

# THEODORE CHAMP

## Chemical Engineering Undergraduate Student

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📍 Boulder, Colorado

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📄 [github.com/theodorechamp](https://github.com/theodorechamp)

## EDUCATION

B.S. in Chemical Engineering

University of Colorado, Boulder | F 2016-Present

GPA 3.62 Engineering Dean's list F 2016 to F 2018

- **Relevant Coursework:** Intro to Engineering Computing, Computer Science 2: Data Structures, Physical Chemistry, Heat Transfer, Separations and Mass Transfer

## EXPERIENCE

Undergraduate Research Assistant

Weimer Group, *Department of Chemical and Biological Engineering*

📅 January 2018 – Present

📍 University of Colorado, Boulder

- Performed computational analysis of materials on the CU Summit Research Computing System, using an Ab Initio quantum mechanical software package (VASP), along with several other software suites to predict material behavior.
- Worked hands on with reactor systems designed for Atomic Layer Deposition, a method of building pure nanometer scale coatings.
- Performed characterization of materials, trained on a variety of techniques such as Transmission Electron Microscopy, XRay Powder Diffraction, and Thermogravimetric Analysis.

Analytical Lab Research Assistant

Rocky Mountain Research Station, *The United States Forest Service*

📅 Summer 2015, Summer 2017

📍 Fort Collins, Colorado

- Use of ion chromatograph, auto-titrator, spectrophotometer, and LECO to generate accurate data about water samples.
- Organized and processed a high volume of unique samples (2000+). Process included logging, filtrating, and organizing to ensure accurate and fast analytic study.
- Interacting with clients to ensure needs are met in a timely manner, including participation in a nationwide air quality study.

## LEADERSHIP

- Captain of the Rocky Mountain High School Debate Team, 2014-2016.
- Managed a small team (2-4 members) at the US Forest Service to maximize sample processing throughout.
- Member of Engineers without Borders, Nepal Team. Designed menstrual health friendly latrines with bio-gas generation systems to be implemented in the Kalinchowk region of Nepal.
- Tutor for Undergraduate Engineering Students  
Classes tutored: Calculus 3, Intro to Computer Science

## HONORS & AWARDS

- Placed in top 32 teams in the NSDA Public Forum Debate Nationals Tournament 2016
- Presentation selected to be presented at the CU Boulder's DLA Symposium, awarded \$100

## RESEARCH PROJECTS

Nanofilm Barrier Coatings for Nuclear Thermal Propulsion Applications

Weimer Group, *Winter 2018 - Present*

- NASA and Idaho National Laboratory funded project to develop nanofilm coating methods to protect Uranium fuel elements for applications in Nuclear Thermal Propulsion Rockets for interplanetary space travel.
- Coating method was 100x thinner than current method, with lower porosity and better durable, offering better protection of fuel elements.
- Computational research allowed accurate prediction of viability of various materials, created ranking of top potential materials.
- Discovery Learning Apprentice Grant Recipient for research proposal entitled "Computational Material Screening for Nuclear Thermal Propulsion Applications", awarded \$3600.

Solar Thermal Water Splitting

Weimer Group, *Summer 2018*

- Troubleshooted a malfunctioning reactor system designed to perform Solar Thermal Water Splitting, an innovative carbon neutral method of fuel generation.
- Synthesized catalysts used in a Reduction Oxidation cycle to generate Hydrogen gas. Using a heliostat, this method has potential to be completely carbon neutral.
- Characterized catalysts and other materials relevant to the project using XRD. Synthesis methods were modified depending on results of XRD characterization.

## PUBLICATIONS

- Second author on Poster submitted to AIChE 2019 Annual Meeting, titled "Tungsten Nitride ALD Nanofilms for Reducing Hydrogen Diffusion." *In Review*
- Second author on Poster submitted to AIChE 2019 Annual Meeting, titled "Particle ALD of Tungsten Nitride As a Hydrogen Environmental Barrier Coating for Nuclear Space Propulsion." *In Review*
- Third author on Manuscript submitted to Corrosion Science, titled "Atomic Layer Deposition of Tungsten Nitride Films as Protective Barriers to Hydrogen." *In Review*

## SKILLS

python, SciPy, Excel  
Using Bash Systems, VBA, DFT  
Java, C++, Neural Nets



Dilution Procedures  
Labview, XRD, ALD Reactor systems  
Synthesis Procedures

