

Nicholas Dewayne Ball
Associate Professor of Chemistry
Pomona College
theballlab.com

EDUCATION

Ph.D. Chemistry, University of Michigan–Ann Arbor (advisor: Melanie Sanford)	2011
B.A., Chemistry, Macalester College	2005

EMPLOYMENT

Pomona College	July 2021- present
Associate Professor of Chemistry	
Pomona College	July 2015-June 2021
Assistant Professor of Chemistry	
University of British Columbia	2018-19
Visiting Assistant Professor of Chemistry, (with Dr. Jennifer Love's group)	
Amherst College	2013-15
Assistant Professor of Chemistry	
California Institute of Technology	2011-12
NIH/NIGMS Postdoctoral Fellow, (Advisor: David Tirrell)	

FELLOWSHIPS AND GRANTS

NSF Center Grant: Center for Computer Assisted Synthesis as co-pi in Data Chemist Network (DCN) research aim. The center budget is \$20M; PIs in DCN receive a dedicated \$175,000 over five years in addition to other center funds.	2022-2027
Henry Dreyfus Teacher-Scholar Award (\$75,000)	Dec 2020-2025
NIH R15 grant Awarded (R15GM134457, \$395,145)	2020-23
Hirsch Research Initiation Grant (\$5,600)	2018-20
American Chemical Society Petroleum Research Fund UNI Award (\$55,000)	2014-18
Professional Development Network Grant – Pomona College (\$2,500)	2015-16
Wig Fund Curriculum Development Grant (\$600)	2016
NSF CAREER (Reviewed, not funded)	2016
Research Corporation Cottrell Scholar Program (Reviewed, second round, not funded)	2016

HONORS AND AWARDS

Claremont Faculty Leadership Faculty Fellow	2022-2023
Chemical and Engineering News LGBTQ+ Trailblazer	2022
2 nd Annual Dr. Schlick Memorial Lecturer – Univ. of Detroit Mercy	2022
Wig Distinguished Professor Award for Excellence in Teaching	2018
Ruth L. Kirschstein Postdoctoral National Research Service Award (F32)	2011 - 2014
Ruth L. Kirschstein Predoctoral National Research Service Award (F31)	2009 - 2011
Beckman Scholars Award	2003 - 2004
ACS Scholars Award	2001 - 2005

PROFESSIONAL MEMBERSHIP AND SERVICE

Advisory Board for Tetrahedron Chem	2022-2024
Executive Committee member for the Beckman Scholars Program at the Arnold and Mabel Beckman Foundation	Dec. 2021-Dec 2023
Member of the Justice, Equity, Diversity, and Inclusion (JEDI) Committee at the Arnold and Mabel Beckman Foundation	2021-present
Elected councilor for Council of Undergraduate Research Chemistry (CUR) <i>Chair of Division of Chemistry Nominations Committee (Fall 2021)</i>	2020 – present
Member of the Network for Diversity in Chemical Research (NDCR)– a part of the NSF Center for Selective C–H functionalization (CCHF) and the Data Chemist Network (DCN) – a part of the NSF Center for Computer Assisted Synthesis (C–CAS).	2019-present
Review Panelist for NIH (NIGMS), NSF (Chemistry), Beckman Foundation	2020 and 2021
Reviewer for the following publications:	2012 - present

Chem, Nature, Nature Chemistry, Nature Synthesis, Angewandte Chemie International Edition, Journal of the American Chemical Society, Proceeding of the National Academy of Sciences, Journal of Organic Chemistry, Chemical Reviews, Chemical Science, Coordination Chemistry Reviews, Organic Letters, Journal of Chemical Education, and Accounts of Chemical Research, Beilstein Journal of Organic Chemistry, Synlett

American Chemical Society

2001- present

COLLEGE SERVICE

Elected as Division II Executive Committee representative	2021-present
Pomona College Admissions and Financial Aid Committee (Chair, 2020-2021)	
Pomona College Ad Hoc Committee on Promotion and Tenure	2016-18
Chemistry Department Professional Development Committee	2016-18
Chemistry Department Seminar Coordinator for the 5C Chemistry Seminar Series	Fall 2016-Spring 18; Fall 19 – present
Faculty advisor to the Pomona College Chemistry Department student liaisons	Fall 2016-Fall 18

PUBLICATIONS

Peer-reviewed publications (undergraduates are underlined identified by year of graduation)

Publications with an asterisk (++) indicate co-corresponding (lead) authors

Google scholar [\[link\]](#)

Number of students advised in research lab: 46 students; 26 students who classify as underrepresented in the sciences. Students have achieved national awards: **2 NSF graduate fellows** (Ariana Tribby '17 and Cristian Woroch, '19), **2 Beckman Scholars** (Cristian Woroch, '19 and Samuel Khasnavis '21), **2 ACS Scholars** (Cristian Woroch, '19 and Jonathan Elizabeth, '23); **1 Goldwater Scholar** (Jonathan Elisabeth, '23). Also, **4** students have a college research-based honors as **Linares Scholars** (Sabrina Carneiro, '21, Jonathan Elizabeth, '23, Fernando Cano Sanchez '24, and Richard Romero '24).

Independent Career – 10 publications; 318 citations (Google Scholar as of 12/29/2022)

1. Thomson B. J.; Khasnavis, S. R.; Grigorian, E. C.; Krishnan, R.; Yassa, T. D.; Lee, K. L.; Sammis, G. M.; and Ball, N. D. Facile synthesis of sulfonyl fluorides from sulfonic acids. *Chem. Commun.* **2023**, Advance Article.

2. Brian Han, Samuel R. Khasnavis ('21), Matthew Nwerem, Michael Bertagna, Nicholas D. Ball⁺⁺, O. Maduka Ogba⁺⁺. Calcium Bistriflimide-Mediated Sulfur(VI)–Fluoride Exchange (SuFEx): Mechanistic Insights toward Instigating Catalysis. *Inorg. Chem.* **2022**, *61*, 9746-9755.
3. Ball, Sulfondiimidamides unlocked as new S(VI) hubs for synthesis and drug discovery, *Chem* (2022), <https://doi.org/10.1016/j.chempr.2022.03.018>
4. Carneiro, S.N., Ball, N.D., Lee, J. and Ende, C.W. (2021). [4-(Acetylamino)phenyl]imidodisulfuryl Difluoride. In *Encyclopedia of Reagents for Organic Synthesis*. <https://doi.org/10.1002/047084289X.rn02400>
5. Lee, C.; Cook, L; Elisabeth, J. E. ('22); Friede, N. C. ('22); Sammis, G. M. ⁺⁺; Ball, N.D. ⁺⁺ The Emerging Applications of Sulfur (VI) Fluorides in Catalysis. *ACS Catalysis*. **2021**, *11*, 6578-6589.
6. *Mahapatra, S.; Woroch, C. P. ('19); Butler, T. W.; Carneiro, S. N. ('21); Kwan, S. C. ('20); Khasnavis, S. R. ('21); Gu, J. ('21); Dutra, J. K. ; Vetelino, B. C.; Bellenger, J.; am Ende, C. W. ⁺⁺, and Ball, N. D. ⁺⁺ SuFEx Activation with Ca(NTf₂)₂: A Unified Strategy to Access Sulfamides, Sulfamates and Sulfonamides from S(VI) Fluorides. *Org. Lett.* **2020**, *22*, 4389-4394.
7. *Ball, N. D. "Properties and Applications of S(VI) Fluorides" in *Emerging Fluorinated Motifs. Properties, Synthesis and Applications*, Cahard, D., Ma, J.–A., Eds.; Wiley-VCH Verlag GmbH & Co: Weinheim, 2020: 621-674.
8. *Lee, C.; Ball, N. D. ⁺⁺; and Sammis, G. M. ⁺⁺ One-Pot Fluorosulfonylation of Grignard Reagents Using Sulfonyl Fluoride. *Chem. Comm.* **2019**, *55*, 14753-14756.
9. *Mukherjee, P.; Woroch, C. P. W. ('19); Cleary, L.; Rusznak, M. ('18); Franzese, R. W. ('19); Reese, M. R.; Tucker, J. W.; Humphrey, J. M. ('19); Etuk, S. M. ('20); Kwan, S. C.; am Ende, C. W. ⁺⁺, and Ball, N. D. ⁺⁺ Sulfonamide Synthesis via Calcium Triflimide Activation of Sulfonyl Fluorides. *Org. Lett.* **2018**, *20*, 3943-3947.
10. Tribby, A. L. ('17); Rodríguez, I. ('16); Shariffudin, S. (AC '15); Ball, N. D.; Pd-Catalyzed Conversion of Aryl Iodides to Sulfonyl Fluorides Using SO₂ Surrogate DABSO and Selectfluor. *J. Org. Chem.* **2017**, *82*, 2294-2299.
 - This work is highlighted in a virtual issue of *Organometallics* featuring undergraduate research programs

Doctoral publications – 6 publications; 1144 citations (Google Scholar as of 2/17/2022)

1. Racowski, J. M.; **Ball, N. D.**; Sanford, M. S. Aryl C–H Activation at Pd(IV) Centers. *J. Am. Chem. Soc.* **2011**, *133*, 18022-18025. [[link](#)]
2. **Ball, N. D.**; Gary, J. B.; Ye, Y.; Sanford, M. S. Mechanistic and Computational Studies of Oxidatively-Induced Aryl–CF₃ Bond-Formation at Pd: Rational Design of Room Temperature Aryl Trifluoromethylation. *J. Am. Chem. Soc.* **2011**, *133*, 7577-7584. [[link](#)]
3. Ye, Y.; **Ball, N. D.**; Kampf, J. W.; Sanford, M. S. Oxidation of Catalytically Relevant Palladium Dimer with “CF₃⁺”: Formation and Reactivity of a Monomeric Palladium(IV) Aquo Complex. *J. Am. Chem. Soc.* **2010**, *132*, 14682-14687. [[link](#)]

4. **Ball, N. D.**; Kampf, J. W.; Sanford, M. S. Aryl C–CF₃ Bond Forming Reductive Elimination from a Palladium(IV) Complex. *J. Am. Chem. Soc.* **2010**, *132*, 2878-2879. [[link](#)]
5. **Ball, N. D.**; Kampf, J. W.; Sanford, M. S. Synthesis and Reactivity of Palladium(II) Fluoride Complexes Containing Nitrogen-Donor Ligands. *Dalton Trans.* **2010**, *39*, 632-640. [[link](#)]
6. **Ball, N. D.**; Sanford, M. S. Synthesis and Reactivity of a Mono- σ -Aryl Palladium(IV) Fluoride Complex. *J. Am. Chem. Soc.* **2009**, *131*, 3796-3797. [[link](#)]

PRESENTATIONS

Invited seminars and conference talks

1. **Ball, N.D.** Unlocking Fluorine: Activation of Sulfur(VI) Fluorides for New Sulfur-fluorine Exchange (SuFEx) Reactions. Scientific Presentations & Panel Discussion by Representative & Industrial LGBTQ+ Chemists. ACS National Conference –Chicago. August 23rd, 2022.
2. **Ball, N.D.** Sulfur-Fluoride Exchange (SuFEx) Chemistry as a Tool Toward Drug Discovery. Accelerating Drug Discovery Across Modalities with High Throughput Chemistry. ACS National Conference –Chicago. August 22nd, 2022.
3. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. 2nd Annual Dr. Schlick Memorial Lecture– U. of Detroit Mercy . April 2nd, 2022.
4. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. Florida Heterocyclic and Synthetic Chemistry Conference –Gainesville, FL . March 9th, 2022.
5. **Ball, N.D.** Laboratory Automation and Accelerated Synthesis: Empowering Tomorrow’s Chemist – A workshop. Panelist. National Academy Academies Chemical Roundtable. November 16th, 2021.
6. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. Occidental College. October 25th, 2021.
7. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. Abbvie Symposium; University of Michigan. October 22nd, 2021.
8. **Ball, N.D.** Catalyzing Equitable Spaces in Education for LGBTQ+ people. ACS LGBTQ+ Mentorship, Advocacy & Community Building Session of the 2021 ACS National Conference. August 25th, 2021.
9. **Ball, N.D.** Navigating Your Early Years in Academia via Nurturing Relationships and Personal Growth, Beckman Symposium. August 7th, 2021.
10. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. Remote Supergroup for Chemistry Undergraduates (RSCU). June 10th, 2021.
11. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. Virtual Science Nights (SOKA University of America). May 4th, 2021.
12. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. American University. December 2nd, 2020.

13. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. University of North Carolina–Greensboro. November 6th, 2020.
14. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. University of California San Francisco. October 15th, 2020.
15. **Ball, N.D.** Synthetic Strategies toward Fluorosulfurylation of Organic Molecules and Sulfur-Fluoride Exchange. San Jose State University. September 22th, 2020.
16. **Ball, N.D.** Unlocking Fluorine: Activation of Sulfur(VI) Fluorides Toward New Sulfur-Fluorine Exchange (SuFEx) Click Reactions. Workshop on Synthetic Organic Chemistry, Steamboat Springs, CO. August 6-8, 2019. [[Link](#)]
 - One of 15 pre-tenured faculty members selected to attend this workshop out of 120 junior faculty across U.S. and Canada. I was the sole faculty member from a PUI.
17. **Ball, N.D.** Unlocking Fluorine: Activation of Sulfur(VI) Fluorides Toward New Sulfur-Fluorine Exchange (SuFEx) Click Reactions. Barnard College. April 23th, 2019.
18. **Ball, N.D.** Unlocking Fluorine: Activation of Sulfur(VI) Fluorides Toward New Sulfur-Fluorine Exchange (SuFEx) Click Reactions. Santa Clara University. April 11th, 2019.
19. **Ball, N.D.** Unlocking Fluorine: Activation of Sulfur(VI) Fluorides Toward New Sulfur-Fluorine Exchange (SuFEx) Click Reactions. Denison University. November 6th, 2018.
20. **Ball, N.D.** Unlocking Fluorine: Activation of Sulfur(VI) Fluorides Toward New Sulfur-Fluorine Exchange (SuFEx) Click Reactions. University of British Columbia. October 18th, 2018.
21. **Ball, N.D.** Lewis Acid Mediated Activation of Aryl and Alkyl Sulfonyl Fluorides Toward Sulfonamides. Macalester College. September 26th, 2018.
22. **Ball, N. D.;** Woroch, C. P.*; Rusznak, M.; Cleary, L., Mukherjee, P.; am Ende, C.; Reese, M. R.; Tucker, J. W.; Humphrey J. M.; Franzese*, R. W.; Etuk*, S.M.; Kwan, S. C.* Calcium Triflimide Activation of Sulfonyl Fluorides to Sulfonamides. Oral and Poster Presentation. 22nd International Symposium on Fluorine Chemistry, Oxford, UK, July 2018.
23. **Ball, N. D.;** Woroch, C. P.; Rusznak, M.; Cleary, L., Mukherjee, P.; am Ende, C.; Reese, M. R.; Tucker, J. W.; Humphrey J. M.; Franzese, R. W.; Etuk, S.M.; Kwan, S. C. Lewis Acid-Mediated Activation of Aryl and Alkyl Sulfonyl Fluoride towards Sulfonamides. Invited Oral Presentation. American Chemical Society National Meeting, New Orleans, LA, March 2018.
24. **Ball, N. D.;** Rodriguez, I; Tribby, A. L.*; Shariffudin, S.* One-Pot Pd-catalyzed Synthesis of Aromatic Sulfonyl Fluorides. Poster Presentation. Poster Presentation Japanese-American Kavli Frontiers in Science Symposium (National Academy of Sciences), Irvine, CA December 2016.
25. **Ball, N. D.;** Rodríguez, I.; Tribby, A. L.*; Shariffudin, S.* One-pot Pd-catalyzed Synthesis of Aromatic Sulfonyl Fluorides. Oral Presentation. 252nd American Chemical Society National Meeting, Philadelphia, PA, August 2016.
26. **Ball, N. D.** ACS Scholars Program Rising Stars in Academe. Oral Presentation and Panelist. 250th American Chemical Society National Meeting and Exposition, Philadelphia, PA, August 2, 2015.

OTHER PRESENTATIONS

1. My Fave Queer Chemist Podcast (guest; published online 8/12/2020) [[link](#)]

2. **Ball, N. D.**, Woroch, C. P. Pollution to Products: Adventures in Sulfur. Oral Presentation. Pomona College Torchbearers Reception, Beverly Hills, CA, March 8, 2017.
3. **Ball, N. D.** Career Panel: Rising Stars in Academe. Panelist. Beckman Symposium, Irvine, CA, August 6, 2016.

CLASSES TAUGHT

Organic Chemistry I (CHEM 110A): Fall 2015, 2016, 2017, 2019, 2020, 2021, 2022

Organic Chemistry II (CHEM 110B): Spring 2020, 2021, 2022

Inorganic Chemistry and Lab (CHEM 147): Spring 2016, 2018, 2020

Advanced Synthesis Lab (CHEM 150): Spring 2022

Organic Chemistry I Lab (CHEM 110AL): Fall 2015, 2016, 2019, 2021, 2022

Organic Chemistry II Lab (CHEM 110BL): Spring 2016, and 2017.