

USGS 2021 STUDENT INTERNSHIP OPPORTUNITIES

We invite you to stop by the USGS booth at the Colorado School of Mines virtual career fair on Wednesday, February 3 from 9 am to 3 pm MST. There you can learn about the USGS and current student internship opportunities at the Geologic Hazards Science Center in Golden, CO. Attending the career fair is not required to apply for an internship. The virtual event will be held here: <https://www.mines.edu/careers/career-day-and-job-events/>

The USGS has the following job opportunities available for student applicants in Golden, CO and Albuquerque, NM. To apply for these USGS Pathways opportunities, go to <https://www.usajobs.gov/> and search for the announcement number listed below which best matches your field of study (science or engineering) and student status (undergraduate or graduate):

- # **USGS-PATH-21-11015145-DE-MA**, Physical Science Student Trainee (GS-03/04 UNDERGRADUATE STUDENTS)
- # **USGS-PATH-21-11016308-DE-MA**, Physical Science Student Trainee (GS-05/07 GRADUATE STUDENTS)
- # **USGS-PATH-21-11013875-MW**, Civil Engineering Student Trainee (GS-05/07 GRADUATE STUDENTS)

The application window will open at 10 pm MST on Feb 3, 2021. These positions are very competitive and have an application limit. We recommend you apply ASAP.

We recommend that you go to USAJOBS.gov in advance to set up your account and upload the required documents to your account. Then, when the application window opens, you'll have everything ready to go. Required documents that *must* be uploaded to USAJOBS.gov by the application deadline:

- **Current transcripts** showing proof of enrollment. Unofficial transcripts are acceptable.
- **Resume.** Please indicate your preferred project number and point-of-contact (POC) name. (see below).

The listing of project opportunities is available here:

https://earthquake.usgs.gov/static/lfs/internships/USGS_internships_2021.pdf

Project opportunities listed below are available in Golden, CO unless otherwise noted. They are grouped by discipline, and all require good organization, communication and writing skills. These positions provide direct exposure to high-visibility research and development and are ideal for learning new skills. Many opportunities request but **do not require** technical programming experience. Those with a strong desire to learn programming languages are encouraged to apply.

Seismic Hazard, Engineering, & Risk

1. Help aggregate earthquake information and process empirical and simulated ground motion data for seismic directivity analysis, machine learning applications, or ground motion comparisons. Programming (Python). (POC: Kyle Withers)
2. Contribute to the development of a framework to assess seismic risk for nationwide infrastructure (bridges and pipelines) and help update nationwide loss estimates and maps. Statistics, GIS, programming (Python, MATLAB). (POC: Kishor Jaiswal)
3. Use geospatial statistics to characterize, improve, and optimize on-demand estimates of the spatial variability of ground shaking for USGS ShakeMaps. Mathematics, statistics, programming (Python, MATLAB), GIS. (POCs David Wald and Eric Thompson)
4. Review and update ShakeMap Atlas events. Visually identify potential problems/issues and collect/update data programmatically. Programming (Python, Unix). (POC: Eric Thompson)
5. Help develop a Bayesian framework for incorporation of near real-time data on earthquake shaking intensity and structural damage/losses into USGS PAGER loss estimates. Statistics, programming (MATLAB, Python). (POC: Kishor Jaiswal)
6. Improve ShakeMap for use in liquefaction and landslide hazard modeling using numerical and statistical modeling and ground motion characterization. Mathematics, seismology. (POC: Eric Thompson)
7. Develop web tools that help structural and geotechnical engineers use forecasts of earthquake ground shaking from the USGS National Seismic Hazard Model (NSHM). Engineering, programming. (POC: Nicolas Luco)
8. Develop web services and dynamic web applications to support public access to the National Seismic Hazard Model (NSHM). Programming. (POC: Peter Powers)
9. Support activities of the National Seismic Hazard Model Project (NSHMP) including running hazard calculations, analyzing earthquake catalogs, performing quality assurance, organizing workshops, and testing new software and web applications. (POC: Peter Powers and Allison Shumway)
10. Develop methods to estimate the likelihood of damage to infrastructure and ports due to earthquake-triggered liquefaction and landslides that build on the existing near-real-time USGS ground failure models. GIS, Data Science. (POC: Kate Allstadt)

Earthquake Monitoring & Data Analysis

11. Develop and test deep learning tools to characterize earthquake source information from time-series data for earthquake monitoring. Programming (Python), machine learning, seismology. (POC: Will Yeck)
12. Test new earthquake rupture finite fault modeling capabilities. This work includes validating finite fault models of past earthquakes using new software and validating the visualization of these models. Programming (Python). (POC: Will Yeck)
13. Improve National Earthquake Information Center (NEIC) regional tectonic and post-earthquake executive summaries through literature searches and compilation of available seismotectonic/geodetic/paleoseismic/geodynamic data sets for subduction zones. (POC: Harley Benz)

14. Develop data mining and display tools to analyze seismicity and quality-control metrics of earthquake catalogs, and assess operational performance at the USGS National Earthquake Information Center (NEIC) and other regional seismic networks in the U.S. Programming (Python), statistics (POC: Paul Earle)

Landslide Hazards

15. Assist with the rapid assessment of large, highly mobile landslides using seismic and imagery analysis. Programming, GIS, remote sensing and signal processing. (POC: Kate Allstadt)
16. Help develop and maintain data acquisition systems and sensors used in landslide monitoring. Process monitoring and survey data to prepare for analysis, publication, and archiving. Programming, fieldwork. (POC: Rex Baum and Jeff Coe)
17. Compile existing literature and mapping on landslides in coastal Alaska and help with mapping and analysis of landslides in Puerto Rico and the conterminous U.S. GIS, Excel. (POC: Rex Baum)
18. Assist in assembling, filtering, and storing of nationwide geospatial basemaps (soils, roads, trails, etc.) for analysis of debris-flow hazard models using GIS tools. Development of web-protocols to download, store, and process real-time rainfall data to monitor the rainfall intensity within recent burn perimeters. GIS, Python-Programming, Data Science. (POC: Dennis Staley and Francis Rengers)

Seismic Source & Ground Motion Characterization

19. Analyze earthquake waveform data to improve understanding of regional seismic structure and to characterize earthquake sources. Employee may examine and model features of the seismic wave field, investigate applications of ambient seismic noise to seismic velocity structure and temporal monitoring, or develop inversion methods from strong-motion data. Seismology, programming (Python, Unix). (POC: Morgan Moschetti)
20. Assist in the collection and analysis of earthquake ground motion data from various regions to improve the National Seismic Hazard Model (NSHM Programming (Python, Unix). (POC: Morgan Moschetti)
21. Contribute to the development of a public database of shear-wave velocity and horizontal-to-vertical spectral ratio data, which are used for prediction of ground shaking during earthquakes. Programming (Python, R, MATLAB), GIS. (POC: Sean Ahdi)

Software Development

22. Work with software and infrastructure development team projects such as web applications and/or cloud architecture in Amazon Web Services. Computer Science, programming. (POC: Lynda Lastowka)
23. Work with development team on geologic hazards web applications. Development tasks include both front and back end processes. For students with an interest in computer science and operational applications and infrastructure. Computer Science, programming. (POC: Lynda Lastowka)

Seismic Instrumentation (Albuquerque, NM)

24. Install seismometers, configure digitizers, and analyze recently collected seismic data. Improve data quality by developing new methods and algorithms to aid in data analysis. Programming, instrumentation, fieldwork. (POC: Adam Ringler)