

CURRENT POSITION	<b>University of Rochester</b> , Rochester, New York Postdoctoral Fellow, 2023-2025	
FUTURE POSITION	<b>Université de Sherbrooke</b> , Sherbrooke, Quebec, Canada Assistant Professor, starting in January of 2026	
EDUCATION	<b>California Institute of Technology</b> , Pasadena, California Ph.D. in Theoretical Chemistry, 2018–2023 <b>University of Toronto</b> , Toronto, Canada B.Sc. (Honours) in Chemistry with High Distinction, 2014–2018	
FELLOWSHIPS AND AWARDS	Steadman <a href="#">Award</a>	2024
	Student Leader Award	2024
	Gray-Hill Award Lecture	2023
	Patricia Beckman Graduate Fellowship	2018
	Michael Rebryk Memorial <a href="#">Scholarship</a>	2018
	Ivan Szak Scholarship in Chemistry	2018
	St. Michael's College Silver Medal	2018
	University of Toronto Excellence <a href="#">Award</a>	2018
	St. Michael's College In-Course Scholarship	2018
	Canadian Society for Chemistry <a href="#">Silver medal</a>	2018
	<a href="#">CQIQC</a> Undergraduate Summer Research Program	2017
	University of Toronto Excellence <a href="#">Award</a>	2017
	F. E. Beamish Scholarship in Chemistry	2017
	Buduchnist Credit Union <a href="#">Scholarship</a>	2017
	Ivan Szak Scholarship in Chemistry	2017
	Michael Both Award for Outstanding Commitment to Dance	2017
	John Melady Memorial Scholarship	2017
	C. W. Burton In-Course Scholarship	2017
	Gollop Memorial Undergraduate Scholarship in Chemistry	2017
	Dean's List Scholar	2017
	University of Toronto Excellence <a href="#">Award</a>	2016
	<a href="#">Kupcinet-Getz</a> Research Scholarship	2015
	University of Toronto Mississauga <a href="#">Honour Roll</a>	2015
	Erindale Admission Scholarship	2014
	Scholarship of the President of Ukraine (awarded annually to approximately 250 highest achieving high school students out of over a million)	2014
	Lutsk's student of the year (awarded annually to the highest achieving high school graduate out of approximately 10,000)	2014
	First Prize at Intel-Eco Ukraine 2014, the national stage of <a href="#">Intel ISEF</a>	2014
	Gold medal at the International Ecology Project Olympiad	2013

## PUBLICATIONS

14. Tiwari, V; Korol, R; Franco\*, I Robust Purely Optical Signatures of Floquet States in Laser-Dressed Crystals. *Phys. Rev. Lett.* **2025**, 135 (18), 186901. DOI: [10.1103/5ywx-7db5](https://doi.org/10.1103/5ywx-7db5)
13. Korol\*, R; Chen, X; Franco\*, I High-Frequency Tails in Spectral Densities. *J. Phys. Chem. A* **2025**, 129 (15), 3587-3596. DOI: [10.1021/acs.jpca.5c00943](https://doi.org/10.1021/acs.jpca.5c00943)
12. Turner\*, A C; Korol, R; Bill, M; Stolper, D A Stable isotope equilibria in the dihydrogen-water-methane-ethane-propane system. Part 2: Experimental determination of hydrogen isotopic equilibrium for ethane-H<sub>2</sub> from 30 to 200 °C and propane-H<sub>2</sub> from 75 to 200 °C. *Geochim. Cosmochim. Acta* **2025**, 396, 91-106. DOI: [10.1016/j.gca.2025.02.033](https://doi.org/10.1016/j.gca.2025.02.033)
11. Korol\*, R; Turner, A C; Nandi, A; Bowman, J M; Goddard, W A; Stolper, D A Stable isotope equilibria in the dihydrogen-water-methane-ethane-propane system. Part 1: Path-integral calculations with CCSD(T) quality potentials. *Geochim. Cosmochim. Acta* **2025**, 396, 71-90. DOI: [10.1016/j.gca.2025.02.028](https://doi.org/10.1016/j.gca.2025.02.028)
10. Turner, A C; Korol, R; Eldridge, D L; Bill, M; Conrad, M E; Miller, T F; Stolper\*, D A Experimental and theoretical determinations of hydrogen isotopic equilibrium in the system CH<sub>4</sub>-H<sub>2</sub>-H<sub>2</sub>O from 3 to 200 °C. *Geochim. Cosmochim. Acta* **2021**, 314, 223-269. DOI: [10.1016/j.gca.2021.04.026](https://doi.org/10.1016/j.gca.2021.04.026)
9. Korol, R; Rosa-Raíces, J L; Bou-Rabee, N; Miller\*, T F Dimension-free path-integral molecular dynamics without preconditioning. *J. Chem. Phys.* **2020**, 152 (10), 104102. DOI: [10.1063/1.5134810](https://doi.org/10.1063/1.5134810)
8. Eldridge, D L; Korol, R; Lloyd, M K; Turner, A C; Webb, M A; Miller, T F; Stolper\*, D A Comparison of Experimental vs Theoretical Abundances of <sup>13</sup>CH<sub>3</sub>D and <sup>12</sup>CH<sub>2</sub>D<sub>2</sub> for Isotopically Equilibrated Systems from 1 to 500 °C. *ACS Earth Space Chem.* **2019**, 3 (12), 2747-2764. DOI: [10.1021/acsearthspacechem.9b00244](https://doi.org/10.1021/acsearthspacechem.9b00244)
7. Korol, R; Bou-Rabee, N; Miller\*, T F Cayley modification for strongly stable path-integral and ring-polymer molecular dynamics. *J. Chem. Phys.* **2019**, 151 (12), 124103. DOI: [10.1063/1.5120282](https://doi.org/10.1063/1.5120282)
6. Korol, R; Segal\*, D Machine Learning Prediction of DNA Charge Transport. *J. Phys. Chem. B* **2019**, 123 (13), 2801-2811. DOI: [10.1021/acs.jpcc.8b12557](https://doi.org/10.1021/acs.jpcc.8b12557)
5. Korol, R; Segal\*, D From Exhaustive Simulations to Key Principles in DNA Nanoelectronics. *J. Phys. Chem. C* **2018**, 122 (8), 4206-4216. DOI: [10.1021/acs.jpcc.7b12744](https://doi.org/10.1021/acs.jpcc.7b12744)
4. Korol, R; Kilgour, M; Segal\*, D ProbeZT: Simulation of transport coefficients of molecular electronic junctions under environmental effects using Büttiker's probes. *Comput. Phys. Commun.* **2018**, 224, 396-404. DOI: [10.1016/j.cpc.2017.10.005](https://doi.org/10.1016/j.cpc.2017.10.005)
3. Korol, R; Kilgour, M; Segal\*, D Thermopower of molecular junctions: Tunneling to hopping crossover in DNA. *J. Chem. Phys.* **2016**, 145 (22), 224702. DOI: [10.1063/1.4971167](https://doi.org/10.1063/1.4971167)
2. Longobardi, L E; Zatsepin, P; Korol, R; Liu, L; Grimme, S; Stephan\*, D W Reactions of Boron-Derived Radicals with Nucleophiles. *J. Am. Chem. Soc.* **2016**, 139 (1), 426-435. DOI: [10.1021/jacs.6b11190](https://doi.org/10.1021/jacs.6b11190)
1. Korol\*, R V; Yanchuk, O M; Marchuk, O V; Orlov, V F; Moroz, I A; Vyshnevskiy, O A Size Stabilizers in Two-electrode Synthesis of ZnO Nanorods. *Phys. Chem. Solid St.* **2021**, 22 (2), 380-387. DOI: [10.15330/pcss.22.2.380-387](https://doi.org/10.15330/pcss.22.2.380-387)

PRESENTATIONS AND AWARDS	CCQS Seminar at the Physics department, University of Rochester, Rochester, New York	2025
	Talk: “How NOT to build control-target gates in semiconductor quantum dots and beyond”	
	Summer of Molecular Quantum Information Science Seminars Series	2025
	Talk: “Opening quantum dynamics on gate-defined quantum dots with RLC circuits”	
	Rochester <a href="#">Conference</a> on Coherence and Quantum Science, Rochester, New York	2025
	Poster: “Hybrid singlet-triplet qubits enable fault-tolerant single-pulse CNOT gate”	
	American <a href="#">Conference</a> on Theoretical Chemistry, Chapel Hill, North Carolina	2024
	Poster: “Analog Simulation of Open Quantum Dynamics”	
	<a href="#">Gray-Hill</a> lecture at the Occidental college, Los Angeles, California.	2023
	<u>Award talk</u> : “A window to Earth’s past with the help of theoretical chemistry”	
	Canadian Chemistry <a href="#">Conference and Exhibition</a> , Calgary, Canada	2022
	Contributed talk: “Accurate quantum statistics from improved path-integrals in imaginary time”	
	Molecular Science <a href="#">Mini-meeting</a> , Montreal, Canada	2022
	Poster: “Dimension-free ring-polymer molecular dynamics”	
	ACS Spring <a href="#">meeting</a> , San Diego, California	2022
	Poster: “Accurate quantum statistics from improved path-integrals in imaginary time”	
	Geological and Planetary Sciences seminar at Caltech, Pasadena, California	2022
	<u>Invited talk</u> : “ $D$ and $^{13}C$ exchange equilibria using Path-Integral Monte-Carlo”	
	Berkeley Statistical Mechanics <a href="#">Meeting</a>	2020
	Poster: “Cayley modification for strongly stable path-integral molecular dynamics”	
	CECAM BioMolecular Electronics <a href="#">Conference</a> , Madrid, Spain	2018
	Poster: “Principles of Charge Transport in DNA: from extensive simulations to neural networks”	
	28 <sup>th</sup> Canadian <a href="#">Symposium</a> on Theoretical and Computational Chemistry, Windsor, Canada	2018
	<u>Poster prize</u> : “Charge transport in DNA: From comprehensive simulations to key principles”	
	100 <sup>th</sup> Canadian Chemistry <a href="#">Conference</a> , Toronto, Canada	2017
	<u>Poster prize</u> : “Tunneling to Hopping Crossover in Thermopower of DNA Molecular Junctions”	
	Chemical Biophysics <a href="#">Symposium</a> , Toronto, Canada	2017
	Contributed talk: “DNA Molecular Junctions: Tunneling to Hopping Crossover”	
	<a href="#">33<sup>rd</sup> Symposium</a> on Chemical Physics, Waterloo, Canada	2017
	Contributed talk: “Probing mechanisms of charge transport in DNA with Landauer-Büttiker formalism”	
	45th Southern Ontario Undergraduate Student Chemistry <a href="#">Conference</a> , Toronto, Canada	2017
	<u>1<sup>st</sup> prize talk</u> : “Tunneling to Hopping Crossover in DNA & DNA-like molecular junctions”	
SERVICE	Student Representative at the Chemistry Department Advisory Committee	2016–2017
	2 <sup>nd</sup> year representative at the <a href="#">Chemistry student union</a>	2016–2017
	Board member of the <i>Chemistry Connections</i> student group	2015–2016

COMMUNITY VOLUNTEER INITIATIVES	Spearheaded and coordinated humanitarian supplies shipment to Ukraine from Caltech campus and beyond	2022–2023
	Volunteer at the <a href="#">Nova Ukraine</a> non-profit, Stanford, California	2021–2023
	Website development, established and coordinated partnership with <i>Teach for Ukraine</i>	
	Volunteer at the <a href="#">Teach for Ukraine</a> nonprofit, Kyiv, Ukraine	2021–2022
	Recruited and interviewed candidate teachers at the remote interview stage	
	International student <a href="#">orientation</a> leader	2019, 2020
	“Big sibling” mentor for the incoming graduate students at Caltech	2019, 2020
	Science outreach program volunteer through <a href="#">Caltech Y</a>	2018–2020
	High-school tutoring with <a href="#">CAUSE Tutoring</a> non-profit	2018–2019
TEACHING	University of Toronto Peer Tutoring group tutor	2015–2018
	<i>Course development:</i> Computational chemistry labs, Chem3 at Caltech	2022
	Focus on structure-function relations and the dangers of approximations.	
	High School Teacher, Rotman Arts and Science School, Vaughan, Canada	2020–2022
	Academic stream, grade 11 and 12 Chemistry, Grade 10 Science.	
	Student placed 3rd in Vaughan, top 200 in Canada at the <a href="#">Avogadro</a> chemistry contest	
	International Chemistry Olympiad Coach	
	Canadian National Team (4 students) – 2 bronze, 1 silver medals	Spring 2018
	Ukrainian National team (1 student) – bronze medal	Spring 2014
PEER REVIEW	Private tutoring of Chemistry, Physics and Math	2014–2018
	High school students: accepted to University college (UK), Columbia University (USA) and others	
	Chemical Biology summer school, Lutsk, Ukraine	Summer 2015
	Designed problems and experiments to help high school students master key concepts in chemistry	
	ACS journals: ACS Physical Chemistry Au	
	APS journals: Physical Review Letters, Physical Review A, B, and E	
	Elsevier journals: Organic Geochemistry, Chemical Geology	
	RSC journals: Physical chemistry chemical physics	
	Wiley journals: Rapid communications in mass spectrometry	
SUMMER SCHOOLS AND WORKSHOPS	Condensed Phase Dynamics <a href="#">Workshop</a> at <a href="#">TSRC</a> (Virtual)	2020
	Theoretical Chemistry <a href="#">School</a> at <a href="#">TSRC</a> , Telluride, Colorado	2019
	Weizmann Institute of Science, Rehovot, Israel	2015
EMPLOYMENT	<a href="#">Kupcinet-Getz</a> Scholar at <a href="#">Rubtchinski lab</a>	
	High School Teacher, Rotman Arts and Science School, Vaughan, Canada	2020–2022
	Research Assistant, Department of Linguistics, University of Toronto	2016–2018
EXTRA CURRICULARS	Heritage language variation and change <a href="#">project</a>	
	Rock climbing, weightlifting	since 2014
	Guitar, base	since 2012
LANGUAGES	Ukrainian folk dance	since 2004
	Fluent in Ukrainian, English & Russian	
COMPUTER LANGUAGES	Python, C++, MATLAB, FORTRAN, Mathematica, Bash; Web development (PHP & django, HTML, CSS, JS)	