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HEATHER J. KULIK

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EDUCATION

2010-2013	Postdoctoral associate, Stanford University, Stanford, CA *Postdoctoral advisor: Todd J. Martínez*
2009-2010	Postdoctoral associate, Lawrence Livermore Lab, Livermore, CA *Postdoctoral advisor: Felice C. Lightstone*
2009	Ph.D. in Materials Science and Engineering, MIT, Cambridge, MA *Doctoral advisor: Nicola Marzari (now at Oxford)*
2004	B.E. in Chemical Engineering, The Cooper Union, New York, NY

ACADEMIC APPOINTMENTS

Department of Chemical Engineering, MIT

07/2024 -	Lammot du Pont (1901) Professor
07/2024 -	Professor
07/2021 - 06/2024	Associate Professor (with Tenure)
07/2019 - 06/2021	Associate Professor
11/2013 - 06/2019	Assistant Professor

Department of Chemistry, MIT

07/2024 -	Professor
07/2022 - 06/2024	Associate Professor (with Tenure)

HONORS AND AWARDS

2025	Presidential Early Career Award for Scientists and Engineers (PECASE)
2024	Sydney Ross Lecturer 2024, Rensselaer Polytechnic Institute, Department of Chemistry 2023 Löwdin Lecturer (awarded 2024), Uppsala University, Sweden, Department of Chemistry TCI Hirschfelder Visitor/Lecturer, Department of Chemistry, University of Wisconsin
2023	AIChE CoMSEF Impact Award Hans Fischer Senior Fellowship, Technical University of Munich (2024-2026) *Current Opinion in Structural Biology* Best Paper Award
2022	Distinguished Romberg Guest Professorship, Heidelberg University Kwang-Yu and Lee-Chien Wang Fellowship Lecture, Department of Chemical Engineering, University of Rochester
2021	Alfred P. Sloan Research Fellowship in Chemistry *Molecular Systems Design & Engineering* (2020) Outstanding Early-Career Paper Award
2020	DARPA Director's Fellowship *Molecular Systems Design & Engineering* Emerging Investigator
2019	*The Journal of Physical Chemistry B* Lectureship (ACS PHYS Division) National Science Foundation CAREER Award Saville Lecture, Department of Chemical and Biological Engineering, Princeton Univ. AAAS Marion Milligan Mason Award *Inorganic Chemistry* Emerging Investigator *Frontiers In Chemistry* Rising Star Prize *Reaction Chemistry & Engineering* Emerging Investigator
2018	DARPA Young Faculty Award Office of Naval Research Young Investigator Award ACS OpenEye Outstanding Junior Faculty Award in Computational Chemistry (ACS COMP Division) Resnick Young Investigator Symposium Speaker *Journal of Chemical Theory and Computation* ACS Editors' Choice
2017	ACS *Industrial & Engineering Chemistry Research* "Class of Influential Researchers" *Journal of Chemical Physics* 2016 Editors' Choice
2016	*Journal of Physical Chemistry* ACS Editors' Choice
2012	Burroughs Wellcome Fund Career Award at the Scientific Interface

2011	BIOL ACS Student & postdoc symposium speaker *(1 of 8 from over 200).*
2008	DMSE Research Image contest winner
2006	Award for outstanding paper by a 1st- or 2nd-Year graduate student
2005	LLNL CCMS Summer Institute Graduate Fellow
2004	National Science Foundation Graduate Research Fellow
	Robert Spice Fund Prize for Excellence in Analytical Chemistry
	William C. and Esther Hoffman Beller Prize for Top Graduating Student in Chemical Engineering
2003	Elmer J. Badin Award for Excellence in Chemistry
	Rockefeller University Summer Undergraduate Research Fellow
2002	Elected to New York Iota Chapter of Tau Beta Pi Honors Society
2000	United States Presidential Scholar
	Times Academic All-Star in Mathematics
	Association for Women in Science Scholar
	Robert Byrd Scholar
	Elks National Foundation Most Valuable Student

PUBLICATIONS (corresponding author indicated by *).

264. W. Luo and **H. J. Kulik*** "Enerzyme: A Framework for Efficient Training of Reactive Neural Network Potentials for Enzyme Catalysis with Application to Methyltransferases", *submitted.*

263. J. W. Toney#, S. Darouich#, Y. Wang, A. G. Garrison, J. Kästner, and **H. J. Kulik*** "ElemeNet: Multiscale Molecular Machine Learning with Uncertainty Quantification Across the Periodic Table", *submitted.* http://arxiv.org/abs/2606.30961

262. N. Ye, A. Del Rio Flores, D. W. Kastner, K. R. Miller-Brown, **H. J. Kulik***, W. Zhang*, and C. L. Drennan* "A Second-Sphere Threonine Residue Directs Iron-oxygen Species in a Fe(II)/α-Ketoglutarate-Dependent Isonitrile Synthase", *submitted.*

261. A. K. Ball and **H. J. Kulik*** "Strong pore hydrophilicity and low confinement drive water permeability inside cage-like metal-organic frameworks", *submitted.*

260. C. Oh, S.-P. Huang, A. K. Ball, and **H. J. Kulik*** "Stability-Aware Multi-Objective Discovery of Metal-Organic Frameworks for Direct Air Capture", *submitted.* https://doi.org/10.26434/chemrxiv.15002945/v1

259. H. Adamji, I. Kevlishvili, D. W. Kastner, R. Meyer, Y. Román-Leshkov, and **H. J. Kulik*** "Multi-objective Optimization of Synthetically Accessible Homogeneous Catalysts Reveals Tradeoffs for Methane-to-Methanol Conversion", *submitted.* https://doi.org/10.26434/chemrxiv.15002611/v1

258. Y. Wang, E. O. Bobylev, K. Wang, **H. J. Kulik**, and J. A. Johnson* "Programming Polymer Network Topology via Homochiral Self-Sorting", *submitted.*

257. Z. Cui, C. J. Meng, S. M. Irwin, H. E. Augustijn, P. P. Papageorgiou, A. T. P. Nguyen, R. Yu, M. A. Aguilar Ramos, **H. J. Kulik**, and E. P. Balskus* "A previously unappreciated class of metal-dependent bile salt hydrolases from the human gut microbiome", *submitted.* https://doi.org/10.64898/2026.04.05.716592

256. T. Kench, G. Wang, J. Seefeldt, A. Mahid, A. M.-H. Yip, J. Shum, G. G. Terrones, Y. Antar, B. V. Holbling, K. K.-W. Lo, N. Metzler-Nolte, **H. J. Kulik**, and R. Vilar* "Exploring Chemical Space for Iridium(III) Complexes: a Direct-to-Biology (D2B) Approach to Identifying Anticancer and Antibacterial Agents", *submitted.*

255. J. A. Oldenstaedt, R. Meyer, C. Duan, and **H. J. Kulik*** "Predicting Isomer and Spin-state Properties of Four-coordinate Transition Metal Complexes with Crystal Field Features", *submitted.*

254. R. G. St. Michel, R. J. Jang, A. G. Garrison, I. Kevlisvili, and **H. J. Kulik*** "The BOS-Lig Dataset: Accurate Ligand Charges from a Consensus Approach for 66,810 Experimentally Synthesized Ligands", *submitted.* https://arxiv.org/abs/2604.06043

253. A. G. Garrison#, J. W. Toney#, T. Nikolaeva, R. G. St. Michel, C. J. Stein, and **H. J. Kulik*** "The BOS-TMC Dataset: DFT Properties of 159k Experimentally Characterized Transition Metal Complexes Spanning Multiple Charge and Spin States", *submitted.* https://arxiv.org/abs/2604.07623

252. G. G. Terrones#, S.-P. Huang#, A. K. Ball, C. Oh, M. P. Rivera, and **H. J. Kulik*** "What makes a plausible metal-organic framework linker? Discovery from a general chemical database", *submitted.* https://doi.org/10.26434/chemrxiv.15000666/v1

251. Z. Song, J. Lu, Y. Du, B. Yu, T. M. Pruyn, Y. Huang, K. Guo, X. Luo, Y. Qu, Y. Qu, Y. Wang, H. Wang, J. Guo, J. Gan, P. Shojaee, D. Luo, A. M. Bran, G. Li, Q. Zhao, S.-X. L. Luo, Y. Zhang, X. Zou, W. Zhao, Y. F. Zhang, W. Zhang, S. Zheng, S. Zhang, S. T. Khan, M. Rajabi-Kochi, S. Paradi-Maropakis, T. Baltoiu, F. Xie, T. Chen, K. Huang, W. Luo, M. Fang, X. Yang, L. Cheng, J. He, S. Hassoun, X. Zhang, W. Wang, C. K. Reddy, C. Zhang, Z. Zheng, M.

Wang, L. Cong, C. P. Gomes, C.-Y. Hsieh, A. Nandy, P. Schwaller, **H. J. Kulik**, H. Jia, H. Sun, S. M. Moosavi, and C. Duan* "Evaluating Large Language Models in Scientific Discovery", *submitted.*
https://doi.org/10.48550/arXiv.2512.15567
250. E. E. Stacy, P. L. Burch, J. Randrianandraina, M. A. Fontaine, M. C. Eaton, J. Kim, L. Aeindartehran, A. K. Ball, M. I. Gonzalez, **H. J. Kulik**, T. Runčevski, M. E. Abbasov, J.-H. Lee, and P. J. Milner* "Late-Stage Fluorosulfurylation using Sulfuryl Fluoride Bound within a Metal–Organic Framework", *submitted.*
249. Z. Wei, B. H. Kang, C. Oh, A. Cheng, Y. Zhang, C. L. Ritt, S. Amirabadi, S. Yang, S. S. Garimella, H. Kang, **H. J. Kulik**, M. S. Strano* "Molecular Design of Electrically Conductive Two-Dimensional Polyaramids", *submitted.*
248. J. Zhu, R. Zhu, H. Adamji, M. S. Webber, B. Liu, **H. J. Kulik**, and Y. Román-Leshkov* "Breaking the Conversion-Selectivity Constraint in Methane Oxidation through Product Stability Control", *submitted.*
247. T. Sakurada, W.S. Lee, Y. Cho, R. Khamlue, P. Chatsiri, N. Samulewicz, T. Deshpande, A. Su, P. Müller, T. Kawamoto, S. Omagari, M. Vacha, W. Paritmongkol, **H.J. Kulik,** and W.A. Tisdale* "Engineering in-plane anisotropy in 2D materials *via* surface-bound ligands", *submitted.* http://arxiv.org/abs/2602.23138
246. M.P. Rivera, **H.J. Kulik**, and Z.P. Smith* "Modeling Polymer Aging and Transport in Solvent Environments with Symbolic Regression", *submitted.*
245. Y. Liu, J. W. Toney, J. M. Cavanagh, K. Sun, A. L. Smith, C.-Y. Yuan, R. G. St. Michel II, P. A. Graggs, D. Toste, **H. J. Kulik**, and T. Head-Gordon* "Exploring Transition Metal Complexes with Large Language Models", *submitted.*
https://doi.org/10.26434/chemrxiv-2025-hm3zb
244. B. A. Johnson, B. Dinakar, E. J. Wu, H. Adamji, **H. J. Kulik,** M. Dincă*, and Y. Román-Leshkov* "Confined Solvents Generate Unique Local Electric Fields at Lewis Acid Zeolite Active Sites", *submitted.*
243. D. W. Kastner, L. Leone C. R. Reinhardt, H. Adamji, M. T. Manetsch, A. Esposito, F. Nastri, Y. Román-Leshkov, A. Lombardi and **H. J. Kulik*** "Dynamic Charge Distribution as a Key Driver of Catalytic Reactivity in an Artificial Metalloenzyme", *submitted.* https://doi.org/10.26434/chemrxiv-2024-xhlgh-v2
242. Y. Du*, C. Duan*, A. M. Bran*, A. Sotnikova, Y. Qu, **H. J. Kulik**, A. Bosselut, J. Xu, and P. Schwaller "Large Language Models are Catalyzing Chemistry Education", *submitted.*
241. H. Roh, S. Bagatella, S. Yue, A. Seshadri, C. Oh, C.E. Cunin, M. Cavallaro, M. Levi, **H.J. Kulik**, and A. Gumyusenge* "Side-Chain-Based Cross-Linking of Amorphous Iono-Electronic Conductive Polymers for Thermo-Chemical Stability in Electrochemical Devices", ACS *Applied Materials & Interfaces* **18**, 35753-35764 (2026).
240. X. Huang, R. G. St. Michel, I. Kevlishvili, and **H. J. Kulik*** "High-Throughput Discovery of Conformation-Switching Mechanophores with Novel Response and Enhanced Reactivity", *Inorganic Chemistry,* **65**, 13662-13674 (2026).
239. S. Darouich, J. W. Toney, W. Luo, J. Kästner, M. Niepert, and **H. J. Kulik*** "Robust Generative Transition State Models for Unseen Chemistry", *Nature Computational Science,* **in press**. http://arxiv.org/abs/2601.16469
238. M. Cheng, W. Luo, H. Tang, B. Yu, Y. Cheng, W. Xie, J. Li, **H. J. Kulik**, M. Li*, "Enhancing Materials Discovery with Valence Constrained Design in Generative Modeling", *Nature Computational Science,* **in press**.
237. X. Gu, T. Wang, F.-Z. Liu, Y. Huang, P. Yu, **H. J. Kulik***, and K.K. Yan* "Endergonic mechanoradical-driven $C(sp^3)$-$C(sp^2)$ coupling with unactivated arenes", *Nature Synthesis,* **in press**.
236. H. Xin*, J. R. Kitchin*, N. López*, N. M. Schweitzer, M. Abolhasani, N. Artrith, L. Árnadóttir, K. Choudhary, R. Ding, A. I. Frenkel, J. A. Gauthier, B. R. Goldsmith, A. Barati Farimani, L. C. Grabow, G. T. K. Gunasooriya, G. Hu, T. R. Josephson, **H. J. Kulik**, R. Kumar, T. Laino, H. Li, X.-Y. Li, W.-L. Li, S. Linic, C. Liu, C. Liu, F. Liu, M. Liu, P. Ma, A. J. Medford, S. Mukhopadhyay, P. Ou, C. Paolucci, J. Peng, C. Phillips, M. D. Porosoff, L. Qi, S. Sun, T. Szilvási, J. Voss, X. Wang, K. T. Winther, Q. Wu, D. Zhang, and Z. Zhang, "Transparent Reporting for Agentic Catalysis Enabled by Artificial Intelligence (TRACE-AI): Community Guidelines and A Publication Checklist", *Chem Catalysis,* **in press**.
235. D. W. Kastner, W. Luo, W. Ho, C. R. Reinhardt, A.M. Keys, and **H. J. Kulik*** "QuantumPDB: A Workflow for High-Throughput Quantum Cluster Model Generation from Protein Structures", *Journal of Chemical Information and Modeling,* **66**, 6011-6026 (2026).
234. Z. Sang, S. Nguyen, K. Ko, S. Lin, H. Jang, S. Gonzalez-Zapata, S. Fitz, Y. Kai, S. Kooi, C. Deng, M. Olvera de la Cruz, M. Koslowski, **H. J. Kulik**, S. L. Craig, K. A. Nelson*, and J. A. Johnson* "Mechanophore cross-linking enhances ballistic energy dissipation of polymers", *Nature,* **654**, 85-91 (2026).
233. M. Xu, D. W. Kastner, W. Luo, F.-S. Li, P. Müller, Y. Sun, W. Huang, C. M. Glinkerman, M. Guempel, **H. J. Kulik**, J.-K. Weng* " Mammalian- like steroidogenesis in plants gives rise to endocrine- mimetic cardenolides", *Science Advances,* **12**, eeab5460 (2026).
232. M. T. Manetsch, D. W. Kastner, Y. Román-Leshkov, and **H. J. Kulik*** "pyEF: A Python Framework for QM and QM/MM Atom-Wise Electric Field Analysis", *Journal of Chemical Theory and Computation*, **10**, 4982-4994 (2026).
231. F.-Z. Liu, S. Li, Y. Zhu, Y. Liu, J. Wang, **H. J. Kulik***, and K.K. Yan* "Out-of-Equilibrium Confinement Catalysis Mediated by Compressive Force", *Chem*, **in press**. https://doi.org/10.1016/j.chempr.2026.103026
230. G.G. Terrones, R.G. St. Michel, J.W. Toney, A.K. Ball, Y. Wang, A.G. Garrison, A. Nandy, R. Meyer, F. Edholm,

C. Oh, S.G. Pujet, D.B.K. Chu, D. Muhammetgulyyev, and **H.J. Kulik*** "molSimplify 2.0: Improved Structure Generation for Automating Discovery in Inorganic Molecular and Reticular Chemistry"*, Journal of Chemical Information and Modeling,* **66**, 2753-2767 (2026).
229. A. G. Garrison and **H. J. Kulik*** "System-specific reparameterization of density functionals with machine learning: application to spin-splitting energies of transition metal complexes", *Journal of Chemical Theory and Computation,* **22**, 2243-2260 (2026).
228. J. G. Vitillo*, A. Aspuru-Guzik, E. Doskocil, O. K. Farha, T. Islamoglu, **H. J. Kulik**, P. M. Margl, S. Miller, J. Redel, A. R. Singh, and V. Bernales* "Accelerating Catalytic Advancements Through the Precision of High-Throughput Experiments & Calculations", *Digital Discovery,* **5**, 497-509 (2026).
227. H. Xin*, J. R. Kitchin*, N. López*, N. M. Schweitzer*, N. Artrith, F. Che, L. C. Grabow, G. T. K. K. Gunasooriya, **H. J. Kulik**, T. Laino, H. Li, S. Linic, A. J. Medford, R. J. Meyer, J. Peng, C. Phillips, J. Qian, L. Qi, W. J. Shaw, Z. W. Ulissi, S. Wang, and X. Wang "Roadmap for Transforming Heterogeneous Catalysis with Artificial Intelligence", *Nature Catalysis,* **9**, 102-111 (2026).
226. Y. Wang, Y. Xie, Y. Chen, C. Oh, Q. Fang, K. Chivukula, H. Zhang, C. Zhao, S. Zhang, N. Ananth, **H. J. Kulik**, and Y. Zhong* "Helical Complex Ladder Polymer with Amplification of Asymmetry", *Journal of the American Chemical Society,* **148**, 2864-2869 (2026).
225. A. Ball, C. Oh, G. Dovranova, and **H. J. Kulik*** "Combining Chemical, Geometric, and Novel Topological Features to Develop Generalizable Machine Learning Models for Predicting Mechanically Stable MOFs", *Journal of Materials Chemistry A,* **14**, 6429-6445 (2026).
224. J. He, J. Randrianandraina, H. Adamji, V. Chang, Y. Lai, T. N. Nguyen, Y. Roman-Leshkov, **H. J. Kulik**, J.-H. Lee, and P. J. Milner* "Photochemical Fluoroalkylations with Fluorinated Gases Facilitated by a Robust Metal-Organic Framework"*, Journal of the American Chemical Society*, **148**, 1369-1380 (2026)
223. M.C. Eaton, A.K. Ball, K.E. Doherty, S. Chen, D.T. Nakamura, T.J. Azbell, **H.J. Kulik**, P.J. Milner* "Caging the Chlorine Radical: Chemoselective Photocatalytic C(sp^3)–H Functionalization Enabled by Terminal Cu–Cl Sites in a Metal-Organic Framework", *Journal of the American Chemical Society*, **148**, 1493-1502 (2026).
222. J. W. Toney, R. G. St. Michel, A. G. Garrison, I. Kevlishvili, and **H. J. Kulik*** "Identifying Dynamic Metal–Ligand Coordination Modes with Ensemble Learning"*, Journal of the American Chemical Society*, **52**, 48218-48234 (2025).
221. E. S. Carlson, R. Haslecker, C. Lecchi, M. A. Ramos, V. Vennelakanti, L. Honaker, A. Stornetta, E. S. Millán, B. A. Johnson, **H. J. Kulik**, S. Balbo*, P. W. Villalta*, V. D'Souza*, E. P. Balskus* "The specificity and structure of DNA crosslinking by the gut bacterial genotoxin colibactin", *Science,* **390**, eady3571 (2025).
220. N. B. Nechmad, L. M. Campos, S. L. Craig*, C. Deng, J. Diodati, S. D. Ekim, E. Garcia-Villatoro, J. P. Gong, A. Herzog-Arbeitman, X. Huang, J. A. Johnson, J. A. Kalow, R. E. Kemmerling, I. Kevlishvili, A. P. Kitos Vasconcelos, R. Klausen, **H. J. Kulik**, J. Leganes Bayon, Y. Ma, E. Mcfee, J. Mendenhall, J. S. Moore, A. Nelson, B. D. Olsen, M. Rubenstein, C. S. Schindler, N. R. Sottos, N. F. Steinmetz, S. Wei, F. Xie "Reimagining Polymer Networks from Molecule to Material", *Macromolecules,* **58**, 129909-12930 (2025).
219. R. Zhu, G. Drake, H. H. Adamji, Z. J. Berkson, J. Zhu, A. R. Head, **H. J. Kulik**, C. Copéret, and Y. Román-Leshkov, "Active Site Dynamics in Molybdenum-Based Silica-Supported Olefin Metathesis Catalysts: Site Renewal and Decay Beyond the Chauvin Cycle", *Journal of the American Chemical Society*, **147**, 43831-43841 (2025).
218. A. Herzog-Arbeitman, I. Kevlishvili, D. Sen, J. Lian, J. Chakraverty, S. Wang, B. D. Olsen*, **H. J. Kulik***, S. L. Craig*, and J. A. Johnson* "Tetrafunctional cyclobutanes tune toughness via network strand continuity", *Nature Chemistry*, **18**, 309-316 (2026).
217. **H. J. Kulik*** "Are we there yet? Adventures on a road trip through machine learning as a computational chemist", *APL Computational Physics*, **1**, 020902 (2025).
216. H. Xin*, J. R. Kitchin*, and **H. J. Kulik*** "Towards agentic science for advancing scientific discovery", *Nature Machine Intelligence* **7**, 1373-1375 (2025).
215. J. W. Toney, A. G. Garrison, W. Luo, R. G. St. Michel, S. Mukhopadhyay, **H. J. Kulik*** "Exploring beyond experiment: generating high-quality datasets of transition metal complexes with quantum chemistry and machine learning", *Current Opinion in Chemical Engineering*, **50**, 101189 (2025).
214. H. Roh, A. Y. Su, C. Oh, J. J. Oppenheim, **H. J. Kulik**, A. Gumyusenge*, M. Dincă* "Turning 2D MOFs into Mixed Ionic-Electronic Conductors via Sidechain Engineering", *Journal of the American Chemical Society,* **147**, 8419–38427 (2025).
213. W. S. Lee, Y. Cho, K. Posmyk, P. Peksa, M. Dyksik, N. Samulewicz, P. Plochocka, M. Baranowski, **H. J. Kulik**, W. A. Tisdale "Excitonic anisotropy in single-crystalline 2D silver phenylchalcogenides", *Advanced Optical Materials*, **13**, e02435 (2025).
212. T. Sakurada, W. Paritmongkol, Y. Cho, W. S. Lee, P. Chatsiri, J. J. Oppenheim, R. Wan, A. Su, P. Müller, M. Dincă, **H. J. Kulik**, W. A. Tisdale "Systematic Bandgap Engineering of a 2D Organic-Inorganic Chalcogenide Semiconductor

via Ligand Modification", *Journal of the American Chemical Society,* **147**, 31704-31712 (2025).
211. C. Y. Kim, D. W. Kastner, A. J. Mitchell, M. A. Gutierrez, J. S. Yao, E. N. Neumann, **H. J. Kulik**, J.-K. Weng* "Tracing the stepwise Darwinian evolution of a plant halogenase", *Science Advances*, **11** eadv6898 (2025).
210. I. Kevlishvili, J. Vakil, D. W. Kastner, X. Huang, S. L. Craig, and **H. J. Kulik*** "High-Throughput Discovery of Ferrocene Mechanophores with Enhanced Reactivity and Network Toughening", *ACS Central Science,* **11**, 839-851 (2025).
209. D. W. Kastner, C. R. Reinhardt, H. Adamji, T. S. Oscar-Okpala, I. Kevlishvili, Y. Roman-Leshkov, **H. J. Kulik*** "The Role of the Unusual 2-Tyr-1-carboxylate Non-heme Iron Motif in the Mechanism of N,N-Dimethylformamidase", *ACS Catalysis*, **15**, 12822-12834 (2025).
208. Z. Wang, T. Shi, W. Luo, **H. J. Kulik**, Y. Liu, X. S. Li, M. Head-Gordon "Regularized second order Møller-Plesset theory: Linear scaling implementation and assessment on large-molecule problems", *Journal of Chemical Theory and Computation*, **21**, 6887-6904 (2025).
207. A. M. Keys, D. W. Kastner, L. L. Kiessling, **H. J. Kulik*** "CH-π Interactions Confer Orientational Flexibility in Protein-Carbohydrate Binding Sites", *Journal of Biological Chemistry*, **301**, 110379 (2025).
206. C. R. Reinhardt, D. W. Kastner, **H. J. Kulik*** "Role of Active Site Residues and Weak Noncovalent Interactions in Substrate Positioning in N,N-Dimethylformamidase", *Biochemistry*, **64**, 2926-2937 (2025).
205. C. H. Ng, E. R. Wearing, D. E. Blackmun, G. G. Terrones, J. Toigo, K-M Tong, K. C. Harper, J. C. Donovan, M. A. Gonley, E. A. Voight, B. D. Bergstrom, M. O. Wolf*, **H. J. Kulik***, C. S. Schindler* "Monocyclic Azetidines via a Visible-Light-Mediated Aza Paternò-Büchi Reaction of Ketone-Derived Sulfonylimines", *Journal of the American Chemical Society*, **147** 29722-29731 (2025).
204. **H. J. Kulik*** "Incorporating anionic ligands in chemical space exploration with new ligand additivity relationships", *Journal of Chemical Information and Modeling*, **65**, 6073-6088 (2025).
203. A. K. Ball, G. G. Terrones, S. Yue, **H. J. Kulik*** "Data-driven discovery of water-stable metal-organic frameworks with high water uptake capacity", *ACS Applied Materials & Interfaces*, **17** 35971-35985 (2025).
202. H. Jia, C. Duan, G. G. Terrones, I. Kevlishvili, **H. J. Kulik*** "Computational Exploration of Codoped Fe and Ru Single-Atom Catalysts for the Oxygen Reduction Reaction", *Journal of Catalysis*, **448**, 116163 (2025).
201. G. Zhao, L. Brabson, S. Chheda, J. Huang, H. Kim, K. Liu, K. Mochida, T. Pham, P. Prerna, G. Terrones, S. Yoon, L. Zoubrtizky, F.-X. Coudert, M. Haranczyk, **H. J. Kulik**, M. Moosavi, D. Sholl, I. Siepmann, R. Snurr, Y. Chung* "CoRE MOF DB: a curated experimental metal-organic framework database with machine-learned properties for integrated material-process screening", *Matter*, **8**, 102140 (2025).
200. C. S. Day, N. Grabicki, D. B. K. Chu, A. M. Keys, A. Singhal, V. Vennelakanti, I. Kevlishvili, R. Gomez-Bombarelli, **H. J. Kulik***, and J. A. Johnson* "Blueprints for the Geometric Control of *N*-Heterocyclic Carbene–Carbodiimide Isomers", *ChemistryEurope*, **3**, e202500023 (2025).
199. Y. Cho, J. Teetz, and **H. J. Kulik*** "Assessing UFF and DFT-tuned Force Fields for Predicting Experimental Isotherms of MOFs", *Journal of Chemical Information and Modeling*, **65**, 3451–3460 (2025).
198. L. Hendricks, C. R. Reinhardt, T. Green, L. Kunczynski, A. J. Roberts, N. Miller, N. Rafalin, **H. J. Kulik**, J. T. Groves, and R. N. Austin* "*Fontimonas thermophila* Alkane Monooxygenase (FtAlkB) Is an Alkyl Fluoride Dehalogenase ", *Journal of the American Chemical Society* **147**, 9085-9090 (2025).
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20. Q. Zhao, L. Xie, and **H. J. Kulik*** "Discovering Amorphous Indium Phosphide Nanostructures with High-Temperature *Ab Initio* Molecular Dynamics" *The Journal of Physical Chemistry C* **119**, 23238–23249 (2015).
19. E. I. Ioannidis and **H. J. Kulik*** "Towards quantifying the role of exact exchange in predictions of transition metal complex properties" *Journal of Chemical Physics* **143**, 034104 (2015).
18. F. Liu, N. Luehr, **H. J. Kulik**, and T. J. Martínez "Quantum Chemistry for Solvated Molecules on Graphical Processing Units Using Polarizable Continuum Models" *Journal of Chemical Theory and Computation* **11**, 3131–3144, (2015).
17. J. Zhang, **H. J. Kulik**, T. J. Martínez, and J. P. Klinman "Mediation of donor–acceptor distance in an enzymatic methyl transfer reaction" *Proceedings of the National Academy of Sciences* **112**, 7954–7959 (2015).
16. **H. J. Kulik*** "Perspective: Treating electron over-delocalization with the DFT+U method" *Journal of Chemical Physics* **142**, 240901 (2015). ***Invited Cover Perspective***.
15. B. D. Mar, H. W. Qi, F. Liu, and **H. J. Kulik*** "Ab Initio Screening Approach for the Discovery of Lignin Polymer Breaking Pathways." *The Journal of Physical Chemistry A* **119**, 6551-6562 (2015).
14. C.E. Diesendruck, G.I. Peterson, **H.J. Kulik**, J.A. Kaitz, B.D. Mar, P.A. May, S.R. White, T.J. Martínez, A.J. Boydston, and J.S. Moore "Mechanically triggered heterolytic unzipping of a low-ceiling-temperature polymer" *Nature Chemistry* **6**, 623-628 (2014).
13. **H.J. Kulik**, S.E. Wong, S.E. Baker, C.A. Valdez, J.H. Satcher, Jr., R.D. Aines, and F.C. Lightstone "Developing an approach for first-principles catalyst design: application to carbon capture catalysis" *Acta Crystallographica C* **70**, 123-131 (2014).
12. **H.J. Kulik** and C.L. Drennan "Substrate placement influences reactivity in non-heme Fe(II) halogenases and hydroxylases" *Journal of Biological Chemistry* **288**, 11233-11241 (2013).
11. **H.J. Kulik**, N. Luehr, I.S. Ufimtsev, and T.J. Martínez "*Ab initio* quantum chemistry for protein structures" *The Journal of Physical Chemistry B* **116**, 12501-12509 (2012).
10. **H.J. Kulik**, E. Schwegler, and G. Galli "Probing the structure of salt water under confinement with first-principles molecular dynamics and theoretical X-ray absorption spectroscopy" *The Journal of Physical Chemistry Letters* **3,** 2653-2658 (2012).
9. **H.J. Kulik** and N. Marzari "Accurate potential energy surfaces with a DFT+U(R) approach" *Journal of Chemical Physics* **135***,* 194105 (2011).
8. **H.J. Kulik** and N. Marzari "Transition metal dioxides: a case for the intersite term in Hubbard-model functionals" *Journal of Chemical Physics* **134**, 094103 (2011).
7. **H.J. Kulik** and N. Marzari "Systematic study of first-row transition metal diatomic molecules: a self-consistent DFT+U approach" *Journal of Chemical Physics* **133**, 114103 (2010).
6. U.G.E. Perera, **H.J. Kulik**, V. Iancu, L.G.G.V. Dias da Silva, S.E. Ulloa, N. Marzari, and S.-W. Hla "Spatially Extended Kondo State in Magnetic Molecules Induced by Interfacial Charge Transfer" *Physical Review Letters* **105**, 106601 (2010).
5. **H.J. Kulik**, N. Marzari, A.A. Correa, D. Prendergast, E. Schwegler and G. Galli "Local effects in the X-ray absorption spectrum of salt water" *The Journal of Physical Chemistry B* **114**, 9594-9601 (2010).
4. **H.J. Kulik**, L.C. Blasiak, N. Marzari, and C.L. Drennan "First-principles study of the non-heme Fe(II) halogenase SyrB2" *Journal of the American Chemical Society* **131**, 14426 (2009).
3. **H.J. Kulik**, A.H. Steeves, and R.W. Field "Ab initio investigation of high multiplicity $\Sigma^+-\Sigma^+$ optical transitions in the spectra of CN and isoelectronic species" *Journal of Molecular Spectroscopy* **258**, 6-12 (2009).
2. **H.J. Kulik** and N. Marzari "A Self-consistent Hubbard U density-functional theory approach to the addition-elimination reactions of hydrocarbons on bare FeO^+" *Journal of Chemical Physics* **129**, 134314 (2008).
1. **H.J. Kulik**, M. Cococcioni, D.A. Scherlis, and N. Marzari "Density Functional Theory in Transition-Metal Chemistry: A Self-Consistent Hubbard U Approach" *Physical Review Letters* **97**, 103001 (2006).

PROCEEDINGS, BOOKS, BOOK CHAPTERS, CONFERENCE PAPERS, AND EDITORIALS

16. **H. J. Kulik*** "Using experimental data in computationally-guided rational design of inorganic materials with machine learning", *Journal of Materials Research,* **40,** 833-848 (2025).
15. **H. J. Kulik*** "Reaction: The Challenge of Open-Shell Transition Metal Catalysis in "Systems Chemistry" *Chem*, 8, 2338-2339 (2024).
14. A. Nandy and **H. J. Kulik*** "Learning Design Rules for Catalysts through Computational Chemistry and Machine Learning", in *Exploring Chemical Concepts through Theory and Computation,* ed. Shubin Liu p. 513-558 (2024).
13. **H. J. Kulik*** "Molecular Interactions and Catalysis", in *Comprehensive Computational Chemistry*, eds. Manuel Yanez and Russell Boyd (H. J. Kulik section editor) **4**, 449-453 (2024).
12. **H. J. Kulik** and P. Tiwary* "Artificial intelligence in computational materials science", *MRS Bulletin*, **47**, 1 (2022).
11. D. H. Ess, K. Jelfs, and **H. J. Kulik*** "Chemical Design by Artificial Intelligence", *Journal of Chemical Physics*, **157**, 120401 (2022). **Editorial**
10. C. Duan, A. Nandy, and **H. J. Kulik*** " A Density Functional Recommendation Approach for Accurate Predictions of Vertical Spin Splitting of Transition Metal Complexes", *ICML* (2022). **Conference paper**
9. C. Duan[#], A. Nandy[#], and **H. J. Kulik*** "Machine Learning for the Discovery, Design, and Engineering of Materials", *Annual Review of Chemical and Biomolecular Engineering*, **13**, 18.1-18.25 (2022). **Review chapter**
8. **H. J. Kulik*** and M. Sigman "Advancing Discovery in Chemistry with Artificial Intelligence: From Reaction Outcomes to New Materials and Catalysts", *Accounts of Chemical Research*, **54**, 2335-2336 (2021). **Editorial**
7. R. Mehmood and **H. J. Kulik*** "Quantum-mechanical/Molecular-mechanical (QM/MM) Simulations for Understanding Enzyme Dynamics", *Enzyme Engineering: Methods and Protocols,* 227-248 (2022). **Book chapter**
6. J. P. Janet and **H. J. Kulik*** "Machine Learning in Chemistry", *ACS InFocus Series* (2020). **Book**
5. L. Frediani, O. Andreussi, and H. J. Kulik "Coding solvation: Challenges and opportunities", *International Journal of Quantum Chemistry* **119**, e25839 (2019). **Editorial**
4. **H. J. Kulik*** "Modeling mechanochemistry from first principles", *Reviews in Computational Chemistry* **31**, 6 (2018). **Book chapter**
3. J.H. Satcher, Jr., S.E. Baker, **H.J. Kulik**, C.A. Valdez, R.L. Krueger, F.C. Lightstone, and R.D. Aines "Modeling, synthesis and characterization of zinc containing carbonic anhydrase active site mimics" *Energy Procedia* **4**, 2090 (2011). **Proceedings**
2. S.E. Wong, E.Y. Lau, **H.J. Kulik**, J.H. Satcher, Jr., C.A. Valdez, M. Worsely, F.C. Lightstone, and R.D. Aines "Designing small-molecule catalysts for CO_2 capture" *Energy Procedia* **4**, 817 (2011). **Proceedings**
1. **H.J. Kulik** and N. Marzari Chapter entitled "Electronic Structure and Reactivity of Transition Metal Complexes" in *Fuel Cell Science: Theory, Fundamentals, and Bio-Catalysis*, a Wiley monograph, eds. Jens Norskov and Andrzej Wiezcowski (2010). **Book chapter**

INVITED PRESENTATIONS

Upcoming, confirmed:

337. Nobel Symposium on "Electronic structure theory: solving quantum mechanics equations for real materials", Stockholm, Sweden. "TBD". *June 2027.*
336. XLI Biennial Meeting of the Royal Spanish Society of Chemistry (RSEQ). Murcia, Spain. "TBD". *June 2027.*
335. Yale University, Department of Chemistry, New Haven, CT. "TBD". *April 2027.*
334. GRC on Metals in Biology, Ventura, CA. "TBD". *January 2027.*
333. Department of Chemistry & Biochemistry, Rutgers University, New Brunswick, NJ. "TBD". *December 2026.*
332. Materials Research Society Fall Meeting, Boston, MA. "TBD" *December 2026.*
331. Flatiron Institute, "Machine Learning for Computational Catalysis" Workshop, Nw York, NY. "TBD" *November 2026.*
330. Department of Chemistry, Florida State University, Tallahassee, FL. "TBD". *November 2026.*
329. Department of Chemistry, Vanderbilt University, Nashville, TN. "TBD". *November 2026.*
328. GRC on Computational Materials Science & Engineering. Newry, ME. "TBD". *August 2026.*
327. GRC on Multiscale Mechanochemistry and Mechanobiology, Bates College, Lewiston, ME. "TBD". *July 2026.*
326. GRC on Computational Chemistry, Castelldefels, Spain. "TBD". *July 2026.*
325. ICTAC-20, Delft, Netherlands. "Overcoming tradeoffs in catalyst activity and stability with machine learning". *July 2026.* **Keynote**
324. ICCC 2026, Odense, Denmark. "Accelerating the discovery of stable metal-organic frameworks with machine learning". *July 2026.* **Keynote**

Completed:

323. 18th International Congress on Quantum Chemistry, Berkeley, CA. "Machine learning for transition states in complex systems". *June 2026*. **Plenary**
322. CECAM on Physics-Aware Machine Learning for Molecules and Materials, New York, NY. "Getting from data to discovery in (transition metal?) chemistry". *June 2026*.
321. GroMoChem 1, Groningen, The Netherlands. "Adventures in Machine Learning for Accelerated Transition Metal Complex, MOF, and Polymer Discovery". *May 2026*.
320. Materials Research Society Spring Meeting, Honolulu, HI. "Automated Materials Discovery in the Big Data Era" Symposium. "Leveraging experiments for deep learning models of dynamic catalyst properties" *April 2026*.
319. Materials Research Society Spring Meeting, Honolulu, HI. "Atomistic and Generative Modeling for Materials Chemistry and Closed-Loop Design" Symposium. "Exploring transition metal complex space with data-driven models" *April 2026*.
318. Orica, Virtual Talk. "Machine learning accelerated discovery in transition metal catalysis". *April 2026*.
317. Georgia Tech, School of Chemical and Biomolecular Engineering Seminar. Atlanta, GA. "How to use data in inorganic chemistry to make computational predictions a reality". *April 2026*.
316. Johns Hopkins University, Department of Chemistry, Baltimore, MD. "How to use data in inorganic chemistry to make computational predictions a reality". *April 2026*.
315. ACS National Meeting, Atlanta, GA. "AI for Chemistry: From Algorithms to Applications" Symposium. "What has machine learning taught me about transition metal chemistry?". *March 2026*.
314. ACS National Meeting, Atlanta, GA. "Catalyst design to respond to the emerging supply chain challenges" Symposium. "High-throughput discovery of earth abundant catalysts". *March 2026*.
313. ACS National Meeting, Atlanta, GA. "Computational Materials Discovery" Symposium. "What has machine learning taught me about transition metal chemistry?". *March 2026*. **Plenary**
312. ACS National Meeting, Atlanta, GA. "Catalysis under External Stimuli: From Design to Dynamic Control in Homogeneous and Heterogeneous Systems" Symposium. "Data-driven models for catalyst dynamics: from ligand hemilability to catalysts under force". *March 2026*.
311. CCI: CMCC Virtual Seminar. "High-Throughput Discovery of Ferrocene Mechanophores with Enhanced Reactivity and Network Toughening (and other adventures in mechanochemistry!)". *March 2026*.
310. CNRS AISSAI Conference. Paris, France. "What artificial intelligence can do to accelerate chemical discovery". *March 2026*.
309. Tosoh. "Machine learning accelerated discovery in transition metal catalysis". *March 2026*.
308. US Army DEVCOM Virtual Seminar. "Accelerating the discovery of stable metal-organic frameworks with machine learning". *February 2026*.
307. UC Berkeley, BIDMAP Seminar, Berkeley, CA. "How to use data in inorganic chemistry to make computational predictions a reality". *January 2026*.
306. UT Austin, Texas Materials Institute, Austin, TX. "How to use inorganic materials data to make computational predictions a reality". *January 2026*.
305. Pacifichem 2025, Honolulu, HI. "Chemical Concepts from Theory and Computation" Symposium. "Accelerating transition metal chemical space exploration with ligand additivity relationships" *December 2025*.
304. NeurIPS AI4Science Workshop, San Diego, CA. "Machine learning accelerated discovery in transition metal chemistry". *December 2025*.
303. University of Michigan, Department of Chemical Engineering, Ann Arbor, MI. "Leveraging experimental data in machine learning and screening to get from computational model to real world materials fast". *December 2025*. **Student selected seminar**
302. US Association for Computational Mechanics Lower Scale Phenomena TTA Webinar. "Machine-learning-accelerated materials design: from prediction to experimental reality" *November 2025*. **Virtual**
301. Chen Institute Symposium for AI Accelerated Science, Berkeley, CA. "Leveraging experimental data in machine learning and screening to get from computational model to real world materials fast". *October 2025*.
300. Tufts Maria Flytzani-Stephanopoulos symposium, Medford, MA. "What's special about single site catalysis? An electronic structure and machine learning perspective". *October 2025*.
299. 3rd International SMLQC, Knoxville, TN. "What has machine learning taught me about transition metal chemistry?". *October 2025*.
298. GLOW Singapore Conference, Singapore, Singapore. "Leveraging experimental data in machine learning and screening to get from computational model to real world materials fast". *October 2025*.
297. Nanyang Technological University, School of Chemistry and Chemical and Biotechnology, Singapore, Singapore. "Leveraging experimental data in machine learning and screening to get from computational model to real world materials fast". *September 2025*.

296. Mitsubishi, Cambridge, MA. "Getting from the computer to real world materials fast with machine learning." *September 2025.*
295. Pfizer, "What has Machine Learning Taught us about Chemistry". *September 2025.* **Virtual**
294. 7th Quantum Bio-Inorganic Chemistry Conference (QBIC VII), Berlin, Germany. "Machine learning and software for discovery in transition metal complexes and metalloenzymes". *August 2025.*
293. Accelerate Consortium, Toronto, CA. "How to use data in inorganic chemistry to make computational predictions a reality". *August 2025.*
292. 6th Artificial Intelligence for Materials Science Workshop, NIST, MD. "Leveraging experimental data in machine learning and screening to get from computational model to real world materials fast". *July 2025.*
291. CECAM on Machine Learning Advances for Molecular and Materials Property Prediction, U. Notre Dame, South Bend, IN. "Leveraging experimental data in machine learning and screening to get from computational model to real world materials fast" . *July 2025.*
290. 13th Triennial Congress of the World Association of Theoretical and Computational Chemists, Oslo, Norway. "What has machine learning taught us about transition metal chemistry?". *June 2025.* **Plenary**
289. Kureha Corporation, Cambridge, MA. "Getting from the computer to real world materials faster with machine learning". *June 2025.*
288. MolSSI Workshop "Challenges for Software Development in Enzyme Design and Engineering", Atlanta, GA. "QuantumPDB: Uncovering Electronic Structure Trends in the PDB with Open Source Software". *June 2025.*
287. Lubrizol, Cambridge, MA. "Getting from the computer to real world materials faster with machine learning". *May 2025.*
286. Technical University of Munich IAS Symposium, Munich, Germany. "Getting from the computer to real world materials faster with machine learning". *May 2025.*
285. CECAM "AIChemist" School. Lausanne, Switzerland. "Leveraging experimental data in machine learning and screening to get from computational model to real world materials fast". *April 2025.*
284. Carnegie Mellon University, Department of Chemical Engineering, Pittsburgh, PA. "Getting from the computer to real world materials faster with machine learning." *April 2025.*
283. Materials Research Society Spring Meeting, Seattle, WA. "Leveraging experimental literature data to discover novel metal-organic frameworks and mechanophores". *April 2025.*
282. ByteDance, LLC. "Getting from the computer to real world materials faster with machine learning." *March 2025.* **Virtual**
281. American Chemical Society National Meeting, San Diego, CA. "Accelerating the discovery of transition metal complexes with machine learning". *March 2025.*
280. American Chemical Society National Meeting, San Diego, CA. "High-Throughput Discovery of Ferrocene Mechanophores with Enhanced Reactivity and Network Toughening". *March 2025.*
279. Lennard Jones Center, University of Cambridge, Cambridge, UK. "Getting from the computer to real world materials faster with machine learning." *February 2025.* **Virtual**
278. MIT ILP Japan Conference, Tokyo, Japan. "Getting from the computer to real world materials faster with machine learning." *January 2025.*
277. Idemitsu, Tokyo, Japan. "Getting from the computer to real world materials faster with machine learning." *January 2025.*
276. Shimadzu, Kyoto, Japan. "Getting from the computer to real world materials faster with machine learning." *January 2025.*
275. Murata LLC, Shiga Prefecture, Japan. "Getting from the computer to real world materials faster with machine learning." *January 2025.*
274. 2025 ONLINE Molecular Machine Learning symposium, University of Muenster. "Getting from the computer to real world materials faster with machine learning." *January 2025.* **Virtual**
273. Löwdin lectures, Uppsala University, Sweden. "Machine learning accelerated design from molecules to materials". *December 2024.*
272. Materials Research Society Fall Meeting, Boston, MA. "Using experimental data in computationally-guided rational design with machine learning". *December 2024.*
271. 8th International Conference on Electronic Materials and Nanotechnology for Green Environment (ENGE 2024), Jeju Island, Korea. "Discovery of Metal-organic Design Rules with Natural Language Processing and Machine Learning". *November 2024.*
270. Department of Chemical Engineering, Busan National University, Busan, Korea. " Discovering transition metal complexes and metal organic framework catalysts with machine learning". *November 2024.*
269. Department of Chemical Engineering, Seoul National University, Seoul, Korea. " Using Machine Learning to

Overcome Limitations in the Computational Design of Materials". *November 2024.*
268. Sydney Ross Lecture, Department of Chemistry, Rensselaer Polytechnic Institute, Troy, NY. "Machine learning accelerated materials discovery". *November 2024.*
267. American Institute of Chemical Engineers National Meeting, San Diego, CA. "Using Machine Learning to Overcome Limitations in Electronic Structure Methodology for Chemical Discovery". *October 2024.*
266. American Institute of Chemical Engineers National Meeting, San Diego, CA. "Leveraging experimental data in machine learning models to accelerate the discovery of new materials and catalysts". *October 2024.*
265. MIT School of Engineering, Dean's Advisory Committee, Cambridge, MA. "Leveraging experimental data for machine learning accelerated computational materials discovery". *October 2024.*
264. 7th RSC AI in Chemistry Meeting, Cambridge, UK. "Leveraging community knowledge in transition metal complex and metal organic framework discovery". *September 2024.*
263. "Data-driven discovery in the chemical sciences" Faraday Discussions, Oxford, UK. "Leveraging natural language processing to curate the tmCAT, tmPHOTO, tmBIO, and tmSCO datasets of functional transition metal complexes". *September 2024.*
262. 60th Symposium on Theoretical Chemistry, Braunschweig, Germany. "Using Machine Learning to Bypass Electronic Structure Method Uncertainty in Chemical Discovery". *September 2024.*
261. American Chemical Society National Meeting, Denver, CO. "Accelerating the discovery of novel transition metal catalysts through divide and conquer analytical and machine learning strategies". *August 2024.*
260. 45th International Conference on Coordination Chemistry, Fort Collins, CO. "Using computation to unify understanding of metal-oxos from transition metal complexes to metal-organic frameworks and enzymes". *July 2024.*
259. CECAM-Chicago Conference on Computational Reactivity, Chicago, IL. " Discovering reactive intermediates and catalysts that bypass scaling limitations with high-throughput screening and machine learning". *July 2024.*
258. Gordon Research Conference on Organometallics, Newport, RI. "Machine learning accelerated DFT for homogeneous open-shell transition metal catalyst discovery". *July 2024.*
257. 18th Triennial European Seminar on Computational Methods in Quantum Chemistry (ESCMQC) "Overcoming the limits of approximate electronic structure models in machine learning accelerated materials discovery". *June 2024.* **Plenary**
256. Gordon Research Conference on Catalysis, New London, NH. "Addressing both activity and stability in computational catalyst discovery with machine learning". *June 2024.*
255. CCSC '24, Heidelberg Germany. "Machine Learning for Open Shell Transition Metal Complex and Metal-Organic Framework Discovery". *May 2024.*
254. University of Wisconsin, Hirschfelder Visitor, Departments of Chemistry and Chemical Engineering, Madison, WI. "Machine Learning for Open Shell Transition Metal Complex and Metal-Organic Framework Discovery". *April 2024.*
253. Brown University, Chemistry Department, Providence, RI. "Overcoming the limits of approximate electronic structure models in machine learning accelerated materials discovery". *April 2024.* **Student-selected speaker**
252. Stanford University, Department of Chemistry, Stanford, CA. "Leveraging experimental data in machine learning models to accelerate the discovery of new materials". *April 2024.* **Student-selected speaker**
251. Asahi x MIT Knowledge Session, MIT ILP, Cambridge MA. "First-principles and machine learning computational strategies for natural and synthetic transition metal catalysts". *April 2024.*
250. Institute for Mathematical and Statistical Innovation "Machine Learning in Electronic-Structure Theory" Workshop, University of Chicago, Chicago, IL. "Addressing electronic structure method uncertainty in machine learning accelerated materials discovery". *March 2024.*
249. American Chemical Society National Meeting, New Orleans, LA. "Discovering catalysts that overcome scaling limitations with high-throughput screening and machine learning". *March 2024.*
248. American Physical Society March Meeting, Minneapolis, MN. "Overcoming the limits of approximate electronic structure models in machine learning accelerated materials discovery". *March 2024.*
247. *R*oyal Society of Chemistry Desktop Seminar "Machine Learning and AI in Chemistry". "What artificial intelligence can do to accelerate chemical discovery". *February 2024.* **Virtual**
246. Tufts University, Department of Chemistry, Medford, MA. "Overcoming the limits of approximate electronic structure models in machine learning accelerated materials discovery". *January 2024.*
245. Gordon Research Conference on Chemical Separations, Galveston, TX. "Discovering Ultrastable Metal-Organic Frameworks for Separations with Machine Learning". *January 2024.*
244. UC Berkeley, Inorganic Chemistry Colloquium, Berkeley, CA. "Machine learning for homogeneous open-shell transition metal catalyst discovery". *January 2024.*
243. Chemical Concepts from Theory and Computation (CCTC3) CECAM Workshop, Lyon, France. "Overcoming the limits of approximate electronic structure models in machine learning accelerated materials discovery". *December 2023.*

242. Materials Research Society Fall Meeting, Boston, MA. "Leveraging community knowledge in machine learning models to accelerate the discovery of new catalysts and materials". *November 2023.*
241. Materials Research Society Fall Meeting, Boston, MA. "Overcoming the limits of approximate electronic structure models in machine learning accelerated materials discovery". *November 2023.*
240. LightChEC Consortium, University of Zurich, Zurich, Switzerland. "Machine learning for discovery in open shell transition metal catalysis". *November 2023.* **Virtual**
239. American Institute of Chemical Engineers National Meeting, Orlando, FL. "Accelerating discovery with computational chemistry in challenging materials spaces". *November 2023.*
238. American Institute of Chemical Engineers National Meeting, Orlando, FL. "Machine learning for homogeneous open-shell transition metal catalyst discovery". *November 2023.*
237. American Institute of Chemical Engineers National Meeting, Orlando, FL. "Discovering single site and single atom catalysts with high-throughput computational screening". *November 2023.*
236. XXII Brazilian Symposium on Theoretical Chemistry (SBQT), Niteroi City, Rio de Janeiro, Brazil "Leveraging community knowledge in machine learning models to accelerate the discovery of new catalysts and materials". *October 2023.* **Plenary**
235. Johns Hopkins University, Department of Chemical & Biological Engineering, Baltimore, MD. "Leveraging community knowledge in machine learning models to accelerate the discovery of new catalysts and materials". *October 2023.*
234. Merck Research Laboratories, Rahway, NJ. "Machine learning accelerated discovery for metal organic frameworks and transition metal catalysts". *September 2023.*
233. 1st Virtual Workshop on Single Atom Catalysis. "Discovering Single Site and Single Atom Catalysts with High-throughput Computational Screening". *August 2023.* **Virtual**
232. American Chemical Society National Meeting, San Francisco, CA. "Leveraging community knowledge in machine learning models to accelerate the discovery of new catalysts and materials". *August 2023.*
231. American Chemical Society National Meeting, San Francisco, CA. "Machine learning for homogeneous open-shell transition metal catalyst discovery". *August 2023.*
230. American Chemical Society National Meeting, San Francisco, CA. "What artificial intelligence can do to accelerate chemical discovery". *August 2023.* **Plenary**
229. American Chemical Society National Meeting, San Francisco, CA. "Overcoming the limits of approximate electronic structure models in machine learning accelerated materials discovery". *August 2023.*
228. SUNCAT Summer School Workshop, SLAC, Stanford, CA. "Addressing challenges for electronic structure and machine learning in open shell transition metal catalysis". *August 2023.*
227. 13th International Conference on Hydrogenases and Other Redox (Bio)catalysts for Energy Conversion, Walla Walla, WA. "Understanding and overcoming limits in bioinspired catalyst design for small molecule activation". *June 2023. Postponed due to COVID-19.* **Keynote**
226. North American Catalysis Society Meeting (NAM-28), Providence, RI. "Discovering Stable and Active Catalysts with Machine Learning and Community Knowledge". *June 2023.* **Keynote**
225. Heidelberg University, IWR, Romberg Lecture, Heidelberg, Germany. "Exploring multi-million compound spaces with chemical accuracy using machine learning". *May 2023.* **Named lecture**
224. Technical University of Munich, Joint Theory Seminar, Munich, Germany. "Choosing the right electronic structure method in materials discovery: Autonomous artificial intelligence workflows to the rescue ". *May 2023.*
223. Technical University of Munich, Physical Chemistry Colloquium, Munich, Germany. "Machine learning accelerated discovery for metal organic frameworks and transition metal catalysts ". *May 2023.*
222. Molecular Systems Design & Engineering Symposium, London, UK. "Materials discovery in challenging spaces with machine learning: from transition metal complexes to metal-organic frameworks". *May 2023.*
221. Heidelberg University, IWR Tutorial Lectures, Heidelberg, Germany. "Addressing challenges of machine learning accelerated materials discovery". *May 2023.* **Two 1.5 hr tutorial lectures**
220. Heidelberg University, Department of Chemistry, Lieseberg Colloquium, Heidelberg, Germany. "Using machine learning to tame electronic structure errors in chemical discovery". *May 2023*
219. SIMPLAIX Workshop, Heidelberg, Germany. "Machine learning tools for discovery in open shell transition metal chemistry ". *May 2023.*
218. University of Bonn, Bonn, Germany. "Machine learning tools for discovery in open shell transition metal chemistry". *April 2023.*
217. IPAM, Los Angeles, CA. "Exploring multi-million compound spaces with chemical accuracy using machine learning." *March 2023. Virtual talk*
216. University of Oslo, Oslo, Norway. "Accelerating metal-organic frameworks and transition metal complex design

with new simulation and machine learning tools". *March 2023.*
215. Denmark Technical University, Lyngby, Denmark. "Machine learning tools for discovery in open shell transition metal chemistry". *February 2023.*
214. Intellectual Ventures, *Virtual Talk.* "Opportunities for metal-organic frameworks". *February 2023.*
213. University of Copenhagen, Copenhagen, Denmark. "Machine learning tools for discovery in open shell transition metal chemistry". *January 2023.*
212. Distinguished MARVEL Lecture Series, EPFL, Lausanne, Switzerland. "Materials discovery in challenging spaces with machine learning: from transition metal complexes to metal-organic frameworks". *December 2022.*
211. IBM Zürich, Zürich, Switzerland. "Machine learning tools for discovery in open shell transition metal chemistry". *December 2022.*
210. ETH Zürich, Laboratory for Physical Chemistry Colloquium, Zürich, Switzerland. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *December 2022.*
209. Norwegian Chemical Society, Bergen, Norway. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *November 2022. Virtual presentation.*
208. ETH Zürich, Laboratory of Inorganic Chemistry Colloquium, Zürich, Switzerland. "Designing new materials and catalysts with simulation and machine learning tools". *November 2022.*
207. Co-Design for Materials Discovery, Reliability, & Extreme Environments, Sandia National Laboratories, Sandia, CA. "Addressing challenges of data scarcity and quality in machine-learning-accelerated computational materials discovery". *November 2022. Virtual workshop.*
206. "Automation and Digital Chemistry for Catalysis" Workshop at Imperial College, London. "Accelerating open shell transition metal catalyst discovery with machine learning". *November 2022.*
205. Korean Institute of Science and Technology (KIST), Seoul, Korea. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools" *October 2022.*
204. University of Zurich, Special Chemistry Seminar, Zürich, Switzerland. "Accelerating the design of materials and open shell transition metal catalysts with machine learning" *October 2022.*
203. Boston University Materials Day "Simulation and Modeling of Extended Materials: Connecting Scales for Practical Applications", Boston University, Boston, MA. "Discovering transition metal catalysts and materials with machine learning" *October 2022.*
202. Telluride Workshop "Machine Learning and Informatics for Chemistry and Materials", Telluride, CO. "Overcoming challenges of data scarcity and data quality for machine learning" *October 2022.*
201. Kwang-Yu and Lee-Chien Wang Fellowship Lecture, Department of Chemical Engineering, University of Rochester, Rochester, NY. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools" *September 2022.*
200. Rennes Institute of Chemistry 2022, Rennes, France. "Audacity of huge: machine learning for the discovery of transition metal catalysts and materials". *September 2022.*
199. DFT 2022, Brussels, Belgium. "Putting density functional theory to the test in machine-learning accelerated discovery". *August 2022.*
198. Psi-k 2020, Lausanne, Switzerland. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *August 2022. Postponed due to COVID-19.*
197. 33rd IUPAP Conference on Computational Physics , "Recent developments and applications of DFT+U" Symposium, Austin, TX (Virtual). "Recovering exact conditions for both delocalization and fractional spin error in transition-metal chemistry with molecular-orbital projector-based DFT+U and jmDFT". *August 2022.*
196. International Younger Chemists Network Webinar on Machine Learning and Artificial Intelligence. "What problems can machine learning solve in inorganic materials discovery?". *July 2022. Virtual.*
195. Foundations of Molecular Modeling and Simulation 2022, Delavan, WI. "New Strategies for Catalyst Discovery from Machine Learning Exploration". *July 2022.* **Plenary**
194. NIST-JARVIS Artificial Intelligence for Materials Science (AIMS) 2022 Workshop, NIST (Virtual). "Revealing molecular design blueprints for open shell transition metal materials and catalysts with machine learning". *July 2022.*
193. 12th Triennial Congress of the World Association of Theoretical and Computational Chemists, Vancouver, Canada. "Putting density functional theory to the test in machine-learning accelerated discovery for transition metal chemistry". *July 2022. Postponed due to COVID-19.*
192. 10th Molecular Quantum Mechanics, Blacksburg, VA. "Putting density functional theory to the test with machine learning". *June 2022.* **Plenary**
191. 75th International Symposium on Molecular Spectroscopy, Urbana-Champaign, IL. "Putting density functional theory to the test with machine learning". *June 2022.*
190. Dow (Virtual). "Discovering transition metal catalysts and materials with machine learning". *June 2022.*

189. MolSSI/Tapia Workshop, Rice University, Houston, TX. "Quantum mechanics and quantum chemistry" and "Navigating transition metal chemical space with computational quantum chemistry and machine learning". *June 2022.*
188. Cornell University, Cornell Energy Systems Institute Distinguished Lecturer Series, Ithaca, NY. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *May 2022.*
187. "Machine Learning in Chemical and Materials Sciences" Virtual Symposium, Center for Nonlinear Studies, Los Alamos National Laboratory, Los Alamos, NM. "Audacity of huge: overcoming challenges of data scarcity and data quality for machine learning in computational materials discovery". *May 2022.*
186. Caltech, Chemical Physics Seminar Series, Pasadena, CA. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *May 2022.*
185. Virginia Tech, Chemical Engineering Department, Blacksburg, VA. "Audacity of huge: machine learning for the discovery of transition metal catalysts and materials". *April 2022.*
184. George Washington University, Department of Chemistry, Washington, DC. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *April 2022.*
183. Harvard University, Department of Chemistry, Cambridge, MA. "Putting first-principles modeling to the test with machine learning". *March 2022.*
182. American Chemical Society Spring 2022 Meeting, San Diego, CA, PHYS Division. "Using machine learning and data mining to leverage community knowledge for the engineering of materials and catalysts". *March 2022.*
181. American Chemical Society Spring 2022 Meeting, San Diego, CA, CATL Division. "Methods for systematic multi-scale modeling of enzyme catalysis". *March 2022.*
180. American Chemical Society Spring 2022 Meeting, San Diego, CA, Presidential Symposium. "Computational Discovery of Transition-metal Complexes: From High-throughput Screening to Machine Learning". *March 2022.*
179. Massachusetts Institute of Technology, Department of Chemistry, Cambridge, MA. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *March 2022.*
178. Molecular Chemistry Meets Materials Science, MolSSI Virtual Workshop. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *March 2022.*
177. 61st Sanibel Symposium, Sanibel, FL. "Audacity of huge: machine learning for the discovery of transition metal catalysts and materials". *February 2022.* **Plenary**
176. Oregon State University, Department of Chemistry, Corvallis, OR. "Audacity of huge: machine learning for the discovery of transition metal catalysts and materials". *January 2022.*
175. UC Santa Barbara, Graduate Simulation Seminar Series (GS^3), Santa Barbara, CA. "Learning from failure". *January 2022.* **Keynote**
174. UC Santa Barbara, Graduate Simulation Seminar Series (GS^3), Santa Barbara, CA. "Audacity of huge: machine learning for the discovery of transition metal catalysts and materials". *January 2022.* **Keynote**
173. International Conference on Theoretical and High Performance Computational Chemistry 2021 (ICT-HPCC21), Beijing, China "Putting density functional theory to the test in machine-learning accelerated materials discovery". *December 2021. Virtual.*
172. ELLIS Machine Learning for Molecule Discovery Workshop "Audacity of huge: machine learning for the discovery of transition metal catalysts and materials". *December 2021. Virtual.*
171. Pacifichem 2020, Honolulu, HI. "Supercharging Computational Chemistry with AI" Symposium. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *December 2021. Virtual due to COVID-19.*
170. Pacifichem 2020, Honolulu, HI. "Chemical Concepts from Theory and Computation" Symposium. "Using conceptual DFT to understand and improve electronic structure method errors for complex systems". *December 2021. Virtual due to COVID-19.*
169. Clarkson University, Department of Chemistry, Potsdam, NY. "What problems can machine learning solve in inorganic materials discovery?". *December 2021. Virtual talk.*
168. Artificial Intelligence and Augmented Intelligence for Automated Investigations for Scientific Discovery (AI3SD), University of Southampton, Southampton, UK. "Audacity of huge: machine learning for the discovery of transition metal catalysts and materials". *December 2021. Virtual talk.*
167. International Symposium on Machine Learning in Quantum Chemistry, Xiamen University, China. "Audacity of huge: machine learning for the discovery of transition metal catalysts and materials" *November 2021. Virtual due to COVID-19.*
166. Ohio State University, Department of Biophysics, Columbus, OH. "What can quantum chemistry teach us about protein structure and function?". *October 2021. Virtual due to COVID-19.*
165. SUNCAT Workshop on Challenges and opportunities in data-driven catalysis research. Stanford & SLAC, Stanford, CA. "Audacity of huge: exploring transition metal chemical space with machine learning". *September 2021. Virtual due to*

COVID-19.
164. CU Denver, Department of Chemistry, Denver, CO. "Uncovering convergent design principles for C-H activation from nature and machine learning". *September 2021. Virtual due to COVID-19*.
163. Chemical Reviews Thematic Talk Series on Machine Learning. "Computational Discovery of Transition-metal Complexes: From High-throughput Screening to Machine Learning" *September 2021*.
162. UT Knoxville, Department of Chemistry, Knoxville, TN. "Putting density functional theory to the test in machine-learning accelerated discovery". *August 2021*.
161. American Chemical Society Fall 2021 Meeting, Atlanta, GA. "Finding the needle in the haystack with ML-accelerated multi-objective design". *August 2021*.
160. IUPAC/CCCE World Congress of Chemistry, Montreal, Quebec, Canada. "Frontiers in Chemical Understanding and Prediction: New Descriptors and Concepts for Chemical Phenomena" Symposium. "Putting density functional theory to the test in machine-learning accelerated discovery" *August 2021. Virtual due to COVID-19*.
159. IUPAC/CCCE World Congress of Chemistry, Montreal, Quebec, Canada. "Computational Design of Materials and Systems for Energy Applications" Symposium. "What can machine learning do to accelerate the design of catalysts and materials?" *August 2021. Virtual due to COVID-19*. **Keynote**
158. International Workshop on High-Performance Computing in Science and Engineering – 2021, IISER TVM, India. "What can machine learning do to accelerate the design of catalysts and materials?" *August 2021. Virtual workshop*. **Keynote**
157. Virtual Conference on 'Machine Learning/Data Science assisted Synthesis', MPI-Kohlenforschung, Germany. "Audacity of huge: exploring transition metal chemical space with machine learning". *July 2021*.
156. Annual Workshop on Recent Developments in Electronic Structure Methods (ES21), Center for Computational Quantum Physics (CCQ), Flatiron Institute, New York, NY. "Putting density functional theory to the test in machine-learning accelerated discovery." *July 2021. Virtual due to COVID-19*.
155. 35th Anniversary Symposium of The Protein Society, Boston, MA. "What can machine learning and big data teach us about metalloenzymes?". *July 2021. Virtual due to COVID-19*.
154. Telluride Workshop on Computational Materials Chemistry, Telluride, CO. "Putting DFT to the test in ML-accelerated discovery". *June 2021*.
153. HBCU-MI, ONR Naval Research Lab Summer Internship Program. "Navigating transition metal chemical space with computational chemistry". *June 2021*.
152. *Molecular Systems Design & Engineering* Virtual Conference, Royal Society of Chemistry, UK. "What problems can machine learning solve in transition metal complex discovery?". *June 2021*.
151. Catalysis Club of Chicago, Chicago, IL. "What problems can machine learning solve in transition metal complex discovery?". *May 2021. Virtual due to COVID-19*. **Keynote**
150. "Machine Learning in Chemical and Materials Sciences" Virtual Symposium, Center for Nonlinear Studies, Los Alamos National Laboratory, Los Alamos, NM. "Putting density functional theory to the test in machine-learning accelerated discovery for transition metal chemistry". *May 2021*.
149. New York University, Department of Chemistry, New York, NY. "Putting density functional theory to the test in machine-learning accelerated discovery for transition metal chemistry". *May 2021. Virtual due to COVID-19*.
148. South Dakota School of Mines & Technology, Chemical and Biological Engineering, Rapid City, South Dakota. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *April 2021. Postponed, then virtual due to COVID-19*.
147. American Chemical Society Spring 2021 Meeting. "Putting density functional theory to the test in machine-learning-accelerated discovery". *April 2021. Virtual due to COVID-19*.
146. Computational Chemistry, Theory, and Dynamics theme of the School of Chemistry, University of Bristol, Bristol, UK. "Putting density functional theory to the test in machine-learning-accelerated discovery". *April 2021. Virtual due to COVID-19*.
145. DMAV-T, ETH Zurich, Zurich, Switzerland. "What problems can machine learning solve in transition metal complex discovery?" *April 2021. Virtual due to COVID-19*.
144. Exxon-Mobil, Baytown, TX. "What problems can machine learning solve in transition metal complex discovery?" *March 2021. Virtual due to COVID-19*.
143. American Physical Society March Meeting, Nashville, TN. "Understanding confinement effects on ion permeability with computation: from first-principles to data-driven models". *March 2021. Virtual due to COVID-19*.
142. Boston Regional Inorganic Colloquium at University of New Hampshire, Durham, NH. "What problems can machine learning solve in transition metal complex discovery?" *February 2021*.
141. Virtual Winter School on Computational Chemistry. "Putting density functional theory to the test in machine-learning accelerated discovery for transition metal chemistry". *February 2021*.

140. University of Houston, Department of Chemical Engineering, Houston, TX. "Molecular design blueprints: catalysts and principles from new simulation and machine learning tools". *November 2020. Virtual seminar due to COVID-19.*
139. American Institute of Chemical Engineers National Meeting, San Francisco, CA. Area 20 "Molecular design blueprints: catalysts and principles from new simulation and machine learning tools". *November 2020.*
138. Pennsylvania State University, MRSEC, Department of Materials Science & Engineering, Pittsburgh, PA. "What problems can machine learning solve in inorganic materials discovery?". *October 2020. Virtual seminar due to COVID-19.*
137. Carnegie Mellon University, Chemical Engineering, Pittsburgh, PA. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *October 2020. Virtual seminar due to COVID-19.*
136. University of Massachusetts Amherst, Chemistry Department, Amherst, MA. "Molecular design blueprints: catalysts and principles from new simulation and machine learning tools". *October 2020. Virtual seminar due to COVID-19.*
135. ICTP – East African Institute for Fundamental Research, Kigali, Rwanda. "DFT+U and beyond for recovering exact conditions and improving properties in correlated materials". *September 2020.*
134. Molecular Modeling & Materials Design (M3DC) "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *July 2020. Virtual symposium.*
133. 2020 Pittsburgh Quantum Institute Annual Symposium, Pittsburgh, PA. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *July 2020.* **Plenary** *Postponed & made virtual due to COVID-19.*
132. University of Delaware, Chemical Engineering Virtual Seminar Series "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *June 2020.*
131. Low-scaling and Unconventional Electronic Structure Techniques, Telluride, CO. "Diagnosing strong correlation with machine learning". *June 2020. Held virtually due to COVID-19.*
130. ML4Science, Virtual Seminar Series hosted by Stefano Sanvito, Trinity College Dublin. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *May 2020.*
129. Netherlands' Catalysis and Chemistry Conference (NCCC), Noordwijkerhout, Netherlands. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *March 2020.* **Keynote**
128. UC Merced, Chemistry Department, Merced, CA. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *January 2020.*
127. UC Berkeley, Chemical & Biomolecular Engineering Department, Berkeley, CA. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *January 2020.*
126. Cornell University, Chemical & Biomolecular Engineering, Ithaca, NY. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *January 2020.*
125. UC San Diego, Chemistry Department, San Diego, CA. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *January 2020.*
124. Stanford University, Chemical Engineering, Stanford, CA. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *January 2020.*
123. Helsinki Winter School on Inorganic Chemistry, Helsinki, Finland. "Machine learning for accelerating discovery in inorganic chemistry" and "Approximate density functional theory for transition metal chemistry – Parts 1 and 2". (three lectures) *December 2019.*
122. Materials Research Society Fall Meeting, Boston, MA. "Accelerating Discovery in Inorganic Chemistry with Machine Learning". *December 2019.*
121. Clemson University, Chemical & Biomolecular Engineering Department, Clemson, SC. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *November 2019.*
120. American Institute of Chemical Engineers National Meeting, Orlando, FL. Area 1A/COMSEF "Spotlights in Thermodynamics and Computational Molecular Science." "Exploiting Electronic Structure and Machine Learning Models for Discovery in Transition Metal Chemistry". *November 2019.*
119. NanoGE Conference, Berlin, Germany. "Electronic Structure Origins of Surface-Dependent Growth in III-V Quantum Dots." *November 2019.*
118. North Dakota State University, Chemistry Department, Fargo, ND. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *October 2019.*
117. Northwestern University, Catalysis Center, Evanston, IL. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *October 2019.*
116. Northwestern University, Chemical & Biological Engineering Department, Evanston, IL. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *October 2019.*
115. "Interpretable Learning in Physical Sciences" workshop, Institute for Pure and Applied Mathematics (IPAM), UCLA, Los Angeles, CA. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *October 2019.*
114. Saville lecture, Princeton University, Chemical and Biological Engineering Department, Princeton, NJ. "Molecular

design blueprints: materials and catalysts from new simulation and machine learning tools". *October 2019*. **Named lecture**
113. Soft matter seminar, Columbia University, Chemical Engineering Department, New York, NY. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *September 2019*.
112. Pennsylvania State University, Physical Chemistry Seminar, State College, PA. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *September 2019*.
111. University of Michigan, Chemical Engineering Department, Ann Arbor, MI. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *September 2019*.
110. University of Pittsburgh, Chemical Engineering Department, Pittsburgh, PA. "Accelerating the computational discovery of catalyst design rules and exceptions with machine learning". *September 2019*.
109. Central Michigan University, Physics Department, Mt. Pleasant, MI. "Molecular design blueprints: materials and catalysts from new simulation and machine learning tools". *September 2019*.
108. 258th American Chemical Society Meeting, San Diego, CA. "AAAS Marion Milligan Mason Awardees" symposium "Predicting properties, learning design rules, and accelerating discovery in inorganic chemistry with computational chemistry" *August 2019*.
107. 258th American Chemical Society Meeting, San Diego, CA. COMP "Elucidating reaction mechanisms with computational and experimental chemistry" symposium "High-throughput first-principles and machine learning discovery of open-shell transition metal catalyst design rules." *August 2019*.
106. 258th American Chemical Society Meeting, San Diego, CA. BIOL/COMP "Frontiers in interdisciplinary research: new paradigms for integration of theory and experiment" symposium "Understanding the protein's role in substrate positioning and reactivity with simulation: the case of SyrB2/SyrB1" *August 2019*.
105. 258th American Chemical Society Meeting, San Diego, CA. PHYS Division Award Symposium: The Journal of Physical Chemistry Lectureship. "Predicting properties, learning design rules, and accelerating discovery in inorganic chemistry with computational chemistry". *August 2019*.
104. 2019 International Materials Research Society Symposium on AI for Materials, Cancun, Mexico. "Transition metal chemical space exploration: artificial intelligence for first-principles design". *August 2019*.
103. DARPA Accelerated Molecular Discovery PI meeting, Arlington, VA. "Adaptive-focus topological features for machine-learning-driven discovery of 2D coordination polymers." *August 2019*.
102. Energy Frontier Research Center PI meeting, Washington, DC. "Inorganometallic Catalyst Design Center: Theory Driving Next-Generation Catalyst Design." *July 2019*.
101. International Society for Theoretical Chemical Physics X, Tromsø, Norway. "Transition metal catalyst discovery with high-throughput screening and machine learning." *July 2019*.
100. Molecular Kinetics: Sampling, Design and Machine Learning (MolKin2019), Berlin, Germany. "Machine learning models for accelerated discovery in transition metal chemistry." *June 2019*.
99. Eni S.p.A. PI meeting, Milan, Italy. "OFR Calculator." *June 2019*.
98. 102nd Canadian Chemistry Conference and Exhibition, Quebec, Canada. "Designing in the face of uncertainty: exploiting electronic structure and machine learning models for discovery in inorganic chemistry." *June 2019*.
97. Silicon Therapeutics, Boston, MA. "Accelerating discovery with machine learning and high throughput screening." *May 2019*.
96. Emory University, Chemistry Department, Atlanta, GA. "Transition metal chemical space exploration: artificial intelligence for first-principles design ." *April 2019*.
95. 257th American Chemical Society Meeting, Orlando, FL. COMP "Machine Learning in Chemistry" "Accelerating discovery in inorganic chemistry with machine learning" *April 2019*.
94. 257th American Chemical Society Meeting, Orlando, FL. COMP "Probing
Reactive Intermediates through Chemical Computations" "Discovering and breaking design rules in single-site catalysis with new computational tools" *April 2019*.
93. Washington State University, Chemical Engineering Department, Chemistry Department, and CIRC Joint Colloquium, Pullman, WA. "Designing in the face of uncertainty: exploiting electronic structure and machine learning models for discovery in transition metal chemistry." *March 2019*.
92. MIT Center for Computational Engineering Symposium, Cambridge, MA. "Exploiting electronic structure and machine learning models for discovery in transition metal chemistry." *March 2019*.
91. Hebrew University of Jerusalem, Jerusalem, Israel. "Exploiting electronic structure and machine learning models for discovery in transition metal chemistry." *February 2019*.
90. Tel Aviv University, Tel Aviv, Israel. "Exploiting electronic structure and machine learning models for discovery in transition metal chemistry." *February 2019*.
89. 84th Annual Meeting of the Israel Chemical Society. Tel Aviv, Israel. "Transition metal chemical space exploration:

artificial intelligence for first-principles design .” *February 2019*. **Keynote**
88. Ben Gurion University of the Negev, Beersheba, Israel. “Designing in the face of uncertainty: exploiting electronic structure and machine learning models for discovery in transition metal chemistry.” *February 2019*.
87. Weizmann Institute of Science, Rehovot, Israel. “Recovering exact conditions at semi-local DFT cost to mitigate energy and density errors for transition metal chemistry.” *February 2019*.
86. University of Minnesota, Chemistry Department, Minneapolis, MN. “Accelerating discovery in transition metal catalysis with machine learning and computational chemistry.” *January 2019*.
85. Exxon-Mobil, Annandale, NJ. “Accelerating Catalyst Discovery with Machine Learning.” *January 2019*.
84. AAAS Marion Milligan Mason Award ceremony, Washington D.C. “Chemistry in a computer: a new era for molecular design.” *December 2018*.
83. 1st International Symposium on Chemical Concepts from Theory and Computation (CCTC2018), Changsha City, China. “Systematically improvable QM/MM with concepts from conceptual DFT.” *December 2018*.
82. Special symposium “Interdisciplinary research in the fields of machine learning and computational chemistry” in conjunction with Löwdin lectures, Uppsala University, Sweden. “Advancing inorganic discovery with machine learning.” *November 2018*.
81. Telluride workshop on "Machine Learning and Informatics for Chemistry and Materials", Telluride, CO. “Machine learning in inorganic chemistry.” *October 2018*.
80. "Electronic structure theory in molecular spintronics" workshop, Donostia-San Sebastian, Spain. “Overcoming functional sensitivity in DFT predictions of spin state ordering.” *September 2018*.
79. Resnick Young Investigators Symposium 2018, Caltech, Pasadena, CA. “Accelerating Sustainable Inorganic Design with Machine Learning.” *September 2018*.
78. National Academy of Sciences, Engineering, and Medicine BCST “A Research Agenda for a New Era in Separations Science” Study Meeting. “Accelerating inorganic discovery with machine learning” *August 2018*.
77. 256th American Chemical Society Meeting, Boston, MA. YCC “Artificial Intelligence & The Chemical Enterprise” symposium. “Transition metal chemical space exploration: artificial intelligence for first-principles design” *August 2018*.
76. 256th American Chemical Society Meeting, Boston, MA. COMP “Recent Advances in DFT & TDDFT: Theory & Simulations” symposium. “Recovering exact conditions at semi-local DFT cost to mitigate energy and density errors for transition metal chemistry” *August 2018*.
75. 256th American Chemical Society Meeting, Boston, MA. COMP “Revolutionizing Chemistry with Artificial Intelligence” symposium. “Accelerating inorganic discovery with machine learning and automation” *August 2018*.
74. RIKEN, Tokyo, Japan. “Machine learning and large scale electronic structure for discovery.” *August 2018*.
73. 43rd International Conference on Coordination Chemistry (ICCC2018), Sendai, Japan. “Overcoming functional sensitivity in DFT predictions of spin state ordering.” *August 2018*.
72. Telluride workshop on "Multi-scale quantum mechanical analysis of condensed phase systems: methods and applications", Telluride, CO. “How systematic QM/MM modeling reveals enzymatic rate enhancements.” *July 2018*.
71. IAQMS 16-ICQC Satellite Meeting: Computational Chemistry Meets Artificial Intelligence, EPFL, Lausanne, Switzerland. “Accelerating inorganic discovery with machine learning.” *June 2018*.
70. Eni S.p.A. PI meeting, Milan, Italy. “OFR Calculator.” *June 2018*.
69. Low-scaling and Unconventional Electronic Structure Techniques, Telluride, CO. “Recovering exact conditions of electronic structure theory with semi-local DFT cost.” *June 2018*.
68. ETH Zürich, Theoretical Chemistry Colloquium, Zürich, Switzerland. “Computational strategies for inorganic design.” *May 2018*.
67. DOE CTC/CCS PI meeting, Gaithersburg, MD. “Recovering exact conditions with DFT for transition metal chemistry.” *May 2018*.
66. Pfizer, Cambridge, MA. “New computational tools for inorganic design.” *May 2018*.
65. Universal Display Corporation, Ewing, NJ. “New computational tools for inorganic design.” *April 2018*.
64. University of Washington, Chemistry Department, Seattle, WA. “New computational tools for inorganic molecular design.” *April 2018*.
63. Oklahoma State University, Chemical Engineering Department, Stillwater, OK. “New computational tools for inorganic molecular design.” *March 2018*.
62. 255th American Chemical Society Meeting, New Orleans, LA. “Uncovering the quantum mechanical origins of enzymatic catalysis with systematic QM/MM methods and accelerated, large-scale electronic structure.” *March 2018*.
61. 255th American Chemical Society Meeting, New Orleans, LA. “Choosing the right chemical representation for machine-learning-accelerated discovery and design in transition metal catalysis.” *March 2018*.
60. Michigan State University, Chemistry Department, East Lansing, MI. “New computational tools for inorganic molecular and materials design.” *February 2018*.

59. University of New Hampshire, Chemistry Department, Durham, NH. "New computational tools for inorganic molecular design." *February 2018*.
58. University of Southern California, Chemical Engineering and Materials Science Department, Los Angeles, CA. "New strategies for inorganic molecular and materials design." *January 2018*.
57. University of California, Irvine, Chemistry Department and CasTL CCI, Irvine, CA. "New strategies for inorganic molecular design with machine learning and automated simulation." *January 2018*.
56. University of Illinois – Urbana-Champaign, Chemical & Biomolecular Engineering Department, Urbana, IL. "New Computational Strategies for Inorganic Catalyst and Materials Design." *December 2017*.
55. Worcester Polytechnic Institute, Chemical Engineering Department, Worcester, MA. "New computational tools for inorganic molecular design." *November 2017*.
54. Boston Regional Inorganic Colloquium at Tufts University, Medford, MA. "New computational tools for inorganic molecular design." *October 2017*.
53. Brown University, Chemistry Department, Providence, RI. "New computational tools for inorganic molecular design." *September 2017*.
52. Corning Incorporated, Corning, NY. "New computational tools for inorganic molecular design." *July 2017*.
51. American Conference on Theoretical Chemistry, Boston, MA. "New computational tools for inorganic molecular design." *July 2017*.
50. MIT School of Engineering Dean's Faculty Lunch, Cambridge, MA. "Designing molecules with quantum mechanics and computation." *May 2017*.
49. MIT Chemical Engineering Visiting Committee, Cambridge, MA. "Computational tools for molecular design." *May 2017*.
48. Robert Bosch LLC, Cambridge, MA. "Predictive computational tools for discovery." *April 2017*.
47. 253rd American Chemical Society Meeting, San Francisco, CA. "New discovery tools for transition metal catalyst design." *April 2017*.
46. 253rd American Chemical Society Meeting, San Francisco, CA. "Understanding and eliminating delocalization error in transition metal chemistry." *April 2017*.
45. IHI Corporation Executive Briefing at MIT ILP, Cambridge, MA. "Computational tools for catalyst discovery." *December 2016*.
44. 4th International Conference on Molecular Simulation, Shanghai, China. "Quantifying electronic effects in enzyme active sites." *October 2016*.
43. EMN Theory Meeting, Las Vegas, NV. "Global and local curvature and delocalization error in DFT." *October 2016*.
42. Materials Theory Division Seminar in Uppsala University, Uppsala, Sweden. "Enabling predictive materials discovery with new computational and theoretical tools." *September 2016*.
41. 252nd American Chemical Society Meeting, Philadelphia, PA. "Automating discovery in inorganic chemistry." *August 2016*.
40. 252nd American Chemical Society Meeting, Philadelphia, PA. "Delocalization error in DFT for computational catalysis." *August 2016*.
39. International Society for Theoretical Chemical Physics IX, Grand Forks, ND. "Quantifying electronic effects in enzyme active sites." *July 2016*.
38. 251st American Chemical Society Meeting, San Diego, CA. "Computational catalysis: functional tuning meets automated discovery." *March 2016*.
37. MITEI Seed Fund Awardees Program Review, Cambridge, MA. "A computational toolbox for catalyst and materials design." *March 2016*.
36. 2015 Psi-k Meeting, San Sebastian, Spain. "Applications of large scale AIMD DFT: growth and structure of quantum dots." *September 2015*.
35. 250th American Chemical Society Meeting, Boston, MA. "Applications and some observations on large-scale DFT." *August 2015*.
34. MIT Information Systems & Technology All Hands Meeting, Cambridge, MA. "Computational Chemistry Research at MIT." *May 2015*.
33. AIChE New England Regional Meeting, Cambridge, MA. "Computational modeling, the research universe, and everything." *March 2015*.
32. ACS Central Eastern Regional Meeting, Pittsburgh, PA. "Efficient DFT-based modeling for catalysis." *October 2014*.
31. MIT Materials Processing Center Review, Cambridge, MA. "First-principles modeling for catalysis and materials." *October 2014*.
30. MIT Summer Research Program, Cambridge, MA. "Computational chemistry for biology, catalysis and materials science." *June 2014*.

29. GTC Express Webinar. "Challenges and advances for DFT on GPUs." *April 2014*.
28. Center for Nano Materials Colloquium, Argonne National Lab, Argonne, IL. "Efficient and accurate quantum chemistry for biological systems." *December 2013*.
27. Cooper Union Colloquium, New York, NY. "Computational chemistry for biology, catalysis, and materials science." *October 2013*.
26. LLNL CCMS Summer School Colloquia, Livermore, CA. "The Practioner's Guide to Density Functional Theory" and "Life, the Universe and Everything: Efficient and Accurate Quantum Chemistry for Biological Systems." *June 2013*.
25. CanBIC-4 4th Georgian Bay International Conference on Bioinorganic Chemistry, Parry Sound, Ontario, Canada. "Simulations reveal how substrate placement influences reactivity in non-heme Fe(II) halogenases." *May 2013*.
24. University of Illinois – Urbana-Champaign, Chemical & Biomolecular Engineering Department, Urbana, IL. "Predictive and fast: new first-principles tools for catalysis." *March 2013*.
23. Massachusetts Institute of Technology, Chemical Engineering Department, Cambridge, MA. "Predictive and fast: new first-principles tools for catalysis." *March 2013*.
22. University of Washington, Chemical Engineering Department, Seattle, WA. "Predictive and fast: new first-principles tools for catalysis." *February 2013*.
21. Columbia University, Chemical Engineering Department, New York, NY. "Predictive and fast: new first-principles tools for catalysis." *February 2013*.
20. New Jersey Institute of Technology, Chemical, Biological & Pharmaceutical Engineering Department, Newark, NJ. "Predictive and fast: new first-principles tools for materials and catalyst design." *February 2013*.
19. Yale University, Chemical Biology Institute & Chemical Engineering Department, New Haven, CT. "Predictive and fast: new first-principles tools for biological catalysis." *February 2013*.
18. Pennsylvania State University, Chemistry Department, University Park, PA. "Predictive and fast: new first-principles tools for biological catalysis." *February 2013*.
17. Washington University in St. Louis, Mechanical Engineering & Materials Science Department, St. Louis, MO. "Predictive and fast: new first-principles tools for materials and catalyst design." *February 2013*.
16. University of Minnesota, Chemical Engineering & Materials Science Department, Minneapolis, MN. "Predictive and fast: new first-principles tools for materials and catalyst design." *February 2013*.
15. Johns Hopkins University, Materials Science & Engineering Department, Baltimore, MD. "Predictive and fast: new first-principles tools for materials and catalyst design." *January 2013*.
14. Rensselaer Polytechnic Institute, Chemical & Biological Engineering Department, Troy, NY. "Predictive and fast: new first-principles tools for catalysis." *January 2013*.
13. Carnegie Mellon University, Materials Science & Engineering and Chemical Engineering Departments, Pittsburgh, PA. "Predictive and fast: new first-principles tools for materials and catalyst design." *January 2013*.
12. University of Delaware, Chemical Engineering Department, Newark, DE. "Predictive and fast: new first-principles tools for catalysis." *January 2013*.
11. University of California Davis, Chemical Engineering & Materials Science Department, Davis, CA. "Predictive and fast: new first-principles tools for materials and catalyst design." *December 2012*.
10. University of Rochester, Chemical Engineering Department, Rochester NY. "Predictive and fast: new first-principles tools for materials and catalyst design." *December 2012*.
9. Boston University, Chemistry Department, Boston, MA. "Predictive and fast: new first-principles tools for materials and catalyst design." *November 2012*.
8. Theory seminar, University of North Carolina, Chemistry Department, Chapel Hill, NC. "Recent developments in Hubbard-augmented DFT." *October 2012*.
7. Theory seminar, Duke University, Chemistry Department, Durham, NC. "Predictive enzyme catalysis with quantum chemistry on GPUs." *October 2012*.
6. Theory seminar, Wake Forest University, Physics Department, Winston-Salem, NC. "Recent developments in Hubbard-augmented DFT." *October 2012*.
5. University of Illinois – Chicago, Chemical Engineering Department, Chicago, IL. "Predictive and fast: new first-principles tools for transition-metal catalysis." April 2012.
4. University at Buffalo, Chemical Engineering Department, Buffalo, NY. "Predictive and fast: new first-principles tools for transition-metal catalysis." *March 2012*.
3. Theory seminar, University of Pennsylvania, Chemistry Department, Philadelphia, PA. "Recent developments in Hubbard-augmented DFT+U." *February 2012*.
2. Drexel University, Chemical Engineering Department, Philadelphia, PA. "Predictive and fast: new first-principles tools for transition-metal catalysis." *February 2012*.
1. Rutgers University, Chemistry Department, Newark, NJ. "Predictive and fast: new first-principles tools for transition-

metal catalysis." *January 2012*.

SELECTED CONTRIBUTED PRESENTATIONS

11. 26th North American Catalysis Society Meeting (NAM), Chicago, IL. "Understanding spin-active-site-activity relationships in open-shell SACs with first principles modeling." *June 2019*.
10. 11th Triennial Congress of the World Association of Theoretical and Computational Chemists, Munich, Germany. "Recovering the flat plane condition in electronic structure theory at semi-local density functional theory cost." *August 2017*.
9. American Physical Society March Meeting, New Orleans, LA. "New discovery tools for molecular materials design." *March 2017*.
8. American Institute of Chemical Engineers National Meeting, San Francisco, CA. "Global and local curvature in density functional theory and delocalization errors." *November 2016*.
7. American Chemical Society Meeting, Boston, MA. "Substrate positioning in catalysis: catechol *O*-methyltransferase." YI Symposium. *August 2015*.
6. American Institute of Chemical Engineers National Meeting, Atlanta, GA. "+U for small basis sets." *November 2014*.
5. American Institute of Chemical Engineers National Meeting, Atlanta, GA. "Lignin depolymerization dynamics." *November 2014*.
4. American Chemical Society Meeting, San Francisco, CA "Advances and challenges for DFT on GPUs." *March 2014*.
3. American Physical Society March Meeting, Denver, CO "Challenges and advances for DFT on GPUs." *March 2014*.
2. American Institute of Chemical Engineers National Meeting, San Francisco, CA. "Tuning reaction pathways for first-principles catalyst design." *November 2013*.
1. American Institute of Chemical Engineers National Meeting, San Francisco, CA. "Not just a fitting parameter: the untold story of DFT+U." *November 2013*.

GRANTS RECEIVED ($17.84M)

External funding ($16.25M)

Pfizer, 09/15/26-09/14/27 $319,500
Machine Learning for Modeling of Lipid Oxidation and RNA Adduct Formation

SynQor Efficiency Fund, 09/01/26-08/31/27 $127,455
LLM-Driven Extraction of Stability & Durability Metrics to Design MOF-Based Mixed-Matrix Membranes for Point-Source CO_2 Capture

National Science Foundation, 09/01/26-08/31/31 – *only amount to Kulik shown* $1,250,000
NSF Center for Molecularly Optimized Networks
(Steve Craig, Duke PI; Kulik co-PI)

American Chemical Society Petroleum Research Fund, 09/01/26-08/31/28* $125,000
Enabling robust and accurate computational discovery of bioinspired binuclear C-H activation catalysts

Defense Threat Reduction Agency, 02/26/25-08/25/26 $200,000
Discovering Highly-Stable Materials for Adsorption and Catalytic Decontamination of C-WMDs

National Institutes of Health, 08/01/24-07/31/29 $1,987,000
Revealing Nature's Blueprints for Single-Site Catalysis of C–H Activation with First-principles Modeling and Machine Learning

Murata LLC, 05/01/24-04/30/27 $592,052
Computational Discovery of Metal-Organic Frameworks for Direct Air Capture

Defense Advanced Research Projects Agency, 09/25/23-09/24/24 $127,787
Metal-Free Mechanically Interlocked Junctions through Organic Dative Covalent Bonds
(Jeremiah Johnson, MIT PI; Kulik co-PI) – only amount to Kulik shown

Technical University of Munich*, 12/01/23-11/30/26 $120,000
Systematically Improvable Modeling of Electrochemical Processes, Hans Fischer Senior Fellowship

Dow Chemical, 09/01/23-08/31/26 $823,624
Developing a 3D Structure Encoder for Deep Learning Methods to Discover a Sn-free Catalyst

Department of Energy, 08/01/23-07/31/27 $525,000
Multi-scale modeling for time-dependent phenomena in the condensed phase

Department of Energy, 08/01/22-07/31/26 $787,500
The Center for Enhanced Nanofluidic Transport (CENT)
(Michael S. Strano, MIT PI; Kulik co-PI)

National Science Foundation, 09/01/21-08/31/26 $1,160,000
NSF Center for Molecularly Optimized Networks
(Steve Craig, Duke PI; Kulik co-PI) – only amount to Kulik shown
Department of Energy, 09/01/21-08/31/25 $700,000
Large-scale algorithms and software for modeling chemical reactivity in complex systems
(Martin Head-Gordon, UC Berkeley PI; Kulik co-PI) – only amount to Kulik shown
Sloan Foundation, 09/01/21-08/31/25 $75,000
Alfred Sloan Fellowship in Chemistry
Department of Energy, 09/01/20-8/31/24 $8,550,000
CESMIX: Center for the Exascale Simulation of material Interfaces in Extreme Environments
(Youssef Marzouk, MIT PI; Kulik co-PI) – approx. $600,000 to Kulik
Office of Naval Research, 03/01/20-02/29/24 $800,000
A Database for Functional Transition Metal Complex Discovery
National Science Foundation CAREER, 06/1/19-05/31/25 $593,678
CAREER: Revealing spin-state-dependent reactivity in open-shell single atom catalysts with systematically-improvable computational tools
DARPA Young Faculty Award and Director's Fellowship, 6/30/18-6/30/22 $875,000
Adaptive-focus topological features for machine-learning-driven discovery of 2D coordination polymers
Exxon Mobil, 11/01/19-04/30/21 $171,544
Bio-inspired computational catalyst design
AAAS Marion Milligan Mason Award*, 12/13/18-12/12/21 $50,000
Navigating Transition Metal Chemical Space: Artificial Intelligence for First-Principles Design
Department of Energy, 08/01/18-7/31/22 $440,000
Inorganometallic Catalyst Design Center (ICDC)
(Laura Gagliardi, U. Minnesota PI; Kulik co-PI)
Department of Energy, 08/01/18-7/31/22 $480,000
The Center for Enhanced Nanofluidic Transport (CENT)
(Michael S. Strano, MIT PI; Kulik co-PI)
Office of Naval Research Young Investigator Program, 06/01/18-08/31/22 $510,000
Adaptive-Resolution Chemical Discovery Strategies for Precise and Fast Computer-Aided Transition Metal Complex Design
Office of Naval Research, 09/01/17-10/31/21 $450,000
Computer-aided design of functional transition metal complexes
Department of Energy, 09/01/17-09/30/21 $292,725
Simultaneous mitigation of density and energy errors in approximate DFT for transition metal chemistry
National Science Foundation, 08/01/17-07/31/21 $317,245
Enabling high-throughput computational discovery of stable and active single-site oxidation catalysts
Eni S.p.A, 06/01/17-05/31/20 $500,000
OFR calculator
Robert Bosch, LLC, 05/01/17-04/30/19 $250,000
Developing new methods for the accurate ionization potential calculation in polymer electrolyte modeling for energy storage
National Science Foundation, 09/01/14-02/15/19 $433,333
SNM: Knowledge-based continuous and scalable manufacture of quantum dots
(Klavs F Jensen, MIT PI; Kulik co-PI w/ Moungi Bawendi, MIT)
Burroughs Wellcome Fund*, 07/01/12-6/30/22 $500,000
Deciphering the role of the protein scaffold in enzyme catalysis with fast and accurate computation

Internal funding ($1.27M)

Wang Family Faculty Research Innovation Fund* 09/01/25-09/01/26 $125,000
Accelerating Enzyme Simulation with a Biochemical Hierarchy of Neural Network Potentials
ORCD Seed Grant 06/01/25-12/01/25 $15,500
Accelerating enzyme simulation with a biochemical hierarchy of neural network potentials
MIT Energy Initiative Chuck Cahn Award* 01/01/25-12/31/26 $119,000

Computational Optimization of Metal-Organic Frameworks for CO2 Direct Air Capture and Conversion with Active Learning

Simon Family Faculty Research Innovation Fund* 04/01/23-03/31/24 $100,000
Understanding the Human Element in Chemical Discovery

2022 Abdul Latif Jameel Water and Food Systems Lab (J-WAFS) Seed Fund* 09/01/22-08/31/24 $150,000
In Silico Discovery of Metal–Organic Frameworks for Selective Ion Separation

MIT-Israel Broshy Brain and Cognitive Sciences Fund Grant* 05/01/22-01/31/24 $29,975
Understanding the behavioral decision making behind chemical discoveries

MIT-Portugal Program Seed Fund 06/01/22-05/31/23 $100,000
Engineering Metal-Organic Frameworks for Stability in Gas Storage Applications

NIH Center for Environmental Health Sciences Pilot Grant 09/01/17-08/31/18 $39,000
Quantum mechanical contributions to methyltransferase inhibition

MIT-RSC NEC Corporation Grant* 09/01/17-08/31/18 $75,000
New computational tools for unveiling electronic contributions to rate enhancements in methyltransferases

MIT Energy Initiative Seed Grant 06/01/17-05/31/19 $150,000
Next generation quantitative structure property relationships for lubricants from machine learning and advanced simulation
(Kulik PI; w/ co-PI: Youssef Marzouk, MIT)

MISTI-Israel Ben Gurion Seed Grant* 01/01/17-08/31/18 $19,525
New Tools for Predictive Computational Catalysis Through Collaboration
(Kulik PI; w/ co-PI: Sebastian Kozuch, Ben Gurion University of the Negev)

Ibn Khaldun Faculty Award* 09/01/16-08/31/17 $20,000
Theoretical prediction of protein-substrate interactions

MIT-RSC Reed Grant* 09/01/14-08/31/15 $75,000
Screening for catalyzable bonds in highly heterogeneous feedstocks

MIT Energy Initiative Seed Grant 04/01/14-09/30/15 $150,000
New computational tools for direct methane-to-methanol catalyst design

*All funds are only portion allocated to Kulik, amount includes indirect costs unless indicated by *, in which case funds are not subject to overhead.*

Computing proposals

DOE NERSC allocation 01/21/26-01/19/27
Leveraging Multiscale Approaches for Challenging Problems in Materials Discovery
115,082 CPU node hours and 117,447 GPU node hours

NSF ACCESS renewal 10/01/25-09/30/26
Developing Accurate Materials Design Strategies Across Method- and Length-Scales
7.00M CPU core hours + 33.1k GPU hours SDSC Expanse (est. value $53,657.85)

DOE NERSC allocation 01/15/25-01/20/26
Leveraging Multiscale Approaches for Challenging Problems in Materials Discovery
10,000 CPU node hours

NSF ACCESS renewal 10/01/24-09/30/25
Developing Accurate Materials Design Strategies Across Method- and Length-Scales
4.31M CPU core hours + 74.75k GPU hours SDSC Expanse (est. value $68,319.44)

NSF ACCESS renewal 07/01/23-10/02/24
Developing Accurate Materials Design Strategies Across Method- and Length-Scales
5.92M SUs SDSC Expanse (est. value $26,215.80) + 2M SU supplement

NSF ACCESS supplement 12/01/22-06/30/23
Developing Accurate Materials Design Strategies Across Method- and Length-Scales
4.55M SUs SDSC Expanse

NSF XSEDE renewal 07/01/22-06/30/23
Developing Accurate Materials Design Strategies Across Method- and Length-Scales
2.96M SUs SDSC Expanse 1k SUs on Comet GPU (est. value $14,109.78)

NSF XSEDE renewal 07/01/21-06/30/22
Developing Accurate Materials Design Strategies Across Method- and Length-Scales

1.05M SUs SDSC Comet, 19k SUs on Bridges GPU, 55k SUs on Comet GPU
NSF XSEDE renewal 07/01/20-06/30/21
Developing Accurate Materials Design Strategies Across Method- and Length-Scales
1.05M SUs SDSC Comet, 19k SUs on Bridges GPU, 55k SUs on Comet GPU
NSF XSEDE renewal 04/01/19-06/30/20
Developing Accurate Materials Design Strategies Across Method- and Length-Scales
382k SUs SDSC Comet, 15k SUs on Bridges GPU, 72k SUs on Comet GPU (est. value $28,830.39)
NSF XSEDE renewal 10/01/17-03/31/19
Developing Accurate Materials Design Strategies Across Method- and Length-Scales
1.1M SUs SDSC Comet, 100k SUs on XStream (est. value: $51,276.04)
NSF XSEDE renewal 10/01/16-09/30/17
Catalytic Mechanism Discovery with First-Principles Simulation: From Enzymes to Heterogeneous Catalysis
617k SUs SDSC Comet, 200k SUs on Maverick, 68k SUs on XStream (est. value: $25,764.59)
NSF XSEDE renewal 10/01/15-09/30/16
Identifying contributions to the free-energy landscape of enzyme-substrate complex dynamics: the case of Catechol O-Methyltransferase
915k SUs SDSC Comet, 915k SUs Stampede, 100k SUs on Maverick (est. value: $63,874.31)
NSF XSEDE 07/01/14-06/30/15
Probing the structure of early-stage reactive intermediates in the growth of Indium Phosphide Quantum Dots with collisionally-accelerated MD and path-based sampling
250k SUs on Maverick (est. value: $8,587.37)
Argonne CNM 04/29/14-05/28/15
Indium Phosphide Growth at Early Stage from Precursors Molecules: A collisionally-accelerated ab initio Molecular Dynamics Study
170k CPU hours

STUDENTS SUPERVISED

Graduate Students

Current

2025- Ayleen Farnood, CSE
2025- Gigi (Yiran) Wang, ChemE
2025- Heecheol Jang, ChemE
2025- Panagiotis Panagopoulos Papageorgiou, ChemE
2025- Soonhyun Kwon, NSE
2024- Yuzhe Wang, Chemistry (co-advised with Jeremiah Johnson)
2024- Elizabeth Sebastian, Chemistry
2024- Tatiana Nikolaeva (TU Munich Ph.D., co-advised with Christopher Stein)
2024- Aaron Garrison, ChemE
2024- Anh Nguyen, ChemE
2023- Weiliang Luo, Chemistry
2023- Jacob Toney, ChemE
2023- Melissa Manetsch, ChemE (co-advised with Yuriy Roman)
2023- Akash Ball, ChemE
2022- Roland St. Michel II, DMSE

Past

2022-26	Changhwan Oh, DMSE	(Ph.D. '26; PD UCLA)
2021-26	Xiao Huang, Chemistry	(Ph.D. '26; Consultant, McKinsey & Associates)
2020-26	Husain Adamji, ChemE	(Ph.D. '26; Machine learning engineer, Radical AI)
2021-25	David Kastner, BE	(Ph.D. '25; Founding member of technical team, Voltaris, Inc.)
2021-25	Allison Keys, CSBi	(Ph.D. '25; Senior Research Scientist, Genesis Therapeutics)
2020-25	Gianmarco Terrones, ChemE	(Ph.D. '25; Comp. Software Test Engineer, Ramona Optics)
2023-25	Oluremi Akindele, BE	(SM '25)
2019-25	Daniel B. K. Chu, ChemE	(Ph.D. '25; Tel Aviv University Postdoctoral Fellow)

2019-24	Hao-Jun Jia, Chemistry	(Ph.D. '24; Founder, Deep Principle, Shenzhen, China)
2018-23	Vyshnavi Vennelakanti, Chemistry	(Ph.D. '23; PD Max Planck Institute, DeBeer/Neese groups)
2018-23	Naveen Arunachalam, ChemE	(Ph.D. '23; ML Scientist, Nosis Bio)
2017-23	Aditya Nandy, Chemistry	(Ph.D. '23; TT Asst. Prof. UCLA)
2017-22	Chenru Duan, Chemistry	(Ph.D. '22: Founder, Deep Principle, Shenzhen, China)
2016-21	Akash Bajaj, DMSE	(Ph.D. '21; Data Scientist, Dublin, Ireland)
2016-21	Rimsha Mehmood, Chemistry	(Ph.D. '21; Senior Scientist, Merck)
2018-21	Daniel Harper, Chemistry	(S.M. '21; Consultant at Sage Analysis)
2018-20	Mengyi Wang, DMSE	(S.M. '20; Ph.D. student, Penn State)
2015-19	Jon Paul Janet, ChemE	(Ph.D. '19; Associate Director, Astra-Zeneca)
2014-19	Helena W. Qi, Chemistry	(Ph.D. '19; Principal Scientist, Pfizer)
2015-18	Terry Z. H. Gani, ChemE	(Ph.D. '20; Senior scientist, Cabot Corporation)
2014-18	Qing Zhao, MechE	(Ph.D. '18; TT Asst. Prof. Northeastern ChemE)
2015-17	Yusu Liu, DMSE	(Ph.D. '19 Grossman lab; Quant. Rsrcher., Weiss Asset Mgmt.)
2014-16	Lisi Xie, ChemE	(Ph.D. '16; Lam Research)
2013-16	Efthymios I. Ioannidis, ChemE	(Ph.D. '16; MIT MBA '18, Co-founder Homli)
2013-15	Natasha Seelam, ChemE	(Ph.D. '21 Tidor lab; MindsDB)

Postdoctoral Associates

Current

2026-	Huiwon Jang	
2025-	Ethan Curtis (co-advised with Troy VanVoorhis)	
2025-	Beck Miller	

Past

2024-26	Daniel Mukasa	
2022-25	Clorice Reinhardt	(TT Asst. Prof. Dept. of Chemistry, U. Vermont)
2021-25	Ilia Kevlishvili	(TT Asst. Prof., Dept. of Chemistry & Biochemistry, Baylor U.)
2022-24	Matt Rivera	(Chief Technical Officer, First Light Solutions, Inc.)
2021-24	Yeongsu Cho	(TT Asst. Prof., Dept. Chemistry, U. Houston)
2021-24	Ralf Meyer	(Postdoctoral Associate, U. Graz)
2021-23	Shuwen Yue	(TT Asst. Prof., Dept. of Chem. Eng., Cornell University)
2021-22	Isuru Ariyarathna	(Feynman Distinguished Postdoc. Fellow, LANL)
2020-22	Azadeh Nazemi	(Senior Scientist, Pfizer)
2020-22	Mingjie Liu	(TT Asst. Prof., Dept. of Chemistry, University of Florida)
2020-22	Yael Cytter	(Research Scientist in Israel)
2020-21	Yashraj Kulkarni	(Postdoctoral Associate, University of Copenhagen)
2019-21	Michael Taylor	(Staff Scientist, LANL)
2018-20	Jing Yang	(Assoc. Prof., Dept. of Chem. Eng., Sun Yat-sen University)
2018-20	Zhongyue Yang	(TT Asst. Prof., Dept. of Chemistry, Vanderbilt Univ.)
2017-20	Fang Liu	(TT Asst. Prof., Dept. of Chemistry, Emory Univ.)
2018-19	Tzuhsiung Yang	(TT Asst. Prof., Dept. of Chemistry, National Tsing Hua Univ.)
2016-18	Jeong Yun Kim	(Scientist, Samsung, Korea)
2014-15	Niladri Patra	(Assoc. Prof., Dept. of Chemistry, IIT Dhanbad)

Visiting Faculty

Current

2025-26	Hongliang Xin (Virginia Tech)

Past

2024	Egil de Brito Sa (UFPI, Brazil)
2022	Yongchul Chung (Busan National University, Korea)
2016	Alexandre Rocha Reilly (Universidade Estadual Paulista, Brazil)

Visiting M.S., Ph.D. Students, and Postdoctoral Associates

Current

2026	Taekgi Lee (B.S./M.S. student Busan National University with Y. G. Chung)

Past

2025-26	Giorgia Brosio (IIT, Ph.D. student with M. DeVivo)
2025	Samir Darouich (U. Stuttgart, Ph.D. student with J. Kastner/M. Niepert)
2025	Huiwon Jang (KAIST, Ph.D. student with Jihan Kim)
2025	FangZi Liu (ShanghaiTech University, Ph.D. student with KaKing Yan)
2024	Kwanchanok Kaewkwan (M.S. Boodsarin Sawotlon, Chulalongkorn University, Thailand)
2024	Mohamed El-Safy (Ph.D. David Balcells, UiO, Norway)
2024	Jose Caetano (Ph.D. MIT-Portugal)
2023-4	Jakob Teetz (Kulik lab M.S. ETH Zurich, Switzerland)
2023	Frederik Ørsted Kjeldal (Ph.D. Janus Juul Eriksen, DTU, Denmark)
2023	Sangeeta Rajpurohit (P.D. LBNL)
2023	Hannes Kneiding (Ph.D. David Balcells, UiO, Norway)
2022	Jonas Oldenstaedt (M.S. '22 TUM M.S.; now at TUM)
2019	Seyed Mohamad Moosavi (Ph.D. Berend Smit lab, EPFL, Switzerland, now U. Toronto)
2018-19	Sahasrajit Ramesh (Kulik lab M.S. '19 Oxford)
2018	Stefan Gugler (Kulik lab M.S. '18 ETH Zürich; now P.D. TU Berlin)

Undergraduate, High School Students

Current

2026	Ndeye Khadidiatou Mbodj (MSRP BIO student)
2026	Joel Kai Chen (Caltech SURF student)
2026	Amelia England (GaTech visiting undergraduate student)
2026	Zheming Zhang (Course X UROP)
2026	Kimberley Sun (Hutchins Science Scholar, Lawrenceville High School, Lawrenceville NJ)
2026	Emma Tao (Course X UROP)
2025-	Ryan Jang (Course V UROP)
2025-	Ching-Chiao (Brian) Ma (Course X UROP)
2025-	Sebastian Pujet

Past

2026	David Sauer (Harvard)
2023-5	Tigest Aboye
2025	Natalie Kozlowski
2025	Thanchon Boonkrong
2025	Hana Sousa
2025	David Flores (MSRP Student, via Penn State)
2025	Lauren Wright (MSRP student, via LSU)
2025	Felipe de Faria Texeira (WPI)
2025	Gerel Bayarmagnai
2023-5	Shih-Peng Huang*, MIT 5/6-3 UROP
2024-5	Sukrith Velmineti, MIT Class of 2027
2023-4	Almira Nurlanova, MIT 5 UROP, Class of 2027
2024	Davut Muhammetgulyyev, MIT 6-3 UROP, Class of 2027
2024	Gozel Dovranova, MIT 10-ENG UROP, Class of 2026
2024	Porter Bowen, MIT 10 UROP, Class of 2025
2024	Sunwoo Lee, MIT UROP, Class of 2027
2024	Gabriel Sanchez, MIT UROP, Class of 2027
2024	Terence Oscar-Okpala, MIT MSRP-BIO
2023-24	Wilson Ho, MIT 6-7 UROP
2024	Joey Lin, MIT Class of 2027
2024	Husam Elnager, MIT Class of 2027
2023	Titus Tsai, MIT 5 UROP
2023	Shaheer Syed, MIT MSRP-BIO (B.S. '24, Mount St. Mary's University, Post-Bac NIH)

2023	Alondra Hernandez*, MIT 10-ENG UROP	
2022-23	Maximiliano Martinez, MIT 10-ENG UROP	
2022-23	Mugyeom Jeon*, MIT 5 UROP	
2022-23	Jelissa Kamguem*, MIT MSRP (Lafayette College U.G. thesis '23, now: Cornell Ph.D.)	
2021-23	Freya Edholm*, MIT 10 UROP (S.B. '23, now: CSE M.S. '24 MIT)	
2022	Hongqian Zheng, UG via USTC	(now: Berkeley Ph.D.)
2022	Grace Li*, MIT 6-3 UROP	
2022	Rafa Chavez, MIT UROP	
2022	Bryan Gough, MIT 20 UROP	
2022	David Gonzalez Narvaez*, MIT MSRP-BIO	(now: Columbia Ph.D.)
2021	Irem Kilic*, via Bogazici University	
2021	Adriana Ladera*, MIT MSRP	(UCF B.S. '22, now: MIT M.S.)
2021	Julian Liu*, MIT 8 UROP	(MIT S.B. '22)
2021	Anna Bair, MIT 5 UROP	(MIT S.B. '24 expected)
2020	Dechen Rota, MIT 10 UROP	(MIT S.B. '23 expected)
2020	Shuxin Chen*, MIT 10 UROP	(MIT S.B. '22)
2020	Conrad Goffinet*, MIT 10 UROP	(MIT MSCEP '22)
2018-20	Natalia Haljasz*, Harvard UROP	(B.S. Harvard, '21 expected)
2018-19	Ava Waggett, MIT 10 UROP	(MIT S.B. '19, now: U Washington Ph.D.)
2018	Eve Xu*, Wellesley exchange	(B.S. Smith, '20, now: Princeton Ph.D.)
2018	Sean Lin*, HS via Troy H.S.	(Troy H.S., '19, now: UC Berkeley UG)
2017-18	June Yang, MIT 10 UROP	(MIT S.B. '20)
2018	Demar Edwards, MIT 10 UROP	(MIT S.B. '21)
2017	Yu Jin, UG via Peking U.	(Peking U. UG '18, now: U Chicago Ph.D.)
2017	Lydia Chan*, HS via Troy H.S.	(Troy H.S. '18, now: Stanford UG)
2016-17	Maria Karelina*, MIT 6-7 UROP	(S.B. '17, now: Stanford Ph.D.)
2016	Naomi Bright, MIT 10 UROP	(MIT S.B. 10 '19)
2015-16	Kristen Eller, MIT 10 UROP	(S.B. '16, now: CU Boulder Ph.D.)
2015	Shouping Chen, UG via Tsinghua	(UC Berkeley Ph.D.)
2015	Jose Salcedo Perez, MIT-MSRP	(MIT Ph.D.)
2015	Stanley Ng*, Phillips Academy	(Imperial College UG)
2014	Zach Giaccone, UG via Holy Cross	
2014	John La, MIT 10 UROP	(MIT S.B. '18)

** indicates author on a published or in preparation Kulik group manuscript*

TEACHING

10.10 "Intro to Chemical Engineering" undergraduate chemical engineering core course co-instructor ('24, '26)

10.37 "Chemical kinetics & reactor design" undergraduate chemical engineering core course co-instructor ('17-)
Evaluations: *6.0/7.0 instructor, 5.7/7.0 course.*

10.637/10.437/5.697/5.698 "Quantum Chemical Simulation", renamed "Computational Chemistry" in 2017. Course designer for graduate/advanced undergraduate elective with 16 lectures, 8 hands-on labs using XSEDE resources. Enrollment is 30-40 students across engineering and science, crosslisted in chemistry and at Harvard University. ('14-)
Evaluations: *6.4/7.0 instructor, 6.3/7.0 course.*

10.65 "Chemical reactor engineering" graduate chemical engineering core course co-instructor ('14-16)

BIOS 203 "Introduction to Atomistic Simulation for Biochemical Applications" (Stanford University). Course designer and primary instructor for (2 hr lab / 1 hr lecture) course. Awarded $10k seed grant for course development (2013).

PROFESSIONAL AFFILIATIONS

American Chemical Society (2005-Present)
American Physical Society (2006-Present)
American Institute of Chemical Engineers (2012-Present)

Israel Chemical Society, Honorary lifetime member (2019-Present)
Materials Research Society (2004-Present)

CONSULTING

Universal Display Corporation, Ewing, NJ. 2018-19
Silicon Therapeutics/Roivant/Psivant, Boston, MA. Open Science Fellow 2020-24
Deep Principle, Shenzhen, China. Chief Scientist (Part time) 2026-

SERVICE

External

Advisory Councils and Boards

The Cooper Union Engineering Advisory Council (2020-)
DOE Chemical Sciences, Geosciences, and Biosciences Council Member (2021-)
SIMPLAIX (Heidelberg Institute for Theoretical Studies) Scientific Advisory Board (2022-)
IDREAM EFRC Scientific Advisory Board (2023-)
HeliECat – A Helicopter View on Electrocatalysis ERC Starting Grant Advisory Board (2026-)

Editorial service

Journal of the American Chemical Society Associate Editor (2025-).
ACS Central Science Editorial Board member (2025-).
Journal of the American Chemical Society Editorial Board member (2023-2025).
Catal Editorial Board member (2024-).
International Journal of Quantum Chemistry Editorial Board member (2018-).
Reaction Chemistry and Engineering Editorial Board member (2021-).
Molecular Systems Design & Engineering Advisory Board member (2022-).
Digital Discovery Advisory Board member (2022-).
Chem Advisory Board member (2023-)
Reaction Chemistry and Engineering Advisory Board member (2020-2021).
The Journal of Physical Chemistry Editorial Board member (2020-2022).
The Journal of Chemical Physics Editorial Board member (2021-2023).
Guest co-editor for special *Int. J. Quantum. Chem.* issue on "Advances in Simulating Solvation" (with Luca Frediani and Oliviero Andreussi)
Guest co-editor for special *Acc. Chem. Res.* issue on "Data Science Meets Chemistry" (with Matt Sigman)
Guest co-editor for special *J. Chem. Phys.* issue "Chemical Design by Artificial Intelligence" (with Dan Ess and Kim Jelfs)
Guest co-editor for *MRS Bulletin* on Machine Learning (with Pratyush Tiwary)
Guest co-editor for *Electronic Structure* issue on "Electronic Structure in Biology" (with Marc van der Kamp and Amir Karton)
Section editor for "Molecular Interactions and Catalysis" in "Comprehensive Computational Chemistry" (editors-in-chief: M. Yanez and R. Boyd) Major Reference Work (Elsevier Publishers)
Guest co-editor for *Chemical Reviews* issue on "Mechanochemistry" (with Jeff Moore and Kerstin Blank)

Conference organization and professional organization service

Chair for GRC on Computational Materials Science and Engineering with K. Thornton (2024)
Vice-chair for GRC on Computational Materials Science and Engineering with R. Ramprasad and K. Thornton (2022)
AIChE Annual Meeting session chair
-"Applications of DFT+X in Catalysis" session co-chair (2013)
-"Applications of DFT+X in Catalysis" session co-chair (2014)
-"Applications of DFT+X in Catalysis" session chair (2015)
-"New Developments in Computational Catalysis" session co-chair (2016)
-"New Developments in Computational Catalysis" session chair (2017)
-"Computational Catalysis" session co-chair (2018)
-"Software Engineering in and for the Molecular Sciences" CoMSEF session co-chair (2018)
-Data Science Topical co-chair (2019, 2020, 2021)
North American Catalysis Society Meeting abstract review (2017)

American Chemical Society presider CATL (Spring 2018), COMP (Fall 2018), session organizer "Data Science for Catalysis" CATL Spring 2019, session organizer ENFL Fall 2021
"Coding Solvation" NSF-MolSSI-funded workshop in Livorno, Italy co-organizer (2017)
New England Catalysis Society Regional Meeting co-organizer (2018)
AIChE Area 1A/CoMSEF Liaison (2019-2021)
ACS PHYS Councilor (2023-2025)
ACS PHYS Theoretical Chemistry Vice-chair (2025-)

Thesis Defense Opponent or Examiner

Iulia Brumboiu, Uppsala University, Uppsala, Sweden (2016)
Joshua Brown, University of Newcastle, New South Wales, Australia (2021)
Søren Meldgaard, Aarhus University, Aarhus, Denmark (2021)

Outreach

Faculty mentor and speaker for MIT Summer Research Program/MIT MSRP-BIO (2015, 2021-2025)
Faculty speaker for women in STEM at AIChE Regional meeting (2015)
MIT ACCESS weekend for underrepresented minorities in STEM facilitator (2015-2022)
Web tutorials: Created monthly web tutorials for quantum chemistry, quantum-ESPRESSO, TeraChem, molSimplify that have been used by researchers (avg. unique visitors per month: 2,000) in over 110 countries worldwide and all 50 states (2011-)
Slideshow instruction: Course materials for MIT 10.637, DFT+U instruction, and GPU-accelerated quantum chemistry have been cumulatively viewed over 30,000 times.

Proposal review for NSF CAREER (2014, 2019, 2020, 2021), NSF DMREF (2014), NSF CBET ad hoc/virtual (2015, 2018, 2020), NSF SBIR (2017,2018), NSF CHE ad hoc/virtual (2018, 2019), NSF DMR ad hoc/virtual (2020). ACS PRF (2015-2017), Kentucky Science and Engineering Foundation (2015, 2016), Brookhaven CFN (computer proposals, 2015-), DOE INCITE (computer proposals, 2016, 2017), Research Corporation Cottrell Scholars (2016, 2023), DOE BES (2015-2018), DOE BES CCS (2017, 2018), the Netherlands Organisation for Scientific Research (2017), NIH NIGMS (2021,2025,2026), ETH Zürich (2021), NSF CCI (2024), DOE EPSCOR (2024), KAUST (2025), Faraday (2025), NIH NIGMS MIRA and F30/F31/F32 (2025)

Journal review for the *Journal of the American Chemical Society, Journal of Catalysis, Journal of Chemical Physics*, *The Journal of Physical Chemistry, Physical Chemistry Chemical Physics, Inorganic Chemistry*, *Journal of Theoretical Biology, Molecular Simulation, Chemical Physics Letters, Nature Materials*, *Nano Letters*, *Applied Catalysis B, Chemical Science, Journal of Computational Chemistry, Journal of Chemical Theory and Computation*, *Crystal Growth & Design, Journal of Physical Chemistry Letters, Physical Review B, Industrial & Engineering Chemistry Research*, *Nature, Nature Catalysis*, *Journal of Molecular Graphics and Modeling, Molecular Systems Design & Engineering, Reaction Chemistry & Engineering, Physical Review Letters, Physical Review X, PNAS, Angewandte Chemie, Science Advances, Science, Journal of Catalysis, and the Journal of Physical Chemistry Au*, *ACS Applied Materials & Interfaces, Journal of Chemical Information & Modeling.*

At MIT

Thesis committee member for over 30 students across Civil Engineering, Chemistry, Chemical Engineering, and Mechanical Engineering (2013-)
ChemE undergraduate academic advisor (2014-)
ChemE graduate admissions (2014-)
Computational Systems Biology (CSBi) admissions (2014-)
ChemE department head search committee (2015)
ChemE graduate academic advisor (2016-)
Computational Science and Engineering Liaison on behalf of ChemE (2016-)
ChemE Seminar series coordinator (2016-2019)
Institute-wide Center for Computational Engineering working group (2018)
ChemE undergraduate curriculum revitalization (10.37) (2018-2019)
Freshman advising (2021-2022)
MIT Climate & Sustainability Consortium ChemE departmental representative (2022-)
ChemE Faculty Search Committee (2023-)
ChemE department head search committee (2023)
MIT ChemE Rising Stars Co-Chair (w/ K. Dane Wittrup, 2023-)
Chemistry graduate admissions (2022-)
Mentoring junior faculty in chemE (2022-)
Mentoring junior faculty in chemistry (2025-)

PRESS

"Self-driving labs are changing how chemists work" *C&E News* 06/25/26
https://cen.acs.org/physical-chemistry/computational-chemistry/Self-driving-labs-changing-chemists/104/web/2026/06
"There is no AlphaFold for Materials - AI for Materials Discovery with Heather Kulik" Latent Space podcast 03/24/26
https://www.youtube.com/watch?v=KSCCKCz2x04
"AI helps chemists design tougher plastics" *MIT News* 08/05/25
https://news.mit.edu/2025/ai-helps-chemists-develop-tougher-plastics-0805
"New model predicts a chemical reaction's point of no return" *MIT News* 04/23/25
https://news.mit.edu/2025/new-model-predicts-chemical-reactions-no-return-point-0423
"The rules for assembling azetidines" *C&E News* 06/28/24
https://cen.acs.org/synthesis/rules-assembling-azetidines/102/i20
"Scientists use computational modeling to guide a difficult chemical synthesis" *MIT News* 06/27/24
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"Researchers develop a detector for continuously monitoring toxic gases" *MIT News* 05/17/24
https://news.mit.edu/2024/researchers-develop-continuously-monitoring-toxic-gases-detector-0517
"Computational model captures the elusive transition states of chemical reactions" *MIT News* 12/15/23
https://news.mit.edu/2023/computational-model-captures-elusive-transition-states-1215
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https://news.mit.edu/2023/scientists-computational-modeling-design-ultrastable-materials-0404
"Mining the right transition metals in a vast chemical space" *MIT News* 03/13/23
https://news.mit.edu/2023/mining-right-transition-metals-vast-chemical-space-0313
"Scientists Use SDSC's Expanse to Advance Green Chemistry" *SDSC News* 1/27/23
https://www.sdsc.edu/News%20Items/PR20230127_GreenChemistry.html
"Heather J. Kulik to join the Chemistry Faculty" *MIT Chemistry News* 12/22/22
https://chemistry.mit.edu/chemistry-news/heather-j-kulik-to-join-the-chemistry-faculty/
"Computational modeling guides development of new materials" *MIT News* 03/11/22
https://news.mit.edu/2022/metal-oxide-frameworks-model-0311
"An explorer in the sprawling universe of possible chemical combinations" *MIT News* 02/06/22
https://news.mit.edu/2022/heather-kulik-chemical-materials-0206
"Accounts of Chemical Research: At the Intersection of Data Science and Chemistry" *ACS Axial,* 06/11/21
https://axial.acs.org/2021/06/11/intersection-data-science-chemistry/
"Materials researchers put machine-learning performance to the test" *Chemical & Engineering News*, 04/11/21
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"Spying on enzymes while they perform chemical reactions could help treat gut ailments" *MIT Biology News,* 03/26/21
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