Cory Simon

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🖥 simonensemble.github.io/

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

24. **C. Simon**, C. Carraro. Multi- and in-stabilities in gas partitioning between nanoporous materials and rubber balloons. *Proc. Royal Soc. A* (2019) DOI

23. A. Sturluson, M. T. Huynh, A. H. York, **C. Simon**. Eigencages: Learning a latent space of porous cage molecules. *ACS Cent. Sci.* (2018) DOI Press coverage: Oregon State University

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 CO_2 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. Compt. 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

Technical 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 CO_2 capture to mitigate climate change: separation costs energy. *Scientific American Guest Blog.* (2013) Link

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Teaching experience

Outstanding Graduate Student Instructor Award at UC Berkeley, 2012.

Winter 2018, 2019	**Instructor**, *CHE 361: Process Dynamics & Simulation*, Oregon State University, ∼115 students.
Spring 2018	**Instructor**, *CHE 461: Process Control*, Oregon State University, ∼115 students.
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: SimonEnsemble

- pyIAST: Python package for Ideal Adsorbed Solution Theory
- PorousMaterials.jl: Julia package for classical molecular modeling of adsorption in porous crystals such as metal-organic frameworks (MOFs)

Computer programming

Proficient scientific programmer.
Julia, Python (numpy, scipy, pandas, scikit-learn, keras), C, C++, CUDA, Bash, SQL.
Data visualization: Matplotlib, Seaborn, VisIt, Gadfly.

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)