

# Henry Geerlings | Resume

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## - Education -

<b>Colorado School of Mines</b> <i>M.S. Materials Science, GPA - 3.7</i>	<b>Golden</b> 2016 - 2018
<b>University of California</b> <i>B.S. Materials Science &amp; Engineering, GPA - 3.2</i>	<b>Berkeley</b> 2011 - 2015

## - Experience -

<b>Colorado School of Mines</b> <i>Researcher</i> As part of the ADAPT Center (Alliance for the Development of Additive Processing Technologies), developed high throughput algorithms for analyzing pore and phase structures measured by uXCT (micro X-ray computed tomography) for selectively laser molten Inconel 718. <i>Detailed achievements:</i> <ul style="list-style-type: none"><li>o Developed automated batch routines for scraping, analyzing, and uploading porosity data to Citrine database for additively manufactured parts of varying processing parameters.</li><li>o Fed data into a machine learning model used to predict optimal processing parameters, given desired performance as input.</li></ul>	<b>Golden</b> 2016 - Current
<b>Lawrence Berkeley National Laboratory</b> <i>Affiliate</i> Participated in a collaboration between the Materials Project and UC Berkeley for implementing defect-dislocation interaction energies into the Materials Project database. <i>Detailed achievements:</i> <ul style="list-style-type: none"><li>o Used existing elastic constants data from the database to feed into continuum model for interactions.</li><li>o Generated (interstitial) defect structures of varying supercell size and chemical species for DFT calculations using the "Python Materials Genomics" package.</li></ul>	<b>Berkeley</b> Aug. 2015 - Current
<b>Lawrence Berkeley National Laboratory</b> <i>Intern</i> Coded and analyzed multiple searching algorithms for large scale materials optimization. Coupled with the Materials Project, this would allow on-the-fly materials screening using the Materials API for the computationally budget conscious. <i>Detailed achievements:</i> <ul style="list-style-type: none"><li>o Search methodologies included genetic algorithms and as well as more black box global optimization engines.</li><li>o Applications included water splitting materials (band gap/edge) and ductile intermetallics (bulk/shear modulus).</li></ul>	<b>Berkeley</b> June 2015 - Aug. 2015
<b>Chrzan Computational Materials Group</b> <i>Undergraduate Researcher</i> Performed molecular dynamics simulations of dislocations near the phase transformation temperature of pure titanium in order to characterize cold working effects. <i>Detailed achievements:</i> <ul style="list-style-type: none"><li>o Verified thermal expansion behavior of empirical potential model by comparing to experimental results.</li><li>o Visually mapped out multiple phases near the transition temperature using bond order parameters.</li></ul>	<b>Berkeley</b> Jan. 2014 - Jan. 2015

## - Publications -

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De Jong, M., Chen, W., Geerlings, H., Asta, M., and Persson, K. (2015). A database to enable discovery and design of piezoelectric materials. *Scientific Data* **2**, 1500053

## - Computing -

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**OS:** Windows, OS X, Ubuntu (Linux)

**Utility:** Git, Slack, L<sup>A</sup>T<sub>E</sub>X, MS Office

**Technical:** FEnICS, Knime, Lammmps, Vesta, ParaView

**Languages:** Python, Bash, Matlab, R

## - Training -

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### Materials Analysis:

Micro X-Ray Computed Tomography (uXCT)

*Research*

Scanning Electron Microscopy (SEM)

*Research*

Energy Backscatter Diffraction (EBSD)

*Research*

Focused Ion Beam (FIB)

*Research*

X-Ray Diffraction (XRD)

*Lab Course*

Metallography

*Lab Course*

Radiation Safety Training (EHS-470)

*LBNL*

## - Coursework -

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### Materials Science and Engineering:

Materials Thermodynamics

Crystallography, Bonding, and Defects

Phase Transformations and Kinetics

Properties of Electronic Materials

Mechanical Behavior of Materials

Experimental Materials Science

Materials Characterization

Materials Production

Polymeric Materials

Corrosion

### Mechanical Engineering and Other:

Fatigue and Fracture

Simulation of Advanced Manufacturing Processes

Engineering Analysis using FEM

Continuum Mechanics

Engineering Dynamics

Solid Mechanics

Heat Transfer

Computational Linear Algebra

Computer Programming with MATLAB

Methods of Engineering Analysis

Engineering Thermodynamics