Harsh G. Bhundiya

U.S. Citizen • Los Angeles, CA • bhundiya@umd.edu • Google Scholar • LinkedIn

EDUCATION:

Massachusetts Institute of Technology **2025**
Ph.D., Department of Aeronautics and Astronautics
Massachusetts Institute of Technology **2022**
M.S., Department of Aeronautics and Astronautics, GPA: 5.0/5.0
California Institute of Technology **2020**
B.S., Mechanical Engineering with Minor in Aerospace, GPA: 4.0/4.0

AWARDS AND FELLOWSHIPS:

- NASA Space Technology Graduate Research Fellow, **2023-2025**
- MIT School of Engineering Communication Fellow, **2022-2025**
- MathWorks Engineering Fellow, **2022-2023**
- Tau Beta Pi Fellow, **2022-2023**
- Best AIAA Spacecraft Structures Research Paper, **2022**
- Best Student Lightning Talk, MIT SpaceTech **2022**

RESEARCH EXPERIENCE:

USC Department of Astronautical Engineering **2025 – present**
Postdoctoral Research Fellow

Johns Hopkins University Applied Physics Laboratory **2025**
Visiting Technologist, Astrodynamics and Control Systems Group

NASA Jet Propulsion Laboratory **2024**
Visiting Technologist, Guidance, Navigation, and Control Section

- Conducted dynamics experiments on a planar air-bearing testbed to understand spacecraft dynamics during in-space assembly of large structures. (C3)

MIT Aerospace Material and Structures Laboratory **2020 – 2025**
Doctoral Researcher

- Developed design guidelines for the efficient in-space assembly and manufacturing of large truss structures and estimates of fabrication time based on power, flexibility, and attitude control constraints. (J1)
- Formulated a concept for in-space assembly of an electrostatically-actuated mesh reflector, for application as a large communications antenna. (J2)
- Invented a method termed Bend-Forming for fabricating 3D wireframe structures via plastic deformation. (J3)
- Developed an engineering framework for assessing materials and processes for in-space manufacturing using quantitate performance metrics. (J4)

Caltech Space Structures Laboratory **2019 – 2020**
Undergraduate Researcher

- Designed a spring-loaded reel mechanism to maintain tension during spacecraft deployment.
- Manufactured carbon fiber longerons with hand lay-up.

Caltech Summer Undergraduate Research Fellowship (SURF) **2017**
Undergraduate Researcher

- Measured the effective radial thermal conductivities of 18650 and 22650 lithium-ion cells. (C7)

JOURNAL PUBLICATIONS:

Superscript * denotes the corresponding author.

J1. **H.G. Bhundiya**, M.A. Marshall, and Z.C. Cordero*, "Fabrication Time Diagrams for In-Space Manufacturing of Large Reticulated Structures," *Journal of Manufacturing Science and Engineering*, 146(12), **2024**. DOI

J2. J.Z. Zhang, **H.G. Bhundiya**, K.D. Overby, F. Royer, J.H. Lang, Z.C. Cordero*, W.F. Moulder, S.K. Jeon, and M.J. Silver, "Electrostatically Actuated X-Band Mesh Reflector with Bend-Formed Support Structure," *Journal of Spacecraft and Rockets*, 61(6), **2024.** DOI

J3. **H.G. Bhundiya**, Z.C. Cordero*, "Bend-Forming: A CNC Deformation Process for Fabricating 3D Wireframe Structures," *Additive Manufacturing Letters*, 6, **2023**. DOI

J4. **H.G. Bhundiya**, F. Royer, and Z. Cordero*, "Engineering Framework for Assessing Materials and Processes for In-Space Manufacturing," *Journal of Materials Engineering and Performance*, 31(2), **2022**. DOI

CONFERENCE PRECEEDINGS:

C1. **H.G. Bhundiya**, Z.C. Cordero, M.A. Marshall, "Passive Gravity Gradient Capture for In-Space Assembly and Manufacturing," AIAA/AAS Astrodynamics Specialist Conference (Boston, MA), Aug. **2025**.

C2. **H.G. Bhundiya**, Z.C. Cordero, "Radially Expanding Euler Paths for Assembly of Truss Structures," International Symposium on Space Technology and Science (Tokushima, Japan), Jul. **2025**.

C3. **H.G. Bhundiya**, Z.C. Cordero, M.A. Marshall, S. Mohan, D. Sternberg, and K. Lo, "Ground Testing of Spacecraft Attitude Dynamics During In-Space Assembly and Manufacturing," AIAA Scitech Forum (Orlando, FL), Jan. **2025**. DOI

C4. **H.G. Bhundiya**, J.Z. Zhang, K.D. Overby, F. Royer, J.H. Lang, Z.C. Cordero, W.F. Moulder, S.K. Jeon, and M.J. Silver, "Electrostatically Actuated X-Band Mesh Reflector with Bend-Formed Support Structure," AIAA Scitech Forum (National Harbor, MD), Jan. **2023**. DOI

C5. F. Royer*, J.Z. Zhang, K.D. Overby, E.Y. Zhu, **H.G. Bhundiya**, J.H. Lang, and Z.C. Cordero, "Electrostatically Actuated Thin-Shell Space Structures," AIAA Scitech Forum (National Harbor, MD), Jan. **2023**. DOI

C6. **(*Awarded 2022 AIAA Spacecraft Structures Best Paper*) H.G. Bhundiya**, F. Royer, and Z. Cordero, "Compressive Behavior of Isogrid Columns Fabricated with Bend-Forming," AIAA SciTech Forum (San Diego, CA), Jan. **2022**. DOI

C7. **H.G. Bhundiya**, M. Hunt, and B. Drolen, "Measurement of the Effective Radial Thermal Conductivities of 18650 and 26650 Lithium-Ion Battery Cells," NASA Thermal and Fluid Analysis Workshop (Galveston, TX), Aug. **2018**. DOI

INTELLECTUAL PROPERTY:

P1. **H.G. Bhundiya**, Z.C. Cordero, "Computer Numerical Control (CNC) Deformation Process for Forming 3D Wireframe Structures." US Patent Application No. 18/147,674. December 28, 2022.

INVITED TALKS:

T1. NASA Langley Research Center, "*Rapid In-Space Assembly and Manufacturing of Next-Generation Space Structures*," Hamton, VA, August **2025**.

T2. Johns Hopkins University Applied Physics Laboratory (APL), "*Rapid In-Space Assembly and Manufacturing of Next-Generation Space Structures*," Laurel, MD, July **2025**.

T3. NASA Goddard Spaceflight Center, "*Rapid In-Space Assembly and Manufacturing of Next-Generation Space Structures*," Greenbelt, MD, July **2025**.

T4. AIAA Emerging Spacecraft Structures Technology Workshop, "*Passive Gravity Gradient Capture for In-Space Assembly and Manufacturing*," Boulder, CO, June **2025**.

T5. MIT Small Satellite Collaborative Seminar, "*Fabrication Time Diagrams for In-Space Manufacturing of Reticulated Structures*," Boston, MA. October **2024**.
T6. AIAA Emerging Spacecraft Structures Technology Workshop, "*Fabrication Time Diagrams for In-Space Manufacturing of Reticulated Structures*," Boston, MA. July **2024**.
T7. Indian Institute of Technology (IIT) Gandhinagar Department of Mechanical Engineering, "*In-Space Manufacturing of Large Electrostatically-Actuated Mesh Reflectors*," Gujarat, India, January **2024**.
T8. American Institute of Aeronautics and Astronautics (AIAA) Emerging Spacecraft Structures Technology Workshop, "*Spacecraft Dynamics during In-Space Manufacturing*," Stanford, CA, August **2023**.
T9. U.S. National Congress of Computational Mechanics, "*Bend-Forming: A CNC Deformation Process for Fabricating 3D Wireframe Structures*," Albuquerque, NM, July **2023**.
T10. Air Force Research Laboratory (AFRL) Space Vehicles Directorate, "*In-Space Manufacturing of Large Electrostatically-Actuated Mesh Reflectors*," Albuquerque, NM, July **2023**.

TEACHING AND MENTORING:

Technical Communication Coach **2022 – 2025**
MIT School of Engineering Communication Lab
- Offered technical communication coaching to undergraduates, graduate students, and postdocs.
- Hosted 1-on-1 sessions with clients to provide feedback on technical writing and presentations.
- Hosted communication workshops such as "How to Organize a Research Paper".

Mentor for Undergraduate Research Opportunities Program **2022 – 2025**
MIT Department of Aeronautics and Astronautics
- Mentored four undergraduate researchers in the Aerospace Materials and Structures laboratory. Supervised their research projects and writing of final reports.
- Nominated for 2025 Outstanding Mentor

Volunteer Instructor **2022 – 2024**
MIT Educational Studies Program
- Taught a biannual class called "Geometry and Beauty of Soap Bubbles" to >100 middle schoolers and high schoolers through the MIT Educational Studies Program.

Mentor for Graduate Application Assistance Program **2020 – 2024**
MIT Department of Aeronautics and Astronautics
- Provided guidance and feedback to undergraduates from underrepresented backgrounds applying to STEM graduate schools by reviewing essays, CVs, and other application materials.

Professional STEM Tutor **2020 – 2025**
- Certified tutor for SAT, GRE, precalculus, and calculus. Taught >10 students.

Undergraduate Teaching Assistant **2019 – 2020**
Caltech Department of Mechanical Engineering
- Served as a teaching assistant for five classes: Thermodynamics, Fluid Dynamics, Statics, Dynamics, and Mechanics of Materials.
- Graded homework and exams, hosted weekly office hours, and wrote homework solutions.

LEADERSHIP AND SERVICE:

Member of AIAA Spacecraft Structures Technical Committee **2024 – present**
- Reviewing abstracts for AIAA Scitech Forum conference.
- Judging papers for annual AIAA Spacecraft Structures Best Paper award.

Voluntary Peer Reviewer 2023 – present

- Serving as an anonymous reviewer for papers in *Acta Astronautica* and *Journal of Spacecraft and Rockets*.

Cambridge Science Festival Guest Lecturer **2023**

- Gave a lecture titled "Manufacturing Large Structures in Space" to an audience of 50 people at the 2023 Cambridge Science Festival, hosted by the MIT Museum.

Intramural Chair for MIT Aeronautics and Astronautics **2020 – 2022**

- Organized teams of graduate students in MIT AeroAstro to play intramural sports.

Leader of Caltech Small Satellite Mission Operations Center **2019 – 2020**

- Learned about small spacecraft operations from engineers at NASA JPL