



## Atri Dutta, Ph.D.

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- 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*

- 2) Prathyusha Karampudi, "*De-orbit times for low-Earth orbit debris removal using laser ablation*," Dec 2019.
- 1) Suwat Sreesawet, \

- **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.

• **Pranav Mahajan** (2019{2020), conducted simulations for hybrid chemical-electric orbit-raising, supported by WSU/NASA JSP.

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### 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

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## V Research

External Research Grants

Journal Publications

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

- ~~http://dx.doi.org/10.1016/j.iswa.2022.200092~~ 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,"



- 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 Wild re 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 OrbitRaising 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

- 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

- 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

*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 Space ight 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 Space ight 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 Symposinposin*

- 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

- 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 ( 1st 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.
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- *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.
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### 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

*CV Last Updated: 04/17/2023.*