

## Sophia Marie Leanza

Ph.D. Student in Mechanical Engineering, admitted Summer 2023

### Publications

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#### PUBLICATIONS

- **Mechanical Instabilities: From Failure Mechanism to Functionality** *APPLIED MECHANICS REVIEWS*  
Lu, L., Leanza, S., Zhao, R.  
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- **2D-to-3D transformation of ring origami via snap-folding instabilities** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*  
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- **Magnetic Milli-Spinner for Robotic Endovascular Surgery.** *Advanced materials (Deerfield Beach, Fla.)*  
Wu, S., Chang, Y., Leanza, S., Sim, J., Lu, L., Li, Q., Stone, D., Zhao, R. R.  
2025: e08180
- **Electromagnetic-stimulated untethered amphibious soft robot with multimodal locomotion** *MATERIALS TODAY*  
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2025; 87: 11-19
- **Buckling and post-buckling of cylindrical shells under combined torsional and axial loads** *EUROPEAN JOURNAL OF MECHANICS A-SOLIDS*  
Lu, L., Leanza, S., Liu, Y., Zhao, R.  
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- **The elastica with pre-stress due to natural curvatures** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*  
Leanza, S., Zhao, R., Hutchinson, J. W.  
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- **Multistability of segmented rings by programming natural curvature.** *Proceedings of the National Academy of Sciences of the United States of America*  
Lu, L., Leanza, S., Dai, J., Hutchinson, J. W., Zhao, R. R.  
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- **Minimal Design of the Elephant Trunk as an Active Filament.** *Physical review letters*  
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- **On the elastic stability of folded rings in circular and straight states** *EUROPEAN JOURNAL OF MECHANICS A-SOLIDS*  
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- **Elephant Trunk Inspired Multimodal Deformations and Movements of Soft Robotic Arms** *ADVANCED FUNCTIONAL MATERIALS*  
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2024
- **Curved Ring Origami: Bistable Elastic Folding for Magic Pattern Reconfigurations** *JOURNAL OF APPLIED MECHANICS-TRANSACTIONS OF THE ASME*  
Dai, J., Lu, L., Leanza, S., Hutchinson, J. W., Zhao, R.  
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- **Multiple equilibrium states of a curved-sided hexagram: Part I-stability of states** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*  
Lu, L., Dai, J., Leanza, S., Zhao, R., Hutchinson, J. W.  
2023; 180
- **Multiple equilibrium states of a curved-sided hexagram: Part II-Transitions between states** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*  
Lu, L., Dai, J., Leanza, S., Hutchinson, J. W., Zhao, R.  
2023; 180
- **Origami With Rotational Symmetry: A Review on Their Mechanics and Design** *APPLIED MECHANICS REVIEWS*  
Lu, L., Leanza, S., Zhao, R.  
2023; 75 (5)
- **Liquid Crystal Elastomer - Liquid Metal Composite: Ultrafast, Untethered, And Programmable Actuation by Induction Heating.** *Advanced materials (Deerfield Beach, Fla.)*  
Maurin, V., Chang, Y., Ze, Q., Leanza, S., Wang, J., Zhao, R. R.  
2023: e2302765
- **Active Materials for Functional Origami.** *Advanced materials (Deerfield Beach, Fla.)*  
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- **Hexagonal Ring Origami Assemblies: Foldable Functional Structures With Extreme Packing** *JOURNAL OF APPLIED MECHANICS-TRANSACTIONS OF THE ASME*  
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- **Phase diagram and mechanics of snap-folding of ring origami by twisting** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*  
Sun, X., Wu, S., Dai, J., Leanza, S., Yue, L., Yu, L., Jin, Y., Qi, H., Zhao, R.  
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- **Spinning-enabled wireless amphibious origami millirobot.** *Nature communications*  
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- **Hexagonal ring origami-Snap-folding with large packing ratio** *EXTREME MECHANICS LETTERS*  
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- **Soft robotic origami crawler.** *Science advances*  
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