

## 2022 USGS Earthquake Science Center Internship Program Announcement

Do you want to work as part of a diverse science institution that researches and monitors earthquakes and faults? The U.S. Geological Survey Earthquake Science Center is recruiting interns to work on earthquake monitoring, research, science support administration, and information technology in Summer 2022.

**Join us for an information session via Zoom at 7 PM Pacific on Thursday February 10, 2022:**

<https://zoom.us/join>

**Meeting ID:** 820 4962 0884

**Passcode:** 021222

[direct Zoom link](#)

**Or just aim your camera at the QR code**



*Please take a moment to review these notes below before calling in: A computer connected to audio is preferred (phone/tablet don't work as well). If possible, join the call 5 to 10 minutes early. Use your full name (first and last) when joining. You'll be placed in a waiting room briefly before entering. Update your Zoom client to the latest version before you join. If you're not familiar with Zoom, we will teach you everything you need to know.*

At the information session, Earthquake Science Center staff will describe the paid student internship opportunities, provide advice for applying, and answer questions. We encourage students at 2-year and 4-year colleges and universities who are considering careers or degrees in earth science, computer science, mathematics, physics, engineering, information technology, or other related fields. Applications from students with any level of experience are encouraged, we hope to hire a diverse cohort of interns. Positions are initially for summer 2022, but some may be extended. Start date is flexible.

Although the vacancy announcements are generic, you may indicate interest in a specific opportunity on the application. To apply for these USGS Pathways internships, go to <https://www.usajobs.gov/> and enter the job number (**to be shared at the zoom event**, or email [esc\\_internships@usgs.gov](mailto:esc_internships@usgs.gov) if you need it or can't find the posting). **The job application will open at 9 PM Pacific on Sunday, February 13, and close after we receive a limited number of applicants; we recommend you apply ASAP.** We suggest that you set up your account and upload the required documents (resume/CV and transcripts) in USAJOBS.gov in advance. **Make sure to include unofficial transcripts (readable pdf format preferred) from all institutions and provide proof of enrollment at your current institution. Please also prepare a short statement of interest to help us match you with a project.** These positions are only open to U.S. citizens. There will be two postings one for undergraduate (2-yr and 4-yr institution) students, and one for graduate students. Be sure to apply to the correct posting.

The internship opportunities are listed beginning on the next page. Mentor name and location are listed, as is the type of student that might fit best. Some positions may only be filled when staff return to offices when mandatory remote telework ends following the COVID-19 pandemic. If you would like to contact the potential mentor, find contact info here: <https://www.usgs.gov/centers/earthquake-science-center/employee-directory>

**Feel free to send any questions to [esc\\_internships@usgs.gov](mailto:esc_internships@usgs.gov)**

<https://www.usgs.gov/centers/earthquake-science-center>

[https://twitter.com/USGS\\_Quakes](https://twitter.com/USGS_Quakes)

[https://www.instagram.com/usgs\\_quakes/](https://www.instagram.com/usgs_quakes/)

## Internship Opportunities

### A) Undergraduate or graduate student

#### Research Support

1. Make the FAST earthquake detection software user-friendly: set up package install, write user guide, make reproducible data workflows with Jupyter, Google Colab, Docker. Knowledge of Linux, GitHub, Python desired. Learn data science and software development; make a portfolio to show future employers. (Clara Yoon – Pasadena or remote, *Undergrad or graduate*).
2. Develop short learning modules for USGS scientists to use during outreach at K-6 schools, covering themes such as geology, earthquake science, historic earthquakes, and preparedness. Assist with outreach to schools in Los Angeles region to set up class-room opportunities. Non-science majors encouraged. (Kate Scharer, Sue Hough, Devin McPhillips – Pasadena. *Undergrad or graduate*.)
3. Improve aspects of the ShakeMap operations including improving consistency across multiple operating instances and modernization of key inputs within California, including shear-wave velocity input grid, ground motion models, finite fault, and waveforms. (Lisa Schleicher – Moffett Field or remote. *Undergrad or graduate*.)
4. Explore the "Did You Feel It" database of earthquake shaking reports to determine which earthquakes are more impactful: smaller magnitude earthquakes which happen more frequently but usually produce weak shaking or larger magnitude earthquakes which are rare but always cause strong shaking? (Sarah Minson, Sue Hough, Jessie Saunders, and Annemarie Baltay – Moffett Field, Pasadena, or remote. *Undergrad or graduate*.)
5. Investigate fault slip rates and mountain evolution in Los Angeles with tectonic geomorphology. Use aerial lidar data to characterize stream channels and help interpret new beryllium-10 erosion rates. Experience with Matlab or GIS is helpful. (Devin McPhillips – Pasadena. *Field work possible, not required. Undergrad or graduate*.)
6. Improve understanding of the seismic velocity structure in Northern California through investigation of available shallow geotechnical datasets, analysis of seismic noise, and performing computer simulations of seismic wave propagation using the San Francisco Bay Area 3D seismic velocity model. (Evan Hirakawa – Moffett Field or remote. *Undergrad or graduate*.)
7. Work with the USGS Aftershock Forecasting Team on how to present the success of our forecasts and build confidence in them. Candidates should have programming experience. Our forecasts help the public cope and guide response operations: see <https://earthquake.usgs.gov/data/oaf/> for more info. (Andrew Michael, Jeanne Hardebeck, Michael Barall, Sara McBride, Morgan Page, and Nicholas van der Elst – Moffett Field, Pasadena, or remote. *Undergrad or graduate*.)
8. Participate in ground motion recordings, as well as analyses of site data, to be acquired in urban and/or rural locations where network seismic monitoring station sites are located. (Alan Yong, Jose Gomez – Pasadena. *Field work likely. Undergrad or graduate*.)
9. Perform geological research such as fault trenching, lidar analysis, GIS to better understand active faults in northern California. (Steve DeLong – Moffett Field. *Field work likely. Undergrad or graduate*.)
10. Organize, interpret, and model InSAR interferograms over geothermal fields in California. Requires some programming background and is a great way to further develop Python coding skills. (Kathryn Materna – Moffett Field. *Undergrad or graduate*.)
11. Earthquake-triggered landslide runout prediction for hazard and risk modeling. Student will use scientific programming (e.g. MATLAB/Python/etc.) and GIS software to help develop predictive models of landslide runout

from earthquake-triggered landslide inventories. (Alex Grant – Seattle or remote. *Field work possible. Undergrad or graduate.*)

12. Map fractures using lidar data and photos from the 2019 M7.1 Ridgecrest earthquake rupture. (Josie Nevitt – Moffett Field or remote. *Field work possible, not required. Undergrad or graduate.*)
13. Assist with active fault studies and geology-based earthquake hazard studies within the Pacific Northwest. Seeking a geology student with field experience and GIS skills (Stephen Angster – Seattle. *Field work likely. Undergrad or graduate.*)

#### *Computer Science-Based Science Support*

14. Help upgrade CentOS Linux computer systems, which range from real-time to HOC systems. (Joe Fletcher and Larry Baker - Menlo Park. Undergrad or graduate.)
15. Work on IT-related projects involving Linux systems administration Amazon Web Services, database administration, cybersecurity, and software/script development. Applicants with interest in any of these are encouraged to apply. (Jeff Brody or Steve Guiwits – Menlo Park, Seattle, or Pasadena. *Undergraduate or graduate*)

#### *Earthquake Monitoring Network Support*

16. Support operations within the National Strong Motion Program. This involves prepping and testing equipment, learning how to operate the seismic hardware, its peripheral equipment and associated software. Intern will be required to work in the field. (Dean Childs - Menlo Park; or other advisor – Pasadena. *Field work likely. Undergrad or graduate.*)

### **B) Undergraduate student preferred**

#### *Research Support*

17. Learn about earthquakes and aftershock behavior while developing graphical and video explainers for the public. Candidates should have a good eye for beautiful, useful graphics that can be used to explain scientific ideas & be familiar with image, video, and/or animation software. (Morgan Page – Pasadena. *Undergraduate.*)

#### *Earthquake Monitoring Network Support*

18. Support the Northern California Seismic Network (NCSN) as a Physical Science Field Assistant - Support construction builds of both upgraded and new NCSN stations; prep and test equipment for the ShakeAlert Earthquake Early Warning (EEW) network of seismometers; and learn how to install and operate the seismic hardware and software associated with the seismometers. (Jim Smith - Menlo Park. *Extensive field work required. Undergraduate.*)