

Manan Arya

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Employment

- 2022- Assistant Professor
Department of Aeronautics and Astronautics, Stanford University
- 2016-2022 Technologist
Jet Propulsion Laboratory, California Institute of Technology

Education

- 2016 PhD in Space Engineering, California Institute of Technology
Advisor: Professor Sergio Pellegrino
- 2012 MS in Space Engineering, California Institute of Technology
- 2011 BAsC in Engineering Science, University of Toronto
Major in Aerospace Engineering

Publications

JOURNAL ARTICLES

- 2021 **M Arya**, FS Mechentel, DR Webb, J Steeves, PD Lisman, SB Shaklan, SC Bradford, E Kelso, K Neff, A Swain, A Iskra, N Beidleman, JD Stienmier, G Freebury, A Tomchek, T Thomas, C Hazelton, K Butler, K Medina, M Pulford, L Adams, D Hepper, and D Turse, “Demonstration of deployment repeatability of key subsystems of a furled starshade architecture”, *Journal of Astronomical Telescopes, Instruments, and Systems*, vol 7, no 2, 021202
- 2020 NA Pehrson, DC Ames, SP Smith, SP Magleby, and **M Arya**, “Self-Deployable, Self-Stiffening, and Retractable Origami-Based Arrays for Spacecraft”, *AIAA Journal*, vol 58, no 7, pp 3221-3228
- 2017 **M Arya**, N Lee, and S Pellegrino, “Crease-free biaxial packaging of thick membranes with slipping folds”, *International Journal of Solids and Structures*, vol 108, pp 24-30

CONFERENCE PAPERS

- 2022 **M Arya**, R Hodges, JF Sauder, S Horst, M Mobrem, A Pedivellano, A Wen, A Truong, and S Pellegrino, “Lightweight composite reflectarray that can be flattened, folded, and coiled for compact stowage”, *Spacecraft Structures Conference, AIAA SciTech Forum*, San Diego CA
- 2022 BY Dharmadasa, JM Mejia-Ariza, **M Arya**, JF Sauder, P Focardi, SC Bradford, and F Lopez Jimenez, “Design of Flexures for Deployable Reflectarrays using High Strain Composites”, *Spacecraft Structures Conference, AIAA SciTech Forum*, San Diego CA
- 2021 S Bandyopadhyay, P McGarey, A Goel, R Rafizadeh, M Delapierre, **M Arya**, J Lazio, P Goldsmith, N Chahat, A Stoica, M Quadrelli, I Nesnas, K Jenks, and G Hallinan, “Conceptual Design of the Lunar Crater Radio Telescope (LCRT) on the Far Side of the Moon”, *IEEE Aerospace Conference*

- 2021 **M Arya**, DR Webb, SC Bradford, L Adams, V Cormarkovic, G Wang, M Mobrem, K Neff, N Beidleman, JD Stienmier, G Freebury, KA Medina, D Hepper, DE Turse, G Antoun, C Rupp, and L Hoffman, “Origami-Inspired Optical Shield for a Starshade Inner Disk Testbed: Design, Fabrication, and Analysis”, *Spacecraft Structures Conference, AIAA SciTech Forum*
- 2021 JF Sauder, CA Gebara, and **M Arya**, “A Survey of CubeSat Deployable Structures: The First Decade”, *Spacecraft Structures Conference, AIAA SciTech Forum*
- 2020 P McGarey, S Bandyopadhyay, R Rafizadeh, A Goel, **M Arya**, I Nesnas, J Lazio, P Goldsmith, A Stoica, M Quadrelli, G Hallinan, “A Concept for the Deployment of a Large Lunar Crater Radio Telescope using Teams of Tethered Robots”, *International Symposium on Artificial Intelligence, Robotics, and Automation (ISAIRAS)*
- 2020 **M Arya**, D Webb, J Steeves, PD Lisman, PA Willems, SC Bradford, E Kelso, K Neff, N Beidleman, JD Stienmier, G Freebury, A Tomchek, T Thomas, C Hazelton, K Butler, K Medina, M Pulford, L Adams, D Hepper, and D Turse, “Demonstration of Deployment Accuracy of the Starshade Inner Disk Subsystem”, *Spacecraft Structures Conference, AIAA SciTech Forum, Orlando FL*
- 2019 **M Arya**, JF Sauder, R Hodges, and S Pellegrino, “Large-Area Deployable Reflectarray Antenna for CubeSats”, *Spacecraft Structures Conference, AIAA SciTech Forum, San Diego CA*
- 2019 JF Sauder, **M Arya**, N Chahat, E Thiel, S Dunphy, M Shi, G Agnes, and T Cwik, “Deployment Mechanisms for High Packing Efficiency One-Meter Reflectarray Antenna (OMERA)”, *Spacecraft Structures Conference, AIAA SciTech Forum, San Diego CA*
- 2017 **M Arya**, D Webb, J McGown, PD Lisman, S Shaklan, SC Bradford, J Steeves, E Hilgemann, B Trease, M Thomson, S Warwick, G Freebury, and J Gull, “Starshade mechanical design for the Habitable Exoplanet Imaging Mission Concept (HabEx)”, *Proc. SPIE 10400, Techniques and Instrumentation for Detection of Exoplanets VIII*
- 2016 **M Arya**, N Lee, and S Pellegrino, “Ultralight Structures for Space Solar Power Spacecraft”, *Spacecraft Structures Conference, AIAA SciTech Forum, San Diego CA*
- 2015 **M Arya**, N Lee, and S Pellegrino, “Wrapping thick membranes with slipping folds”, *Spacecraft Structures Conference, AIAA SciTech Forum, Kissimmee FL*
- 2014 **M Arya** and S Pellegrino, “Unfolding mechanics of highly compacted thin membrane structures”, *Spacecraft Structures Conference, AIAA SciTech Forum, National Harbor MD*
- 2011 **M Arya** and CA Steeves “Bandgaps in octet truss lattices”, *23th Canadian Congress of Applied Mechanics, Vancouver*

BOOK CHAPTERS

- 2020 N Chahat, **M Arya**, JF Sauder, E Thiel, M Zhou, and T Cwik, “One Meter Reflectarray Antenna: OMERa” in *CubeSat Antenna Design*, N Chahat, Ed. Piscataway, New Jersey: IEEE Press
- 2017 CA Steeves, GD Hibbard, **M Arya**, and AT Lausic, “Dynamics of Nanolattices: Polymer-Nanometal Lattices” in *Dynamics of Lattice Materials*, AS Phani and MI Hussein, Eds. Chichester, United Kingdom: John Wiley & Sons, Inc.

THESES

- 2016 **M Arya**, “Packaging and Deployment of Large Planar Spacecraft Structures”, PhD Thesis, California Institute of Technology
- 2011 **M Arya**, “Solar sail attitude control systems that reduce sail deflections during slew manoeuvres”, Undergraduate Thesis, University of Toronto

PATENTS

- 2021 **M Arya**, JF Sauder, RE Hodges, and S Pellegrino, “Large aperture deployable reflectarray antenna”, US Patent No. 11,063,356 B2
- 2020 S Pellegrino, HA Atwater, SA Hajimiri, **M Arya**, C Leclerc, and N Lee, “Large-area structures for compact packaging”, US Patent No. 10,696,428 B2
- 2019 S Pellegrino, HA Atwater, SA Hajimiri, **M Arya**, N Lee, and M Delapierre, “Large-scale space-based solar power station: packaging, deployment and stabilization of lightweight structures”, US Patent No. 10,340,698
- 2019 TA Cwik, NE Chahat, J Sauder, **M Arya**, and E Thiel, “Deployable reflectarray antenna”, US Patent No. 10,276,926 B2
- 2018 HA Atwater, SA Hajimiri, S Pellegrino, B Abiri, F Bohn, JP Bosco, D Callahan, EC Warmann, **M Arya**, N Lee, and M Delapierre, “Large-scale space-based solar power station: multi-scale modular space power”, US Patent No. 10,144,533 B2

Honors & awards

- 2022- David Morgenthaler II Fellowship
in the School of Engineering at Stanford University
- 2019 JPL Astronomy and Physics Team Award
for leadership in a study to select a starshade mechanical architecture
- 2018, 2017 JPL Section 355 Science-Enabling Technology Award
for developing creative methods for packaging spacecraft structures
- 2015, 2014 Charles D. Babcock Award
from GALCIT for contributions in teaching
- 2011 Ontario Graduate Scholarship (declined)
- 2010 John M. Empey Scholarship
from the University of Toronto for academic excellence
- 2010 Undergraduate Student Research Award
from the Canadian National Science and Engineering Research Council
- 2009 Shaw Design Scholarship
from the University of Toronto for academic excellence
- 2007 University of Toronto Scholars Program
- 2007-2010 Queen Elizabeth II Aiming for the Top Scholarship
- 2007 Governor General’s Academic Medal

Invited talks

- 2022 AAPI Month Lecture, *NASA Langley Research Center*
- 2021 Department of Aeronautics Seminar, *Imperial College London*
- 2021 Distinctive Voices Lecture, *National Academies of Sciences, Engineering, and Medicine*
- 2021 Global Engineering Engagement Series, *University of Pittsburgh*
- 2021 Von Kármán Lecture, *Jet Propulsion Laboratory*
- 2020 Fermilab Seminar

2020 Keck Institute for Space Studies Lecture
2018 The Knowledge Society Summit

Outreach

2019 Workshop Lead, *Atlas Obscura/The New York Times LA Science Weekend*
2018 Artist and Exhibitor, *San Diego Festival of Science and Engineering*

Teaching

INSTRUCTOR

AA 151 Lightweight Structures *Stanford University*, 2022
Space Origami Engineering *Esteban E Torres High School, for The Huntington Library*, 2016

TEACHING ASSISTANT

Ae105abc Aerospace Engineering *California Institute of Technology*, 2013, 2014, 2015

Professional service

2021- Vice-Chair, Secretary, *AIAA Spacecraft Structures Technical Committee*

JOURNAL REVIEWS

AIAA Journal
Acta Astronautica
Journal of Spacecraft and Rockets
Advances in Space Research
International Journal of Solids and Structures

CONFERENCE REVIEWS

ASME IDTEC-CIE, 2022
AIAA SciTech Forum, 2022