

# Stanford

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## Maria Sakovsky

Assistant Professor of Aeronautics and Astronautics

### Bio

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#### 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 (ex. 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. For her ongoing research on physically reconfigurable antennas, she was awarded the ETH Zürich postdoctoral fellowship as well as the Innovation Starting Grant.

#### ACADEMIC APPOINTMENTS

- Assistant Professor, Aeronautics and Astronautics

#### PROGRAM AFFILIATIONS

- Stanford SystemX Alliance

### Teaching

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#### COURSES

##### 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)

#### 2021-22

- Large Spacecraft Structures: AA 114Q (Spr)

### STANFORD ADVISEES

#### Doctoral Dissertation Advisor (AC)

Catherine Catrambone, Kai Jun Chen, Enquan Chew

#### Master's Program Advisor

Sidharth Anantha, Yong Lin He, Thomas Huang, Samuel Montagut Agudelo, Aditi Pattabhiraman, Cruz Soto

#### Doctoral (Program)

Colton Crosby, Sevan Vlieghe

## Publications

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### PUBLICATIONS

- **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)
- **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-Wurtemberg, 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-Wurtemberg, Germany)*  
Risso, G., Sakovsky, M., Ermanni, P.  
2022: e2202740
- **A thin -shell shape adaptable composite metamaterial** *COMPOSITE STRUCTURES*  
Sakovsky, M., Ermanni, P.  
2020; 246