Luke Fairchild | Curriculum Vitae

University of California, Berkeley | Department of Earth & Planetary Science
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Education

- **University of California, Berkeley** — **Berkeley, CA**
  Master of Science, Earth and Planetary Science — *2015–present*
  Thesis The end of Midcontinent Rift magmatism and the paleogeography of Laurentia

- **Carleton College** — **Northfield, MN**
  Bachelor of Arts, Geology (Honors), cum laude — *2011–2015*
  Thesis High temperature emplacement of clastic breccia dikes and implications for the development and magnetization of impact craters

Experience

Teaching

- **Teaching Assistant** — **University of California, Berkeley**
  EPS 115: Stratigraphy and Earth History, Prof. Nicholas Swanson-Hysell — *Spring 2018*
- **Graduate Student Instructor** — **University of California, Berkeley**
  EPS 50: The Planet Earth, Prof. Michael Manga — *Fall 2017*
- **Teaching Assistant** — **Carleton College**
  Petrology, Prof. Cameron Davidson — *Spring 2015*

Field Work

- **Zavkhan Basin** — **Mongolia**
  4 weeks — *2017*
- **Midcontinent Rift** — **Upper Midwestern U.S.A. & Ontario, Canada**
  14 weeks — *2014, 2015, 2016 & 2017*
- **Slate Islands Impact Structure** — **Ontario, Canada**
  5 weeks — *2013, 2014 & 2015*
- **Carleton Geology Field Camp** — **New Zealand**
  10 weeks — *2013*
- **Cannon River Watershed** — **Rice County, Minnesota**
  5 weeks — *2013*

Other

- **Laboratory Safety Coordinator** — **University of California, Berkeley**
  Swanson-Hysell Group, Dept. of Earth and Planetary Science — *2017–present*

Awards

GSA Graduate Student Research Grant — **2017**
Geological Society of America
Paleomagnetism of the Freda Sandstone

EarthScope Award for Geochronology Student Research — **2016**
Earthscope AGeS Program
Constraining rapid paleogeographic change in the Mesoproterozoic as recorded by the North American Midcontinent Rift

Chancellor's Fellowship — **2015**
University of California, Graduate Division

Class of 1963 Fellowship **2014**
Carleton College

Kolenkow-Reitz Fellowship **2013**
Carleton College

Publications

9. **Fairchild, L.M.**, Buffett, B.A., and Biggin, A.J., 2018, *A stochastic coupling of geomagnetic intensity and reversal frequency*. (in preparation)

8. Tikoo, S.M., Swanson-Hysell, N.L., **Fairchild, L.M.**, and Gaastra, K.M., 2018, *A thermal origin for the impact-induced magnetization of the Slate Islands Impact Structure*. (in preparation)

7. Swanson-Hysell, N.L., **Fairchild, L.M.**, and Slotznick, S.P., 2018, *Primary red bed magnetization revealed by fluvial intraclasts*. (in review)

6. Swanson-Hysell, N.L., Ramezani, J., **Fairchild, L.M.**, and Bowring, S.A., 2017, *Failed rifting and fast drifting: Midcontinent Rift development, Laurentia's rapid motion and the driver of Grenvillian orogenesis*: GSA Bulletin. (in review)

5. Sprain, C.J., Swanson-Hysell, N.L., **Fairchild, L.M.**, and Gaastra, K., 2017, *A field like today's? The geomagnetic field 1.1 billion years ago*: Geophysical Journal International, doi:10.1093/gji/ggy074.

4. **Fairchild, L.M.**, Swanson-Hysell, N.L., Ramezani, J., Sprain, C.J., and Bowring, S.A., 2017, *The end of Midcontinent Rift magmatism and the paleogeography of Laurentia*: Lithosphere, doi:10.1130/L580.1.

3. **Fairchild, L.M.**, Swanson-Hysell, N.L., and Tikoo, S.M., 2016, *A matter of minutes: Breccia dike paleomagnetism provides evidence for rapid crater modification*: Geology, doi:10.1130/G37927.1.

2. Bezaeva, N.S., Swanson Hysell, N.L., Tikoo, S.M., Badyukov, D.D., Kars, M., Egli, R., Chareev, D.A., **Fairchild, L.M.**, Khakhalova, E., Strauss, B.E., and Lindquist, A.K., 2016, *The effect of 10 to >160 GPa spherically convergent shock waves on the magnetic properties of basalt of diabase*: Geochemistry, Geophysics, Geosystems, doi:10.1002/2016GC006583.

1. Tauxe, L., Shaar, R., Jonestrask, L., Swanson-Hysell, N.L., Minnett, R., Koppers, A.A.P., Constable, C.G., Jarboe, N., Gaastra, K., **Fairchild, L.M.**, 2016, *PmagPy: Software package for paleomagnetic data analysis and a bridge to the Magnetics Information Consortium (MagIC) Database*: Geochemistry, Geophysics, Geosystems, doi:10.1002/2016GC006307.

Conference Abstracts

- Swanson-Hysell, N.L., **Fairchild, L.M.**, Ramenzani, J., 2018, *Chronostratigraphy of Midcontinent Rift volcanics provides new insight on rift development and the rate of rapid paleogeographic change*, Abstract 323067, GSA Annual Meeting.

- Kulakov, E.V., Smirnov, A.V., Biggin, A.J., Sprain, C.J., Hawkins, L., Patterson, G., **Fairchild, L.M.**, 2018, *The long-term history of the Mesozoic-Jurassic geodynamo: A paleointensity perspective*, European Geosciences Union General Assembly, Vienna, Austria.

- **Fairchild, L.M.**, Buffett, B., Biggin, A., 2017, *Stochastic models and the absolute paleointensity (PINT) database: a new look at geomagnetic reversal rates*, 2017 Nordic Paleomagnetism Workshop, Leirubakki, Iceland.

- **Fairchild, L.M.**, Swanson-Hysell, N.L., Ramenzani, J., Sprain, C., Gaastra, K., Bowring, S., 2017, *The end of Midcontinent Rift magmatism and the paleogeography of Laurentia*, 2017 Magnetics Information Consortium (MagIC) Workshop, La Jolla, California.

- **Fairchild, L.M.**, Swanson-Hysell, N.L., Ramenzani, J., Sprain, C., Gaastra, K., Bowring, S., 2016, *The end of Midcontinent Rift magmatism and the paleogeography of Laurentia*, Abstract 283146, GSA Annual Meeting.

- Swanson-Hysell, N.L., Ramenzani, J., **Fairchild, L.M.**, Rose, I., 2016, *New geochronologic and paleomagnetic constraints on Midcontinent Rift development*, Abstract 284544, GSA Annual Meeting.

- Sprain, C.J., Swanson-Hysell, N.L., **Fairchild, L.M.**, Gaastra, K., 2016, *The strength of the Mesoproterozoic geomagnetic field: new absolute paleointensity estimates from ~1.1 billion-year-old Midcontinent Rift volcanics*, Abstract 154089, AGU Fall Meeting.
- Bezaeva, N.S., Swanson-Hysell, N.L., Tikoo, S.M., Kars, M., Egli, R., Badyukov, D.D., Chareev, D.A., Fairchild L.M., 2016, *Discrimination of Thermal versus Mechanical Effects of Shock on Rock Magnetic Properties of Spherically Shocked up to ~10–160 GPa Basalt and Diabase*, Abstract GP31A-1282, AGU Fall Meeting.
- Bezaeva, N.S., Swanson-Hysell, N.L., Tikoo, S.M., Kars, M., Egli, R., Badyukov, D.D., Chareev, D.A., **Fairchild, L.M.**, 2016, *How to discriminate between thermal and mechanical effects of shock on the rock magnetic properties of basalt and diabase spherically shocked up to ~10–160 GPa.* Book of Abstracts of the 11th International Conference and School "Problems of Geocosmos", October 3–7, 2016, St Petersburg, Petrodvorets, Russia, 126–127.
- **Fairchild, L.M.**, Swanson-Hysell, N.L., Ramenzani, J., Sprain, C., Gaastra, K., Bowring, S., 2015, *When did Midcontinent Rift volcanism end and where was Laurentia at that time?* Abstract GP31A-1364, AGU Fall Meeting.
- Bezaeva, N.S., Swanson-Hysell, N.L., Tikoo, S.M., Badyukov, D., Kars, M., Egli, R., Chareev, D., **Fairchild, L.M.**, Khakhalova, E., Strauss, B., and Lindquist, A., 2015, *Rock magnetic effects induced in terrestrial basalt and diabase by >20 GPa experimental spherical shock waves.* Abstract GP43A-1233, AGU Fall Meeting.
- Tikoo, S.M., Swanson-Hysell, N.L., **Fairchild, L.M.**, Renne, P.R., and Schuster, D.L., 2015, *Origins of impact-related magnetization at the Slate Islands impact structure, Canada.* Abstract 2474, 46th Lunar and Planetary Science Conference.
- **Fairchild, L.M.**, Swanson-Hysell, N.L., Tikoo, S.M., 2014, *High temperature emplacement of clastic breccia dikes and implications for the development and magnetization of impact craters.* Abstract 19163, AGU Fall Meeting.
- Tikoo, S.M., Swanson-Hysell, N.L., **Fairchild, L.M.**, Renne, P.R., and Schuster, D.L., 2014, *Testing the shock remanent magnetization hypothesis at the Slate Islands impact structure, Canada.* Abstract 23778, AGU Fall Meeting.

Memberships

International Geoscience Programme (IGCP) 648 **2015**
Supercontinent Cycles & Global Geodynamics

Geological Society of America **since 2016**

American Geophysical Union **since 2013**

Sigma Xi Research Society **since 2015**

Technical and Personal Skills

Programming Languages

- python™
  Proficient with a variety of scientific computing and data analysis tools written in Python. Experience with software development, including the development of graphical user interface (GUI) applications with wxPython/Phoenix. Active contributor to PmagPy (github.com/PmagPy), an open-source software package widely used within the geomagnetism and paleomagnetism research communities that also provides the core data analysis and visualization tools underlying the Magnetics Information Consotium (MagIC) database, an online archive of paleomagnetic data (earthref.org/MagIC). An overview of the PmagPy project is provided in Tauxe et al. (2016) (listed above in Publications).
- Proficient in Bash and other Unix shell/command line interface (CLI) tools
- Experience with MATLAB; limited experience with C and C++ from miscellaneous projects (no formal training)
- Some experience with frontend web development (CSS, Javascript) and static site generators (Jekyll, GitHub Pages)

Markup Languages

- LaTeX
- Markdown
- HTML

Industry Software Skills

Geographic Information Systems (GIS)

- **QGIS**
  Proficient and highly experienced. I have used QGIS over many years to integrate field observations and structural measurements in creating geologic maps, investigate geographic trends in laboratory data, and develop spatial and temporal (paleo)geographic models.
- **ArcGIS**
  While ultimately more familiar with the QGIS interface, I do also have ample experience with ArcGIS in generating custom maps and referencing high-resolution imagery.
- Extensive experience with Adobe Creative Suite software (Illustrator, Photoshop, Lightroom)
- Fluent in `git` version control software and related online platforms such as GitHub

Field Skills

- Geologic mapping
- Rock core drilling/orienting
- Geological structural analysis
- Field work logistics and planning

Laboratory Skills