

# COREY OSES

Ph.D. Candidate in Materials Science, Duke University

## PERSONAL INFORMATION

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website	<a href="http://coreyoses.com">coreyoses.com</a>

## EDUCATION

	2013–Present	Duke University
Ph.D. Candidate	GPA: 3.8/4.0 · Department: Mechanical Engineering and Materials Science Thesis: <i>Advanced Techniques in High-Throughput Computational Materials Science</i> <b>Advisor:</b> Stefano Curtarolo	
	2009–2013	Cornell University
Bachelor of Science	Department: Applied and Engineering Physics Thesis: <i>Plume Propagation Simulation for Pulsed Laser Deposition</i> <b>Advisor:</b> Joel Brock	

## PRESS AND NEWS RELEASES

MRS Bulletin	August 2017	<i>“Universal fragment descriptor predicts materials properties”</i> <a href="http://cambridge.org/core/journals/mrs-bulletin/news/universal-fragment-descriptor-predicts-materials-properties">cambridge.org/core/journals/mrs-bulletin/news/universal-fragment-descriptor-predicts-materials-properties</a>
UNC Eshelman School of Pharmacy	June 2017	<i>“Breakthrough Tool Predicts Properties of Theoretical Materials, Finds New Uses for Current Ones”</i> <ul style="list-style-type: none"><li>This press release is featured on <a href="#">AAAS EurekAlert!</a> and <a href="#">Phys.org</a>. <a href="http://pharmacy.unc.edu/news/2017/06/06/breakthrough-tool-predicts-properties-theoretical-materials-finds-new-uses-current-ones/">pharmacy.unc.edu/news/2017/06/06/breakthrough-tool-predicts-properties-theoretical-materials-finds-new-uses-current-ones/</a></li></ul>
Duke University Pratt School of Engineering Research	April 2017	<i>“Computers Create Recipe for Two New Magnetic Materials”</i> <ul style="list-style-type: none"><li>This press release is featured on <a href="#">Phys.org</a>, <a href="#">Slashdot</a>, <a href="#">Hacker News</a>, <a href="#">Reddit</a>, <a href="#">engadget</a>, <a href="#">The Engineer</a>, <a href="#">Science Alert</a>, <a href="#">Azo Materials</a>, <a href="#">Next Big Future</a>, <a href="#">Futurism</a>, <a href="#">New Atlas</a>, and <a href="#">International Business Times</a>. <a href="http://pratt.duke.edu/about/news/predicting-magnets">pratt.duke.edu/about/news/predicting-magnets</a></li></ul>
Computational Chemistry Highlights	January 2015	<i>“Materials Cartography: Representing and Mining Materials Space Using Structural and Electronic Fingerprints”</i> <ul style="list-style-type: none"><li>“This paper is a <a href="#">tour de force</a> for computational materials science” — Prof. Alán Aspuru-Guzik, Harvard University. <a href="http://compchemhighlights.org/2015/01/materials-cartography-representing-and.html">compchemhighlights.org/2015/01/materials-cartography-representing-and.html</a></li></ul>
Duke University Research	January 2015	<i>“Molecular Tornado”</i> <a href="http://research.duke.edu/molecular-tornado">research.duke.edu/molecular-tornado</a>
Duke University	October 2014	<i>“Competing for NSF Fellowships: Advice from a Current Fellow”</i> <a href="http://gradschool.duke.edu/professional-development/blog/competing-nsf-fellowships-advice-current-fellow">gradschool.duke.edu/professional-development/blog/competing-nsf-fellowships-advice-current-fellow</a>
Duke University	June 2014	<i>“Pratt Profiles: Corey Oses”</i> <a href="http://pratt.duke.edu/graduate/diversity/pratt-profiles-corey-oses">pratt.duke.edu/graduate/diversity/pratt-profiles-corey-oses</a>
New York Kiwanis	February 2013	<i>“New York Kiwanis Mid-Winter Conference 2013”</i> <a href="http://kiwanis-ny.org/1213/midyear.htm">kiwanis-ny.org/1213/midyear.htm</a>
New York Kiwanis	June 2012	<i>“K-Kids Show Talent for Fundraising”</i> <a href="http://patch.com/new-york/eastmeadow/k-kids-show-talent-for-fundraising">patch.com/new-york/eastmeadow/k-kids-show-talent-for-fundraising</a>
New York Kiwanis	March 2012	<i>“Past Circle K Governors Help Celebrate 50th Convention”</i> <a href="http://kiwanis-ny.org/news/view_news.php?nid=618">kiwanis-ny.org/news/view_news.php?nid=618</a>

Cornell University      March 2011      “Undergraduate Student of the Month”  
[engineering.cornell.edu/diversity/about/honors/students/2011-03.cfm](http://engineering.cornell.edu/diversity/about/honors/students/2011-03.cfm)

#### HONORS AND AWARDS

Publication Award	2018		Editor’s Choice, <a href="#">Publication in Comput. Mater. Sci.</a> , Elsevier
Award	November 2017	3,	<a href="#">Presentation Winner at the Engineering Science Symposium</a> , SHPE National Conference
Publication Award	2017		Editor’s Choice, <a href="#">Publication in Comput. Mater. Sci.</a> , Elsevier
Award	November 2016	4,	<a href="#">Presentation Finalist at the Engineering Science Symposium</a> , SHPE National Conference
Award	Spring 2015		<a href="#">Best Teaching Assistant Award (ME 221)</a> , Duke University Department of Mechanical Engineering and Materials Science
Publication Award	2015		Editor’s Choice, <a href="#">Publication in Comput. Mater. Sci.</a> , Elsevier
Publication Award	2015		Editor’s Choice, <a href="#">Publication in Chem. Mater.</a> , American Chemical Society
Fellowship	2013–2016		Graduate Research Fellowship, National Science Foundation
Fellowship	2013–2015		Associate Fellow, National GEM Consortium
Award	November 2013	1,	<a href="#">Technical Poster and Paper Finalist at the Engineering Science Symposium</a> , SHPE National Conference
Award	August 22, 2013		<a href="#">Best Presentation Award at the MEMS Departmental Retreat</a> , 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		<a href="#">First Place in Nanoscience and Physics Research Presentation</a> , 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		<a href="#">Gold Medallion Winner in Engineering and Mathematics</a> , 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		<a href="#">Superintendent’s Bengal Pride Award</a> for Excellence in Academics and Citizenship

<i>Scholarship</i>	2009	Good Citizen Award, The Daughters of the American Revolution
<i>Honor</i>	2008–2009	National Honor Society

## TALKS / PRESENTATIONS

<i>Poster Presentation</i>	2018	Cloud-oriented computational phase diagrams with AFLOW-CHULL CECAM (Centre Européen de Calcul Atomique et Moléculaire) Open Databases Integration for Materials Design (OPTiMaDe) Workshop, Lausanne, Switzerland — June 11, 2018.
<i>Contributed Talk</i>	2018	Universal Fragment Descriptors for Predicting Properties of Inorganic Crystals <b>Contributed talk</b> at the Hopkins Extreme Materials Institute Mach Conference, Annapolis, Maryland — April 05, 2018. <b>Contributed talk</b> at the SHPE National Conference, Kansas City, Missouri — November 03, 2017. • <a href="#">Presentation Winner at the Engineering Science Symposium</a> <b>Contributed talk</b> at the Duke University Chemistry Department Third Annual Graduate Research Symposium, Durham, North Carolina — October 09, 2017. <b>Contributed talk</b> at the American Physical Society March Meeting, New Orleans, Louisiana — March 14, 2017.
<i>Invited Talk</i>	2018	Advancements in Materials Informatics with AFLOW <b>Invited talk</b> at the Fritz-Haber-Institut der Max-Planck-Gesellschaft Theory Department Seminar, Berlin, Germany — January 18, 2018. <b>Invited talk</b> at the Humboldt University of Berlin Physics Department Seminar, Berlin, Germany — January 16, 2018.
<i>Contributed Talk</i>	2016	Modeling Off-Stoichiometric Materials with a High-Throughput, <i>Ab-Initio</i> Approach <b>Contributed talk</b> at the SHPE National Conference, Seattle, Washington — November 04, 2016. • Presentation Finalist at the Engineering Science Symposium <b>Contributed talk</b> at the American Physical Society March Meeting, Baltimore, Maryland — March 16, 2016.
<i>Invited Talk</i>	2016	Materials Cartography: Representing and Mining Materials Space using Structural and Electronic Fingerprints <b>Invited talk</b> at the Brigham Young University Condensed Matter Physics Seminar, Provo, Utah — February 18, 2016. <b>Contributed talk</b> at the Duke Mechanical Engineering and Materials Science (MEMS) Department Graduate Student Seminar, Durham, North Carolina — September 25, 2015. <b>Contributed talk</b> at the American Physical Society March Meeting, San Antonio, Texas — March 02, 2015.
<i>Contributed Talk</i>	2014	Plume Propagation Simulation for Pulsed Laser Deposition <b>Contributed talk</b> at the NSF / AAAS / EHR Emerging Researchers National Conference, Washington, D.C. — February 22, 2014. <b>Poster presentation</b> at the MRS / ASM / AVS / AReMS Meeting, North Carolina State University, Raleigh, North Carolina — November 15, 2013. <b>Contributed Talk</b> <b>Poster presentation</b> at the SHPE National Conference, Indianapolis, Indiana — November 01, 2013. • Technical Poster and Paper Finalist at the Engineering Science Symposium <b>Poster presentation</b> at the Duke Mechanical Engineering and Materials Science (MEMS) Department Annual Retreat, Durham, North Carolina — August 22, 2013. • <a href="#">Best Presentation Award</a>

2013                      Synchrotron Radiation Focusing Optics — Capillary Beam  
Stop Design

*Contributed Talk*      **Contributed talk** at the NSF / AAAS / EHR Emerging Researchers National Conference,  
Washington, D.C. — March 02, 2013.

- [First Place in Nanoscience and Physics Research Presentation](#)

**Poster presentation** at the Cornell University Chapter of LSAMP Research Symposium, Ithaca,  
New York — August 07, 2012.

## BOOK PUBLICATIONS 2018

- 3                      Automated computation of materials properties, *to be determined*  
*Submitted*      **Authors:** Cormac Toher, [Corey Oses](#) & Stefano Curtarolo  
**arXiv:** [arxiv:1805.05309](#)
- 2                      Machine learning and high-throughput approaches to magnetism, *to be  
determined*  
*Submitted*      **Authors:** Stefano Sanvito, Mario Zic, James Nelson, Thomas Archer, [Corey Oses](#) & Stefano  
Curtarolo
- 1                      The AFLOW Fleet for Materials Discovery, *to be determined*  
*Submitted*      **Authors:** Cormac Toher, [Corey Oses](#), David Hicks, Eric Gossett, Frisco Rose, Pinku Nath, Demet  
Usanmaz, Denise C. Ford, Eric Perim, Camilo E. Calderon, Jose J. Plata, Yoav Lederer, Michal  
Jahnátek, Wahyu Setyawan, Shidong Wang, Junkai Xue, Kevin M. Rasch, Roman V. Chepulsii,  
Richard H. Taylor, Geena Gomez, Harvey Shi, Andrew R. Supka, Rabih Al Rahal Al Orabi,  
Priya Gopal, Frank T. Cerasoli, Laalitha Liyanage, Haihang Wang, Ilaria Siloi, Luis A. Agapito,  
Chandramouli Nyshadham, Gus L. W. Hart, Jesús Carrete, Fleur Legrain, Natalio Mingo, Eva  
Zurek, Olexandr Isayev, Alexander Tropsha, Stefano Sanvito, Robert M. Hanson, Ichiro Takeuchi,  
Michael J. Mehl, Aleksey N. Kolmogorov, Kesong Yang, Pino D'Amico, Arrigo Calzolari, Marcio  
Costa, Riccardo De Gennaro, Marco Buongiorno Nardelli, Marco Fornari, Ohad Levy & Stefano  
Curtarolo  
**arXiv:** [arxiv:1712.00422](#)

## JOURNAL PUBLICATIONS 2018

- 16                      AFLOW-CHULL: Cloud-oriented platform for autonomous phase stability  
analysis  
*Submitted*      **Authors:** [Corey Oses](#), Eric Gossett, David Hicks, Frisco Rose, Michael J. Mehl, Eric Perim, Ichiro  
Takeuchi, Stefano Sanvito, Matthias Scheffler, Yoav Lederer, Ohad Levy, Cormac Toher & Stefano  
Curtarolo  
**arXiv:** [arxiv:1806.06901](#)
- 15                      Autonomous data-driven materials design of inorganic compounds with  
AFLOW  
*Submitted*      **Authors:** [Corey Oses](#), Cormac Toher & Stefano Curtarolo  
**arXiv:** [arxiv:1803.05035](#)
- 14                      Novel high-entropy high-hardness metal carbides discovered by entropy  
descriptors  
*Submitted*      **Authors:** Pranab Sarker<sup>†</sup>, Tyler Harrington<sup>†</sup>, Cormac Toher, [Corey Oses](#), Mojtaba Samiee, Jon-  
Paul Maria, Donald W. Brenner, Kenneth S. Vecchio & Stefano Curtarolo  
<sup>†</sup> contributed equally
- 13                      Machine learning modeling of superconducting critical temperature  
NPJ Comput. Mater. 4(29) (2018)  
*NPJ Computational  
Materials*      **Authors:** Valentin Stanev, [Corey Oses](#), Aaron Gilad Kusne, Efrain Rodriguez, Johnpierre Paglione,  
Stefano Curtarolo & Ichiro Takeuchi  
**DOI:** [10.1038/s41524-018-0085-8](#)

- 2017
- Computational Materials Science 12 *AFLOW-ML: A RESTful API for machine-learning prediction of materials properties*  
Comput. Mater. Sci. **152**, 134–145 (2018)  
**Authors:** Eric Gossett, Cormac Toher, [Corey Oses](#), Olexandr Isayev, Fleur Legrain, Frisco Rose, Eva Zurek, Jesús Carrete, Natalio Mingo, Alexander Tropsha & Stefano Curtarolo  
• This paper was selected for [Editor's Choice](#).  
DOI: [10.1016/j.commatsci.2018.03.075](#)
- Acta Crystallographica Section A 11 *AFLOW-SYM: platform for the complete, automatic and self-consistent symmetry analysis of crystals*  
Acta Cryst. A **74**, 184–203 (2018)  
**Authors:** David Hicks, [Corey Oses](#), Eric Gossett, Geena Gomez, Richard H. Taylor, Cormac Toher, Michael J. Mehl, Ohad Levy & Stefano Curtarolo  
DOI: [10.1107/S2053273318003066](#)
- Inorganic Chemistry 10 *The structure and composition statistics of 6A binary and ternary structures*  
Inorg. Chem. **57**(2), 653–667 (2017)  
**Authors:** Alon Hever, [Corey Oses](#), Stefano Curtarolo, Ohad Levy & Amir Natan  
DOI: [10.1021/acs.inorgchem.7b02462](#)
- 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 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<sup>†</sup>, [Corey Oses](#)<sup>†</sup>, Cormac Toher, Eric Gossett, Stefano Curtarolo & Alexander Tropsha  
<sup>†</sup> 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 Toher, [Corey Oses](#), Jose J. Plata, David 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. Coe & Stefano Curtarolo  
DOI: [10.1126/sciadv.1602241](#)
- 2016

Physical Review X	4	<i>High-Throughput Computation of Thermal Conductivity of High-Temperature Solid Phases: The Case of Oxide and Fluoride Perovskites</i> Phys. Rev. X <b>6</b> (4), 041061 (2016)
		<b>Authors:</b> Ambroise van Roekeghem, Jesús Carrete, <a href="#">Corey Oses</a> , Stefano Curtarolo & Natalio Mingo <b>DOI:</b> <a href="#">10.1103/PhysRevX.6.041061</a>
Chemistry of Materials	3	<i>Modeling Off-Stoichiometry Materials with a High-Throughput Ab-Initio Approach</i> Chem. Mater. <b>28</b> (18), 6484–6492 (2016)
		<b>Authors:</b> Kesong Yang, <a href="#">Corey Oses</a> & Stefano Curtarolo <b>DOI:</b> <a href="#">10.1021/acs.chemmater.6b01449</a>
2015		
Computational Materials Science	2	<i>The AFLOW Standard for High-Throughput Materials Science Calculations</i> Comput. Mater. Sci. <b>108A</b> , 233–238 (2015)
		<b>Authors:</b> Camilo E. Calderon, Jose J. Plata, Cormac Toher, <a href="#">Corey Oses</a> , Ohad Levy, Marco Fornari, Amir Natan, Michael J. Mehl, Gus L. W. Hart, Marco Buongiorno Nardelli & Stefano Curtarolo • This paper was selected for <a href="#">Editor's Choice</a> . <b>DOI:</b> <a href="#">10.1016/j.commatsci.2015.07.019</a>
Chemistry of Materials	1	<i>Materials Cartography: Representing and Mining Materials Space Using Structural and Electronic Fingerprints</i> Chem. Mater. <b>27</b> (3), 735–743 (2015)
		<b>Authors:</b> Olexandr Isayev, Denis Fourches, Eugene N. Muratov, <a href="#">Corey Oses</a> , Kevin M. Rasch, Alexander Tropsha & Stefano Curtarolo • This paper was selected for <a href="#">Editor's Choice</a> . <b>DOI:</b> <a href="#">10.1021/cm503507h</a>

## TEACHING EXPERIENCE

Teaching Assistant	Fall 2014–Spring 2015	ME 221: Structure and Properties of Solids, Duke University Department of Mechanical Engineering and Materials Science
		• <a href="#">Best Teaching Assistant Award</a> , Spring 2015

## WORK EXPERIENCE

Internship	Summer 2013	Cornell High Energy Synchrotron Source (BioSAXS on F2 and G Beamlines)
		<b>Supervisors:</b> Richard Edward Gillilan & Ernest Fontes
Internship	Summer 2012	Cornell High Energy Synchrotron Source
		<b>Supervisors:</b> Rong Huang & Ernest Fontes

## CERTIFICATIONS

Graduate	June 25–29, 2018	Machine Learning Summer School (MLSS) at Duke University
Participant	June 11–15, 2018	CECAM (Centre Européen de Calcul Atomique et Moléculaire) Open Databases Integration for Materials Design (OPTiMaDe) Workshop at the École polytechnique fédérale de Lausanne (EPFL)
Graduate	September 26–29, 2017	NextProf Workshop at the University of Michigan
Graduate	January 7–16, 2015	Machine Learning Summer School (MLSS) at the University of Texas at Austin
Graduate	May 22–27, 2011	The LeaderShape Institute at Cornell University

*Technician License*     *July 29–29, 2010*     American Radio Relay League (ARRL) in Roselle, New Jersey

#### ACTIVITIES AND OUTREACH

<i>Graduate Representative</i>	<i>2015–Present</i>	Council of Presidents, Duke University Graduate School
<i>Member</i>	<i>2014–Present</i>	American Physical Society
<i>Graduate Student Advisor</i>	<i>2009–Present</i>	Society of Hispanic Professional Engineers, Duke University & Cornell University <b>Positions:</b> Graduate Student Advisor, <a href="#">President</a> , Corporate Vice President & Treasurer
<i>Undergraduate Researcher</i>	<i>2011–2013</i>	Brock Research Group, Cornell University
<i>Distinguished Past Governor</i>	<i>2010–2013</i>	Circle K, Cornell University <b>Positions:</b> New York District <a href="#">Distinguished Past Governor</a> , New York District <a href="#">Distinguished Past Treasurer</a> & <a href="#">Restarting Chapter President</a> at Cornell University
<i>Mechanical Engineer</i>	<i>2009–2011</i>	Cornell University Autonomous Flight Team, Cornell University <b>Positions:</b> Mechanical Engineer, Safety Officer & Systems Manager