

Will Steinhardt

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Appointments

UC Santa Cruz | Postdoctoral Scholar

Current

Education

Harvard University | Ph.D. in Earth & Planetary Sciences

Feb 2020

Caltech | B.A. in Geophysics

2011

Honors and Awards

Outstanding Student Presentation Award | AGU

2018

Shaler Teaching Award | Harvard Earth & Planetary Sciences

2016

Certificate of Distinction in Teaching | Harvard Bok Center

Spring 2015, Spring 2016

NASA Earth and Space Science Fellowship | NASA (declined)

2013

Fritz Burns Prize, Caltech Division of Geologic & Planetary Sciences

2011

Student Life and Masters Award, Caltech

2011

Publications

1. **Steinhardt, W.** & Rubinstein, S. M. Geometric rules for the annihilation dynamics of step lines on fracture fronts. *Phys. Rev. E* 107, 055003 (2023). ([LINK](#))
2. **Steinhardt, W.**, Dillavou, S., Agajanian, M., Rubinstein, S. M. & Brodsky, E. E. Seismological Stress Drops for Confined Ruptures Are Invariant to Normal Stress. *Geophysical Research Letters* 50, e2022GL101366 (2023). ([LINK](#))
3. **Steinhardt, W.** & Rubinstein, S.M. "How Material Heterogeneity Creates Rough Fractures" *Phys. Rev. Lett.*, 129, 128001 (2022). ([LINK](#)) ([Chosen For Cover](#))
4. Solomatova, N.V., Jackson, J.M., Sturhahn, W., Wicks, J.K., Zhao, J., Toellner, T.S., Kalkan, B. and **Steinhardt, W.** "Equation of state and spin crossover of (Mg, Fe) O at high pressure, with implications for explaining topographic relief at the core-mantle boundary." *American Mineralogist*, 101(5), pp.1084-1093. (2016).
5. Bindi, L., Yao, N., Lin, C., Hollister, L.S., Andronicos, C.L., Distler, V.V., Eddy, M.P., Kostin, A., Kryachko, V., MacPherson, G.J., **Steinhardt, W.**, Yudovskaya M., Steinhardt P.J., "Decagonite, Al₇₁Ni₂₄Fe₅, a quasicrystal with decagonal symmetry from the Khatyrka CV3 carbonaceous chondrite." *American Mineralogist*, 100(10), pp.2340-2343. (2015).
6. Bindi, L., Yao, N., Lin, C., Hollister, L.S., Andronicos, C.L., Distler, V.V., Eddy, M.P., Kostin, A., Kryachko, V., MacPherson, G.J., **Steinhardt, W.**, Yudovskaya M., Steinhardt P.J., 2015. "Natural quasicrystal with decagonal symmetry." *Scientific Reports*, 5, p.9111. (2015).
7. Bindi, L., Yao, N., Lin, C., Hollister, L.S., MacPherson, G.J., Poirier, G.R., Andronicos, C.L., Distler, V.V., Eddy, M.P., Kostin, A., Kryachko, V., **Steinhardt, W.**, Yudovskaya M., Steinhardt P.J., "Steinhardtite, a new body-centered-cubic allotropic form of aluminum from the Khatyrka CV3 carbonaceous chondrite." *American Mineralogist*, 99(11-12), pp.2433-2436. (2014).
8. Hollister, L.S., Bindi, L., Yao, N., Poirier, G.R., Andronicos, C.L., MacPherson, G.J., Lin, C., Distler, V.V., Eddy, M.P., Kostin, A., Kryachko, V., **Steinhardt, W.**, Yudovskaya M., Eiler J.M., Guan Y., Clarke J.J., Steinhardt P.J, "Impact-induced shock and the formation of natural quasicrystals in the early solar system." *Nature Communications*, 5, p.4040. (2014).
9. MacPherson, G.J., Andronicos, C.L., Bindi, L., Distler, V.V., Eddy, M.P., Eiler, J.M., Guan, Y., Hollister, L.S., Kostin, A., Kryachko, V., **Steinhardt, W.**, Yudovskaya M., Steinhardt P.J., "Khatyrka, a new CV 3 find from the Koryak Mountains, Eastern Russia." *Meteoritics & Planetary Science*, 48(8), pp.1499-1514. (2013).
10. M. Obrić, Ž Ivezic, P. N. Best, R. H. Lupton, C. Tremonti, J. Brinchmann, M. A. Agüeros, G. R. Knapp, J. E. Gunn, C. M. Rockosi, D. Schlegel, D. Finkbeiner, M. Gaćša, V. Smolčić, S. F. Anderson, W. Voges, M. Jurić, R. J. Siverd, **Steinhardt, W.**, A. S. Jagoda, M. R. Blanton, D. P. Schneider; "Panchromatic properties of 99 000 galaxies detected by SDSS, and (some by) ROSAT, GALEX, 2MASS, IRAS, GB6, FIRST, NVSS and WENSS surveys", *Monthly Notices of the Royal Astronomical Society*, Volume 370, Issue 4, 1677–1698 (2006).
11. Sesar, B., Sviloković, D., Ivezic, Ž., Lupton, R.H., Munn, J.A., Finkbeiner, D., **Steinhardt, W.**, Siverd, R., Johnston, D.E., Knapp, G.R. and Gunn, J.E., "Variable faint optical sources discovered by comparing the POSS and SDSS catalogs." *The Astronomical Journal*, 131(6), p.2801. (2006).
12. Ivezic, Ž., Richards, G., Hall, P., Lupton, R., Jagoda, A., Knapp, G., Gunn, J., Strauss, M., Schlegel, D., **Steinhardt, W.** and Siverd, R., June. "Quasar Radio Dichotomy: Two Peaks, or not Two Peaks, that is the Question." *AGN Physics with the Sloan Digital Sky Survey (Vol. 311, p. 347)*. (2004).

Invited Talks

Computational Infrastructure for Geodynamics	3 / 2023
<i>"Physical Fault Models: Using Rubber Earthquakes to Understand Seismological Stress Drops and Earthquake Nucleation"</i>	
Brandeis MRSEC Seminar	10 / 2022
<i>"The Rules of Roughness"</i>	
MIT Geophysics Seminar	10 / 2022
<i>"What Rubber and Jello Can Teach Us About Earthquakes and Fractures"</i>	
USGS Earthquake Science Center Seminar	7 / 2022
<i>"What Rubber and Jello Can Teach Us About Earthquakes and Fractures"</i>	
University of Washington Earth and Space Science Colloquium	1 / 2022
<i>"What Rubber and Jello Can Teach Us About Earthquakes and Fractures"</i>	
UCSC IGPP Seminar	2 / 2020
<i>"The Rules of Roughness: An Experimental Investigation into the Origins of Brittle Fracture Complexity"</i>	
American Physical Society (March Meeting 2019)	3 / 2019
<i>"The Rules of Roughness: Understanding the Dynamic Generation of 3D Complexity in Fractures"</i>	

Contributed Talks

American Geophysical Union Fall Meeting	12 / 2022
Southern California Earthquake Center Annual Meeting	9 / 2022
Gordon Research Conference Rock Mechanics	8 / 2022
American Geophysical Union Fall Meeting	12 / 2021
Southern California Earthquake Center Annual Meeting	9 / 2021
American Geophysical Union Fall Meeting	12 / 2020
American Geophysical Union Fall Meeting	12 / 2019
Southern California Earthquake Center Annual Meeting	9 / 2019
American Physical Society March Meeting	3 / 2019
American Geophysical Union Fall Meeting	12 / 2018
World Congress on Computational Mechanics	8 / 2018
BIRS Workshop Hydraulic Fracturing: Modeling, Simulation, and Experiment	6 / 2018
Harvard-CUPB Workshop on Rock Physics for Fracking and EOR	11 / 2017
Society of Engineering Science Annual Meeting	10 / 2016
American Geophysical Union Fall Meeting	12 / 2015

Teaching

Teaching Fellow for <i>ENG-SCI 123: Introduction to Fluid Mechanics and Transport Processes</i>	Spr 2015, Spr 2016
Teaching Assistant for <i>GE 1: Earth and Environment</i>	Spr 2010

Service and Outreach

Reviewer for <i>Scientific Reports</i>	
Reviewer for <i>Review of Scientific Instruments</i>	
Supervised undergraduate Jaiden Zak on friction research	2022 - Present
Supervised undergraduate Sydney Haith on interacting asperity research	2022 - Present
Supervised graduate student Caroline Martin on fracture surface analysis project	2019 - 2019
Supervised graduate student Rodrigo Telles on hydrogel heterogeneity project	2018 - 2019
Supervised undergraduate Aria Hamann on interfacial hydrogel fracture project through Harvard REU Program	2014
Led <i>Science Days</i> lab tours and demonstrations for middle school students	2015, 2016