Matthew D. **Witman, Ph.D.**

Computational Material Scientist · Chemical Engineer

(+1) 484-318-6213 | mwitman1@gmail.com | mwitman1.github.io

Education

University of California, Berkeley — *Berkeley, CA*

Ph.D. Candidate in the Department of Chemical & Biomolecular Engineering — *Sep. 2014 - PRESENT*

- **Developed and programmed statistics/computer science/machine learning/material science techniques** to successfully address novel research problems related to nanoporous materials for clean energy applications.
- **Forged international collaborations between research teams** at the University of California (Berkeley), NIST, University College London, École Polytechnique Fédérale de Lausanne (Switzerland), and the Norwegian University of Science and Technology (NTNU).

Schreyer Honors College at the Pennsylvania State University — *State College, PA*

B.Sc. in Chemical Engineering (*Summa Cum Laude*) — *Sep. 2009 - Dec. 2013*

Chemical engineering semester study abroad (*University of Bath, UK*) — *Spring 2011*

Experience

UC Berkeley Laboratory of Molecular Simulation (Berend Smit Group) — *Berkeley, CA*

Graduate Student Researcher, Instructor, and Mentor — *Jan. 2015 - CURRENT*

- **Trained an artificial neural network** representation of atomic interactions in zeolites to significantly reduce the computational expense of molecular dynamics simulations while retaining quantum chemical accuracy.
- **Coded a recursive, minimal cut graph theory algorithm** to perform high-throughput data analysis and identify materials with previously unrecognized potential for 2-dimensional synthesis and application in water desalination.
- **Derived and programmed enhanced Monte Carlo sampling schemes** to efficiently generate more and better statistical information when performing high-throughput materials screening for adsorption applications involving flexible chain molecules.
- **Utilized cheminformatics and computer vision techniques** to perform hypothetical crystal structure prediction in the search for novel, high-performing adsorbents.
- **Developed statistical physics models and high-throughput screening techniques** to identify systematic biases that arise when simulating adsorption in flexible materials.
- **Provided mentorship and guidance** for undergraduate research projects related to Monte Carlo/Molecular Dynamics code development for studying adsorption in flexible materials.
- **Synthesized novel undergraduate course content** (homeworks, exams, and projects) for chemical kinetics and reactor engineering and co-taught ∼260 students throughout two semesters, achieving an average instructor rating of 4.4/5.

General Electric, Inc. — *Twinsburg, OH*

Process Engineering Intern — *Jun. 2013 - Aug. 2013*

- **Coded a VBA application** to automate the Returned Materials Authorization process and capitalize on a portion of the $20 MM Enterprise Resource Planning investment that was being wasted.

Janssen (A Pharmaceutical Company of Johnson & Johnson) — *Raritan, NJ*

Customer Management Co-op — *Jun. 2012 - Dec. 2012*

- **Wrote VBA programs to optimize data acquisition and demand planning analysis** for the US Sales & Operations supply chain team to improve reporting accuracy and reduce monthly man hour requirements by 80% in a constrained work stream.
- **Managed the monthly Executive Sales & Operations Planning Dashboard:** automated the identification of poor alignments between financial and operating forecasts of Janssen's multi-$BB Tier 1 product portfolio to create actionable intelligence for the North America leadership team.
- **Implemented an automated statistical forecasting tool** to monitor over 200 established pharmaceutical products which yielded improved forecast/demand alignment and inventory levels.

PSU Department of Chemical Engineering (Enrique Gomez Group) — *State College, PA*

Undergraduate Researcher — *Jun. 2011 - Dec. 2013*

- **Constructed a block co-polymer organic photovoltaic device** with record 3% efficiency due to a microphase separated active layer.
- **Built, tested, and optimized** organic electronic devices such as photovoltaic cells and transistors for 2+ years.

Publications & Awards

Publications:

- **Authored 8 articles (4 as first author)** in high impact journals such as Journal of the American Chemical Society, Chemical Science, Nature Communications, Journal of Physical Chemistry Letters, and ACS Central Science.

Awards:

2017	**Thomas Young Centre Junior Research Fellowship,** Outstanding research project with a UK institution	*London, UK*
2016	**Peder Sather Fellowship,** Outstanding research project between UC Berkeley and a Norwegian institution	*Berkeley, CA*
2013	**Eagleton Design Award,** Best chemical plant design project among 2013 class of PSU chemical engineers	*State College, PA*
2012	**Platinum and Bronze Encore Awards,** Outstanding performance at Johnson & Johnson	*Raritan, NJ*
2011	**NSF-REU Fellowship,** Award to study organic photovoltaics at PSU	*State College, PA*

Skills

Programming	Python, NumPy, SciPy, Bash (EXPERT); Tensorflow/Keras, C/C++, HTML/CSS, Matlab/Mathematica, SQL, VBA, Blender, LaTex, Aspen HYSYS (PROFICIENT)
Coursera Classes	Machine Learning, Design of Algorithms I & II, Interactive Programming in Python I & II, Data Science at Scale (*in progress*), Deeplearning.ai Specialization (*in progress*)
Languages	French (Niveau B1/B2)
Outreach	Bay Area Scientists in Schools (BASIS)
Hobbies	Mountaineering, Snowboarding, Backpacking, Soccer, Art, Travel