



USGS NSF Internship Opportunity

Point of Contact Name:	Gilpin Robinson
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USGS Center:	Eastern Mineral & Environmental Resources Science Center
Project Title:	Understanding Minerals and Resources through Big Data Science
Summary:	This is an opportunity to integrate diverse data sources on mineral deposits, resources, minerals, geology, and spatial data, and apply predictive analytics to discover new insights into the occurrence, distribution, type, and quality of known and undiscovered earth resources. The intern may participate in any combination of these efforts consistent with their background and interests.
Project Hypothesis or Objectives:	The objective of this internship is to assist the development of strategies and methodologies to integrate diverse data sources on mineral deposits and resources, mineral occurrence localities, and geological and geophysical spatial data to model the spatial and temporal distribution of mineral deposits. Special emphasis may be given to the study of rare, scarce, and critical mineral resources. The intern may support this study using skills in mineralogy, mineral deposit science, computer science, data analytics, and/or applied mathematics.
Duration:	Up to 12 months
Internship Location:	Reston, VA
Field(s) of Study:	Geoscience, Computing
Applicable NSF Division:	EAR Earth Sciences, BD HS Big Data Regional Innovation Hubs and Spokes, HPC High Performance Computing, DMS Mathematical Sciences
Intern Type Preference:	Any Type of Intern
Keywords:	Mineral deposits, mineralogy, resources, big data analytics
Expected Outcome:	The project will provide the intern with a unique opportunity to work with economic geologists, crowd-sourced data (c.f. MINDAT), and

other established scientists. The student may use this opportunity to develop a thesis topic that will allow continued collaboration with USGS scientists working on mineral resources and data analysis. The USGS study will benefit from having a junior colleague who can contribute their emerging skill sets, different perspective, and curiosity towards the larger study.

● **Special skills/training Required:**

The intern's specific involvement will be determined by their skill set and academic interests. Proficiency in computer programming and GIS skills would be useful for georeferencing and integrating data sets. A working knowledge of ore deposits, mineralogy, and geology would be applicable to working with large mineral deposit and mineral locality databases and understanding metal and mineral associations. A working knowledge of data analytics, neural networks, parallel processing tools, and machine learning would be applicable to Big Data applications.

● **Duties/Responsibilities:**

The intern will provide support and insight to USGS scientists related to data integration and analytics, and High Performance Computing (HPC) tools, techniques, methodologies, and capabilities. Depending on skill sets and expertise, the intern may assist on projects involving data integration and synthesis, optimization of computational models, transformation and preparation of scientific data, performance tuning of algorithms, application of parallel programming methods, and exploration of advanced concepts of automation and information processing for efficient use on HPC systems.

Internal Information - Not to be posted:

Center Director Name: Daniel Hayba

USGS Responsibilities: Equipment, Facilities, Mentoring, On-boarding, Background Check, Volunteer Agreement Management

Preliminary Approval: This opportunity has my Center's approval

I already have a student in mind:

Comments:
