
ATRI DUTTA, PH.D.

Aerospace Engineering, Wichita State University, Wichita KS 67260, USA

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<https://www.wichita.edu/profiles/academics/engineering/aerospace/astronautics/Dutta-Atri.php>

I EDUCATION

Georgia Institute of Technology, Atlanta GA USA

- Doctor of Philosophy, Aerospace Engineering 2009
Major Area: Flight Mechanics and Control, Advisor: Dr. Panagiotis Tsiotras
- Master of Science, Aerospace Engineering 2005

Indian Institute of Technology (IIT), Kharagpur, India

- Bachelor of Technology (Honors), Aerospace Engineering 2002

II ACADEMIC APPOINTMENTS

Wichita State University (WSU), Wichita KS USA

- *Associate Professor, Aerospace Engineering* 2020 (Aug) - Current
- *Assistant Professor, Aerospace Engineering* 2014 – 2020
- *Director/PI, Disaster Resilience Analytics Center* 2021 (Aug) - Current

Air Force Research Laboratory, Rome NY USA (Visiting Faculty Research Program)

- *Research Associate (Mentor: Dr. Joseph Raquepas)* Summer 2018, 2019, 2020

Princeton University, Princeton NJ USA (Mechanical & Aerospace Engineering)

- *Postdoctoral Research Associate, (Advisor: Dr. N. Jeremy Kasdin)* 2011—2013

Georgia Institute of Technology, Atlanta GA USA

- *Research Engineer II, Aerospace Engineering (Advisor: Dr. John-Paul Clarke)* 2009—2011
- *Graduate Teaching/Research Assistant* 2003—2009

III HONORS AND AWARDS

- AIAA Outstanding Section Award, Third Place (Small Category), received as the Chair of AIAA Wichita Section, 2021–2022.
- AIAA Technical Chair, AAS/AIAA Astrodynamics Specialist Conference, Charlotte NC, Aug 7-11, 2022.
- Member, *Sigma Gamma Tau*, National Aerospace Engineering Honor Society, 2022.
- Excellent Reviewer, *AIAA Journal of Guidance, Control and Dynamics*, 2016, 2019–2022.
- University Research/Creativity Award, *Office of Research, Wichita State University*, 2020.
- Outstanding Reviewer, *ASCE Journal of Aerospace Engineering*, 2017.

- Brenton Myers Innovation in Engineering Education Award, *College of Engineering, Wichita State University*, 2017.
- Award for Research/Creative Projects in Summer, *Office of Research, Wichita State University*, 2017.
- Multidisciplinary Research Project Award, *Office of Research, Wichita State University*, 2016 (jointly with Dr. Nick Solomey from Physics).

IV TEACHING

DOCTORAL STUDENTS

- Graduated Students
 - 2) **Pardhasai Chadalavada**, “*Hybrid CubeSat constellation design for observing hurricanes*,” Dec 2022, position after graduation: Flight Mechanics Engineer, Analytical Mechanical Associates (was a NASA Future Investigator selected by NASA FINESST program).
 - 1) **Suwat Sreesawet**, “*Optimal orbit-raising and attitude control of all-electric satellites*,” Dec 2018, position after graduation: Researcher at GISTDA, Thailand (Won *John V. Breakwell Student Travel Award* from *American Astronautical Society* in 2016–17; won *Dora Wallace Hodgson Outstanding Graduate Student Award* from *Wichita State University Graduate School* in 2017-18).
- Current Students
 - i) **Kyle Messick**, Topic: Mission design for in-space neutrino detection, advising since Summer 2021.
 - ii) **Amrutha Dasyam**, Topic: Machine learning assisted trajectory design for aerobraking maneuvers, advising since Summer 2021.
 - iii) **Adrian Arustei**, Topic: Optimal control of low-thrust spacecraft for cislunar missions, advising since Fall 2021.

MASTERS STUDENTS

- Graduated Students (Thesis Option)
 - 7) **Kyle Messick**, “*Preliminary mission design for proposed NuSol probe*,” May 2021, continued as a doctoral student after graduation.
 - 6) **Tanzimul Farabi**, “*Neural network based prediction of solar array degradation during all-electric satellite deployment*,” May 2021.
 - 5) **Garba Subedi**, “*Neuroadaptive observer design for spacecraft attitude control and formation attitude synchronization*,” Dec 2020, position after graduation: Systems Engineer at Caterpillar.
 - 4) **Nikolas Bascue**, “*Impact of launch injection errors on orbit-raising of all-electric satellites*,” May 2020.
 - 3) **Lakshay Arora**, “*Reinforcement learning framework for spacecraft low-thrust orbit raising*,” May 2020, position after graduation: doctoral student at Carleton University, Canada.

- 2) **Prathyusha Karampudi**, “*De-orbit times for low-Earth orbit debris removal using laser ablation*,” Dec 2019.
 - 1) **Suwat Sreesawet**, “*A New Algorithm to Determine Low-Thrust Spacecraft Trajectories*,” Dec 2014, continued as a doctoral student after graduation.
- Graduated Students (Directed Project)
 - 5) **Matthew Kornfeld**, “Comparison of approaches for powered descent and landing,” May 2019.
 - 4) **Zac Matson**, “Effects of perturbing forces on continuous thrust orbit transfers of all-electric Earth satellites,” May 2018, employed in local aircraft industry during project.
 - 3) **Ajay Abraham**, Topic: “Collision avoidance with dynamic obstacles exhibiting periodic motion,” May 2017.
 - 2) **Biraj Gupta**, “Entry and exit positions and times in Earth’s shadow during electric orbit-raising,” May 2017, employed in the local aircraft industry during project.
 - 1) **Tyler Olson**, “Analysis of the geosynchronous transfer orbit radiation environment for low-thrust trajectories,” May 2016, position after graduation: Mechanical Engineer at Harris Corporation.
 - Current Masters Students
 - i) **Joel Pegg**, Thesis Topic: Artificial Neural Network Based Solution of Lambert’s Problem, advising since 2021.
 - ii) **Laura Elliott**, Project Topic: Assessment of dynamic models for three-body mission planning, advising since Fall 2021.
 - iii) **Liam Hood**, Thesis Topic: Electrodynamics tethers, advising since 2022.
 - iv) **Noah Johnson**, Thesis Topic: Spacecraft control for cislunar missions, advising since 2023.

UNDERGRADUATE STUDENT SUPERVISION

- **Jose Michel-Cano** (2023–), working on hardware implementation of control algorithms, supported by WSU/NASA Jump Start Program (JSP).
- **Ella Kreger** (Spring 2023), investigating policy implications for on-orbit debris, supported by WSU First Year Research Experience (FYRE) program (Spring 2023).
- **Andres Erives** (Spring 2023), investigating policy implications for on-orbit debris, supported by WSU FYRE program (Spring 2023).
- **Alexis Silva** (2022–), conducting research on on-orbit debris, supported by WSU/NASA JSP.
- **Joseph Anglin** (2022–), conducting simulations related to three-body problem, supported by WSU/NASA JSP.
- **Nick Rodriguez** (Summer 2022), conducted simulations related to constellations for monitoring wildfires, supported by College of Engineering (CoE) program.
- **Matthew Chace** (2020–2022), conducted simulations using GMAT for cislunar mission design.
- **Alex Sterzing** (Spring 2021), analyzed data on hurricanes in relation to provided satellite coverage, supported by FYRE program.

- **Ramses Young** (2020–2021), conducted simulations for hybrid chemical-electric orbit-raising, supported by WSU/NASA JSP.
- **Shritha Jagadheeswaran** (Summer 2020), conducted simulations for hardware-in-the-loop attitude dynamics simulations, supported by CoE.
- **Linda Harl** (Summer 2020), conducted simulations on Lambert’s problem, supported by WSU/NASA JSP.
- **Bryan Cline** (2019–2020), conducted Monte Carlo simulations for propagation of uncertainties associated with launch of all-electric satellites, supported by WSU/NASA JSP.
- **Dillon Whitmarsh** (2019–2020), analyzing cost of a heliocentric space mission, supported by WSU/NASA Jump Start Program.
- **Shireen Fikree** (2019–2020), conducted research related to system engineering tests for nano-satellites, supported through a NASA project.
- **Gaberial Booker** (2018), worked on designing weights for manual stabilization for air bearing platform, supported by WSU/NASA JSP and WSU Honors College Undergraduate Research and Creative Activity (URCA) program.
- **Skylar Dean** (2017–2018), conducted simulations for a heliocentric mission design, WSU/NASA JSP.
- **Brina Wallace** (2018–19), conducted simulations related to spacecraft attitude dynamics, supported by WSU/NASA JSP and Honors College URCA program.
- **Chimuka Cheepa** (2018), analyzed attitude dynamics of an air bearing platform, supported by WSU Honors College URCA program.
- **Samadini Weerasakera** (2018), worked on a project on nanosatellite propulsion, supported by CoE.
- **Nathan Lipsinki** (2016–2017), analyzed coverage for satellites, WSU/NASA JSP.
- **Levi Mann** (2016), worked on satellite attitude determination, supported by NASA JSP.
- **Eric LaRue** (2016), conducted mission analysis for flying a dark matter detector, supported by a WSU internal grant, won two awards at WSU Engineering Open House (jointly with Hooloomaan Ramdial).
- **Hooloomaan Hommes Ramdial** (2016), conducted mission analysis for flying a dark matter detector, won two awards at WSU Engineering Open House (jointly with Eric LaRue).
- **Ehiremen Nathaniel Omoarebun** (2015–2016), conducted simulations related to all-electric satellite attitude dynamics, supported by Honors College URCA program.
- **Alexander Foster** (2014–2015), conducted simulations related to radiation damage dose computation for Earth-orbiting satellites, supported by a NASA grant, won award at the 2015 Kansas Capitol Graduate Research Symposium held at Topeka, KS.
- **Christina Wilson** (2014–2015), conducted hardware-in-the-loop simulation for maneuver planning, supported by a NASA project.
- **Nathan Templon** (2014), conducted heliocentric mission analysis using gravity assists, won award at WSU Undergraduate Research and Creative Activity Forum (URCAF).

OTHER INDIVIDUAL STUDENT SUPERVISION

- Kord Byers (2019–2020), Spacecraft attitude control.
- Akshay Tummala (2016–2018), Nanosatellite mission analysis.
- Manoj Panthi (2016), Spacecraft attitude control.
- Sainath Vijayan (2014–2015), All-electric satellite mission analysis.

GRADUATE COURSES DEVELOPED

- **Nanosatellite Engineering** (AE-718, 3 credit hours) provides a fundamental understanding of spacecraft design applied to nano-satellite missions. Specific topics covered in this course include mission analysis, attitude control, electrical power systems, propulsion subsystem, thermal system, telemetry, data handling/processing and systems engineering tests. The course includes hands-on experimentation utilizing nano-satellite educational kits.
- **Modern Flight Control System Design II** (AE-807, 3 credit hours) provides an overview of the application of optimal control techniques to flight systems. Specific topics covered are optimal spacecraft trajectories including high-thrust and low-thrust transfers, optimization of powered and unpowered atmospheric flights, numerical methods including both direct and indirect optimization schemes.
- **Advanced Matlab** (AE-770, 0.5 credit hour Badge course) provides an overview of Matlab tools for the simulation of dynamic systems, design of controllers and optimization of goals subject to constraints.

LABORATORY DEVELOPED

Astronautics Laboratory has the following capabilities for training undergraduate and graduate students related to space flight dynamics and control theory: two nano-satellite educational kits for understanding space systems engineering, air-bearing platform for understanding attitude dynamics and control, small control moment gyroscope platform, computer workstations with commercial non-linear programming solvers as well as in-house software tools to analyze spacecraft missions.

EDUCATION AND OUTREACH GRANTS

- Co-Principal Investigator, “Enhancing Disaster Literacy of Kansas Communities Through Incorporation Of NASA-Relevant Materials in Middle School Curriculum,” NASA Kansas Space Grant Consortium, Award amount: \$50,000, Cost match: \$ 25,000, 2022–23, PI: Rajiv Bagai (School of Computing), My share: 20%.
- Co-Principal Investigator, “Celebrating The Scientific Legacy of NASA and Apollo: Symposia and Student Award Competitions,” NASA Space Grant Consortium, 2019, Award amount: \$12,580, Cost match: \$6,290, PI: James Schwartz (Philosophy), My share: 25%.

COURSES TAUGHT

- **AE-415**, *Introduction to Space Dynamics*, Fall 2014–2022, Spring 2015, 2017.
- **AE-607**, *Flight Control System*, Fall 2019–2022.
- **AE-707**, *Modern Flight Control System Design I*, Spring 2019–2023.
- **AE-715**, *Intermediate Space Dynamics*, Spring 2014, 2016, 2020, 2022.

- **AE-718**, *Nano-satellite Engineering*, Spring 2023, ran as *two different special topics course* during 2015, 2017–19, 2021, 2023.
- **AE-773**, *Intermediate Dynamics*, Spring 2016, 2018.
- **AE-807**, *Modern Flight Control System Design II*, Fall 2015, 2018.
- **AE-690**, *Independent Study (undergraduate)*, offered three times.
- **AE-890**, *Independent Study (graduate)*, offered three times.

GRADUATE STUDENT ADVISORY COMMITTEES

- **Member, Ph.D. Dissertation Committee**
 - Jonathan Folkerts, Physics, Wichita State University, current.
 - Balaji Karthikeyan, Aerospace Engineering, Wichita State University, current.
 - Smitha Haridasan, School of Computing, Wichita State University, current.
 - Meysam Ghanavati, Electrical Engineering, Wichita State University, 2017.
 - Scott Reed, Aerospace Engineering, Wichita State University, 2017.
 - Debesh Bhatta, Electrical Engineering, Georgia Tech, 2014.
 - Prabir Saha, Electrical Engineering, Georgia Tech, 2013.
 - Tonmoy Mukherjee, Electrical Engineering, Georgia Tech, 2010.
- **Member, M.S. Thesis Committee**
 - Madhurika Patil, School of Computing, Wichita State University, 2022.
 - Shrey Tripathi, Physics, Wichita State University, 2021.
 - Brian Doty, Physics, Wichita State University, 2021.
 - Jonathan Folkerts, Physics, Wichita State University, 2020.
 - Jesus Gomez, Aerospace Engineering, Wichita State University, 2019.
 - Thomas Thibodeaux, Aerospace Engineering, Wichita State University, 2019.
 - Nidhi Sathyanarayana, Aerospace Engineering, Wichita State University, 2019.
 - Caleb Gimar, Physics, Wichita State University, 2019.
 - Vinod Yadav, Electrical Engineering, Wichita State University, 2015.
 - Shuang Xia, Electrical Engineering, Wichita State University, 2014.

MISCELLANEOUS TEACHING

- Delivered 12 lectures of a graduate course on “Optimal Control” in Fall 2009 at Georgia Tech on behalf of Dr. John-Paul Clarke.
- Delivered 2 lectures of an undergraduate course “Space System Design” in Fall 2013 at Princeton University on behalf of Dr. Jeremy Kasdin.
- Conducted recitation classes (Fall 2003) and experimental labs (Spring 2009) as a teaching assistant at Georgia Tech.

V RESEARCH

EXTERNAL RESEARCH GRANTS

Role: Research Lead – Principal Investigator (PI) or Science PI

- G6) “Artificial Intelligence Assisted Spacecraft Trajectory Optimization and Planning,” NASA EPSCOR Cooperative Agreement Notice, 2020-2023, Award amount: \$750,000, Cost match: \$375,000 (State-level EPSCOR directors serve as default PI or administrative leads under this program).
- G5) “Continuous Monitoring of Hurricanes Using RaIn CubeSats,” NASA SMD FINESST Program, Earth Science Division, 2019–2022, Award amount: \$135,000 (Future Investigator: Pardha Sai Chadalavada).
- G4) “Integrated Optimization Framework for Detecting and Characterizing Unobserved Spacecraft Maneuvers,” Air Force Research Laboratory, Extension Grant to Visiting Faculty Research Program, 2019, Award amount: \$9,457.
- G3) “Optimal Control Based Approach to Spacecraft Maneuver Detection,” Air Force Research Laboratory, Extension Grant to Visiting Faculty Research Program, 2018, Award amount: \$7,500.
- G2) “Hardware Implementable Control Algorithms for Space Missions,” *Kansas NASA EPSCOR Program Partnership Development Grant*, 2018–2019, Award amount: \$15,200, Cost Match: \$3,041.
- G1) “Multi-Objective Optimization Framework for Spacecraft Low-Thrust Orbit-Raising,” Kansas NASA EPSCOR Program Seed Research Initiative, 2014–2015, Award amount: \$119,484, Cost Match: \$46,595.

Role: Co-Principal Investigator (Co-PI) or Co-Investigator

- CG3) “Understanding and Mitigating Bias of AI-based Natural Disaster Assessment Models for Rescue Coordination and Resiliency,” *NSF EPSCOR REI*, 2023–24, Award amount: \$49,983, Co-I share: 20%, PI: Dr. Ajita Rattani (School of Computing, WSU).
- CG2) “Cube-Sat Space Flight test of a Neutrino Detector,” *NASA Innovative Advanced Concepts (NIAC) Phase III*, 2021–23, Award amount: \$1,999,998, Co-I share: 20% of WSU share of \$1,099,959, PI: Dr. Nick Solomey (Physics, WSU).
- CG1) “Astrophysics and Technical Lab Studies of a Solar Neutrino Spacecraft Detector,” *NASA Innovative Advanced Concepts (NIAC) Phase II*, 2019–21, Award amount: \$500,000, Co-I share: 23% of WSU share of \$390,628, PI: Dr. Nick Solomey (Physics, WSU).

INSTITUTIONAL GRANT

- Disaster Resilience Analytics Center, WSU President’s Convergent Science Initiative, 2020–2023 (Co-PI in first year, but serving as PI/Director from year 2 after departure of original PI from WSU. Team consists of more than fifteen faculty across five different colleges).

JOURNAL PUBLICATIONS

(Student co-authors, working under direct supervision, have been underlined.)

- J15) A. Mughal, P. Chadalavada, A. Munir, A. Dutta, M. Qureshi, “Design of deep neural networks for transfer time prediction of spacecraft electric orbit-raising,” Elsevier Intelligent Systems with Applications, Vol. 15, 2022, Art no 200092.
<https://doi.org/10.1016/j.iswa.2022.200092>.
- J14) P. Chadalavada and A. Dutta, “Regional CubeSat Constellation Design to Monitor Hurricanes,” IEEE Transactions on Geoscience and Remote Sensing, vol. 60, pp. 1-8, 2022, Art no. 1001608.
 doi: 10.1109/TGRS.2021.3124473.
- J13) P. Chadalavada, T. Farabi, A. Dutta, “Sequential Low-Thrust Orbit-Raising of All-Electric Satellites,” MDPI Aerospace, Special Issue on Electric Propulsion, Vol 7(6), No 74, pp. 1-27.
<https://doi.org/10.3390/aerospace7060074>
- J12) S. Sreesawet, A. Dutta, “Fast and Robust Computation of Low-Thrust Orbit-Raising Trajectories,” *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 41, No. 9 (2018), pp. 1888–1905.
<https://doi.org/10.2514/1.G003319>
- J11) Y. Zhao, A. Dutta, P. Tsiotras, M. Costello, ”Optimal Aircraft Trajectories for Wind Energy Extraction,” *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 41, No. 2 (2018), pp. 488–496 (Engineering Note). <http://dx.doi.org/10.2514/1.G003048>
- J10) A. Tummala, A. Dutta, “An Overview of Cube-Satellite Propulsion Technologies and Trends,” *MDPI Aerospace*, Vol. 4, No. 58 (2017), pp. 1–30. <http://dx.doi.org/10.3390/aerospace4040058>
- J9) A. Dutta, J. Kasdin, E. Choueiri, P. Francken, “Minimizing Proton Displacement Damage Dose during Electric Orbit-raising of Satellites,” *AIAA Journal of Guidance, Control and Dynamics*, Vol. 39, No. 4 (2016), pp. 963–969 (Engineering Note).
<https://doi.org/10.2514/1.G000503>
- J8) B. Du, Y. Zhao, A. Dutta, J. Yu, X. Chen, “Optimal scheduling of Multi-spacecraft Refueling Based on Cooperative Maneuver,” *Elsevier Advances in Space Research*, Vol. 55, No. 12 (2015), pp. 2808–2819. <http://dx.doi.org/10.1016/j.asr.2015.02.025>
- J7) P. Libraro, J. Kasdin, E. Choueiri, A. Dutta, “Quaternion-Based Coordinates for Non-Singular Modeling of High-Inclination Orbital Transfer,” *AIAA Journal of Guidance, Control and Dynamics*, Vol. 37, No. 5 (2014), pp. 1638–1643 (Engineering Note).
<http://dx.doi.org/10.2514/1.G000613>
- J6) S. Coene, F. Spieksma, A. Dutta and P. Tsiotras, “On the Computational Complexity of P2P Refueling Strategies,” *INFOR: Informational Systems and Operations Research*, Vol. 50, No. 2 (2012), pp 88–94. <https://doi.org/10.3138/infor.50.2.088>
- J5) A. Dutta, N. Arora, R. Russell, “Peer-to-Peer Refueling Strategy using Low-Thrust Propulsion,” *AIAA Journal of Spacecraft and Rockets*, Vol. 49, No. 5 (2012), pp 944–954.
<https://doi.org/10.2514/1.A32106>
- J4) A. Dutta and P. Tsiotras, “A Network Flow Formulation for Cooperative P2P Refueling Strategies,” *AIAA Journal of Guidance, Control and Dynamics*, Vol. 33, No. 5 (2010), pp. 1539–1549. <https://doi.org/10.2514/1.45570>

- J3) A. Dutta and P. Tsiotras, “Hohmann-Hohmann and Hohmann-Phasing Cooperative Rendezvous Maneuvers,” *AAS Journal of the Astronautical Sciences*, Vol. 57, No. 1–2 (2009), pp. 393–417.
<https://doi.org/10.1007/BF03321510>
- J2) A. Dutta and P. Tsiotras, “An Egalitarian Peer-to-Peer Satellite Refueling Strategy,” *AIAA Journal of Spacecraft and Rockets*, Vol. 45, No. 3 (2008), pp. 608–618.
<https://doi.org/10.2514/1.31299>
- J1) A. Dutta and P. Tsiotras, “Asynchronous Optimal Mixed Peer-to-Peer Satellite Refueling Strategies,” *AAS Journal of the Astronautical Sciences*, Vol. 54, No. 3–4 (2006), pp. 543–565.
<https://doi.org/10.1007/BF03256505>

CONFERENCE/WORKSHOP PROCEEDINGS (WHERE FULL MANUSCRIPT IS REVIEWED)

(Student co-authors, working under direct supervision, have been underlined.)

- CP6) P. Chadalavada, A. Dutta, “CubeSat Formations for Monitoring Hurricanes,” *IEEE Aerospace Conference*, Big Sky, MT, Mar 2022, pp. 1-12.
 doi: 10.1109/AERO53065.2022.9843636.
- CP5) S. Haridasan, A. Rattani, Z. Demisse, A. Dutta, “Multispectral Deep Learning Models for Wildfire Detection,” International Workshop on Data-driven Resilience Research, June 2022.
- CP4) S. Kotha, S. Haridasan, A. Rattani, A. Bowen, G. Rimmington, A. Dutta, “Multimodal Combination of Text and Image Tweets for Disaster Response Assessment,” International Workshop on Data-driven Resilience Research, June 2022.
- CP3) S. Sreesawet, A. Dutta, “Receding Horizon Control for Spacecraft with Low-Thrust Propulsion,” *American Control Conference*, Milwaukee WI, Jun 2018.
<https://doi.org/10.23919/ACC.2018.8431788>
- CP2) A. Dutta, “Optimal Low-Thrust Orbital Transfers for Rendezvous Between Active Spacecraft with Return Position Constraints,” *AIAA Guidance Navigation and Control Conference, AIAA SciTech Forum*, Kissimmee FL, Jan 2015 (AIAA 2015-2012).
<https://doi.org/10.2514/6.2015-2012>
- CP1) A. Dutta, P. Libraro, J. Kasdin, E. Choueiri, P. Fracken, “Minimum-Fuel Electric Orbit Raising of Telecommunication Satellites Subject to Time and Radiation Damage Constraints,” *American Control Conference*, Portland OR, Jun 2014, pp. 2943–2947.
<https://doi.org/10.1109/ACC.2014.6859179>

CONFERENCE/SYMPOSIUM PROCEEDINGS (WHERE EXTENDED ABSTRACT IS REVIEWED)

(Student co-authors, working under direct supervision, have been underlined.)

- C47) P. Chadalavada, A. Dutta, “Hybrid Constellation Design of CubeSats for Monitoring Hurricanes,” AAS/AIAA Space Flight Mechanics Meeting, Austin TX, Jan 2023.
- C46) A. Dasyam, A. Dutta, “Artificial Neural Network based Atmospheric Density Model for Aerobraking Trajectory Design,” AAS/AIAA Space Flight Mechanics Meeting, Austin TX, Jan 2023.
- C45) A. Arustei, A. Dutta, “An adjoint sensitivity method for the sequential low-thrust orbit raising problem,” AAS/AIAA Astrodynamics Specialist Conference, Charlotte NC, Aug 2022.

- C44) P. Chadalavada, A. Dutta, “Relative Coverage Analysis for Hurricane Monitoring Formations,” AAS/AIAA Astrodynamics Specialist Conference, Charlotte NC, Aug 2022.
- C43) Y. Pillay, M. Chace, J. Steck, A. Dutta, “Neural Network for predicting unmodelled dynamics in multi-revolution transfers in cis-lunar missions,” AAS/AIAA Astrodynamics Specialist Conference, Charlotte NC, Aug 2022.
- C42) P. Chadalavada, A. Dutta, “Coverage Characteristics of Hurricane Monitoring CubeSat Constellations under Orbital Perturbations,” AAS/AIAA Space Flight Mechanics Meeting (AIAA Scitech Forum), San Diego CA, Jan 2022.
- C41) P. Chadalavada, A. Dutta, P. Ghosh, “An Efficient Algorithm for the Longitude-Targeted Ascent of All-Electric Satellites,” AAS/AIAA Space Flight Mechanics Meeting (AIAA Scitech Forum), San Diego CA, Jan 2022.
- C40) A. Dasyam, P. Chadalavada, C. Fry, A. Dutta, C. McLaughlin, “Neural Network Based Estimation of Atmospheric Density during Aerobraking,” AAS/AIAA Astrodynamics Specialist Meeting, Virtual, Aug 2021.
- C39) Y. Pillay, M. Chace, K. Messick, J. Steck, A. Dutta, “Modified State Observer for Characterization of Unmodeled Dynamics in Cis-lunar Missions,” AAS/AIAA Astrodynamics Specialist Meeting, Virtual, Aug 2021 (AAS 21-737).
- C38) G. Subedi, A. Dutta, “Modified State Observer for Attitude Synchronization of Formation Flying Spacecraft,” AAS/AIAA Space Flight Mechanics Meeting, Virtual, Feb 2021 (AAS 21-371).
- C37) K. Messick, A. Dutta, H. Meyer, N. Solomey, “Preliminary Mission Design for Proposed NuSol Probe,” AAS/AIAA Space Flight Mechanics Meeting, Virtual, Feb 2021 (AAS 21-377).
- C36) T. Farabi, A. Dutta, “Artificial Neural Network Based Prediction of Solar Array Degradation during Electric Orbit-Raising,” AAS/AIAA Space Flight Mechanics Meeting, Virtual, Feb 2021 (AAS 21-424).
- C35) P. Chadalavada, A. Dutta, “Minimizing Ground Track Closure Error of Repeating Ground Track Orbits to Monitor Hurricanes using CubeSats,” AAS/AIAA Astrodynamics Specialist Conference, Virtual, Aug 2021 (AAS 20-691).
- C34) A. Dutta, J. Raquepas, “Stochastic Optimization Framework for Spacecraft Maneuver Detection,” *AAS/AIAA Space Flight Mechanics Meeting, AIAA Scitech Forum*, Orlando FL, Jan 2020.
- C33) N. Bascue, A. Dutta, P. Ghosh, “Impact of Launch Injection Errors on Orbit-Raising of All-Electric Satellites,” *AAS/AIAA Space Flight Mechanics Meeting, AIAA Scitech Forum*, Orlando FL, Jan 2020.
- C36) L. Arora, A. Dutta, “Reinforcement Learning for Sequential Low-Thrust Orbit Raising Problem,” *AAS/AIAA Space Flight Mechanics Meeting, AIAA Scitech Forum*, Orlando FL, Jan 2020.
- C32) A. Dutta, “Selecting Planning Horizon Length for Sequential Low-Thrust Orbit-Raising Optimization Problem,” *AAS/AIAA Astrodynamics Specialist Conference*, Portland ME, Aug 2019 (AAS 19-878).
- C31) A. Dutta and L. Arora, “Objective Function Weight Selection for Sequential Low-Thrust Orbit-Raising Optimization Problem,” *AAS/AIAA Space Flight Mechanics Meeting*, Ka’anapali, HI, Jan 2019 (AAS 19-567).

- C30) A. Dutta and J. Raquepas, "Spacecraft Maneuver Detection using Optimal Control Problem and Relative Equation of Motion," *AAS/AIAA Astrodynamics Specialist Conference*, Snowbird UT, Aug 2018 (AAS 18-459).
- C29) S. Chadalavada and A. Dutta, "Spacecraft Relative Equations of Motion using a New Set of Orbital Elements," *AAS/AIAA Astrodynamics Specialist Conference*, Snowbird UT, Aug 2018 (AAS 18-455).
- C28) S. Sreesawet, A. Dutta, "'Mission Scenario Analysis for All-Electric Satellites," *AAS/AIAA Space Flight Mechanics Meeting, AIAA SciTech Forum*, Kissimmee FL, Jan 2018, pp 2996 – 3001.
<https://doi.org/10.2514/6.2018-0722>
- C27) A. Dutta, "CubeSat Communication Network for Supporting Mars Surface Operations," *IAF International Workshop on Satellite Constellation and Formation Flying*, Boulder CO, Jun 2017.
- C26) S. Sreesawet, A. Dutta, "A Novel Methodology for Fast and Robust Computation of Low-Thrust Orbit-Raising Trajectories," *AAS/AIAA Space Flight Mechanics Meeting*, San Antonio TX, Feb 2017 (AAS 17-510).
- C25) P. Karampudi, A. Dutta, "De-Orbit Time Of On-Orbit Debris For Laser-Based Removal Methods," *AAS/AIAA Space Flight Mechanics Meeting*, San Antonio TX, Feb 2017 (AAS 17-501).
- C24) A. Dutta, "Computational Performance of GRASP Algorithms for Spacecraft Multi-Rendezvous Mission Planning," *AIAA/AAS Astrodynamics Specialist Conference*, AIAA SPACE Forum, Long Beach CA, 2016 (AIAA 2016-5509). <https://doi.org/10.2514/6.2016-5509>
- C23) A. Dutta, S. Vijayan, T. Olson, "Deployment of High Power Class All-Electric Satellites in the Geosynchronous Equatorial Orbit," *AIAA/AAS Astrodynamics Specialist Conference*, AIAA SPACE Forum, Long Beach CA, 2016. <https://doi.org/10.2514/6.2016-5639>
- C22) A. Dutta, "GRASP Algorithm for Multi-Rendezvous Mission Planning for Optimized Trip Times," *AAS/AIAA Astrodynamics Specialist Conference*, Vail CO, Aug 2015.
- C21) S. Sreesawet, V. Pappu, A. Dutta, J. Steck, "Neural Networks Based Adaptive Controller for Attitude Control of All-Electric Satellites," *AAS/AIAA Astrodynamics Specialist Conference*, Vail CO, Aug 2015 (AAS 15-754).
- C20) S. Sreesawet, A. Dutta, "Low-Thrust Orbit-Raising Trajectories using Eclipse Constraints," *AAS/AIAA Space Flight Mechanics Meeting*, Williamsburg VA, 2015 (AAS 15-431).
- C19) S. Vijayan, A. Dutta, "Low-Thrust Orbit-Raising using Non-Singular Orbital Elements and Proximity Quotient Approach," *Space Flight Mechanics Meeting*, Williamsburg VA, 2015 (AAS 15-416).
- C18) A. Foster, A. Dutta, "Analytical Model of Van Allen Proton Radiation Flux for Low-Thrust Trajectory Optimization Solvers," *Space Flight Mechanics Meeting*, Williamsburg VA, 2015 (AAS 15-407).
- C17) A. Dutta, "A Greedy Random Adaptive Search Procedure for Multi-Rendezvous Mission Planning," *AAS/AIAA Space Flight Mechanics Meeting*, Williamsburg VA, 2015 (AAS 15-460).
- C16) A. Dutta, S. Sreesawet, S. Vijayan, A. Foster, "On the Design of the Power and Propulsion Subsystem of All-Electric Telecommunication Satellites," *AIAA International Communica-*

- tion Satellite Systems Conference*, San Diego CA, Aug 2014 (AIAA 2014-4243).
<https://doi.org/10.2514/6.2014-4243>
- C15) P. Libraro, J. Kasdin, A. Dutta, E. Choueiri, “Application of a Quaternion-Based Formulation to the Electric Orbit-Raising of GEO Satellites from High-Inclination Injection Orbits,” *Astrodynamics Specialist Conference*, San Diego, Aug 2014 (AIAA 2014-4426).
<https://doi.org/10.2514/6.2014-4426>
- C14) A. Dutta, P. Libraro, J. Kasdin, E. Choueiri, P. Fracken, “Design of the Next-Generation All-Electric Telecommunication Satellites,” *AIAA International Communications Satellite Systems Conference*, Florence, Italy, 2013 (AIAA 2013-5625). <https://doi.org/10.2514/6.2013-5625>
- C13) A. Dutta, “Low-Thrust Egalitarian Peer-to-Peer Maneuvers for Servicing Satellites in Circular Constellations,” *AAS/AIAA Spaceflight Mechanics Meeting*, Kauai, HI, 2013 (AAS 13-472).
- C12) A. Dutta, P. Libraro, J. Kasdin, E. Choueiri, “Satellite Power Subsystem Requirements for Time-Constrained Electric Orbit-Raising with Minimal Radiation Impact,” *AAS/AIAA Spaceflight Mechanics Meeting*, Kauai, HI, 2013 (AAS 13-256).
- C11) A. Dutta, P. Libraro, J. Kasdin, E. Choueiri, “Minimizing Radiation Fluence during Time Constrained Electric Orbit-Raising,” *International Symposium of Space Flight Dynamics*, Pasadena, CA, 2012.
- C10) A. Dutta, P. Libraro, J. Kasdin, E. Choueiri, “A Direct Optimization Based Tool to Determine Orbit-Raising Trajectories to GEO for All-Electric Telecommunication Satellites,” *AAS/AIAA Astrodynamics Specialist Conference*, Minneapolis, MN, 2012 (AIAA 2012-4589).
<https://doi.org/10.2514/6.2012-4589>
- C9) A. Dutta, “On-Orbit Servicing of Satellites in Circular Constellations using a Single Service Vehicle,” *AAS/AIAA Space Flight Mechanics Meeting*, New Orleans, LO, 2011 (AAS 11-227).
- C8) A. Dutta, “Peer-to-Peer Servicing of Satellites in Circular Constellations,” *AAS/AIAA Space Flight Mechanics Meeting*, New Orleans, LO, 2011 (AAS 11-230).
- C7) A. Dutta, N. Arora, and R. Russell, “A Peer-to-Peer Refueling Strategy using Low-Thrust Propulsion,” *AAS Astrodynamics Specialist Conference*, Pittsburg, PA, 2009 (AAS 09-392).
- C6) A. Dutta and P. Tsiotras, “A Cooperative Egalitarian P2P Strategy for Refueling Satellites in Circular Constellations,” *AAS/AIAA Space Flight Mechanics Meeting*, Savannah, GA, 2009 (AAS 09-109).
- C5) A. Dutta and P. Tsiotras, “A Cooperative Peer-to-Peer Strategy for Refueling Satellites in Circular Constellations,” *AIAA Space Conference and Exhibit*, San Diego, CA, 2008 (AIAA 2008-7643). <https://doi.org/10.2514/6.2008-7643>
- C4) A. Dutta and P. Tsiotras, “Hohmann-Hohmann and Hohmann-Phasing Cooperative Rendezvous Maneuvers,” *AAS L. Markley Astronautics Symposium*, Chesapeake Bay, MD, 2008 (AAS 08-297).
- C3) A. Dutta and P. Tsiotras, “A Network Flow Formulation for an Egalitarian Peer-to-Peer Refueling Strategy,” *AAS/AIAA Space Flight Mechanics Meeting*, Sedona, AZ, 2007 (AAS 07-151).
- C2) A. Dutta and P. Tsiotras, “A Greedy Random Adaptive Search Procedure for Optimal Scheduling of P2P Refueling,” *AAS/AIAA Space Flight Mechanics Meeting*, Sedona, AZ, 2007 (AAS 07-150).

- C1) A. Dutta and P. Tsiotras, “Asynchronous Optimal Mixed Peer-to-Peer Satellite Refueling Strategies,” *AAS Malcom D. Shuster Astronautics Symposium*, Buffalo, NY, 2005 (AAS 05-474).

TECHNICAL REPORTS AND DISSERTATION

- T6) A. Dutta, “Uncertainty Propagation Applied to Spacecraft Maneuver Detection,” Final Report, Visiting Faculty Research Program (VFRP), Air Force Research Laboratory, Rome NY, Aug 2019.
- T5) A. Dutta, “Spacecraft Maneuver Detection,” Final Report, Visiting Faculty Research Program (VFRP), Air Force Research Laboratory, Rome NY, Aug 2018.
- T4) N. Solomey, A. Dutta, “Technology Development for a Deep Space Dark Matter Search Experiment,” Final Report, Multidisciplinary Research Project Award, Wichita State University, Sep 2016.
- T3) A. Dutta, “Kansas NASA EPSCOR Program Seed Research Initiative: Multi-Objective Low-Thrust Optimization Framework for Spacecraft Low-Thrust Orbit-Raising,” Final Report, Kansas NASA EPSCOR Program, NASA in Kansas, Nov 2015.
- T2) J. Kasdin, E. Choueiri, A. Dutta, P. Libraro, “Potential of Electric Propulsion on Future Geostationary Satellite Architectures,” Final Report to SES, Princeton NJ, Oct 2014.
- T1) J. Clarke, K. Feigh, A. Dutta, B. Lee, S. Milway, C. Tino, “Final Findings on the Development and Evaluation of an En-Route Fuel Optimal Conflict Resolution Algorithm to Support Strategic Decision-Making,” PARTNER Project 5 Report No. PARTNER-COE-2012001, Georgia Institute of Technology, Jan 2012.
- D) A. Dutta, “Optimal Cooperative and Non-Cooperative Peer-to-Peer Maneuvers for Refueling Satellites in Circular Constellations,” *Ph.D. Dissertation*, Georgia Institute of Technology, USA, May 2009 (Advisor: Dr. Panagiotis Tsiotras). <http://hdl.handle.net/1853/28082>

PRESENTATIONS ONLY

- Recent Presentations

- A. Dutta, R. Bagai, Z. Demissie, A. Bowen, M. Sclafani, “Enhancing disaster literacy among middle school children for improving community resilience,” GSA South-Central Meeting (Special Session on *Improving Natural Hazard Resilience of the Society*), Stillwater OK, Mar 2023.
- A. Dutta, “Overview of Data-Driven Hazard Detection Research at WSU’s Disaster Resilience Analytics Center for Enhancing Community Resilience,” International Workshop on Data-Driven Resilience Research, Jun 2022 (Virtual).
- A. Dutta, “Optimization Framework for Spacecraft Maneuver Detection,” Air Force Research Laboratory, Rome NY, Jul 2019.
- A. Dutta, “How to fly a spacecraft?”, Wichita Space Initiative, Wichita KS, 2019.
- A. Dutta, “Spacecraft maneuver planning and detection,” Air Force Research Laboratory, Rome NY, Jul 2018.
- A. Dutta, “Optimal planning and detection of spacecraft maneuvers,” Armed Forces Communications and Electronics Association (AFCEA) Erie Canal Chapter C4I and Cyber Technology Symposium, Utica NY, Jun 2018.

- Older Presentations

- Industrial and Manufacturing Engineering, Wichita State University, 2017.
- International Conference and Exhibition on Satellite, Houston, TX, Aug, 2015.
- Department of Mechanical Engineering, *Worcester Polytechnic Institute*, Worcester, MA, 2013.
- Department of Mechanical and Aerospace Engineering, *Missouri University of Science and Technology*, Rolla MO, 2012.
- Department of Aerospace Engineering, *Indian Institute of Technology*, Kanpur India, 2011 (Webinar).
- Department of Mechanical and Aerospace Engineering, *West Virginia Univ*, Morgantown WV, 2010.
- *Optimal Synthesis*, Palo Alto CA, 2008.
- Department of Aerospace Engineering, *Mississippi State University*, Starkville MS, 2008.
- *General Electric Global Research Center*, Niskayuna NY, 2008.

RESEARCH IMPACT

- Number of Citations as per Google Scholar = 571.
- Dynamic model developed in [J12] was ranked among the best for spacecraft trajectory optimization (first for geocentric mission and third for asteroid mission) by Junkins and Taheri in their 2019 study published in AIAA Journal of Guidance Control and Dynamics.
- Paper [J10] is the third-most cited among all papers published in MDPI Aerospace.
- Number of countries from where work has been cited = 12.

VI SERVICE

PROFESSIONAL SOCIETY MEMBERSHIPS

- Senior Member, American Institute of Aeronautics and Astronautics (AIAA).
- Member, AIAA Astrodynamics Technical Committee, 2017–Current (Secretary since 2018).
- Member, American Astronautical Society (AAS).
- Member, Control Systems Society, Institute of Electrical and Electronic Engineers (IEEE).

VII SERVICE TO LOCAL PROFESSIONAL SOCIETY

- Outgoing Chair, AIAA Wichita Section, 2022-23.
- Chair, AIAA Wichita Section, 2021-22 (served as the State Captain on AIAA Congressional Visits Day, organized monthly section meetings, represented the section at Region-V meetings, represented the section at meetings of the Wichita Council of Engineering Societies, helped with the organization of two dinner meetings and a virtual stem camp, represented the section at two engineering fairs (one prior to WCES Annual Banquet and one during SWE Engineering Expo).
- Vice Chair, AIAA Wichita Section, 2020-21.
- *Report Judge*, AIAA Design Build Fly Competition, 2015.

- *Judge*, AIAA Region-V Student Conference, 2015.
- *Judge*, AIAA Region-I Student Conference, 2012–2013.

CONFERENCE ORGANIZATION

- AIAA Technical Chair, AAS/AIAA Astrodynamics Specialist Conference, Charlotte NC, Aug 7–11, 2022.
- Co-organizer of a public, free to attend, 1-day symposium on “Celebrating The Scientific Legacy of NASA and Apollo” held on WSU campus on 2019.

CONFERENCE SESSION ORGANIZATION

- *Session Chair*, “Session: Orbital Dynamics, Perturbations, and Stability” at AAS/AIAA Space Flight Mechanics Meeting, Austin TX, Jan 2023.
- *Session Chair*, “Session 11: Cislunar - II” at AAS/AIAA Astrodynamics Specialist Conference, held virtually, Aug 2021.
- *Session Chair*, “Session 27: Guidance and Control” at AAS/AIAA Space Flight Mechanics Meeting, held virtually, Feb 2021.
- *Session Chair* (jointly with Dr. R. Anderson), “Session 25: Orbital Dynamics, Perturbations, and Stability - II” at AAS/AIAA Astrodynamics Specialist Conference, held virtually, Aug 2020.
- *Session Chair*, “Session 453-SFM-20: Low-Thrust Trajectory Design and Optimization I” at AAS/AIAA Space Flight Mechanics Meeting (AIAA SciTech Forum), Orlando FL, Jan 2020.
- *Session Chair*, “Attitude Dynamics and Control I” at AAS/AIAA Astrodynamics Specialist Conference, Portland ME, Aug 2019.
- *Session Chair*, “Session 20: Trajectory Design and Optimization IV” at AAS/AIAA Space Flight Mechanics Meeting, Ka’anapali HI, Feb 2019.
- *Session Chair*, “Session 6: Attitude Dynamics and Control-III” at AAS/AIAA Astrodynamics Specialist Conference, Snowbird UT, Aug 2018.
- *Session Chair*, “Session 3: Astrodynamics-IV” at AAS/AIAA Astrodynamics Specialist Conference, Snowbird UT, Aug 2018.
- *Session Co-Chair*, “Optimization II” at American Control Conference, Jun 2018.
- *Session Chair*, “SFM-04 Low-Thrust Trajectory Optimization” at AAS/AIAA Space Flight Mechanics Meeting (part of AIAA SciTech Forum), Kissimmee FL, Jan 2018.
- *Session Chair*, “SFM-02 Trajectory Optimization I” at AAS/AIAA Space Flight Mechanics Meeting, San Antonio TX, Feb 2017.
- *Session Chair*, “ASD-08 Spacecraft GNC: Proximity Operations,” AIAA Space Forum, Astrodynamics Specialist Conference, Long Beach CA, 2016.
- *Session Chair*, “Astrodynamics-4,” Astrodynamics Specialist Conference, Vail CO, Aug, 2015.
- *Session Co-Chair*, “Optimization I,” American Control Conference, Portland OR, Jun, 2014.

SERVICE TO UNIVERSITY

- *Faculty Advisor*, Wichita State Rocket Club (undergraduate student organization), 2016–.
- *Member* of the WSU committee for hosting the TVIW Interstellar Workshop and NASA Interstellar Propulsion Symposium, 2019.
- *Advisor* for undergraduate students majoring in Aerospace Engineering, 2016–.
- *Judge*, WSU Wallace Invitational for Scholarship in Engineering Competition, 2014–18, 2021–22.
- *Member*, AE Departmental Committee on two-year associate degree students, 2017.
- *Member*, AE Certificate Ideas Committee, 2017.
- *Notebook Judge*, Kansas BEST Robotics Competition, 2016–17.
- *Poster Judge*, WSU Graduate Research and Scholarly Projects Symposium, 2017.
- *Observer*, WSU Distinguished Scholarship Invitational, 2015.
- *Judge*, WSU Undergraduate Research and Creative Activity Forum, 2015.
- *Mission Judge*, Mindstorms, Wichita State University, 2015.
- *Judge*, Princeton Graduate Research Symposium, Princeton University, 2011.
- *Jury*, Faculty Status and Grievance Committee, Georgia Tech, 2011.

JOURNAL REVIEW SERVICE

- AIAA Journals: Guidance, Control and Dynamics, Journal of Spacecraft and Rockets
- Elsevier Journals: Advances in Space Research, Acta Astronautica, Aerospace Science and Technology
- ASCE Journal of Aerospace Engineering
- IEEE Transactions: Automation Science and Engineering, Intelligent Transportation Systems
- Springer Journal of Optimization Theory and Applications

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