

C. Rose Kennedy

Assistant Professor of Chemistry
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Professional Appointments

Jan. 2020 – present **Assistant Professor of Chemistry, University of Rochester**
Research Areas: Organometallic Chemistry, Catalysis & Synthetic Methods,
Mechanistic & Physical Organic Chemistry

Education & Research Experience

Jan. 2017 – Dec. 2019 **Postdoctoral Research Fellow, Princeton University**
Kirschstein NRSA Postdoctoral Fellowship (NIH F32, 2018)
Research Advisor: Professor Paul J. Chirik
Research Area: Chemo- and Regioselective Iron-Catalyzed Olefin Cross-
dimerization and Polymerization
(6 publications, 3 patents + 1 patent pending)

Jul. 2011 – Dec. 2016 **Doctorate of Philosophy (Chemistry), Harvard University**
NSF Graduate Research Fellowship (NSF GRFP, 2011)
Research Advisor: Professor Eric N. Jacobsen
Dissertation: *Mechanistic Studies in Enantioselective Ion-Pairing Catalysis with
Dual Hydrogen-Bond Donors* (8 publications)

Sept. 2007 – May 2011 **Bachelor of Science (Chemistry), University of Rochester**
Summa Cum Laude, Phi Beta Kappa (Junior Election),
Renaissance Scholarship
Research Advisors: Professor Alison J. Frontier (thesis)
& Professor Kara L. Bren
Research Areas: Synthetic Organic Method Development & Bioinorganic
Chemistry

May – July 2010 **DAAD RISE Fellow, Technische Universität Dortmund**
Research Advisor: Professor Martin Hiersemann
Research Area: Natural Product Total Synthesis

Awards & Honors

2023 Thieme Chemistry Journals Awardee (editorial boards of *Synthesis*, *Synlett*, and *Synfacts*)
NIH Maximizing Investigator Research Award (MIRA, R35)
(National Institutes of Health, National Institute of General Medical Sciences)
Excellence in Peer Reviewing Award (American Chemical Society, Petroleum Research
Fund)

2022 Packard Fellow in Science & Engineering (The David & Lucile Packard Foundation)

- 2021 Doctoral New Investigator (PRF-DNI) Award (ACS Petroleum Research Fund)
- 2018 NIH Ruth L. Kirschstein NRSA Postdoctoral Fellowship (F32)
(National Institutes of Health, National Institute of General Medical Sciences)
- 2017 ACS Green Chemistry Institute Pharmaceutical Roundtable Travel Grant
- 2016, 2014 Christensen Prize for Outstanding Research Achievement (*travel fellowship*)
(Harvard University, Department of Chemistry and Chemical Biology)
- 2015 Dudley R. Herschbach Teaching Award
(Harvard University, Department of Chemistry and Chemical Biology)
- 2011 NSF Graduate Research Fellowship (National Science Foundation)

Publications

ORCID: [0000-0003-3681-819X](https://orcid.org/0000-0003-3681-819X), † undergraduate, ‡ equal contributor, * corresponding author

21. Afandiyeva, M. ‡; Wu, Xijue^{†‡}; Brennessel, W. W.; Kadam, A. A.; Kennedy, C. R.* Secondary-Sphere Preorganization Enables Nickel-Catalyzed Nitrile Hydroboration. *Chem. Commun.* **2023**, 59, 13450–13453. DOI: [10.1039/D3CC04229D](https://doi.org/10.1039/D3CC04229D) (*Invited for 2023 Emerging Investigators Collection*)
[preprint] *ChemRxiv.* **2023**, DOI: [10.26434/chemrxiv-2023-ks784](https://doi.org/10.26434/chemrxiv-2023-ks784)
20. Kadam, A. A.; Kennedy, C. R.* Insights into H⁺ and e⁻ transfer by swapping Fe for Mn in a [NiFe] hydrogenase model. *Chem.* **2023**, 9, 2370–2373. DOI: [10.1016/j.chempr.2023.08.017](https://doi.org/10.1016/j.chempr.2023.08.017) (*Invited Preview*)
19. Malyk, K. R. ‡; Pillai, V. G. ‡; Brennessel, W. W.; Leon Baxin, R.; Silk, E. S. †; Nakamura, D. T. †; Kennedy, C. R.* Distinguishing Competing Mechanistic Manifolds for C(acyl)–N Functionalization by a Ni/N-Heterocyclic Carbene Catalyst System. *JACS Au.* **2023**, 3, 2451–2457. DOI: [10.1021/jacsau.3c00283](https://doi.org/10.1021/jacsau.3c00283)
[preprint] *ChemRxiv.* **2023**, DOI: [10.26434/chemrxiv-2023-cb75z](https://doi.org/10.26434/chemrxiv-2023-cb75z)
18. Kadam, A. A.; Kennedy, C. R.* Remixing the Secondary Coordination Sphere. *Trends Chem.* **2023**, 5, 506–508. DOI: [10.1080/00958972.2022.211703](https://doi.org/10.1080/00958972.2022.211703) (*Invited Spotlight*)
17. Hanaway, D. H. †; Kennedy, C. R.* An Automated Variable Electric-Field DFT Application for Evaluation of Optimally Oriented Electric Fields on Chemical Reactivity. *J. Org. Chem.* **2023**, 88, 106–115. DOI: [10.1021/acs.joc.2c01893](https://doi.org/10.1021/acs.joc.2c01893)
[preprint] *ChemRxiv.* **2022**, DOI: [10.26434/chemrxiv-2022-4wr1m](https://doi.org/10.26434/chemrxiv-2022-4wr1m)
16. Afandiyeva, M. A. ‡; Kadam, A. A. ‡; Wu, X. †‡; Brennessel, W. W.; Kennedy, C. R.* Synthesis, Structure, and Hydroboration Reactivity of Anionic Nickel(0) Complexes Supported by Bidentate NHC-Pyridone Ligands. *Organometallics*, **2022**, 21, 3014–3023. DOI: [10.1021/acs.organomet.2c00439](https://doi.org/10.1021/acs.organomet.2c00439) (*Selected as ACS Editors' Choice; Top 3 Most-Read Papers*)
[preprint] *ChemRxiv.* **2022**, DOI: [10.26434/chemrxiv-2022-gk2cs](https://doi.org/10.26434/chemrxiv-2022-gk2cs)
15. Craig, S. M. †‡; Malyk, K. R. ‡; Silk, E. S. †‡; Nakamura, D. T. †; Brennessel, W. W. ; Kennedy, C. R.* Synthesis and characterization of Ni(0) complexes supported by an unsymmetric C,N ligand. *J. Coord. Chem.* **2022**, 75, 1841–1852. DOI: [10.1080/00958972.2022.2117037](https://doi.org/10.1080/00958972.2022.2117037). (*Invited contribution to Emerging Leaders Special Issue.*)

14. Beromi, M. M.; Kennedy, C. R.; Younker, J. M.; Carpenter, A. E.; Mattler, S. J.; Throckmorton, J. A.; Chirik, P. J.* Iron Catalyzed Synthesis and Chemical Recycling of Telechelic, 1,3-Enchained Oligocyclobutanes. *Nature Chem.* **2021**, *13*, 156–162. DOI: [10.1038/s41557-020-00614-w](https://doi.org/10.1038/s41557-020-00614-w);
[preprint] *ChemRxiv*, **2020**, DOI: [10.26434/chemrxiv.11994489.v1](https://doi.org/10.26434/chemrxiv.11994489.v1)
13. Kennedy, C. R.[‡]; Joannou, M. V.[‡]; Steves, J. E.; Hoyt, J. M.; Kovel, C. B.; Chirik, P. J.* Iron-Catalyzed Vinylsilane Dimerization and Cross-Cycloadditions with 1,3-Dienes: Probing the Origins of Chemo- and Regioselectivity. *ACS Catal.* **2021**, *11*, 1368–1379. DOI: [10.1021/acscatal.0c04608](https://doi.org/10.1021/acscatal.0c04608)
12. Kennedy, C. R.; Choi, B. Y.[‡]; Reeves, M.-G. R.[‡]; Jacobsen, E. N.* Enantioselective Catalysis of an Anionic Oxy-Cope Rearrangement Enabled by Synergistic Ion Binding. *Isr. J. Chem.* **2020**, *60*, 461–474. DOI: [10.1002/ijch.201900168](https://doi.org/10.1002/ijch.201900168) (Special issue dedicated to Profs. Stephen Buchwald and John Hartwig in celebration of their receipt of the 2019 Wolf Prize.)
11. Kennedy, C. R.; Zhong, H.; Joannou, M. V.; Chirik, P. J.* Pyridine(diimine) Iron Diene Complexes Relevant to Catalytic [2+2]-Cycloaddition Reactions. *Adv. Synth. Catal.* **2020**, *362*, 404–416. DOI: [10.1002/adsc.201901289](https://doi.org/10.1002/adsc.201901289) (Special issue in honor of Professor Eric N. Jacobsen's 60th birthday.)
10. Rosenkoetter, K.; Kennedy, C. R.; Chirik, P. J.*; Harvey, B. G.* [4+4]-Cycloaddition of Isoprene for the Production of High-Performance Bio-Based Jet Fuel. *Green Chem.* **2019**, *21*, 5616–5623. DOI: [10.1039/C9GC02404B](https://doi.org/10.1039/C9GC02404B)
9. Kennedy, C. R.; Zheng, H.; Macaulay, R. L.[‡]; Chirik, P. J.* Regio- and Diastereoselective, Iron-Catalyzed [4+4]-Cycloaddition of 1,3-Dienes. *J. Am. Chem. Soc.* **2019**, *141*, 8557–8573. DOI: [10.1021/jacs.9b02443](https://doi.org/10.1021/jacs.9b02443) (Highlighted as "Synfact of the Month": Knochel, P.; Balkenhohl, M. Diastereoselective [4+4] Cycloadditions. *Synfacts*, 2019, *15*, 0879)
8. Schmidt, V. A.; Kennedy, C. R.; Bezdek, M. J.; Chirik, P. J.* Selective [1,4]-Hydrovinylation of 1,3-Dienes with Unactivated Olefins Enabled by Iron–Diimine Catalysts. *J. Am. Chem. Soc.* **2018**, *140*, 3443–3453. DOI: [10.1021/jacs.8b00245](https://doi.org/10.1021/jacs.8b00245)
7. Klausen, R. S.; Kennedy, C. R.; Hyde, A. M.; Jacobsen, E. N.* Chiral Thioureas Promote Enantioselective Pictet–Spengler Cyclization by Stabilizing Every Intermediate and Transition State in the Carboxylic Acid-Catalyzed Reaction. *J. Am. Chem. Soc.* **2017**, *139*, 12299–12309. DOI: [10.1021/jacs.7b06811](https://doi.org/10.1021/jacs.7b06811)
6. Kennedy, C. R.[‡]; Lehnher, D.[‡]; Rajapaksa, N. S.; Park, Y.; Ford, D. D.; Jacobsen, E. N.* Mechanism-Guided Development of a Highly Active Bis-thiourea Catalyst for Anion-Abstraction Catalysis. *J. Am. Chem. Soc.* **2016**, *138*, 13525–13528. DOI: [10.1021/jacs.6b09205](https://doi.org/10.1021/jacs.6b09205)
5. Kennedy, C. R.[‡]; Lin, S.[‡]; Jacobsen, E. N.* The Cation– π Interaction in Small-Molecule Catalysis. *Angew. Chem. Int. Ed.* **2016**, *55*, 12596–12624. DOI: [10.1002/anie.201600547](https://doi.org/10.1002/anie.201600547)
4. Kennedy, C. R.; Guidera, J. A.[‡]; Jacobsen, E. N.* Synergistic Ion-Binding Catalysis Demonstrated via an Enantioselective, Catalytic [2,3]-Wittig Rearrangement. *ACS Cent. Sci.* **2016**, *2*, 416–423. DOI: [10.1021/acscentsci.6b00125](https://doi.org/10.1021/acscentsci.6b00125)
3. Lehnher, D.; Ford, D. D.; Bendelsmith, A. J.; Kennedy, C. R.; Jacobsen, E. N.* Conformational Control of Chiral Amido-Thiourea Catalysts Enables Improved Activity and Enantioselectivity. *Org. Lett.* **2016**, *18*, 3214–3217. DOI: [10.1021/acs.orglett.6b01435](https://doi.org/10.1021/acs.orglett.6b01435)
2. Ford, D. D.; Lehnher, D.; Kennedy, C. R.; Jacobsen, E. N.* Anion-Abstraction Catalysis: The Cooperative Mechanism of α -Chloroether Activation by Dual H-Bond Donors. *ACS Catal.* **2016**, *6*, 4616–4620. DOI: [10.1021/acscatal.6b01384](https://doi.org/10.1021/acscatal.6b01384)

1. Ford, D. D.[‡]; Lehnerr, D.[‡]; Kennedy, C. R.; Jacobsen, E. N. On- and Off-Cycle Catalyst Cooperativity in Anion-Binding Catalysis. *J. Am. Chem. Soc.* **2016**, *138*, 7860–7863. DOI: [10.1021/jacs.6b04686](https://doi.org/10.1021/jacs.6b04686)

Patents

5. Chirik, P. J.; Register, R. A.; Covell, K. B.; Tortajada Navarro, A.; Kennedy, C. R.; Macaulay, R. Purification and ROMP of 1,6-dimethylcyclooctadiene to access new microstructure of polyisoprene. U.S. Provisional Patent Application in Progress.
4. Carpenter, A. E.; Culcu, G.; Cai, I. C.; Lin, T.-P.; Chirik, P. J.; Kennedy, C. R.; Beromi, M. M. Improved Method to Produce Step Dienes. Application No. 17/680,556. Filed: February 25, 2022. U.S. Provisional Application No. 63/154,043. Filed: February 26, 2021.
3. Chirik, P. J.; Kennedy, C. R.; Beromi, M. M. Depolymerization of Oligomers and Polymers Comprising Cyclobutane Units. [WO2021154931A1](https://pubchem.ncbi.nlm.nih.gov/patent/WO2021154931A1) **2021**. Application No. PCT/US2021/015403. Filed: January 28, 2021. U.S. Provisional Application No. 62/966,863. Filed: January 28, 2020.
2. Harvey, B. G.; Rosenkoetter, K. E.; Chirik, P. J.; Kennedy, C. R. Producing Cyclic Fuels from Conjugated Diene. Patent No. [US10981846B1](https://pubchem.ncbi.nlm.nih.gov/patent/US10981846B1), **2021**. Application No. US16/542547. Filed: August 16, 2019
1. Chirik, P. J.; Kennedy, C. R.; Russel, S. Oligomeric and Polymeric Species Comprising Cyclobutane Units. Patent No. [US11001667B2](https://pubchem.ncbi.nlm.nih.gov/patent/US11001667B2), **2021**. Application No. US16/239938. Filed: January 4, 2019

Presentations

Conferences & Symposia

- 2024 American Chemical Society (ACS) National Meeting, Denver
(invited symposium speaker "*Advances in Molecular Reactivity and Material Properties Enabled by Mechanistic and Structural Methods*", planned 2024-08)
- 6th International Conference on Organometallics and Catalysis (OM&CAT-6)
(“Young Invited Speaker”, planned 2024-08)
- Telluride Meeting on Accelerating Reaction Discovery
(invited participant, planned 2024-08)
- Gordon Research Conference (GRC) – Stereochemistry @ Newport, RI
(invited discussion leader, planned 2024-07)
- 2024 Canadian Society of Chemistry (CSC) Meeting, Winnipeg
(invited symposium speaker "*Ligand Design in Coordination Chemistry and Beyond*", declined)
- 28th Annual ACS Green Chemistry and Engineering Conference
(invited symposium speaker "*Sustainable Catalysis by Early-Career Scientists*", planned 2024-06)
- Florida Heterocyclic and Synthetic Chemistry (FloHet) Conference
(invited speaker, planned 2024-03)
- 34th U.S. Kavli Frontiers of Science Symposium
(invited participant, planned 2024-03)

- 2023 35th Annual Packard Fellows Reunion (invited speaker, 2023-09)
 Paul Chirik 50th Birthday Symposium @ Princeton University
 (invited speaker, 2023-07)
 2023 Canadian Society of Chemistry (CSC) Meeting, Vancouver
 (invited symposium speaker "*Organic Chemistry (OC) in 2023: Highlighting the Diversity of People and Pursuits*", 2023-06)
- 2022 Southeast Regional Meeting of the American Chemical Society (SERMACS), San Juan
 (invited symposium speaker "*Unusual Structure and Reactivity of Inorganic Molecules*", 2022-10)
 American Chemical Society (ACS) National Meeting, Chicago
 (contributed oral presentation, 2022-08)
 Gordon Research Conference (GRC) – Organometallic Chemistry @ Newport, RI
 (contributed poster, 2022-07)
- 2020 Eric N. Jacobsen 60th Birthday Symposium @ Harvard University
 (invited flash talk, 2020-02)
- 2018 Gordon Research Conference (GRC) – Organometallic Chemistry @ Newport, RI
 (contributed poster, 2018-07)
 Graduate Research Symposium (GRS) – Organometallic Chemistry @ Newport, RI
 (contributed oral presentation, 2018-07)
- 2017 American Chemical Society (ACS) Green Chemistry & Engineering Conference
 (contributed oral presentation, 2017-06)
- 2016 American Chemical Society (ACS) National Meeting, Philadelphia, PA
 (contributed oral presentation, 2016-08)
 Gordon Research Conference (GRC) – Organic Reactions & Processes
 (contributed poster, 2016-07)
 1st Annual Catalysis in Chemistry Symposium, Boston, MA
 (contributed poster, 2016-05)
- 2015 4th Annual Boston Symposium for Organic & Bioorganic Chemistry, Merck Research Laboratories, Boston, MA. (contributed poster, 2015)
 8th CaRLa Winter School, University of Heidelberg/BASF, Heidelberg, Germany.
 (invited poster, 2015)
- 2014 Gordon Research Conference (GRC) – Stereochemistry @ Newport, RI
 (contributed poster, 2014-07)

Invited Seminars

- 2024 University of New Hampshire, Department of Chemistry (planned fall 2024)
 New York University, Department of Chemistry (planned fall 2024)
- 2023 Indian Institute of Technology (IIT) – Delhi, Department of Chemistry (2023-12)
 Rochester Institute of Technology, Department of Chemistry (2023-10)

- 2022 Williams College, Chemistry Department (Class of 1960's Scholars Seminar; 2022-12)
 Binghamton University, Chemistry Department (2022-08)
 University of Rochester, Chemistry–Biology Interface Training Program (2022-06)
 University of Rochester, Materials Science Program (2022-05)
 SUNY Potsdam, Department of Chemistry (2022-04)
 SUNY Buffalo State, Department of Chemistry (2022-03)
 Juniata College, Chemistry & Biochemistry Department (2022-03)
- 2019 The College of New Jersey, Chemistry Department (senior seminar guest, 2019-10)
- 2018 University of Rochester, Department of Chemistry (2018-03)

Funding

- 2023-07 – **NIH Maximizing Investigator Research Award (MIRA, R35) [PI]**
 2028-06 *Mechanistic Insights into Catalytic Acyl C-O and C-N Activation and Cross Coupling*
 Role: Principal Investigator Total Award Amount: \$1,925,000
- 2023-01 – **2022 Packard Fellowship in Science and Engineering [PI]**
 2027-12 *Borrowing Functionality for Sustainable Synthesis by Cooperative Molecular Catalysis*
 Role: Principal Investigator Total Award Amount: \$875,000
- 2021-09 – **ACS Petroleum Research Fund Doctoral New Investigator Award [PI]**
 2023-08 *Magnetically Modulated Radical Relay Catalysis: Stimulus-Controlled Olefin
 Polymerization and Alkane C(sp³)-H Functionalization*
 Role: Principal Investigator Total Award Amount: \$110,000
- 2022-08– **NSF Major Research Instrumentation Grant [co-PI]**
 2025-07 *MRI: Acquisition of a Cryoprobe 500 MHz Nuclear Magnetic Resonance (NMR)
 Spectrometer*
 Role: co-Principal Investigator Total Award Amount: \$605,314

Teaching Activities

- CHEM 172 First-Year Organic Chemistry II** (Spring 2020, Spring 2022–2024)
 Typical Enrollment: 30–50 students Workshop Leaders Supervised: 4–5
- CHEM 433 Advanced Organic Chemistry** (Fall 2020, Fall 2021)
 Typical Enrollment: 6–15 students Workshop Leaders Supervised: 1
- CHEM 434 Methods for Mechanistic Elucidation** (Spring 2023, Spring 2024)
 Typical Enrollment: 3–10 students

Synergistic Activities & Service

- Department Activities** Faculty Recruiting Committee (2023–present)
 Diversity, Equity, Inclusion & Outreach Committee
 (2020–present; Forum Series Coordinator, 2021–2022; Chair, 2022–present);

Graduate Recruiting Committee (2020–present)
Ad Hoc Committee for Department Associate Chair Selection (2022)
Development/News-Outreach Committee (2021–2022)
Ad Hoc Committee for Instructional-Track Faculty Hiring (2021)
Ad Hoc Committee for Instructional-Track Faculty Review (2021)
Ad Hoc Committee for Department Chair Selection (2021)
ACS Bridge Program Partner Site
(Application Facilitator, 2020; Program Liaison, 2022–2023);
Graduate Orientation Co-organizer (2020–2021);
Graduate Studies Committee (2020–2022)

**University
Activities**

AS&E Promotion and Tenure Guidelines Review Committee (Spring 2024)
Blackboard Ultra Pilot Group (Spring 2024)
Equity in Graduate Education, Department Liaison (2022–present)
UR Undergraduate Research Discover Grant Reviewer (2022, 2023)
UR Undergraduate Research Expo Judge (2021–2023)
#URSTEMrecharge Co-organizer (2021)
Sproull University Fellowship Reviewer (2020)

**Reviewing
Activities**
(Journals)

ACS Catalysis; Accounts of Chemical Research; Angewandte Chemie International Edition; Cell Reports Physical Science; Chem; Chemistry – A European Journal; ChemCatChem; Chemical Reviews; European Journal of Organic Chemistry; Journal of the American Chemical Society; Journal of Organic Chemistry; Nature Catalysis; Organic Process Research & Development; Organometallics; Synlett

**Reviewing
Activities**
(Funding)

National Institutes of Health (2022)
American Chemical Society Petroleum Research Fund (2021–2022)
National Science Foundation (2020–2023)

**National
Activities**

Organic Chemistry Frontiers Early Career Advisory Board (2024–present)
Chem Next Generation Advisory Board (2023–present)
JACS Au Early Career Advisory Board (2022)
ACS Northeast Regional Meeting Symposium Co-Chair (2022)
Iota Sigma Pi, National Council, Members-at-Large Coordinator (2020)
Chemistry Women Mentorship Network, Mentor (2017–present)