Michael Hasson, Ph.D.

Dartmouth College

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Summary

As a Neukom Fellow, I currently focus on quantifying the risks that climate change poses to humans and human infrastructure. In my past research, I have focused on unraveling how physical processes shape the surface of the Earth and how those processes are represented in Earth's stratigraphic record. I have worked at a range of scales, from individual grains of sand to the entire globe, and use a combination of remote sensing, machine learning, and fieldwork to understand Earth's past and present.

Education

Stanford Department of Earth & Planetary Sciences, Ph.D. June 2026

- Ph.D. Candidate 2022-2026
  Advisor: Dr. Mathieu Lapôtre
- Ph.D. Student 2020-2022

Colorado College Department of Geology, B.A., Distinction in Geology 2019

Professional Experience

Neukom Institute for Computational Science, Dartmouth College Hanover, NH
Neukom Postdoctoral Fellow September 2026-present

- Co-mentors: Dr. Justin Strauss and Dr. Justin Mankin.

Orbital Sidekick San Francisco, CA
Data analytics intern Sept.-Dec. 2024

- Designed and implemented workflow to prevent hydrocarbon leaks by monitoring oil and gas assets in the continental United States.
- Developed sensor-agnostic change detection algorithm combining multi- and hyperspectral spaceborne sensors.
- Projected revenue >$2M annually with current contracts.

Colorado College Colorado Springs, CO
Paraprofessional 2019-2020

- Led labs and field trips for upper and lower-division undergraduate geology courses of up to 25 students.

TRC Consulting Concord, CA
Geological intern May-Aug. 2016

- Analyzed and documented environmental contaminant data collected from various in-progress remediation sites.

Technical

- **Machine learning:** TensorFlow, PyTorch, scikit-learn, xgboost
- **Geospatial:** Google Earth Engine, QGIS, ArcGIS, UAV stereophotogrammetry, LASTools, CloudCompare
- **Data management, analysis, and processing:** Python, Matlab, AWS
- **Other:** Experience with large (>50 TB) geospatial datasets (using local, cloud, and cluster computing resources), scanning electron microscopy, Adobe suite

Publications

Hasson, M., Ielpi, A., Lapôtre, M.G.A. Transient and long-term dynamics of unvegetated meanders from high-resolution topographic change detection. *In revision, Earth and Planetary Science Letters.*

Hasson, M., Marvin, M.C., and Lapôtre, M.G.A (2026). Zircon transport histories revealed by automated classification of scanning electron microscope images. Journal of Sedimentary Research, doi:10.2110/jsr.2026.050.

Hasson, M., Finotello, A., Ielpi, A., Lapôtre, M.G.A. (2025). Vegetation alters the trajectory of river meander bends. Science, doi:10.1126/science.adv4939.

Marvin, M.C., **Hasson, M.,** Colicci, V., Abubo, R., and Lapôtre, M.G.A. (2025). Detrital zircon microtextures as a powerful new tool to interpret the Precambrian sedimentary record. Geology, doi:10.1130/G53712.1.

Hasson, M., Marvin, M.C., and Lapôtre, M.G.A. (2024). Determining depositional environments in sand and sandstones using quartz microtextures and deep learning. Proceedings of the National Academy of Sciences, doi: 10.1073/pnas.2407655121.

Hasson, M., Marvin, M.C., Gunn, A.L., Lapôtre, M.G.A., and Ielpi, A. (2023). A depositional model for meandering rivers without land plants. Sedimentology, doi:10.1111/sed.13121.

Myrow, P.M., **Hasson, M.,** Taylor, J.F., Tarhan, L., Fike, D.A., Ramirez, G., Fowlkes, G., Popov, L.E., Liu, H., and Chen, J. (2023a). Revised Paleozoic depositional history of the central Rocky Mountains (Utah and Colorado): Sedimentary Geology, doi:10.1016/j.sedgeo.2023.106373.

Myrow, P.M., **Hasson, M.,** Taylor, J.F., Tarhan, L.G., Ramirez, G., Fowlkes, G., and Chen, J. (2023b). Structural control of Cambrian paleotopography and patterns of transgression in western Laurentia: Geology, doi:10.1130/G51055.1.

Invited Talks

- Dartmouth-Tel Aviv University Summer School, October, 2026
- Golden Gate STEM Fair, Randall Museum, March, 2026
- AGU Fall Meeting 2025: Vegetation Changes the Trajectory of River Bends (EP24C), December, 2025
- Paul Myrow Retirement Symposium, November, 2025
- Caltech GeoClub Seminar, May, 2025
- Coastal Morphodynamics and Machine Learning (COMOMoLA) seminar, February, 2025

In the News

Vegetation Changes the Trajectory of River Bends:

- Science Perspective by J. Pizzuto, Stanford News, Radio France (French), Science Daily, Environmental News Network, The Hindu

SandAI: An AI tool to decipher the history of sand grains:

- Science Friday, Stanford Report, Radio Canada (French), Imaging and Machine Vision Europe

Non-academic Publications

Hasson, M., 2018, Geology of the Sierra Nevada in *Discovering the John Muir Trail* by Damon Corso (Falcon Guides, 2018).

Honors and Awards

- Outstanding Graduate Award, Stanford University, 2026
- Achievement Rewards for College Scientists (ARCS) Scholar, 2025-2026s
- NSF Student Travel Grant, 2024
- Stanford Centennial Teaching Award, 2022
- NSF Graduate Research Fellowship Program Honorable Mention, 2022
- McGee/Levorsen Graduate Student Research Grant, Stanford University, 2022
- National Center for Airborne Laser Mapping (NCALM) Seed Proposal Winner, 2021
- McGee/Levorsen Graduate Student Research Grant, Stanford University, 2020
- Estwing Outstanding Senior Geologist Award, Colorado College Dept. of Geology, 2019
- Patricia J. Buster Research Scholarship, Colorado College, 2019

Teaching Experience

Guest lecturer:

- U.C. Berkeley: Civil Engineering 203N: *Surface Hydrology,* 2023
- Stanford: Earth 1C: *Know Your Planet – Science in the Field,* 2022

Teaching assistant:

- Earth & Planetary Sciences 3: *Earth and Planetary Processes and Mechanics,* 2023
- Earth & Planetary Sciences 224: *Rivers: The Arteries of Earth's Continents*, 2022

Outreach and Community Engagement

- Science and Education Lead, Surfrider Foundation, Santa Cruz Chapter, 2025-present.
  - Founded coastal science and conservation speaker series.
  - Obtained series sponsorship from Patagonia.
- Science consultant with BBC Studios Science Unit for TV program entitled "Green Earth," 2022.

Other

Long-distance hiking:

- Pacific Crest Trail thru-hike attempt, 2014 (approx. 1,300 miles).
- Pacific Crest Trail full thru-hike, 2015 (2,650 miles).

Rock climbing:

- Sport redpoint to 5.13b, boulder to V11, trad redpoint to .12b/c.

Expedition grants funded (Ritt Kellogg Memorial Fund, Colorado College):

- Alpine climbing, Wind River Range, Wyoming, 2016
- Sierra High Route thru-hike, California, 2017
- Sailboat-accessed rock climbing, British Columbia, Canada (as vessel captain and climber), 2018