



LEAH M. GINSBERG, Ph.D.
SR. STAFF CONSULTANT

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Dr. Leah Ginsberg is a Senior Staff Consultant with Engineering Systems Inc. (ESi) with expertise in the analysis and investigation of failures including piping systems, valves, and bolted connections. Dr. Ginsberg applies her background in mechanical engineering and materials science and her proficiency in utilizing applied mechanics, experimental techniques, and computational modeling to understand the relationship between structures and constitutive material properties.

In her recent work, Dr. Ginsberg has focused on studying and mitigating fatigue failures in various industrial applications. She has conducted extensive research on the fatigue and fracture of threaded fasteners and presented her work on this topic at technical meetings with other experts in the field of experimental and applied mechanics. Her insights into the behavior of bolted connections have been instrumental in identifying design flaws, optimizing structural integrity, and recommending preventive measures.

Some of Dr. Ginsberg's latest research involves exploring fatigue and fracture mechanics in buried pipelines. These investigations focus on behavior and failure modes of pipelines under different operating conditions, environmental factors, and external loads. By employing advanced analytical techniques and considering factors such as corrosion, material properties, and soil interactions, she aims to enhance the integrity and longevity of buried pipeline systems.

Dr. Ginsberg has also been actively involved in the analysis of valves and other connections for railroad tank cars to ensure the safety and reliability of these critical components. Her comprehensive understanding of valve mechanisms, combined with her expertise in stress analysis and finite-element modeling, has enabled her to provide accurate assessments of performance and identify potential vulnerabilities in these systems.

Prior to joining ESi, Dr. Ginsberg worked in the aerospace industry for NASA's Jet Propulsion Laboratory and Boeing Commercial Airplanes. While at NASA, she assembled a ground station for radio communication with small satellites (CubeSats). At Boeing, she developed and documented the finite-element model to be used in bird strike analyses. She also studied fastener mechanics and the mechanical behavior of composites and honeycomb structures in aircraft.

Dr. Ginsberg has demonstrated a commitment to the broader scientific community throughout her career. Her research work has been published in peer-reviewed scientific literature and presented at prestigious technical conferences. In addition to her research contributions, Dr. Ginsberg serves as the chair of a committee focused on fatigue and fracture where she leads discussions and initiatives to advance understanding and best practices in this critical area. Furthermore, she actively contributes to the scientific community as a reviewer for journals specializing in failure analysis and prevention, as well as experimental techniques in the field of applied mechanics. Dr. Ginsberg's dedication to knowledge dissemination and collaboration underscores her passion for advancing the field and ensuring the highest standards of engineering practice.

May 2024

Areas of Specialization

- Applied Mechanics
- Computational Modeling
- Contact Mechanics
- Mechanics
- Mechanical Engineering
- Mechanics of Materials
- Mechanical Testing
- Polymers & Composites
- Vibrations

Education

Ph.D., Mechanical Engineering, California Institute of Technology

M.S., Mechanical Engineering, California Institute of Technology

B.S., Mechanical Engineering, Georgia Institute of Technology

Continuing Education

American Society of Mechanical Engineers (ASME) - Pressure Relief Devices: Design, Sizing, Construction, Inspection & Maintenance

Northwestern University Center for Public Safety – Traffic Crash Reconstruction

American Society of Mechanical Engineers (ASME) - Fracture Mechanics

Hartzell Propeller Inc. – Propeller Accident Reconstruction Class

Professional Affiliations/Honors

- Society of Experimental Mechanics - Fracture & Fatigue - Committee Member
- Society of Engineering Science - Member
- Journal of Failure Analysis and Prevention – Reviewer
- EAS New Horizons Diversity, Equity & Inclusion Award, Caltech – 2021
- NASA Group Achievement Award – 2019
- Summa Cum Laude, Georgia Institute of Technology – 2016

Positions Held

Engineering Systems Inc., Norcross, GA

Sr. Staff Consultant, 2023 - Present

Staff Consultant, 2021 - 2023

The Boeing Company, Everett, WA

Structural Analysis Intern, Summer of 2015, 2016, and 2017

Jet Propulsion Laboratory

Intern, Summer of 2013, 2014

Publications & Presentations

"*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.

"*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, Issue December, 2020.

"*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.

"*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.

[†] Equal contribution