CHRISTOPHER ROSS OMELON, PH.D.

Assistant Professor, Queen's University
Department of Geography and Planning
Department of Geological Science and Engineering
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EDUCATION

2006 DOCTOR OF PHILOSOPHY, Department of Geology, University of Toronto TORONTO, ONTARIO
Thesis title: High Arctic cryptoendolithic microbial communities: environmental constraints and survival strategies in a polar desert environment.
· Explored geomicrobiological interactions between microorganisms and minerals through characterization of microbial communities and investigation of the effects of microbial activity on mineral weathering.

1999 MASTER OF SCIENCE, Department of Geography, McGill University MONTRÉAL, QUÉBEC
Thesis title: A geochemical investigation of perennial spring activity and associated mineral precipitates at Expedition Fiord, Axel Heiberg Island, Canadian High Arctic.
· Focused on aqueous geochemistry and modeling of mineral precipitation and dissolution reactions.

1995 BACHELOR OF ARTS, McGill University MONTRÉAL, QUÉBEC
Major in Physical Geography, Minor in Environmental Studies
· Specialized in Arctic landscapes and processes as well as environmental and climate change studies.

EMPLOYMENT EXPERIENCE

2019 RESEARCH ASSOCIATE, MCGILL UNIVERSITY MONTRÉAL, QUÉBEC
· Conduct research using a polyphasic approach to study microbial biomass, phosphorus sequestration, and mineral crystallization associated with photoheterotrophic bacteria in the processing of municipal organic waste.
· Apply techniques in light and electron microscopy (SEM, TEM) as well as synchrotron radiation-based analyses including x-ray absorption and x-ray fluorescence spectroscopy to document and characterize microbial uptake of phosphorus in bioreactors to determine the distribution of polyphosphate and potential for crystallization to apatite.

2016-2018 RESEARCH ASSOCIATE, THE UNIVERSITY OF KANSAS LAWRENCE, KANSAS
· Research position with the Kansas Interdisciplinary Carbonates Consortium (KICC), an energy industry partner associated with the University of Kansas Department of Geology. Commitment of ~75% concerned with oil industry-related research and 25% in the Department of Geology. The latter included graduate student co-supervision, teaching, and ongoing research in the Arctic.
· KICC Research: conducted field- and laboratory-based observational and experimental research to quantify carbonate and clay mineral precipitation kinetics in alkaline, lacustrine environments with incorporation into porewater evolution models as analogues for textural, mineralogical, and geochemical signatures in the pre-salt/sub-salt carbonate reservoirs of offshore Brazil and Angola.

2011-2016 RESEARCH ASSOCIATE, THE UNIVERSITY OF TEXAS AT AUSTIN AUSTIN, TEXAS
· Conducted field- and laboratory-based observational and experimental research on microbial ecosystems and the geochemical dynamics of their environments to identify, characterize, and elucidate unique processes of geomicrobiological significance. Research highlights include: (1) microbe-mineral interactions in polar terrestrial endolithic habitats; (2) the geochemical dynamics of microbial ecosystems in cold, saline perennial springs (Axel Heiberg Island, Canada) and arsenic-rich geyser fields (El Tatio, Chile); (3) processes driving mineral precipitation and subsequent biosignature preservation in these and other environments.
· Applied techniques in light, confocal laser scanning and electron microscopy as well as synchrotron radiation-based analyses including x-ray absorption and x-ray fluorescence spectroscopy to characterize bacteria and their habitats as well as study the role of microorganisms in the distribution, speciation, and mobilization of trace elements.

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· Designed and deployed meteorological stations and *in situ* measurement sensors relevant to microbial activity (e.g. temperature, moisture) using dataloggers and associated peripherals.
· Utilized microelectrodes designed by Unisense Inc. to characterize in situ conditions (e.g. pH, O_2) within microbial mats in hot spring and lacustrine environments.
· Examined the diversity of microbial communities using techniques in both microbiology (culturing) and molecular biology (16S rRNA metagenome) to identify key microorganisms associated with complex geochemical processes such as metal cycling, redox chemistry, and mineral precipitation.
· Wrote proposals to funding agencies to support ongoing and future research programs.
· Developed multi-disciplinary field programs to accommodate the diverse needs of research projects focusing on high Arctic environments, including Axel Heiberg Island and Ellesmere Island.
· Mentored and supervised Ph.D., M.Sc. and B.Sc. students, including committee membership, fieldwork activities, laboratory experiments, and guidance with thesis completion.

2008-2011 NSERC POSTDOCTORAL FELLOW, WESTERN UNIVERSITY LONDON, ONTARIO
· Developed technical skills in Focused Ion Beam (FIB) milling, Time-of-Flight Secondary Ion Mass Spectrometry (ToF-SIMS), Confocal Laser Scanning Microscopy (CLSM), Scanning and Transmission Electron Microscopy (SEM, TEM), X-ray Absorption Spectroscopy (XAS) including X-Ray Absorption Near Edge Structure (XANES) and μ-X-ray Fluorescence Mapping (μ-XFM).
· Submitted proposals for funding, including fieldwork through the Polar Continental Shelf Program.

2007-2008 POSTDOCTORAL FELLOW, THE UNIVERSITY OF TEXAS AT AUSTIN AUSTIN, TEXAS
· Conducted research in arsenic and antimony geochemistry, molecular characterization of microbial communities from the El Tatio Geyser Field, and the isolation of bacteria for subsequent experiments.

2006 CANADIAN SPACE AGENCY AXEL HEIBERG ISLAND, ELLESMERE ISLAND, NUNAVUT
FIELD PROGRAM LEADER, CSA'S SEARCH FOR TERRESTRIAL ANALOGUE SITES
· Headed the field program to identify terrestrial planetary analogue sites for deployment of Canadian Space Agency programs focusing on robotic and scientific missions for extraterrestrial life exploration.
· Responsibilities included working closely with CSA management and scientists to identify and confirm sites of interest that would fulfill both engineering and scientific criteria for future missions.

2006-2007 POSTDOCTORAL FELLOW, UNIVERSITY OF TORONTO TORONTO, ONTARIO
· Focused on the metabolic activity of cyanobacteria and their potential to accelerate rock weathering under rising temperatures associated with Arctic warming due to global climate change.

2004 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION EUREKA, ELLESMERE ISLAND, NUNAVUT
TEAM LEADER, NASA'S MARS/ARCTIC DEEP DRILL PROJECT
· Headed the scientific field program to test a prototype drill for Mars exploration.
· Responsibilities included working closely with NASA scientists and engineers to identify and realize key research goals, coordinating logistics for travel to and from the high Arctic, as well as planning, organizing and executing field experiments and activities.

2000-2001 MCGILL UNIVERSITY MONTRÉAL, QUÉBEC
ENVIRONMENT CANADA'S CLIMATE CHANGE ACTION FUND INTERNSHIP PROGRAM
· Generated baseline data on Arctic coastal erosion using satellite imagery and GPS surveys to monitor present and future effects of climate change on rates and extent of permafrost degradation.

2000 RESEARCH ASSOCIATE, MCGILL UNIVERSITY MONTRÉAL, QUÉBEC
· Examined chemical interactions of high-salinity brines in low-temperature mineral precipitation reactions.

1999 NASA PLANETARY BIOLOGY INTERN, PORTLAND STATE UNIVERSITY PORTLAND, OREGON
· Investigated the role of aquatic photosynthesizing microorganisms in the chemical precipitation of carbonate minerals to create microfossils and biosignatures in Pavilion Lake, British Columbia.

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1999 McGILL UNIVERSITY'S ELECTRON MICROSCOPY CENTRE MONTRÉAL, QUÉBEC
· Evaluated sample preparation techniques for transmission electron microscopy to examine the thermal behaviour of ikaite, a metastable calcium carbonate crystal forming in high Arctic perennial springs.

1994 McGILL UNIVERSITY AXEL HEIBERG ISLAND, NUNAVUT
FIELD AND RESEARCH ASSISTANT
· Conducted fieldwork and data collection for an independent research project examining the role of surficial material and climate change on ice-wedge polygonal development.

TEACHING EXPERIENCE

2019 QUEST UNIVERSITY
COURSE INSTRUCTOR, PHY2207 – EARTH SYSTEMS AND HUMAN IMPACTS
· Introduction to the practices of geological inquiry, and methods of extracting economically valuable resources (e.g. petroleum, metals) from rocks. Examination of environmental problems associated with resource extraction, and methods for remediation. A substantive treatment of climate science and the impacts of pollution on climate change. Application of quantitative analysis of geological and environmental data and the creation of cogent arguments that use technical information.

2018 McGILL UNIVERSITY
COURSE INSTRUCTOR, EPSC373 – ARCTIC FIELD STUDIES; GEOLOGY AND GEOLOGIC TECHNIQUES
· Introduction to the principles of geology, hydrogeology, and biogeochemistry and its field context in the Canadian North. The primary objectives are to help students gain insight into these areas of study through activities that will provide them with practical experience in field methods. Field activities will include the identification of rocks and minerals, mapping rock outcrops, interpreting large-scale geologic processes, collecting cores, waters, and sediments, and analyzing samples using standard field methods.

QUEST UNIVERSITY
COURSE INSTRUCTOR, PHY2207 – EARTH SYSTEMS AND HUMAN IMPACTS

QUEST UNIVERSITY
COURSE INSTRUCTOR, PHY3013 – CYCLES IN EARTH SYSTEMS
· Introduction to biogeochemistry, the interdisciplinary scientific field of study that examines the transport and fate of elements crucial for life - carbon, nitrogen, oxygen, sulfur, and phosphorus - through the major "spheres" of our planet: biosphere, atmosphere, hydrosphere, and lithosphere. Biogeochemical cycling results in the transportation of, and chemical reactions with, elements as they move through the different spheres at various scales and rates. Characterizing and documenting their movement has important implications for understanding a wide array of scientific topics including early life on Earth, the regulation of Earth's climate and environment, and environmental changes due to human activity. Using a combination of literature reviews, discussions, and field trips, students will have the opportunity to delve into a specific biogeochemical area of their interest and present their findings to peers.

2017 QUEST UNIVERSITY
COURSE INSTRUCTOR, PHY2207 – EARTH SYSTEMS AND HUMAN IMPACTS

2016 McGILL UNIVERSITY
COURSE INSTRUCTOR, ATOC373 – ARCTIC CLIMATE AND CLIMATE CHANGE
· Introduction to the principles of Arctic climate and climate change with a special focus on the Canadian Arctic. The primary objectives of the course are to: 1) develop an understanding of the present-day high latitude climate, including the atmosphere, ocean and land; 2) develop an understanding of the role of the polar regions in the global climate and climate change; and 3) introduce students to field methods in polar research including climate monitoring and data analysis, sediment coring, and sampling waters for geochemical and microbiological analyses.

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2015 THE UNIVERSITY OF TEXAS AT AUSTIN
COURSE INSTRUCTOR, GEO193 – TECHNICAL SESSIONS
· Involved the organization and management of weekly technical presentations presented by Faculty both from within and outside the Jackson School of Geosciences; attended by Faculty and students.
· Organized Masters' thesis day presentations.

2014 THE UNIVERSITY OF TEXAS AT AUSTIN
COURSE INSTRUCTOR, GEO391 (also COURSE CO-INSTRUCTOR, 2011) – GEOMICROBIOLOGY
· Introduction to geologic and hydrologic controls on microbial growth, metabolism, and community structure, the geochemical consequences of microbial processes, and the influence of geology on microbial ecology.

2014 THE UNIVERSITY OF TEXAS AT AUSTIN
COURSE INSTRUCTOR, GEO476 – CHEMICAL HYDROGEOLOGY
· Introduction to aqueous geochemistry and contaminant hydrogeochemistry; topics include basic thermodynamics, kinetics, rock-water interactions, and solute transport.

2004-2007 UNIVERSITY OF TORONTO
COURSE CO-INSTRUCTOR, GLG351 – GEOCHEMICAL AND BIOLOGICAL REGULATION OF AQUATIC SYSTEMS
· Introduction to chemical thermodynamics, equilibria, and reactivity of abiotic and biotic systems.

2005 UNIVERSITY OF TORONTO
LABORATORY DEMONSTRATOR, CHMB16 – TECHNIQUES IN ANALYTICAL CHEMISTRY
· Supervised and mentored upper-level undergraduate students in analytical chemistry techniques.

TEACHING ASSISTANT POSITIONS
2002 · GLG105 – Evolution of the Earth, UNIVERSITY OF TORONTO
1999 · GEOG495 – Field Studies: Physical Geography, MCGILL UNIVERSITY
1998 · ENVR202 – The Evolving Earth, MCGILL UNIVERSITY
1998 · ENVR200 – The Global Environment, MCGILL UNIVERSITY
1997-1998 · GEOG499 – Subarctic Field Studies: Schefferville (Québec), MCGILL UNIVERSITY
1997 · GEOG350 – Ecological Biogeography, MCGILL UNIVERSITY
1997 · GEOG301 – The Geography of Nunavut, MCGILL UNIVERSITY

STUDENT SUPERVISION, TRAINING AND MENTORING EXPERIENCE

2007-present · *Graduate student thesis committee member at The University of Texas at Austin*

- John Warden, Ph.D. (2016), "Carbonate Thrombolite Genesis: Microbial Calcification and the Role of Salinity"
- Aaron Jones, Ph.D. (2015), "Mineralogical Controls on Microbial Community Structure and Biogeochemical Processes in Subsurface Environments"
- Kimberly Myers, Ph.D. (2015), "Microbial Ecology and Biogeochemistry of Cyanobacteria in the Arsenic-rich and Inorganic Carbon-limited Geothermal Waters of El Tatio Geyser Field, Chile"
- Eugenio Santillan, Ph.D. (2014), "Microbial Responses to CO_2 During Carbon Sequestration: Insights into an Unexplored Extreme Environment"
- Aaron Jones, M.Sc. (2011), "Microbe Mineral Affinity in Sulfuric Acid Karst Systems"

· *Graduate student mentoring at The University of Kansas*

- Adam Yoerg, M.Sc. (2018); Taught techniques in XAFS and μ-XFM at the Advanced Photon Source (Argonne National Laboratory) for thesis-related research.
- Hannah Hubert, M.Sc. (2017); Mentored education in microbial mats, microbial metabolisms, and the role of microorganisms in carbonate precipitation and formation of microbialites; taught techniques in SEM.
- Mathew Edwards, M.Sc. (2016); Taught techniques in staining and imaging of bacteria using fluorescence light microscopy.

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· *Graduate student mentoring at McGill University*

- Melissa Ward, M.Sc. (2015); Taught techniques in cryo-SEM to image minerals such as hydrohalite; used geochemical modeling to predict mineral precipitation pathways.

· *Undergraduate student mentoring at The University of Texas at Austin*

- Kian Maharaj (B.Sc. 2017); Learned techniques in microbiology applied to terrestrial and aquatic ecosystems, isolated both phototrophic and heterotrophic bacteria from high Arctic endolithic habitats, characterized them by microscopy.
- Emilie Gentry, B.Sc. (2013); Taught basic techniques in microbiology applied to terrestrial microorganisms; isolated phototrophic bacteria from endolithic habitats from around the world.
- Jen Denbow, B.Sc. (2008); Taught basic techniques in microbiology (media preparation, culturing, transferring, aseptic techniques) applied to thermophilic ecosystems; isolated and characterized a chemoorganotrophic bacterium from El Tatio Geyser Field, Chile.

· *Undergraduate student mentoring at The University of Kansas*

- Adam Yoerg, B.Sc. (2016); Taught techniques in biological sample preparation for SEM, as well as SEM imaging and EDAX mapping; provided guidance in geochemical modeling to predict mineral precipitation pathways during evaporative fractionation; visited the LacCore facility (University of Minnesota) to image and sample lake sediment cores.

TECHNICAL EXPERTISE

Scanning electron microscopy (SEM) including focused ion beam (FIB) milling and cryo-SEM; Transmission electron microscopy (TEM); Confocal laser scanning microscopy (CLSM); Time-of-Flight secondary ion mass spectrometry (ToF-SIMS); Inductively coupled plasma optical emission spectrometry (ICP-OES); Ion chromatography (IC); X-ray diffraction (XRD); Cavity ring-down spectroscopy (CRDS) for field-based gas measurements (e.g. CO_2, CH_4, H_2O, $\delta^{13}C$-CO_2; *in situ* geochemical measurements of sediments using microelectrodes (e.g. pH, O_2)

SYNCHROTRON RADIATION EXPERIENCE AND EXPERTISE

SYNCHROTRON RADIATION FACILITIES

2009-2019: 9-BM and 20-ID beamlines at the Advanced Photon Source, Argonne National Laboratory
2012: VESPERS beamline at the Canadian Light Source, University of Saskatchewan

SYNCHROTRON RADIATION TECHNIQUES

· Full spectrum X-Ray Absorption Spectroscopy (XAS) including X-Ray Absorption Near Edge Structure (XANES) to characterize the speciation of metals in environmental samples
· μ-X-ray Fluorescence Mapping (μ-XFM) for 2-D spatial characterization across the cell-mineral interface

ARCTIC FIELDWORK EXPERIENCE

· Expedition Fiord, Axel Heiberg Island, Nunavut, Canada (1994, 1997-1999, 2007-2019)
· Cape Bounty, Melville Island, Nunavut, Canada (2018-2019)
· Fosheim Peninsula, Ellesmere Island, Nunavut, Canada (2002-2015)
· Herschel Island, Yukon, Canada (1999-2001)

GLOBAL FIELDWORK EXPERIENCE

· El Tatio Geyser Field, Chile (microbial ecology of the arsenic-rich El Tatio Geyser Field; 2008, 2009, 2011, 2012)
· Lake Clifton, Western Australia (microbe-mineral interactions and the formation of carbonate thrombolites; 2011)
· Kane Cave, Wyoming, USA (microbial influence on sulfuric acid speleogenesis; 2007, 2008, 2014)
· Sandhills, Nebraska, USA (microbial influence on early diagenesis in alkaline lake systems; 2017)

MANAGEMENT EXPERIENCE

2012-present SCIENCE/LOGISTICS BASE MANAGER, MCGILL ARCTIC RESEARCH STATION
· Maintain a long-term climate change research program at MARS that includes collating, analyzing, and distributing baseline climate, hydrologic, and permafrost data

- Establish interdisciplinary scientific collaborations to further develop our ability to characterize and monitor climate change on western Axel Heiberg Island
- Coordinate scientific activities at MARS, including logistical and technical requirements
- Acquire land use permits and licenses associated with scientific research; these include the Territorial Land Use Permit, Nunavut Water Board Licence, Nunavut Research Licence, Emergency Spill Plan, HF Radio Licence, and satellite communication contract
- Acquire PCSP support for scientific research projects
- Submit annual reports to licencing organizations
- Organize logistical movements into and out of the station, including fixed-wing and helicopter
- Monitor and maintain infrastructure at MARS, including buildings, fuel caches, and equipment
- Maintain Ka-band satellite communications system
- Monitor and maintain infrastructure, including buildings, fuel caches, and equipment
- Manage activities associated with the McGill Arctic Field Studies Semester

PROFESSIONAL SERVICE AND DEVELOPMENT

2017 — NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) — ST. LOUIS, MISSOURI
- Panel member for the NAI CAN 8 Program to review and recommend scientific proposals for funding by NASA's Science Mission Directorate

2016 — NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) — PHOENIX, ARIZONA
- Panel member for the Exobiology (EXO) Program to review and recommend scientific proposals for funding by NASA's Science Mission Directorate

2015 — NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) — ATLANTA, GEORGIA
- Panel member for the Exobiology (EXO) Program to review and recommend scientific proposals for funding by NASA's Science Mission Directorate

2015 — NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) — WASHINGTON, D.C.
- Panel member for the Planetary Science and Technology Through Analogue Research (PSTAR) Program to review and recommend scientific proposals for funding by NASA's Science Mission Directorate

2014 — WRITE WINNING NSF CAREER AWARD PROPOSALS — AUSTIN, TEXAS
- The University of Texas at Austin in association with the Grant Writers' Seminars and Workshop, a 2-day seminar focusing on how to write successful NSF proposals

2014 — MEPAG SCIENCE ANALYSIS GROUP — DENVER, COLORADO
- Working team to "Review of Potential Habitats on Mars: Special Regions Definitions, Locations, and Resource Relationships", chartered by NASA to provide technical information and advice relating to Mars exploration

2013 — TRANSANTARCTIC MOUNTAIN CAMP WORKSHOP — MINNEAPOLIS, MINNESOTA
- Workshop forum where researchers identified and discussed disciplinary research priorities and identified new opportunities for interdisciplinary research

2012 — INTERNATIONAL SOCIETY FOR ENVIRONMENTAL BIOGEOCHEMISTRY — CANCUN, MEXICO
- Microbe-Mineral Interactions: Molecular to Global Scale Processes Short Course
- Invited speaker, talk entitled "Biosedimentology, Bacterial Taphonomy, Astrobiology, and Polar Analogue Exploration"

2012 — 22ND GOLDSCHMIDT CONFERENCE — MONTRÉAL, QUÉBEC
- Co-convener with V. Phoenix and D. Tobler, Theme 21e: Recent Advances in Applied Microbial Biomineralization
- Invited speaker, Theme 15a: "Water, Elements and Life in Early-Earth and Mars Analogs"

2012 — TRANSANTARCTIC MOUNTAIN CAMP WORKSHOP — INDIANAPOLIS, INDIANA
- Workshop forum where researchers identified and discussed disciplinary research priorities and identified new opportunities for interdisciplinary research
- Selection of next deep field logistics hub in the Transantarctic Mountains (Shackleton Glacier)

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2012 UNISENSE USER WORKSHOP AARHUS, DENMARK
· Workshop to learn theory behind microsenor technology and applications through presentations, tour of the facility and production, as well as training and demonstration of sensors, instruments and software

2011 20TH INTERNATIONAL SYMPOSIUM ON ENVIRONMENTAL BIOGEOCHEMISTRY ISTANBUL, TURKEY
· Session Chair: Biogeochemical Cycles and Global Change
· Elected to the ISEB International Committee (term runs until 2019)

2011 ANALOGUE SITES FOR MARS MISSIONS: MSL AND BEYOND THE WOODLANDS, TEXAS
· Workshop to develop an inventory of analogue sites of value to NASA's Mars Science Laboratory (MSL), the Mars 2018 missions, and Mars analogue missions by the Canadian Space Agency

2010 20TH GOLDSCHMIDT CONFERENCE KNOXVILLE, TENNESSEE
· Co-convener with G. Southam, Theme 15j: Microbe-Mineral Interactions; The Role of Microorganisms in Promoting Carbonation Reactions
· Invited speaker, Theme 15m: Microbial Biominerals: Structure, Formation and Applications

2010 EUREKA 2010: CANADIAN ARCTIC RESEARCH AT 80°N OTTAWA, ONTARIO
· Workshop to identify key research activities and forge logistical collaborations between scientists
· Invited speaker; talk entitled "Microbiology Research Activities in the Eureka Area"

2009 DEPARTMENT OF EARTH SCIENCES, UNIVERSITY OF OTTAWA OTTAWA, ONTARIO
· Invited speaker; talk entitled "Biosignatures: Understanding the Process Behind the Form"

2008 NATIONAL SCIENCE FOUNDATION (NSF) WASHINGTON, D.C.
· Panel member for the NSF's Arctic Natural Sciences and Arctic System Sciences Programs to review and recommend scientific proposals for funding by NSF's Office of Polar Programs with a budget of $17M.

2007 DEEP UNDERGROUND SCIENCE AND ENGINEERING LABORATORY (DUSEL) WASHINGTON, D.C.
· Involved in the planning of future phases for the development of the DUSEL in Lead, South Dakota, investigating scientific questions pertaining to fields including particle and nuclear physics, geology, hydrology, geo-engineering, biology, and biochemistry, with an early implementation budget of $116M.

2003 POLAR CONNECTIONS EDMONTON, ALBERTA
· Participated in an international workshop to identify the present activities, achievements, and goals of Canadian scientists in Antarctic research programs, and how to move forward in future endeavours.
· University of Alberta

2002 QUEEN'S UNIVERSITY KINGSTON, ONTARIO
Short Course: Team-Based Project Management for Researchers at Canadian Universities
· Queen's Executive Development Centre, Queen's School of Business

2002 UNIVERSITY OF BERGEN BERGEN, NORWAY
Short Course: The Deep Biosphere: Distribution, Microbial Diversity and Interactions with the Lithosphere
· Department of Geology and Department of Microbiology

RESEARCH FUNDING

2016 National Science Foundation's Antarctic Earth Sciences Program ($154,814)
Grant funded to Dr. C.R. Omelon (PI), The University of Kansas
Activity, preservation and fossilization of cryptoendolithic microorganisms in Antarctica

2015 Jackson School of Geosciences Seed Grant Program, Climate, Carbon & Geobiology ($16,829)
Collaborative Grant with Drs. Martindale, Shanahan, and Omelon, The University of Texas at Austin
New Techniques for Assessing Microbial Communities and Endosymbionts in Fossil Reefs

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2015 ArcticNet's Phase 4 (2015-2018), Network of Centres of Excellence, Government of Canada
Collaborative Grant with Drs. Scott Lamoureux and Melissa Lafrenière (Queen's University, Canada)

2014 U.S. Department of Energy's Opportunities, Knowledge Advancements, and Technology Improvements for Increased CO_2 Storage in Enhanced Oil Recovery (EOR) Operations ($1.8M)
Grant funded to Dr. Ian Duncan (PI), Bureau of Economic Geology, University of Texas at Austin
Optimizing CO_2 Sweep based on Geochemical and Reservoir Characterization of the Residual Oil Zone of Hess's Seminole Unit

2014 Jackson School of Geosciences Seed Grant Program, Climate, Carbon & Geobiology ($19,588)
Collaborative Grant with Drs. Omelon, Bennett, and Breecker, The University of Texas at Austin
Activity, Preservation and Fossilization of Cryptoendolithic Microorganisms in Antarctica

2012 Research Partnership to Secure Energy for America's Unconventional Resources Program ($1.3M)
Grant funded to Dr. J.-P. Nicot (PI), Bureau of Economic Geology, University of Texas at Austin
Understanding and Managing Environmental Roadblocks to Shale Gas Development: An Analysis of Shallow Gas, NORMs, and Trace Metals (Texas)

2011 National Aeronautics and Space Administration's ROSES-2010 Program ($150,000)
Grant funded to Dr. Omelon with C.P. McKay, G. Southam, D. Breecker, M. Helper, and P. Bennett
Cryptoendolithic Microorganisms of the Antarctic Dry Valleys: Identification of and Processes Controlling Biosignature Preservation and Fossilization of Microorganisms

2009 National Science Foundation's Arctic Natural Sciences Program ($355,936)
Grant funded to Dr. P.C. Bennett, The University of Texas at Austin
The Geochemical Ecology of Cryptoendolithic Microorganisms: Relationships Between Cyanobacteria and Sandstone Weathering in the Canadian High Arctic

2007 NASA Astrobiology Institute's Director's Discretionary Fund ($253,075)
Collaborative Grant with Dr. T.C. Onstott (PI), Princeton University
Mars Environmental Simulator Studies of Forward Contamination and Biogeochemical Processes

2006 Canadian Space Agency's Canadian Analogue Research Network Program ($13,520)
Understanding Relationships Between Microbial Diversity, Environment, and their Role in Terrestrial Biosignature Formation in a High Arctic Polar Desert

2002 Environment Canada's Research Support Opportunity in Arctic Environmental Studies ($40,000)
· Awarded by the Canadian Northern Scientific Research Program; sponsored by Atmospheric Environment Service for 365 days of support at the Eureka Weather Station, Nunavut, Canada

1994-2004 Department of Indian and Northern Affairs Canada's Northern Scientific Training Program
· 7 awards received (~$3,500/award)

1994 Royal Canadian Geographical Society Student Research Award
· Awarded by the Royal Canadian Geographical Society ($2,365)

JOURNAL PUBLICATIONS

1. Qu, E., Omelon, C., Oren, A., Meslier, V., Cowan, D.A., and DiRuggiero, J. 2019. Trophic selective pressures found to organize the composition of endolithic microbial communities in a global comparative study. *Frontiers in Microbiology (accepted with revisions)*.
2. Zentilli, M., Omelon, C.R., Hanley, J., and LeFort, D. 2019. Hydrothermal precursor to perennial springs at Expedition Fiord, Axel Heiberg Island, Nunavut. *Geofluids*, doi.org/10.1155/2019/9502904.
3. Warden, J.G., Coshell, L., Rosen, M.R., Breecker, D.O., Ruthrof, K.X., and Omelon, C.R. 2019. The importance of groundwater flow to the formation of modern thrombolitic microbialites. *Geobiology*; doi.org/10.1111/gbi.12344
4. Hubert, H.L., Rankey, E.C., and Omelon, C.R. 2018. Organic matter, textures, and pore attributes of hypersaline lacustrine microbial deposits (Holocene, Bahamas). *Journal of Sedimentary Research* 88(7), 827-849; doi.org/10.2110/jsr.2018.42

5. Ronholm, J., Goordial, J., Izawa, M.M.R., Applin, D., Sapers, H.M., Pontefract, A., Omelon, C.R., Cloutis, E.A., and Whyte, L.G. 2018. Comparison of microbial eukaryotic and prokaryotic lithic communities between serpentine and felsic intrusives in Jeffrey Mine, Canada. *Astrobiology* 18(8), 1008-1022.
6. Plenge, M., Summers Engel, A., Omelon, C.R., and Bennett, P.C. 2017. Thermophilic archaeal diversity and methanogenesis from El Tatio Geyser Field, Chile. *Geomicrobiology Journal* 34, 220-230; doi: 10.1080/01490451.2016.1168496.
7. Warden, J.G., Casaburi, G., Omelon, C.R., Bennett, P.C., Breecker, D.O., and Foster, J.S. 2016. Characterization of microbial mat microbiomes in the modern thrombolite ecosystem of Lake Clifton, Western Australia using shotgun metagenomics. *Frontiers in Microbiology* 7, 1064; doi: 10.3389/fmicb.2016.01064.
8. Mykytczuk, N.C.S., Lawrence, J.R., Omelon, C.R., Southam, G., and Whyte, L.G. 2016. Microscopic characterization of the cell envelope of *Planococcus halocryophilus* Or1 during subzero growth at -15˚C. *Polar Biology* 39, 701-712; doi: 10.1007/s00300-015-1826-5.
9. Santillan, E.F.U., Shanahan, T.M., Omelon, C.R., Major, J.R., and Bennett, P.C. 2015. Isolation and characterization of a CO_2-tolerant *Lactobacillus* strain from Crystal Geyser, Utah, U.S.A. *Frontiers in Earth Science* 3, 41; doi: 10.3389/feart.2015.00041.
10. Lau, M.C.Y., Stackhouse, B.T., Layton, A.C., Chauhan, A., Vishnivetskaya, T., Pfiffner, S.M., Mykytczuk, N.C.S., Bennett, P., Lamarche-Gagnon, G., Burton, N., Ronholm, J., Whyte, L.G., Pollard, W.H., Omelon, C.R., Medvigy, D.M., and Onstott, T.C. 2015. An active atmospheric methane sink in high Arctic mineral cryosols. *The ISME Journal* 9, 1880-1891; doi:10.1038/ismej.2015.13.
11. Rummel, J.D., Beaty, D.W., Jones, M.A., Bakermans, C., Barlow, N.G., Boston, P., Chevrier, V., Clark, B.C., de Vera, J-.P., Gough, R.V., Hallsworth, J.E., Head, J.W., Hipkin, V.J., Kieft, T.L., McEwen, A.S., Mellon, M.T., Mikucki, J., Nicholson, W.L., Omelon, C.R., Peterson, R., Roden, E., Sherwood Lollar, B., Tanaka, K.L., Viola, D., Wray, J.J. 2014. A new analysis of Mars 'Special Regions': Findings of the Second MEPAG Special Regions Science Analysis Group (SR-SAG2). *Astrobiology* 14, 887-968.
12. Shtober-Zisu, N., Schwarcz, H.P., Chow, T., Omelon, C.R., and Southam, G. 2014. Caves in caves: Evolution of post-depositional macroholes in stalagmites. *International Journal of Speleology* 43, 323-334.
13. Akhter, F., Omelon, C.R., Gordon, R.A., Moser, D., and MacFie, S.M. 2014. Localization and chemical speciation of cadmium in the roots of barley and lettuce. *Environmental and Experimental Botany* 100, 10-19.
14. Omelon, C.R., Brady, A.L., Slater, G.F., Laval, B., Lim, D.S.S., and Southam, G. 2013. Microstructure variability due to phototrophic and heterotrophic metabolisms in freshwater microbialites, Pavilion Lake, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology* 392, 62-70.
15. Mykytczuk, N.C.S., Foote, S.J., Omelon, C.R., Southam, G., Greer, W.C., and Whyte, L.G. 2013. Subzero growth at -15°C; genomic, transcriptomic, and physiological insights from the permafrost bacterium *Planococcus halocryophilus* Or1. *The ISME Journal* 7, 1211-1226.
16. Ziolkowski, L.A., Mykytczuk, N.C.S., Omelon, C.R., Johnson, H., Whyte, L.G., and Slater G.F. 2013. Arctic gypsum endoliths: a biogeochemical characterization of a viable and active microbial community. *Biogeosciences* 10, 7661-7675.
17. Steinhauer, E.S., Omelon, C.R., and Bennett, P.C. 2010. Limestone corrosion by neutrophilic sulfur oxidizing bacteria: A coupled microbe-mineral system. *Geomicrobiology Journal* 27, 723-738.
18. Brady, A., Slater, G., Omelon, C.R., Southam, G., Druschel, G., Andersen, D., Hawes, I., Laval, B., and Lim, D.S.S. 2010. Photosynthetic isotope biosignatures in laminated micro-stromatolitic and non-laminated nodules associated with modern, freshwater microbialites in Pavilion Lake, B.C. *Chemical Geology* 274, 56-67.
19. Pollard, W.H., Haltigin, T., Whyte, L., Niederberger, T., Andersen, D., Omelon, C., Nadeau, J., Ecclestone, M., and Lebeuf, M. 2009. Overview of analogue science activities at the McGill Arctic Research Station, Axel Heiberg Island, Canadian High Arctic. *Planetary and Space Science* 57, 646-659.
20. Omelon, C.R. 2008. Endolithic microbial communities in polar desert habitats. *Geomicrobiology Journal* 25, 404-414.

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21. Omelon, C.R., Pollard, W.H., and Ferris, F.G. 2007. Inorganic species distribution and microbial diversity within high Arctic cryptoendolithic habitats. *Microbial Ecology* 54, 740-752.

22. Omelon, C.R., Pollard, W.H., and Ferris, F.G. 2006. Environmental controls on microbial colonization of high Arctic cryptoendolithic habitats. *Polar Biology* 30, 19-29.

23. Omelon, C.R., Pollard, W.H., and Ferris, F.G. 2006. Chemical and ultrastructural characterization of high Arctic cryptoendolithic habitats. *Geomicrobiology Journal* 23, 189-200.

24. Omelon, C.R., Pollard, W.H., and Andersen, D.T. 2006. A geochemical evaluation of perennial spring activity and associated mineral precipitates at Expedition Fjord, Axel Heiberg Island. *Applied Geochemistry* 21, 1-15.

25. Cockell, C.S., McKay, C.P., and Omelon, C.R. 2003. Polar endoliths - an anti-correlation between climatic extremes and biodiversity. *International Journal of Astrobiology* 1, 305-310.

26. Omelon, C.R., Pollard, W.H., and Marion, G.M. 2001. Seasonal formation of ikaite ($CaCO_3 \cdot 6H_2O$) in saline spring discharge at Expedition Fjord, Canadian High Arctic: assessing conditional constraints for natural crystal growth. *Geochimica et Cosmochimica Acta* 65, 1429-1437.

27. Pollard, W.H., Omelon, C., Andersen, D., and McKay, C. 1999. Perennial spring occurrence in the Expedition Fiord area of western Axel Heiberg Island, Canadian High Arctic. *Canadian Journal of Earth Sciences* 36, 105-120.

BOOK CHAPTERS

28. Omelon, C.R. 2016. Endolithic microorganisms and their habitats. In: Hurst, C.J. (ed), *Advances in Environmental Microbiology, Volume 1: Their World: A Diversity of Microbial Environments*. Springer, p.171-20

29. Bennett, P.C, and Omelon, C.R. 2011. Microbial geochemistry: at the intersection of disciplines. In: Harmon, R.S., Parker, A. (eds), *Frontiers in Geochemistry: Contributions of Geochemistry to the Study of the Earth, 1st Edition*. Blackwell Publishing, p.175-199.

PEER-REVIEWED PROCEEDINGS

30. Omelon, C.R., Pollard, W.H., Ferris, F.G., and Bennett, P.C. 2008. Cyanobacteria within cryptoendolithic habitats: the role of high pH in biogenic rock weathering in the Canadian high Arctic. *Proceedings, 9th International Conference on Permafrost, Fairbanks, Alaska, June 29 - July 3*, p.1327-1332.

31. Budkewitsch, P., Pollard, W., Leduc, F., Omelon, C., Gauthier, E., and Molch, K. 2005. Detection and mapping of permafrost degradation on Herschel Island, Yukon, using RADARSAT-1, SPOT and IKONOS satellite data. *In:* Rachold, V., Lantuit, H., Couture, N., Pollard, W.H. (Eds.), Report on the 5th International Workshop on Arctic Coastal Dynamics, Montréal, Québec, Canada, October 13-16. *Reports on Polar and Marine Research* 506, 30.

32. Omelon, C.R., Ferris, F.G., Pollard, W.H., Andersen, D.T., and Whyte, L. 2003. High Arctic cryptoendolithic microorganisms in a polar desert environment. *Proceedings, 8th International Conference on Permafrost, Zurich, Switzerland, July 21-25*, p.851-858.

33. Pollard, W., Omelon, C., Couture N., Solomon, S., and Budkewitsch, P. 2002. Ice content and sensitivity analysis based on landscape interpretation for several sites along the Beaufort Sea coast. *In:* Rachold, V., Brown, J. and Solomon, S. (Eds.), Report on the 2nd International Workshop on Arctic Coastal Dynamics, Potsdam, Germany, November 26-30. *Reports on Polar and Marine Research* 413, 48-51.

34. Pollard, W.H., Omelon, C., Andersen, D., and McKay, C. 1998. Geomorphic and hydrologic characteristics of perennial springs on Axel Heiberg Island, Canadian High Arctic. *Proceedings, 7th International Conference on Permafrost, Yellowknife, N.W.T., June 23-27*, p.909-914.

CONFERENCES AND WORKSHOPS

35. Omelon, C.R. 2019. Discovery of schwertmannite in Colour Lake, Axel Heiberg Island, Nunavut. *24th International Symposium on Environmental Biogeochemistry, Potsdam, Germany, September 22-29.*

36. Omelon, C.R. and Mykytczuk, N. 2019. Evidence for sub-permafrost microbial communities revealed through perennial spring activity, Axel Heiberg Island, Nunavut. *24th International Symposium on Environmental Biogeochemistry, Potsdam, Germany, September 22-29.*

37. Lamoureux, S.F., Amann, B., Kyser, T.K., Simpson, M.J., Pautler, B.G., Pieńkowski, A.J., La Farge, C., and Omelon, C.R. 2018. Thaw slurry lake deposits: paleoenvironmental indicators of long term permafrost dynamics. *5th European Conference on Permafrost, Chamonix-Mont Blanc, France, June 23-July 1.*

38. Hubert, H., Omelon, C.R., and Rankey, E.C. 2017. Influence of organic matter type and abundance on depositional textures and associated pore attributes of hypersaline microbial deposits (Holocene, Bahamas). *2017 Mountjoy Carbonate Research Conference, Austin, Texas, June 26-30.*

39. Omelon, C.R., Hubert, H., Roberts, J., and Rankey, E.C. 2017. Investigating the role of microorganisms in the growth and diagenesis of hypersaline microbialites, southern Bahamas. *Kansas Interdisciplinary Carbonates Consortium Annual Meeting, The University of Kansas, Lawrence, Kansas, March 5-7.*

40. Omelon, C.R., Yoerg, A., Stotler, R., Fowle, J., and Roberts, J. 2017. Evaluation of early diagenesis in an alkaline lake system of the Nebraska Sand Hills. *Kansas Interdisciplinary Carbonates Consortium Annual Meeting, The University of Kansas, Lawrence, Kansas, March 5-7.*

41. Hubert, H., Omelon, C., Olcott-Marshall, A., Zhang, C., and Rankey, E.C. 2017. Influence of organic matter type and abundance on depositional textures and pore attributes of hypersaline lacustrine microbial deposits (Holocene, Bahamas). *Kansas Interdisciplinary Carbonates Consortium Annual Meeting, The University of Kansas, Lawrence, Kansas, March 5-7.*

42. Fowle, D.A., Stotler, R., Omelon, C.R., and Roberts, J. 2017. Theoretical, experimental and field based constraints on clay diagenesis in saline environments. *Kansas Interdisciplinary Carbonates Consortium Annual Meeting, The University of Kansas, Lawrence, Kansas, March 5-7.*

43. Stotler, R., Omelon, C., Yoerg, A., Roberts, J., and Fowle, D.A. 2017. Observations and insights into chemical processes and mineralization in alkaline lakes. *Kansas Interdisciplinary Carbonates Consortium Annual Meeting, The University of Kansas, Lawrence, Kansas, March 5-7.*

44. Yoerg, A., Roberts, J., and Omelon, C.R.2017. Investigating surface chemistry-controlled dolomite nucleation in saline, alkaline, and dilute waters. *Kansas Interdisciplinary Carbonates Consortium Annual Meeting, The University of Kansas, Lawrence, Kansas, March 5-7.*

45. Roberts, J.A., Edwards, M., Yoerg, A., Fowle, D.A., Goldstein, R.H., González, L.A., and Omelon, C.R. 2016. The role of surface-bound carboxyl-group density of organic matter in low-temperature dolomite formation. *Dolomieu Conference on Carbonate Platforms and Dolomite, Selva Di Val Gardena, Italy, October 4-7.*

46. Omelon, C.R., Fowle, D., Stotler, R., Yoerg, A., and Roberts, J.A. 2016. Evaluation of Early Diagenesis in an Alkaline Lake System of the Nebraska Sand Hills. *Kansas Interdisciplinary Carbonates Consortium Annual Meeting, The University of Kansas, Lawrence, Kansas, April 25-27.*

47. Roberts, J.A., Yoerg, A., Omelon, C.R., Fowle, D., and Stotler, R. 2016. Geochemical controls on authigenic mineral formation in alkaline lakes, Sand Hills, Nebraska. *Kansas Interdisciplinary Carbonates Consortium Annual Meeting, The University of Kansas, Lawrence, Kansas, April 25-27.*

48. Warden, J.G., Coshell, L., Rosen, M.R., Breecker, D.O., Ruthrof, K.X., Omelon, C.R., and Bennett, P.C. 2015. Hydrologic controls on modern microbialite formation. *American Geophysical Union Fall Meeting, San Francisco, California, December 14-18.*

49. Omelon, C.R., Mykytczuk, N.C.S., Foote, S., Lawrence, J., Whyte, L.G., and Southam, G. 2014. Geomicrobiological implications of freezing, saline conditions on the cell envelope of *Planococcus halocryophilus Or1*. *International Society for Environmental Biogeochemistry Short Course and Research Colloquium, Cancún, Mexico, November 16-21.*

50. Mykytczuk, N., Foote, S., Lawrence, J., Omelon, C., Southam, G., and Whyte, L. 2014. Subzero growth and adaptation; insights from *Planococcus halocryophilus sp. nov. Or1* in Canadian high Arctic permafrost. *14th International Symposium on Microbial Ecology, Copenhagen, Denmark, August 19-24.*

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51. Beaty, D.W. and the MEPAG SR2-SAG 2014. Introduction to an updated analysis of planetary protection "special regions" on Mars. *45th Lunar and Planetary Science Conference, The Woodlands, Texas, March 17-21.*

52. Beaty, D.W., Rummel, J.D., Jones, M.A., Bakermans, C., Barlow, N., Boston, P., Chevrier, V., Clark, B., de Vera, J-.P., Gough, R., Hallsworth, J., Head, J., Hipkin, V., Kieft, T., McEwen, A., Mellon, M., Mikucki, J., Nicholson, W., Omelon, C., Peterson, R., Roden, E., Sherwood Lollar, B., Tanaka, K., Viola, D., Wray, J. 2014. An updated understanding of "Special Regions" on Mars: The second MEPAG Special Regions Science Analysis Group (SR-SAG2). *The Eighth International Conference on Mars, Pasadena, California, July 14-18.*

53. Mykytczuk, N.C.S., Lawrence, J.R., Omelon, C.R., Southam, G., and Whyte, L.G. 2014. Microscopic characterization of the cell envelope of *Planococcus halocryophilus* Or1 during subzero growth at -15˚C. *International Union of Microbiological Societies, Montréal, Québec, July 27-August 1.*

54. Myers, K.D., Omelon, C.R., and Bennett, P. 2013. Physical and geochemical controls on the structure and function of microbial mat communities at El Tatio Geyser Field, Chile. *American Geophysical Union Fall Meeting, San Francisco, California, December 9-13.*

55. Santillan, E.F.U., Major, J.R., Omelon, C.R., Shanahan, T.M., and Bennett, P. 2013. Isolation and characterization of a novel CO2-tolerant Lactobacillus strain form Crystal Geyser, UT. *American Geophysical Union Fall Meeting, San Francisco, California, December 5-9.*

56. Omelon, C.R., Mykytczuk, N.C.S., and Bennett, P.C. 2013. Photosynthesis and respiration dynamics in high Arctic cryptoendolithic environments. *21st International Symposium on Environmental Biogeochemistry, Wuhan, China, October 13-18.*

57. Jones, A.A., Omelon, C.R., and Bennett, P.C. 2013. Mineralogical control of microbial accumulation and diversity on rock surfaces. *21st International Symposium on Environmental Biogeochemistry, Wuhan, China, October 13-18.*

58. Omelon, C.R., Warden, J.G., Mykytczuk, N.C.S., Breecker, D.O., and Bennett, P.C. 2013. Microbial respiration in high Arctic cryptoendolithic habitats. *5th International Conference on Polar and Alpine Microbiology, Big Sky, Montana, September 8-12.*

59. Zentilli, M., Hanley, J., Lefort, D., and Omelon, C.R. 2013. Fluid inclusions study of salt-structure related hydrothermal development in Axel Heiberg Island, Canadian Arctic Archipelago. *Atlantic Geoscience Society Colloquium, Dartmouth, Nova Scotia, February 1-2.*

60. Omelon, C.R., Warden, J., Mykytczuk, N.C.S., Breecker, D.O., and Bennett, P.C. 2012. Phototrophic and heterotrophic respiration associated with cryptoendolithic microorganisms, Ellesmere Island, Canadian high Arctic. *ASM2012 – ArcticNet's 8th Annual Scientific Meeting, Vancouver, British Columbia, December 10-14.*

61. Omelon, C.R., Pollard, W.H., Andersen, D.T., and Zentilli, M. 2012. High Arctic perennial spring activity and associated minerals: their value to Mars analogue studies. *Invited speaker - 22nd Goldschmidt Conference, Montréal, Québec, June 24-29.*

62. Zentilli, M., Omelon, C.R., Hanley, J., LeFort, D., Andersen, D.T., and Pollard, W.H. 2012. Remains of ancient precursors of perennial springs in the High Arctic. *22nd Goldschmidt Conference, Montréal, Québec, June 24-29.*

63. Santillan, E.F.U., Omelon, C.R., Shanahan, T.M., and Bennett, P.C. 2012. Membrane-dependent microbial inhibition during CO_2 sequestration: Implications for the alteration of subsurface community composition. *22nd Goldschmidt Conference, Montréal, Québec, June 24-29.*

64. Maclean, L.C., Dynes, J.J., Omelon, C.R., and Southam, G. 2012. Organic-mineral interactions in biogenic FeS systems. *22nd Goldschmidt Conference, Montréal, Québec, June 24-29.*

65. Santillan, E.F.U., Franks, M.A., Omelon, C.R., and Bennett, P. 2011. Microbes under pressure: A comparison of CO_2 stress responses on three model organisms and their implications for geologic carbon sequestration. *American Geophysical Union Fall Meeting, San Francisco, California, December 5-9.*

66. Myers, K.D., Omelon, C.R., and Bennett, P.C. 2011. The role of cyanobacteria in arsenic biogeochemistry at El Tatio Geyser Field, Chile. *20th International Symposium on Environmental Biogeochemistry, Istanbul, Turkey, Sept. 27-30.*

67. Omelon, C.R., Myers, K.D., and Bennett, P.C. 2011. Cyanobacterial colonization of the Et Tatio Geyser Field, Chile: temperature-controlled niche habitats. *20th International Symposium on Environmental Biogeochemistry, Istanbul, Turkey, September 27-30.*

68. Mykytczuk, N., Ziolkowski, L., Omelon, C.R., Slater, G., Southam, G., Whyte, L.G. 2011. Living off 8 months of sun per year: a cryptoendolithic community from Canadian high Arctic gypsum. *Canadian Society of Microbiologists 61st Annual Conference, St. John's, Newfoundland, June 20-23.*

69. Myers, K.D., Omelon, C.R., and Bennett, P.C. 2010. Carbon uptake in low dissolved inorganic carbon environments: the effect of limited carbon availability of photosynthetic organisms in thermal waters. *American Geophysical Union Fall Meeting, San Francisco, California, December 13-17.*

70. Omelon, C.R., Power, I.M., MacLean, L., and Southam, G. 2010. Evaluation of calcium binding and carbonate precipitation by cyanobacteria in aquatic and terrestrial habitats by XAFS. *Invited speaker - 20th Goldschmidt Conference, Knoxville, Tennessee, June 13-18.*

71. Brady, A., Slater, G., Omelon, C.R., Southam, G., Druschel, G., Andersen, D., Hawes, I., Sumner, D., Laval, B., and Lim, D.S.S. 2009. Biosignatures of photosynthetic influences on carbonate precipitation in surface nodules associated with modern, freshwater microbialites in Pavilion Lake, B.C. *American Geophysical Union Fall Meeting, San Francisco, California, December 14-18.*

72. Omelon, C.R., Brady, A.L., Slater, G.F., Laval, B., Lim, D.S., and Southam, G. 2009. A microscopic evaluation of carbonate microbialites from Pavilion Lake, Canada: microstructure variability associated with microbe-mineral interactions. *19th International Symposium on Environmental Biogeochemistry, Hamburg, Germany, September 14-18.*

73. Steinhauer, E.S., Omelon, C.R., and Bennett, P.C. 2009. Limestone weathering by neutrophilic sulfur-oxidizing bacteria in Lower Kane Cave, Wyoming, USA. *19th International Symposium on Environmental Biogeochemistry, Hamburg, Germany, September 14-18.*

74. Franks, M., Omelon, C.R., Engel, A., and Bennett, P. 2009. Correlations between archaeal diversity and geochemical parameters in an arsenic-rich hydrothermal system. *European Geosciences Union General Assembly, Vienna, Austria, April 19-24.*

75. Franks, M., Bennett, P., Omelon, C., Engel, A. 2008. Diversity of archeal consortia in an arsenic-rich hydrothermal system. *American Geophysical Union Fall Meeting, San Francisco, California, December 15-19.*

76. Engel, A.S., Birdwell, J.E., Johnson, L., Brannen, K.M., Franks, M., Omelon, C.R., Landrum, J.T., Alsina, M.A., Pastén, P.A., and Bennett, P.C. 2008. Biofilm development, microbial diversity and dissolved organic matter from El Tatio, Chile: implications for metalloid biogeochemical cycling. *Joint Meeting of The Geological Society of America, Soil Science Society of America, American Society of Agronomy, Crop Science Society of America, Gulf Coast Association of Geological Societies with the Gulf Coast Section of SEPM, Houston, Texas, Oct 5-9.*

77. Bennett, P.C. and Omelon, C.R. 2008. Microbial Geochemistry: The influence of microbes on geochemistry; the influence of geology on microbial ecology. *33rd International Geological Congress, Oslo, Norway, August 6-14.*

78. Omelon, C.R., Pollard, W.H., Ferris, F.G., and Bennett, P.C. 2008. Carbonate precipitation potential by cyanobacterial activity in high Arctic cryptoendolithic habitats. *18th Goldschmidt Conference, Vancouver, BC, Canada, July 13-18.*

79. Franks, M.A., Bennett, P.C., Omelon, C.R., and Engel, A.S. 2007. Environmental controls on methanogen viability in El Tatio geyser field, Chile. *American Geophysical Union fall meeting, San Francisco, California, December 10-14.*

80. Denbow, J.N., Omelon, C.R., Hoeft, S.E., and Bennett, P.C. 2007. Chemoautotrophic, thermophilic, aerobic, arsenite-oxidizing bacteria isolated from the El Tatio geothermal field, Chile. *18th International Symposium on Environmental Biogeochemistry, Taupo, New Zealand, November 11-16.*

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81. Pollard, W.H., Ecclestone, M., Whyte, L.G., Haltigin, T.W., Anderson, D.T., Niederberger, T.D., Omelon, C.R., Nadeau, J., and Vali, H. 2007. The McGill Arctic Research Station (M.A.R.S.), Expedition Fjord, Axel Heiberg Island: scientific and logistical overview. *Canadian Space Agency 2nd Analogue Research Workshop, Hamilton, Ontario, Canada, May 17-19.*

82. Pollard, W., Whyte, L., Anderson, D., Omelon, C., Niederberger, T., Ecclestone, M., and Haltigin, T. 2007. Overview of analogue science activities at the McGill Arctic Research Station (MARS), Axel Heiberg Island, Canadian high Arctic. *2nd International Workshop - Exploring Mars and its Earth Analogues, Trento, Italy, June 19-23.*

83. Briggs, G., George, J., Cooper, G., Derkowski, B., Domville, S., Fincher, R., Omelon, C., Pollard, W., Whyte, L., Zacny, K. 2006. The Mars/Arctic deep drill project. *Planetary and Terrestrial Mining Sciences Symposium, Sudbury, Ontario, Canada, June 4-7. Astrobiology* 6, 186.

84. Briggs, G., George, J., Clifford. S., Cooper, G., Derkowski, B., Domville, S., Fincher, R., Lee, P., McKay, C., Omelon, C., Pollard, W., Whyte, L., and Zacny, K. 2006. Mars drill project progress. *Astrobiology Science Conference, Washington, D.C., March 26-30.*

85. Omelon, C.R., Pollard, W.H., and Ferris, F.G. 2005. Microbial and element distribution within a high Arctic cryptoendolithic habitat. *17th International Symposium on Environmental Biogeochemistry, Jackson, WY, August 14-19.*

86. Omelon, C.R., Pollard, W.H., and Ferris, F.G. 2004. Biogenic weathering of high Arctic sandstones inhabited by endolithic microorganisms. *14th Goldschmidt Conference, Copenhagen, Denmark, June 5-11.*

87. Omelon, C.R., and Ferris, F.G. 2003. Chemical characterization and microbial diversity within high arctic cryptoendolithic habitats. *13th Goldschmidt Conference, Kurashiki, Japan, September 7-12.*

88. Omelon, C.R., and Ferris, F. G. 2003. Investigation of microbial colonization of a high Arctic cryptoendolithic environment. *16th International Symposium on Environmental Biogeochemistry, Oirase, Aomori Prefecture, Japan, September 1-6.*

89. Omelon, C.R., Andersen, D.T., and Pollard, W.H. 2001. High Arctic cryptoendoliths: ecological constraints and survival strategies in a polar desert environment. *3rd Canadian Space Exploration Workshop, Montréal, Québec, Canada, May 25-26.*

90. Pollard, W.H., Andersen, Vali, H., Omelon, C., and McKay, C.P. 2001. Analogue research in the Canadian High Arctic. *3rd Canadian Space Exploration Workshop, Montréal, Québec, Canada, May 25-26.*

91. Andersen, D.T., Pollard, W.H., Vali, H., Blank, C., Omelon, C.R., and McKay, C.P. 1999. Perennial springs in the Canadian High Arctic: Analogs of ancient Martian hydrothermal systems. *Annual Meeting of the Geological Society of America, Denver, Colorado, October 27-30.*

92. Omelon, C.R., Pollard, W.H., Andersen, D.T., and McKay, C.P. 1999. Mineral precipitation associated with saline perennial springs at Expedition Fiord, Axel Heiberg Island, N.W.T. *Proceedings, 29th Arctic Workshop, Institute of Arctic and Alpine Research (INSTAAR), University of Washington, Seattle, Washington, April 11-13.*

93. Andersen, D., Pollard, W.H., McKay, C.P., and Omelon, C. 1998. Perennial springs in the Canadian High Arctic – analogues for past Martian liquid habitats. *Proceedings, American Geophysical Union Fall Meeting, San Francisco, California, December 6-10.*

94. Omelon, C.R. and Pollard, W.H. 1998. A geochemical investigation of perennial spring activity, Axel Heiberg Island, N.W.T. *Proceedings, 28th Arctic Workshop, Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, Colorado, March 12-14,* p.121-122.

95. Omelon, C. and Pollard, W. 1998. A geochemical investigation of perennial spring activity, Axel Heiberg Island, NWT. *Proceedings, 5th National Student Conference on Northern Studies, Association of Canadian Universities for Northern Studies (ACUNS), Vancouver, British Columbia, Canada, November 28-30,* p.70-72.

96. Omelon, C.R. and Bell, T. 1994. Effects of climate change and surficial material on the geometry of ice-wedge polygons, Canadian High Arctic. *Proceedings, 4th National Student Conference on Northern Studies, Association of Canadian Universities for Northern Studies (ACUNS), Ottawa, Ontario, Canada, November 26-27.*

CHRISTOPHER ROSS OMELON, PH.D.

FELLOWSHIPS, SCHOLARSHIPS, AWARDS

2010 NSERC CREATE (Collaborative Research and Training Experience) Program Postdoctoral Fellowship
· Awarded by the Natural Sciences and Engineering Research Council of Canada ($53,333)

2008 NSERC Postdoctoral Fellowship
· Awarded by the Natural Sciences and Engineering Research Council of Canada ($80,000)

2007 Canadian Space Agency's Space Science Supplement to the NSERC Postdoctoral Fellowship
· Awarded by the CSA's Space Science Directorate, Grant & Contributions Program ($26,667)

2006 H.V. Ellsworth Graduate Fellowship in Mineralogy
· Awarded by the Department of Geology, University of Toronto ($5,000)

2004 Ontario Graduate Scholarship
· Awarded by the Ontario Government, Ministry of Training, Colleges and Universities ($30,000)

2003 NSERC Postgraduate Scholarship
· Awarded by the Natural Sciences and Engineering Research Council of Canada ($42,000)

2003 NSERC Northern Research Supplement
· Awarded by the Natural Sciences and Engineering Research Council of Canada ($10,000)

2002 University of Toronto Fellowship Award
· Awarded by the University of Toronto ($10,000)

2001 Science Horizon's Youth Internship Program
· Awarded by Environment Canada ($17,000)

REVIEWER FOR THE FOLLOWING FUNDING AGENCIES AND JOURNALS

Natural Sciences and Engineering Research Council of Canada; National Science Foundation; National Aeronautics and Space Administration; Acta Astronautica; Acta Palaeontologica Polonica; Applied and Environmental Microbiology; Applied Geochemistry; Arctic, Antarctic, and Alpine Research; Antarctic Science; Astrobiology; Biogeochemistry; Biogeosciences; Canadian Journal of Microbiology; Chemical Geology; FEMS Microbiology Ecology; Geochimica et al Cosmochimica Acta; Geology; Geomicrobiology Journal; ICARUS; International Journal of Astrobiology; International Microbiology; JGR Biogeosciences; Journal of Hydrology; Journal of Phycology; Microbial Ecology; Polar Biology

PROFESSIONAL MEMBERSHIPS

American Society for Microbiology

American Geophysical Union

Geochemical Society