# COREY OSES

*Ph.D. Candidate in Materials Science,* Duke University

## PERSONAL INFORMATION

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| *email* | corey.oses@duke.edu |
| *phone* | (M) +1 (201) 674 1407 · (W) +1 (919) 684 1553 |
| *website* | coreyoses.com |

## EDUCATION

**2013–Present · Duke University**

*Ph.D. Candidate*

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

**2009–2013 · Cornell University**

*Bachelor of Science*

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

## PRESS AND NEWS RELEASES

*MRS Bulletin*

August 2017    *"Universal fragment descriptor predicts materials properties"*
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!, Phys.org, and ScienceDaily.

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.

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.

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

*Duke University Research*

January 2015    *"Molecular Tornado"*
research.duke.edu/molecular-tornado

*Duke University*

October 2014    *"Competing for NSF Fellowships: Advice from a Current Fellow"*
gradschool.duke.edu/professional-development/blog/competing-nsf-fellowships-advice-current-fellow

*Duke University*

June 2014    *"Pratt Profiles: Corey Oses"*
pratt.duke.edu/graduate/diversity/pratt-profiles-corey-oses

*New York Kiwanis*

February 2013    *"New York Kiwanis Mid-Winter Conference 2013"*
kiwanis-ny.org/1213/midyear.htm

*New York Kiwanis*

June 2012    *"K-Kids Show Talent for Fundraising"*
patch.com/new-york/eastmeadow/k-kids-show-talent-for-fundraising

*New York Kiwanis*

March 2012    *"Past Circle K Governors Help Celebrate 50th Convention"*
kiwanis-ny.org/news/view_news.php?nid=618

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| *Cornell University* | *March 2011* | *"Undergraduate Student of the Month"* <br> engineering.cornell.edu/diversity/about/honors/students/2011-03.cfm |

## H O N O R S   A N D   A W A R D S

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|---|---|---|
| *Publication Award* | *2018* | Editor's Choice, Publication in Comput. Mater. Sci., Elsevier |
| *Award* | *November 3, 2017* | Presentation Winner 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, 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 |

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| *Scholarship* | *2009* | Good Citizen Award, The Daughters of the American Revolution |
| *Honor* | *2008–2009* | National Honor Society |

## TALKS / PRESENTATIONS

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| *Poster Presentation* | *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.

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| | *2018* | Universal Fragment Descriptors for Predicting Properties of Inorganic Crystals |

**Contributed talk** at the Hopkins Extreme Materials Institute Mach Conference, Annapolis, Maryland — April 05, 2018.

*Contributed Talk* — **Contributed talk** at the SHPE National Conference, Kansas City, Missouri — November 03, 2017.
- Presentation Winner at the Engineering Science Symposium

**Contributed talk** at the Duke University Chemistry Department Third Annual Graduate Research Symposium, Durham, North Carolina — October 09, 2017.

**Contributed talk** at the American Physical Society March Meeting, New Orleans, Louisiana — March 14, 2017.

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| | *2018* | Advancements in Materials Informatics with AFLOW |

*Invited Talk* — **Invited talk** at the Fritz-Haber-Institut der Max-Planck-Gesellschaft Theory Department Seminar, Berlin, Germany — January 18, 2018.

**Invited talk** at the Humboldt University of Berlin Physics Department Seminar, Berlin, Germany — January 16, 2018.

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| | *2016* | Modeling Off-Stoichiometric Materials with a High-Throughput, *Ab-Initio* Approach |

*Contributed Talk* — **Contributed talk** at the SHPE National Conference, Seattle, Washington — November 04, 2016.
- Presentation Finalist at the Engineering Science Symposium

**Contributed talk** at the American Physical Society March Meeting, Baltimore, Maryland — March 16, 2016.

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| | *2016* | Materials Cartography: Representing and Mining Materials Space using Structural and Electronic Fingerprints |

*Invited Talk* — **Invited talk** at the Brigham Young University Condensed Matter Physics Seminar, Provo, Utah — February 18, 2016.

**Contributed talk** at the Duke Mechanical Engineering and Materials Science (MEMS) Department Graduate Student Seminar, Durham, North Carolina — September 25, 2015.

**Contributed talk** at the American Physical Society March Meeting, San Antonio, Texas — March 02, 2015.

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| | *2015* | Plume Propagation Simulation for Pulsed Laser Deposition |

**Poster presentation** at the University of Texas at Austin Machine Learning Summer School (MLSS), Austin, Texas — January 12, 2015.

**Contributed talk** at the NSF / AAAS / EHR Emerging Researchers National Conference, Washington, D.C. — February 22, 2014.

**Poster presentation** at the MRS / ASM / AVS / AReMS Meeting, North Carolina State University, Raleigh, North Carolina — November 15, 2013.

**Poster presentation** at the SHPE National Conference, Indianapolis, Indiana — November 01, 2013.
- Technical Poster and Paper Finalist at the Engineering Science Symposium

*Contributed Talk* — **Poster presentation** at the Duke Mechanical Engineering and Materials Science (MEMS) Department Annual Retreat, Durham, North Carolina — August 22, 2013.
- Best Presentation Award

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| | *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. |

## B O O K   P U B L I C A T I O N S
## 2018

| | |
|---|---|
| *Submitted* | *3*      Automated computation of materials properties |
| | **Authors**: Cormac Toher, Corey Oses & Stefano Curtarolo |
| | **arXiv**: arxiv:1805.05309 |
| *Submitted* | *2*      Machine learning and high-throughput approaches to magnetism |
| | **Authors**: Stefano Sanvito, Mario Zic, James Nelson, Thomas Archer, Corey Oses & Stefano Curtarolo |
| *Submitted* | *1*      The AFLOW Fleet for Materials Discovery |
| | **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. Chepulskii, 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 |

## J O U R N A L   P U B L I C A T I O N S
## 2018

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

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| *Computational Materials Science* | 12 | *AFLOW-ML: A RESTful API for machine-learning prediction of materials properties*<br>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.

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| *Acta Crystallographica Section A* | 11 | *AFLOW-SYM: platform for the complete, automatic and self-consistent symmetry analysis of crystals*<br>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

# 2017

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| *Inorganic Chemistry* | 10 | *The structure and composition statistics of 6A binary and ternary structures*<br>Inorg. Chem. **57**(2), 653–667 (2017) |

**Authors**: Alon Hever, Corey Oses, Stefano Curtarolo, Ohad Levy & Amir Natan

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| *Computational Materials Science* | 9 | *AFLUX: The LUX materials search API for the AFLOW data repositories*<br>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.

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| *Nature Communications* | 8 | *Universal Fragment Descriptors for Predicting Properties of Inorganic Crystals*<br>Nat. Commun. **8**, 15679 (2017) |

**Authors**: Olexandr Isayev[†], Corey Oses[†], Cormac Toher, Eric Gossett, Stefano Curtarolo & Alexander Tropsha

[†] contributed equally

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| *Physical Review Materials* | 7 | *Combining the AFLOW GIBBS and elastic Libraries to efficiently and robustly screening thermomechanical properties of solids*<br>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

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

**Authors**: Chandramouli Nyshadham, Corey Oses, Jacob E. Hansen, Ichiro Takeuchi, Stefano Curtarolo & Gus L. W. Hart

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| *Science Advances* | 5 | *Accelerated Discovery of New Magnets in the Heusler Alloy Family*<br>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

# 2016

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| *Physical Review X* | 4 | *High-Throughput Computation of Thermal Conductivity of High-Temperature Solid Phases: The Case of Oxide and Fluoride Perovskites*<br>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

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

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

## 2015

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

**Authors**: Camilo E. Calderon, Jose J. Plata, Cormac 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

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|---|---|---|
| *Chemistry of Materials* | 1 | *Materials Cartography: Representing and Mining Materials Space Using Structural and Electronic Fingerprints*<br>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

## TEACHING EXPERIENCE

| | | |
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| *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

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

**Supervisors**: Richard Edward Gillilan & Ernest Fontes

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| *Internship* | *Summer 2012* | Cornell High Energy Synchrotron Source |

**Supervisors**: Rong Huang & Ernest Fontes

## CERTIFICATIONS

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|---|---|---|
| *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 |

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

### 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

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|---|---|---|
| *Undergraduate Researcher* | *2011–2013* | Brock Research Group, Cornell University |
| *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

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

**Positions**: Mechanical Engineer, Safety Officer & Systems Manager