

# Graham Harper Edwards

— he, him —

## Postdoctoral Fellow

Earth Sciences, Physics & Astronomy  
Dartmouth College  
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## APPOINTMENTS

### 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)

*Lecturer* 2023–24

Department of Physics & Astronomy

## EDUCATION

### University of California Santa Cruz

2021

*PhD in Earth Sciences*

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, U.S.A.

2014

*Bachelor of Arts*

Earth and Oceanographic Science with Honors, minor in Classics (*Summa cum Laude*, ΦBK Society)

## PUBLICATIONS

\* mentored student author

... **G.H. Edwards**, G. Piccione, T. Blackburn, 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 review, *Nature Astronomy*. [arXiv:2309.10906](https://arxiv.org/abs/2309.10906).

6. M.A. Thompson, M. Telus, **G.H. Edwards**, L. Schaefer, J. Dhaliwal, B. Dreyer, J.J. Fortney, K. Kim. 2023. Outgassing composition of the Murchison meteorite: implications for volatile depletion of planetesimals and interior-atmosphere connections for terrestrial exoplanets, in press, *Planetary Science Journal*.

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

#### Lecturer

- |           |   |
|-----------|---|
| Fall 2023 | Exploring the Universe ( <i>Instructor of Record</i> )                                    |
| Fall 2023 | “The Stretch” (Field Camp) — Glacial and climate history section ( <i>Co-Instructor</i> ) |

#### Guest Lecturer

- |             |                                   |
|-------------|-----------------------------------|
| Spring 2022 | Igneous and Metamorphic Petrology |
|-------------|-----------------------------------|

#### Research Group Leader      2022 – 2023

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 | <i>Measuring Earth's 4.5 Billion-Year History</i> (radiogenic and stable isotope geochemistry) |
| Fall 2020   | <i>Evolution of Earth</i> (Earth history overview)   |
| Fall 2019   | <i>Elements of Field Geology</i>   |
| Spring 2018 | <i>Geochemistry of the Solar System</i>  |
| Winter 2018 | <i>Geologic Principles</i> (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.

2015 – 2016

### *Curatorial Intern* 2015 – 2016

- 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 – 2014

- 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 ACADEMIC TALKS

7. **Goldschmidt Conference (Lyon)** | Invited Keynote, 12 July 2023  
Title: *Data & computational science for Earth & planetary history: lessons from the terrestrial archive*
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*

## INVITED OUTREACH & COMMUNITY TALKS

3. **Moosilauke Ravine Lodge** | 11 August, 2023  
*Guest scientist & speaker for Perseid meteor shower. Public talk for families.*
2. **Richmond Middle School** | 5 April, 2023 (Hanover, NH)  
*Guest scientist presentation for all sixth grade classes.*
1. **Montshire Museum of Science** | 21 Januray, 2023  
*Public talk on meteorites at "Astronomy Day" event (middle to high school learning level).*

## ACADEMIC SERVICE & EXPERIENCE

**Interdisciplinary Earth Data Alliance 2 (IEDA<sup>2</sup>)**

2023 →

*Community Advisory Board, Co-Chair*

- Co-chair of primary community advising body for the NSF-funded [IEDA<sup>2</sup>](#) 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, UC Santa Cruz* 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*

2023 Chambliss Award Judge (best student poster presentation)

*Meteoritical Society Annual Meeting*

2022 McKay Award Judge (best student oral presentation)

*AGU Fall Meeting*

2017 Co-Chair/Co-Convener: Applications of Thermochronology to Understand Crustal Systems

**Reviewer for:** *Geochronology, Geology, Nature Communications*

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

## FUNDING

### Current / Active

2021–24 National Science Foundation — Astronomy & Astrophysics Postdoctoral Fellowship  
Award #2102591 — \$310,000

## Prior / Inactive

- 2020–21 ARCS Foundation — Scholar Award (Fellowship)
- 2016–17 University of California Santa Cruz — Regent’s Fellowship
- 2013 Bowdoin College — Grua/O’Connell Research Award
- 2012 Bowdoin College — Freedman Research Fellowship in Coastal/Environmental Studies

## AWARDS & HONORS

- 2020 UCSC Earth & Planetary Sciences Outstanding TA Award (Honorable Mention)
- 2019 Aaron and Elizabeth Waters Award — *Issued annually for the most outstanding proposal for PhD research in the UCSC Department of Earth & Planetary Sciences*
- 2014 National Association of Geoscience Teachers Outstanding TA Award
- 2011–13 Sarah and James Bowdoin Scholar (Dean’s List)

## TEN 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. [Talk]: Disk-driven migration of Jupiter: support from meteorite thermochronology. *Goldschmidt Conference*, Lyon, FR.
9. **G.H. Edwards**, C.B. Keller, E.R. Newton, C. Stewart. 2023. [iPoster]: Constraining the timescales of giant planet migration from the meteorite record. *241<sup>st</sup> American Astronomical Society Meeting*, Seattle, WA, U.S.A.
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 Conference*, 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. *80<sup>th</sup> 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 Keweenaw 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. *44<sup>th</sup> 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.