

Jacqueline Goordial

Bigelow laboratory for Ocean Sciences
60 Bigelow Dr., P.O. Box 380
East Boothbay, Maine
USA, 04544

Phone: +1 (207)-315-2567, ext. 418
Email: jgoordial@bigelow.org
www.web.jackiegoordial.com

EDUCATION

- 2015** Ph.D., Environmental Microbiology, **McGill University**
2010 MSc., Molecular Ecology, **University of Toronto**
2008 H. B.Sc., Cell and Molecular Biology, **University of Toronto**

PROFESSIONAL EXPERIENCE

- 2019 (August)** Postdoctoral Research Fellow – Advisors Andy Juhl and Sonya Dyhrman
Lamont-Doherty Earth Observatory at Columbia University, NY, USA
- 2016 – present** Postdoctoral Research Fellow - Advisor Dr. Beth Orcutt
Deep Biosphere Laboratory, **Bigelow Laboratory for Ocean Sciences, ME, USA.**
- 2015 – 2016** Postdoctoral Research Fellow - Advisor Dr. Lyle Whyte
Department of Natural Resource Sciences, **McGill University, QC, Canada.**
- 2016** Scientist for ‘CanMARS’ Mars analogue mission
Centre for Planetary Science and Exploration, **Western University, ON, Canada / Canadian Space Agency, St. Hubert, QC, Canada**
- 2013** Visiting Scientist, **Honeybee Robotics, San Francisco, CA, USA**
- 2011** Visiting Scientist, **Instituto Nacional de Técnica Aeroespacial, CAB, Madrid, Spain**

PUBLICATIONS

Refereed Journal Articles

- 2019 Chan-Yam, K., **Goordial, J.**, Greer, C., Davila, A., McKay, C.P., Whyte, L. Habitability of Antarctic water tracks in the McMurdo Dry Valleys, Antarctica. *Astrobiology*. **In Press.**
- Osinski, G.R., CanMars team (**Goordial, J.**). The CanMars Mars Sample Return Analogue Mission. *Planetary and Space Science*. 166: 110-130 doi:10.1016/j.pss.2018.07.011
- 2018 Jones, R.M., **Goordial, J.**, Orcutt, B.N. Low Energy subsurface environments as extraterrestrial analogs. *Frontiers in Microbiology*. *Doi:* 10.3389/fmicb.2018.01605
- Raymond-Bouchard, I., **Goordial, J.**, Zolotorov, Y., Ronholm, J., Stromvik, M., Bakermans, C., Whyte, L., Conserved genomic and amino acid cold adaptation traits in sub-zero growing Arctic permafrost bacteria. *FEMS microbial ecology*. 2018. 94 (4) doi: 10.1093/femsec/fiy023
- Brady, A.L., **Goordial, J.**, Sun, H., Whyte, L., Slater, G.F. Variability in carbon uptake and (re) cycling in Antarctic cryptoendolithic microbial ecosystems demonstrated through radiocarbon analysis of organic biomarkers. *Geobiology*. 2018;16, 62-79 doi: 10.1111/gbi.12263
- Ronholm, J., **Goordial, J.**, Izawa, M.M.R., Applin, D., Sapers, H., Pontefract, A., Omelon, C.R., Lamarche-Gagnon, G., Osinski, G., Cloutis, E.A., Whyte, L.G. Comparison of Prokaryotic and

Microbial Eukaryotic Lithic Community Composition Between Serpentine and Felsic Intrusives in Jeffrey (Asbestos) Mine. *Astrobiology*. doi: 10.1089/ast.2017.1685

2017 **Goordial, J.** Altschuler, I., Hindson, K., Yan-Cham, K., Marcolefes, E., Leveille, R., Whyte, L. *In situ* field sequencing and life detection in remote (79°26'N) Canadian High Arctic permafrost ice wedge microbial communities. *Frontiers in Microbiology*. doi: 10.3389/fmicb.2017.02594.

Goordial, J., Davila, A., Greer, C., Canam, R., DiRuggiero, J., McKay, C., Whyte, L. Comparative activity and functional ecology of permafrost and cryptoendolithic microbial communities in a hyper-arid upper Dry Valley, Antarctica. *Environmental Microbiology*. 2017. 19 (2) 443-458.

2016 **Goordial, J.**, Davila, A., Lacelle, D., Pollard, W., Marinova, M., Greer, C., DiRuggiero, J., McKay, C., Whyte, L. Nearing the cold-arid limits of microbial life in permafrost of an upper Dry Valley, Antarctica. *International Society of Microbial Ecology (ISME) journal*, 2016. 10 (7), 1613-1624.

Goordial, J., Raymond-Bouchard, I., Zolotorov, Y., de Bethencourt, L., Ronholm, J., Shapiro, N., Woyke, T., Stromvik, M., Greer, C., Bakermans, C., Whyte, L. Cold adaptive traits revealed by comparative genomic analysis of the eurypsychrophile *Rhodococcus* sp. JG3 isolated from high elevation McMurdo Dry Valley permafrost, Antarctica. *FEMS microbial ecology*. 2016. 92(2).

Ricker, N., Shen, S., **Goordial, J.**, Jin, S., Fulthorpe, R. PacBio SMRT assembly of a complex multi-replicon genome reveals chlorocatechol degradative operon in a region of genome plasticity. *Gene*. 2016. 586 (2) 239-247.

2015 **Goordial, J.**, Raymond-Bouchard, I., Ronholm, J., Shapiro, N., Woyke, T., Whyte, L., Bakermans, C. Improved-high-quality draft genome sequence of *Rhodococcus* sp. JG-3, a eurypsychrophilic Actinobacteria from Antarctic Dry Valley permafrost. *Standards in Genomic Sciences*. 2015;10:1

Perron, G., Whyte, L., Turnbaugh, P., **Goordial, J.**, Hanage, W., Dantas, G., Desai, M. Functional characterization of bacteria isolated from ancient Arctic soil exposes diverse resistance mechanisms to modern antibiotics. *PLoS ONE*. 2015. 10(3): e0069533.

Book chapters

2017 Altschuler, I., **Goordial, J.**, Whyte, L.G. 2017. Microbial Life in Permafrost. *Psychrophiles: From Biodiversity to Biotechnology, 2nd edition*. Springer Verlag, Berlin Heidelberg.

2014 **Goordial, J.**, and Whyte, L. 2014. Microbial Life in Antarctic Permafrost Environments. *Antarctic Terrestrial Microbiology* (pp 217-232): Springer Berlin Heidelberg.

2013 **Goordial, J.**, Lamarche-Gagnon, G., Lay, C-Y., and Whyte, L.G. 2013. Left out in the cold: Life in cryoenvironments. *Polyextremophiles: Microorganisms and macroorganisms living under multiple forms of stress* (27: 335-363): Springer

Manuscripts in peer review

- Orcutt, B.N., Bradley, J., Brazelton, W.J., Estes, E., **Goordial, J.**, Huber, J.A., Jones, R.M, Mahmoudi, N., Marlow, J.J., Murdock, S., Pachiadaki, M., Tivey, M.K. Impacts of Deep-Sea Mining on Microbial Ecosystem Services. *In Review in Limnology and Oceanography*
- Mykytczuk, N., Magnuson, E., Pellerin, A., **Goordial, J.**, Twine, S., Wing, B., Foote, S.J., Fulton, K., Whyte, L. Sulfur cycling by microbial biofilms filaments from in anoxic hypersaline springs in the Canadian high Arctic. *In Review Environmental Microbiology*.
- Maggiore, C., Stromberg, J., Blanco, Y., **Goordial, J.**, Cloutis, E., Parro, V., Whyte, L., Nanopore sequencing for life detection in a sinuous ridge analogue: limits, capabilities, and potential. *In Review in Astrobiology*.

Other publications

- 2018 **Goordial, J.** and Ronholm, J. Metagenomics meets read clouds. *Nature Biotechnology*. 36:11, 1049. (*Commentary Article*)
- 2017 Slater, G., Cloutis, E., Morrill, P., Samson C., Whyte, L., Leveillé, R., Cowan, N., Doyen, R., Banerjee, N., Sherwood Lollar, B., Daly, M., Osinski, G., Pudritz, R., Herd C., Scott A., **Goordial, J.**, Sapers, H., Brady, A., Pearce, B., and Ford, S. Topical Teams Report on Planetary Exploration – Astrobiology, *Topical Teams Reports on Planetary Exploration*. Canadian Space Agency. 9-24.
- 2016 Contributed text/photography on fungi within polar cryptoendolithic systems for: McCoy, Peter. *Radical Mycology: A Treatise on Seeing & Working with Fungi*. Chthaeus Press.
- 2016 **Goordial, J.**, Raymond-Bouchard, I., Riley, R., Ronholm, J., Shapiro, N., Woyke, T., Grigoriev, I., LaButti, K., Greer, C., Whyte, L., Bakermans, C. Draft Genome of eurypsychrophile yeast *Rhodotorula* sp. JG1b isolated from permafrost in the hyper-arid Upper Elevation McMurdo Dry Valleys, Antarctica. *ASM genome announcements*. 4:2, e00069-16
- 2012 Lacelle, D., Pollard, W., Whyte, L., Davila, A., Andersen, D., DeWitt, R., **Goordial, J.**, Heldmann, J., Marinova, M., Zacny, K., McKay, C. 2012. Origin, Stability and Habitability of Ice-Bearing Permafrost in University Valley, McMurdo Dry Valleys, Antarctica: Analogue for Ground Ice on Mars. *Newsletter for the Canadian Antarctic Research Network* 31:17-22

FELLOWSHIPS AND AWARDS (Total to date: \$654,293)

- 2019-2021 Lamont Doherty Earth Observatory (Columbia University) Postdoctoral Fellowship. “Fate of ancient carbon caused by permafrost erosion into marine environments” PI. **USD \$139,500**
- 2019-2021 NASA Astrobiology Postdoctoral Program fellowship. “Using cell sorting and nanoSIMS to improve life detection and habitability assessments in hypersaline environments and on ocean worlds”. PI. Stanford University. **USD \$168,500 (declined)**.
- 2016-2018 Center for dark energy biosphere investigations (C-DEBI) Postdoctoral Fellowship. “Investigations into the diversity and function of active microbial subpopulations in Atlantis Massif oceanic crust” PI. **USD \$232,126**
- 2017 Oxford Nanopore Technologies bursary to attend AbSciCon, April 2017. **USD \$1000**
- 2015-2016 McGill Space Institute Postdoctoral Fellowship. “Development of a MICRO life detection platform” PI. **CAD \$30,000** (Second year declined).
- 2016 ECOGEO bursary to attend the ECOGEO Workshop. **CAD \$2,397.65**
- 2011- 2014 Canadian Astrobiology Training Program (CATP) NSERC CREATE Graduate fellowship, McGill University. **CAD \$64,000**
- 2014 Graduate Research Enhancement and Travel (GREAT) award, McGill University, **CAD \$700**

- 2013 Early Career Scientist Travel Award invitation to give a talk at the 5th annual Conference on Polar and Alpine Microbiology (PAM) held in Big Sky, Montana. **USD \$1,200**
- 2012 Canadian Institute for Advanced Research (CIFAR) bursary **CAD \$1,250**
- 2012 Graduate Research Enhancement and Travel (GREAT) award, McGill University, **CAD \$500**
- 2010 Reino S. Freeman Fellowship, University of Toronto, **CAD \$500**
- 2009 UTSC Student Academic Conference and Travel fund, **CAD \$1,920**
- 2009 Frederick P. Ide Award in Ecology & Evolutionary Biology, University of Toronto. **CAD \$500**
- 2008 NSERC Undergraduate Student Research Award (USRA), University of Toronto. **CAD \$5700**
- 2008 University of Toronto Excellence Award (UTEA), University of Toronto, 2008, **CAD \$4,500**

GRANTS AWARDED

- 2018 **Principle Investigator.** Census of Deep Life funding for proposal “Investigation of single amplified genomes (SAGs) of Bacteria and Archaea sorted from subsurface samples at Atlantis Massif”. Metagenomic sequencing of 3 samples, equivalent to ~ USD \$2500
- 2018 **Principle Investigator.** Census of Deep Life funding for proposal “Diversity and Activity of microorganisms in 6-year mineral colonization experiments in the crustal subsurface at North Pond, mid-Atlantic ridge” Amplicon sequencing of 24 samples, equivalent to ~ USD \$1200
- 2017-2019 **Collaborator.** NASA Concepts for Ocean worlds Life Detection Technology Program (COLD tech) grant “Development of Nanopore Sequencing for Automated Ocean World Life Detection”. **USD \$700,000** total. PI: Chris P. McKay
- 2017-2019 **Co-Investigator.** Canadian Space Agency (CSA) Flights and Fieldwork for the advancement of science and technology (FAST) grant “MICRO Life Detection Instrument Platform Developing and Testing”. **CAD \$500,000** total. PI: Lyle G. Whyte
- 2016-2018 **Co-Investigator.** CSA space exploration science definition studies grant “MICRO Life Detection for planetary protection and biosignatures”. **CAD \$70,000** total. PI: Lyle G. Whyte
- 2017 **Principle Investigator.** Census of Deep Life funding for proposal “Active microbes in serpentinizing subsurface of Atlantis Massif revealed by coupled flow cytometry and metagenomics analysis” Metagenomic sequencing of 3 samples, equivalent to ~ USD \$2500
- 2017 **Principle Investigator.** Census of Deep Life funding for proposal “Investigation of diversity and distribution of subsurface Bacteria and Archaea sorted from different lithologies of serpentinizing crust at Atlantis Massif” PI. Amplicon sequencing of 24 samples, equivalent to ~ USD \$1200

PRESENTATIONS (*presenting author)

- 2018 Goordial, J.*** Microbial ecology and activity of Mid-Atlantic Ridge oceanic crust and sediments through sorted cell -omics. CDEBI Networked Speaker Series. September 27, 2018. **Invited Online Oral Presentation.**
- Goordial, J.*** Microbial ecology and activity of Mid-Atlantic Ridge oceanic crust through sorted cell -omics. International Society of Microbial Ecology. August 17, 2018. Leipzig, Germany. **Oral Presentation.**
- Jones, R.*, **Goordial, J.**, Orcutt, B. Energy in the Deep Subsurface and as Extraterrestrial Habitability Analogs. Goldschmidt. August 14, 2018. Boston, MA, USA. **Oral presentation.**
- Orcutt, B.N.*, D’Angelo, T., **Goordial, J.**, Jones, R. Active Microbial Groups in Oceanic Crust. Goldschmidt. August 14, 2018. Boston, MA, USA. **Oral presentation.**
- Goordial, J.*** Single Cell Sorting to overcome low biomass: Microbial function and diversity in the Atlantis Massif subsurface. North East Geobiology Symposium. April 7, 2018. Woods Hole, MA. **Poster.**

Jones, R.* , **Goordial, J.**, Orcutt, B.N. ‘Following the energy’ in the search for intra- and extra- terrestrial life. North East Geobiology Symposium. April 7, 2018. Woods Hole, MA. **Oral presentation.**

2017 **Goordial J***. In Situ life detection and sequencing in the Canadian high Arctic. Laboratory of Dr. William Brazelton, Dept. of Biology, University of Utah. Dec. 13th, 2017. Salt Lake City, UT, USA. **Invited oral presentation.**

Orcutt, B. N*., T., **Goordial, J.**, D’Angelo. Sorting out the ocean crust deep biosphere with single cell omics approaches. American Geophysical Union fall meeting. Dec. 11-15th, 2017. New Orleans, LA, USA. **Poster.**

Goordial J*, Altshuler, I., Hindson, K., Ronan, R., Raymond-Bouchard, I., Whyte, LG. In Situ Life and Nucleic Acid Biomarker Detection Using the MICRO Life Detection Platform on Mars Analogue Polygonal Permafrost Terrain in the Canadian High Arctic. Astrobiology Science Conference (AbSciCon), April 24-28th, 2017, Mesa, Arizona, USA. **Oral presentation.**

Whyte, L. G.* , **Goordial, J.**, Raymond-Bouchard, I., Lamarche-Gagnon, G., Davila, A., McKay, C. Terrestrial Cryoenvironments as Mars, Europa, and Enceladus Analogues. Astrobiology Science Conference (AbSciCon), April 24-28th, 2017, Mesa, Arizona, USA. **Oral presentation.**

Orcutt, B. N*., D’Angelo, T., Labonté, J., **Goordial, J.**, Bergenthal, M., Freudenthal, T., Lilley, M., Früh-Green, G. Microbial Activity in the serpentinizing subsurface of Atlantis Massif Initial Results from IODP Expedition 357. Astrobiology Science Conference (AbSciCon), April 24-28th, 2017, Mesa, Arizona, USA. **Oral presentation.**

Goordial, J., Zacny, K*., Whyte, L., Spring, J. Evaluating core contamination under Mars-like conditions. Lunar and Planetary Science Conference, March 20-28th, 2017, The Woodlands, Texas. **Poster.**

Osinski, G.R*., **Goordial, J.**, et al (CANMARS science team) Overview of the 2016 #CanMars Mars Sample Return Analogue Mission. Lunar and Planetary Science Conference, March 20-28th, 2017, The Woodlands, Texas. **Poster.**

2016 **Goordial, J***, Maggiori, C., Ronan, R., Leveille, R., Parro, V., Whyte, L. The MICRO Life Detection for Planetary Protection and Biosignature detection. CSA Canadian Space Exploration Workshop CSEW7, Nov. 24-25, 2016, Montreal. **Poster.**

Goordial, J*, Davila, AF. Lacelle, D., Pollard, W., Marinova, M., Greer, C., Ruggiero, J., McKay, C.P., Whyte, L. Nearing the cold-arid limit of life in dry permafrost soils and the thriving lithic life hidden within University Valley, Antarctica. International Society of Microbial Ecology meeting, August 21-26, 2016, Montreal. **Poster.**

Goordial, J*, Davila, A. Lacelle, D., Pollard, W., Marinova, M., Greer, C., Ruggiero, J., McKay, C.P., Whyte, L. Survivors and Thrivers: Permafrost and Cryptoendolithic microbial communities in a hyper-arid polar desert in the high elevation McMurdo Dry Valleys of Antarctica. Canadian Society of Microbiology meeting, June 12-15th, 2016, Toronto. **Oral Speaker in the Young Investigator Plenary.**

Goordial, J.* Surviving and maybe thriving: Permafrost and Cryptoendolithic microbial communities in University Valley, a hyper-arid polar desert. Feb. 29th, 2016. Laurentian University, Sudbury, ON. **Invited oral presentation.**

2015 Brady, AL.* , **Goordial, J.**, Davila, AF., Whyte, L., Slater, GF. Organic and Isotopic Biomarkers of Antarctic Endolith Microbial Communities. 25th annual Goldschmidt conference. Prague, CZ. August 16-21, 2015. **Poster presentation.**

Chan-Yam, K*., Cong, H., **Goordial, J.**, Riley, R., Raymond, I., Ronholm, J., Whyte, L.G. 2015. Characterization of Cold Adaptations of a Halocryophilic Yeast. ASM. May 30–June 2 2015, New Orleans. **Poster.**

Raymond-Bouchard, I*., **Goordial, J.**, Zolotarov, Y., de Bethencourt, L., Ronholm, J., Stromvik, M., Bakermans, C., Whyte, L. Comparative Genomic Analyses of Cold Adaption in Cryophilic Bacteria Isolated from Arctic and Antarctic Permafrost. 115th General meeting of the American Society for Microbiology (ASM). New Orleans, Louisiana. May 30-June 2, 2015. **Oral Presentation.**

- 2014** **Goordial, J*.,** Davila, A., Lacelle, D., Pollard, W., Marinova, M., Greer, C., DiRuggiero, J., McKay, C., Whyte, L. Reaching the cold-arid limit of life in dry permafrost soils and the thriving lithic life hidden within University Valley, Antarctica. 15th International Symposium on Microbial Ecology (ISME). COEX, Seoul, Korea. August, 2014. **Oral Presentation.**
- Goordial, J*.,** Davila, A., Lacelle, D., Greer, C., McKay, C., Whyte, L. Mars-like soils in an Upper Dry Valley, Antarctica and the cold-arid limit of life. International Union of Microbiological Sciences. Palais du Congres, Montreal, Quebec. July 27th – August 1st, 2014. **Oral presentation as part of the Canadian Society of Microbiology Student symposia competition.**
- 2013** **Goordial, J*.** Microbial life in permafrost and cryptoendolith environments in a hyper-arid Antarctic University Valley. 4th Annual Meeting Canadian Astrobiology Program, September 16-17th, 2013. Holiday Inn, Montreal, Quebec, Canada. **Oral Presentation.**
- Goordial, J*.,** Davila, A., Marinova, M., Greer, C., McKay, C., Whyte, L. Microbial life in permafrost and cryptoendolith environments in a hyper-arid Antarctic Dry Valley. 5th International Conference on Polar and Alpine Microbiology. 2013. Big Sky, Montana. September 8th-12th. **Invited Oral Presentation.**
- Goordial, J*.,** Davila, A., Marinova, M., Greer, C., McKay, C., Whyte, L. A Deep Dry-freeze: Life in the Hyper Arid Cold Desert of the McMurdo Dry Valleys, Antarctica. AbGradCon 2013 (Astrobiology Graduate Conference). McGill University, Montreal, Quebec. June 10th-June 14th. **Oral Presentation.**
- 2012** **Goordial, J*.,** Davila, A., Marinova, M., Andersen, D., Greer, C., Pollard, W., McKay, C., Whyte, L. Microbial Activity and Diversity through a cold, hyper-arid desert permafrost core in University Valley, Antarctica. 14th International Symposium on Microbial Ecology (ISME). Copenhagen, Denmark. August 19-24, 2012. **Poster.**
- 2011** **Goordial, J*.,** Davila, A., Pollard, W., Andersen, D., Greer, C., Whyte, L., McKay, C. Cryomicrobiology of University Valley, Antarctica. 4th International Conference on Polar and Alpine Microbiology, September 4-8th, 2011 Ljubljana, Slovenia. **Poster.**
- Goordial, J*.** Cryomicrobiology of the Upper Dry Valleys of the Antarctic. 2nd Annual Meeting Canadian Astrobiology Program, May 29-31st. 2011. McGill University, Montreal, Quebec, Canada. **Oral Presentation.**
- Goordial, J*.,** L.G. Whyte., T.D. Niederberger, N.C.S. Mykytczuk, N.N. Perreault, B. Sherwood Lollar, D. T. Andersen, C. W. Greer, W. Pollard. Microbial communities in subzero brine environments in the Canadian high Arctic. European Geophysical Union General Assembly, April 3-8th, 2011, Vienna, Austria. **Poster.**
- 2010** **Goordial, J*.,** Jin, S., Fulthorpe, R. 2010. Imbalanced catabolic repression and constitutive recombinases found in a chlorobenzoate degrader. 60th Annual Conference of the Canadian society of Microbiologists (CSM). Hamilton, Ontario. June 14-17 2010. **Poster.**
- 2009** **Goordial, J*.,** Ricker, N., Jin, S., Fulthorpe, R. 2009. Portrait of Finicky Bacterium- An ancestral Chlorobenzoate degrader? 59th Annual Conference of the Canadian Society of Microbiologists (CSM). Montreal, Quebec. June 15-18, 2009. **Oral Presentation and Poster.**
- 2008** **Goordial, J*.,** Stronghill, J., Fulthorpe, R. 2008. Plant Species Effect on Rhizosphere Bacterial Community Structure and Function. 12th International Symposium on Microbial Ecology (ISME). Cairns, Australia. August 17-22, 2008. **Poster.**

TEACHING EXPERIENCE

- Guest Lecturer Pollution and Bioremediation (NRSC 333), McGill University, 2015
- Guest Lecturer Environmental Microbiology (MICR450), McGill University, 2015
- Supervision and scientific planning of 4 undergraduate research projects (Rebecca Canam, Luke Anderson-Trocme, Megan Mouw, Katie Hindson) - 2012-2016

Teaching Assistant

- McGill University • Pollution and Bioremediation (NRSC 333) 2014

- Environmental Microbiology (MICRO 450) 2013
- Introductory Microbiology (LSCI 230) 2011-2013

University of Toronto • Microbial Biogeochemistry (EES C30) 2009-2010

- Feeding humans (EES B16) 2008-2009
- Introductory biology (BGY A01) 2008-2010

PROFESSIONAL SERVICE ACTIVITIES

Session chair	<p>Session “Lessons from Earth Analogs to Inform the Search for Life in the Universe” Astrobiology Science Conference (AbSciCon), June 24-28th, 2019, Seattle, WA.</p> <p>Session “Life Detection Lessons from Analogue Environments on Earth” at the Astrobiology Science Conference (AbSciCon), April 24-28th, 2017, Mesa, Arizona, USA.</p> <p>Session “Biodiversity, Ecosystem Function, and Environmental Change: Past, Present and Future” at the 5th International Conference on Polar and Alpine Microbiology. September 8th-12th, 2013. Big Sky, Montana.</p>
Institutional/ Committee service	<p>Postdoctoral representative board member for McGill Space Institute (2016)</p> <p>McGill University- Macdonald campus student representative for the Canadian Society of Microbiologists (2011-2016)</p> <p>Lead local organization committee member for Astrobiology Graduate Conference (AbGradCon2013). Sponsored by the NASA Astrobiology Institute and Lockheed Martin, and held in Canada for the first time. Montreal, QC, June 2013.</p> <p>Local organization committee for a 2-day grant proposal writing workshop (research focus group) after the Astrobiology Graduate Conference (AbGradCon2013). Gault Nature Reserve, Quebec. June 2013.</p> <p>Graduate student representative board member for Canadian Astrobiology Training Program (CATP) committee meeting. 2012.</p> <p>Departmental (Natural Resource Sciences) Graduate student representative for the Macdonald campus graduate student union (MCGSS). Sept 2012-Sept 2013</p> <p>Macdonald campus Graduate student representative (NRS Dept) for the McGill University Post Graduate Student Society (PGSS). Sept 2012-Sept 2013</p>
Peer Review	<p>Panelist, External reviewer (2018), Executive Secretary (2017) for NASA Planetary Science and Technology from Analog Research (PSTAR) Program and Planetary Protection Research review panel, Australian Antarctic Science Research Program (2019).</p> <p>Reviewer for <i>Frontiers in Microbiology</i>, <i>Microbiome</i>, <i>FEMS microbial Ecology</i>, <i>Extremophiles</i>, <i>Biotechnology Journal</i>, <i>Canadian Journal of Microbiology</i>, <i>Catena</i>, <i>PeerJ</i></p>

OTHER PROFESSIONAL DEVELOPMENT ACTIVITIES

2016 ECOGEO Workshop – Introduction to Environmental ‘Omics (PI Ed DeLong). University of Hawai‘i at Mānoa, Honolulu Hawai‘i

- 2012 NASA astrobiology short course scholar- Held by the NASA Astrobiology Institute in Santander, Spain. Support provided by Canadian Institute for advanced research (CIFAR).
- 2011 Environmental Genomics workshop. Dr. Eric Collins, McGill University
- 2010 Planetary Science Short Course, University of Western Ontario - Center for Planetary Science and Exploration.
- 2010 Macdonald Innovations for Teaching Improvement (MITI) Teaching Workshop, McGill University

SERVICE AND PUBLIC OUTREACH ACTIVITIES

- 2018 Presentation and hands-on activities for Grade 4-8 students, “Astrobiology: What can Microorganisms tell us about the possibility of life in Space?” December 17th, 2018. St. Wilfrid School, Pickering, ON, Canada. (~ 150 students)
- 2018 Café Scientifique public outreach lecture. August 7, 2018. Bigelow Laboratory for Ocean Science.
- 2018 Guest speaker (5 lectures) for adult incarcerated populations at Grafton Correctional Institution, Grafton Reintegration Center, London Correctional Institution, Noble Correctional Institution, Noble Correctional Institution, and Franklin Medical Center as part of a lecture series coordinated by the Initiative to Bring Science Programs to the Incarcerated (INSPIRE). Ohio. May 2018.
- 2017 Guest speaker (5 lectures) for youth and adult incarcerated populations at Decker Lake Youth Facility, Wasatch Youth Facility, Metro Jail, and Utah State Prison as part of a lecture series coordinated by the Initiative to Bring Science Programs to the Incarcerated (INSPIRE). Salt Lake City, Utah. Dec 2017.
- 2017 Outreach lecture to NASA Nationwide, a consortia of formal and informal educators who perform outreach programming (museums, schools, community centres etc). These presentations are for volunteers and educators to stay current with recently funded research, and to bring information and excitement into their programs. August 2017.
- 2017 Astrobiology Science Conference (AbSciCon) Meeting Mentor. Mesa, Arizona, USA.
- 2014-2016 A founding member of *Mycollectif(ve)*, at Santropol Roulant, Montreal. A mushroom collective whose mandate is to be a mycology knowledge hub for the Montreal community on cultivation, identification and isolation of mushrooms through holding workshops and educational outreach events regularly. Santropol Roulant is a non-profit organization which focuses on breaking social isolation through food.
- 2014-2015 Mycoremediation citizen science project at Champs des Possibles, Montreal. Assisting in a citizen science pilot project to remediate a city lot contaminated with PAHs and heavy metals through mycoremediation.
- 2013 Organization of an education and public outreach event "Ask an Astrobiologist" night at McGibbons pub, Montreal where the public was invited to talk over a pint to graduate students and members of the Astrobiology community including a researcher from the Canadian Space Agency.
- 2013 Organization of an education and public outreach event "Astrobiospeaks!" a public speaking competition. Participants gave 4 minute presentations on an Astrobiology related topic.
- 2013 Science outreach from the Antarctic to several schools in the United States and in Canada. Students remotely operated a permafrost drill located in Antarctica. Was covered by multiple media outlets, and included a segment on the Discovery channel: <http://watch.discoverychannel.ca/#clip872845>.
- 2011 Provided video and still microscopy images for the PBS/NOVA documentary: Finding Life Beyond Earth. Aired October 18, 2011 on PBS. <http://www.pbs.org/wgbh/nova/space/finding-life-beyond-earth.html>
- 2008-2010 Volunteer with the science outreach group Let's Talk Science. Activities range from supervising high school students to running workshops and judging student science fairs.

FIELD EXPEDITIONS

- Oct-Nov 2017 Mid-Atlantic Ridge, ‘North Pond’ site, Atlantic Ocean. R/V Atlantis
- April- May 2016 Axel Heiberg Island, Canadian high Arctic, McGill Arctic Research Station

Dec 2012 – Feb 2013

McMurdo Dry Valleys, Antarctica