# Leah Ginsberg, Ph.D., P.E.

Lecturer

**Email**: leah.m.ginsberg@gmail.com
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Passionate and dedicated engineering professional and college professor with a strong commitment to advancing both academic excellence and practical engineering solutions. With extensive experience in industry and research, I excel at bridging the gap between theoretical concepts and real-world applications, particularly in areas such as mechanical design, material performance, and bolted joint analysis.

## EDUCATION

**California Institute of Technology** — Pasadena, CA · 2017-2021
Ph.D. in Mechanical Engineering
M.S. in Mechanical Engineering

**Georgia Institute of Technology** — Atlanta, GA · 2012-2016
B.S. in Mechanical Engineering

## WORK EXPERIENCE

**Texas State University** — San Marcos, TX · 2025-present

- Served as an instructor for *Introduction to Digital Mechanical Engineering*, an entry-level course designed to introduce first-year Mechanical Engineering students to digital tools and concepts in the discipline.
- Implemented new hands-on activities in class to provide students with active learning experiences in product development and systems thinking/systems engineering.
- Helped advance ABET accreditation by refining curriculum and documenting continuous improvement in alignment with the seven ABET student outcomes.

**Kennesaw State University** — Atlanta, GA · 2024-2025

- Designed and taught Machine Design and Engineering Statics courses, revamping the curriculum with new lecture materials, quizzes, exams, and problem sets to strengthen student understanding of power transmission and stress analysis.
- Integrated real-world applications and supplemental videos into lectures, enhancing student engagement and connecting theoretical concepts to practical engineering problems
- Provided individualized support and mentorship to a diverse student body, fostering academic growth and preparing students for successful engineering careers.

**Engineering Systems Inc.** — Atlanta, GA · 2021-2024

- Led root cause failure analyses for mechanical systems, delivering expert insights that informed corrective actions and improved client outcomes.
- Conducted finite element analysis (FEA) and stress analysis using first principles, providing detailed technical reports and solutions for complex engineering challenges.
- Mentored junior engineers, fostering a collaborative environment and enhancing team capabilities in engineering problem-solving and analysis.

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**The Boeing Company** Everett, WA · Summer of 2015, 2016, and 2017
Structural Analysis Intern
*Summer 2017 (Automation of Shear Joint Coupons):*

- Determined material properties to properly account for non-linearities, plasticity, damage, and failure in the model.
- Automated shear joint coupon generation in Abaqus through creation of a Python plug-in.
- Correlated results to test data and shear joint allowables to validate the modeling process.

*Summer 2016 (Main Landing Gear Door Honeycomb Behavior):*

- Investigated the honeycomb material behavior on the main landing gear door during impact.
- Created a single element test tool GUI in MATLAB that creates Abaqus and LS-Dyna input files.
- Tested a FEM panel of the honeycomb core under impact from various angles in Abaqus.

*Summer 2015 (Bird-Strike FEM):*

- Created standard finite-element model of bird to use in all bird-strike analyses.
- Compared finite-element analysis results to quantitative load cell data and qualitative high-speed camera data.

**NASA's Jet Propulsion Laboratory** Pasadena, CA · Summer of 2013, 2014
*Summer 2014 (Ka-Band Parabolic Deployable Antenna):*

- Designed new system for deployment of ribs supporting the antenna mesh.
- Acquired or created parts to implement new design.
- Tested deployment prototype and performed stress analysis on testing data.

*Summer 2013 (CubeSat ground station):*

- Set up remote access and control of the receiving system.
- Implemented new software (Orbitron and PuTTy) to use as an interface between the computer and the hardware previously installed in the ground station.

## RESEARCH

**Mechanical Characteristics of U-bolts** Atlanta, GA · 2022-2024
Engineering Systems Inc. – Senior Staff Consultant

- Conducted in-depth analysis of the torque-tension relationship in U-bolts, identifying key factors affecting preload accuracy and joint performance.
- Developed improved methods for predicting clamp load in bolted joints, enhancing reliability in mechanical assemblies.
- Presented findings on optimizing U-bolt design for various load conditions, contributing to advancements in bolted joint performance analysis.

**Mechanics of Engineered Living Materials** Pasadena, CA · 2018-2021
California Institute of Technology – Graduate Research Assistant

- Develop a general experimental methodology, non-harmful to living cells, to obtain material properties of individual cellular components and composite living materials.
- Perform micro-compression and force-controlled atomic-force microscope experiments.
- Utilize an inverse analysis to extract properties of interest from experimental data.

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**University Nanosatellite Program** Atlanta, GA · 2014
Undergraduate Research Assistant

- Built a satellite receiver station on campus to communicate with Prox-1 satellite.
- Lead and taught team to prepare campus ground station to flight-readiness.
- Set up a public website to host received transmissions and other updates.

## ACCOMPLISHMENTS

### Honors

EAS New Horizons Diversity, Equity & Inclusion Award, Caltech – 2021
NASA Group Achievement Award – 2019
Summa Cum Laude, Georgia Institute of Technology – 2016

### Publications

"*Measuring Tension Imbalance in U-Bolts During Tightening*", **L. Ginsberg**, J. Hassebrock, J. Wagner, H. Iwand, A. Pettinger, *J Fail. Anal. and Preven.* 25, 802–812, April 2025.

"*Cell wall and cytoskeletal contributions in single cell biomechanics of Nicotiana tabacum",* **L. Ginsberg**, R. McDonald, Q. Lin, R. Hendrickx, G. Spigolon, G. Ravichandran, C. Daraio, and E. Roumeli, *Quantitative Plant Biology*, Vol. 3, January 2022.

*Multiscale Mechanical Characterization of Subcellular Structures in Living Walled Cells*. Dissertation (Ph.D.), California Institute of Technology (2021).

*"Structure and Biomechanics during Xylem Vessel Transdifferentiation in Arabidopsis thaliana",* E. Roumeli†, **L. Ginsberg,**† R. McDonald, G. Spigolon, R. Hendrickx, M. Ohtani, T. Demura, G. Ravichandran, and C. Daraio, *Plants*, Vol. 9, December 2020.

### Conferences

"*Basics of Fatigue, Fracture, and Forensics*," presented at the Society of Experimental Mechanics Annual Meeting, **L. Ginsberg**, P. Umberger, Vancouver, WA, June 3, 2024.

"*Fatigue Crack Growth and Relief of Preload in Bent, Threaded Fasteners (U-bolts)*," presented at the Society of Experimental Mechanics Annual Meeting**, L. Ginsberg**., J. Hassebrock, J. Wagner, H. Iwand, A. Pettinger, Orlando, FL, June 7, 2023.

"*Cell wall and Cytoskeletal Contributions in Single Cell Biomechanics of Nicotiana tabacum*," presented at the Society of Experimental Mechanics Annual Meeting, **L. Ginsberg**., R. McDonald, Q. Lin, R. Hendrickx, G. Spigolon, G. Ravichandran, C. Daraio, E. Roumeli, Pittsburgh, PA, June 14, 2022.

"*Bacillus subtilis as polymeric crosslinker and particle reinforcement in NHMAA hydrogel,"* presented at Society of Engineering Science Virtual Technical Meeting, **L. Ginsberg**, P. Chittur, S. Sim, J. Kornfield, D. Tirrell, G. Ravichandran, September 29, 2020.

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"*Microcompression of plant cells to estimate turgor pressure*," presented at the Society of Experimental Mechanics XIV International Congress, **L. Ginsberg**, E. Roumeli, C. Daraio, and G. Ravichandran, August 14, 2020.

"*Extracting mechanical properties of plant cells from atomic-force microscopy and micro-compression experiments,*" presented at Society of Engineering Science Mechanobiology Annual Symposium, **L. Ginsberg**, E. Roumeli, C. Daraio, and G. Ravichandran, St. Louis, MO, October 12, 2019.

"*Extracting mechanical properties of thin biofilms using inverse analysis,*" presented at Society of Experimental Mechanics Annual Meeting (SEM 2019); **L. Ginsberg** and G. Ravichandran, Reno, NV, August 3, 2019.