Stanford

Natalie Marie Larson

Assistant Professor of Mechanical Engineering and, by courtesy, of Materials Science and Engineering

Curriculum Vitae available Online

Bio

ACADEMIC APPOINTMENTS

- Assistant Professor, Mechanical Engineering
- Assistant Professor (By courtesy), Materials Science and Engineering
- Member, Bio-X

PATENTS

- Natalie M. Larson, Jochen Mueller, Jennifer A. Lewis. "United States Patent 12,005,631 B2 Printhead and method of printing multimaterial filaments including oriented, twisted and/or helical features", President and Fellows of Harvard College, Jun 11, 2024

LINKS

- Larson Lab Website: https://larsonlab.stanford.edu/

Teaching

COURSES

2025-26

- Continuum Mechanics: ME 338 (Spr)
- Intro to Solid Mechanics: ENGR 14 (Win)
- Multimaterial Additive Manufacturing: MATSCI 351, ME 321 (Aut)
- Seminar in Solid Mechanics: ME 395 (Aut, Win, Spr)

2024-25

- Continuum Mechanics: ME 338 (Spr)
- Intro to Solid Mechanics: ENGR 14 (Win)
- Multimaterial Additive Manufacturing: ME 321 (Aut)
- Seminar in Solid Mechanics: ME 395 (Aut, Win, Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Mingqi Shuai

Doctoral Dissertation Advisor (AC)

Elise Yang

Master's Program Advisor

Ashley Davidson, Jacob Eldred, Joseph Garcia, Tori Hassmann, Carter Hughes, Mathieu Johnson, Simon Kliger, Haonan Kong, Amber Leung, Caitlin Ramos, Jesus Tejeda, Aayush Wadehra

Doctoral Dissertation Co-Advisor (AC)

Sofia Madrigal Gamboa

Doctoral (Program)

Chen Dai, Suyeon Jeong, Alice Kutsyy

Publications

PUBLICATIONS

- **Rotational 3D printing of active-passive filaments and lattices with programmable shape morphing.** *Proceedings of the National Academy of Sciences of the United States of America*
  Abdelrahman, M. K., Wilt, J. K., Jung, Y., Telles, R., Paink, G. K., Larson, N. M., Aizenberg, J., Mahadevan, L., Lewis, J. A.
  2026; 123 (17): e2537250123
- **Rotational Multimaterial 3D Printing of Soft Robotic Matter With Embedded Asymmetrical Pneumatics.** *Advanced materials (Deerfield Beach, Fla.)*
  Wilt, J. K., Larson, N. M., Lewis, J. A.
  2025: e10141
- **Opportunities at the frontier of multimaterial additive manufacturing with subvoxel control** *MRS BULLETIN*
  Larson, N. M.
  2024
- **Reinforcement induced microcracking during the conversion of polymer-derived ceramics** *ACTA MATERIALIA*
  O'Masta, M. R., Bui, P. P., Larson, N. M., Porter, K. A., Wernick, E. S., Stonkevitch, E., Eckel, Z. C., Schaedler, T. A.
  2024; 275
- **Rotational multimaterial printing of filaments with subvoxel control.** *Nature*
  Larson, N. M., Mueller, J., Chortos, A., Davidson, Z. S., Clarke, D. R., Lewis, J. A.
  2023; 613 (7945): 682-688
- **Programmed shape-morphing into complex target shapes using architected dielectric elastomer actuators.** *Science advances*
  Hajiesmaili, E., Larson, N. M., Lewis, J. A., Clarke, D. R.
  2022; 8 (28): eabn9198
- **Cracking during pyrolysis of preceramic polymers within glass microtubes** *JOURNAL OF THE AMERICAN CERAMIC SOCIETY*
  Larson, N. M., Summers, W. D., Zok, F. W.
  2022; 105 (5): 3211-3225
- **X-ray computed tomography of microstructure evolution during matrix impregnation and curing in unidirectional fiber beds** *COMPOSITES PART A-APPLIED SCIENCE AND MANUFACTURING*
  Larson, N. M., Cuellar, C., Zok, F. W.
  2019; 117: 243-259
- **Insights from in-situ X-ray computed tomography during axial impregnation of unidirectional fiber beds** *COMPOSITES PART A-APPLIED SCIENCE AND MANUFACTURING*
  Larson, N. M., Zok, F. W.
  2018; 107: 124-134
- **In-situ 3D visualization of composite microstructure during polymer-to-ceramic conversion** *ACTA MATERIALIA*
  Larson, N. M., Zok, F. W.
  2018; 144: 579-589

- **Insight into 3D micro-CT data: exploring segmentation algorithms through performance metrics.** *Journal of synchrotron radiation*
  Perciano, T., Ushizima, D., Krishnan, H., Parkinson, D., Larson, N., Pelt, D. M., Bethel, W., Zok, F., Sethian, J.
  2017; 24 (Pt 5): 1065-1077

- **Synchrotron X-ray micro-tomography at the Advanced Light Source: Developments in high-temperature in-situ mechanical testing**
  Barnard, H. S., MacDowell, A. A., Parkinson, D. Y., Mandal, P., Czabaj, M., Gao, Y., Maillet, E., Blank, B., Larson, N. M., Ritchie, R. O., Gludovatz, B., Acevedo, C., Liu, et al
  edited by Rau, C.
  IOP PUBLISHING LTD.2017

- **High Temperature X-Ray Micro-Tomography**
  MacDowell, A. A., Barnard, H., Parkinson, D. Y., Haboub, A., Larson, N., Zok, F., Parerai, F., Mansour, N. N., Bale, H., Gludovatz, B., Acevedo, C., Liu, D., Ritchie, et al
  edited by Shen, Q., Nelson, C.
  AMER INST PHYSICS.2016