Stanford

Lu Lu

Postdoctoral Scholar, Mechanical Engineering

Bio

BIO

Dr. Lu Lu is currently a postdoctoral researcher at Stanford University. He received his B.S. and Ph.D. degrees from Ningbo University and Shanghai University in China in 2014 and 2019, respectively. He then worked as a postdoctoral researcher at Peking University from 2020 to 2022 before joining Stanford. His research interests focus on solid mechanics, with emphasis on mechanical instabilities, deployable structures, mechanics of intelligent soft materials, plate and shell theories, and nonlocal elasticity. He has published nearly 30 peer-reviewed papers in journals such as PNAS, JMPS, IJSS, AMR, IJMS, JAM, and PRSA, and received the ASME Melville Medal in 2024.

HONORS AND AWARDS

- ASME Melville Medal, American Society of Mechanical Engineers (2024)
- Boya Postdoctoral Fellowship, Peking University (2020)
- Excellent Doctoral Dissertation, Shanghai University (2020)
- Outstanding Mechanics Student, Shanghai Society of Mechanics (2019)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, Shanghai University (2019)
- Bachelor of Engineering, Ningbo University (2014)
- Postdoctoral Fellow, Peking University , Solid Mechanics (2022)
- Doctor of Engineering, Shanghai University , Solid Mechanics (2019)
- Bachelor of Engineering, Ningbo University , Engineering Mechanics (2014)

STANFORD ADVISORS

- Renee Zhao, Postdoctoral Faculty Sponsor

LINKS

- Google Scholar: https://scholar.google.com/citations?user=0wrd3w8AAAAJ

Research & Scholarship

LAB AFFILIATIONS

- Renee Zhao, Soft Intelligent Materials Laboratory (7/15/2022)

Publications

PUBLICATIONS

- **Elastic rod origami (RodOri) for programming static and dynamic mechanical properties.** *Science advances*
  Leanza, S., Lee, J., Lu, L., Zhao, R. R.
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- **Mechanical Instabilities: From Failure Mechanism to Functionality** *APPLIED MECHANICS REVIEWS*
  Lu, L., Leanza, S., Zhao, R.
  2026; 78 (3)

- **Electromagnetic (EM)-Driven Functional Materials.** *Advanced materials (Deerfield Beach, Fla.)*
  Sim, J., Lu, L., Zhao, R. R.
  2026: e21268

- **2D-to-3D transformation of ring origami via snap-folding instabilities** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Lu, L., Leanza, S., Ning, L., Zhao, R.
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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

- **Buckling and post-buckling of cylindrical shells under combined torsional and axial loads** *EUROPEAN JOURNAL OF MECHANICS A-SOLIDS*
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- **Selective Actuation Enabled Multifunctional Magneto-Mechanical Metamaterial for Programming Elastic Wave Propagation** *ADVANCED FUNCTIONAL MATERIALS*
  Sim, J., Wu, S., Hwang, S., Lu, L., Zhao, R.
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- **Mechanics of magnetic-shape memory polymers** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Lu, L., Wu, S., Zhao, R.
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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.
  2024; 121 (31): e2405744121

- **Mechanics of hard-magnetic soft materials: A review** *MECHANICS OF MATERIALS*
  Lu, L., Sim, J., Zhao, R.
  2024; 189

- **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)
- **Easy snap-folding of hexagonal ring origami by geometric modifications** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Lu, L., Leanza, S., Dai, J., Sun, X., Zhao, R.
  2023; 171
- **Conical Kresling origami and its applications to curvature and energy programming** *PROCEEDINGS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES*
  Lu, L., Dang, X., Feng, F., Lv, P., Duan, H.
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- **Free vibration and dynamic stability of functionally graded composite microtubes reinforced with graphene platelets** *COMPOSITE STRUCTURES*
  Lu, L., Wang, S., Li, M., Guo, X.
  2021; 272
- **Size-dependent postbuckling analysis of graphene reinforced composite microtubes with geometrical imperfection** *INTERNATIONAL JOURNAL OF MECHANICAL SCIENCES*
  Lu, L., She, G., Guo, X.
  2021; 199
- **Metamaterial Vibration of Tensioned Circular Few-Layer Graphene Sheets** *JOURNAL OF APPLIED MECHANICS-TRANSACTIONS OF THE ASME*
  Lu, L., Ru, C. Q., Guo, X.
  2020; 87 (6)
- **Vibration isolation of few-layer graphene sheets** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
  Lu, L., Ru, C. Q., Guo, X.
  2020; 185: 78-88
- **A nonlocal strain gradient shell model incorporating surface effects for vibration analysis of functionally graded cylindrical nanoshells** *APPLIED MATHEMATICS AND MECHANICS-ENGLISH EDITION*
  Lu, L., Zhu, L., Guo, X., Zhao, J., Liu, G.
  2019; 40 (12): 1695-1722
- **A unified size-dependent plate model based on nonlocal strain gradient theory including surface effects** *APPLIED MATHEMATICAL MODELLING*
  Lu, L., Guo, X., Zhao, J.
  2019; 68: 583-602
- **Small size effect on the wrinkling hierarchy in constrained monolayer graphene** *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE*
  Zhao, J., Guo, X., Lu, L.
  2018; 131: 19-25
- **On the mechanics of Kirchhoff and Mindlin plates incorporating surface energy** *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE*
  Lu, L., Guo, X., Zhao, J.
  2018; 124: 24-40
- **Negative effective mass of a filled carbon nanotube** *INTERNATIONAL JOURNAL OF MECHANICAL SCIENCES*
  Lu, L., Ru, C. Q., Guo, X.
  2017; 134: 174-181
- **Small-size effect on wrinkle and fracture of monolayer graphene subjected to in-plane shear** *NANOTECHNOLOGY*
  Zhao, J., Guo, X., Lu, L.
  2017; 28 (45): 455702
- **A unified nonlocal strain gradient model for nanobeams and the importance of higher order terms** *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE*
  Lu, L., Guo, X., Zhao, J.

2017; 119: 265-277

- **Size-dependent vibration analysis of nanobeams based on the nonlocal strain gradient theory** *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE*
  Lu, L., Guo, X., Zhao, J.
  2017; 116: 12-24

- **Controlled wrinkling analysis of thin films on gradient substrates** *APPLIED MATHEMATICS AND MECHANICS-ENGLISH EDITION*
  Zhao, J., Guo, X., Lu, L.
  2017; 38 (5): 617-624

- **Vibration of a multilayer graphene sheet under layerwise tension forces** *INTERNATIONAL JOURNAL OF MECHANICAL SCIENCES*
  Lu, L., Ru, C. Q., Guo, X. M.
  2017; 121: 157-163