

Education

2012

2016

Ph.D. Chemical Engineering, *University of California, Berkeley*.

Topic: screening large databases of nanoporous materials for storing and separating gases using statistical mechanical models, molecular simulations, and machine learning

Supervisor: Berend Smit

GPA: 3.7/4.0.

2010

2012

Ph.D. Mathematics, *University of British Columbia*.

Topic: understanding how a protein signaling network orchestrates cellular wound healing using mathematical models

Supervisor: Leah Keshet

Passed qualifying exams. Course average: 93.6%.

2005

2010

B.S. Chemical Engineering, *The University of Akron*.

Summa Cum Laude. GPA: 3.993/4.0

Minor: Applied mathematics

Professional appointments

2017- **Assistant Professor**, *Oregon State University*, Corvallis, Oregon.

School of Chemical, Biological, and Environmental Engineering

2017 **Fellow**, *Altius Institute for Biomedical Sciences*, Seattle, Washington.

- developed zero-inflated ConvNet regression model to predict gene expression from DNA promoter sequence
- employed ConvNet autoencoders to learn structure in DNA promoter sequences

Summer 2016 **Visiting Scholar**, *École Polytechnique Fédérale de Lausanne (EPFL)*, Sion, Switzerland.

Developed statistical mechanical model of porous crystals with rotating ligands

Spring, Summer 2015 **Department of Energy Fellow**, *Lawrence Berkeley National Lab*, Berkeley, CA.

Rapidly screened large databases of nanoporous materials using machine learning

Fall 2014 **Data Science Intern**, *Stitch Fix*, San Francisco, CA.

Developed and wrote recommendation algorithms for clothing purchases (collaborative filtering, matrix factorization)

Summer 2012 **Research Intern**, *Okinawa Institute of Science and Technology*, Okinawa, Japan.

Investigated how the morphology of dendritic spines influences the compartmentalization of diffusing surface receptors using mathematical models

Summer 2009 **REU student**, *Virginia Bioinformatics Institute*, Blacksburg, VA.

Distinguished between sociological and biological factors in the transmission of H1N1/09 influenza using mathematical model

2007–2009 **Chemical Engineering Co-op**, *Bridgestone Center for Research and Technology*, Akron, OH.

Characterized reaction rates in a bulk polymerization process to produce butadiene, wrote control programs in DeltaV

Summer 2006 **Research Assistant**, *Dept. of Chemical and Biomolecular Engineering*, Akron, OH.

Investigated the effect of wavelength of light on cyanobacteria growth

Peer-reviewed publications

Google Scholar Profile

22. D. Banerjee, **C. Simon**, S. Elsaidi, M. Haranczyk, P. Thallapally. Xenon Gas Separation and Storage using Metal Organic Frameworks. *Chem.* (2018) DOI
21. S. Li, Y. Chung, **C. Simon**, R. Snurr. High-Throughput Computational Screening of Multivariate Metal-Organic Frameworks (MTV-MOFs) for CO₂ Capture. *J. Phys. Chem. Lett.* (2018) DOI
20. **C. Simon**, E. Braun, C. Carraro, B. Smit. Statistical mechanical model of gas adsorption in porous crystals with dynamic moieties. *Proc. Natl. Acad. Sci.* (2017) DOI
19. S. Elsaidi, M. Mohamed, **C. Simon**, E. Braun, T. Pham, K. Forrest, W. Xu, D. Banerjee, B. Space, M. Zaworotko, P. Thallapally. Effect of ring rotation upon gas adsorption in SIFSIX-3-M (M = Fe, Ni) pillared square grid networks. *Chem. Sci.* (2017) DOI
18. S. Jawahery, **C. Simon**, E. Braun, M. Witman, D. Tiana, B. Vlaisavljevich, B. Smit. Adsorbate-induced lattice deformation in the IRMOF-74 series. *Nat. Comm.* (2017) DOI

17. A. Thornton, **C. Simon**, J. Kim, O. Kwon, K. Deeg, K. Konstas, S. Pas, M. Hill, D. Winkler, M. Haranczyk, B. Smit. The Materials Genome in action: identifying the performance limits of physical hydrogen storage. *Chem. Mater.* (2017) DOI
16. R. Patil, D. Banerjee, **C. Simon**, J. Atwood, P. Thallapally. Noria, a highly Xe-selective Nanoporous Organic Solid. *Chem. Eur. J.* (2016) DOI Press coverage: Frontispiece, Hot paper, Chemistry Views
15. D. Banerjee, **C. Simon**, A. Plonka, R. Motkuri, J. Liu, X. Chen, B. Smit, J. Parise, M. Haranczyk, P. Thallapally. Metal-Organic Framework with Optimal Adsorption, Separation, and Selectivity towards Xenon. *Nat. Comm.* (2016) DOI
Press coverage: LBL, EPFL, Research Gate, Chemical & Engineering News
14. D. Gomez-Gualdron, **C. Simon**, W. Lassman, D. Chen, R. L. Martin, M. Haranczyk, O. K. Farha, B. Smit, R. Q. Snurr. Impact of the strength and spatial distribution of adsorption sites on methane deliverable capacity in nanoporous materials. *Chem. Eng. Sci.* (2016) DOI
13. **C. Simon**, B. Smit, M. Haranczyk. pyIAST: Ideal Adsorbed Solution Theory (IAST) Python package. *Comput. Phys. Commun.* (2016) DOI
12. **C. Simon**, R. Mercado, S. K. Schnell, B. Smit, and M. Haranczyk. What Are the Best Materials To Separate a Xenon/Krypton Mixture? *Chem. Mater.* (2015) DOI
11. **C. Simon**, J. Kim, D. Gomez-Gualdron, J. Camp, Y. Chung, R. L. Martin, R. Mercado, M.W. Deem, D. Gunter, M. Haranczyk, D. Sholl, R. Snurr, B. Smit. The Materials Genome in Action: Identifying the Performance Limits to Methane Storage. *Energy Environ. Sci.* (2015) DOI Inside front cover art.
Press coverage: Chemistry World, EPFL
10. Y. Bao, R. L. Martin, **C. Simon**, M. Haranczyk, B. Smit, and M.W. Deem. In Silico Discovery of High Deliverable Capacity Metal-Organic Frameworks. *J. Phys. Chem. C.* (2014) DOI
9. D. Feng, K. Wang, Z. Wei, Y.P. Chen, **C. Simon**, R. Arvapally, R.L. Martin, M. Bosch, T.F. Liu, S. Fordham, D. Yuan, M.A. Omary, M. Haranczyk, B. Smit, H.C. Zhou. Kinetically tuned dimensional augmentation as a versatile synthetic route towards robust metal-organic frameworks. *Nat. Comm.* (2014) DOI
8. R. L. Martin, **C. Simon**, B. Medasani, D. Britt, B. Smit, and M. Haranczyk. In silico Design of Three-Dimensional Porous Covalent Organic Frameworks via Known Synthesis Routes and Commercially Available Species. *J. Phys. Chem. C.* (2014) DOI
7. R. L. Martin, **C. Simon**, B. Smit, M. Haranczyk. In silico design of porous polymer networks: high-throughput screening for methane storage materials. *J. Am. Chem. Soc.* (2014) DOI
6. **C. Simon**, J. Kim, L.C. Lin, R.L. Martin, M. Haranczyk, B. Smit. Optimizing nanoporous materials for gas storage. *PCCP.* (2014) DOI Front cover art.
5. R. L. Martin, H.C. Zhou, M.N. Shahrak, B. Smit, J. Swisher, **C. Simon**, J. Sculley, and M. Haranczyk. Modeling Methane Adsorption in Interpenetrating Porous Polymer Networks. *J. Phys. Chem. C.* (2013) DOI
4. **C. Simon**, I. Hepburn, W. Chen, E. De Schutter. The role of dendritic spine morphology in the compartmentalization and delivery of surface receptors. *J. Comput. Neurosci.* (2013) DOI
3. **C. Simon**, E. Vaughan, W. Bement, and L. Edelstein-Keshet. Pattern formation of Rho GTPases in single cell wound healing. *Mol. Biol. Cell.* (2013) DOI
2. K. Han, H. Hu, E. Ko, O. Ozer, **C. Simon**, C. Tan. A variational approach to modeling aircraft hoses and flexible conduits. *Mathematics-in-Industry Case Studies.* (2012) DOI
1. **C. Simon**, N. Yosinao. A mathematical model to distinguish the sociological and biological susceptibility factors in disease transmission in the context of H1N1/09 influenza. *J. Theor. Biol.* (2011) DOI
Recommended by Faculty of 1000

Articles for public outreach

Personal blog: <http://corysimon.github.io/>

5. **C. Simon**, J. Kim, R. L. Martin, M. Haranczyk, B. Smit. Accelerating Materials Discovery with CUDA. *NVIDIA's Parallel for All blog.* (2015) Link
4. **C. Simon**, J. Kim, D. Gomez-Gualdron, Y. Chung, R. L. Martin, R. Mercado, M. Deem, D. Gunter, M. Haranczyk, R. Snurr, and B. Smit. Computer-Aided Search for Materials to Store Natural Gas for Vehicles. *Frontiers for Young Minds.* (2015) Link
3. **C. Simon**. What are the best materials to separate a Xe/Kr mixture? *UC Berkeley ChemE Blog.* (2015) Link
2. **C. Simon** and B. Smit. Viagra ads and NSA watchlists: smoke but usually no fire. *Scientific American Guest Blog.* (2013) Link
1. **C. Simon**. Post-combustion CO₂ capture to mitigate climate change: separation costs energy. *Scientific American Guest Blog.* (2013) Link

Teaching experience

Outstanding Graduate Student Instructor Award at UC Berkeley, 2012.

- Fall 2015 **Graduate student instructor**, *Graduate Statistical Mechanics*, UC Berkeley.
Teaching effectiveness: 4.2/5.0
- Fall 2013 **Graduate student instructor**, *Graduate Statistical Mechanics*, UC Berkeley.
Teaching effectiveness: 4.6/5.0
- Fall 2012 **Graduate student instructor**, *Material and Energy Balances*, UC Berkeley.
Teaching effectiveness: 6.6/7.0
- Spring 2011 **Teaching assistant**, *Linear Systems*, University of British Columbia.
Held computer lab session (programming in MATLAB)
- 2010-2012 **Math center drop-in tutor**, University of British Columbia.
Spontaneously explained math problems to undergraduates using a dry erase board
- 2006, 2010 **Math and chemistry tutor**, University of Akron.

Software

Github username: CorySimon

- o pyIAST: Python package for Ideal Adsorbed Solution Theory
- o PEGrid: Julia package for analyzing potential energy of adsorbed molecules in nanoporous crystals

Computer programming languages

Proficient scientific programmer (7 years, daily).

Python (numpy, scipy, pandas, scikit-learn, keras), Julia, C, C++, CUDA, Bash, SQL.

Data visualization: Matplotlib, Seaborn, Vislt, Gdply.

Workshops

- Aug 2017 **BC data workshop**, *University of British Columbia*, Vancouver, BC, Canada.
Designed project "Elucidating enhancer-promoter gene expression using ConvNets" and mentored nine PhD students for a week.

Awards

- 2014 **DOE Office of Science Graduate Fellowship (SCGSR)**, *Lawrence Berkeley National Lab*.
- 2012 **Outstanding Graduate Student Instructor Award**, *UC Berkeley*.
- 2011-2013 **Pacific Institute of Mathematical Sciences Math Biology Fellowship**, *University of British Columbia*.
- 2010 **Department of Chemical Engineering Faculty Award**, *The University of Akron*.
- 2008, 2009 **The American Chemical Society (ACS) Rubber Division Scholarship**, *The University of Akron*.
- 2009 **Larry G. Foght Chemical Engineering Department Award**, *The University of Akron*.
- 2009, 2010 **Lubrizol Scholarship**, *The University of Akron*.
- 2006-2009 **Presidential Scholarship**, *The University of Akron*.
- 2006-2009 **Honors College Scholarship**, *The University of Akron*.

Invited talks

- June 2017 **The University of British Columbia**, *Department of Mathematics*, Vancouver, BC, Canada.
"Statistical learning models to identify the ingredients of enhancer-responsive gene promoters"

Personal interests

Snowboarding, running, hiking, backpacking, snorkeling, playing guitar, traveling, photography (Ello page)