetman, and **H. Schaub**, "Spacecraft Formation Flying and Reconfiguration with Electrostatic Forces," AAS Space Flight Mechanics Meeting, Sedona, Arizona, January 28–February 1, 2007. Paper No. AAS 07-113.

C-56. **H. Schaub** and I. I. Hussein, "Stability and Reconfiguration Analysis of a Circulary Spinning 2-Craft Coulomb Tether," IEEE Aerospace Conference, Big Sky, MT, March 3–10, 2007.

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C-58. H. Vasavada and **H. Schaub**, "Analytic Solutions for Equal Mass 4-Craft Static Coulomb Formation," AAS/AIAA Astrodynamics Specialist Conference, Mackinac Island, MI, August, 19–23, 2007. Paper No. 07-268.

C-59. S. Wang and **H. Schaub**, "1-D Constrained Coulomb Structure Stabilization With Charge Saturation Limits," AAS/AIAA Astrodynamics Specialist Conference, Mackinac Island, MI, August, 19–23, 2007. Paper No. 07-267.

C-60. I. Hussein and **H. Schaub**, "Stability and Control of Relative Equilibria for the Three-Spacecraft Coulomb Tether Problem," AAS/AIAA Astrodynamics Specialist Conference, Mackinac Island, MI, August, 19–23, 2007. Paper No. 07-269.

C-61. S. Wang and **H. Schaub**, "Open-Loop Electrostatic Spacecraft Collision Avoidance using the Method of Patched Conics," 44th Annual Technical Meeting of the Society of Engineering Science, College Station, TX, October 19–24, 2007.

C-62. A. Natarajan and **H. Schaub**, "Orbit-Nadir Aligned Coulomb Tether Reconfiguration Analysis," AAS Space Flight Mechanics Meeting, Galveston, Texas, January 27–31, 2008. Paper No. 08–149.

C-63. S. Wang and **H. Schaub**, "Open-Loop Electrostatic Spacecraft Collision Avoidance using Patched Conics Analysis," AAS Space Flight Mechanics Meeting, Galveston, Texas, January 27–31, 2008. Paper No. 08-207.

C-64. N. Sneeuw, M. A. Sharifi and **H. Schaub**, "Formation Flight Stability in a Gravitational Field," 3rd International Symposium on Formation Flying, Missions and Technologies, Noordwijk, The Netherlands, April 23–25, 2008.

C-65. **H. Schaub** and C. R. Seubert, "Tethered Coulomb Structures: Prospects and Challenges", F. Landis Markley Astrodynamics Symposium, Cambridge, Maryland, June 29–July 2, 2008.

C-66. **H. Schaub**, "Locally Power-Optimal Spacecraft Attitude Control for Redundant Reaction Wheel Cluster," AAS/AIAA Astrodynamics Specialist Conference, Honolulu, Hawaii, August 18–21, 2008.

C-67. C. D. Karlgaard and **H. Schaub**, "Adaptive Huber-Based Filtering Using Projection Statistics: Application to Spacecraft Attitude Estimation," AIAA Guidance, Navigation and Control Conference and Exhibit, Honolulu, Hawaii, August 18–21, 2008.

C-68. R. Chakravarty and **H. Schaub**, "Partial Sphere Tracking Using Visual Snakes: Application to Spacecraft Pose Estimation," AAS/AIAA Space Flight Mechanics Meeting, Savannah, Georgia, February 8–12, 2009.

C-69. C. D. Karlgaard and **H. Schaub**, "Nonsingular Attitude Filtering Using Modified Rodrigues Parameters," AAS/AIAA Space Flight Mechanics Meeting, Savannah, Georgia, February 8–12, 2009.

C-70. S. Wang and **H. Schaub**, "Electrostatic Spacecraft Collision Avoidance Using Piece-Wise Constant Charges," AAS/AIAA Space Flight Mechanics Meeting, Savannah, Georgia, February 8–12, 2009.

C-71. C. R. Seubert and **H. Schaub**, "One-Dimensional Test bed for Coulomb Controlled Spacecraft," AAS/AIAA Space Flight Mechanics Meeting, Savannah, Georgia, February 8–12, 2009.

C-72. S. Wang and **H. Schaub**, "Coulomb Feedback Control of a Triangular 3-Vehicle Cluster," AAS/AIAA Astrodynamics Specialist Conference, Pittsburgh, PA, August 9–13, 2009.

C-73. S. Wang and **H. Schaub**, "Nonlinear Coulomb Feedback Control of a Two Spacecraft Virtual Structure," AAS/AIAA Astrodynamics Specialist Conference, Pittsburgh, PA, August 9–13, 2009.

C-74. C. Seubert and **H. Schaub**, "One-Dimensional Position Feedback Control Experiments Using the Coulomb Testbed," tAAS/AIAA Astrodynamics Specialist Conference, Pittsburgh, PA, August 9–13, 2009.

C-75. C. M. Saaj, V. Lappas, D. Richie, V. Gazi, and **H. Schaub**, "Satellite Formation Flying: Robust Algorithms for Propulsion, Path Planning and Control," European Control Conference, Budapest, Hungary, August 23–26, 2009. Paper No. TuB4.5

C-76. G. G. Parker, F. Leban, **H. Schaub**, J. Blough, J. Teter, J. D. Bird, W. Zhao, P. Söderstedt, "Ship Crane Pendulation Control: From Government R&D to Commercial-Off-The-Shelf," Maritime Systems and Technology Conference, Stockholm, Sweden, Oct. 21–23, 2009.

C-77. R. Inampudi and **H. Schaub**, "Two-Craft Coulomb Formation Relative Equilibria about Circular Orbits and Libration Points," AAS/AIAA Space Flight Mechanics Conference, San Diego, CA, February 14–18, 2010. Paper No. AAS 10-163.

C-78. J. McMahon and **H. Schaub**, "Simplified Singularity Avoidance Using Variable Speed Control Moment Gyroscope Null Motion," AAS/AIAA Space Flight Mechanics Conference, San Diego, CA, February 14–18, 2010. Paper No. AAS 10-210.

C-79. C. R. Seubert and **H. Schaub**, "Dynamic Modeling of the Tethered Coulomb Structure," AAS/AIAA Space Flight Mechanics Conference, San Diego, CA, February 14–18, 2010. Paper No. AAS 10-268.

C-80. J. Mullen and **H. Schaub**, "Hypersphere Stereographic Orientation Parameters," AAS/AIAA Space Flight Mechanics Conference, San Diego, CA, February 14–18, 2010. Paper No. AAS 10-228.

C-81. **H. Schaub** and D. F. Moorer, "Geosynchronous Large Debris Reorbiter: Challenges and Prospects," AAS Kyle T. Alfriend Astrodynamics Symposium, Monterey, CA, May 17–19 2010. Paper No. AAS 10-311.

C-82. C. R. Seubert, S. Panosian, and **H. Schaub**, "Dynamic Feasibility Study of a Tethered Coulomb Structure," AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2–5, 2010.

C-83. L. A. Stiles, **H. Schaub**, K. Maute, and D. F. Moorer, "Electrostatic Inflation of Membrane Space Structures," AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2–5, 2010.

C-84. C. D. Karlgaard, and **H. Schaub**, "Adaptive Nonlinear Huber–Based Navigation For Rendezvous in Elliptical Orbit," AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2–5, 2010.

C-85. E. Hogan, and **H. Schaub**, "Collinear Invariant Shapes for Three-Craft Coulomb Formations," AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2–5, 2010.

C-86. S. Wang, and **H. Schaub**, "Nonlinear Charge Control for a Collinear Fixed Shape Three-Craft Equilibrium," AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2–5, 2010.

C-87. R. Inampudi, and **H. Schaub**, "Orbit Radial Dynamic Analysis of Two-craft Coulomb Formation at Libration Points," AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2–5, 2010.

C-88. R. Inampudi, and **H. Schaub**, "Optimal Maneuvers of Two-Craft Coulomb Formation in Circular Orbits," AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2–5, 2010. **(selected best paper in session)**

C-89. C. Seubert and **H. Schaub**, "Coulomb Testbed Force Model Verification for Charged Relative Motion Experiments," 61th International Astronautical Congress, Prague, Czech Republic, Sept. 27–Oct. 1, 2010. Paper IAC-10.C1.1.9.

C-90. E. Hogan and **H. Schaub**, "Linear Stability and Shape Analysis of Spinning Three-Craft Coulomb Formations," AAS Spaceflight Mechanics Meeting, New Orleans, Louisiana, February 13–17, 2011. Paper No. AAS 11–225

C-91. L. A. Stiles and **H. Schaub**, "Voltage Requirements for Electrostatic Inflation of Gossamer Space Structures," 12th AIAA Gossamer Systems Forum, Denver, Colorado, April 4–7, 2011.

C-92. R. Inampudi and **H. Schaub**, "Orbit-Radial Control of a Two-Craft Coulomb Formation about Circular Orbits and Libration Points," 4th International Conference on Spacecraft Formation Flying Missions & Technologies, St-Hubert, Québec, May 18–20, 2011.

C-93. **H. Schaub** and L. E. Z. Jasper, "Circular Orbit Radius Control Using Electrostatic Actuation for 2-Craft Configurations," AAS/AIAA Astrodynamics Specialist Conference, Girdwood, Alaska, July 31 – August 4, 2011. Paper No. AAS 11–498

C-94. E. A. Hogan and **H. Schaub**, "Relative Motion Control for Two-Spacecraft Electrostatic Orbit Corrections," AAS/AIAA Astrodynamics Specialist Conference, Girdwood, Alaska, July 31 – August 4, 2011. Paper No. AAS 11–466

C-95. L. E. Z. Jasper and **H. Schaub**, "Effective Sphere Modeling for Electrostatic Forces on a Three-Dimensional Spacecraft Shape," AAS/AIAA Astrodynamics Specialist Conference, Girdwood, Alaska, July 31 – August 4, 2011. Paper No. AAS 11–465

C-96. D. Stevenson and **H. Schaub**, "Nonlinear Control Analysis of a Double Gimbal Variable Speed Control Moment Gyro," AAS/AIAA Astrodynamics Specialist Conference, Girdwood, Alaska, July 31 – August 4, 2011. Paper No. AAS 11–567

C-97. C. R. Seubert, S. Panosian and **H. Schaub**, "Operational Analysis of a Tethered Coulomb Structure for Close Proximity Situational Awareness," AAS/AIAA Astrodynamics Specialist Conference, Girdwood, Alaska, July 31 – August 4, 2011. Paper No. AAS 11–632

C-98. M. Nazari, E. Samiei, E. A. Butcher and **H. Schaub**, "Spacecraft Local Attitude Stabilization using Nonlinear Delayed Actuator Control," AAS Spaceflight Mechanics Meeting, Charleston, January 29 – February 2, 2012.

C-99. E. A. Hogan, P. Jasch and **H. Schaub**, "Three-Dimensional Linear Stability Analysis of Spinning Three-Craft Coulomb Formations," AAS Spaceflight Mechanics Meeting, Charleston, January 29 – February 2, 2012.

C-100. E. Samiei, M. Nazari, E. A. Butcher and **H. Schaub**, "Delayed Feedback Control of Rigid Body Attitude using Neural Networks," AAS Spaceflight Mechanics Meeting, Charleston, January 29 – February 2, 2012.

C-101. L. E. Z. Jasper, C. R. Seubert, **H. Schaub**, T. Valery and E. Yutkin, "Tethered Tug for Large LEO Debris Removal," AAS Spaceflight Mechanics Meeting, Charleston, January 29 – February 2, 2012.

C-102. D. Stevenson and **H. Schaub**, "Multi-Sphere Modeling for Electrostatic Forces on Three-Dimensional Spacecraft Shapes," AAS Spaceflight Mechanics Meeting, Charleston, January 29 – February 2, 2012.

C-103. L. A. Stiles, C. R. Seubert and **H. Schaub**, "Effective Coulomb Force Modeling in a Space Environment," AAS Spaceflight Mechanics Meeting, Charleston, January 29 – February 2, 2012.

C-104. E. A. Hogan and **H. Schaub**, "Space Debris Reorbiting Using Electrostatic Actuation," the AAS Guidance, Navigation and Control Conference, Breckenridge, February 3–8, 2012.

C-105. L. A. Stiles and **H. Schaub**, "Electron Flux Deflection Experiments with Coulomb Gossamer Structures," 13th AIAA Gossamer Systems Forum, Honolulu, Hawaii, April 23–26, 2012.

C-106. D. Stevenson and **H. Schaub**, "Optimization of Sphere Population for Electrostatic Multi Sphere Model," 12th Spacecraft Charging Technology Conference, Kitakyushu, Japan, May 14–18, 2012

C-107. **H. Schaub** and D. Stevenson, "Prospects Of Relative Attitude Control Using Coulomb Actuation," Jer-Nan Juang Astrodynamics Symposium, College Station, Texas, June 25–26, 2012

C-108. P. Anderson and **H. Schaub**, "Local Orbital Debris Flux Study in the Geostationary Ring," AIAA/AAS Astrodynamics Specialist Conference, Minneapolis, MN, August 13–16, 2012

C-109. P. Anderson and **H. Schaub**, "Impulsive Feedback Control of Nonsingular Elements in the Geostationary Regime," AIAA/AAS Astrodynamics Specialist Conference, Minneapolis, MN, August 13–16, 2012

C-110. E. A. Hogan and **H. Schaub**, "Attitude Parameter Inspired Descriptions of Relative Orbital Motion," AIAA/AAS Astrodynamics Specialist Conference, Minneapolis, MN, August 13–16, 2012

C-111. D. R. Jones and **H. Schaub**, "Collinear Three-Craft Coulomb Formation Stability Analysis and Control," AIAA/AAS Astrodynamics Specialist Conference, Minneapolis, MN, August 13–16, 2012

C-112. E. A. Hogan and **H. Schaub**, "Three-Axis Attitude control Using redundant Reaction Wheels with Continuous Momentum Dumping," AAS/AIAA Spaceflight Mechanics Meeting, Kauai, HI, February 10–14, 2013.

C-113. L. Stiles, Z. Sternovsky and **H. Schaub**, "Remote Charging Mechanics for Electrostatic Inflation of Membrane Space Structures," 14th AIAA Gossamer Systems Forum, Boson, Massachusetts, April 8–11, 2013.

C-114. **H. Schaub** and Z. Sternovsky, "Active Space Debris Charging for Electrostatic Disposal Maneuvers," 6th European Conference on Space Debris, ESOC, Darmstadt, Germany, April 22–25, 2013.

C-115. P. Anderson and **H. Schaub** , "Local Debris Congestion in the Geosynchronous Environment with Population Augmentation," 6th European Conference on Space Debris, ESOC, Darmstadt, Germany, April 22–25, 2013.

C-116. L. E. Z. Jasper and **H. Schaub** , "Input Shaped Large Thrust Maneuver with a Tethered Debris Object," 6th European Conference on Space Debris, ESOC, Darmstadt, Germany, April 22–25, 2013.

C-117. D. Stevenson and **H. Schaub** , "Rotational Testbed for Coulomb Induced Spacecraft Attitude Control," 5th International Conference on Spacecraft Formation Flying Missions and Technologies, München, Germany, May 29–31, 2013.

C-118. D. R. Jones and **H. Schaub** , "Periodic Relative Orbits of two Spacecraft Subject to Differential Gravity and Coulomb Forces," 5th International Conference on Spacecraft Formation Flying Missions and Technologies, Münich, Germany, May 29–31, 2013.

C-119. S. O'Keefe and **H. Schaub**, "Sun Heading Estimation using Underdetermined Set of Coarse Sun Sensors," AAS/AIAA Astrodynamics Specialist Conference, Hilton Head, South Carolina, August 11–15, 2013

C-120. S. O'Keefe and **H. Schaub**, "Shadow Set Considerations For Modified Rodrigues Parameter Attitude Filtering," AAS/AIAA Astrodynamics Specialist Conference, Hilton Head, South Carolina, August 11–15, 2013

C-121. E. A. Hogan and **H. Schaub**, "Space Weather Influence on Relative Motion Control using the Touchless Electrostatic Tractor," AAS/AIAA Spaceflight Mechanics Meeting, Santa Fe, New Mexico, January 26–30, 2014.

C-122. L. E. Z. Jasper and **H. Schaub**, "Tether Design Considerations for Large Thrust Debris De-orbit Burns," AAS/AIAA Spaceflight Mechanics Meeting, Santa Fe, New Mexico, January 26–30, 2014.

C-123. L. E. Z. Jasper and **H. Schaub**, "Discretized Input Shaping for a Large Thrust Tethered Debris Object," AAS/AIAA Spaceflight Mechanics Meeting, Santa Fe, New Mexico, January 26–30, 2014.

C-124. P. Anderson and **H. Schaub**, "Longitude-Dependent Effects of Fragmentation Events in the Geosynchronous Orbit Regime," AAS/AIAA Spaceflight Mechanics Meeting, Santa Fe, New Mexico, January 26–30, 2014.

C-125. P. Anderson and **H. Schaub**, "Characterizing Localized Debris Congestion in the Geosynchronous Orbit Regime," AAS/AIAA Spaceflight Mechanics Meeting, Santa Fe, New Mexico, January 26–30, 2014.

C-126. T. Bennett and **H. Schaub**, "Non-Cooperative Spacecraft Attitude Control Using Coulomb Actuation," AAS/AIAA Spaceflight Mechanics Meeting, Santa Fe, New Mexico, January 26–30, 2014.

C-127. C. W. T Roscoe, J. J. Westphal, J. D. Griesbach and **H. Schaub**, "Formation Establishment and Reconfiguration Using Differential Elements in J2-Perturbed Orbits," IEEE Aerospace Conference, Big Sky, MO, March 1–8, 2014.

C-128. S. A. O'Keefe and **H. Schaub**, "Sun Heading Estimation Using a Partially Underdetermined Set of Coarse Sun Sensors," 2nd IAA Conference on Dynamics and Control of Space Systems (DYCOSS), Rome, Italy, March 24–26, 2014.

C-129. E. A. Hogan and **H. Schaub**, "Impacts of Tug and Debris Sizes on Electrostatic Tractor Beam Performance," International High Power Laser Ablation and Beamed Energy Propulsion, Santa Fe, New Mexico, April 21–25, 2014.

C-130. T. Bennett, D. Stevenson, E. Hogan and **H. Schaub**, "Prospects and Challenges of Touchless Electrostatic Detumbling of Small Bodies," 1st Stardust Global Virtual Workshop on Asteroids and Space Debris, Glasgow, Scotland, May 6–9, 2014

C-131. D. Stevenson and **H. Schaub**, "Advances in Experimental Verification of Remote Spacecraft Attitude Control by Coulomb Charging," 9th International ESA Conference on Guidance, Navigation and Control Systems, Oporto, Portugal, June 2–6, 2014.

C-132. L. E. Z. Jasper, P. V. Anderson and **H. Schaub**, "Economic and Risk Challenges of Operating in the Current Space Debris Environment," 3rd workshop on Space Debris Modeling and Remediation in Paris, CNES-HW, Paris, France, June 16–18, 2014.

C-133. T. Bennett, D. Stevenson, E. Hogan, L. McManus and **H. Schaub**, "Prospects and Challenges of Touchless Space Debris Despinning Using Electrostatics," 3rd workshop on Space Debris Modeling and Remediation in Paris, CNES-HW, Paris, France, June 16–18, 2014.

C-134. E. A. Hogan and **H. Schaub**, "Impacts of Solar Storm Events and Ion Beam Emission on Electrostatic Tractor Performance," 13th Spacecraft Charging Technology Conference, Pasadena, California, June 23–27, 2014.

C-135. **H. Schaub**, L. E. Z. Jasper, P. Anderson and Darren S. McKnight, "Cost and risk assessment for spacecraft operation decisions caused by the space debris environment," 65th International Astronautical Congress, Toronto, Canada, Sept. 29 – Oct. 3, 2014.

C-136. P. V. Anderson and **H. Schaub**, "Methodology for Characterizing High-Risk Orbital Debris in the Geosynchronous Orbit Regime," AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January 11–15, 2015.

C-137. P. V. Anderson and **H. Schaub**, "Conjunction Challenges of Low-Thrust Geosynchronous Debris Removal Maneuvers," AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January 11–15, 2015.

C-138. D. P. Lubey and **H. Schaub**, "An Instantaneous Quadratic Power Optimal Attitude-Tracking Control Policy for N-CMG Systems," AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January 11–15, 2015.

C-139. T. Bennett and **H. Schaub**, "Touchless Electrostatic Detumbling While Tugging Large GEO Debris," AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January 11–15, 2015.

C-140. J. Chabot and **H. Schaub**, "Spherical Dipole Actuator for Spacecraft Attitude Control," AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January 11–15, 2015.

C-141. S. A. O'Keefe and **H. Schaub**, "Gyro Accuracy and Failure Sensitivity of Underdetermined Coarse Sun Heading Estimation," AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January 11–15, 2015.

C-142. S. A. O'Keefe and **H. Schaub**, "On-Orbit Coarse Sun Sensor Calibration Sensitivity to Sensor and Model Error," AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January 11–15, 2015.

C-143. D. Stevenson and **H. Schaub**, "Performance Optimization Study for Touches Electrostatic Spacecraft De-Spin Operations," AAS GN&C Conference, Breckenridge, CO, January 30 – February 4, 2015.

C-144. T. Bennett and **H. Schaub**, "Faster-Than-Natural Spacecraft Circumnavigation Via Way Points," 8th International Workshop on Satellite Constellations and Formation Flying, Delft, Nederland, June 8–10, 2015.

C-145. N. Baresi, D. J. Scheeres and **H. Schaub**, "Bounded Relative Orbits About Asteroids For Formation Flying And Applications," 8th International Workshop on Satellite Constellations and Formation Flying, Delft, Nederland, June 8–10, 2015. (Best Student Paper Award)

C-146. D. Stevenson, **H. Schaub**, and Donald R. Pettit, "Electrostatic Model Applied to ISS Charged Water Droplet Experiment," Annual Meeting of the Electrostatics Society of America, Paloma, CA, June 16–18, 2015.

C-147. P. Anderson and **H. Schaub**, "Geosynchronous Debris Conjunction Lead-Time Requirements For Autonomous Low-Thrust Disposal Guidance," AAS Astrodynamics Specialist Conference, Vail, Colorado, August 10–13, 2015.

C-148. L. McManus and **H. Schaub**, "Establishing a Formation of Small Satellites in a Lunar Flower Constellations," AAS Astrodynamics Specialist Conference, Vail, Colorado, August 10–13, 2015.

C-149. T. Bennett and **H. Schaub**, "Continuous-Time Modeling and Control Using Linearized Relative Orbit Elements," AAS Astrodynamics Specialist Conference, Vail, Colorado, August 10–13, 2015.

C-150. T. Bennett and **H. Schaub**, "Space-to-Space Based Relative Motion Estimation Using Direct Relative Orbit Parameters," Advanced Maui Optical and Space Surveillance (AMOS) Technologies Conference, Wailea Marriott, Maui, Hawaii, September 15–18, 2015.

C-151. P. Anderson, D. McKnight, F. Di Pentino and **H. Schaub**, "Operational Considerations of GEO Debris Synchonization Dynamics," 66th International Astronautical Congress, Jerusalem, October 12–16 2015.

C-152. T. Bennett and **H. Schaub**, "Spacecraft Formations Dynamics Using Variational Equations of First-Order Relative Motion Invariants," Society of Engineering Science 52nd Annual Technical Meeting, College Station, Texas, October 26–28 2015.

C-153. J. Alcorn, **H. Schaub**, D. Kubitschek and A. AlSayegh, "Attitude Control Performance Analysis Using Discretized Thruster With Residual Tracking," AAS GN&C Conference, Breckenridge, Colorado, February 5–10 2016.

C-154. C. Allard, **H. Schaub**, and S. Piggott, "General Hinged Solar Panel Dynamics Approximating First-Order Spacecraft Flexing," AAS GN&C Conference, Breckenridge, Colorado, February 5–10 2016.

C-155. T. Bennett and **H. Schaub**, "Relative Motion Estimation using Rectilinear and Curvilinear Linearized Relative Orbit Elements," AAS Spaceflight Mechanics Meeting, Napa Valley, California, February 14–18, 2016. Paper No. 16-336.

C-156. J. Hughes and **H. Schaub**, "Appropriate Fidelity Electrostatic Force Evaluation Considering A Range Of Spacecraft Separations," AAS Spaceflight Mechanics Meeting, Napa Valley, California, February 14–18, 2016. Paper No. 16-486.

C-157. P. Chow, J. Hughes and **H. Schaub**, "Automated Sphere Geometry Optimization For The Volume Multi-Sphere Method," AAS Spaceflight Mechanics Meeting, Napa Valley, California, February 14–18, 2016. Paper No. 16-472.

C-158. P. Kenneally and **H. Schaub**, "High Geometric Fidelity Modeling Of Solar Radiation Pressure Using Graphics Processing Unit," AAS Spaceflight Mechanics Meeting, Napa Valley, California, February 14–18, 2016. Paper No. 16-500.

C-159. J. Fulton and **H. Schaub**, "Dynamics and Control of the Flexible Electrostatic Sail Deployment," AAS Spaceflight Mechanics Meeting, Napa Valley, California, February 14–18, 2016. Paper No. 16-499.

C-160. T. Bennett and **H. Schaub**, "Capitalizing on Relative Motion in Electrostatic Detumble of Axi-Symmetric GEO Objects," 6th International Conference on Astrodynamics Tools and Techniques (ICATT), ESOC, Darmstadt, Germany, March 14–17, 2016.

C-161. J. Hughes and **H. Schaub**, "Monte-Carlo Analysis Of The Pulsed Electrostatic Tractor Strength," Spacecraft Charging Technologies Conference, Space Research and Technology Centre of the European Space Agency (ESA/ESTEC), Holland, April 4–8, 2016.

C-162. J. Fulton and **H. Schaub**, "Sensitivity Analysis of Deployment Dynamics Parameters for the Electric Sail," 5th International Conference On Tethers In Space, University of Michigan, Ann Arbor, Michigan, May 24–26, 2016.

C-163. **H. Schaub**, T. Bennett and J. Hughes, "Current Developments in Three-Dimensional Electrostatic Detumble of Axi-Symmetric GEO Debris," 4th International Workshop on Space Debris Modelling and Remediation, CNES, Paris, June 6–8, 2016. Paper No. #6.4

C-164. J. Alcorn, C. Allard and **H. Schaub**, "Fully-Coupled Dynamical Modeling of a Rigid Spacecraft with Imbalanced Reaction Wheels," AIAA/AAS Astrodynamics Specialist Conference, Long Beach, California, September 12–15, 2016.

C-165. C. Allard, M. Diaz Ramos and **H. Schaub**, "Spacecraft Dynamics Integrating Hinged Solar Panels and Lumped-Mass Fuel Slosh Model," AIAA/AAS Astrodynamics Specialist Conference, Long Beach, California, September 12–15, 2016.

C-166. M. Cols Margenet, **H. Schaub** and S. Piggott, "Modular Attitude Guidance Development using the Basilisk Software Framework," AIAA/AAS Astrodynamics Specialist Conference, Long Beach, California, September 12–15, 2016.

C-167. J. Hughes and **H. Schaub**, "Charged Geosynchronous Debris Perturbation Using Rapid Electromagnetic Force and Torque Evaluation," Advanced Maui Optical and Space Surveillance Technologies Conference, Maui, Hawaii, September 20–23, 2016.

C-168. J. Alcorn, **H. Schaub**, S. Piggott and D. Kubitschek, "Simulating Attitude Actuation Options Using the Basilisk Astrodynamics Software Architecture," 67th International Astronautical Congress, Guadalajara, Mexico, September 26–30, 2016.

C-169. H. Engwerda, J. Hughes, and **H. Schaub**, "Remote Sensing for Planar Electrostatic Characterization using the Multi-Sphere Method," Stardust Final Conference on Asteroids and Space Debris, ESTEC, Netherlands, Oct 31 – Nov 4 2016.

C-170. S. Piggott, J. Alcorn, M. Cols Margenet, P. Kenneally and **H. Schaub**, "Flight Software Development Through Python," 2016 Workshop on Spacecraft Flight Software , JPL, California, Dec. 13–15 2016.

C-171. **H. Schaub** and S. Piggott, "Speed-Constrained Three-Axes Attitude Control Using Kinematic Steering," AAS Guidance, Navigation and Control Conference, Breckenridge, Feb. 2–8, 2017.

C-172. P. Panicucci, C. Allard and **H. Schaub**, "Spacecraft Dynamics Employing a General Multi-tank and Multi-thruster Mass Depletion Formulation," AAS Guidance, Navigation and Control Conference, Breckenridge, Feb. 2–8, 2017.

C-173. P. Kenneally and **H. Schaub**, "Modeling Of Solar Radiation Pressure and Self-Shadowing Using Graphics Processing Unit," AAS Guidance, Navigation and Control Conference, Breckenridge, Feb. 2–8, 2017.

C-174. M. Diaz-Ramos and **H. Schaub**, "Kinematic Steering Law Enabling Conically Constrained Spacecraft Attitude Control," AAS Guidance, Navigation and Control Conference, Breckenridge, Feb. 2–8, 2017.

C-175. J. Hughes and **H. Schaub**, "Kinematic Steering Law Enabling Conically Constrained Spacecraft Attitude Control," AAS Spaceflight Mechanics Meeting, San Antonio, TX, Feb. 5–9, 2017.

C-176. G. Ingram, J. Hughes, T. Bennett, C. Reilly and **H. Schaub**, "Autonomous Volume Multi-Sphere-Model Development Using Electric Field Matching," AAS Spaceflight Mechanics Meeting, San Antonio, TX, Feb. 5–9, 2017.

C-177. T. Bennett and **H. Schaub**, "Electrostatically Charged Spacecraft Formation Estimation Using Linearized Relative Orbit Elements," AAS Spaceflight Mechanics Meeting, San Antonio, TX, Feb. 5–9, 2017.

C-178. J. Hughes and **H. Schaub**, "Spacecraft Electrostatic Force and Torque Expansions yielding Appropriate Fidelity Measures," AAS Spaceflight Mechanics Meeting, San Antonio, TX, Feb. 5–9, 2017.

C-179. M. Quadrelli, A. Stoica, M. Ono, H. Garrett, J. Castillo, C. Christianson, D. Jusso and **H. Schaub**, "Active Electrostatic Flight For Airless Bodies," IEEE Aerospace Conference, Big Sky, Montana, March 4–11, 2017

C-180. T. Bennett and **H. Schaub**, "Touchless Electrostatic Detumble of a Representative Box-and-Panel Spacecraft Configuration," 7th European Conference on Space Debris, ESOC, Darmstadt, Germany, April 18–21, 2016

C-181. J. Hughes and **H. Schaub**, "Pulsed Electrostatic Tractor Performance Analysis Considering Geosynchronous Space Weather Variations," 7th European Conference on Space Debris, ESOC, Darmstadt, Germany, April 18–21, 2016

C-182. J. Hughes and H. Schaub, "The Impact of Space Weather on GEO Space Debris Orbit Evolution," Space Weather Workshop, Broomfield, Colorado, May 1–5, 2017.

C-183. T. Sasaki, T. Shimomura, S. Pullen and **H. Schaub**, "Attitude and Vibration Control for a Flexible Spacecraft with Double-Gimbal Variable-Speed Control Moment Gyros," IAA Conference on Dynamics and Control of Space Systems (DYCOSS), Moscow, Russia, May 30 – June 1, 2017

C-184. M. Cols Margenet, **H. Schaub** and S. Piggott , "Modular Platform for Hardware-in-the-Loop Testing of Autonomous Flight Algorithms," International Symposium on Space Flight Dynamics, Himegin Hall, Matsuyama-Ehime, Japan, June 3–9, 2017.

C-185. J. Hughes and **H. Schaub**, "Electrostatic Force and Torque Modeling for Dielectric Spacecraft Using the Multi-Sphere Method," 9th International Workshop on Satellite Constellations and Formation Flying, University of Colorado, Boulder, June 19–21, 2017.

C-186. T. Bennett and **H. Schaub**, "Guidance, Navigation And Control Advances In Electrostatic Attitude Control On Passive GEO Objects," 9th International Workshop on Satellite Constellations and Formation Flying, University of Colorado, Boulder, June 19–21, 2017.

C-187. T. Shibata, T. Bennett and **H. Schaub**, "Prospects Of A Hybrid Magnetic/Electrostatic Sample Container Retriever," 9th International Workshop on Satellite Constellations and Formation Flying, University of Colorado, Boulder, June 19–21, 2017.

C-188. J. Maxwell and **H. Schaub**, "Applicability of the Multi-Sphere Method to Flexible One-Dimensional Conducting Structures," AAS/AIAA Astrodynamics Specialist Conference, Stevenson, WA, August 20–24, 2017.

C-189. J. Alcorn, C. Allard and **H. Schaub**, "Fully-Coupled Dynamical Jitter Modeling Of Variable-Speed Control Moment Gyroscopes," AAS/AIAA Astrodynamics Specialist Conference, Stevenson, WA, August 20–24, 2017.

C-190. J. Fulton and **H. Schaub**, "Dynamic Modeling of Folded Deployable Space Structures With Flexible Hinges," AAS/AIAA Astrodynamics Specialist Conference, Stevenson, WA, August 20–24, 2017.

C-191. T. Sasaki, **H. Schaub** and T. Shimomura, "Convex Optimization of a Spacecraft Stabilization with a Double-Gimbal Variable-Speed Control Moment Gyro Actuator: Geometric Approach," IEEE Conference on Control Technology and Applications (CCTA), Waimea, Hawaii, August 27–30, 2017.

C-192. M. Cols Margenet, A. Harris and **H. Schaub**, "Software Architecture for Deep-Space Navigation Filter Development," International Astronautical Congress, Adelaide, Australia, Sept. 25–29, 2017.

C-193. **H. Schaub** and S. Piggott, "Speed-Constrained Three-Axes Attitude Control Using Kinematic Steering," International Astronautical Congress, Adelaide, Australia, Sept. 25–29, 2017.

C-194. T. Teil and **H. Schaub**, "Force and Torque Disturbance Modeling Due to General Thruster Plume Impingements," International Astronautical Congress, Adelaide, Australia, Sept. 25–29, 2017.

C-195. T. Sasaki, J. Alcorn and **H. Schaub**, "Fully-Coupled Dynamical Jitter Modeling of a Rigid Spacecraft with Imbalanced Double-Gimbal Variable-Speed Control Moment Gyros," International Astronautical Congress, Adelaide, Australia, Sept. 25–29, 2017.

C-196. P. Kenneally and **H. Schaub**, "Parallel Spacecraft Solar and Thermal Radiation Pressure Modeling Using Graphic Processing Unit," International Astronautical Congress, Adelaide, Australia, Sept. 25–29, 2017.

C-197. J. Hughes and **H. Schaub**, "Effects of Space Weather on Geosynchronous Electromagnetic Spacecraft Perturbations Using Statistical Fluxes," AGU Fall Meeting, New Orleans, Louisiana, December 11–15, 2017

C-198. M. Cols Margenet, P. Kenneally, **H. Schaub** and S. Piggott, "Black Lion: Software Spacecraft Simulation Architecture Joining Heterogeneous Components," 10th Workshop on Spacecraft Flight Software, The Johns Hopkins University Applied Physics Laboratory, Maryland, Dec. 4–8 2017.

C-199. A. Harris and **H. Schaub**, "Linear Coupled Attitude-Orbit Control Through Aerodynamic Forces," AIAA/AAS Space Flight Mechanics Meeting, Kissimmee, Florida, January 8–12, 2018

C-200. C. Allard, M. Diaz Ramos, P. Kenneally, **H. Schaub** and S. Piggott, "Modular Software Architecture for Fully-Coupled Spacecraft Simulations," AAS Guidance and Control Conference, Breckenridge, CO, February 2–7, 2018

C-201. T. Teil, **H. Schaub** and S. Piggott, "Comparing Coarse Sun Sensor Based Sequential Sun-Heading Filters," AAS Guidance and Control Conference, Breckenridge, CO, February 2–7, 2018

C-202. A. Harris and **H. Schaub**, "Reinforcement Learning Techniques For Autonomous Aerobraking," AAS Guidance and Control Conference, Breckenridge, CO, February 2–7, 2018

C-203. J. Wood, M. Cols Margenet, P. Kenneally, **H. Schaub** and S. Piggott, "Flexible Basilisk Astrodynamics Visualization Software Using the Unity Rendering Engine," AAS Guidance and Control Conference, Breckenridge, CO, February 2–7, 2018

C-204. M. Cols Margenet, P. Kenneally and **H. Schaub**, "Software Simulator for Heterogeneous Spacecraft and Mission Components," AAS Guidance and Control Conference, Breckenridge, CO, February 2–7, 2018

C-205. P. Kenneally and **H. Schaub**, "Fast Spacecraft Solar Radiation Pressure Modeling By Ray-Tracing On Graphic Processing Unit," AAS Guidance and Control Conference, Breckenridge, CO, February 2–7, 2018

C-206. C. Allard and **H. Schaub**, "Impulsive Thruster Based Attitude Stability Analysis of Spacecraft with Flexible Solar Arrays," AAS Guidance and Control Conference, Breckenridge, CO, February 2–7, 2018

C-207. M. Cols Margenet, P. Kenneally, **H. Schaub** and S. Piggott, "Simulation of Heterogeneous Spacecraft and Mission Components through the Black Lion Framework," AAS John L. Junkins Dynamical Systems Symposium, College Station, TX, May 20–21, 2018

C-208. T. Teil, and **H. Schaub**, "Software Architecture for closed-loop Autonomous Optical Navigation Scenarios," 1st Annual RPI Workshop on Image-Based Modeling and Navigation for Space Applications, Rensselaer Polytechnic Institute, Troy, NY, June 4–5, 2018

C-209. J. Hughes and **H. Schaub**, "Electrostatic Tractor Analysis Using a Measured Flux Model,," 15th Spacecraft Charging Technology Conference, Kobe, Japan, June 25–29, 2018

C-210. K. T. H. Wilson and **H. Schaub**, "Prospects and Challenges of Bremsstrahlung-based Electrostatic Potential and Material Composition Determination for Spacecraft," 15th Spacecraft Charging Technology Conference, Kobe, Japan, June 25–29, 2018

C-211. M. Bengtson, J. Hughes and **H. Schaub**, "Remote sensing of spacecraft electrostatic potential using secondary electrons", Kobe, Japan, June 25–29, 2018

C-212. J. Maxwell, R. Hoffmann and **H. Schaub**, "Low Earth Orbit Plasma Wake Shaping and Applications to On-Orbit Proximity Operations", Kobe, Japan, June 25–29, 2018

C-213. P. Cappuccio, C. Allard and **H. Schaub**, "Fully-Coupled Spherical Pendulum Model To Simulate Spacecraft Propellant Slosh," AAS/AIAA Astrodynamics Specialist Conference, Snowbird, UT, August, 19–23, 2018.

C-214. J. Maxwell, K. T. H. Wilson and **H. Schaub**, "Multi-Sphere Method for Flexible Conducting Space Objects: Modeling and Experiments," AAS/AIAA Astrodynamics Specialist Conference, Snowbird, UT, August, 19–23, 2018.

C-215. D. Shteinman, T. Theil, S. Dorrington, J. Lin, **H. Schaub**, J. Carrico and L. Policastri, "Statistical Approaches To Increase Efficiency Of Large-Scale Monte-Carlo Simulations," AAS/AIAA Astrodynamics Specialist Conference, Snowbird, UT, August, 19–23, 2018.

C-216. J. Fulton and **H. Schaub**, "Closed-Chain Forward Dynamics Modeling of a Four-Panel Folding Spacecraft Structure," International Astronautical Congress, Bremen, Germany, October 1–5, 2018.

C-217. V. Aslanov and **H. Schaub**, "Prospects Of Touchless Space Debris Detumbling Using An Electrostatic Pusher Configuration," International Astronautical Congress, Bremen, Germany, October 1–5, 2018.

C-218. J. Hughes and **H. Schaub**, "Rapid Modeling of Electrostatic Forces and Torques Considering Dielectrics," International Astronautical Congress, Bremen, Germany, October 1–5, 2018.

C-219. J. Maxwell, A. Harris and **H. Schaub**, "Balancing Differential Drag with Coulomb Repulsion in Low Earth Orbit Plasma Wakes," International Astronautical Congress, Bremen, Germany, October 1–5, 2018.

C-220. P. Kenneally, **H. Schaub** and S. Piggott, "Basilisk: A Flexible, Scalable and Modular Astrodynamics Simulation Framework," 7th International Conference on Astrodynamics Tools and Techniques (ICATT), DLR Oberpfaffenhofen, Germany, November 6–9, 2018.

C-221. J. F. S. Trentin, S. da Silva and **H. Schaub**, "Nonlinear Control of an Inverted Pendulum using Two Reaction Wheels," Dynamics Days Latin America and the Caribbean, Punta del Este, Uruguay, Nov. 26–30, 2018

C-222. J. Fulton and **H. Schaub**, "Non-Symmetric Behavior of High Strain Composite Tape Spring Hinges in Folding Structures," AIAA Science and Technology Forum and Exposition (SciTech 2019), San Diego, California, January 7–11, 2019.

C-223. T. V. Peters, V. Lappas, A. Tsourdos, R. Biesbroek and **H. Schaub**, "Feasibility of Active Debris Removal Testing on the International Space Station using Free-flyers," AIAA Science and Technology Forum and Exposition (SciTech 2019), San Diego, California, January 7–11, 2019.

C-224. ★ M. Bengtson and **H. Schaub**, "Remote Sensing of Spacecraft Potential at Geosynchronous Orbit using Secondary and Photo Electrons," AIAA Science and Technology Forum and Exposition (SciTech 2019), San Diego, California, January 7–11, 2019.
AIAA Atmospheric and Space Environments Best Paper Award

C-225. J. Maxwell and **H. Schaub**, "Electrostatic Actuation within Expanded Low Earth Orbit Plasma Wakes: Experiments and Analysis," AIAA Science and Technology Forum and Exposition (SciTech 2019), San Diego, California, January 7–11, 2019.

C-226. P. Kenneally and **H. Schaub**, "Spacecraft Radiation Pressure Using Complex Bidirectional-Reflectance Distribution Functions On Graphics Processing Unit," AAS Spaceflight Mechanics Meeting, Maui, Hawaii, January 13–17, 2019.

C-227. A. Harris and **H. Schaub**, "Differential Lift And Drag Constellation Control Using Trimmed Attitude," AAS Spaceflight Mechanics Meeting, Maui, Hawaii, January 13–17, 2019.

C-228. A. Harris, T. Teil and **H. Schaub**, "Spacecraft Decision-Making Autonomy using Deep Reinforcement Learning," AAS Spaceflight Mechanics Meeting, Maui, Hawaii, January 13–17, 2019.

C-229. T. Teil and **H. Schaub**, "Removing Rate Un-observability in Sun Heading Filters Without Rate Gyros," AAS Spaceflight Mechanics Meeting, Maui, Hawaii, January 13–17, 2019.

C-230. S. Carnahan and **H. Schaub**, "Impact of Internal Heating on Spacecraft Thermal Signature," AAS Spaceflight Mechanics Meeting, Maui, Hawaii, January 13–17, 2019.

C-231. J. F. Silva Trentin, S. da Silva and **H. Schaub**, "Inverted Pendulum Control via Variable Speed Control Moment Gyroscope," International Symposium on Dynamic Problems of Mechanics (DINAME 2019), Armação de Búzios, RJ, Brazil, March 10–15, 2019.

C-232. K. Wilson, M. Bengtson and **H. Schaub**, "Electron-Induced X-Rays for Remote Potential Sensing," Applied Space Environments Conference, Los Angeles, CA, May 13–17, 2019.

C-233. M. Bengtson, K. Wilson and **H. Schaub**, "Simulations and Experimental Results of Electron Method for Remote Spacecraft Charge Sensing," Applied Space Environments Conference, Los Angeles, CA, May 13–17, 2019.

C-234. M. Cols-Margenet, **H. Schaub**, S. Piggott, "A Portable Flight Operating System Combining Micropython And The Basilisk Software Framework," DASIA (Data Systems In Aerospace), Torremolinos, Spain, June 4–6, 2019

C-235. E. Burnett and **H. Schaub**, "Study Of Highly Perturbed Spacecraft Formation Dynamics Via Approximation," International Workshop on Satellite Constellations and Formation Flying, University of Strathclyde, Glasgow, Scotland, July 16, 2019.

C-236. E. Burnett and **H. Schaub**, "Spacecraft Formation And Orbit Control Using Attitude-Dependent Solar Radiation Pressure," International Workshop on Satellite Constellations and Formation Flying, University of Strathclyde, Glasgow, Scotland, July 16, 2019.

C-237. J. Maxwell and **H. Schaub**, "Charge-Product Control Approach to Electrostatic Lead-Follower In LEO Plasma Wakes," International Workshop on Satellite Constellations and Formation Flying, University of Strathclyde, Glasgow, Scotland, July 16, 2019.

C-238. J. Maxwell and **H. Schaub**, "Electrostatically Actuated Deployment for Close-Proximity Leader-Follower Formation in LEO Plasma Wakes," International Workshop on Satellite Constellations and Formation Flying, University of Strathclyde, Glasgow, Scotland, July 16, 2019.

C-239. M. Cols Margenet and **H. Schaub**, "Sequentially Distributed Attitude Guidance Software Across A Spacecraft Constellation," International Workshop on Satellite Constellations and Formation Flying, University of Strathclyde, Glasgow, Scotland, July 16, 2019.

C-240. S. Van Overeem and **H. Schaub**, "Small Satellite Formation Flying Application using the Basilisk Astrodynamics Software Architecture," International Workshop on Satellite Constellations and Formation Flying, University of Strathclyde, Glasgow, Scotland, July 16, 2019.

C-241. A. Harris and **H. Schaub**, "Desensitized Optimal Attitude Guidance for Differential-Drag Rendezvous," Astrodynamics Specialist Conference, Portland, Main, Aug 11-15, 2019

C-242. E. Burnett and **H. Schaub**, "Time-Explicit Approximations of Orbit Geometry in a Rotating Higher Order Gravity Field," Astrodynamics Specialist Conference, Portland, Main, Aug 11-15, 2019

C-243. E. Burnett and **H. Schaub**, "Desensitized Optimal Spacecraft Rendezvous Control with Poorly Known Gravitational and Solar Radiation Pressure Perturbations," Astrodynamics Specialist Conference, Portland, Main, Aug 11-15, 2019

C-244. A. Bennett and **H. Schaub**, "Assessing Debris Strikes in Spacecraft Telemetry: Development and Comparison of Various Techniques," International Astronautical Congress, Washington, D.C., Oct. 21–25, 2019.

C-245. J. Fulton and **H. Schaub**, "Forward Dynamics Algorithm for Origami-Folded Deployable Spacecraft Structures," International Astronautical Congress, Washington, D.C., Oct. 21–25, 2019.

C-246. T. Teil, **H. Schaub** and D. Kubitschek, "Center and Apparent Diameter Optical Navigation on Mars Orbit," 2nd RPI Space Imaging Workshop, Saratoga Springs, NY, Oct. 28–30, 2019

C-247. A. A. Bennett and **H. Schaub**, "Identifying and Assessing Debris Strikes in NASA Spacecraft Telemetry," First International Orbital Debris Conference, Sugar Land, TX, Dec. 9–12, 2019.

C-248. ★ K. Wilson and **H. Schaub**, "An X-ray Spectroscopic Approach to Remote Space Object Potential Determination: Experimental Results," AIAA SciTech Forum, Orlando, Florida, Jan. 6–10, 2020
AIAA Atmospheric and Space Environments Best Paper Award

C-249. A. Harris and **H. Schaub**, “Spacecraft Command and Control with Safety Guarantees using Shielded Deep Reinforcement Learning,” AIAA SciTech Forum, Orlando, Florida, Jan. 6–10, 2020

C-250. A. A. Bennett and **H. Schaub**, ”Effect of Spacecraft Parameters on Identification of Debris Strikes in GN&C Telemetry,” AAS Guidance, Navigation and Control Conference, Breckenridge, CO, Jan. 30 – Feb. 5 2019.

C-251. S. J. K. Carnahan and **H. Schaub**, ”A New Messaging System for Basilisk,” AAS Guidance, Navigation and Control Conference, Breckenridge, CO, Jan. 30 – Feb. 5 2019.

C-252. S. J. K. Carnahan and **H. Schaub**, ”Simultaneous and Distinct Visible and Thermal Radiation Pressure Dynamics,” AAS Guidance, Navigation and Control Conference, Breckenridge, CO, Jan. 30 – Feb. 5 2019.

C-253. A. Harris and **H. Schaub**, ”Deep On-Board Scheduling For Autonomous Attitude Guidance Operations,” AAS Guidance, Navigation and Control Conference, Breckenridge, CO, Jan. 30 – Feb. 5 2019.

C-254. A. Romero-Calvo and **H. Schaub**, ”Magnetic Control of Propellant Sloshing in Microgravity,” AAS Guidance, Navigation and Control Conference, Breckenridge, CO, Jan. 30 – Feb. 5 2019.

C-255. M. Cols-Margenet, **H. Schaub** and S. Piggott, ”Avionics Hardware Modeling and Embedded Flight Software Testing in an Emulated Flat-Sat,” AAS Guidance, Navigation and Control Conference, Breckenridge, CO, Jan. 30 – Feb. 5 2019.

C-256. T. Teil and **H. Schaub**, ”Autonomous On-Orbit Optical Navigation Techniques for Robust Pose-Estimation,” AAS Guidance, Navigation and Control Conference, Breckenridge, CO, Jan. 30 – Feb. 5 2019.

C-257. K. Wilson, M. Bengtson and **H. Schaub**, “Spacecraft Electrostatic Potential Sensing Using Fused X-ray and Electron Sensor Data,” IEEE Aerospace Engineering Conference, Big Sky, Montana, March 7–14, 2020

C-258. S. W. Albert, R. D. Braun and **H. Schaub**, ”Aerodrop: Prospects And Challenges For Co-Delivery Of Probe And Orbiter Via Aerocapture,” AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, CA, Aug. 9–13, 2020

C-259. E. Burnett and **H. Schaub**, ”Modal Decomposition Of Spacecraft Relative Motion In Quasi-Periodic Orbits,” AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, CA, Aug. 9–13, 2020

C-260. A. Herrmann and **H. Schaub**, ”Monte Carlo Tree Search With Value Networks For Autonomous Spacecraft Operations,” AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, CA, Aug. 9–13, 2020

C-261. J. D. Nelson and **H. Schaub**, ”Autonomous Selection of Spacecraft Landing Location on Hazardous Small Bodies,” AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, CA, Aug. 9–13, 2020

C-262. J. R. Martin and **H. Schaub**, ”GPGPU Implementation Of Pines’ Spherical Harmonic Gravity Model,” AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, CA, Aug. 9–13, 2020

C-263. J. R. Martin and **H. Schaub**, ”Using Artificial Neural Networks For Offline Gravimetry,” AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, CA, Aug. 9–13, 2020

C-264. K. T. Wilson and **H. Schaub**, ”Impact Of Electrostatic Perturbations On Proximity Operations In High Earth Orbits,” AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, CA, Aug. 9–13, 2020

C-265. Á. Romero Calvo, G. Gaias and **H. Schaub**, ”Magnetic Buoyancy-Based Water Electrolysis In Zero-Gravity,” International Astronautical Congress (IAC), Dubai, UAE, Oct. 12–16, 2020

C-266. Á. Romero Calvo, M. Ángel Herrada Gutieérrez, G. Cano Gómez and **H. Schaub**, "Advanced Numerical Simulation Of Magnetic Liquid Sloshing In Microgravity," International Astronautical Congress (IAC), Dubai, UAE, Oct. 12–16, 2020

C-267. S. W. Albert, A. Doostan and **H. Schaub**, "Finite-Dimensional Density Representation For Aerocapture Uncertainty Quantification," AIAA SciTech, Nashville, TN, Jan. 11–15, 2021
doi:10.2514/6.2021-0932

C-268. Á. Romero Calvo, G. Cano Gómez and **H. Schaub**, "Electron Beam Expansion And Deflection Uncertainty For Active Charging Applications," AIAA SciTech, Nashville, TN, Jan. 11–15, 2021
doi:10.2514/6.2021-1540

C-269. M. T. Bengtson, K. T. Wilson and **H. Schaub**, "Broad-Spectrum Electron Gun for Laboratory Simulation of Orbital Environments," AIAA SciTech, Nashville, TN, Jan. 11–15, 2021
doi:10.2514/6.2021-1539

C-270. K. T. Wilson, M. T. Bengtson, J. Maxwell, Álvaro Romero-Calvo and **H. Schaub**, "Characterization of the ECLIPS Space Environments Simulation Facility," AIAA SciTech, Nashville, TN, Jan. 11–15, 2021
doi:10.2514/6.2021-1538

C-271. Á. Romero Calvo, M. Herrada and **H. Schaub**, "Axisymmetric Bubble Growth and Detachment Subject to Inhomogeneous Magnetic Fields in Microgravity," 43rd COSPAR Scientific Assembly, Sydney, Australia, Jan. 28–Feb. 4, 2020.

C-272. J. R. Martin and **H. Schaub**, "Applications of Physics Informed Neural Networks for Gravity Field Modeling," AAS/AIAA Space Flight Mechanics Meeting, Charlotte, NC, January 31–February 4, 2021.

C-273. A. Herrmann and **H. Schaub**, "Autonomous Spacecraft Tasking using Monte Carlo Tree Search Methods," AAS/AIAA Space Flight Mechanics Meeting, Charlotte, NC, January 31–February 4, 2021.

C-274. K. T. Wilson and **H. Schaub**, "Predictive control for spacecraft proximity operations under electrostatic perturbations," IEEE Aerospace Engineering Conference, Big Sky, Montana, March 6–13, 2021

C-275. J. Hammerl and **H. Schaub**, "Effects of Electric Potential Uncertainty on Electrostatic Tractor Relative Motion Control," 8th European Conference on Space Debris, Darmstadt, Germany, April 20–23, 2021

C-276. S. W. Albert, **H. Schaub** and R. D. Braun, "Using Aerocapture To Co-Deliver Orbiter And Probe Under Uncertainty," John Glenn Memorial Symposium, July 13–15, 2021.

C-277. E. Burnett and **H. Schaub**, "Satellite Relative State Uncertainty Dynamics in the Vicinity of a Poorly Tracked Target Object," AAS/AIAA Astrodynamics Specialist Conference, Big Sky, MT, August 8–12, 2021

C-278. R. Calaon and **H. Schaub**, "Constrained Attitude Maneuvering Via Modified Rodrigues Parameters Based Motion Planning Algorithms," AAS/AIAA Astrodynamics Specialist Conference, Big Sky, MT, August 8–12, 2021

C-279. J. Hammerl and **H. Schaub**, "Debris Attitude Effects on Electrostatic Tractor Relative Motion Control Performance," AAS/AIAA Astrodynamics Specialist Conference, Big Sky, MT, August 8–12, 2021

C-280. Á. Romero Calvo, J. Hammerl, **H. Schaub** and M. Bengtson, "Touchless Potential Sensing Of Complex Differentially-Charged Shapes Using Secondary Electrons," AIAA SciTech Forum, San Diego, CA, January 3-7, 2022.
doi:10.2514/6.2022-2311

C-281. R. Calaon, M. Trowbridge and **H. Schaub**, "A Basilisk-Based Benchmark Analysis Of Different Constrained Attitude Dynamics Planners," AIAA SciTech Forum, San Diego, CA, January 3-7, 2022.
doi:10.2514/6.2022-2277

C-282. J. Vaz Carneiro, **H. Schaub**, M. Lahijanian, K. Lang and K. Borozdin, "Machine Learning for Reaction Wheel Fault Detection using Simulated Telemetry Data," AIAA SciTech Forum, San Diego, CA, January 3-7, 2022.
doi:10.2514/6.2022-2507

C-283. E. R. Burnett and **H. Schaub**, "Spacecraft Relative Motion Dynamics and Control Using Fundamental Solution Constants," AIAA SciTech Forum, San Diego, CA, January 3-7, 2022.
doi:10.2514/6.2022-2462

C-284. J. Hammerl, Á. Romero Calvo, A. López and **H. Schaub**, "Touchless Potential Sensing of Complex Differentially-Charged Shapes Using X-Rays," AIAA SciTech Forum, San Diego, CA, January 3-7, 2022.
doi:10.2514/6.2022-2312

C-285. S. W. Albert and **H. Schaub**, "Co-Delivery of Multiple Small Probes to the Martian Surface," AIAA SciTech Forum, San Diego, CA, January 3-7, 2022.
doi:10.2514/6.2022-1653

C-286. J. Ridderhof, P. Tsiotras, S. W. Albert and **H. Schaub**, "Linear Covariance Analysis of Entry and Aerocapture Trajectories in an Uncertain Atmosphere," AIAA SciTech Forum, San Diego, CA, January 3-7, 2022.
doi:10.2514/6.2022-1216

C-287. J. R. Martin and **H. Schaub**, "Reinforcement Learning and Orbit-Discovery Enhanced by Small-Body Physics-Informed Neural Network Gravity Models," AIAA SciTech Forum, San Diego, CA, January 3-7, 2022.
doi:10.2514/6.2022-2272

C-288. Á. Romero Calvo, V. Urbanskiy, V. Yudintsev, **H. Schaub** and V. Trushliakov, "Microgravity Restart of Liquid Rocket Engine With Low Propellant Residuals," AAS Guidance and Control Conference, Breckenridge, CO, Feb. 3–9, 2022

C-289. E. R. Burnett, S. W. Albert and **H. Schaub**, "A New Guidance Technique For Discrete-Event Drag Modulation For Aerocapture Missions," AAS Guidance and Control Conference, Breckenridge, CO, Feb. 3–9, 2022

C-290. A. Herrmann, J. Vaz Carneiro and **H. Schaub**, "Reinforcement Learning For The Multi-Satellite Earth-Observing Scheduling Problem," AAS Guidance and Control Conference, Breckenridge, CO, Feb. 3–9, 2022

C-291. J. Hammerl and **H. Schaub**, "Uncertainty Analysis of the Electrostatic Tractor Control Performance," IEEE Aerospace Conference, Big Sky, MT, March 5–12, 2022.

C-292. A. Herrmann and **H. Schaub**, "Autonomous On-board Planning for Earth-orbiting Spacecraft," IEEE Aerospace Conference, Big Sky, MT, March 5–12, 2022.

C-293. J. Hammerl, A. López, Á. Romero Calvo and **H. Schaub**, "Measuring Multiple Potentials of a Rotating and Differentially-Charged Object Simultaneously Using X-rays," 16th Spacecraft Charging Technology Conference, Virtual, April 4–8, 2022

C-294. K. Champion and **H. Schaub**, "Effective Debye Lengths in Representative Cislunar Environment Regions," 16th Spacecraft Charging Technology Conference, Virtual, April 4–8, 2022

C-295. Á. Romero Calvo, K. Champion and **H. Schaub**, "Touchless Spacecraft Potential Sensing Using Energetic Electron Beams And Active Photoemission," 16th Spacecraft Charging Technology Conference, Virtual, April 4–8, 2022

C-296. I. Nazmy, A. Harris, M. Lahijanian and **H. Schaub**, "Shielded Deep Reinforcement Learning for Multi-Sensor Spacecraft Imaging," American Control Conference, Atlanta, GA, June 8–10, 2022

C-297. J. Vaz Carneiro and **H. Schaub**, "Novel Architecture for Numerical Multi-satellite Simulations," International Workshop on Satellite Constellations and Formation Flying," Milano, Italy, June 7–10, 2022

C-298. A. Herrmann and **H. Schaub**, "Reinforcement Learning For Small Body Science Operations," AAS Astrodynamics Specialist Conference, Charlotte, North Carolina, August 7–10 2022, Paper No. AAS 22-563

C-299. J. R. Martin and **H. Schaub**, "Augmenting Periodic Orbit Discovery with Physics-Informed Neural Networks," AAS Astrodynamics Specialist Conference, Charlotte, North Carolina, August 7–10 2022, Paper No. AAS 22-567.

C-300. R. Calaon and **H. Schaub**, "Constrained Attitude Path Planning Via Least Squares MRP-Based NURBS Curves," AAS Astrodynamics Specialist Conference, Charlotte, North Carolina, August 7–10 2022, Paper No. AAS 22-541

C-301. A. López, J. Hammerl and **H. Schaub**, "Detecting Space Objects With Binary Wide Field Of View X-Ray Sensing," AAS Astrodynamics Specialist Conference, Charlotte, North Carolina, August 7–10 2022, Paper No. AAS 22-602

C-302. G. Bascom and **H. Schaub**, "Modular Dynamic Modeling Of Hinged Solar Panel Deployments," AAS Astrodynamics Specialist Conference, Charlotte, North Carolina, August 7–10 2022, Paper No. AAS 22-725

C-303. S. Albert and **H. Schaub**, "Modular Dynamic Modeling Of Hinged Solar Panel Deployments," AAS Astrodynamics Specialist Conference, Charlotte, North Carolina, August 7–10 2022

C-304. J. Walker, J. Hammerl and **H. Schaub**, "Design and Analysis for Experimental Validation of Touchless Charge Control Testing," AAS Astrodynamics Specialist Conference, Charlotte, North Carolina, August 7–10 2022, Paper No. AAS 22-661

C-305. R. Calaon and **H. Schaub**, "Optimal Actuator-Based Attitude Maneuvering Of Constrained Spacecraft Via Motion Planning Algorithms," International Astronautical Congress, Paris, France, Sept. 18–22, 2022

C-306. J. R. Martin and **H. Schaub**, "Small-Body Gravity Field Estimation using Physics-Informed Neural Networks and Square-Root Information Filters," International Astronautical Congress, Paris, France, Sept. 18–22, 2022

C-307. C. Allard, J. Maxwell and **H. Schaub**, "A Transport Theorem For The Inertia Tensor For Simplified Spacecraft Dynamics Development," International Astronautical Congress, Paris, France, Sept. 18–22, 2022

C-308. J. C. Sanchez and **H. Schaub**, "Small Body Navigation And Gravity Estimation Using Kalman Filter And Least-Squares Fitting," AAS/AIAA Spaceflight Mechanics Meeting, Austin, TX, Jan. 15–19, 2022

C-309. J. Vaz Carneiro, A. Morell and **H. Schaub**, "Post-Docking Spacecraft Dynamics Using Baumgarte Stabilization," AAS/AIAA Spaceflight Mechanics Meeting, Austin, TX, Jan. 15–19, 2022

C-310. J. Martin and **H. Schaub**, "Post-Docking Spacecraft Dynamics Using Baumgarte Stabilization," AAS/AIAA Spaceflight Mechanics Meeting, Austin, TX, Jan. 15–19, 2022

C-311. G. Bascom, L. Kiner and **H. Schaub**, "Spacecraft Dynamics Analysis Using Point-Mass Model Of Human Motion," AAS/AIAA Spaceflight Mechanics Meeting, Austin, TX, Jan. 15–19, 2022

C-312. S. W. Albert and **H. Schaub**, "Relative Motion on Highly-Eccentric Atmospheric Entry Trajectories," AAS/AIAA Spaceflight Mechanics Meeting, Austin, TX, Jan. 15–19, 2022

C-313. A. Herrmann and **H. Schaub**, "A Comparison Of Deep Reinforcement Learning Algorithms For Earth-Observing Satellite Scheduling," AAS/AIAA Spaceflight Mechanics Meeting, Austin, TX, Jan. 15–19, 2022

C-314. A. López, J. Hammerl and **H. Schaub**, "Dynamic Detection of Nearby Space Objects with Binary Wide Field of View X-Ray Sensing," AIAA Science and Technology Forum and Exposition (SciTech), National Harbor, Maryland, January 23–28, 2023.

C-315. K. Champion and **H. Schaub**, "Spacecraft Wake Formation in Cislunar Plasma Regions," AIAA Science and Technology Forum and Exposition (SciTech), National Harbor, Maryland, January 23–28, 2023.

C-316. J. Hammerl, A. López and **H. Schaub**, "Electric Potential Estimation of Inhomogeneous and Differentially Charged Objects Using X-Rays," AIAA Science and Technology Forum and Exposition (SciTech), National Harbor, Maryland, January 23–28, 2023.

C-317. J. D. Walker, J. Hammerl and **H. Schaub**, "Experimental Concept Validation of Touchless Electric Potential Sensing using a Pulsed Electron Beam," AIAA Science and Technology Forum and Exposition (SciTech), National Harbor, Maryland, January 23–28, 2023.

C-318. K. Champion, Á. Romero Calvo and **H. Schaub**, "Large Scale Particle Tracing Simulation For Touchless Potential Sensing," AIAA Science and Technology Forum and Exposition (SciTech), National Harbor, Maryland, January 23–28, 2023.

C-319. V. Bajenaru, A. Herrmann, **H. Schaub** and S. Philipps, "Command and Control of Satellite Constellations using Explainable Deep Reinforcement Learning," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–8, 2023

C-320. K. Center, E. Sneath, J. Vaz Carneiro and **H. Schaub**, "On-board Swarm Control for Autonomy and Responsiveness (OSCAR)," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–8, 2023

C-321. L. Kiner, J. Vaz Carneiro, C. Allard and **H. Schaub**, "Spacecraft Simulation Software Implementation Of General Prescribed Motion Dynamics Of Two Connected Rigid Bodies," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–8, 2023

C-322. R. Calaon, L. Kiner, C. Allard and **H. Schaub**, "Momentum Management Of A Spacecraft Equipped With A Dual-Gimballed Electric Thruster," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–8, 2023

C-323. A. Herrmann, M. Stephenson and **H. Schaub**, "Reinforcement Learning for Multi-Satellite Agile Earth Observing Scheduling Under Various Communication Assumptions," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–8, 2023

C-324. J. Vaz Carneiro, C. Allard and **H. Schaub**, "Rotating Rigid Body Dynamics Architecture for Spacecraft Simulation Software Implementation," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–8, 2023

C-325. J. Hammerl and **H. Schaub**, "Comparison of Reduced Order Spacecraft Charging Models for Electrostatic Proximity Operations," IEEE Aerospace Conference, Big Sky, MT, March 4–11, 2023.

C-326. S. Albert, A. Doostan and **H. Schaub**, "Onboard Density Modeling for Hypersonic Flight via Karhunen-Loève Expansion," IEEE Aerospace Conference, Big Sky, MT, March 4–11, 2023.

C-327. M. Stephenson and **H. Schaub**, "Optimal Target Sequencing In The Agile Earth-Observing Satellite Scheduling Problem Using Learned Dynamics," AAS/AIAA Astrodynamics Specialist Conference, Big Sky, Montana, August 13–17 2023.

C-328. R. Calaon, C. Allard and **H. Schaub**, "Continuous Center Of Mass Estimation For A Gimbaled Ion Thruster Equipped Spacecraft," AAS/AIAA Astrodynamics Specialist Conference, Big Sky, Montana, August 13–17 2023.

C-329. J. Vaz Carneiro, C. Allard and **H. Schaub**, "Effector Dynamics For Sequentially Rotating Rigid Body Spacecraft Components," AAS/AIAA Astrodynamics Specialist Conference, Big Sky, Montana, August 13–17 2023.

C-330. L. Kiner, C. Allard and **H. Schaub**, "Multi-Body Prescribed Spacecraft Dynamics Subject To Actuator Inputs," AAS/AIAA Astrodynamics Specialist Conference, Big Sky, Montana, August 13–17 2023.

C-331. J. Vaz Carneiro, A. Morell and **H. Schaub**, "Post-Docking Complex Spacecraft Dynamics Using Baumgarte Stabilization," AAS/AIAA Astrodynamics Specialist Conference, Big Sky, Montana, August 13–17 2023.

C-332. A. López and **H. Schaub**, "Relative Orbit Estimation with Wide Field of View Binary X-ray Sensing," AMOS, Maui, Hawaii, Sept. 19–22, 2023

C-333. K. Champion and **H. Schaub**, "Electron Beam Properties for Touchless Potential Sensing of Complex Geometry Spacecraft," AIAA Science and Technology Forum and Exposition (SciTech), Orlando, Florida, Jan. 8–12, 2024.
doi:10.2514/6.2024-1064

C-334. M. Stephenson, L. Quevedo Mantovani, S. Phillips and **H. Schaub**, "Using Enhanced Simulation Environments to Accelerate Reinforcement Learning for Long-Duration Satellite Autonomy," AIAA Science and Technology Forum and Exposition (SciTech), Orlando, Florida, Jan. 8–12, 2024.
doi:10.2514/6.2024-0990

C-335. J. D. Walker and **H. Schaub**, "Active Charge Control Using an Electron Beam and Ultraviolet Light Source," AIAA Science and Technology Forum and Exposition (SciTech), Orlando, Florida, Jan. 8–12, 2024.
doi:10.2514/6.2024-2691

C-336. A. Morrell, J. Vaz Carneiro, L. Kiner and **H. Schaub**, "Multi-Arm Post-Docking Spacecraft Dynamics Using Penalty Methods," AIAA Science and Technology Forum and Exposition (SciTech), Orlando, Florida, Jan. 8–12, 2024.
doi:10.2514/6.2024-1870

C-337. M. Stephenson and **H. Schaub**, "Reinforcement Learning for Earth-Observing Satellite Satellite Autonomy with Event-Based Task Intervals," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–7, 2024

C-338. G. Fereoli, **H. Schaub** and P. Di Lizia, "Meta-Reinforcement Learning For Spacecraft Proximity Operations Guidance And Control In Cislunar Space," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–7, 2024

C-339. R. Calaon, C. Allard and **H. Schaub** an, "Solar Electric Propulsion Gn&C Pointing State Overview For The Emirates Mission To The Asteroid Belt," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–7, 2024

C-340. J. Vaz Carneiro, C. Allard and **H. Schaub** an, "Modular Rotational Stability Analysis of Spacecraft with Rotating Flexible Solar Arrays," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–7, 2024

C-341. L. Kiner, C. Allard and **H. Schaub** an, "Prescribed Motion Dynamics For Spacecraft Solar Array Deployment," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–7, 2024

C-342. J. Hammerl, T. Teil and **H. Schaub** an, "Automated Constrained Maneuver Design For Asteroid Payload Delivery," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–7, 2024

C-343. M. Stephenson, L. Quevedo Mantovani and **H. Schaub** an, "Intent Sharing and Auctions for Emergent Collaboration in Autonomous Earth Observing Constellations," AAS Rocky Mountain GN&C Conference, Breckenridge, CO, Feb. 2–7, 2024

C-344. R. Calaon, **H. Schaub** and C. Allard, "Attitude Reference Generation for Spacecraft with Rotating Solar Arrays and Pointing Constraints," IEEE Aerospace Conference, Big Sky, Montana, March 2–9, 2024

C-345. A. Haft and **H. Schaub**, "Effects of the Double-Maxwellian Plasma on Continuous Spacecraft Charging in GEO," Spacecraft Charging and Technology Conference, Avignon, France, June 17–21, 2024.

C-346. A. López and **H. Schaub**, "Touchless Time-Varying Electrostatic Potential Sensing in Orbit: Fusion of X-ray and Electron Methods," Spacecraft Charging and Technology Conference, Avignon, France, June 17–21, 2024.

C-347. J. Hammerl and **H. Schaub**, "Pulsed Electron Beam For Electric Potential Sensing And Control," Spacecraft Charging and Technology Conference, Avignon, France, June 17–21, 2024.

C-348. K. Champion and **H. Schaub**, "Ion Optics for Laboratory Spacecraft Wake Generation," Spacecraft Charging and Technology Conference, Avignon, France, June 17–21, 2024.

C-349. J. D. Walker and **H. Schaub**, "Development of Experimental Methods for Active Charge Control using Remote Sensing Methods Techniques," Spacecraft Charging and Technology Conference, Avignon, France, June 17–21, 2024.

C-350. R. Reed, **H. Schaub** and M. Lahijanian, "Shielded Deep Reinforcement Learning for Complex Spacecraft Specifications," American Control Conference, Toronto, Canada, July 8–12, 2024.

C-351. A. Haft and **H. Schaub**, "Electrostatic Tractor Effectiveness in a Non-Maxwellian GEO Plasma Environment," AAS Astrodynamics Specialist Conference, Broomfield, CO, Aug. 11–15 2024.

C-352. L. Kiner and **H. Schaub**, "Spacecraft Dynamics Containing Prescribed Motion Platforms with Dynamic Sub-Components," AAS Astrodynamics Specialist Conference, Broomfield, CO, Aug. 11–15 2024.

C-353. L. Q. Quevedo, Y. Nagano and **H. Schaub**, "Reinforcement Learning For Satellite Autonomy Under Different Cloud Coverage Probability Observations," AAS Astrodynamics Specialist Conference, Broomfield, CO, Aug. 11–15 2024.

C-354. J. Vaz Carneiro, P. Johnson and **H. Schaub**, "Backsubstitution Method For Spacecraft With Generally Translating Appendages," AAS Astrodynamics Specialist Conference, Broomfield, CO, Aug. 11–15 2024.

C-355. J. D. Walker and **H. Schaub**, "Reaction Wheel Momentum Control While Electrostatically Tugging Tumbling Space Object," AAS Astrodynamics Specialist Conference, Broomfield, CO, Aug. 11–15 2024.

C-356. A. Morell and **H. Schaub**, "Back-Substitution Based Spacecraft Dynamics Modeling with Selective Configuration Space Branching," AAS Astrodynamics Specialist Conference, Broomfield, CO, Aug. 11–15 2024.

C-357. S. Piggott and **H. Schaub**, "Spacecraft Thruster Plume Modeling for Inter-Spacecraft Impacts," AAS Astrodynamics Specialist Conference, Broomfield, CO, Aug. 11–15 2024.

C-358. M. Stephenson and **H. Schaub**, "BSK-RL: Modular, High-Fidelity Reinforcement Learning Environments for Spacecraft Tasking," International Astronautical Congress, Milan, Italy, Oct. 14–18 2024.

C-359. M. Stephenson and **H. Schaub**, "Autonomous Decentralized Constellation Tasking for Wildfires on Asynchronous Semi-Markov Decision Processes," International Workshop on Satellite Constellations & Formation Flying, Kaohsiung, Taiwan, December 2–4, 2024.

C-360. C. Vela, R. Opromolla, G. Fasano and **H. Schaub**, "Modal Solutions-based Approach to Relative Dynamics in the Cislunar Environment," AIAA SciTech Forum, Orlando, Florida, Jan. 6–10, 2025.

C-361. Y. Nagano and **H. Schaub**, "Fault Resilience of Reinforcement-Based Satellite Autonomous Task Scheduling," AAS Space Flight Mechanics Meeting, Kauai, HI, January 19–23, 2025.

C-362. K. Champion and **H. Schaub**, "Passive Potential Sensing in Cislunar Space: Simulations Using Nascap-2k and SPIS," AAS Space Flight Mechanics Meeting, Kauai, HI, January 19–23, 2025.

C-363. A. Morell and **H. Schaub**, "Expanded Back-Substitution Dynamics Modeling For Branched Force And Torque Based Spacecraft Components," AAS Space Flight Mechanics Meeting, Kauai, HI, January 19–23, 2025.

C-364. J. Hammerl and **H. Schaub**, "Orbiting Spacecraft Relative Motion In The Inertial Frame For Inertially Fixed Constraints," AAS Space Flight Mechanics Meeting, Kauai, HI, January 19–23, 2025.

C-365. A. Haft and **H. Schaub**, "Increasing the Electrostatic Force Between Spacecraft Using a Pulsed Electron Beam," AAS Space Flight Mechanics Meeting, Kauai, HI, January 19–23, 2025.

C-366. J. Vaz Carneiro and **H. Schaub**, "Spacecraft Dynamics With The Backsubstitution Method: Survey And Capabilities," AAS Space Flight Mechanics Meeting, Kauai, HI, January 19–23, 2025.

C-367. M. Stephenson, L Quevedo Mantovani, A. Cheval and **H. Schaub**, "Quantifying the Optimality of a Distributed RL-Based Autonomous Earth-Observing Constellation," AAS Guidance, Navigation and Control Conference, Breckenridge, CO, January 31 – February 5, 2025.

C-368. L. Quevedo Mantovani and **H. Schaub**, "Improving Robustness Of Autonomous Spacecraft Scheduling Using Curriculum Learning," AAS Guidance, Navigation and Control Conference, Breckenridge, CO, January 31 – February 5, 2025.

C-369. L. Kiner, C. Allard and **H. Schaub**, "Two-Axis Gimbal Simulation Overview For The Emirates Mission To The Asteroid Belt," AAS Guidance, Navigation and Control Conference, Breckenridge, CO, January 31 – February 5, 2025.

C-370. A. Haft, E. Weber and **H. Schaub**, "Characterizing Field Emission in Electrostatic Tractor Operations for Geosynchronous Orbit Debris Removal," 9th European Conference on Space Debris, Bonn, Germany, April 1–4, 2025

C-371. M. Stephenson, D. Huterer Prats and **H. Schaub**, "Autonomous Satellite Inspection in Low Earth Orbit with Optimization-Based Safety Guarantees, " International Workshop on Planning & Scheduling for Space, Toulouse, France, April 28–30, 2025

C-372. M. Stephenson and **H. Schaub**, "Achieving Near-Optimal Performance in Autonomous Earth Observing Satellite Scheduling using semi-MDPs, " International Workshop on Planning & Scheduling for Space, Toulouse, France, April 28–30, 2025

C-373. L. Quevedo Mantovani and **H. Schaub**, "Performance Evaluation of Shielded Neural Networks for Autonomous Agile Earth Observing Satellites in Long Term Scenarios, " International Workshop on Planning & Scheduling for Space, Toulouse, France, April 28–30, 2025

C-374. A. Ghedira and **H. Schaub**, "Spacecraft Relative Motion With Respect To A Spinning Target Body Frame," AAS Astrodynamics Specialist Conference, Boston, Massachusetts, August 10–14, 2025

C-375. A. Cheval and **H. Schaub**, "Reinforcement Learning For Autonomous Strip Imaging Task Scheduling In Super-Agile Satellites," AAS Astrodynamics Specialist Conference, Boston, Massachusetts, August 10–14, 2025

C-376. A. López, J. W. McMahon and **H. Schaub**, "Gaussian Mixture Square Root Filters For Cislunar Angles-Only Relative Orbit Determination," AAS Astrodynamics Specialist Conference, Boston, Massachusetts, August 10–14, 2025

C-377. Y. Nagano and **H. Schaub**, “Enhancing Fault Resilience In RL-Based Satellite Autonomous Task Scheduling,” AAS Astrodynamics Specialist Conference, Boston, Massachusetts, August 10–14, 2025

C-378. J. Garcia-Bonilla and **H. Schaub**, “A Model-Based Astrodynamics Simulation Paradigm For Multi-Body Spacecraft Systems,” AAS Astrodynamics Specialist Conference, Boston, Massachusetts, August 10–14, 2025

C-379. L. Kiner and **H. Schaub**, “Backsubstitution Method For Prescribed Motion Actuators With Attached Dynamic Sub-Components,” AAS Astrodynamics Specialist Conference, Boston, Massachusetts, August 10–14, 2025

C-380. W. Schwend and **H. Schaub**, “Planar Spacecraft Control Through One Degree of Freedom Time-Varying Thruster Configurations,” AAS Astrodynamics Specialist Conference, Boston, Massachusetts, August 10–14, 2025

C-381. D. Huterer Prats, **H. Schaub** and Chris Wheeler, ”Reinforcement Learning for Space-to-Space Surveillance: Autonomous Scheduling for Resident Space Object Imaging,” Advanced Maui Optical and Space Surveillance Technologies Conference, Maui, Hawaii, September 16–19, 2025

C-382. M. Stephenson and **H. Schaub**, ”Safe, Autonomous Multiagent Inspection of Space Objects Leveraging Relative Orbit Dynamics,” Advanced Maui Optical and Space Surveillance Technologies Conference, Maui, Hawaii, September 16–19, 2025

C-383. J. Ludwig, D. Tuohy, **H. Schaub**, A. Anaïs, S. Phillips and Kristina Miller, “An Architecture for Trusted Long-Duration Satellite Autonomy,“ AIAA SciTech, Orlando, Florida, January 12–16, 2026

C-384. J. D. Walker and **H. Schaub**, “Combined Remote Sensing Methods for Active Charge Control Using an Electron Beam in a Dynamic Space Environment,“ AIAA SciTech, Orlando, Florida, January 12–16, 2026

C-385. A. Cheval and **H. Schaub**, “Reinforcement Learning with Hybrid Action Representation for Autonomous Strip Imaging Task Scheduling in Super-Agile Satellites,“ AIAA SciTech, Orlando, Florida, January 12–16, 2026

C-386. Y. Nagano and **H. Schaub**, “Autonomous Task Scheduling for Earth-Observing Satellites Tracking Moving Targets,“ AIAA SciTech, Orlando, Florida, January 12–16, 2026

C-387. W. Schwend and **H. Schaub**, “Spacecraft Six Degrees-of-Freedom Control via Multiple Arm Mounted Thrusters,“ AIAA SciTech, Orlando, Florida, January 12–16, 2026

C-388. E. Weber and **H. Schaub**, “Touchless Electrostatic Detumbling of Differentially Charged Spacecraft in Geosynchronous Earth Orbit,“ AIAA SciTech, Orlando, Florida, January 12–16, 2026

C-389. S. Hampl, A. Ghedira, **H. Schaub**, I. Patel and Z. McNulty, “Characterizing Electroadhesion in Vacuum: Experimental and Simulation Frameworks for Space Docking,“ AIAA SciTech, Orlando, Florida, January 12–16, 2026

C-390. J. Garcia-Bonilla and **H. Schaub**, “Simulation of Generally Articulated Spacecraft for GN&C Algorithm Design and Validation,“ AAS Rocky Mountain GN&C Conference, Breckenridge, Colorado, Jan. 31–Feb. 4, 2026

C-391. L. Quevedo Mantovani and **H. Schaub**, “Shielding Against The Unsafe: Evaluation Of Shielded Deep Reinforcement Learning Training Approaches For Autonomous Spacecraft,“ AAS Rocky Mountain GN&C Conference, Breckenridge, Colorado, Jan. 31–Feb. 4, 2026

C-392. D. Huterer Prats and **H. Schaub**, “Autonomous Space-Based Imaging: Reinforcement Learning Scheduling with Downlink Latency and Resource-Aware Actions,“ AAS Rocky Mountain GN&C Conference, Breckenridge, Colorado, Jan. 31–Feb. 4, 2026

C-393. M. Stephenson and **H. Schaub**, “Learning Multi-Agent Inspection of Complex Space Objects Leveraging Relative Orbit Dynamics,“ AAS Rocky Mountain GN&C Conference, Breckenridge, Colorado, Jan. 31–Feb. 4, 2026

C-394. L. Kiner and **H. Schaub**, “Spacecraft Backsubstitution Dynamics for Prescribed Motion Branching with Single-Axis Dynamic Sub-Components,“ AAS Rocky Mountain GN&C Conference, Breckenridge, Colorado, Jan. 31–Feb. 4, 2026

C-395. M. Stephenson and **H. Schaub**, “Autonomous Tip-and-Cue Earth-Observing Constellation Tasking with Reinforcement Learning,“ IEEE Aerospace Conference, Big Sky, Montana, March 7–14, 2026

C-396. J. Garcia-Bonilla and **H. Schaub**, “Modeling Stochastic Process Uncertainties in Spacecraft Dynamics: A New Capability in Basilisk ,“ IEEE Aerospace Conference, Big Sky, Montana, March 7–14, 2026

Conference Presentations (No Papers)

W-1. L. A. Stiles and **H. Schaub**, “Electrostatically Inflated Membrane Structures: Prospects and Challenges,” Oral Presentation at the 5th European Workshop on Inflatable Space Structures, Noordwijk, The Netherlands, May 10-12, 2011.

W-2. M. Cols Margenet, **H. Schaub** and S. Piggott, “End-To-End Flight Algorithm Development And Testing: Transitioning From Desktop Prototyping To Embedded Testing,” 12th Annual Workshop on Spacecraft Flight Software (FSW 2019) in Huntsville, Alabama, Dec. 9–12, 2019.

W-3. **H. Schaub**, and P. Kenneally and A. Harris, “Incorporating Planetary Space Environments into the Basilisk Astrodynamics Framework,” Asian Pacific Congress on Computational Mechanics (APCOM), Taipei, Taiwan, Dec. 18–21, 2019.

W-4. Á. Romero Calvo, G. and **H. Schaub**, ”Preliminary Design Of Magnetically Enhanced Low-Gravity Electrolysis And Phase Separation System,” ASGSR Annual Meeting, November 5–6, 2020

W-5. S. W. Albert, **H. Schaub** and R. D. Braun, ”Co-Delivery Of Probe And Orbiter Via Aerocapture For Interplanetary Missions,” IPPW workshop, JPL, CA, July 27, 2021.

W-6. Á. Romero Calvo, Ö. Akay, K. Brinkert and **H. Schaub**, ”Magnetic enhancement of water electrolysis in reduced gravity environments,” Lunar Surface Science Workshop: Fundamental and Applied Lunar Surface Research in Physical Sciences, Virtual, August 18–19, 2021

W-7. J. Hammerl and **H. Schaub**, ”Remote Electric Potential Sensing Considerations for the Electrostatic Tractor,” Stardust-R global virtual workshop II, Sept. 13–17, 2021.

W-8. J. Hammerl and **H. Schaub**, ”Motivation and Development of Touchless Potential Sensing Methods for the Electrostatic Tractor,” AIAA Rocky Mountain Annual Technical Symposium, Sept. 29, 2021.

W-9. S. Albert and **H. Schaub**, ”Designing Probe and Aerocapture Orbiter for a Single Entry Trajectory,,” AIAA Rocky Mountain Annual Technical Symposium, Sept. 29, 2021.

W-10. Á. Romero Calvo and **H. Schaub**, ”Low-Gravity Magnetohydrodynamics: Concept And Applications,” AIAA Rocky Mountain Annual Technical Symposium, Sept. 29, 2021.

W-11. I. Nazmy and **H. Schaub**, ”Autonomous Attitude Tasking for Surface Mapping of Large Bodies,” AIAA Rocky Mountain Annual Technical Symposium, Sept. 29, 2021.

W-12. R. Calaon and **H. Schaub**, ”Constrained Attitude Maneuvering, State Of The Art And Novel Applications,” AIAA Rocky Mountain Annual Technical Symposium, Sept. 29, 2021.

W-13. J. Martin and **H. Schaub**, "Development and Applications of the Physics-Informed Neural Network (PINN) Gravity Model," AIAA Rocky Mountain Annual Technical Symposium, Sept. 29, 2021.

W-14. A. Herrmann and **H. Schaub**, "Reinforcement Learning for Autonomous Spacecraft Planning and Scheduling," AIAA Rocky Mountain Annual Technical Symposium, Sept. 29, 2021.

W-15. Á. Romero Calvo, K. Champion and **H. Schaub**, "Touchless Potential Sensing Model For Active Spacecraft Charging Scenarios," Applied Space Environments Conference, Nov. 1–5, 2021

W-16. J. Hammerl and **H. Schaub**, "Using A Pulsed Electron Beam To Prevent Charging While Sensing Electric Potentials," Applied Space Environments Conference, Nov. 1–5, 2021

W-17. A. A. Bennett and **H. Schaub**, "Identifying Minor Debris Strikes in Spacecraft Telemetry: Methods and Applications," Applied Space Environments Conference, Nov. 1–5, 2021

W-18. Á. Romero Calvo, C. Nogales, K. Billings, W. West and **H. Schaub**, "ASGSR Ken Souza Program 2020: Post-PDR Design Update," ASGSR Annual Meeting, Baltimore, Maryland, Nov. 3–6, 2021

W-19. Á. Romero Calvo, M. Á. Herrada Gutiérrez, G. Cano Gómez and **H. Schaub**, "Axisymmetric Bubble Growth And Detachment Subject To Inhomogeneous Magnetic Fields In Microgravity," APS Meeting, Chicago, IL, March 14–18, 2022.

W-20. S. Albert and **H. Schaub**, "Efficient Delivery of a Network of Small Probes to the Martian Surface," Low-Cost Science Mission Concepts for Mars Exploration workshop, Pasadena, CA, March 29-31, 2022

W-21. A. Bennett, R. Carpenter and **H. Schaub**, "Methods to Detect Impact-Induced Orbit Perturbations Using Spacecraft Navigation Data," 6th European Workshop on Space Debris Modeling and Remediation, Paris, France, May 18–20, 2022

W-22. A. Bennett and **H. Schaub**, "Developing a Method for Agile Prediction of Expected Impact Perturbations for Comparison to On-Orbit Data," 6th European Workshop on Space Debris Modeling and Remediation, Paris, France, May 18–20, 2022

W-23. S. Albert and **H. Schaub**, "Flight Mechanics Analysis For Shield: Small High Impact Energy Landing Device," International Planetary Probe Workshop", Pasadena, CA, Aug. 29 – Sept. 2, 2022

W-24. M. Felix, S. Albert and **H. Schaub**, "Aerocapture Simulation In Basilisk, An Open-Source Astrodynamics Framework", Pasadena, CA, Aug. 29 – Sept. 2, 2022

W-25. J. C. Sanchez and **H. Schaub**, "Semi-autonomous navigation and gravity estimation around small bodies," 2nd International Stardust Conference, ESA European Space Research and Technology Centre (ESTEC), Noordwijk, Netherland, Nov. 7–11, 2022

W-26. J. Martin and **H. Schaub**, "Physics-Informed Neural Network Gravity Model for Small-Body Exploration," 2nd International Stardust Conference, ESA European Space Research and Technology Centre (ESTEC), Noordwijk, Netherland, Nov. 7–11, 2022

W-27. A. Herrmann and **H. Schaub**, "Monte Carlo Tree Search for Autonomous Small Body Science Operations," 2nd International Stardust Conference, ESA European Space Research and Technology Centre (ESTEC), Noordwijk, Netherland, Nov. 7–11, 2022

W-28. J. Hammerl and **H. Schaub**, "Spacecraft Charging Considerations for On-Orbit Servicing and Debris Mitigation in High Earth Orbit," 2nd International Stardust Conference, ESA European Space Research and Technology Centre (ESTEC), Noordwijk, Netherland, Nov. 7–11, 2022

W-29. Á. Romero Calvo, C. Nogales, K Billings, W. West and **H. Schaub**, "Design and Results of the Magnetically Enhanced Electrolysis Experiment," ASGSR Annual Meeting, Houston, Texas, Nov. 9–12, 2022

W-30. S. L. Buchner, N. Abeson, J. Wood, H. Schaub, A. P. Anderson, "Virtual Reality To Visualize And Display Uncertainty In Spaceflight Operations For Mission Control Personnel," NASA Human Research Program Investigators' Workshop (HRP IWS) , Galveston, TX, Feb. 7–9, 2023

W-31. Á. Romero Calvo, C. Nogales, K. Billings, W. West and **H. Schaub**, "The Magnetically Enhanced Electrolysis (MEE) Experiment," Next-Generation Suborbital Researchers Conference, Broomfield, CO, Feb. 27–March 1, 2023.

W-32. S. L. Buchner, N. Abeson, J. Wood, **H. Schaub**, A. P. Anderson, "Integrated Virtual Reality Visualizations And Information Display To Understand Uncertainty In Training For Spaceflight Operations," Aerospace Medical Association, New Orleans, LA, May 21–26, 2023

W-33. S. W. Albert and **H. Schaub**, "Stochastic Aerocapture Guidance via Iterative Covariance Steering," IPPW workshop, Marseille, France, Aug. 28–Sept. 1, 2023.

W-34. K. Champion and **H. Schaub**, "Impacts of Cislunar Plasma on Electrostatic Tractor Potentials," Applied Space Environments Conference, Huntsville, AL, October 9–13 2023.

W-35. A. López and **H. Schaub**, "Object Relative Heading Estimation with Binary Wide Field of View X-Ray Sensing," Applied Space Environments Conference, Huntsville, AL, October 9–13 2023.

W-36. J. Hammerl, A. Haft and **H. Schaub**, "Neighboring Spacecraft Charging due to Continuous Electron Beam Emission and Impact," Applied Space Environments Conference, Huntsville, AL, October 9–13 2023.

W-37. J. D. Walker, J. Hammerl and **H. Schaub**, "Experimentally Estimating Secondary Electron Yield," Applied Space Environments Conference, Huntsville, AL, October 9–13 2023.

W-38. Á.Romero-Calvo, C. Nogales, K. Billings, W. West and H. Schaub, "The Magnetically-Enhanced Electrolysis (MEE) Experiment: Design, Results, and Lessons Learned," COSPAR 2024, Bexco Busan, South Korea, July 13–21, 2024.

W-39. J. Cuberovic, J. Wood, S. Rodine, M. Frew, **H. Schaub** and A. Hayman, "Development Of A Virtual Reality Xgeo Orbit Visualization Tool For Cislunar Mission Design," NASA IWS 2025, Galveston, TX, Jan 28–31, 2025.

W-40. M. Stephenson, L. Quevedo Mantovani and **H. Schaub**, "Achieving Near-Optimal Performance in Autonomous Earth Observing Satellite Scheduling using semi-MDPs (Presentation Only)," International Workshop on Planning & Scheduling for Space, Toulouse, France, April 28–30, 2025

W-41. K. Champion and **H. Schaub**, "Cislunar Touchless Potential Sensing Through Barriers," Applied Space Environments Conference, Houston, TX, May 5–8, 2025

W-42. K. Champion, A. Haft and **H. Schaub**, "Multi-Spacecraft Wake Formations," Applied Space Environments Conference, Houston, TX, May 5–8, 2025

W-43. J. D. Walker, S. Hampl and **H. Schaub**, "Development of Experimental Methods for Active Charge Control Using Combined Remote Sensing Methods," Applied Space Environments Conference, Houston, TX, May 5–8, 2025

W-44. S. Hampl, J. D. Walker and **H. Schaub**, "Analytical Investigation of Two-Vehicle Active Charge Control for Experimental Validation," Applied Space Environments Conference, Houston, TX, May 5–8, 2025

W-45. D. Huterer Prats, M. Stephenson, C. Wheeler and **H. Schaub**, "Autonomous Observation Scheduling using Reinforcement Learning Under Operational and Visibility Constraints," 4th Annual AI For Contested Space Workshop, MIT Lincoln Labs, Boston, September 23–25, 2025

W-46. S. Buchner, J. Wood, G. Schauss, B. Bateman, H. Schaub and A. Hayman, "Situation Awareness of Spacecraft Operators Trained in Virtual Reality," The 69th Human Factors and Ergonomics Society International Annual Meeting, Chicago, IL, October 13–17, 2025

TECHNICAL REPORTS

T-1. **H. Schaub** and J. L. Junkins, "An Eigenfactor Square Root Algorithm Formulation for Nonlinear Dynamics," Technical Report, Texas A&M University, College Station, TX, May 16th, 1996.

T-2. **H. Schaub** and J. L. Junkins, "Dynamics and Control of Micro-Robot Swarms: Planar Motion and State Estimation," Technical Report, Texas A&M University, College Station, TX, Aug, 1998.

T-3. **H. Schaub** and J. L. Junkins, "Dynamics and Control of Micro-Robot Swarms: Three-Dimensional Surface," Technical Report, Texas A&M University, College Station, TX, Aug, 1998.

T-4. **H. Schaub** and J. L. Junkins, "Kalman Filter Study of a Micro-Robot With Track Slippage," Technical Report, Texas A&M University, College Station, TX, May, 1999.

T-5. **H. Schaub** and K. Groom, "Ship Motion Filter Algorithm," Technical Report, Sandia National Labs, Albuquerque, NM, July, 2001.

T-6. **H. Schaub**, Cartesian Payload Swing Damping, Technical Report, Sandia National Labs, Albuquerque, NM, August, 2001.

T-7. **H. Schaub** and K. Groom, Lighter Tracking Control Algorithm Study, Technical Report, Sandia National Labs, Albuquerque, NM, March, 2002.

T-8. **H. Schaub** and C. Wilson, "Matching a Statistical Pressure Snake to a Four-Sided Polygon and Estimating the Polygon Corners," Technical Report, Sandia National Labs, SAND2004-1871, Albuquerque, NM, February, 2003.

T-9. **H. Schaub**, Extracting Primary Features of a Statistical Pressure Snake, Technical Report, Sandia National Labs, SAND2004-1869, Albuquerque, NM, February, 2003.

T-10. **H. Schaub**, Reading Color Barcodes using Visual Snakes, Technical Report, Sandia National Labs, SAND2004-1870, Albuquerque, NM, April, 2003.

T-11. **H. Schaub**, Statistical Pressure Snakes based on Color Images, Technical Report, Sandia National Labs, SAND2004-1867, Albuquerque, NM, April, 2003.

T-12. **H. Schaub**, Visual Servoing Using Statistical Pressure Snakes, Technical Report, Sandia National Labs, SAND2004-1868, Albuquerque, NM, April, 2003.

T-13. **H. Schaub**, Performance Study of the Rate-Based Pendulation Control System, Technical Report, Virginia Tech, Aerospace and Ocean Engineering Department, Blacksburg, VA, April, 2005.

T-14. **H. Schaub**, Rate-Based Pendulation Control System Study, Technical Report, Virginia Tech, Aerospace and Ocean Engineering Department, Blacksburg, VA, April, 2005.

T-15. **H. Schaub**, G. G. Parker, and L. B. King, "Coulomb Thrusting Application Study," Technical Report, Virginia Tech, Aerospace and Ocean Engineering Department, Blacksburg, VA, January, 2006. Report No. A261344.

T-16. S. Dieckmann and **H. Schaub**, "Disk and Ellipse Tracking in Video Stream Data using Statistical Pressure Snakes," Technical Report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, October, 2010.

T-17. **H. Schaub**, K. K. Maute, and D. F. Moorer, "Tethered Coulomb Structure," Technical Report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, October, 2010.

T-18. **H. Schaub**, "Low Cost Orbital Debris Removal System: Geosynchronous Large Debris Reorbiter (GLiDeR)," SBIR Phase I Final Report, Wacari Group, January 2011.

T-19. **H. Schaub**, "Electrostatic Charge Deflection Experiments," University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, Oct, 2011.

T-20. **H. Schaub**, "Electrostatic Charge Deflection Experiments (Extended Study)," NASA NIAC Phase I Report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, June 26, 2012.

T-21. **H. Schaub**, "Faster-than-Realtime Electrostatic Force and Torque Modeling for SSA Applications," AFOSR Research Grant FA9550-15-1-0407, Year 1 annual report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, Sept 14, 2016.

T-22. **H. Schaub**, "Faster-than-Realtime Electrostatic Force and Torque Modeling for SSA Applications," AFOSR Research Grant FA9550-15-1-0407, Year 2 annual report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, Sept 14, 2017.

T-23. **H. Schaub**, "Experimental Facility for Space Object Charging and Electrostatic Actuation," AFOSR DURIP Final Report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, October 13, 2017.

T-24. **H. Schaub**, "Faster-than-Realtime Electrostatic Force and Torque Modeling for SSA Applications," AFOSR Research Grant FA9550-15-1-0407, Final report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, October 16, 2018.

T-25. **H. Schaub**, "Touchless Sensing of Electrostatic Potential and Material Characterization Using Neighboring Spacecraft," AFOSR Research Grant FA9550-20-1-0025, Year 1 annual report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, Jan. 31, 2021.

T-26. **H. Schaub**, "Touchless Sensing of Electrostatic Potential and Material Characterization Using Neighboring Spacecraft," AFOSR Research Grant FA9550-20-1-0025, Year 2 annual report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, Jan. 31, 2022.

T-27. **H. Schaub**, "Touchless Sensing of Electrostatic Potential and Material Characterization Using Neighboring Spacecraft," AFOSR Research Grant FA9550-20-1-0025, Year 3 annual report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, Jan. 31, 2023.

T-28. **H. Schaub**, "Touchless Charge Control of Neighboring Spacecraft in Geostationary and Cislunar Space," AFOSR Research Grant FA9550-23-1-0570, Year 1 annual report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, August 15, 2024.

T-29. **H. Schaub**, "Touchless Charge Control of Neighboring Spacecraft in Geostationary and Cislunar Space," AFOSR Research Grant FA9550-23-1-0570, Year 2 annual report, University of Colorado, Aerospace Engineering Sciences Department, Boulder, CO, August 15, 2025.

Research Associates

RA-1. Jennifer Wood, *Professional Research Assistant*, MS from Computer Science and Aerospace Engineering Sciences Department, University of Colorado, Boulder, Fall 2018 –

RA-2. Dr. Julio Cesar Sanchez Marino, *Post-Doctoral Research Associate*, Ph.D. from University of Seville, Spain, Jan. 2022 – April 2023
Marie Skłodowska-Curie Global Fellowship, XI Manuel Gayan Buiza award

RA-3. Reece Humphreys, August 2025–

PRIMARY GRADUATE STUDENT ADVISOR

Ph.D. Students

PhD-1. Arun Natarajan, "2-Craft Coulomb Tether Concept," Ph.D. Dissertation, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, May 2007.

PhD-2. Shuquan Wang, "Shape Control of Charged Spacecraft Cluster with Two or Three Nodes," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2010.

AAS Breakwell Student Travel Award

PhD-3. Chris Karlgaard, "Robust Adaptive Estimation for Autonomous Rendezvous in Elliptical Orbit," Ph.D. Dissertation, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, August 2010.

PhD-4. Ravi Inampudi, "Two-Craft Coulomb Formation Study about Circular Orbits and Libration Points," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2010.

PhD-5. Carl R. Seubert, "One-Dimensional Spacecraft Formation Flight Testbed for Terrestrial Charged Relative Motion Experiments," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2011.

AIAA Foundation Willy Z. Sadeh Graduate Student Award, AIAA Foundation Graduate Award, AAS John V. Breakwell Student Travel Award

PhD-6. Drew Jones, "A Dynamical Systems Theory Analysis of Coulomb Spacecraft Formations," Ph.D. Dissertation, Aerospace Engineering and Engineering Mechanics, University of Texas, Austin, TX. August 2013

NDSEG Graduate Fellowship, UT Cockrell School of Engineering Graduate Fellowship 2008-2010, UT travel award 2012

PhD-7. Laura Stiles, "Electrostatic Inflation of Membrane Space Structures," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2013.

2009 Air Force Space Scholar Award, NSF graduate research fellowship, 2x Amelia Earthart scholarship, CU travel grant (2x), AAS Breakwell Travel Award, P.E.O. scholar award, Beverly Sears Graduate Student Grant award, John A. Vise Graduate Student Excellence Award, GAANN Fellowship

PhD-8. Lee E. Z. Jasper, "Open-Loop Thrust Profile Development for Tethered Towing of Large Space Objects," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2014

2012 Air Force Space Scholar Award, CU Travel Grant, 2013 Abrams Scholarship, GAANN fellowship

PhD-9. Erik A. Hogan, "Electrostatic Tractor Analysis for GEO Debris Remediation," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2014

John A. Vise Graduate Student Excellence Award, 3x GAANN fellowship, AAS John V. Breakwell Student Travel Award, Vela Fellowship, Los Alamos Presentation Award, CU Travel award

PhD-10. Paul V. Anderson, "Characterizing Longitude-Dependent Orbital Debris Congestion in the Geosynchronous Orbit Regime," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2015

Negler family graduate fellowship, Dean's fellowship, AIAA Foundation Orville and Wilbur Wright Graduate Award, GAANN fellowship, NSF graduate fellowship, NDSEG fellowship, Aviation Week Twenty20s award, AAS John V. Breakwell Travel Award, John A. Vise Graduate Student Excellence Award

PhD-11. Steve O'Keefe, "Autonomous Sun-Direction Estimation Using Partially Underdetermined Coarse Sun Sensor Configurations," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2015

Negler family graduate fellowship, CU Travel award, GAANN fellowship, ASEN Lead TA

PhD-12. Daan Stevenson, "Remote Spacecraft Attitude Control by Coulomb Charging," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2015

NSF, NDSEG (declined), and NASA NSTRF graduate fellowship (4x), 2010 Air Force Space Scholar Award, CU Dean's Outstanding Merit Fellowship, CU travel award, ARCS Scholar

PhD-13. Khashayar Parsay, "Invariant Solar Sail Formations in Elliptical Sun-Synchronous Orbits," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, Dec 2016

PhD-14. Trevor Bennett, "On-Orbit 3-Dimensional Electrostatic Detumble for Generic Spacecraft Geometries," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017

NSF fellowship (declined), NASA NSTRF graduate fellowship, ASEN Lead TA, John V. Breakwell award, CU travel award, John A. Vise award, Aviation Week 20 Twenties Award, AIAA Orville and Wilbur Wright Graduate Award

PhD-15. Cody Allard, "Modular Software Architecture for Complex Multi-Body Fully-Coupled Spacecraft Dynamics," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2018

Dean's Graduate Assistantship, AIAA Luis de Florez Graduate Award, CU travel award

PhD-16. Joseph Hughes, "Dynamics of Complex Spacecraft Subject to Forced and Environmental Charging," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2018

2015 Air Force Space Scholar Award, CU travel award, AAS John V. Breakwell Award, John A. Vise Graduate Student Excellence Award

PhD-17. Patrick Kenneally, "Faster than Real-Time GPGPU Radiation Pressure Modeling Methods," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2019

AIAA Guidance Navigation and Control Graduate Award, CU travel award, Basilisk Software Lead, IAC travel award

PhD-18. Thibaud Teil, "Optical Navigation using Near Celestial Bodies for Spacecraft Autonomy," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2020

AIAA John Leland Atwood Graduate Award, RPI Workshop on Image-Based Modeling and Navigation for Space Applications Best Paper Award

PhD-19. Mar Cols Margenet, "End-to-End Flight Software Development and Testing: Modularity, Transparency and Scalability across Testbeds," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2020

Balsell's Undergraduate Fellowship, Balsell's graduate Fellowship, CU travel award, UGGS travel award, Amelia Earthart scholarship, AIAA Guidance Navigation and Control Graduate Award

PhD-20. JoAnna Fulton, "Deployment Dynamics Analysis of Origami-Folded Spacecraft Structures with Elastic Hinges," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2020

Smead graduate fellowship, Dean's Graduate Assistantship, 2015 Air Force Space Scholar Award, NDSEG Fellowship (declined), NSF Fellowship, NASA NSTRF fellowship,CU travel award, Outstanding TA award, Amelia Earhart scholarship, IAC travel award

PhD-21. Jordan Maxwell, "Development of Electrostatic Actuation Techniques for Close-Proximity Formation Flying in Low Earth Orbit Plasma Wakes," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2020

Dean's graduate fellowship, 2017 Air Force Space Scholar Award, Dr. Charles Stein Outstanding Scholar Award, 2019 Department Graduate Student Award for Service, 2020 Department Graduate Student Award for Teaching

PhD-22. Miles Bengtson, "Electron Method for Touchless Electrostatic Potential Sensing of Neighboring Spacecraft," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2020

Dean's fellowship, Negler fellowship, 2016 Air Force Space Scholar Award, NDSEG fellowship, SMART Fellowship, SSPI Dean Olmstead Memorial Scholarship, Applied Space Environments Conference Travel award, 2019 AIAA Atmospheric and Space Environments Best Paper Award

PhD-23. Kieran T. Wilson, "Remote Electrostatic Potential Determination for Spacecraft Relative Motion Control," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2021

RIO Entrepreneurial fellowship, Applied Space Environments Conference Travel Award, 2020 Department Graduate Student Award for Research, AIAA Atmospheric and Space Environments Best Paper Award

PhD-24. Andrew Harris, "Autonomous Management and Control of Multi-Spacecraft Operations Leveraging Atmospheric Forces," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2021

NDSEG Fellowship, Dean's Graduate Assistantship, 2017 Air Force Space Scholar Award, AIAA Guidance, Navigation and Control Graduate Award

PhD-25. Ethan Burnett, "Novel Dynamics and Control Formulations for Multi-Spacecraft Formation Flying, Rendezvous, and Proximity Operations," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2021

Dean's Fellowship, NSF Fellowship (declined), NDSEG Fellowship, IWSCFF travel award

PhD-26. Álvaro Romero Calvo, "Novel Electromagnetic Space Applications: Electron-Based Touchless Potential Sensing and Low-Gravity Magnetohydrodynamics," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2022

La Caixa Fellowship Program, Rafael Del Pino Fellowship, Dean's Graduate Fellowship, ASGSR Ken Souza Blue Origin Flight Award, finalist of IAF Luigi G. Napolitano Award, ASGSR travel award, APS travel award, Graduate Award for Research, CU College of Engineering Outstanding dissertation award, Honorable mention for outstanding in International contest of PhD theses in the field of Magnetic Fluids

PhD-27. Anne Bennett, "Methods to Detect Minor Debris Strikes in Spacecraft Telemetry," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2022

Dean's Assistantship, National Military Family Association scholarship, Draper Graduate Fellowship, NASA NSTRF Fellowship, Zonta International Amelia Earhart Fellowship

PhD-28. John R. Martin, "Physics-Informed Neural Networks for Gravity Field Modeling," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2023

Dean's Assistantship, NSF Fellowship, John A. Vise Graduate Student Excellence Award, Graduate School Completion Fellowship

PhD-29. Samuel W. Albert, "Aerocapture, Entry, and Co-Delivery in Uncertain Planetary Atmospheres," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2023

NASA Science and Technology Research Fellowship (NSTRF), Matthew Isakowitz Fellowship and Stamps Scholar, John A. Vise Graduate Student Excellence Award, IPPW Outstanding Student Presentation Award

PhD-30. Adam P. Herrmann, "Reinforcement Learning for Spacecraft Planning and Scheduling Modeling," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2023

NSF Fellowship (declined), NASA NSTGRO Fellowship, John A. Vise Graduate Student Excellence Award

PhD-31. Riccardo Calaon, "Guidance, Control and Momentum Management of Spacecraft with Multiple Pointing Constraints," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2024

Fulbright Scholar, Ermenegildo Zegna Founder's Scholarship, Bahls Travel Award

PhD-32. Julian Hammerl, "Coupled Interactions between Charged Spacecraft: Relative Motion, Charging and Sensing," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, June 2025

NASA FINESST graduate fellowship, Outstanding DLA Mentor, Born Travel Award, AES Outstanding Research Graduate Award

PhD-33. João Vaz Carneiro, "Extending the Backsubstitution Method for Single and Multi-Spacecraft Simulations, Charging and Sensing," Ph.D. Dissertation, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, November 2026

La Caixa Fellowship Program

PhD-34. Kaylee Champion, 2021–
NSF Fellowship, NSTGRO Fellowship, Zonta International Amelia Earhart Fellowship

PhD-35. Leah Kiner, 2021–
CU travel award, Amelia Earhart fellowship

PhD-36. Andrea López, 2021–
NASA FINESST Fellowship, Amelia Earthart scholarship

PhD-37. James D. Walker, Jan. 2022–
NDSEG Fellowship

PhD-38. Andrew Morell, August 2022–
CU Travel Grant, NSTGRO Fellowship

PhD-39. Mark Stephenson, August 2022–
NSF Fellowship, NSTGRO Fellowship, CU travel award

PhD-40. Amy C. Haft, August 2023–

PhD-41. Lorenzzo Quevedo Mantovani, August 2023–

PhD-42. Yumeka Nagano, January 2024–

PhD-43. Afrah Ghedira, August 2024–
GPSG travel grant, Caelan B. Lapointe Memorial Graduate Scholarship

PhD-44. Anaïs Cheval, August 2024–

PhD-45. Daniel Huterer Prats, August 2024–

PhD-46. Ethan Weber, August 2024–

PhD-47. Sebastian Hampl, August 2024–

PhD-48. William R. Schwend, August 2024–

PhD-49. Juan Garcia Bonilla, August 2024–

Master of Science (Thesis)

MS-1. Hyunsik Joe, "Sensor Craft Control Using Drone Craft with Coulomb Propulsion System," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, May 2005.

MS-2. John Berryman, "Analytical and Numerical Analysis of Static Coulomb Formations," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, December 2005.

2004, 2005 AFOSR Space Scholar Award

MS-3. Mark J. Monda, "Hardware Testbed for Relative Navigation of Unmanned Vehicles Using Visual Servoing," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, May 2006.

NDSEG Fellowship Award

MS-4. Christopher Romanelli, "Software Simulation of an Unmanned Vehicle Performing Relative Spacecraft Orbits," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, May 2006.

MS-5. Josh Zhou, "Simplified Analysis of IMU Sensor Corruptions on Existing Pendulation Control System For Ship-Mounted Crane," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, December 2006.

MS-6. Harsh Vasavada, "Four Craft Virtual Coulomb Structure Analysis for 1 to 3 Dimensional Geometries," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, May 2007.

2006 Air Force Space Scholar Award

MS-7. Charles M. Southward III, "Autonomous Convoy Study of Unmanned Ground Vehicles using Visual Snakes,"Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, May 2007.

2006, 2007 Air Force Space Scholar Award

MS-8. Brady W. Young, "Design and Specification of an Attitude Control System for the DANDE Mission," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2008.

MS-9. Stephen Panosian, "Stiffness Analysis of the Tethered Coulomb Structure Concept and Application," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2011.

MS-10. Samantha Kroening, "Visual Spacecraft Relative Motion Control using Higher Order Geometric Moments," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2011.

MS-11. Daniel Dunn, "A Hybrid Hardware and Software Simulation Environment for Relative Orbit Motion Studies," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2011.

NDSEG Fellowship Award

MS-12. Robin Blenden, "Regenerative Power Optimal Reaction Wheel Attitude Control," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2011.

MS-13. Marc Saunders, "Adaptive Formation Flying Maneuvers for Multiple Relative Orbits," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2011.

MS-14. Stephanie L. Jones, "Negating the Yearly Eccentricity Magnitude Variation of Super-Synchronous Disposal Orbits due to Solar Radiation Pressure," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2013.

MS-15. Michael A. Trowbridge, "Autonomous 3D Model Generation of Orbital Debris using Point Cloud Sensors," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2014

2012 and 2013 Dean's List, Software Technical Lead Award for 2012/2013 Senior Projects, Distinguished Senior Recognition, Best Presentation at the 2013 Ground Systems Architecture Workshop

MS-16. Joshua Chabot, "A Spherical Magnetic Dipole Actuator for Spacecraft Attitude Control," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2015

First Place Mechanical Engineering Research Project at the 2013 Undergraduate Research Conference at the University of New Hampshire

MS-17. Lauren McManus, "An Investigation into Establishing a Formation of Small Satellites in a Lunar Flower Constellation," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2015

NSF fellowship, Smead graduate fellowship

MS-18. Patrick Kenneally, "High Geometric Fidelity Solar Radiation Pressure Modeling via Graphics Processing Unit," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2016

CU travel award

MS-19. Heiko Engwerda, "Remote Sensing for Spatial Electrostatic Characterization using the Multi-Sphere Method," Aerospace Engineering Sciences Department, Delft Technical University, Delft, The Netherlands, March 2017.

MS-20. Manuel D. Ramos, "Kinematic Steering Law for Conically-Constrained Torque-Limited Spacecraft Attitude Control," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017

Fulbright Fellowship, 2017 Caltech Space Challenge, Argentine Presidential Fellowship in Science & Technology

MS-21. Christopher B. Rabotin, "Feasibility of reusable continuous thrust spacecraft for cargo resupply missions to Mars," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017

MS-22. John Alcorn, "Fully-Coupled Dynamical Jitter Modeling of Momentum Exchange Devices," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017

Dean's Graduate Fellowship, IAC travel award, CU travel award

MS-23. Gabriel J. Ingram, "Development and Analysis of Volume Multi-Sphere Method Model Generation using Electric Field Fitting," Master's Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017

MS-24. Fausto Casale, "Lyapunov Optimal Touchless Electrostatic Detumbling of Space Debris in GEO using a Surface Multisphere Model," Master of Science in Space Engineering, School of Industrial and Information Engineering, Politecnico di Milano, Italy, May 2020.

MS-25. Giulio Napolitano, "A Model-Based Thruster Fault Detection and Isolation Tool with Low Level Implementation in Basilisk Astrodynamics Simulation Framework," Master of Science in Space Engineering, School of Industrial and Information Engineering, Politecnico di Milano, Italy, May 2020.

MS-26. Conor Ryan, "Momentum Transfer due to Hypervelocity Impacts into Spacecraft Solar Arrays," Aerospace Engineering Sciences Department, Delft Technical University, Delft, The Netherlands, March 2022.

MS-27. Guillem Rueda Oller, "Thrusting System for Electrostatic Space Debris Control," Aerospace Engineering Sciences Department, Delft Technical University, Delft, The Netherlands, May 2023.

MS-28. Giovanni Fereoli, "Meta-Reinforcement Learning for Spacecraft Proximity Operations Guidance and Control in Cislunar Space," School of Industrial and Information Engineering, Politecnico di Milano, Italy, December 2023.

Master of Science (Non-Thesis)

MSNT-1. Donald Shrewsbury, "Providing a Camera Sensor with Pointing Capabilities Independent of an Unmanned Ground Vehicle," Non-Thesis Master's Degree, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, December 2006.

MSNT-2. Paul Speth, "A Probabilistic Assessment of Earth-Orbiting Spacecraft Lifetime," Non-Thesis Master's Degree, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, May 2008.

MSNT-3. Nicholas E. Bradley, "Low Earth Orbit Plasma Environment Visualization," Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2010.

MSNT-4. Nicholas P. Tarasenko, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2010.

MSNT-5. Daan Stevenson, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2011.

MSNT-6. Laura Stiles, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2011.

MSNT-7. Felix Bidner, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2012.

MSNT-8. Steve O'Keefe, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2012.

MSNT-9. John P. Mills, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2013.

MSNT-10. Peter Jasch, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2013.

MSNT-11. Nicholas Zinner, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2013.

MSNT-12. Andrew Zizzi, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2013.

MSNT-13. Khashayar Parsay, Non-Thesis Master's Degree, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2013.

MSNT-14. Kevin Dinkel, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2014, Outstanding Graduate for Research award

MSNT-15. Paul Anderson, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2014

MSNT-16. Tamara Cottam, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2015

MSNT-17. Patrick C. Haas, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2015

MSNT-18. Taabish Z. Rashied, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2015

MSNT-19. Franklin Hinckley, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2016

MSNT-20. Nicholas Ravago, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2016

MSNT-21. Jacob Sullivan, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2016

MSNT-22. Nathan Gustilo, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017
Dean's Graduate Fellowship, CU travel award

MSNT-23. Petra Chow, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017

MSNT-24. Erik J. Lessac-Chenen, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017

MSNT-25. Andre Litinsky, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2017

MSNT-26. Kyle Bridgeo, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2017

MSNT-27. Andrew Harris, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2018

MSNT-28. Jordan Maxwell, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2018

MSNT-29. Joseph E. Brown, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2018

MSNT-30. Charles Goble, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2018

MSNT-31. Nick Cenedella, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2019

MSNT-32. Matthew Foster, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2019

MSNT-33. Robert Hakulin, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2019

MSNT-34. Jacob A. Tarnoff, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2019

MSNT-35. Andrew Lyons, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2019

MSNT-36. Tony Ly, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2019

MSNT-37. Jeffrey Jenkins, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2019

MSNT-38. Scott Carnahan, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2019

Dean's Assistantship, Draper Graduate Fellowship, 2019 1st place Research Palooza winner, ARCS Scholarship

MSNT-39. Andrew Alder, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2020

MSNT-40. Jack Toland, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2020

MSNT-41. Dylan O'Brien Languth, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2020

MSNT-42. Meer Baker, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2020

MSNT-43. Marissa Reynolds, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2020
GAANN Fellowship

MSNT-44. Sean Downs, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2020

MSNT-45. Benjamin K. Hagenau, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2020

MSNT-46. Alexander M. Reynolds, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2020

MSNT-47. Amanda Marx, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2021

MSNT-48. Dillon B. Waxman, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2021

MSNT-49. Jacob Schroeder, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2021

MSNT-50. Corey LePine, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2022

MSNT-51. Joshua D. Nelson, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2022

MSNT-52. João Vaz Carneiro, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2022

MSNT-53. Matthew Lauto, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2022

MSNT-54. Aniket Goel, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2022

MSNT-55. Benjamin Freid, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2023

MSNT-56. Galen Bascom, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2023

MSNT-57. Joshua F. Gregg, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2023

MSNT-58. Billy Weigl, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2023

MSNT-59. Julian Hammerl, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2023

MSNT-60. Kaylee Champion, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2023

MSNT-61. Tyler Mason, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2024

MSNT-62. Scott McKinley, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2024
NSF Fellowship (declined)

MSNT-63. Andrea López, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2024

MSNT-64. Matthew Grewe, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2024

MSNT-65. Samuel Packard, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2024

MSNT-66. Kaylie Rick, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2024

MSNT-67. Amanda Marlow, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2024

MSNT-68. Leah Kiner, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2024

MSNT-69. Andrew Morell, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2024

MSNT-70. James D. Walker, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2024

MSNT-71. Mark Stephenson, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December 2024

MSNT-72. Jack Fox, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2025

MSNT-73. Mikaela Felix, University of Colorado, Boulder, CO, expected December 2025
NSF Fellowship

MSNT-74. Nicholas Natsoulas, University of Colorado, Boulder, CO, expected May 2026

MSNT-75. Jacob Mesley, University of Colorado, Boulder, CO, expected May 2027

MSNT-76. Mitchell Pentecost, University of Colorado, Boulder, CO, expected May 2027

MSNT-77. Peter Johnson, University of Colorado, Boulder, CO, expected May 2027

Master of Engineering

ME-1. Rajtilok Chakravarty, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2009

ME-2. Sarah Stansbury, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2011

Undergraduate Research Advisor

UG-1. Justin McFarland, "Modeling the Ballistic Missile Problem with the State Transition Matrix: A Comparative Analysis," AOE 4994 Semester Report, Virginia Tech, Blacksburg, VA 24061, May 2004.

UG-2. Justin McFarland, "Modeling the Ballistic Missile Problem with the State Transition Matrix: An Analysis of Trajectories including a Rotating Earth and Atmospheric Drag," AOE 4994 Semester Report, Virginia Tech, Blacksburg, VA 24061, May 2004.

UG-3. Jeremy Davis, "Mathematical Modeling of Earth's Magnetic Field," AOE 4994 Semester Report, Virginia Tech, Blacksburg, VA 24061, May 2004.

UG-4. Kevin Daugherty, "Restricted Three-Body Problem," AOE 4994 Semester Report, Virginia Tech, Blacksburg, VA 24061, Dec. 2004.

UG-5. Thomas Reppert, "Extending the Patched-Conic Approximation to the Restricted Four-Body Problem," AOE 4994 Semester Report, Virginia Tech, Blacksburg, VA 24061, May. 2006.

UG-6. Thomas Reppert, "Extending the Patched-Conic Approximation to the Restricted Four-Body Problem," AIAA Student Journal, Vol. 44, No. 2, May–Aug. 2006, pp 1–11.

UG-7. Thomas Reppert, "Interplanetary Trajectory Development: Sensitivities of the Restricted Four-Body Problem," AOE 4994 Semester Report, Virginia Tech, Blacksburg, VA 24061, Dec. 2006.

UG-8. Thomas Reppert, "Interplanetary Trajectory Development," Undergraduate Honors Thesis, Virginia Tech, Blacksburg, VA 24061, May 2007.

UG-9. Nicholas Zinner, "Spacecraft Coulomb Thrust Testbed Enhancements," Discovery Learning Apprenticeship Oral Presentation Winner, University of Colorado, Boulder, May 2009.
Mentor: Carl Seubert

UG-10. Wenceslao E. Shaw-Cortez, "Coulomb Thrusting Testbed," Discovery Learning Apprenticeship Oral Presentation Winner, University of Colorado, Boulder, May 2010.
Mentor: Carl Seubert

UG-11. Brandon Bosomworth, "Identification and Reduction of External Forces On The Coulomb Testbed", Discovery Learning Apprenticeship, University of Colorado, Boulder, May 2011.
Mentor: Carl Seubert

UG-12. John P. Mills, Discovery Learning Apprenticeship, University of Colorado, Boulder, 2011–2012. Received Discovery Learning Research Symposium Award.
Mentor: Laura Stiles

UG-13. Tyson M. Sparks, Discovery Learning Apprenticeship, University of Colorado, Boulder, 2011–2012.
Mentor: Daan Stevenson

UG-14. Julie Slaughter, Undergraduate Researcher, Univeristy of Colorado, Boulder, Jan.–May 2012.
Mentor: Erik Hogan

UG-15. Matthew Holmes, Discovery Learning Apprenticeship, University of Colorado, Boulder, 2012–2013.
Mentor: Laura Stiles

UG-16. Kelsey E. McGowan, "Effect of Mitigation on Debris Congestion in Geosynchronous Orbit," Undergraduate Researcher, University of Colorado, Boulder, 2013.
Mentor: Paul Anderson

UG-17. Ian B. Thom, "Torque Control by Coulomb Forces," Discovery Learning Apprenticeship, University of Colorado, 2013–2014.
Mentor: Daan Stevenson

UG-18. Anthony Lima, "Space Debris Removal through High Thrust Towing," Discovery Learning Apprenticeship, University of Colorado, 2013–2014.
Mentor: Lee Jasper

UG-19. James A. Penrod, "Feasibility of Using Lunar Magnetic Fields to Control CubeSat Attitude," Undergraduate Thesis, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2015

UG-20. Steven Pfeifer, "Electromagnetic Interference in Strong Electric Fields," Discovery Learning Apprenticeship, University of Colorado, 2014–2015.
Mentor: Daan Stevenson, Trevor Bennett, Joseph Hughes

UG-21. Himanshi Singhal, "An Exploration Into Optimal Multi-Sphere Method Sphere Population For Electrostatic Interaction," UROP Researcher, University of Colorado, 2014–2015.
Mentor: Trevor Bennett

UG-22. Mar Cols Margenet, Balsells Undergraduate Fellowship, University of Colorado, Fall 2015.
Mentor: P. Kenneally

UG-23. Christine Reilly,"May the Electrostatic Force be With You: Charged Spacecraft Models," Discovery Learning Apprenticeship (Top DLA Poster Presentation Award), University of Colorado, Boulder, CO 2015–2016.
Awards: Aviation Week 20 Twenties Award, Brooke Owens Fellow for Virgin Galactic
Mentor: T. Bennett

UG-24. Lee Huynh, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2015–2016.
Mentor: J. Hughes

UG-25. Tony Ly, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2015–2016.
Mentor: J. Fulton

UG-26. Thierry Shimoda, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2015–2016.
Mentor: T. Bennett

UG-27. Robert J. Belter, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2016–2017.
Mentor: C. Allard

UG-28. Hanwen Zhao, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2016–2017.
Mentor: M. Cols Margenet

UG-29. Aparajithan Venkateswaran, YOU'RE@CU Undergraduate Researcher, University of Colorado, Boulder, CO, 2016–2017.
Mentor: Thibaud Teil

UG-30. Ryan Waugh, YOU'RE@CU Undergraduate Researcher, University of Colorado, Boulder, CO, 2016–2017.
Mentor: Joseph Hughes

UG-31. Mahdi Ghanei, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2017–2018.
Mentor: Jordan Maxwell

UG-32. Dalton Turpen, Undergraduate Researcher, University of Colorado, Boulder, CO, Nov. 2018 – May 2019.
Mentor: Kieran Wilson

UG-33. William Starck, Undergraduate Researcher, University of Colorado, Boulder, CO, Nov. 2018 – May 2019.
Mentor: Miles Bengtson

UG-34. Michelle H. Tran, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, Fall 2019.
Mentor: S. Carnahan

UG-35. Dalton Turpen, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2019–2020.
Mentor: Miles Bengtson

UG-36. Trace Valade, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2019–2020.
Mentor: Andrew Harris

UG-37. Lucas Webb, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2019–2020.
Mentor: Thibaud Teil

UG-38. Dana Coe, YOU'RE@CU Undergraduate Researcher, University of Colorado, Boulder, CO, 2019–2020.
Mentor: John Martin

UG-39. Trace Valade, UROP, University of Colorado, Boulder, CO, 2020–2021.
Mentor: Andrew Harris

UG-40. Libby Moore, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2020–2021.
Mentor: Anne Bennett

UG-41. Ryan Block, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2020–2021.
Mentor: Álvaro Romero Calvo

UG-42. Samuel Alvis, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2021–2022.
Mentor: Ethan Burnett

UG-43. Mikaela Felix, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2021–2022.
Mentor: Samuel Albert

UG-44. Matthew Grewe, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2021–2022.
Mentor: Adam Herrmann

UG-45. Saurabh Totey, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2021–2022.
Mentor: John Martin

UG-46. Karina Andersen, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2022–2023.
Mentor: John Martin

UG-47. Zachary Ellis, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2022–2023.
Mentor: Julian Hammerl

UG-48. Ketan Kamat, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2022–2023.
Mentor: Riccardo Calaon

UG-49. John Aldrete, Undergraduate Software Assistant, University of Colorado, Boulder, CO, Fall 2023.
Mentor: Mark Stephenson

UG-50. Peter Johnson, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2023-2024.
Mentor: João Vaz Carneiro

UG-51. Leya Shaw, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2023-2024.
Mentor: Kaylee Champion

UG-52. Andrew Swackhamer, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2023-2024.
Mentor: Andrea López

UG-53. Shawn Patel, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2024-2025.
Mentor: Mark Stephenson

UG-54. Raaghav Lele, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2024-2025.
Mentor: James Walker

UG-55. Isabella Davila, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2025–2026, Mentor Andrew Morell

UG-56. Landon Holligan, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2025–2026, Mentor Kaylee Champion

UG-57. Ian Youngblood, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2025–2026, Mentor Amy Haft

UG-58. Isaias Perez, Discovery Learning Apprenticeship, University of Colorado, Boulder, CO, 2025–2026, Mentor Lorenzzo Quevedo Mantovani

Highschool Research Advisor

HS-1. Katherine Ferris, “Einstein-Sat: Resurrecting the Drag-Free Satellite Motion Control Experiment,’ University of Colorado, Boulder, September 2010 - April 2011.
Mentor: Carl Seubert

HS-2. Andrew Dewey, “Control System for Detumbling and Pointing a CubeSat,” High-School Researcher, University of Colorado, Boulder, 2013.
Mentor: Erik Hogan

HS-3. Nina Janjic, High-School Researcher, University of Colorado, Boulder, 2012–2013.
Mentor: Daan Stevenson

Visiting Scholars

VS-1. Simon Dieckmann, “Disk and Ellipse Tracking in Video Stream Data using Statistical Pressure Snakes,” RWTH Aachen University, Germany, May - November 2010.

VS-2. Mar Cols Margenet, Balsells Undergraduate Fellowship, Polytechnic University of Catalonia, Spain, August - December 2015.

VS-3. Heiko Engwerda, Delft University, Nederland, February - July 2016.

VS-4. Paolo Panicucci, ”Spacecraft Dynamics Employing a General Multi-tank and Multi-thruster Mass Depletion Formulation”, ASI-CAIF grant, Supaero, Paris, June - September 2016.

VS-5. Takuma Shibata, National University SOKENDAI, Japan, September 2016 - March 2017.

VS-6. Takahiro Sasaki, Osaka Prefecture University, Japan, January 2017 - January 2018.

VS-7. Iosto Fodde, Delft University, Nederland, August - December 2017.

VS-8. Paolo Cappuccio, La Sapienza University of Rome, Italy, August - September 2017 .

VS-9. João Trentin, Departamento de Engenharia Mecânica, Universidade Estadual Paulista, Brazil, October - December 2017.

VS-10. Simon Van Overeem, Delft University, Nederland, August 2019 - January 2019.

VS-11. Giulio Napolitano, Aerospace Engineering Department, Politecnico di Milano, Italy, April - September 2019.

VS-12. Fausto Casale, Aerospace Engineering Department, Politecnico di Milano, Italy, August 2019 - February 2020.

VS-13. Hirotaka Kondo, Aerospace Engineering Department, University of Tokyo, Japan, February 2020.

VS-14. Demet Cilden-Guler, Department of Aeronautical and Astronautical Engineering, Istanbul Technical University, Istanbul, Turkey, Aug 2019 - July 2020.

VS-15. Iván Barcelona Moreno, Politecnico di Milano, Italy, Feb. – July 2021

VS-16. Conor Ryan, Delft University of Technology, Nederland, Jan. 20, 2021 to August, 2021

VS-17. Guillem Rueda Oller, Delft University of Technology, Nederland, Jan. – April, 2022
CU Mobility program scholarship, La Caixa Fellow

VS-18. Juan Garcia Bonilla, Delft University of Technology, Nederland, Feb. – June 2023
La Caixa Fellow, JPL Visiting Student Research Fellow, CU Mobility program scholarship

VS-19. Giovanni Fereoli, Politecnico di Milano, Italy, Aug. – Dec. 2023
CU Mobility program scholarship

VS-20. Estelle Crouzet, Luleå Universitet, Sweden, Feb. – Oct. 2023
CU Mobility program scholarship

VS-21. Claudio Vela, University of Naples, Italy, Jan. 15 – July 15, 2024
CU Mobility program scholarship

VS-22. Oliver Hasler, Norwegian University of Science and Technology (NTNU), Norway, Sept. 15, 2025 – March 15, 2026

VS-23. Carlo Cena, Politecnico di Torino, Italy, Nov. 1, 2025 – May 1, 2026
CU Mobility program scholarship

Graduate Degree Advisory Committee Member

Ph.D. Students

1. Matthew Berry, "A Variable-Step Double-Integration Multi-Step Integrator," Ph.D. Dissertation, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute, Blacksburg, VA, May 2004.

2. Jana L. Schwartz, "The Distributed Spacecraft Attitude Control System Simulator: From Design Concept to Decentralized Control," Ph.D. Dissertation, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute, Blacksburg, VA, July 2004.

3. Mischa Kim, "'Continuous Low-Thrust Trajectory Optimization: Techniques and Applications," Ph.D. Dissertation, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute, Blacksburg, VA, May 2005.

4. Marcus Holzinger, "Optimal Control Applications in Space Situational," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2011.

5. Sungwoo Moon, "Auto-Tuning of Digitally Controlled Single-Phase Low Harmonic Rectifiers and Inverters," Electrical Engineering Department, University of Colorado, Boulder, CO, May 2011.

6. Jay McMahon, "An Analytical Theory for the Perturbative Effect of Solar Radiation Pressure on Natural and Artificial Satellites," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2011.

7. Jill Tombasco, "Orbit Estimation of Geosynchronous Objects Via Ground-Based and Space-Based Optical Tracking," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, August 2011.

8. Mike Krieg, "Modeling and Thrust Optimization of a Bio-Inspired Pulsatile Jet Thruster," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, May 2012.

9. Aurore Sibois, "GPS-based Sub-Hourly Polar Motion Estimates: Strategies and Applications," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO, December, 2011.

10. Christine Hartzell, "The Dynamics of Near-Surface Dust on Airless Bodies," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. August 2012.

11. Dylan Boone, "Integration of Geodesy Mission Design and Navigation for Planetary Satellite Orbiters," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2013

12. David Gerhardt, "Small Satellite Passive Magnetic Attitude Control," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2014

13. Aaron Rosengren, "Long-term Dynamical Behavior of Highly Perturbed Natural and Artificial Celestial Bodies," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2014

14. Simon Tardivel, "The Deployment of Scientific Packages to Asteroid Surfaces," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2014

15. Masatoshi Hirabayashi, "Structural Stability of Asteroids," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. August 2014

16. Antonella Albuja, "Rotational Dynamics of Inactive Satellites as a Result of the YORP Effect," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. December 2015

17. Inkwan Park, "Continuous Low-Thrust Trajectory Optimization: Techniques and ApplicationsDynamical Realism and Uncertainty Propagation," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2016

18. Zubin Olikara, "Collocation Techniques for Computing Quasi-Periodic Tori and Connecting Orbits in Astrodynamics," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2016

19. Anthony Harness, "High Contrast Astronomy with Starshades," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. December 2016

20. Nicola Baresi, "High Contrast Astronomy with Starshades," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2017

21. Ann Dietrich, "Supporting Autonomous Navigation with Flash Lidar Images in Proximity to Small Celestial Bodies," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. August 2017

22. Samantha Rieger, "Natural and Artificial Satellite Dynamics and Evolution around Near-Earth Asteroids with Solar Radiation Pressure," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. December 2017

23. Stefaan Van Wal, "High-Fidelity Simulation of Small-Body Lander/Rover Spacecraft," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2018

24. Benjamin Bercovic, "Mapping And Navigation Of Small Bodies In The Presence Of Uncertainty," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2019

25. Daniel N. Brack, "Investigations into the Relationship Between Surface Activity and the Dynamical State of Asteroids," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. Dec 2019

26. Alex Davis, "On Binary Asteroids: Dynamics, Formation and Parameter Estimation," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. Aug 2020

27. Conor Benson, "Solar Torque and Dissipation Dynamics for Tumbling Bodies: Theory and Observations," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. June 2021

28. Daniel A. Marsillach, "Abort-Safe Spacecraft Motion: Reachability Theory and Predictive Control," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. December 2021

29. Chandrakanth Venigalla, "Multi-Spacecraft Cooperative and Non-Cooperative Trajectory Optimization," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. December 2021

30. Sean Napier, "Novel Transcription Techniques for Multiple-Spacecraft, Multiple-Target Global Trajectory Optimization," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. December 2021

31. Casey Heidrich, "Optimal Covariance Control on Singular Manifolds with Application to Aerospace Mission Design," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. December 2021

32. Herrmann Kaptui, "Stochastic and Distributed Geometric Guidance for Spacecraft Formation Planning," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2022

33. Ian Elliott, "Relative Trajectory Design and Control near Periodic Orbits in Multi-Body Systems using Local Toroidal Coordinates," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2022

34. Thomas Dearing, "Efficient Trajectory Optimization for Constrained Spacecraft Attitude Maneuvers using Momentum Exchange Devices,," Electrical, Computer and Energy Engineering Department, University of Colorado, Boulder, CO. May 2023

35. Oscar Fuentes Muñoz, "Semi-analytical Methods of Orbit Propagation for Near-Earth Asteroids,," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. July 2023

36. Taralicin Deka, "Astrodynamics-Informed Kinodynamic Motion Planning For Relative Spacecraft Motion,," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. August 2023

37. Damennick B. Henry, "Leveraging Quasi-periodic Orbits for Spacecraft Trajectory Design and Control ," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2024

38. Alex J. Meyer, "The Dynamical Evolution of Perturbed Near-Earth Binary Asteroids," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. May 2024

39. Thomas Claudet, "Modélisation, guidage et navigation pour satellites flexibles lors de missions de rendez-vous," Aerospace Engineering Department, ISAE-SUPAERO, Toulouse, France, May 2025.

40. Michael Klonowski, "Cislunar Space Situational Awareness Architecture Design and Analysis," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. July 2025

41. Savannah Buchner, "Influence of Display Designs on Spaceflight Supervisory Control for Operations and Training," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. July 2025

42. Ryotaro Sakamoto, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO.

43. Jackson Jandreau, Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO.

Master of Sciences (Thesis) Students

1. Erin E. Kruse, "Nonlinear Modeling and Simulation of a Hydrostatic Drive System," Master's Thesis, Mechanical Engineering Department, Michigan Technological University, Houghton, MI, December 2001.

2. Matthew C. VanDyke, "Decentralized Coordinated Attitude Control of a Formation of Spacecraft," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute, Blacksburg, VA, July 2004.

3. Scott E. Lennox "Coupled Attitude and Orbital Control System Using Spacecraft Simulators," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute, Blacksburg, VA, July 2004.

4. Michael Morrow, "A Self-Sustaining, Boundary-Layer-Adapted System for terrain Exploration and Environmental Sampling," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute, Blacksburg, VA, June 2005.

5. Christopher L. Nickell, "Modular Modification of a Buoyant AUV for Low-Speed Operation," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute, Blacksburg, VA, September 2005.

6. Amir F. Ajami, "Adaptive Flight Control in the Presence of Input Constrain," Master's Thesis, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute, Blacksburg, VA, December 2005.

7. Farheen Rizvi, "Solar Sail Attitude Dynamics And Coning Control: On Developing Control Methods for Solar Sail Coning at Orbit Rate to Attain Desired Orbital Effects," Aerospace Engineering Sciences Department, University of Colorado, Boulder, Colorado, December 2010.

8. Nathan Shupe, "Orbit Options for an Orion-Class Spacecraft Mission to a Near-Earth Object," Aerospace Engineering Sciences Department, University of Colorado, Boulder, Colorado, December 2010.

9. Padraig Lysandrou, "A Successive Convexification Optimal Guidance Implementation for the Pinpoint Landing of Space Vehicles," Aerospace Engineering Sciences Department, University of Colorado, Boulder, Colorado, December 2019.

10. Jesse Tambornini, "2D Soft Robotics Modeling for Small Body Environments and Granular Electroadhesion Characterization," Aerospace Engineering Sciences Department, University of Colorado, Boulder, CO. August 2020

Master of Sciences (Non-Thesis) Students

1. Samuel Wright, "Parameter Estimation of a Spacecraft Simulator Using Parameter-Adaptive Control," Non-Thesis Master's Project, Aerospace and Ocean Engineering DepartmentVirginia Polytechnic Institute, Blacksburg, VA, May 2006.
2. Mohammed Ali Nejat, Non-Thesis Master's Degree, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, December 2006.
3. William Oehlschlager, "Nonlinear and Linear Control Law Study of Front-Wheel Steering Dynamics," Non-Thesis Master's Degree, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, December 2006.
4. Chris Legendre, "Solar Electric Propulsion for a Lunar/Martian Tug," Non-Thesis Master's Degree, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, May 2007.
5. Curtis Wilkerson, "Specialized Attitude Coordinate Development," Non-Thesis Master's Degree, Aerospace and Ocean Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, VA, August 2007.

Course Development and Teaching

University of Colorado

Course	Nos.	New	Restr.	Description
ASEN 2003	1x		x	**Introduction to Dynamics and Systems:** Covered the planar rigid body component of this class.
ASEN 3200	5x		x	**Orbital Mechanics/Attitude Dynamics and Control:** Covered the spacecraft attitude and control section of this class.
ASEN 4018	1x			**Senior Design:** Was a PAB member for senior design for the fall and spring semester.
ASEN 5010	13x		x	**Spacecraft Dynamics and Control:** required graduate course for ASEN
ASEN 6010	11x	x	x	**Advanced Spacecraft Dynamics and Control:** developed this new course, and taught it the 2nd time on CAETE
ASEN 6014	8x	x	x	**Spacecraft Formation Flying:** developed this new course. First such special topics course offered at US universities.
ASEN 6519	1x			**ASN Seminar Series:** Organize and host the astrodynamics and navigation seminar series by inviting external speakers

Coursera.org

Course	Learners	Course Links
Spacecraft Dynamics and Control Specialization		
Kinematics: Describing the Motions of Spacecraft	19,293	Link
Kinetics: Studying Spacecraft Motion	8,340	Link
Control of Nonlinear Spacecraft Attitude Motion	9,690	Link
Spacecraft Dynamics Capstone: Mars Mission	5,451	Link
Advanced Spacecraft Dynamics and Control Specialization		
Attitude Control with Momentum Exchange Devices	999	Link
Analytical Mechanics for Spacecraft Dynamics	1,030	Link
Advanced Capstone Spacecraft Dynamics and Control Project	429	Link
Spacecraft Formation Relative Orbits Specialization		

Spacecraft Relative Motion Kinematics and Kinetics	657	Link
Spacecraft Relative Motion Control	228	Link
Spacecraft Formation Flying and Control Capstone Project	166	Link

Virginia Tech

Course	Nos.	New	Restr.	Description
AOE 4134	4x		x	**Astromechanics:** Required AOE undergraduate course. Broke the large 100-130 student classes into two sections. Restructured this course around a new text book.
AOE 4140	4x		x	**Spacecraft Dynamics and Control:** AOE technical elective, required for seniors doing space related design project. Restructured this course around a new text book.
AOE 5234	2x	x		**Orbital Mechanics:** developed a new graduate course to cover this material. Taught it using real-time two-way video conferences for both on- and off-campus students.
ASEN 6234	1x	x		**Spacecraft Dynamics and Control:** developed this new graduate course.

Texas A&M University

Course	Nos.	New	Restr.	Description
AERO 310	2x		x	**Aerospace Dynamics:** Required AERO undergraduate course. Redeveloped this course to have a stronger focus on fundamental rigid body kinematics, as well as new text book.