

Graham Harper Edwards

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Postdoctoral Fellow

Earth Sciences, Physics & Astronomy
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CURRENT APPOINTMENT

Dartmouth College

2021 →

NSF Astronomy & Astrophysics Postdoctoral Fellow

“Planetesimal formation, giant planet migration, and stellar accretion in our solar system and beyond”

Advisors: Profs. C. Brenhin Keller (Earth Sciences) & Elisabeth R. Newton (Physics & Astronomy)

EDUCATION

University of California Santa Cruz

2021

PhD: Earth Sciences

Dissertation Title: Applications of the uranium decay systems in deep time and the Quaternary: chronologic insights within planetary interiors and beneath glaciers [PDF]

Committee: Profs. Terrence Blackburn (Chair), Slawek Tulaczyk, Myriam Telus.

Bowdoin College Brunswick, ME

2014

Bachelor of Arts: Earth and Oceanographic Science with Honors, Classics (minor)

Summa cum Laude, ΦBK Society

PUBLICATIONS

* denotes student author

- ... **G.H. Edwards**, T. Blackburn, G. Piccione, S. Tulaczyk. Uranium-series isotopes as tracers of physical and chemical weathering in glacial sediments from Taylor Valley, Antarctica, *in prep*, *Chemical Geology*.
- ... **G.H. Edwards**, C.B. Keller, C. Stewart*, E.R. Newton. An early giant planet instability recorded in asteroidal meteorites, *in prep*, *Nature Astronomy*.
- 5. **G.H. Edwards**, T. Blackburn, G. Piccione, S. Tulaczyk, G.H. Miller, C. Sikes*. 2022. Terrestrial evidence for ocean forcing of Heinrich events and subglacial hydrologic connectivity of the Laurentide Ice Sheet. *Science Advances*. doi: [10.1126/sciadv.abp9329](https://doi.org/10.1126/sciadv.abp9329).
- 4. T. Blackburn, **G.H. Edwards**, S. Tulaczyk, M. Scudder*, G. Piccione, B. Hallet, J.C. Zachos, B. Cheney, N. McLean, J.T. Babbe. 2020. Ice retreat in Wilkes Basin of East Antarctica during a warm interglacial. *Nature* (583), 554-559. doi: [10.1038/s41586-020-2484-5](https://doi.org/10.1038/s41586-020-2484-5). **Press**: National Geographic.
- 3. **G.H. Edwards**, T. Blackburn. 2020. Accretion of a large LL parent planetesimal from a recently formed chondrule population. *Science Advances* (6), eaay8641. doi: [10.1126/sciadv.aay8641](https://doi.org/10.1126/sciadv.aay8641)
- 2. **G.H. Edwards**, T. Blackburn. 2018. Detecting the extent of ca. 1.1 Ga Midcontinent Rift plume heating using U-Pb thermochronology of the lower crust. *Geology* (46), 911-914. doi: [10.1130/G45150.1](https://doi.org/10.1130/G45150.1)

1. **G.H. Edwards.** 2014. Geochemical and stratigraphic analysis of the Linnévatnet sediment record: a study of Late Holocene cirque glacier activity in Spitsbergen, Svalbard. [*Honor's Thesis*] Bowdoin College: Brunswick, ME, U.S.A. 73 pp. [[Undergraduate Research Commons](#)]

TEACHING & MENTORING

Dartmouth College

Guest Lecturer

Spring 2022 Igneous and Metamorphic Petrology

Research Group Leader 2022–23

Acting leader of a research group (4 graduate, 2 undergraduate students) in the Department of Physics & Astronomy while the Primary Investigator was on leave. Responsibilities included:

- Coordinate and facilitate group meetings.
- Provide non-specialist research guidance.
- Evaluate progress and assign grades.
- Organize/present mini-workshops on research tools and skills.

Mentored Graduate Researchers

2022 → Rayna Rampalli (PhD student)

Mentored Undergraduate Researchers

2023 Jack Duranceau (thesis 2023)

2023 Chase Alvarado-Anderson (thesis 2023)

2022 Cameron Stewart

University of California Santa Cruz

Graduate Teaching Assistant

Spring 2021 *Measuring Earth's 4.5 Billion-Year History* (radiogenic and stable isotope geochemistry)

Fall 2020 *Evolution of Earth* (Earth history overview)

Fall 2019 *Elements of Field Geology*

Spring 2018 *Geochemistry of the Solar System*

Winter 2018 *Geologic Principles* (introductory Earth science)

Mentored Undergraduate Researchers

2019–21 Cosmo Varah-Sikes (thesis 2021)

2020 Linh Phan

2018–20 Michael Scudder (thesis 2020)

2018 Alexander Levinson

2018 Frances O'Byrne

2017–18 Paul Colosi

Bowdoin College Brunswick, ME, U.S.A.

Laboratory Teaching Assistant

Fall 2012, 2013 *Investigating Earth*

Fall 2013 *Marine Biogeochemistry*

Bozeman & Livingston Public Schools MT, U.S.A. 2015

Substitute Teacher

- Instructor and paraprofessional in K-12 classrooms.
- Taught students with various educational needs in diverse subjects.

OUTREACH & PUBLIC SERVICE

Montshire Museum of Science 2022 →

Guest Scientist

- Lead and assist educational activities within the museum.
- Explain Earth and space science concepts to pre-K through adult audiences.
- Develop programming focused on planetary science topics.

Santa Cruz Museum of Natural History 2018 – 2022

Volunteer Scientist

- Created educational content and hosted activities at monthly museum events.
- Co-hosted monthly educational video streams covering geoscience topics.
- Link: [Rockin' Pop-Up Archives](#).

Skype a Scientist 2019 →

Volunteer Scientist

- Prepare educational content and host video calls with elementary and secondary school classrooms.
- Teach geoscience concepts and share stories about experiences as a scientist.

Geoscientists Encouraging Openness and Diversity in the Earth Sciences (GEODES) 2019 – 2020

Graduate Student Leader

- A student-run group in the UCSC Earth & Planetary Sciences Department.
- One of six graduate student leaders responsible for the operation and development of GEODES.
- Organized and implemented outreach events centered on promoting underrepresented groups in the geosciences and cultivating a culture of inclusivity within the department.

Peary-MacMillan Arctic Museum Brunswick, ME, U.S.A. 2012 – 2016

Curatorial Intern 2015–16

- Developed outreach programming and exhibit content.
- Supplemented undergraduate courses with lectures and discussions drawing on museum collections.
- Mentored and trained undergraduate student interns and employees.

Student Tour Guide 2012–14

- Led museum tours for all age groups of museum exhibits and interactive collections.

Museum of the Rockies Bozeman, MT, U.S.A. 2015

Security Volunteer

- Answered visitors' questions and facilitated interpretive discussions about natural history exhibits.

INVITED TALKS

6. **Center for Astrophysics | Harvard & Smithsonian** | Astrophysics Data System, 13 June 2023

Title: *Transcribing the cosmochemical codex*

5. **Colby College** | Geology Seminar, 17 Mar 2023
Title: *In the light of a newborn sun: transcribing the first chapters of our solar system from meteorites*
4. **Thayer School of Engineering, Dartmouth College** | Ice+Climate Seminar Series, 10 Feb 2023
Title: *A terrestrial record of Heinrich events*
3. **Carnegie Institution for Science** | Astronomy Seminar Series, 28 Oct 2022
Title: *Reconstructing asteroid assembly from the thermal records of chondrites*
2. **Massachusetts Institute of Technology** | Planetary Lunch Seminar, 3 May 2022
Title: *The early history of the LL chondrite parent planetesimal*
1. **Princeton University** | Environmental Geology and Geochemistry Seminar, 31 Mar 2022
Title: *Peering beneath the northern Laurentide ice sheet during the last glacial maximum*

ACADEMIC SERVICE & EXPERIENCE

Interdisciplinary Earth Data Alliance 2 (IEDA²) 2023 →

Community Advisory Board, Co-Chair

- Co-chair of primary community advising body for the NSF-funded [IEDA²](#) data facility.
- Guide approaches to promote and ensure access, preservation, and re-usability of Earth system data.

Departmental Service

Department of Earth Sciences, Dartmouth

Postdoc Representative for Faculty Search Committee 2023

- Organized meetings with candidates and departmental postdocs.
- Compiled and presented quantitative and qualitative feedback to Search Committee.

Earth & Planetary History Journal Club — Organizer Spring 2022

- Scheduled, coordinated, and oversaw multidisciplinary reading group.

Department of Earth & Planetary Sciences, UCSC

Whole Earth Seminar — Organizer Spring 2019

- Coordinated departmental seminar series (one of two graduate student organizers)
- Contacted and scheduled speakers from diverse disciplines in Earth and planetary sciences.

Laboratory Research & Management

Analytical Experience:

Expert: TIMS

Proficient: MC-ICP-MS, ICP-MS, SEM-EDS

Limited: ICP-OES, XRF, XRD

W.M. Keck Isotope Facility, UCSC 2016 – 2021

Under the advisorship of lab director Prof. Terry Blackburn, I was partially responsible for the operation and maintenance of this multi-user clean lab facility, including:

- Maintenance and operation of mass spectrometers and wet chemistry labs.
- Training and supporting researchers in chemical and mass spectrometric methods.
- Preparation, measurement, and reporting of isotopic analyses of geologic and biomineral material for external contracts.
- Procurement and preparation of lab consumables.

Academic Meetings

American Astronomical Society

Chambliss Award Judge (best student poster presentation) 2023

Meteoritical Society Annual Meeting

McKay Award Judge (best student oral presentation)	2022
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AGU Fall Meeting

Co-Chair/Co-Convener: Applications of Thermochronology to Understand Crustal Systems	2017
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Reviewer for: *Geochronology, Geology*

Society Affiliations: Meteoritical Society, American Astronomical Society, Geochemical Society, National Association of Geoscience Teachers, Geological Society of America, American Geophysical Union.

FUNDING

Current / Active

National Science Foundation — Astronomy & Astrophysics Postdoctoral Fellowship Award #2102591	2021 – 2024
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Prior / Inactive

ARCS Foundation — Scholar Award (Fellowship)	2020 – 2021
University of California Santa Cruz — Regent's Fellowship	2016 – 2017
Bowdoin College — Grua/O'Connell Research Award	2013
Bowdoin College — Freedman Summer Research Fellowship in Coastal/Environmental Studies	2012

AWARDS & HONORS

UCSC Earth & Planetary Sciences Outstanding TA Award (Honorable Mention)	2020
Aaron and Elizabeth Waters Award <i>Issued annually for the most outstanding proposal for PhD research in the UCSC Department of Earth & Planetary Sciences</i>	2019
National Association of Geoscience Teachers Outstanding TA Award	2014

SELECTED CONFERENCE ABSTRACTS

More comprehensive lists of abstracts are available on the [Astrophysical Data System](#) or [Google Scholar](#).

10. **G.H. Edwards**, C.B. Keller, E.R. Newton, C. Stewart. 2023. [iPoster]: Constraining the timescales of giant planet migration from the meteorite record. *241st American Astronomical Society Meeting*, Seattle, WA, U.S.A.
9. **G.H. Edwards**, C.B. Keller, C. Stewart, E.R. Newton. 2022. [Poster]: A Bayesian framework for exploring the early impact history of the asteroid belt with meteorite thermochronology. *85th Annual Meeting of the Meteoritical Society*, Glasgow, Scotland.
8. **G.H. Edwards**, G. Piccione, M. Gomez. 2022. [Poster]: Comparing in-person and virtual modes of a 4-year museum-based geoscience outreach program. *Earth Educators' Rendezvous 2022*, Minneapolis, MN, U.S.A.
7. **G.H. Edwards**, T. Blackburn, G. Piccione, S. Tulaczyk, G.H. Miller, C. Sikes. 2020. [Talk]: Baffin Island subglacial precipitates record subglacial melting beneath the northern Laurentide Ice Sheet concurrent with Heinrich events. *American Geophysical Union Fall Meeting*, New Orleans, LA, U.S.A.

6. C.T. Varah-Sikes, **G.H. Edwards**, T. Blackburn. 2020. [Poster]: Thermal histories in Type 7 ordinary chondrites: interpreting residence in parent body using petrologic observation and Pb-Pb phosphate thermochronology. *Geological Society of America Annual Scientific Meeting*, Virtual.
5. **G.H. Edwards**, T. Blackburn, S. Tulaczyk, G.G. Piccione. 2019. [Poster]: U-Series isotopics constrain timescale of bedrock comminution and glacial incision in Taylor Valley, Antarctica. *Goldschmidt Annual Meeting*, Barcelona, ES.
4. **G.H. Edwards**, T. Blackburn, G.G. Piccione. 2018. [Talk]: Cooling and disruption of the LL chondrite parent body. *Lunar and Small Bodies Graduate Forum (LunGradCon)*, Mountain View, CA, U.S.A.
3. **G.H. Edwards**, T. Blackburn, C.M.O'D. Alexander. 2017. [Talk]: Accretion and disruption histories of the ordinary chondrite parent bodies. *80th Annual Meeting of the Meteoritical Society*, Santa Fe, NM, U.S.A.
2. **G.H. Edwards**, T. Blackburn, K.V. Smit. 2017. [Poster]: Timescales of crustal cooling of the Superior Craton near Attawapiskat, Ontario, Canada, and implications for extent of Keweenawan plume heating. *American Geophysical Union Fall Meeting*, New Orleans, LA, U.S.A.
1. **G.H. Edwards**. 2014. [Poster]: Geochemical and stratigraphic analysis of the Linnévatnet sediment record: a provenance study of Late Holocene cirque glacier activity in Linnédalen, Spitsbergen, Svalbard. *44th International Arctic Workshop*, Boulder, CO, U.S.A.

Additional Work Experience

Wildland Firefighter (Type 2) — U.S. Forest Service, Winthrop, WA, U.S.A. — 2015.
 Server & Bartender — Trio Restaurant, Fish Creek, WI, U.S.A. — 2014.

Non-Academic Interests

Bicycling, cross-country skiing, birdwatching, breadmaking, classical history and literature.