COREY OSES

Ph.D. Candidate in Materials Science, Duke University

PERSONAL INFORMATION

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EDUCATION

Ph.D. Candidate

2013–Present Duke University

GPA: 3.8/4.0 · Department: Mechanical Engineering and Materials Science
Thesis: *Advanced Techniques in High-Throughput Computational Materials Science*
Advisor: Stefano Curtarolo

Bachelor of Science

2009–2013 Cornell University

Department: Applied and Engineering Physics
Thesis: *Plume Propagation Simulation for Pulsed Laser Deposition*
Advisor: Joel Brock

RESEARCH

Duke University

2015–2018 Advanced Techniques in High-Throughput Computational Materials Science

- Completed Preliminary Defense — June 24, 2016.

Committee Members: Stefano Curtarolo, Cormac H. Toher, Laurens E. Howle & Gus L. W. Hart

Duke University

2015–2017 Fragment Descriptors for Predicting Property of Inorganic Crystals

- Presentation Winner (Third Place) at the Engineering Science Symposium, SHPE National Conference — November 3, 2017.
- Presented at APS March Meeting — March 14, 2017.
- Publication in Nat. Commun. (2017).

Advisor: Stefano Curtarolo

Duke University

2014–2016 Modeling Off-Stoichiometry Materials

- Presentation Finalist at the Engineering Science Symposium, SHPE National Conference — November 4, 2016.
- Presented at APS March Meeting — March 16, 2016.
- Publication in Chem. Mater. (2016).

Advisor: Stefano Curtarolo

2014 — Materials Cartography

Duke University

- Presented at BYU Condensed Matter Physics Seminar — February 18, 2016.
- Presented at Duke MEMS Department Graduate Student Seminar — September 25, 2015.
- Presented at APS March Meeting — March 2, 2015.
- Publication in Chem. Mater. (2015).

Advisor: Stefano Curtarolo

Fall 2012–Spring 2013 — Plume Propagation Simulation for Pulsed Laser Deposition

Cornell University

- Presented at NSF / AAAS / EHR Emerging Researchers National Conference — February 22, 2014.
- Technical poster presentation, MRS / ASM / AVS / AReMS Meeting at North Carolina State University — November 15, 2013.
- Technical Poster and Paper Finalist at the Engineering Science Symposium, SHPE National Conference — November 1, 2013.
- Best Presentation Award, Duke Mechanical Engineering and Materials Science (MEMS) Department Retreat — August 22, 2013.

Advisor: Joel Brock

Summer 2012 — Synchrotron Radiation Focusing Optics — Capillary Beam Stop Design

Cornell High Energy Synchrotron Source

- First Place in Nanoscience and Physics Research Presentation, NSF / AAAS / EHR Emerging Researchers National Conference — March 2, 2013.
- Technical poster and research presentation, Cornell University LSAMP Research Symposium — August 7, 2012.

Advisors: Ernest Fontes & Rong Huang

Teaching Experience

Teaching Assistant — *Fall 2014–Spring 2015* — ME 221: Structure and Properties of Solids, Duke University Department of Mechanical Engineering and Materials Science

- Best Teaching Assistant Award, Spring 2015

Work Experience and Skills

Proficient Coder — *Present* — `Python`, LaTeX, `C++`, `MATLAB` & `R`

Graduate — *September 2017* — *NextProf* Workshop at the University of Michigan

Graduate — *January 2015* — Machine Learning Summer School at the University of Texas, Austin

Internship — *Summer 2013* — Cornell High Energy Synchrotron Source (BioSAXS on F2 and G Beamlines)

Supervisors: Richard Edward Gillilan & Ernest Fontes

Graduate — *May 2011* — *The LeaderShape Institute*

Technician License	*July 2010*	American Radio Relay League (ARRL)

Activities and Outreach

Graduate Representative	*2015–Present*	Council of Presidents, Duke University Graduate School
Member	*2014–Present*	American Physical Society
Graduate Student Advisor	*2009–Present*	Society of Hispanic Professional Engineers, Duke University & Cornell University

Positions: Graduate Student Advisor, President, Corporate Vice President & Treasurer

Distinguished Past Governor	*2010–2013*	Circle K, Cornell University

Positions: New York District Distinguished Past Governor, New York District Distinguished Past Treasurer & Restarting Chapter President at Cornell University

Mechanical Engineer	*2009–2011*	Cornell University Autonomous Flight Team, Cornell University

Positions: Mechanical Engineer & Safety Officer

Press and News Releases

MRS Bulletin — *August 2017* — *"Universal fragment descriptor predicts materials properties"*

https://www.cambridge.org/core/journals/mrs-bulletin/news/universal-fragment-descriptor-predicts-materials-properties

UNC Eshelman School of Pharmacy — *June 2017* — *"Breakthrough Tool Predicts Properties of Theoretical Materials, Finds New Uses for Current Ones"*

- This press release is featured on AAAS EurekAlert! and Phys.org.

http://pharmacy.unc.edu/news/2017/06/06/breakthrough-tool-predicts-properties-theoretical-materials-finds-new-uses-current-ones/

Duke University Pratt School of Engineering Research — *April 2017* — *"Computers Create Recipe for Two New Magnetic Materials"*

- This press release is featured on Phys.org, Slashdot, Hacker News, Reddit, engadget, The Engineer, Science Alert, Azo Materials, Next Big Future, Futurism, New Atlas, and International Business Times.

http://pratt.duke.edu/about/news/predicting-magnets

Computational Chemistry Highlights — *January 2015* — *"Materials Cartography: Representing and Mining Materials Space Using Structural and Electronic Fingerprints"*

- "This paper is a *tour de force* for computational materials science" — Prof. Alán Aspuru-Guzik, Harvard University.

http://www.compchemhighlights.org/2015/01/materials-cartography-representing-and.html

Duke University Research — *January 2015* — *"Molecular Tornado"*

https://research.duke.edu/molecular-tornado

Duke University	*October 2014*	*"Competing for NSF Fellowships: Advice from a Current Fellow"* https://gradschool.duke.edu/professional-development/blog/competing-nsf-fellowships-advice-current-fellow
Duke University	*June 2014*	*"Pratt Profiles: Corey Oses"* http://pratt.duke.edu/graduate/diversity/pratt-profiles-corey-oses
New York Kiwanis	*February 2013*	*"New York Kiwanis Mid-Winter Conference 2013"* http://www.kiwanis-ny.org/1213/midyear.htm
New York Kiwanis	*June 2012*	*"K-Kids Show Talent for Fundraising"* http://patch.com/new-york/eastmeadow/k-kids-show-talent-for-fundraising
New York Kiwanis	*March 2012*	*"Past Circle K Governors Help Celebrate 50th Convention"* http://www.kiwanis-ny.org/news/view_news.php?nid=618
Cornell University	*March 2011*	*"Undergraduate Student of the Month"* https://www.engineering.cornell.edu/diversity/about/honors/students/2011-03.cfm

Honors and Awards

Award	*November 3, 2017*	Presentation Winner (Third Place) at the Engineering Science Symposium, SHPE National Conference
Publication Award	*2017*	Editor's Choice, Publication in Comput. Mater. Sci., Elsevier
Award	*November 4, 2016*	Presentation Finalist at the Engineering Science Symposium, SHPE National Conference
Award	*Spring 2015*	Best Teaching Assistant Award (ME 221), Duke University Department of Mechanical Engineering and Materials Science
Publication Award	*2015*	Editor's Choice, Publication in Comput. Mater. Sci., Elsevier
Publication Award	*2015*	Editor's Choice, Publication in Chem. Mater., American Chemical Society
Fellowship	*2013–2016*	Graduate Research Fellowship, National Science Foundation
Fellowship	*2013–2015*	Associate Fellow, The National GEM Consortium
Award	*November 1, 2013*	Technical Poster and Paper Finalist at the Engineering Science Symposium, SHPE National Conference
Award	*August 22, 2013*	Best Presentation Award at the MEMS Departmental Retreat, Duke University Department of Mechanical Engineering and Materials Science

City Citation	*March 21, 2013*	New York City Citation as Circle K Governor, Council Member Fernando Cabrera
Award	*March 2, 2013*	First Place in Nanoscience and Physics Research Presentation, NSF / AAAS / EHR Emerging Researchers National Conference
Scholarship	*2011–2013*	Shell Incentive Fund Scholarship
Honor	*2010–2013*	Louis Stokes Alliance for Minority Participation (LSAMP) Scholar
Scholarship	*2010 & 2011*	Xerox Corporation Scholarship
Scholarship	*2010 & 2011*	Intel Academic Award
Scholarship	*2010–2013*	GE Foundation / LULAC Scholarship
Scholarship	*2009–2013*	Meinig Family Cornell National Scholars
Scholarship	*2009*	Gold Medallion Winner in Engineering and Mathematics, Hispanic Heritage Youth Awards
Scholarship	*2009*	New Jersey Principals and Supervisors Association Scholarship
Scholarship	*2009*	Edward J. Bloustein Distinguished Scholar
Scholarship	*2009*	Investors Savings Bank Scholarship
Scholarship	*2009*	Superintendent's Bengal Pride Award for Excellence in Academics and Citizenship
Scholarship	*2009*	Good Citizen Award, The Daughters of the American Revolution
Honor	*2008–2009*	National Honor Society

JOURNAL PUBLICATIONS

2017

In Preparation

12 *AFLOW Platform for Low-Temperature Thermodynamic Phase Stability Analyses*

Authors: Corey Oses, Eric Perim, Eric Gossett, Frisco Rose & Stefano Curtarolo

Submitted

11 *Machine learning modeling of superconducting critical temperature*

Authors: Valentin Stanev, Corey Oses, Aaron Gilad Kusne, Efrain Rodriguez, Johnpierre Paglione, Stefano Curtarolo & Ichiro Takeuchi
arXiv: arxiv:1709.02727

Submitted

10 *The structure and composition statistics of 6A binary and ternary structures*

Authors: Alon Hever, Corey Oses, Stefano Curtarolo, Ohad Levy & Amir Natan
arXiv: arxiv:1703.04497

Computational Materials Science

9 *AFLUX: The LUX materials search API for the AFLOW data repositories*
Comput. Mater. Sci. **137**, 362–370 (2017)

Authors: Frisco Rose, Cormac H. Toher, Eric Gossett, Corey Oses, Marco Buongiorno Nardelli, Marco Fornari & Stefano Curtarolo

- This paper was selected for Editor's Choice.

DOI: 10.1016/j.commatsci.2017.04.036

Nature Communications

8 *Universal Fragment Descriptors for Predicting Properties of Inorganic Crystals*
Nat. Commun. **8**, 15679 (2017)

Authors: Olexandr Isayev[†], Corey Oses[†], Cormac H. Toher, Eric Gossett, Stefano Curtarolo & Alexander Tropsha
[†] contributed equally
DOI: 10.1038/ncomms15679

Physical Review Materials

7 *Combining the AFLOW GIBBS and elastic Libraries to efficiently and robustly screening thermomechanical properties of solids*
Phys. Rev. Mater. **1**, 015401 (2017)

Authors: Cormac H. Toher, Corey Oses, Jose J. Plata, David J. Hicks, Frisco Rose, Ohad Levy, Maarten de Jong, Mark Asta, Marco Fornari, Marco Buongiorno Nardelli & Stefano Curtarolo
DOI: 10.1103/PhysRevMaterials.1.015401

Acta Materialia

6 *A Computational High-Throughput Search for New Ternary Superalloys*
Acta Mater. **122**, 438–447 (2017)

Authors: Chandramouli Nyshadham, Corey Oses, Jacob E. Hansen, Ichiro Takeuchi, Stefano Curtarolo & Gus L. W. Hart
DOI: 10.1016/j.actamat.2016.09.017

Science Advances

5 *Accelerated Discovery of New Magnets in the Heusler Alloy Family*
Sci. Adv. **3**(4), e1602241 (2017)

Authors: Stefano Sanvito, Corey Oses, Junkai Xue, Anurag Tiwari, Mario Zic, Thomas Archer, Pelin Tozman, Munuswamy Venkatesan, J. Michael D. Coey & Stefano Curtarolo
DOI: 10.1126/sciadv.1602241

2016

Physical Review X

4 *High-Throughput Computation of Thermal Conductivity of High-Temperature Solid Phases: The Case of Oxide and Fluoride Perovskites*
Phys. Rev. X **6**(4), 041061 (2016)

Authors: Ambroise van Roekeghem, Jesús Carrete, Corey Oses, Stefano Curtarolo & Natalio Mingo
DOI: 10.1103/PhysRevX.6.041061

Chemistry of Materials

3 *Modeling Off-Stoichiometry Materials with a High-Throughput Ab-Initio Approach*
Chem. Mater. **28**(18), 6484–6492 (2016)

Authors: Kesong Yang, Corey Oses & Stefano Curtarolo
DOI: 10.1021/acs.chemmater.6b01449

2015

Computational Materials Science

2 *The AFLOW Standard for High-Throughput Materials Science Calculations*
Comput. Mater. Sci. **108A**, 233–238 (2015)

Authors: Camilo E. Calderon, Jose J. Plata, Cormac H. Toher, Corey Oses, Ohad Levy, Marco Fornari, Amir Natan, Michael J. Mehl, Gus L. W. Hart, Marco Buongiorno Nardelli & Stefano Curtarolo

- This paper was selected for Editor's Choice.

DOI: 10.1016/j.commatsci.2015.07.019

Chemistry of Materials

1 *Materials Cartography: Representing and Mining Materials Space Using Structural and Electronic Fingerprints*
Chem. Mater. **27**(3), 735–743 (2015)

Authors: Olexandr Isayev, Denis Fourches, Eugene N. Muratov, Corey Oses, Kevin M. Rasch, Alexander Tropsha & Stefano Curtarolo

- This paper was selected for Editor's Choice.

DOI: 10.1021/cm503507h

Book Publications

2017

In Preparation

1 Automated High-Throughput Computation of Material Properties, *Materials Informatics. Methods, Tools and Applications*

Authors: Cormac H. Toher, Corey Oses & Stefano Curtarolo