CURRICULUM VITAE
Ryan J. Trovitch

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PROFESSIONAL EXPERIENCE

- **Associate Professor** *Aug. 2019 – Present*
  Assistant Professor *Aug. 2015 – Aug. 2019*
  School of Molecular Sciences
  Arizona State University, Tempe, AZ
- **Assistant Professor** *Jan. 2012 – Aug. 2015*
  Department of Chemistry & Biochemistry
  Arizona State University, Tempe, AZ
- **Postdoctoral Research Associate** *Sept. 2008 – Jan. 2012*
  Glenn T. Seaborg Postdoctoral Fellow *June 2009 – May 2011*
  Chemistry Division – Inorganic, Isotope, and Actinide Chemistry (C-IIAC)
  Los Alamos National Laboratory, Los Alamos, NM
  Advisor: Dr. Kevin D. John
  Co-Advisor: Prof. R. Tom Baker (currently at the University of Ottawa)

EDUCATION

- **Ph.D. in Chemistry and Chemical Biology** *Jan. 2009*
  M.S. in Chemistry and Chemical Biology *May 2006*
  Cornell University, Ithaca, NY
  Advisor: Prof. Paul J. Chirik (currently at Princeton University)
  Dissertation: *Iron Complexes with Terdentate Ligands: Preparation, Electronic Structure Determination, and Utility as Catalyst Precursors.*
- **B.S. in Chemistry; *summa cum laude*** *May 2004*
  The Honors Program at King's College, Wilkes-Barre, PA
  Advisor: Prof. Robert L. LaDuca (currently at Michigan State University)

BOARD EXPERIENCE

- **Green Chemistry Commitment**
  Advisory Board Member *Dec. 2014 – Dec. 2022*
  The Green Chemistry Commitment is an initiative of Beyond Benign (a non-profit organization) aimed at expanding access to green chemistry in higher education. A 433% increase in the number of signing institutions (from 24 to 104) was achieved along with progress towards training at least 25% of chemistry majors in green chemistry by 2025.
- **ASU Chemical and Environmental Characterization Core Research Facilities**
  Elected Governance Board Member *Aug. 2019 – May 2021*
  Shared responsibility for the financial oversight of ASU's Nuclear Magnetic Resonance, Electron Paramagnetic Resonance, and Ultrafast Laser Facilities as well as the Metals, Environmental, and Terrestrial Analytical Laboratory (METAL). Over this period, revenue increased 209% from $55,000 in the first quarter of 2019 to $115,000 in the third quarter of 2021.

PEER-REVIEWED PUBLICATIONS (*DENOTES PI – TRADITIONALLY AT END OF AUTHOR LIST, †DENOTES ASU GRADUATE STUDENT, ‡DENOTES ASU UNDERGRADUATE, H-INDEX = 23, CITATIONS = 2112)

Arizona State University

49. Nguyen, T. T.†; Sharma, A.†; Nguyen, T. L. P.†; Trimble, M. A.; Seo, D.-K.; Trovitch, R. J. "Silane Diamine Copolymers: Efficient Synthesis, Solvent Absorption Capacity, and Limitations as Coatings." *Green Chem.* (Submitted).
48. Ghosh, C.†; Slater, G. C.†; Groy, T. L.; Trovitch, R. J.* "Tuning a Phosphine-Substituted Diimine Ligand to Afford an Iron Monocarbonyl Complex." *Polyhedron.* (Submitted – Invited for Special Issue).
47. Sharma, A.†; Bean, R. H.†; Long, T. E.; Trovitch, R. J.* "Efficient Cobalt Catalyzed Coupling of Amines and Siloxanes to Prepare Ceramics and Polymers." *ACS Sustainable Chem. Eng.* **2023**, *11*, 11172-11180. ***2022 Impact Factor: 8.4***
46. Leland, B. E.‡; Mondal, J.†; Trovitch, R. J.* "Sustainable Preparation of Aminosilane Monomers, Oligomers, and Polymers through Si-N Dehydrocoupling Catalysis." *Chem. Commun.* **2023**, *59*, 3665-3684. (Invited Feature Article) ***2022 Impact Factor: 4.9***
45. Sharma, A.†; So, S.; Kim, J.-H.; MacMillan, S. N.; Baik, M.-H.*; Trovitch, R. J.* "An Aryl Diimine Cobalt(I) Catalyst for Carbonyl Hydrosilylation." *Chem. Commun.* **2022**, *58*, 10793-10796. (Designated as a *Chemical Communications* HOT Article) ***2022 Impact Factor: 4.9***
44. Nawaz, Z.; Ullah, H.; Gürbüz, N.; Zafar, M. N.; Verpoort, F.*; Tahir, M. N.; Özdemir, I.; Trovitch, R. J. "Benzimidizole-based *N*-Heterocyclic Carbene Silver Complexes as Catalysts for the Formation of Carbonates from Carbon Dioxide and Epoxides." *Mol. Catal.* **2022**, *526*, 112369. ***2022 Impact Factor: 4.6***
43. Mena, M. R.†; Kim, J.-H.; So, S.; Ben-Daat, H.†; Porter, T. M.‡; Ghosh, C.†; Sharma, A.†; Flores, M.; Groy, T. L.; Baik, M.-H.*; Trovitch, R. J.* "Comparing the Electronic Structure of Iron, Cobalt, and Nickel Compounds That Feature a Phosphine-Substituted Bis(imino)pyridine Chelate." *Inorg. Chem.* **2022**, *61*, 6438-6450. (Top 20 Most Downloaded *Inorganic Chemistry* Manuscripts in May 2022) ***2022 Impact Factor: 4.6***
42. Nguyen, T. T.†; Mukhopadhyay, T. K.†; MacMillan, S. N.; Janicke, M. T.; Trovitch, R. J.* "Synthesis of Aminosilane Chemical Vapor Deposition Precursors and Polycarbosilazanes through Manganese-Catalyzed Si-N Dehydrocoupling." *ACS Sustainable Chem. Eng.* **2022**, *10*, 4218-4226. (Featured by ASU News and SMS Connects) ***2022 Impact Factor: 8.4***
41. Sharma, A.†; Trovitch, R. J.* "Phosphorous-Substituted Redox-Active Ligands in Base Metal Hydrosilylation Catalysis." *Dalton Trans.* **2021**, *50*, 15973-15977. (Named a *Dalton Transactions* HOT Article) ***2021 Impact Factor: 4.569***

40. Pal, R.[†]; Kim, S.; Lee, W.; Mena, M. R.[†]; Khurshid, A.; Ghosh, C.[†]; Groy, T. L.; Chizmeshya, A. V. G.*; Baik, M.-H.*; Trovitch, R. J.* "Reaction of a Molybdenum Bis(dinitrogen) Complex with Carbon Dioxide: A Combined Experimental and Computational Investigation." *Inorg. Chem.* **2021**, *60*, 7708-7718. ***2021 Impact Factor: 5.436***
39. Oh, C.; Siewe, J.; Nguyen, T. T.[†]; Kawamura, A.; Flores, M.; Groy, T. L.; Anderson, J. S.; Trovitch, R. J.*; Baik, M.-H.* "The Electronic Structure of a β-Diketiminate Manganese Hydride Dimer." *Dalton Trans.* **2020**, *49*, 14463-14474. ***2020 Impact Factor: 4.390***
38. Nguyen, T. T.[†]; Kim, J.-H.; Kim, S.; Oh, C.; Flores, M.; Groy, T. L.; Baik, M.-H.*; Trovitch, R. J.* "Scope and Mechanism of Nitrile Hydroboration Mediated by a β-Diketiminate Manganese Hydride Catalyst." *Chem. Commun.* **2020**, *56*, 3959-3962. ***2020 Impact Factor: 6.222***
37. Vartak, P. B.[†]; Wang, Z.[†]; Groy, T. L.; Trovitch, R. J.; Wang, R. Y.* "Solution and Solid-State Characterization of PbSe Precursors." *ACS Omega* **2020**, *5*, 1949-1955. ***2020 Impact Factor: 3.512***
36. Ghosh, C.[†]; Kim, S.; Mena, M. R.[†]; Kim, J.-H.; Pal, R.[†]; Rock, C. L.[†]; Groy, T. L.; Baik, M.-H.*; Trovitch, R. J.* "Efficient Cobalt Catalyst for Ambient-Temperature Nitrile Dihydroboration, the Elucidation of a Chelate-Assisted Borylation Mechanism, and a New Synthetic Route to Amides." *J. Am. Chem. Soc.* **2019**, *141*, 15327-15337. (Featured by ASU Now and SMS Connects) ***2019 Impact Factor: 14.612***
35. Zhang, G.*; Wu, J.; Zhang, S.; Neary, M. C.; Mao, J.*; Flores, M.; Trovitch, R. J.; Dub, P. A.* "Redox Noninnocent Ligand-Supported Vanadium Catalysts for the Chemoselective Reduction of C=X (X = O, N) Functionalities." *J. Am. Chem. Soc.* **2019**, *141*, 15230-15239. ***2019 Impact Factor: 14.612***
34. Rock, C. L.[†]; Trovitch, R. J.* "Anti-Markovnikov Terminal and *gem*-Olefin Hydrosilylation Using a κ^4-Diimine Nickel Catalyst: Selectivity for Alkene Hydrosilylation over Ether C-O Bond Cleavage." *Dalton Trans.* **2019**, *48*, 461-467. (Invited for Special Issue on d-Block Chemistry) ***2019 Impact Factor: 4.174***
33. Mukhopadhyay, T. K.[†]; Flores, M.; Groy, T. L.; Trovitch, R. J.* "A β-Diketiminate Manganese Catalyst for Alkene Hydrosilylation: Substrate Scope, Silicone Preparation, and Mechanistic Insight." *Chem. Sci.* **2018**, *9*, 7673-7680. ***2018 Impact Factor: 9.556***
32. Rock, C. L.[†]; Groy, T. L.; Trovitch, R. J.* "Carbonyl and Ester C-O Bond Hydrosilylation Using κ^4-Diimine Nickel Catalysts." *Dalton Trans.* **2018**, *47*, 8807-8816. ***2018 Impact Factor: 4.052***
31. Mukhopadhyay, T. K.[†]; MacLean, N. L.[‡]; Flores, M.; Groy, T. L.; Trovitch, R. J.* "Isolation of Mn(I) Compounds Featuring a Reduced Bis(imino)pyridine Chelate and Their Relevance to Electrocatalytic Hydrogen Production." *Inorg. Chem.* **2018**, *57*, 6065-6075. ***2018 Impact Factor: 4.85***
30. Trovitch, R. J.* "The Emergence of Manganese-Based Carbonyl Hydrosilylation Catalysts." *Acc. Chem. Res.* **2017**, *50*, 2842-2852. (Invited Article, Cited more than 100 times) ***2017 Impact Factor: 20.955***
29. Mukhopadhyay, T. K.[†]; Ghosh, C.[†]; Flores, M.; Groy, T. L.; Trovitch, R. J.* "Hydrosilylation of Aldehydes and Formates Using a Dimeric Manganese Precatalyst." *Organometallics* **2017**, *36*, 3477-3483. (Top 20 Most Downloaded *Organometallics* Manuscripts in October 2017) ***2017 Impact Factor: 4.051***
28. Ben-Daat, H.[†]; Rock, C. L.[†]; Flores, M.; Groy, T. L.; Bowman, A. C.; Trovitch, R. J.* "Hydroboration of Alkynes and Nitriles Using an α-Diimine Cobalt Hydride Catalyst." *Chem. Commun.* **2017**, *53*, 7333-7336. (Invited for Emerging Investigators Issue) ***2017 Impact Factor: 6.290***
27. Mukhopadhyay, T. K.[†]; Rock, C. L.[†]; Hong, M.; Ashley, D. C.; Groy, T. L.; Baik, M.-H.*; Trovitch, R. J.* "Mechanistic Investigation of Bis(imino)pyridine Manganese Catalyzed Carbonyl and Carboxylate Hydrosilylation." *J. Am. Chem. Soc.* **2017**, *139*, 4901-4915. (Cited more than 100 times) ***2017 Impact Factor: 14.357***
26. Pal, R.[†]; Laureanti, J. A.[†]; Groy, T. L.; Jones, A. K.*; Trovitch, R. J.* "Hydrogen Production from Water Using a Bis(imino)pyridine Molybdenum Electrocatalyst." *Chem. Commun.* **2016**, *52*, 11555-11558. ***2016 Impact Factor: 6.319***
25. Mukhopadhyay, T. K.[†]; Groy, T. L.; Smythe, N. C.; Gordon, J. C.; Trovitch, R. J.* "Reactivity of (Triphos)$FeBr_2$(CO) towards Sodium Borohydrides." *J. Coord. Chem.* **2016**, *69*, 2083-2046. (Invited for Emerging Leaders Issue) ***2016 Impact Factor: 1.795***

24. Pal, R.[†]; Cherry, B. R.; Flores, M.; Groy, T. L.; Trovitch, R. J.* "Isolation of a Bis(imino)pyridine Molybdenum(I) Iodide Complex through Controlled Reduction and Interconversion of its Reaction Products." *Dalton Trans.* **2016**, *45*, 10024-10033. (Invited for New Talent: Americas Issue) ***2016 Impact Factor: 4.029***
23. Ghosh, C.[†]; Groy, T. L.; Bowman, A. C.; Trovitch, R. J.* "Two-step C-H, C-P Bond Activation at an α-Diimine Iron Dinitrogen Complex." *Chem. Commun.* **2016**, *52*, 4553-4556. ***2016 Impact Factor: 6.319***
22. Ghosh, C.[†]; Mukhopadhyay, T. K.[†]; Flores, M.; Groy, T. L.; Trovitch, R. J.* "A Pentacoordinate Mn(II) Precatalyst that Exhibits Notable Aldehyde and Ketone Hydrosilylation Turnover Frequencies." *Inorg. Chem.* **2015**, *54*, 10398-10406. ***2015 Impact Factor: 4.82***
21. Pal, R.[†]; Groy, T. L.; Trovitch, R. J.* "Conversion of Carbon Dioxide to Methanol Using a C-H Activated Bis(imino)pyridine Molybdenum Hydroboration Catalyst." *Inorg. Chem.* **2015**, *54*, 7506-7515. ***2015 Impact Factor: 4.82***
20. Mukhopadhyay, T. K.[†]; MacLean, N. L.[‡]; Gan, L.; Ashley, D. C.; Groy, T. L.; Baik, M.-H.*; Jones, A. K.*; Trovitch, R. J.* "Carbon Dioxide Promoted H^+ Reduction Using a Bis(imino)pyridine Manganese Electrocatalyst." *Inorg. Chem.* **2015**, *54*, 4475-4482. ***2015 Impact Factor: 4.82***
19. Mukhopadhyay, T. K.[†]; Flores, M.; Feller, R. K.; Scott, B. L.; Taylor, R. D.; Paz-Pasternak, M.; Henson, N. J.; Rein, F. N.; Smythe, N. C.*; Trovitch, R. J.*; Gordon, J. C.* "A New Spin on Cyclooctatetraene (COT) Redox-Activity: Low-Spin Fe(I) Complexes that Exhibit Antiferromagnetic Coupling to a Singly Reduced η^4-COT Ligand." *Organometallics* **2014**, *33*, 7101-7112. (Top 20 Most Downloaded *Organometallics* Manuscripts in December 2014) ***2014 Impact Factor: 4.126***
18. Pal, R.[†]; Groy, T. L.; Bowman, A. C.; Trovitch, R. J.* "Preparation and Hydrosilylation Activity of a Molybdenum Carbonyl Complex That Features a Pentadentate Bis(imino)pyridine Ligand." *Inorg. Chem.* **2014**, *53*, 9357-9365. ***2014 Impact Factor: 4.762***
17. Trovitch, R. J.* "Comparing Well-Defined Manganese, Iron, Cobalt, and Nickel Ketone Hydrosilylation Catalysts." *Synlett* **2014**, *25*, 1638-1642. (Invited Synpacts Article) ***2014 Impact Factor: 2.419***
16. Mukhopadhyay, T. K.[†]; Flores, M.; Groy, T. L.; Trovitch, R. J.* "A Highly Active Manganese Precatalyst for the Hydrosilylation of Ketones and Esters." *J. Am. Chem. Soc.* **2014**, *136*, 882-885. (Cited more than 100 times) ***2014 Impact Factor: 12.113***
15. Porter, T. M.[‡]; Hall, G. B.; Groy, T. L.; Trovitch, R. J.* "Importance of Co-Donor Field Strength in the Preparation of Tetradentate α-Diimine Nickel Hydrosilylation Catalysts." *Dalton Trans.* **2013**, *42*, 14689-14692. ***2013 Impact Factor: 4.097***
14. Ben-Daat, H.[†]; Hall, G. B.; Groy, T. L.; Trovitch, R. J.* "Rational Design of Rhodium Complexes Featuring κ^4-*N*,*N*,*N*,*N*- and κ^5-*N*,*N*,*N*,*P*,*P*-Bis(imino)pyridine Ligands." *Eur. J. Inorg. Chem.* **2013**, 4430-4442. ***2013 Impact Factor: 2.965***
13. Mukhopadhyay, T. K.[†]; Feller, R. K.; Rein, F. N.; Henson, N. J.; Smythe, N. C.; Trovitch, R. J.*; Gordon, J. C.* "Investigation of Formally Zerovalent Triphos Iron Complexes." *Chem. Commun.* **2012**, *48*, 8670-8672. ***2012 Impact Factor: 6.378***

Los Alamos National Laboratory

12. Trovitch, R. J.; Guo, N.; Janicke, M. T.; Li, H.; Marshall, C. L.; Miller, J. T.; Sattelberger, A. P.*; John, K. D.*; Baker, R. T.* "Spectroscopic Characterization of Alumina-Supported Bis(allyl)iridium Complexes: Site-isolation, Reactivity, and Decomposition Studies." *Inorg. Chem.* **2010**, *49*, 2247-2258.
11. Trovitch, R. J.; John, K. D.*; Martin, R. L.; Obrey, S. J.; Scott, B. L.; Sattelberger, A. P.*; Baker, R. T.* "Interplay of Metal-Allyl and Metal-Metal Bonding in Dimolybdenum Allyl Complexes." *Chem. Commun.* **2009**, 4206-4208.

Cornell University

10. Wile, B. M.; Trovitch, R. J.; Bart, S. C.; Tondreau, A. M.; Lobkovsky, E.; Milsmann, C.; Bill, E.; Wieghardt, K.; Chirik, P. J.* "Reduction Chemistry of Aryl- and Alkyl-Substituted Bis(imino)pyridine Iron

Dihalide Compounds: Molecular and Electronic Structures of [$(PDI)_2Fe$] Derivatives." *Inorg. Chem.* **2009**, *48*, 4190-4200.

9. Trovitch, R. J.; Lobkovsky, E.; Bouwkamp, M. W.; Chirik, P. J.* "Carbon-Oxygen Bond Cleavage by Bis(imino)pyridine Iron Compounds: Catalyst Deactivation Pathways and Observation of Acyl C-O Bond Cleavage in Esters." *Organometallics* **2008**, *27*, 6264-6278. (Cited more than 100 times)
8. Trovitch, R. J.; Lobkovsky, E.; Chirik, P. J.* "Bis(imino)pyridine Iron Alkyls Containing β-Hydrogens: Synthesis, Evaluation of Kinetic Stability, and Decomposition Pathways Involving Chelate Participation." *J. Am. Chem. Soc.* **2008**, *130*, 11631-11640.
7. Trovitch, R. J.; Lobkovsky, E.; Bill, E.; Chirik, P. J.* "Functional Group Tolerance and Substrate Scope in Bis(imino)pyridine Iron Catalyzed Alkene Hydrogenation." *Organometallics* **2008**, *27*, 1470-1478. (Cited more than 200 times, featured in *Chem. Eng. News* **2008**, *86*, 53-57)
6. Fernández, I.; Trovitch, R. J.; Lobkovsky, E.; Chirik, P. J.* "Synthesis of Bis(imino)pyridine Iron Di- and Monoalkyl Complexes: Stability Differences between $FeCH_2SiMe_3$ and $FeCH_2CMe_3$ Derivatives." *Organometallics* **2008**, *27*, 109-118.
5. Trovitch, R. J.; Lobkovsky, E.; Chirik, P. J.* "Bis(diisopropylphosphino)pyridine Iron Dicarbonyl, Dihydride and Silyl Hydride Complexes." *Inorg. Chem.* **2006**, *45*, 7252-7260. (Cited more than 100 times)
4. Bouwkamp, M. W.; Bart, S. C.; Hawrelak, E. J.; Trovitch, R. J.; Lobkovsky, E.; Chirik, P. J.* "Square Planar Bis(imino)pyridine Iron Halide and Alkyl Complexes." *Chem. Commun.* **2005**, 3406-3408.

King's College

3. Montney, M. R.; Thomas, J. G.; Supkowski, R. M.; Trovitch, R. J.; Zubieta, J.; LaDuca, R. L.* "Synthesis, Structure and Magnetic Properties of a Copper Molybdate Hybrid Inorganic/Organic Solid with a Novel 10-Connected Three-Dimensional Network Topology." *Inorg. Chem. Commun.* **2009**, *12*, 534-539.
2. Knapp, W. R.; Thomas; J. G.; Martin, D. P.; Braverman, M. A.; Trovitch, R. J.; LaDuca, R. L.* "Divalent Nickel and Monovalent Copper Pseudohalide Coordination Polymers Incorporating the Kinked Organodiimine 4,4'-Dipyridylamine: From a (4,4)-Type Lamellar Motif to an Unprecedented Staircase Morphology." *Z. Anorg. Allg. Chem.* **2007**, *633*, 575-581.
1. Trovitch, R. J.; Rarig, R. S.; Zubieta, J. A.; LaDuca, R. L.* "A Coordination Polymer with Conformationally Distinct Layers: Poly[(μ-1,3-di-4-pyridylpropane-κ^2N,N')bis(μ_3-thiocyanato-$\kappa^3N,S:S$)dicopper(I)]." *Acta Cryst.* **2007**, *E63*, m339-m341.

BOOK CHAPTERS (*DENOTES PI, †DENOTES ASU GRADUATE STUDENT)

Arizona State University

1. Nguyen, T. T.†; Trovitch, R. J.* "Manganese-catalyzed Hydrosilylation and Hydroboration Reactions." In *Manganese Catalysis in Organic Synthesis*; Sortais, J.-B., Ed.; Wiley-VCH: Weinheim, Germany, 2022; pp 101-135.

PATENTS AND DISCLOSURES (*DENOTES PI, †DENOTES ASU GRADUATE STUDENT, ‡DENOTES ASU UNDERGRADUATE)

Arizona State University – Patents

3. Trovitch, R. J.*; Nguyen, T. T.†; Mukhopadhyay, T. K.†; Glazier, B. M.† "Beta-Diketiminate Manganese Catalysts for Hydrosilylation, Hydroboration, and Dehydrogenative Pnictogen-Silicon and Pnictogen-Boron Bond Formation," U.S. Patent 11,273,432, **2022**.
2. Trovitch, R. J.*; Mukhopadhyay, T. K.†; Pal, R.†; Ben-Daat, H.†; Porter, T. M.‡; Ghosh, C.† "First-Row Transition Metal Hydrogenation and Hydrosilylation Catalysts," U.S. Patent 10,407,451, **2019**.

1. Trovitch, R. J.*; Mukhopadhyay, T. K.†; Pal, R.†; Ben-Daat, H.†; Porter, T. M.‡; Ghosh, C.† "First-Row Transition Metal Hydrogenation and Hydrosilylation Catalysts," U.S. Patent 9,708,355, **2017**. Licensed by Sigma-Aldrich Corporation for the distribution of **(^{Ph_2PPr}PDI)Mn** and **(^{Ph_2PPr}DI)Ni**.

Arizona State University – Provisional Applications

5. Trovitch, R. J.*; Sharma, A.†; Nguyen, T. T.† "Late First Row Transition Metal Arene Diimine Catalysts for Hydrofunctionalization and Dehydrocoupling," U.S. Patent Application No. 63/249,151 (*Filed – September 2021*).
4. Trovitch, R. J.*; Nguyen, T. T.†; Mukhopadhyay, T. K.†; Glazier, B. M.† "Beta-Diketiminate Manganese Catalysts for Hydrosilylation, Hydroboration, and Dehydrogenative Pnictogen-Silicon and Pnictogen-Boron Bond Formation," U.S. Patent Application No. 16/407,317 (*Filed – May 2019*).
3. Trovitch, R. J.*; Mukhopadhyay, T. K.† "Manganese Hydrofunctionalization Catalysts Featuring Beta-Diiminate Ligands," U.S. Patent Application No. 62/678,624 (*Filed – May 2018*).
2. Trovitch, R. J.*; Mukhopadhyay, T. K.†; Ghosh, C.†; Ben-Daat, H.†; Pal, R.† "Hydride-Containing and Hydride-Derived First Row Transition Metal Hydrogenation and Hydrosilylation Catalysts," U.S. Patent Application No. 61/916,448 (*Filed – Dec. 2013*).
1. Trovitch, R. J.*; Mukhopadhyay, T. K.†; Pal, R.†; Ben-Daat, H.†; Porter, T. M.‡ "Late First-Row Transition Metal Hydrogenation and Hydrosilylation Catalysts," U.S. Patent Application No. 61/834,220 (*Filed – June 2013*).

INVITED LECTURES (PRESENTATIONS AT ASU ARE UNDERLINED)

Arizona State University

43. "Formation of Silane Diamine Copolymers Using Sustainable Catalysts." Arizona State University, Biodesign Center for Sustainable Macromolecular Materials and Manufacturing (SM3) Technical Conference and Review, Scottsdale, AZ. Co-presented with Anuja Sharma. (*Oct. 2023*)
42. "Advances in Polymerization Catalysis: From Functionalized Polyethylene to Coatings and Ceramics." SABIC Technology Center, Sugar Land, TX. (*Sept. 2023*)
41. "Silylamines: A Dehydrocoupling Odyssey." Princeton University, 50 Years of Organometallic Chemistry & Catalysis Symposium, Princeton, NJ. (*June 2023*)
40. "Atom-Efficient Preparation of Polysilazanes and Related Polymers via Earth-Abundant Metal Catalyzed Dehydrocoupling." 52nd North American Silicon Symposium, Midland, MI. (*June 2023*)
39. "Advancing Sustainable Chemistry through Earth-Abundant Metal Catalysis." University of Missouri – Columbia, MizzouForward Keynote Lecture, Columbia, MO. (*Apr. 2023*)
38. "In Search of Sustainable Aminosilane Synthesis through Earth-Abundant Metal Catalyzed Dehydrocoupling." Truman State University, Chemistry Department Seminar, Kirksville, MO. (*Feb. 2023*)
37. "Losing Hydrogen: Earth-Abundant Metal Catalysts for the Dehydrocoupling of Amines and Silanes." University of Texas at El Paso, Chemistry & Biochemistry Seminar, El Paso, TX. (*Sept. 2022*)
36. "Developing Sustainable Catalysts for the Preparation of Small Molecules and Macromolecules." Arizona State University, Sustainable Macromolecular Materials and Manufacturing Technical Conference and Review, Tempe, AZ. Chaired Session 3. (*Feb. 2022*)
35. "Merging Green Chemistry and Catalysis at Arizona State University." Kirori Mal College, University of Delhi, Department of Chemistry, International Lecture Series on Catalysis for Sustainable Chemistry, New Delhi, India. (*Jan. 2022*)
34. "Finding Applications for Manganese Catalysis and Identifying Trends that Promote Base Metal Catalyst Activity." The University of Arizona, Chemistry & Biochemistry Colloquium, Tucson, AZ. (*Jan. 2022*)

33. "Preparing Chemical Vapor Deposition Precursors and Polysilazanes through Manganese Catalysis." Gabor A. Somorjai Award for Creative Research in Catalysis: Symposium Honoring Paul J. Chirik, ACS Spring 2021 Virtual National Meeting. (*Apr. 2021*)
32. "Recent Advances in Manganese Catalysis and Molybdenum-Based Carbon Dioxide Capture." Southern Illinois University, Department of Chemistry and Biochemistry, Carbondale, IL. (*Nov. 2020*)
31. "Making Materials with Manganese." Russian Science Technology and Education Conference (RUSTEC2020), Minneapolis, MN and Phoenix, AZ. (*Oct. 2020*)
30. "Preparing Organic Compounds and Polymers Using Manganese Catalysts." International Webinar on Recent Advances in Chemistry, Distinguished Speaker, Vivekananda Mahavidyalaya, Burdwan, India. (*July 2020*)
29. "The Advancement of Base Metal Hydrofunctionalization Catalysis." KAIST, Department of Chemistry, Daejeon, Korea. (*Dec. 2019*)
28. "Catalysis with Earth-Abundant Metals at Arizona State University." Ithaca College, Department of Chemistry & Chemical Biology, Ithaca, NY. (*Oct. 2019*)
27. "Recent Advances in Base Metal Catalyzed Hydrofunctionalization." Cornell University, Department of Chemistry & Biochemistry, Ithaca, NY. (*Oct. 2019*)
26. "Preparing Small Molecules and Polymers with Manganese Hydrosilylation Catalysts." POSTECH, Department of Chemistry, Pohang, Korea. (*May 2019*)
25. "Tuning Ligand Denticity to Enhance Base Metal and Molybdenum Catalysis." KAIST, IBS Center for Hydrocarbon Functionalizations, Daejeon, Korea. (*May 2019*)
24. "Preparing Small Molecules and Polymers with Manganese Hydrosilylation Catalysts." KAIST, IBS Center for Hydrocarbon Functionalizations, Daejeon, Korea. (*May 2019*)
23. "Design of Manganese Catalysts for Alkene Hydrosilylation." 50th Annual North American Silicon Symposium, Columbia, SC. Served as judge for graduate student oral presentation awards. (*May 2019*)
22. "Base Metal Catalysis at Arizona State University." Vietnam National University – Ho Chi Minh City, Faculty of Chemistry, Ho Chi Minh City, Vietnam. (*Dec. 2018*)
21. "Manganese Catalysis at Arizona State University." Vietnam National University – Hanoi, Faculty of Chemistry, Hanoi, Vietnam. (*Dec. 2018*)
20. "Manganese Catalysts for Organic Transformations." Hanoi National University of Education, Faculty of Chemistry, Hanoi, Vietnam. (*Dec. 2018*)
19. "Utilization of Donor-Functionalized Redox Non-Innocent Ligands to Promote Manganese- and Molybdenum-Based Catalysis." Arizona State University, School of Molecular Sciences, Tempe, AZ. (*Aug. 2018*)
18. "Pentadentate Ligands for Manganese- and Molybdenum-Based Catalysis." North Carolina State University, Department of Chemistry Inorganic Seminar, Raleigh, NC. (*Sept. 2017*)
17. "Donor-Functionalized Bis(imino)pyridine Ligands for Manganese- and Molybdenum-Based Catalysis." University of Missouri – Columbia, Department of Chemistry Colloquium, Columbia, MO. (*Sept. 2017*)
16. "Donor-Functionalized Schiff Base Ligands in Homogeneous Catalysis." Iowa State University, Department of Chemistry Seminar Series, Ames, IA. (*Sept. 2017*)
15. "Phosphine-Functionalized Redox Non-Innocent Ligands for Homogeneous Manganese and Molybdenum Catalysis." University of Texas at San Antonio, Department of Chemistry Seminar, San Antonio, TX. (*Sept. 2017*)
14. "Preparation and Reactivity of Phosphine-Substituted Bis(imino)pyridine and Diimine Molybdenum Compounds." Organometallic Chemistry Gordon Research Conference, Salve Regina University, Newport, RI. (*July 2017*)
13. "Donor-Functionalized Redox Non-Innocent Ligands in Homogeneous Catalysis." Southern Methodist University, Department of Chemistry Seminar, Dallas, TX. (*Mar. 2017*)

12. "Phosphine-Functionalized Redox Non-Innocent Ligands in Homogeneous Catalysis." Brown University, Chemistry Colloquium, Providence, RI. (*Feb. 2017*)
11. "Mechanism of Bis(imino)pyridine Manganese-Catalyzed Carbonyl Hydrosilylation." Harry Gray Award for Creative Work in Inorganic Chemistry by a Young Investigator: Symposium in Honor of Eric J. Schelter, 251st American Chemical Society National Meeting & Exposition, San Diego, CA. Presided over Session 2. (*Mar. 2016*)
10. "The Development and Application of Manganese Hydrosilylation Catalysts." 46th Annual North American Silicon Symposium, Davis, CA. Served as discussion moderator for Session 2A. (*June 2015*)
9. "A Bis(imino)pyridine Manganese Electrocatalyst for Carbon Dioxide Reduction." 5th Annual Scialog Conference on Solar Energy Conversion, Tucson, AZ. (*Oct. 2014*)
8. "The Application of Redox-Active Ligands in Homogeneous Catalysis." Russian American Workshop – Design of Advanced Functional Materials: Education, Research & Innovations in Engineering, Kazan, Russia. (*Oct. 2013*)
7. "How Guiding Chelate Denticity Leads to Improved Redox-Active Ligand Supported Transition Metal Catalysts." Arizona State University, Center for Bio-Inspired Solar Fuel Production, Tempe, AZ. (*Sept. 2013*)

Los Alamos National Laboratory

6. "Bis(imino)pyridine Iron Catalyzed Olefin Hydrogenation: Substrate Scope, Functional Group Tolerance, and Catalyst Decomposition Pathways." Arizona State University, Department of Chemistry & Biochemistry, Tempe, AZ. (*Jan. 2011*)
5. "The Intricacies of Bis(imino)pyridine Iron Catalyzed Olefin Hydrogenation." University of Sydney, School of Chemistry, Sydney, NSW, Australia. (*Oct. 2010*)
4. "Bis(imino)pyridine Iron Catalyzed Olefin Hydrogenation: Substrate Scope, Functional Group Tolerance, and Catalyst Decomposition Pathways." Dow Chemical Company, Dispersants and Additives Polymer Group, Spring House, PA. (*Sept. 2010*)
3. "Ligand Development for Lanthanide/Actinide Separations." Glenn T. Seaborg Institute Actinide Science Lecture, Los Alamos National Laboratory, Los Alamos, NM. (*Aug. 2010*)
2. "Substrate Scope and Functional Group Tolerance of Bis(imino)pyridine Iron Catalyzed Olefin Hydrogenation." Pacific Northwest National Laboratory, Physical Sciences Division, Richland, WA. (*Sept. 2009*)

Cornell University

1. "Functional Group Tolerance in Bis(imino)pyridine Iron Mediated Olefin Hydrogenation." Los Alamos National Laboratory, Chemistry Division, Los Alamos, NM. (*Jan. 2008*)

CONTRIBUTED CONFERENCE ABSTRACTS (UNDERLINE DENOTES PRESENTER, †DENOTES ASU GRADUATE STUDENT, ‡DENOTES ASU UNDERGRADUATE)

Arizona State University

41. Sharma, A.†; Bean, R. H.†; MacMillan, S. N.; Long, T. E.; Trovitch, R. J. "Efficient Cobalt Catalyzed Carbonyl Hydrosilylation and Dehydrocoupling of Amines and Siloxanes." Arizona State University, Biodesign Center for Sustainable Macromolecular Materials and Manufacturing (SM3) Technical Conference and Review, Scottsdale, AZ. (*Poster – Oct. 2023*)
40. Sharma, A.†; Bean, R. H.†; MacMillan, S. N.; Long, T. E.; Trovitch, R. J. "Efficient Cobalt Catalyzed Carbonyl Hydrosilylation and Dehydrocoupling of Amines and Siloxanes." 2023 Organometallic Chemistry Gordon Research Seminar and Conference, Newport, RI. (*Poster – July 2023*)

39. Sharma, A.[†]; Bean, R. H.[†]; MacMillan, S. N.; Long, T. E.; Trovitch, R. J. "Efficient Cobalt Catalyzed Carbonyl Hydrosilylation and Dehydrocoupling of Amines and Siloxanes." Arizona State University, Fusion 2023 – A Biodesign Scientific Retreat, Phoenix, AZ. (*Poster – Apr. 2023*)
38. Sharma, A.[†]; MacMillan, S. N.; Trovitch, R. J. "Exploring the Versatility of an Arene Diimine Cobalt Catalyst for Silylation Reactions." ACS Spring 2022. (*Talk – Mar. 2022*)
37. Nguyen, T. T.[†]; Mukhopadhyay, T. K.[†]; MacMillan, S. N.; Janicke, M. T.; Trovitch, R. J. "Preparing Aminosilane Chemical Vapor Deposition Precursors and Polycarbosilazanes through Manganese Catalysis." ACS Spring 2022. (*Talk – Mar. 2022*)
36. Sharma, A.[†]; MacMillan, S. N.; Trovitch, R. J. "Preparation of Organic Polysilazanes through Dehydrogenative Coupling of Amines and Silanes." Arizona State University, Inclusive Future Faculty Symposium, Tempe, AZ. (*Poster – Mar. 2022*)
35. Nguyen, T. T.[†]; Mukhopadhyay, T. K.[†]; MacMillan, S. N.; Janicke, M. T.; Trovitch, R. J. "Sustainable Preparation of Aminosilane Precursors for Chemical Vapor Deposition and Polycarbosilazanes through Manganese Catalyzed Si–N Dehydrogenative Coupling." Arizona State University, Inclusive Future Faculty Symposium, Tempe, AZ. (*Poster – Mar. 2022*)
34. Nguyen, T. T.[†]; Mukhopadhyay, T. K.[†]; MacMillan, S. N.; Janicke, M. T.; Trovitch, R. J. "Synthesis of Aminosilanes and Polycarbosilazanes through Dehydrogenative Coupling of Amines and Silanes Using a Manganese Catalyst." Arizona State University, Sustainable Macromolecular Materials and Manufacturing Technical Conference and Review, Tempe, AZ. (*Poster – Feb. 2022*)
33. Sharma, A.[†]; MacMillan, S. N.; Trovitch, R. J. "Arene Diimine Cobalt Catalyzed Dehydrogenative Coupling of Amines and Silanes to Prepare Polysilazanes." Arizona State University, Sustainable Macromolecular Materials and Manufacturing Technical Conference and Review, Tempe, AZ. (*Poster – Feb. 2022*)
32. Trovitch, R. J. "An NSF REU Program Focused on Green Chemistry." 4th Annual Green Chemistry Commitment Summit, Wilmington, MA. (*Talk – June 2021*)
31. Trovitch, R. J. "How Does Electron Count Influence Base Metal Hydrosilylation Activity?" Organometallic Chemistry: Catalysis – Late Transition Metals, ACS Spring 2021. Served as Session Presider. (*Talk – Apr. 2021*)
30. Mukhopadhyay, T. K.[†]; Rock, C. L.[†]; Hong, M.; Ashley, D. C.; Flores, M.; Groy, T. L.; Baik, M.-H.; Trovitch, R. J. "Efficient Manganese Catalysts for Carbonyl and Alkene Hydrosilylation." Beilstein Organic Chemistry Symposium on Earth-Abundant 3d Metal Catalysis, Frankfurt, Germany. (*Poster – Sept. 2020*)
29. Mukhopadhyay, T. K.[†]; Nguyen, T. T.[†]; Flores, M.; Groy, T. L.; Trovitch, R. J. "Design of Manganese Catalysts for Alkene Hydrosilylation." Gordon Research Conference: Organometallic Chemistry, Newport, RI. (*Poster – July 2019*)
28. Ghosh, C.[†]; Pal, R.[†]; Groy, T. L.; Trovitch, R. J. "A Highly Efficient Cobalt Catalyst for Nitrile and Imine Hydroboration: Mechanistic Study and Substrate Scope." Gordon Research Conference: Inorganic Chemistry, Biddeford, ME. (*Poster – June 2018*)
27. Rock, C. L.[†]; Mukhopadhyay, T. K.[†]; Groy, T. L.; Trovitch, R. J. "Carbonyl and Alkene Hydrosilylation via Base Metal Catalysis." 48th Annual North American Silicon Symposium, Philadelphia, PA. (*Poster – June 2017*)
26. Balderas, D.[‡]; Pal, R.[†]; Trovitch, R. J. "Carbon Dioxide Activation by Diimine Molybdenum Compounds." 12th Annual WAESO Student Research Conference, Tempe, AZ. (*Poster – Mar. 2017*)
25. Mukhopadhyay, T. K.[†]; Groy, T. L.; Trovitch, R. J. "Redox Non-Innocent Ligand Supported Manganese Complexes for Solar-Fuel Generation." 251st American Chemical Society National Meeting & Exposition, San Diego, CA. (*Talk – Mar. 2016*)

24. Ghosh, C.[†]; Groy, T. L.; Bowman, A. C.; Trovitch, R. J. "C-H and C-P Activation by a Redox Non-Innocent Ligand Supported Iron Dinitrogen Complex." 251st American Chemical Society National Meeting & Exposition, San Diego, CA. (*Poster – Mar. 2016*)
23. Levin, H.[†]; Groy, T. L.; Trovitch, R. J. "Introducing a κ^4-Diazadiene Co(I) Hydride Catalyst for Alkyne Hydroboration." 251st American Chemical Society National Meeting & Exposition, San Diego, CA. (*Poster – Mar. 2016*)
22. Pal, R.[†]; Flores, M.; Groy, T. L.; Trovitch, R. J. "Molybdenum(I) Oxidation State: Preparation, Characterization, and Reactivity of Bis(imino)pyridine Mo Complexes." 251st American Chemical Society National Meeting & Exposition, San Diego, CA. (*Talk – Mar. 2016*)
21. Pal, R.[†]; Groy, T. L.; Trovitch, R. J. "Selective Conversion of Carbon Dioxide to Methanol Using a Homogeneous Molybdenum Catalyst." Gordon Research Conference: Inorganic Reaction Mechanisms, Galveston, TX. (*Poster – Mar. 2015*)
20. Trovitch, R. J. "A New Ligand Platform for Manganese-Catalyzed Carbon Dioxide Reduction." 5th Annual Scialog Conference on Solar Energy Conversion, Tucson, AZ. (*Poster – Oct. 2014*)
19. Trovitch, R. J. "Exploring the Mechanism of (^{Ph_2PPr}PDI)Mn-Catalyzed Hydrosilylation." Gordon Research Conference: Organometallic Chemistry, Newport, RI. (*Poster – July 2014*)
18. Trovitch, R. J. "Exploring the Mechanism of (^{Ph_2PPr}PDI)Mn-Catalyzed Hydrosilylation." Gordon Research Conference: Inorganic Chemistry, Biddeford, ME. (*Poster – June 2014*)
17. Trovitch, R. J. "Designing Well-Defined Catalysts for Solar-Driven Fuels Production." 4th Annual Scialog Conference on Solar Energy Conversion, Tucson, AZ. (*Poster – Oct. 2013*)
16. Mukhopadhyay, T. K.[†]; Groy, T. L.; Trovitch, R. J. "Development of Redox-Active Ligand Supported Manganese Catalysts." 246th American Chemical Society National Meeting & Exposition, Indianapolis, IN. (*Poster – Sept. 2013*)
15. Porter, T. M.[‡]; Groy, T. L.; Trovitch, R. J. "Synthesis and Characterization of Formally Zerovalent α-Diimine Supported Nickel Complexes." 246th American Chemical Society National Meeting & Exposition, Indianapolis, IN. (*Poster – Sept. 2013*)
14. Mukhopadhyay, T. K.[†]; Porter, T. M.[‡]; Flores, M.; Feller, R. K.; Scott, B. L.; Taylor, R. D.; Paz-Pasternak, M.; Henson, N. J.; Rein, F. R.; Smythe, N. C.; Gordon, J. C.; Trovitch, R. J. "Preparation of Low-Valent Iron Complexes for Dinitrogen Activation." 246th American Chemical Society National Meeting & Exposition, Indianapolis, IN. (*Poster – Sept. 2013*)
13. Smythe, N. C.; Duque, J.; Feller, R. K.; Gordon, J. C.; Henson, N. J.; Paz-Pasternak, M.; Rein, F. R.; Scott, B. L.; Taylor, R. D.; Trovitch, R. J. "Fe-based Dinitrogen Chemistry at Los Alamos." 245th American Chemical Society National Meeting & Exposition, New Orleans, LA. (*Talk – Sept. 2013*)
12. Mukhopadhyay, T. K.[†]; Feller, R. K.; Rein, F. N.; Henson, N. J.; Smythe, N. C.; Trovitch, R. J.; Gordon, J. C. "Electronic Structure Determination of Low-valent Iron Complexes." 244th American Chemical Society National Meeting & Exposition, Philadelphia, PA. (*Talk – Aug. 2012*)

Los Alamos National Laboratory

11. Smythe, N. C.; Gordon, J. C.; Henson, N. J.; Rein, F. N.; Scott, B. L.; Trovitch, R. J. "Dinitrogen Functionalization Chemistry at Los Alamos." 243rd American Chemical Society National Meeting & Exposition, San Diego, CA. (*Poster – Mar. 2012*)
10. Gordon, J. C.; Henson, N. J.; Rein, F. N.; Scott, B. L.; Smythe, N. C.; Trovitch, R. J. "Some Recent Results in N_2 Functionalization Chemistry from Los Alamos." 243rd American Chemical Society National Meeting and Exposition, San Diego, CA. (*Talk – Mar. 2012*)
9. Dupont, V.; Kuiper, D.; Rollin, B.; Baca, J.; Sekhar, P.; Page, K.; Dayeh, S.; Singh, R.; Trovitch, R.; With, M. A. "Los Alamos Postdoc Association Annual Career Fair." 2011 National Postdoctoral Association Annual Meeting, Bethesda, MD. (*Poster – Mar. 2011*)
8. Trovitch, R. J.; John, K. D. "Redox-Active Ligand Archetypes for *f*-Element Chemistry: The Utilization of π-Stacking in Separation Science and Platforms for Lanthanide-Based Catalysis." 2010 Los Alamos

National Laboratory Glenn T. Seaborg Postdoctoral Program Capability Review, Los Alamos, NM. (*Poster – June 2010*)

7. Trovitch, R. J.; Janicke, M. T.; Guo, N.; Baker, R. T.; John, K. D. "An Approach to Upgrading Low Molecular Weight Hydrocarbon Fuels: Alkane Dehydrogenation Mediated by Supported Iridium Catalysts." 1st Annual Los Alamos Postdoc Research Day, Los Alamos, NM. (*Poster – June 2010*)
6. Trovitch, R. J.; Janicke, M. T.; Guo, N.; Baker, R. T.; John, K. D. "An Approach to Upgrading Low Molecular Weight Hydrocarbon Fuels: Alkane Dehydrogenation Mediated by Supported Iridium Catalysts." 2010 Los Alamos National Laboratory Chemical Science Capability Review – Energy Production, Conversion, Storage, and Utilization. (*Poster - May 2010*)
5. Trovitch, R. J.; Guo, N.; Li, H.; Sattelberger, A. P.; John, K. D.; Baker, R. T. "Characterization, Reactivity, and Decomposition of Solid-Supported Organoiridium Complexes." 238th American Chemical Society National Meeting, Washington, DC. (*Poster – Aug. 2009*)

Cornell University

4. Trovitch, R. J.; Lobkovsky, E. B.; Chirik, P. J. "Oxidative Addition with Bis(imino)pyridine Iron: Ligand vs. Metal Based Oxidation." 236th American Chemical Society National Meeting, Philadelphia, PA. (*Talk – Aug. 2008*)
3. Trovitch, R. J.; Lobkovsky, E. B.; Chirik, P. J. "Functional Group Tolerance in Bis(imino)pyridine Iron Mediated Olefin Hydrogenation." Gordon Graduate Research Seminar: Organometallic Chemistry, Newport, RI (*Poster – July 2007*) and 234th American Chemical Society National Meeting, Boston, MA. (*Poster – Aug. 2007*)

University of Michigan – NSF REU Fellowship

2. Trovitch, R.; Gottfried, A.; Bartolin, J.; Banaszak Holl, M. M. "The Preparation of a Stable Silylene for C-H Activation Studies." Michigan State University, Department of Chemistry, East Lansing, MI. (*Poster – Aug. 2003*)

King's College

1. Trovitch, R. J.; LaDuca, R. L. "Copper and Nickel Halide/Pseudohalide Coordination Polymers with Functionalized Pyridines via Hydrothermal Synthesis." 13th Annual Saint Joseph's University Sigma Xi Student Research Symposium, Philadelphia, PA. (*Poster – Apr. 2002*)

SPONSORED RESEARCH GRANTS

Arizona State University - Current

- ACS Bridge Project
  American Chemical Society
  "ACS Bridge Site: Arizona State University School of Molecular Sciences."
  Award Amount: $180,000 (*July 2021 – June 2024*)
  PI: A. K. Jones; Senior Faculty: R. J. Trovitch
- National Science Foundation
  Research Experiences for Undergraduates
  "REU Site: Research Experiences for Undergraduates in Sustainable Chemistry and Catalysis at Arizona State University."
  Award Amount: $312,000 (*Aug. 2021 – Aug. 2024*)
  PI: R. J. Trovitch (20%, $62,400); Co-PI: L. K. G. Ackerman; Non-Co-PI Senior Personnel: K. F. Biegasiewicz, C. S. Birkel, M. Heyden, A. K. Jones, D.-K. Seo
- SABIC
  "Recycling Polyethylene."
  Amount Targeted: $300,000 (*Dec. 2022 – Dec. 2024*)
  PI: T. Long; co-PI: R. J. Trovitch (50%, $150,000)

- National Science Foundation
  Chemical Catalysis Program
  "CAS: Elucidating Trends in Earth-Abundant Metal Catalyzed Dehydrocoupling"
  Amount Requested: $480,000 (*Mar. 2022 – May 2025*)
  PI: R. J. Trovitch
- TSMC Joint Development Program
  "Selective Growth of Silicon Nitride on Silicon and Germanium-Doped Silicon."
  Amount Targeted: $240,000 (*July 2023 – June 2025*)
  PI: J. Kouvetakis, R. J. Trovitch (50%, $120,000)

Arizona State University - Completed

- National Science Foundation
  Faculty Early Career Development Program (CAREER)
  "SusChEM: Development of Manganese Hydrosilylation Catalysts for Silicone Curing."
  Award Amount: $650,000 (*June 2017 – May 2023*)
  PI: R. J. Trovitch
- ASU Lightworks: Fossil Free Future
  Sustainable Fuels and Products Accelerator
  "Enhanced Carbon Dioxide Hydrogenation to Methanol in a Membrane Reactor."
  Award Amount: $30,000 (*Nov. 2020 – June 2021*)
  Co-PI: S. Deng, R. J. Trovitch
- Dignity Health and Arizona State University
  2018 Collaborative Strategic Initiatives Program
  "One Shot Morphologic, Hemodynamic and Metabolic MR Imaging of Brain Tumors."
  Award Amount: $250,000 (*Sept. 2018 – Mar. 2020*)
  PI: V. D. Kodibagkar, C. Quarles; Co-I: R. J. Trovitch
- American Chemical Society Petroleum Research Fund
  Doctoral New Investigator Award
  "Mechanism and Scope of Bis(imino)pyridine Manganese-Catalyzed Hydrosilylation."
  Award Amount: $110,000 (*Sept. 2015 – Aug. 2018*)
  PI: R. J. Trovitch
- Research Corporation for Science Advancement
  Scialog Collaborative Innovation Award
  "Targeting a New Product for Electrocatalytic CO_2 Reduction: Formaldehyde."
  Award Amount: $100,000 / $50,000 to ASU (*Jan. 2014 – Dec. 2016*)
  Co-PI: R. J. Trovitch, M.-H. Baik
- LANL Directed Research & Development Program - Exploratory Research
  "Developing a Mild Catalytic Route for the Reduction of N_2 to NH_3."
  Award Amount: $1,050,000 (*Oct. 2010 – Sept. 2013*) / $20,000 to ASU (*Mar. 2013 – Sept. 2013*)
  PI: J. C. Gordon, co-PI: R. J. Trovitch, N. C. Smythe, N. J. Henson

Los Alamos National Laboratory - Completed

- U.S. Department of Energy, Office of Basic Energy Sciences Catalysis Research Program "Site-Isolated Catalysts for Tandem Reactions."
  Award Amount: $120,000 (*July 2009 – June 2010*)
  PI: K. D. John, co-PI: R. J. Trovitch

PROFESSIONAL AWARDS, FELLOWSHIPS, AND ACCOLADES

Arizona State University

- ASU SUN Award for Sustainability (*2023*)
- Top 5% of Highly Cited Authors in Royal Society of Chemistry Journals (*2019*)
- Thieme Chemistry Journal Award (*2015*)

Los Alamos National Laboratory

- LANL Los Alamos Award (*2010, 2009*)

Cornell University

- Cornell University Graduate Fellowship (*Aug. 2005 – May 2006*)

King's College

- Susquehanna Valley Regional American Chemical Society Award (*May 2004*)

TEACHING EXPERIENCE

Arizona State University

- CHM 452 – Inorganic Chemistry Laboratory (1-unit course, 2 sections)
  Spring 2024 (total enrollment of 12)
  Spring 2023 (total enrollment of 20)
  Spring 2022 (total enrollment of 22)
  Spring 2021 (total enrollment of 14)
  Spring 2020 (total enrollment of 24)
  Spring 2019 (total enrollment of 22)
  Spring 2018 (total enrollment of 21)
  Spring 2017 (total enrollment of 9)
  Spring 2014 (total enrollment of 13)
- CHM 494/598 – Organometallic Chemistry (3-unit course)
  Fall 2023 (combined enrollment of 8)
  Fall 2021 (combined enrollment of 17)
  Fall 2019 (combined enrollment of 8)
- CHM 494/598 – Business of Chemistry (3-unit course)
  Fall 2022 (combined enrollment of 15)
- CHM 501 – Inorganic Chemistry Seminar (3-unit course)
  Spring 2019 (enrollment of 10)
  Fall 2014 (enrollment of 7)
  Spring 2013 (enrollment of 7)
- CHM 453 – Inorganic Chemistry (3-unit course)
  Fall 2018 (enrollment of 45)
  Fall 2016 (enrollment of 28)
  Fall 2015 (enrollment of 38)
  Fall 2014 (enrollment of 39)
- CHM 553 – Advanced Inorganic Chemistry (3-unit course)
  Fall 2018 (enrollment of 13)
  Spring 2015 (enrollment of 4)
  Spring 2013 (enrollment of 3)
- CHM 113 – General Chemistry I (4-unit course)
  Spring 2016 (enrollment of 163)
- CHM 598 – Organometallic Chemistry (3-unit course)
  Fall 2013 (enrollment of 6)

Spring 2012 (enrollment of 9)

Cornell University

- CHEM 608 – Organometallic Chemistry
  Spring 2007 (graded graduate course)
- CHEM 605 – Advanced Inorganic Chemistry I
  Fall 2006 (graded graduate course)
- CHEM 208 – General Chemistry
  Spring 2005 (teaching assistant)
- CHEM 206 – Introduction to General Chemistry
  Fall 2004 (teaching assistant)

RESEARCH MENTORING

Arizona State University – Current Graduate Students

- Anuja Sharma *Aug. 2019 – present*
  First-Row Metal Catalysts Featuring High-Coordinate Monoanionic Ligands
- Joydeb Mondal *Aug. 2022 – present*
  Design of Monoanionic and Dianionic Ligands for Base Metal Catalysis
- Gautam Mehta *Aug. 2022 – present*
  Manganese Catalysts Featuring Redox-Active Ligands
- Gavin C. Slater *Aug. 2022 – present*
  Base Metal Catalyzed Dehydrocoupling of Silanes and Amines
- Fernando Carbajal *Aug. 2023 – present*
  Design of Borylated Ligands for Base Metal Catalysis
- Hannah Knipmeyer *Aug. 2023 – present*
  Design of Sustainable Siloxane-Derived Ceramics
- Shrutika Agrawal *Aug. 2023 – present*
  Base Metal Catalyzed Formation of Preceramic Coatings

Arizona State University – Former Graduate Students

- Samuel Peoples *July 2023 – Dec. 2023*
  M.S. Capstone: *Accessing Complex Saturated Rings: Modern Strategies in Dearomative Functionalization*
  Currently a Faculty Associate at Arizona State University - West Valley (Phoenix, AZ)
- Yichen Yan *July 2022 – Apr. 2023*
  Molecular Standards for the Development of Atomic Clocks
  Currently a Laboratory Technician at Recognition AnalytiX (Tempe, AZ)
- Thu Thao Nguyen *Aug. 2018 – Dec. 2022*
  Ph.D. Dissertation: *Development of Homogeneous Manganese Catalysts for Organic Transformations and Inorganic Polymerizations*
  Currently a Research Scientist at Gelest (Morrisville, PA)
- Aaron Gabriel B. Uy *Feb. 2021 – Sept. 2021*
  Utilization of Phosphine-Substituted β-Diketiminate Ligands
  Currently a Graduate Student in the Borges Group (Arizona State University)
- Matthew R. Mena *July 2018 – June 2021*
  M.S. Thesis: *Synthesis and Reactivity of Diiminopyridine and Iminopyridine Cobalt Complexes*
  Currently a Graduate Student at University of Pennsylvania
- A K M Fazlul Karim Rasel *Aug. 2019 – June 2020*

Vanadium Catalysts for Reductive Transformations
Currently a Graduate Student in the Hayes Group (Arizona State University)

- Brian M. Glazier *July 2017 – May 2019*
  Evaluation of Manganese Catalysts for Dehydrogenative Amine Silylation
- Christopher L. Rock *Aug. 2013 – Dec. 2018*
  Ph.D. Dissertation: *Evaluation of κ^4-Diimine Nickel and Cobalt Hydrofunctionalization Catalysts*
  Postdoctoral Research Assistant at Arizona State University (Kodibagkar Group, *2019*)
  Currently a Group Leader/Scientist II at KBI Biopharma (Durham, NC)
- Chandrani Ghosh *Oct. 2012 – Aug. 2018*
  Ph.D. Dissertation: *Development of Homogeneous First Row Metal Catalysts (Fe, Mn, Co) for Organic Transformations and Bond Activation*
  Currently a Module & Integration Yield Engineer at Intel Corporation (Hillsboro, OR)
- Sthitadhi Maiti *Aug. 2016 – May 2018*
  Chelate Effects on Molybdenum Catalyzed Small Molecule Activation
  Currently a Graduate Student in the Heyden Group (Arizona State University)
- Raja Pal *Jan. 2012 – Mar. 2017*
  Ph.D. Dissertation: *Development of Homogeneous Molybdenum Catalysts for the Activation of Small Molecules*
  Currently a Senior Process Engineer at Intel Corporation (Hillsboro, OR)
- Tufan K. Mukhopadhyay *Jan. 2012 – May 2016*
  Ph.D. Dissertation: *Development of Homogeneous Manganese and Iron Catalysts for Organic Transformations and Renewable Fuel Production*
  Postdoctoral Research Assistant at University of Michigan
  Postdoctoral Research Assistant at University of Zurich
  Postdoctoral Research Assistant at New York University
  Currently a Module Development Engineer at Intel Corporation (Hillsboro, OR)
- Hagit Ben-Daat Levin *Jan. 2012 – May 2016*
  M.S. Thesis: *Synthesis and Reactivity of Group 9 Complexes Featuring Redox Non-Innocent Ligands*
  Currently an R&D Chemist at Wacker Chemie AG (Ann Arbor, MI)

Arizona State University – Current Undergraduate Students

- Veronica Lee (*ASU*) *Dec. 2021 – Present*
  Development of Molecular Quantum Sensors

Arizona State University – Former Undergraduate Students

- Elizabeth March (*Barrett, The Honors College at ASU*) *Oct. 2021 – July 2023*
  Honors Thesis: *Transition Metal Catalyzed Depolymerization of Polyethylene Terephthalate and Synthesis of a Novel Redox Active Ligand*
  Currently a Graduate Student at Texas A&M University (Fout Group)
- Ethan Chavarin (*Cal. State Poly., Pomona, NSF REU Fellow*) *May 2023 – July 2023*
  Comparing the Activity of Base Metal PDI Catalysts
- Riley Seminara (*ASU*) *Oct. 2021 – Apr. 2023*
  Base Metal Catalyzed CO_2 Hydrogenation
- Brock Leland (*Barrett, The Honors College at ASU*) *Jan. 2020 – Dec. 2022*
  Honors Thesis: *Design and Isolation of a Novel Phosphine Functionalized Carbodiimide as a Versatile Precursor to Accessing Hemilabile Amidinate and Guanidinate Ligands*
  Currently a Graduate Student at Massachusetts Institute of Technology (Suess Group)
- Michael Trimble (*St. Mary's University, NSF REU Fellow*) *May 2022 – July 2022*
  Evaluation of Mn-based Polycarbosilazane Synthesis

Currently a Graduate Student at University of Wisconsin-Madison

- Yubeen Kim (*Seoul National University*) *Jan. 2020 – Mar. 2020*
  Catalytic Defluorination of Environmental Contaminants
- Eric W. Trinh (*ASU*) *Feb. 2018 – Aug. 2018*
  Preparation of β-Diketiminate Molybdenum Complexes
- Yvonne Manjarrez (*Barrett, The Honors College at ASU*) *Jan. 2017 – May 2018*
  Honors Thesis: *Synthesis of Enzyme-Mimetic Catalysts*
  Currently a Graduate Student at the University of Southern California (Fieser Group)
- Nicholas L. MacLean (*ASU*) *Apr. 2013 – Sept. 2017*
  Development of Manganese CO_2 Reduction Catalysts
  Currently an Applications Scientist at Endress+Hauser Optical Analysis
- Daniela Balderas (*ASU*) *Jan. 2016 – Aug. 2017*
  Development of Molybdenum Catalysts for CO_2 Reduction
- Corbin G. Parker (*ASU*) *May 2015 – Dec. 2016*
  Development of Nickel Electrocatalysts for C-O Cleavage
  Formerly a Laboratory Manager at Grand Canyon University
- Joe Rosser (*University of Manchester, UK*) *Jan. 2015 – June 2015*
  Development of Bimetallic Electrocatalysts
- Lin E. Wang (*Barrett, The Honors College at ASU*) *Jan. 2015 – May 2015*
  Ligand Development for CO_2 Reduction Catalysis
  Formerly a Fulbright U.S. Student Scholar in Taiwan
- Piper S. Boyll (*Barrett, The Honors College at ASU*) *Mar. 2014 – Dec. 2014*
  Substrate Scope of Iron Hydrosilylation Catalysis
  Formerly in Medical School at the University of Arizona
- Tyler M. Porter (*Barrett, The Honors College at ASU*) *July 2012 – June 2014*
  Honors Thesis: *Synthesis and Characterization of Low-valent Nickel Hydrosilylation Catalysts*
  Ph.D. at University of California, San Diego
  Formerly a Postdoctoral Research Assistant at Stanford University (Kanan Group)
  Currently a Research Scientist III at SRI International

Arizona State University – Former Visiting Scholars

- Zahid Nawaz (*IRSIP Scholar, Quaid-I-Azam University*) *Jan. 2021 – June 2021*
  Utilization of N-Heterocyclic Carbene Ligands
- Afshan Khurshid (*IRSIP Scholar, Quaid-I-Azam University*) *Oct. 2019 – Apr. 2020*
  Carbon Dioxide Disproportionation at Molybdenum

Arizona State University – Current Member of Doctoral Dissertation Advisory Committee

- Genevieve Hall (Bertoni Group – School of Electrical, Computer and Energy Engineering)
- Kelsea Evraets (Jones Group – School of Molecular Sciences)
- Rose Snyder (Birkel Group – School of Molecular Sciences)
- Gaurav Galiyan (Jones Group – School of Molecular Sciences)
- Ren Bean (Long Group – School of Molecular Sciences)
- Lillian Hensleigh (G. Moore Group – School of Molecular Sciences)
- Jordan Sinclair (Birkel Group – School of Molecular Sciences)

Arizona State University – Former Doctoral Dissertation Committee Member

- Manik Sharma (Biegasiewicz Group – School of Molecular Sciences, *2023*)
- Jung-Ying Lin (Ackerman Group – School of Molecular Sciences, *2023*)

- Reem Nsouli (Ackerman Group – School of Molecular Sciences, *2023*)
- Lauren Tackett (Biegasiewicz Group – School of Molecular Sciences, *2023*)
- Edgar Reyes (G. Moore Group – School of Molecular Sciences, *2023*)
- David Ciota (Seo Group – School of Molecular Sciences, *2022*)
- Narges Masoumi (Wolf and Chizmeshya Groups – School of Molecular Sciences, *2021*)
- Samuel Williams (Jones Group – School of Molecular Sciences, *2020*)
- Brian Wadsworth (G. Moore Group – School of Molecular Sciences, *2020*)
- Prathamesh Vartak (Wang Group – School for Engineering of Matter, Transport and Energy, *2020*)
- Ting Hu (Kouvetakis Group – School of Molecular Sciences, *2019*)
- Shaojiang Chen (Seo Group – School of Molecular Sciences, *2019*)
- Apar Prasad (Shock Group – School of Molecular Sciences, *2019*)
- Indrajit Bandyopadhyay (Hecht Group – School of Molecular Sciences, *2019*)
- Patrick Wallace (Kouvetakis Group – School of Molecular Sciences, *2018*)
- Sijie Yang (Tongay Group – School for Engineering of Matter, Transport and Energy, *2017*)
- Shanika Abeysooriya (Seo Group – School of Molecular Sciences, *2016*)
- Joseph Rheinhardt (Buttry Group – Department of Chemistry & Biochemistry, *2015*)
- Abhishek Debnath (Green Group – Department of Chemistry & Biochemistry, *2015*)
- Souvik Roy (Jones Group – Department of Chemistry & Biochemistry, *2013*)

Arizona State University – Chair of Oral Examination Committee

- Aixin Zhang (Kouvatakis Group – School of Molecular Sciences, *2022*)
- John Jamboretz (Birkel Group – School of Molecular Sciences, *2021*)
- Lan Zhu (Liu Group – School of Molecular Sciences, *2017*)
- Miyuki Thirumurthy (Jones Group – School of Molecular Sciences, *2015*)

Arizona State University – Former Member of Oral Examination Committee

- Giselle De La Torre (Ackerman Group – School of Molecular Sciences, *2023*)
- Joshua Nye (Hartnett Group – Department of Chemistry & Biochemistry, *2015*)
- Charutha Senaratne (Kouvetakis Group – Department of Chemistry & Biochemistry, *2014*)
- Patrick Sims (Kouvetakis Group – Department of Chemistry & Biochemistry, *2014*)

Arizona State University – Former Member of Honors Thesis Committee

- Lauren Harstad (Biegasiewicz Group – School of Molecular Sciences, *2022*)
- Robert Lozanovski (Ackerman Group – School of Molecular Sciences, *2022*)

PROFESSIONAL ACTIVITIES AND SERVICE

Service to Profession

- Reviewer for the ACS Petroleum Research Fund (Ad Hoc – *2023*, *2021*, *2020*, *2017*, *2016*, *2015*, *2014*)
- Reviewer for *Journal of the American Chemical Society* (*2023*, *2018x3*, *2016*), *ACS Catalysis* (*2023*, *2022*, *2021*, *2020x3*, *2018*, *2017*), *Chemical Science* (*2023*, *2020x2*, *2015x2*), *Green Chemistry* (*2023*), *Inorganic Chemistry* (*2023*, *2022*, *2021x3*, *2020*, *2019x2*, *2017x2*, *2016*, *2015x2*, *2014x2*), *Organometallics* (*2023x2*, *2021x2*, *2019*, *2017x4*, *2016*, *2015x7*, *2012*), *Accounts of Chemical Research* (*2022*), *Dalton Transactions* (*2022x2*, *2021*, *2019x3*, *2018x3*, *2017*, *2016x2*, *2015*), *Polyhedron* (*2022*, *2018*), *Chemical Communications* (*2020x3*, *2019x2*, *2018x3*), *Science Advances* (*2019*, *2018*), *Angewandte Chemie* (*2019*, *2017*), *ACS Sustainable Chemistry & Engineering* (*2018x2*), *ChemCatChem* (*2018*, *2017*), *Journal of Organic Chemistry*

(*2018x2*), *Nature Catalysis* (*2017*), *European Journal of Organic Chemistry* (*2017*), *Nature Communications* (*2016x2*), *The Chemical Record* (*2016*), *Journal of Coordination Chemistry* (*2016*), *Journal of Physical Chemistry* (*2015*), *Catalysis Science & Technology* (*2014*), *Journal of Molecular Structure* (*2014*), and *Advanced Synthesis & Catalysis* (*2013*)

- Poster Judge for the Annual WAESO Student Research Conference (*2022, 2021*)
- External promotion reviewer for University of the West Indies (*2022*)
- Reviewer for the Department of Energy, Office of Basic Energy Sciences (Ad Hoc – *2022, 2019x3, 2018, 2017x2, 2016*)
- Reviewer for the Green Chemistry Education Challenge Award sponsored by Beyond Benign and Dow (*2021*)
- Presenter for Arizona State University – Audacia: Scholars of Jóvenes de Excelencia Citibanamex, a virtual event for Mexican scholars interested in pursuing graduate studies (*2020*)
- Reviewer for the National Science Foundation (Panel – *2020, 2019, 2018*; Ad Hoc – *2018, 2017, 2015*)
- Reviewer for the Research Corporation for Science Advancement (Ad Hoc – *2019, 2017*)
- Academic Contributor to "A Guide to Green Chemistry Experiments for Undergraduate Organic Chemistry Labs," a first of its kind manual for greener laboratory experiments developed in collaboration with Beyond Benign, MilliporeSigma, and My Green Lab
- Presenter for Phoenix Public Library Science Café Series (Cholla Branch, *2018*)
- Reviewer for the ETH Zurich Research Commission (Ad Hoc – *2017*)
- Reviewed the 7th Edition of *Inorganic Chemistry*, by Weller and Shriver (*2016*) and the 3rd Edition of *Organometallic Chemistry*, by Spessard and Miessler (*2014*)
- Grand Awards Judge for the Intel International Science and Engineering Fair (*2016, 2013*)
- Host for ASU's AECP teacher training program with Sichuan University (*2014*)

Service to ASU – College of Liberal Arts and Sciences

- Elected Member of Academic Standards Committee (*Aug. 2023 – Present*)
- Limited submission reviewer for William T. Grant Scholars Program (*Apr. 2019*)
- Member of RTS EPR Facility Advisory Committee (*Apr. 2014 – Aug. 2016*)
- Member of RTS X-Ray Diffraction Facility Advisory Committee (*June 2012 – Aug. 2016*)

Service to ASU – School of Molecular Sciences

- Chair of Graduate Recruitment (*Aug. 2022 – Present, Aug. 2019 – July 2020*)
- Member of Quantum Chemistry Faculty Search Committee (*Aug. 2023 – Present*)
- Faculty Mentor to Laura Ackerman (*Jan. 2020 – July 2023*)
- Elected Member of Personnel and Budget Committee (*Jan. 2021 – Dec. 2022*)
- Member of Space Planning Committee (*Sept. 2021 – July 2022*)
- Member of SM3 Polymer Chemistry Faculty Search Committee (*Aug. 2021 – June 2022*)
- Member of Committee on Undergraduate Programs and Awards (*Aug. 2018 – July 2019*)
- Member of Synthetic Faculty Search Committee (*2018 – 2019*)
- Member of Ad Hoc Committee on Seminars (*Aug. 2018 – June 2019*)
- Member of Committee on Graduate Recruitment (*Aug. 2015 – Aug. 2018*)
- Member of Computational Interfacial Analysis Faculty Search Committee (*2016 – 2017*)
- Member of Committee on Departmental Instruction (*Aug. 2015 – June 2016*)
- Member of Bioenergy Faculty Search Committee (*2015 – 2016*)

Service to ASU – Department of Chemistry & Biochemistry

- Member of Instrumentation & Facilities Committee (*Aug. 2014 – Aug. 2015*)
- Member of Committee on Graduate Recruitment (*Oct. 2012 – Aug. 2015*)
- Member of Upper Division Laboratory Manager Hiring Committee (*2014*)

Society Membership

- Member of the American Chemical Society, Inorganic Division (*May 2004 – Present*)
- Member of the New York Academy of Sciences (*Feb. 2023 – Present*)
