Stanford



Manan Arya

Assistant Professor of Aeronautics and Astronautics

Curriculum Vitae available Online

Bio

BIO

Manan Arya leads the Morphing Space Structures Lab. His research is on shape-changing structures, including spacecraft structures that are folded for launch and then unfolded in space, and also morphing robots. Previously, he was a technologist in the Advanced Deployable Structures Group at the Jet Propulsion Laboratory (JPL), which is managed for NASA by Caltech.

ACADEMIC APPOINTMENTS

- Assistant Professor, Aeronautics and Astronautics

PROFESSIONAL EDUCATION

- PhD, California Institute of Technology (2016)
- Masters, California Institute of Technology (2012)
- BASc in Engineering Science, University of Toronto (2011)

LINKS

- Lab site: https://morphingspace.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Manan Arya leads the Morphing Space Structures Laboratory. His research is on structures that can adapt their shape to respond to changing requirements. Examples include deployable structures for spacecraft that can stow in constrained volumes for launch and then unfold to larger sizes in space, terrestrial structures with variable geometry, and morphing robots. Key research thrusts include lightweight fiber-reinforced composite materials to enable innovative designs for flexible structures, and the algorithmic generation of the geometry of morphing structures – the arrangement of stiff and compliant elements – to enable novel folding mechanisms.

He has published more than 20 journal and conference papers and has been awarded 5 US patents. Prior to joining Stanford, he was a Technologist at the Advanced Deployable Structures Laboratory at the Jet Propulsion Laboratory, California Institute of Technology, where he developed and tested breakthrough designs for space structures, including deployable reflectarrays, starshades, and solar arrays.

Teaching

COURSES

2026-27

- Introduction to Aeronautics and Astronautics: AA 100 (Aut)
- Origami Engineering: AA 255 (Win)
- Stability of Structures: AA 245 (Spr)

2025-26

- Analysis of Structures: AA 240B (Spr)
- Introduction to Aeronautics and Astronautics: AA 100 (Aut)

2024-25

- Introduction to Aeronautics and Astronautics: AA 100 (Aut)
- Spacecraft Design Laboratory: AA 236B (Win)
- Stability of Structures: AA 245 (Spr)

2023-24

- Introduction to Aeronautics and Astronautics: AA 100 (Win)
- Spacecraft Design: AA 236A (Aut)
- Stability of Structures: AA 245 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Kai Jun Chen, Enquan Chew, Jeffrey Durrant

Doctoral Dissertation Advisor (AC)

Emily Ellison, Hannah Fisher, Alexandra Haraszti, Connie Liou, Kevin Murillo

Master's Program Advisor

Malek Abu-Shawish, Evan Alfandre, Adrian Chan, Zain Jamal, Chance Pape, Victoria Porto, Siddarth Ramasubramanian, Andy Solganik, Anjali Vu, Brad Yac-Diaz, Michelle Zheng

Publications

PUBLICATIONS

- **Adaptive Stiffness and Shape Control of a Modular Origami-Inspired Robot**
  Ochalek, M., Haraszti, A., Arya, M.
  edited by Lu, G., You, Z., Assis, M.
  SPRINGER-VERLAG SINGAPORE PTE LTD.2026: 83-98

- **Toward a hybrid ground-space exoplanet observatory: summary of Caltech Keck Institute for Space Studies (KISS) Report**
  Soliman, A., Shaklan, S., Mather, J., Perez, E., Gregg, C., Arya, M., Damiano, M., Kasper, M., Nousiainen, J., Taaki, J., Christiansen, J. L., Chandra, A., Ahmed, et al
  edited by Coyle, L. E., Matsuura, S., Perrin, M. D.
  SPIE-INT SOC OPTICAL ENGINEERING.2026

- **Regular and Semi-regular Tessellations of Origami Flashers**
  Jatusripitak, N., Arya, M.

edited by Lu, G., You, Z., Assis, M.
SPRINGER-VERLAG SINGAPORE PTE LTD.2026: 211-224

- **Deployable MetaL ens for G-Band Earth Science Applications**
  Hodges, R., Hoppe, D., Arya, M., Aaron, K., Hofmann, D., IEEE
  IEEE.2025: 2457-2460

- **Origami-Inspired Structural System for in-Space Assembly**
  Ochalek, M., Formoso, O., Arya, M., Cheung, K., IEEE
  IEEE.2025

- **Stowage Analysis of a Flat Flexure Elastic Hinge for Deployable Space Structures** *AIAA JOURNAL*
  Dharmadasa, B., Mejia-Ariza, J., Sauder, J., Focardi, P., Bradford, S., Arya, M., Jimenez, F.
  2024

- **Modelling science return from the lunar crater radio telescope on the far side of the moon.** *Philosophical transactions. Series A, Mathematical, physical, and engineering sciences*
  Pisanti, D., Goel, A., Gupta, G., Arya, M., Byron, B., Chahat, N., Lazio, J., Goldsmith, P., Bandyopadhyay, S.
  2024; 382 (2271): 20230073

- **Free Vibration of a Panel Supported by a Shear Compliant Two-Flexure Hinge** *AIAA JOURNAL*
  Yasara Dharmadasa, B., Mejia-Ariza, J., Sauder, J., Focardi, P., Case Bradford, S., Arya, M., Lopez Jimenez, F.
  2024

- **Origami-Wrapped Structures with Corrugated Unfolded Forms** *AIAA JOURNAL*
  Kreider, M., Arya, M.
  2024

- **Multilayer Tensioned Membrane Structures for Radio -Frequency Lenses**
  Park, J., Brownt, G. C., Arya, M., Hoppe, D., Hofmann, D., Hodges, R., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2024

- **A Closed-Form Formulation to Estimate the Natural Frequency of Tape Spring Hinges**
  Dharmadasa, B., Blesinger, S., Mejia-Ariza, J., Saude, J., Focardi, P., Ii, S., Arya, M., Jimenez, F., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2024

- **Design and Modeling of Pre-stressed, Flat-Folding, Modular Origami Tube Structures**
  Ochalek, M. E., Arya, M., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2024

- **A Validated Numerical Model of Deployment Accuracy and Repeatability of the Starshade Inner Disk Subsystem**
  Antoun, G., Ferraro, S., McDonell, R., Bradford, C., Arya, M., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2024

- **Kilometer-Scale Parabolic Reflector for a Radio Telescope in a Lunar Crater**
  Arya, M., Herrscher, J. T., Pisanti, D., Verniani, A., Delapierre, M., Gupta, G., Goel, A., Lazio, J., Goldsmith, P., Bandyopadhyay, S., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2023

- **Design, Fabrication and Testing of a Scalable Hinge Architecture Using High Strain Composite Flexures**
  Dharmadasa, B., Mejia-Ariza, J., Sauder, J., Focardi, P., Bradford, S., Arya, M., Jimenez, F., AIAA
  AMER INST AERONAUTICS & ASTRONAUTICS.2023

- **NASA's starshade technology development activity**
  Willems, P. A., Shaklan, S., Hu, R., Martin, S., Lisman, D., Ferraro, S., Stegman, M., Harness, A. D., Freebury, G., Arya, M.
  edited by Coyle, L. E., Matsuura, S., Perrin, M. D.
  SPIE-INT SOC OPTICAL ENGINEERING.2022

- **ORIGAMI-INSPIRED CLOSEOUTS FOR STARSHADE INNER DISK OPTICAL SHIELDS**
  Haraszti, A., Arya, M., AMER SOC MECHANICAL ENGINEERS
  AMER SOC MECHANICAL ENGINEERS.2022

- **Crease-free biaxial packaging of thick membranes with slipping folds** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
  Arya, M., Lee, N., Pellegrino, S.
  2017; 108: 24-39