



Phil De Luna


Education

PhD	MSc	BSc [H]
<i>University of Toronto</i> Materials Science & Engineering Sept 2019 – Jan 2019	<i>University of Ottawa</i> Chemistry Sept 2013 – Aug 2015	<i>University of Windsor</i> Chemistry Sept 2009 – April 2013


Work Experience


 **Program Director, National Research Council Canada**
Supervisor: *Susanna Laaksonen-Craig, Director General Energy, Mining, & Environment, NRC*
Duration: February 2019 – Present
Responsibilities: Leading a 7-year \$57M collaborative research program on Canada-made next generation materials for renewable fuels and chemical feedstocks.


 **Member of the Board of Directors, CMC Research Institutes**
Duration: September 2019 – Present
Responsibilities: Duties include providing high level strategic direction, serving on subcommittees, and participating in organizational governance.


 **Founder & CEO, CERT**
Carbon XPRIZE Finalist (1 of 10 globally)
Duration: January 2016 – January 2019
Responsibilities: Led a team to scale up CO₂ conversion technology from bench to prototype in under a year. Raised \$1.5M in non-dilutive funding. 2019 Creative Destruction Lab and Next36 participant.

Academic Research Experience


 **University of Toronto**
Supervisor: *Prof. Ted Sargent*
Duration: September 2015 – December 2018
Research: Experimental materials synthesis, computational design, and x-ray synchrotron characterization of solar fuel catalysis.


 **University of California – Berkeley**
Supervisor: *Prof. Peidong Yang*
Duration: March 2017 – July 2017
Research: Nanomaterials synthesis and characterization of novel CO₂ utilization catalysts.


 **University of Ottawa**
Supervisor: *Prof. Tom Woo*
Duration: June 2013 – August 2015
Research: Computational design of metal-organic frameworks for carbon capture. Machine learning discovery for cryogenics.

 **University of Windsor**
Supervisor: *Prof. James Gauld*
Duration: March 2012 – June 2013
Research: Computational investigations on small antioxidant molecules, mutagenic enzyme catalysis mechanisms, and DNA telomerase binding.

Industrial Research Experience

 **TOTAL S.A (Funded Research Collaboration)**
Supervisor: *Dr. Shaffiq Jaffer*
Duration: April 2017 – January 2019
Research: Spectroscopic, computational, and experimental electrocatalyst discovery for renewably-powered CO₂ conversion to ethylene.

 **IBM TJ Watson Research Center (Research Internship)**
Supervisor: *Dr. Ruhong Zhou*
Duration: May 2016 – August 2016
Research: Large scale computational simulations of organic-inorganic interfaces between DNA and nanostructured electrodes for biosensing.

 **Toyota Research Institute (Research Internship)**
Supervisor: *Dr. Jens Hummelshøj*
Duration: June 2018 – September 2018
Research: Machine learning driven discovery of advanced materials for fuel cells and batteries.

Professional Activities

- 2019 *Forbes Top 30 Under 30* – Energy Stream, 2019 Next36 Cohort, 2019 Creative Destruction Lab – Energy
- \$20M NRG COSIA Carbon XPrize Finalist, 1 of 10 worldwide, scaled up CO₂ conversion technology from bench to prototype. Designed team website and logo. Performed techno-economic analyses and life cycle assessments.

- \$3M OCE Solutions 2030 Challenge Semi-Finalist, 1 of 20 worldwide.
- Member of the OECD Advanced Materials Steering Committee on for Collaborative Research Programs.
- Authored a case study for the *World Gold Council* on the role of gold in nanotechnology.
- Developed programming, secured speakers, raised funds as *co-chair* of several exclusive conferences such as the University of Toronto Connaught Industry Alliance Symposium and Gordon Research Seminar on Solar Fuels.
- Brokered funded research projects to Fortune 500 oil and gas/ petrochemical corporations such as Total, Suncor, and Dow. My scientific grant writing contributions have totalled more than \$5M in awarded funds and partnerships.
- Managed synchrotron particle accelerator activities at 6 light sources around the world such as the *Canadian Light Source*, *Soleil Synchrotron*, *Advanced Light Source*, etc. resulting in new major scientific discoveries.
- First place winner (total 12 teams) in the 2018 GMCA consulting case competition. Invited to highly competitive summer programs - *Bridge to BCG* and *McKinsey Insight*.
- Research, press features, and interviews featured in *Popular Mechanics*, *Vice Magazine*, *Forbes*, *CBC*, etc.
- Visiting researcher at:
 - *IBM TJ Watson Research Center*, New York (May 2016 – August 2016)
 - *Peidong Yang Research Group*, UC Berkeley (March 2017 – June 2017)
 - *Nanostructured Theory Group, Molecular Foundry*, LBNL (March 2017 – June 2017)

citations = 3050, h-index = 23 †contributed equally

First-Authored Publications

1. **De Luna, P.**, Hahn Higgins, D., Jaffer, S. A., Jaramillo, T. F., & Sargent, E. H. What would it take for renewably powered electrosynthesis to displace petrochemical processes? *Science*, 2019, 364, 6438
2. **De Luna, P.**, Wei, J. N., Bengio, Y., Aspuru-Guzik, A., & Sargent, E. H. Use machine learning to find energy materials. *Nature*, 2017, 552 (7683), 23-25
3. Liu, M. †, Pang, Y. †, Zhang, B. †, **De Luna, P.†**, Voznyy, O., Zheng, X., Xu, J., Dinh, C.T., Fan, F., Cao, C., Garcia de Arquer, F. P., Filleter, T., Sinton, D., Kelley, S. O., & Sargent, E. H. Enhanced CO₂ Reduction Catalysts via Field-Induced Reagent Concentration. *Nature*, 2016, 537 (7620), 383-386
4. **De Luna, P.**, Quintero-Bermudez, R., Dinh, C. T., Ross, M. B., Bushuyev, O., Todorovic, P., Regier, T., Yang, P., & Sargent, E. H. Electro-redeposited catalysts control morphology and oxidation state for selective carbon dioxide reduction. *Nature Catalysis*, 2018, 1 (2), 103–110
5. Zheng, X.†, Zhang, B.†, **De Luna, P.†**, Liang, Y., Comin, R., Voznyy, O., Garcia de Arquer, F. P., Liu M., Dinh, C.T., Dynes, J., Regier, T., Xin, H. L., Prendergast, D., Du, X., & Sargent, E. H. Theory-driven design of high-valence metal sites for water oxidation confirmed using *in-situ* soft X-ray absorption. *Nature Chemistry*, 2017, 10 (2), 149-154
6. Bushuyev, O.S.†, **De Luna, P.†**, Dinh, C.T., Tao, L., Saur, G., van de Lagemaat, J., Kelley, S. O., Sargent, E.H. What Should We Make with CO₂ and How Can We Make It? *Joule*. 2018, 2 (5), 825-832
7. Zheng, X.†, **De Luna, P.†**, Garcia de Arquer, F. P., Zhang, B., Becknell, N., Ross, M., Liu, M., Banis, M. N., Voznyy, O., Dinh, C.T., Zhuang, T., Du, X., Yang, P., & Sargent, E. H. Sulfur-promoted metal sites enable efficient electrochemical reduction of CO₂ to formate. *Joule*, 2017, 1 (4), 794-805
8. de Arquer, F. P. G.,† Bushuyev, O. S.,† **De Luna, P.,†** Dinh, C. T., Seifitokaldani, A., Saidaminov, M. I., Quan, L. N., Proppe, A., Kibria, M. G., Kelley, S., Sinton, D., & Sargent, E. H. 2D-Derived Catalysts for Efficient CO₂ Electroreduction. *Advanced Materials*. 2018, 30 (38), 1802858
9. **De Luna, P.**, Mahshid, S., Das, J., Luan, B., Sargent, E. H., Kelley, S. O., & Zhou, R. High-Curvature Nanostructuring Enhances Probe Display for Biomolecular Detection. *Nano Letters*, 2017, 17 (2), 1289–1295
10. Klinkova A.†, **De Luna, P.†**, Dinh C. T., Voznyy O., Larin E. M., Kumacheva E., & Sargent, E. H. Rational Design of Efficient Palladium Catalysts for Electroreduction of Carbon Dioxide to Formate. *ACS Catalysis*, 2016, 6, 8115-8120
11. **De Luna, P.**, Liang, W., Shekhah, O., Mallick, A., Garcia de Arquer, F. P., Proppe, A., Todorovic, Petar., Kelley, S. O., Sargent, E. H., & Eddaoudi, M. Metal-Organic Framework Thin Films on High-Curvature Nanostructures Towards Tandem Electrocatalysis. *ACS Applied Materials & Interfaces*. 2018, 10 (37), 31225–31232
12. **De Luna, P.**, Bushnell, E. A., & Gauld, J. W. A Molecular Dynamics Examination on Mutation Induced Catalase Activity in Coral Allene Oxide Synthase. *The Journal of Physical Chemistry B*, 2013, 117 (47), 14635–14641.

13. **De Luna, P.**, Bushnell, E. A., & Gauld, J. W. A Density Functional Theory Investigation into the Binding of the Antioxidants Ergothioneine and Ovothiols to Copper. *The Journal of Physical Chemistry A*, 2013, 117 (19), 4057-4065.

Co-Authored Publications

†contributed equally

14. Dinh, C. T.,† Burdyny, T.,† Kibria, M.,† Seifitokaldani, A.,† Gabardo, C., de Arquer, F. P. G., Kiani, A., Edwards, J., **De Luna, P.**, Bushuyev, O., Zou, C., Quintero-Bermudez, R., Pang, Y., Sinton, D., & Sargent E. H. Sustained high-selectivity CO₂ electroreduction to ethylene via hydroxide-mediated catalysis at an abrupt reaction interface. *Science*. 2018, 360 (6390), 783-787
15. Zhang, B., Zheng, X., Voznyy, O., Comin, R., Bajdich, M., García-Melchor, M., Xu, J., Liu, M., García de Arquer, F. P., Dinh, C.T., Fan, F., Yuan, M., Yassitepe, E., Janmohamed, A., Chen, N., Reiger, T., Han, L., Liu, P., Li, Y., **De Luna, P.**, Xin, H.L., Zheng, L., Vojvodic, A., & Sargent, E.H. Homogeneously-Dispersed Multi-Metal Oxygen-Evolving Catalysts. *Science*, 2016, 352 (6283), 333-337.
16. Ross, M., **De Luna, P.**, Li, Y., Dinh, C. T., Kim, D., Yang, P., & Sargent, E. H. Designing materials for electrochemical carbon dioxide recycling. *Nature Catalysis*. 2019, 2, 648-658
17. Pang, Y., Li, J., Wang, Z., Tan, C. S., Hsieh, P. L., Zhuang, T., Liang, Z. Q., Zou, C., Wang, X., **De Luna, P.**, Edwards, J., Xu, Y., Li, F., Dinh, C. T., Zhong, M., Chen, L. J., Lou, Y., Wu, D., & Sargent, E. H. Efficient electrocatalytic conversion of carbon monoxide to propanol using fragmented copper. *Nature Catalysis*. 2019, 2, 251-258
18. Dinh C. T.,† Jain, A.,† de Arquer, F. P. G.,† **De Luna, P.**, Wang, N., Zheng, X., Cai, J., Gregory, B. Z., Voznyy O., Zhang, B., Liu, M., Sinton, D., Crumlin, E. J., & Sargent, E. H. Multi-Site Catalysts Destabilize Water Molecules and Achieve High-Activity Neutral Hydrogen Evolution. *Nature Energy*. 2018, 4, 107-114.
19. Zhou, Y.,† Che, F.,† Liu, M., Zou, C., Liang, Z.Q., **De Luna, P.**, Yuan, H., Li, J., Wang, Z., Chen, P., Bladt, E., Quintero-Bermudez, R., Sham, T. K., Bals, S., Hofkens, J., Sinton, D., Chen, G., & Sargent, E. H. Dopant-induced electron localization drives CO₂ reduction to C₂ hydrocarbons. *Nature Chemistry*, 2018, 10, 974–980
20. Zhuang, T.,† Liang, Z.Q.,† Seifitokaldani, A.,† Li, Y., **De Luna, P.**, Burdyny, T., Meng, F., Quintero-Bermudez, R., Dinh, C.T., Zhong, M., Che, F.L., Zhang, B., Li, J., Chen, P.N., Zheng, X.L., Liang, H.Y., Ge, W.N., Ye, B.J., Sinton, D., Yu, S.H., & Sargent, E.H. Steering post-C-C coupling selectivity enables high efficiency electroreduction of carbon dioxide to multi-carbon alcohols. *Nature Catalysis*. 2018, 1, 421–428
21. Zhuang, T. T.,† Pang, Y.,† Liang, Z. Q., Li, Y., Tan, C. S., Li, J., Din, C. T., **De Luna, P.**, Hsieh, P. L., Burdyny, T., Li, H. H., Liu, M., Wang, Y., Li, F., Proppe, A., Johnston, A., Wu, Z. Y., Zheng, Y. R., Ip, A. H., Tan, H., Chen, L. J., Yu, S. H., Kelly, S. O., Sinton, D., & Sargent, E. H. Copper nanocavities confine intermediates for efficient electrosynthesis of C₃ alcohol fuels from carbon monoxide. *Nature Catalysis*. 2018, 1, 946–951
22. Liang, Z.,† Zhuang, T.,† Seifitokaldani, A., Tan C. S., Li, Y., **De Luna, P.**, Huang, C. W., Hsieh, P. L., Dinh, C. T., Wang, Y., Quintero-Bermudez, R., Zhou, Y., Li, J., Chen, P., Pang, Y., Lo, S. C., Chen, L. J., Tan, H., Xu, Z., Zhao, S., & Sargent, E. H. Copper-on-nitride enhances the stable electrosynthesis of multi-carbon products from CO₂. *Nature Communications*. 2018, 9, 3828
23. Li, J.,† Che, F.,† Pang, Y.,† Zou, C.,† Howe, J. Y., Burdyny, T., Edwards, J. P., Wang, Y., Li, F., **De Luna, P.**, Dinh, C. T., Zhuang, T. T., Saidaminov, M. I., Cheng, S., Wu, T., Finck, Y. Z., Ma, L., Hsieh, S. H., Liu, Y., Botton, G., Pong, W. F., Du, X., Guo J., Sham, T. K., Sargent, E. H., & Sinton, D. Copper adparticle enabled selective electrosynthesis of n-propanol. *Nature Communications*. 2018, 9, 4614
24. Coskun, H., Aljabour A., **De Luna, P.**, Farka D., Greunz, T., Stifter, D., Kus, M., Zheng, X., Liu, M., Sariciftci, N. S., Sargent, E. H., & Stadler, P. Biofunctionalized conductive polymers enable efficient CO₂ electroreduction. *Science Advances*, 2017, 3 (8), e1700686
25. Liu, M., Liu, M., Wang, X., Kozlov, S. M., Cao, Z., Seifitokaldani, A., **De Luna, P.**, Li, J., He, J., Zhou, K., Wang, Z., Lan, X., Dinh, C.T., Zhuang, T., Liang, H., Zou, C., Zhang, D., Yang, Y., Han, Y., Cavallo, L., Sham, T.K., Hwang, B.J., & Sargent, E.H. Quantum-Dot-Derived Catalysts for CO₂ Reduction Reaction. *Joule*. 2019, 3 (7), 1703 – 1718
26. Ross, M. B., Li, Yi., **De Luna, P.**, Kim, D., Sargent, E. H., & Yang, P. Electrocatalytic Rate Alignment Enhances Syngas Generation. *Joule*. 2018, 3 (1), 257-264

27. Kibria, M. G., Dinh, C. T., Seifitokaldani, A., **De Luna, P.**, Burdyny, T., Quintero-Bermudez, R., Ross, M. B., Bushuyev, O. S., de Arquer, F. P. G., Yang, P., Sinton, D., & Sargent, E. H. A Surface Reconstruction Route to High Productivity and Selectivity in CO₂ Electroreduction Toward C₂+ Hydrocarbons. *Advanced Materials*. 2018, 1804867
28. He, S., Zhang, Y., Qiu, L., Zhang, L., Zhang B., Xie, Y., Pan, J., Chen, P., Song, H., Hu, Y., Wang, B., Dinh, C. T., **De Luna, P.**, Banis, M. N., Wang, Z., Sham, T. K., Gong, X., Peng, H., Sargent, E. H. Chemical-to-Electricity Carbon: Water Device. *Advanced Materials*. 2018, 30 (18), 1707635
29. Nam, D., Bushuyev, O., Li, J., **De Luna, P.**, Seifitokaldani, A., Dinh, C. T., Garcia de Arquer, F. P., Wang, Y., Liang, Z., Proppe, A., Tan, C. S., Todorovic, P., Shekhah, O., Gabardo, C., Jo, Jea W., Choi, J., Choi, M. J., Baek, S. W., Kim, J., Sinton, D., Kelley, S., Eddaoudi, M., & Sargent, E. H. Metal-Organic Frameworks Mediate Cu Coordination for Selective CO₂ Electroreduction. *Journal of American Chemical Society*. 2018, 140 (36), 11378 – 11386
30. Ross, M. B., Dinh, C. T., Li, Yi., Kim, D., **De Luna, P.**, Sargent, E. H., & Yang, P. Cu-Enrichment of Nanostructured Catalysts Enables Designer Syngas Electrosynthesis from CO₂. *Journal of American Chemical Society*, 2017, 139 (27), 9359–9363
31. Klinkova, A., **De Luna, P.**, Sargent, E. H., Kumacheva, E., & Cherepanov, P. V. Enhanced electrocatalytic performance of palladium nanoparticles with high energy surfaces in formic acid oxidation. *Journal of Materials Chemistry A*, 2017, 5, 11582-11585
32. Duan, G., Chen, L., Jing, Z., **De Luna, P.**, Wen, L., Zhao, L., Xu, J., Li, Z., Yang, Z., & Zhou, R. Robust Antibacterial Activity of Tungsten Oxide (WO_{3-x}) Nanodots. *Chemical Research in Toxicology* 2019, 32 (7), 1357-1366
33. Zhang, W., Ye, C., **De Luna, P.**, & Zhou, R. Snatching the Ligand or Destroying the Structure: Disruption of WW Domain by Phosphorene. *The Journal of Physical Chemistry C*, 2017, 121 (2), 1362–1370
34. Gu, Z., **De Luna, P.**, Yang, Z., & Zhou, R. Structural Influence of Proteins Upon Adsorption to MoS₂ Nanomaterials: Comparison of MoS₂ Force Field Parameters. *Physical Chemistry Chemical Physics*, 2017, 19, 3039-3045
35. Briard, J.†, Fernandez, M.†, **De Luna, P.**, Meyer, J., Woo, T.K., & Ben, R. 3D-QSAR Prediction for Small Molecular Ice Recrystallization Inhibitor Activity. *Scientific Reports*, 2016, (6), 26403
36. Nandi, S., **De Luna, P.**, Daff T.D., Liu, M., Buchanan, W., Hawari, A.I., Woo, T.K., & Vaidhyanathan, R. A Single Ligand Ultra-Microporous MOF with Exceptional CO₂ Capacity and Selectivity. *Science Advances*, 2015, 1 (11), e150042
37. Ion, B. F., Bushnell, E. A., **De Luna, P.**, & Gauld, J. W. A Molecular Dynamics (MD) and Quantum Mechanics/Molecular Mechanics (QM/MM) Study on Ornithine Cyclodeaminase (OCD): A Tale of Two Iminiums. *International Journal of Molecular Sciences*, 13(10), 2012, 12994-13011.

†contributed equally

Publications Accepted & Under Review

38. Zhong, M.,† Min, Y.,† Tran, K.,† Wang, C.,† Voznyy, O., **De Luna, P.**, Yu, Z., Brodersen, P., Sun, S., Askerka, M., Tan, C. S., Seifitokaldani, A., Liu, M., Che, F., Dinh, C. T., Pang, Y., Lo, S. C., Ip, A., Ulissi, Z., & Sargent, E. H. Accelerated Discovery of Cu-Al Motifs for Highly Active CO₂ Electroreduction to Ethylene. *Nature*. 2018, under review (2018-04-05137)
39. Coskun, H., Aljabour, A., **De Luna, P.**, Sun, H., Nishiumi, N., Yoshida, T., Koller, G., Ramsey, M. G., Greunz, T., Stifter, D., Hassel, A. W., Sariciftci, N. S., Sargent, E. H., & Stadler, P. Bio-inspired hydrogen-bonded polymers mimic noble metal electrocatalysts. *Science Advances*. 2018, under review (aav5139)

Awards

- 2019 Forbes Best of Canada Top 30 Innovators, Forbes
- 2019 Forbes Top 30 Under 30 – Energy, Forbes
- 2019 Governor General's Gold Medal, Governor General of Canada
- 2019 GreenBiz Top 30 Under 30, GreenBiz Magazine
- 2017 Massey College Catherall Award, \$1,400 Massey College

- 2016** Michael Smith Foreign Study Supplement, \$6,000 NSERC
2016 Top 25 Environmentalists Under 25 Nomination, The Starfish Magazine
2016 Alexander Graham Bell Canada Graduate Scholarship (CGS-D), \$105,000 NSERC
2015 Atsumi Ohno Scholarship, \$10,000 University of Toronto
2015 Dr. Yu Graduate Scholarship, \$10,000 University of Ottawa
2014 uOttawa Teaching Assistant Excellence Award, \$5,000 University of Ottawa
2014 Top Poster Prize Award, \$500 Carbon Management Canada (CMC) Annual Conference
2014 Honourable Mention Poster Award at the Transformational Technologies in Materials Science (TTMS) Summer School, University of Wisconsin-Madison
2013 Tito Scaiano Graduate Scholarship, \$10,000 University of Ottawa
2013 Department of Chemistry Undergraduate Excellence Award, \$5000 University of Windsor
2012 Top Undergraduate Poster Award at the 25th Canadian Symposium for Theoretical and Computational Chemistry (CSTCC), \$300 University of Guelph

Patents

1. Electrocatalysts Exhibiting Field-induced Reagent Concentration, U.S Patent Application #62370037, 2016,
2. Boron-Doped Copper Catalysts for Efficient Conversion of CO₂ to Multi-carbon Hydrocarbons, #10003535, 2018

Invited Talks

- 13th Carbon Dioxide Utilization Summit, *InnoTech Alberta*, September 11th, 2019
COSIA Innovation Summit, *Canadian Oil Sands Innovation Alliance*, June 3rd, 2019
University of Waterloo, *Waterloo Nanotechnology Conference*, November 10th, 2018
National Research Council of Canada, Ottawa, *Invited Seminar*, May 18th, 2018
University of Waterloo, *Invited Seminar*, February 7th, 2018
University of Toronto, *SKULE Alumni Association*, November 8th, 2017
Molecular Foundry, Lawrence Berkeley National Labs, *Theory of Nanostructures Division Seminar*, June 22nd, 2017
IBM Thomas J. Watson Research Center, *Invited Seminar*, January 4th, 2016

Conferences/Presentations

- CIFAR Bio-inspired Solar Energy Meeting, *Toronto*. March 25th, 2018 [Talk]
Gordon Research Seminar on Solar Fuels, *Ventura Beach*, January 28th, 2018. [Talk]
University of Toronto BioZone Annual Symposium, *Toronto*, November 10th, 2017. [Talk]
100th Canadian Society for Chemistry (CSC) Conference, *Toronto*. May 31st, 2017. [Talk]
CIFAR Machine Learning for Energy Materials Discovery Workshop, *MIT Boston*. May 30th, 2017. [Talk]
KAUST Solar Energy Conference, *King Abdullah University of Science & Technology*. Nov 2nd, 2016 [Poster]
CIFAR Bio-inspired Solar Energy Meeting, *Montreal*. October 29th, 2016 [Talk]
CIFAR Bio-inspired Solar Energy Meeting, *Vancouver*. May 12th, 2016 [Talk]
CIFAR Bio-Inspired Solar Energy Meeting, *San Francisco*. December 12th, 2015 [Poster]
98th Canadian Society for Chemistry (CSC) Conference, *Ottawa*. June 17th, 2015. [Talk]
98th Canadian Society for Chemistry (CSC) Conference, *Ottawa*. June 15th, 2015. [Poster]
Thousand Island's Energy Research Forum (TIERF), *Ottawa*. October 24th, 2014. [Talk]
International Congress on Physical Organic Chemistry 22, *Ottawa*. August 10-15th, 2014. [Poster]
Carbon Management Canada (CMC) Conference, *Banff*. May 25 – 27th, 2014. [Poster]
Transformational Technologies in Materials Science (TTMS) Summer School, *University of Wisconsin-Madison*. May 18-22nd, 2014. [Poster]
Southern Ontario Undergraduate Student Chemistry Conference (SOUSCC), *Hamilton*. March 30th, 2013. [Poster]
25th Canadian Symposium for Theoretical and Computational Chemistry (CSTCC), *Guelph*. July 22 – 27th, 2012. [Poster]

Teaching Experience

Research Subgroup Leader

University of Toronto/Sargent Lab

July 2017 – Present

Subgroup project manager for the Sargent lab. Supervised 3 post-doctoral fellows full time on specific research projects. Organized and set research deliverables. Drafted paper outlines and edited manuscripts. Organized collaborations with groups from Caltech, Berkeley, KAUST, and more.

Course Instructor & Lecturer

University of Toronto

December 2015

University of Ottawa

September 2014 – December 2014

Organized course material and lectured the second half of a graduate level course on Solar Energy Technology. Lectured General Chemistry and Materials Science Engineering classes of more than 200 students. Designed undergraduate lab experiments implementing the latest technologies in tablet and multi-media equipment.

Teaching Assistant

University of Toronto

September 2015 – December 2015

University of Ottawa

September 2013 – April 2015

Supervised undergraduate labs, marked assignments and exams, and tutored for a variety of classes including Physical Chemistry, Environmental Chemistry, Advanced Characterization of Materials, Materials Science, General Chemistry, and Organic Chemistry. Received a *teaching assistant excellence award* at the University of Ottawa.

Extra-Curricular & Volunteer Activities

Organization for Economic Co-operation and Development (OECD) | May 2019 - Present
Member of the Advanced Materials Steering Committee

Carbon XPRIZE Competition | September 2016 – January 2019
Finalist (1 of 10 worldwide, only Ontario team ever to advance)
Director of Catalyst Design & Advanced Characterization

Massey College | August 2016 – January 2019
Junior Fellow
Co-Chair Junior Fellow Lecture Series
Co-Chair Quarter Century Fund
Lionel Massey Fund Committee Member
Junior Fellow/Senior Fellow Liaison Committee Member
Science at Massey Committee Member
House Committee Member
Massey Tutors Program High School Tutor

Canadian Institute for Advanced Research | September 2015 – January 2019
Bio-inspired Solar Energy Graduate Student Fellow
Meeting recorder, co-organizer

Epilepsy Canada Charity Gala | January 2015
Organizer, Fundraiser, Logistics Management, Procurement

Ottawa Bluesfest | 2013-2015
Volunteer

Collaboratory on Energy Research and Policy (CERP) | January 2014 – September 2015
Founding Member, Lead Science Advisor

Conference Co-Chair and Organizer
Gordon Research Seminar on Solar Fuels | 2020
Massey College Clean Energy Roundtable | March 2018
UofT-CIFAR Machine Learning Seminar Series | August 2017
University of Toronto Connaught Industry Alliance Symposium | October 2016
98th Canadian Chemistry Conference and Exhibition | June 2015
Thousand Islands Energy Research Forum (TIERF) | October 2014
International Congress on Physical Organic Chemistry 22 (ICPOC22) | August 2014