



Maria Sakovsky

Assistant Professor of Aeronautics and Astronautics

Bio

BIO

Maria Sakovsky's work focuses on the use of shape adaptation to realize space structures with reconfigurable geometry, stiffness, and even non-mechanical performance (e.g., electromagnetic, optical). Particular focus is placed on the mechanics of thin fiber reinforced composite structures, the interplay between composite material properties and structural geometry, as well as embedded functionality and actuation of lightweight structures. The work has led to applications in deployable space structures, reconfigurable antennas, and soft robotics.

Maria Sakovsky received her BSc in Aerospace Engineering from the University of Toronto. Following this, she completed her MSc and PhD in Space Engineering at Caltech, where she developed a deployable satellite antenna based on origami concepts utilizing elastomer composites. She concurrently worked with NASA's Jet Propulsion Laboratory on developing cryogenically rated thin-ply composite antennas for deep space missions. She was awarded the ETH Zurich Postdoctoral Fellowship in 2018 as well as the DARPA Young Faculty Award in 2024.

ACADEMIC APPOINTMENTS

- Assistant Professor, Aeronautics and Astronautics

HONORS AND AWARDS

- ASME Rising Star of Mechanical Engineering, ASME (2025)
- DARPA Young Faculty Award, DARPA (2024)
- Inspiring Early Academic Career Award, Stanford Faculty Women's Forum (2024)
- Outstanding Contribution Award, ASME SMASIS Division (2024)
- ETH Zurich Postdoctoral Fellowship, ETH Zurich (2018 - 2020)

Teaching

COURSES

2025-26

- Introduction to Mechanics of Composite Materials: AA 156 (Spr)
- Smart Structures: AA 280 (Win)
- Spacecraft Design: AA 236A (Aut)

2024-25

- Introduction to Mechanics of Composite Materials: AA 156 (Spr)

- Large Spacecraft Structures: AA 114Q (Win)
- Spacecraft Design: AA 236A (Aut)

2023-24

- Introduction to Mechanics of Composite Materials: AA 156 (Spr)
- Large Spacecraft Structures: AA 114Q (Aut)
- Spacecraft Design Laboratory: AA 236B (Win)

2022-23

- Introduction to Mechanics of Composite Materials: AA 156 (Spr)
- Large Spacecraft Structures: AA 114Q (Aut)
- Spacecraft Design Laboratory: AA 236B (Win)

STANFORD ADVISEES

Doctoral Dissertation Advisor (AC)

Catherine Catrambone, Kai Jun Chen, Sevan Vlieghe

Master's Program Advisor

Liana Gfrerer, Spencer Hise, Jacob Loufek, Matthew Nguyen, Pablo Nuñez Martinez, Sujay Rao, Cruz Soto

Publications

PUBLICATIONS

- **A Visible-UV DIC Technique for Full-Field Reconstruction of Multi-Layer Tensioned Membrane Systems** *EXPERIMENTAL MECHANICS*
Vlieghe, S., Gonzalez Ayala, G., Sakovsky, M.
2026
- **Model-Based Design of Antagonistic Shape Memory Alloy Actuators for Bistable Structures** *AIAA JOURNAL*
Schmidt, J., Sakovsky, M.
2025
- **Editors' Choice 2024.** *Communications engineering*
Vinay, M., Sakovsky, M., Rizzo, A., Ghasempour, Y., Daw, R., Huang, C., Denholme, S., Behnood, A., Chen, W. T., Perlman, O., Vasylichenkova, A., Mastrangeli, M., Rugonyi, et al
2025; 4 (1): 7
- **Kinematics-driven design of reconfigurable bistable hinges with high stiffness and stability** *MATERIALS & DESIGN*
Vogel, T., Mukherjee, A., Tarter, E., Sakovsky, M., Ermanni, P.
2024; 244
- **Dynamically reprogrammable stiffness in gecko-inspired laminated structures** *SMART MATERIALS AND STRUCTURES*
Chen, K., Sakovsky, M.
2024; 33 (1)
- **Variable Stiffness Metastructures through Reversible Lamination**
Chen, K., Sakovsky, M., AIAA
AMER INST AERONAUTICS & ASTRONAUTICS.2024
- **Multistable Structures for Deployable and Reconfigurable Antennas**
Sakovsky, M., Costantine, J., Tawk, Y., IEEE
IEEE.2024
- **A multi-stable deployable quadrifilar helix antenna with radiation reconfigurability for disaster-prone areas.** *Nature communications*
Bichara, R. M., Costantine, J., Tawk, Y., Sakovsky, M.

2023; 14 (1): 8511

- **Electromagnetic Reconfiguration Using Stretchable Mechanical Metamaterials.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
Sakovsky, M., Negele, J., Costantine, J.
2023: e2203376
- **Thin ply composite materials with embedded functional elements for cryogenic environments** *MATERIALS LETTERS*
Sakovsky, M., Mihaly, J.
2023; 330
- **A Highly Multi-Stable Meta-Structure via Anisotropy for Large and Reversible Shape Transformation.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
Risso, G., Sakovsky, M., Ermanni, P.
2022: e2202740
- **A thin -shell shape adaptable composite metamaterial** *COMPOSITE STRUCTURES*
Sakovsky, M., Ermanni, P.
2020; 246