

CURRICULUM VITAE

BARBARA SHERWOOD LOLLAR CC, FRS, FRSC, FRCGS

PERSONAL INFORMATION

Position and Address: University Professor
Department of Earth Sciences
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Toronto, Ont. M5S 3B1
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email: barbara.sherwoodlollar@utoronto.ca
www.bsherwoodlollar.weebly.com

Cross-appointments: Dept. of Chemical Engineering and Applied Chemistry (2016-2020)
Dept. of Chemistry (2017-2021)

Citizenship: Canadian
Languages: English, French

ACADEMIC QUALIFICATIONS:

1985: B.A. (Honours - Geological Sciences) Harvard University *Summa cum laude*
1990: Ph.D. (Earth Sciences) University of Waterloo

EMPLOYMENT HISTORY:

2018-2023 Dr. Norman Keevil Chair in Ore Deposits Geology
2007 to present Canada Research Chair Tier 1 in Isotopes of the Earth and Environment
2016-2020 Science Chair, Massey College University of Toronto
2001-2010 Professor, Dept. of Geology and Director, Stable Isotope Laboratory
1996-2001 Associate Professor, Dept. of Geology and Director, Stable Isotope Laboratory
1996 Awarded Tenure
1992-1996 Assistant Professor, Dept. of Geology and Director, Stable Isotope Laboratory
University of Toronto
1990-92 NSERC Postdoctoral Fellow, University of Cambridge, U.K.

h index = 60. Sept. 13 2020 (Total citations 11760) i10 index = 144

EXECUTIVE SUMMARY

In recognition of both her ground-breaking research and international impact in terms of professional contributions and global leadership, Sherwood Lollar has been awarded the highest distinction of the University of Toronto as a *University Professor*, and the highest civilian honour Canada can bestow, *Companion of the Order of Canada*. (an honour bestowed on only 165 living Canadians). She was the recipient of the **2019 C.C. Patterson Award** for environmental chemistry, and the **2012 Eni Award in Protection of the Environment** presented for outstanding research and innovation in areas concerning the environmental impact of human activities, specifically protection and restoration of the environment. The latter award is chosen by a 24 member scientific review panel and **previous winners of the award include J. Craig Venter (2008) and Nobel Prize winner Frances Arnold (2018)** (see: <http://www.eni.com/eni-award/eng/home.shtml>). Sherwood Lollar is a Fellow of the Royal Society London (2019), the Royal Society of Canada (2004), the America Geophysical Union (2015), the Geochemical Society and European Association of Geochemistry (2019) and the Royal Canadian Geographic Society (2019). Her most recent awards include the 2012 Geological Society of America **Geobiology and Geomicrobiology Division Award**, 2014 Helmholtz International fellowship (Germany), and Canada's greatest prizes for research in science and engineering, the **2020 Canada Council Killam Prize for Natural Sciences**, the Natural Sciences and

Engineering Research Council of Canada **2019 Gerhard Herzberg Gold Medal**, the Natural Sciences and Engineering Council's **2016 John Polanyi Award**, and the **2018 Geological Association of Canada's Logan Medal**.

Over the past thirty years, Sherwood Lollar and colleagues' work has expanded both fundamental science and practical applications in environmental chemistry and geochemistry with profound implications for our understanding of the Earth, the chemistry of groundwater, and extending to planetary science and astrobiology including:

- Pioneering approaches in compound specific isotope geochemistry to quantitatively evaluate chemical transformation mechanisms for remediation of organic contaminants in groundwater, and independent verification of biodegradation and chemical degradation rates – models and techniques now driving innovation in academia and commercial applications worldwide
- Discovery of longstanding processes of chemical water-rock reaction creating hydrogen- and methane-rich environments in the terrestrial subsurface – transforming understanding of global habitability, and sustainability of deep subsurface microbial communities
- Implications of her discoveries on the chemistry and habitability of groundwaters in the Earth's deep subsurface are driving insights into mission planning for Mars, Enceladus and Europa
- Transforming understanding of the age and extent of groundwater using chemical tracers in the Earth's deep "hidden hydrogeosphere" through discovery of deep saline fracture fluids preserved on million-and-billion-year timescales, with implications for formation of ore deposits, nuclear waste repositories, and carbon capture and storage
- Co-Director with Dr. Jack Mustard of Brown University of the new CIFAR program Earth 4D – Subsurface Science and Exploration.

Her work includes two studies highlighted on the cover of *Nature* (2002; 2009) and discoveries that have also generated public excitement worldwide – for example, with coverage in over 200 major media outlets worldwide in 2013 for the discovery of "billion year old water" (one of the **Top Ten Science Stories of 2013**) and coverage by the Economist, the BBC, CBC and US news outlets of the discovery of microbial life 2,4 km below surface on the Canadian Shield. She was recognized by her selection in 2013 by **Canadian Geographic** magazine in their **List of Top Ten Canadians "Changing the World"** along with Commander of the International Space Station Chris Hadfield and Oscar winning director and ocean explorer James Cameron.

ACADEMIC AWARDS AND HONOURS

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| Canada Council for the Arts - Killam Prize for Natural Sciences | 2020 |
| Royal Society of Canada Willet G. Miller Medal in Earth Sciences | 2020 |
| NSERC Gerhard Herzberg Gold Medal Highest award for sustained distinguished achievement in Canadian science and engineering | 2019 |
| Fellow of the Royal Society London | 2019 |
| C.C. Patterson Award in Environmental Geochemistry from the Geochemical Society | 2019 |
| Fellow of the Royal Geographic Society of Canada | 2019 |
| Fellow of the Geochemical Society and the European Association of Geochemistry | 2019 |
| CIFAR Fellow and Co-Director <i>"Earth 4D – Subsurface Science and Exploration"</i> | 2019-2024 |
| Advisory Council to the Governor-General for the Order of Canada | 2018-2020 |
| Geological Association of Canada Logan Medal Highest award for sustained distinguished achievement in Canadian earth science | 2018 |

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| Appointed Companion of the Order of Canada | 2016 |
| NSERC John C. Polanyi Award | 2016 |
| Royal Society of Canada Bancroft Medal | 2016 |
| Speaker of the House Recognition by Canadian Parliament at Question Period Session Feb 16. 2016 | 2016 |
| Fellow , American Geophysical Union | 2015 |
| President of the Geochemical Society (2014-2015) (Vice- President for 2012-2013) | 2014-2015 |
| Canada Research Chair Tier I - Renewal Isotopes of the Earth and Environment | 2014-2021 |
| Helmholtz International Fellow Award for research excellence (20,000 Euros) | 2014 |
| Geoscience Information Society (GSIS) Mary B. Ansari Best Reference Work Award for 2014 for the “ Treatise on Geochemistry ” | 2014 |
| Top Ten Science Stories for 2013 Billion year old water Selected by Fox News, Discovery, and Geochemical News Holland, Sherwood Lollar et al. Nature 497: 367-360. | 2013 |
| Macleans Magazine List of “Top Stories to Follow in 2014” | 2013 |
| Canadian Geographic List of Top Canadians “The Changemakers” October issue | 2013 |
| Eni Award in Protection of the Environment | 2012 |
| Geological Society of America Geobiology and Geomicrobiology Division Award | 2012 |
| University Professor, University of Toronto | 2010 to present |
| Senior Fellow, Massey College, University of Toronto | 2010 to present |
| NSERC Accelerator Award | 2013-2016 |
| Liang et al. 2013 selected as one of Faculty of 1000 Prime | 2013 |
| Geochimica Cosmochimica acta one of Top 25 Most Highly Cited Papers | 2010 |
| Chemical Geology one of Top 10 Most Highly Cited Papers | 2005-2010 |
| SERDP Environmental Restoration Project-of-the-Year Award | 2010 |
| NSERC Accelerator Award | 2008-2011 |
| Canada Research Chair Tier I- Isotopes of the Earth and Environment | 2007-2014 |
| Science Council of Japan - Royal Society of Canada WISET Lecturer to Japan | 2007 |

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| Fellow of Royal Society of Canada | | 2004 |
| Canada Council Killam Research Fellowship | | 2004-2006 |
| TIME Magazine - Canada Edition - Profiled as one of 25 “Leaders for the 21st Century” | | 2000 |
| NSERC E.W.R. Steacie Fellowship | University of Toronto | 1999-2001 |
| Henry Darcy Distinguished Lecturer | U.S. National Groundwater Association | 1998 |
| NSERC Postdoctoral Fellowship | University of Cambridge | 1990-92 |
| Governor-General's Gold Medal for PhD | University of Waterloo | 1990-91 |
| W.B. Pearson Medal in Earth Sciences for PhD | University of Waterloo | 1990-91 |
| J.H. Stewart Reid Memorial Fellowship | University of Waterloo | 1989-90 |
| Petro-Canada Inc. Graduate Research Award | University of Waterloo | 1987-89 |
| NSERC Postgraduate Scholarship | University of Waterloo | 1985-89 |
| University of Waterloo Graduate Scholarship | University of Waterloo | 1985-86 |

PROFESSIONAL LEADERSHIP AND ACTIVITIES

Work on Gender, Diversity and Excellence and Best Practice

Sherwood Lollar, B. The Diversity of Excellence - Beyond “weight-lifting for girls”. **Keynote** Gairdner/L’Oreal-UNESCO Diversity Forum Toronto ON. Sept. 30, 2019.

Geochemical Society and **European Association of Geochemistry** – as President of GS worked in collaboration with EAG President to write and establish the first Best Practice Guidance for Accelerating the Diversity of Excellence and application of best practice in prize, fellowships and committee work (2014-2015).

American Geophysical Union Honors and Recognition Committee Working Group - using the GS/EAG protocols as a base, worked with the other members of the working group to write the **Leading Practice Guidelines for AGU Honors and Recognition Program** for all AGU Prize and Fellowships Selection Committees (2018-2019). Adopted October 2019 by AGU Board.

As Director, Division of Earth Ocean and Atmospheric Sciences, **Royal Society of Canada**, drafted the base document for development of the first Best Practice Guidelines document for prize and fellowships for RSC (2017-2019).

Royal Society of Canada Gender Equity Committee 2013-2018

Work on Research Program Peer Review Panels, Prize Committees and Academic Organizations

Member of the **Eni Scientific Prize Commission 2013-2020** (see: <http://www.eni.com/eni-award/eng/home.shtml>)

Member **National Academies of Sciences Decadal Survey** on Planetary Sciences and Astrobiology Steering Committee (2020-2023)

Member Sectional Committee 5: Earth and Environmental Sciences **The Royal Society London** (2020-2023)

Member United States **National Academy of Sciences Space Studies Board** (2016-2022) 3 consecutive terms

Scientific Advisory Committee - **Helmholtz Centre Potsdam**, (GFZ) German Research Centre for Geosciences (2020-2023)

Member **American Geophysical Union** Honors and Recognition Committee (2018-2022)

Member **Advisory Council for the Institute for Earth and Space Exploration**, Western University (2020-2023)

Chair, **United States National Academies** Committee for the Astrobiology Strategy for Search for Life in the Universe (2017-2018)

Director, Division of Earth Ocean and Atmospheric Sciences, **Royal Society of Canada** (2017-2019)

Board of Directors (SNOLAB) **Sudbury Neutrino Laboratory** (2018-2019)

Member of Fellows Selection Committee, **Royal Society of Canada** (2018-2020)

Member International Review Panel on **Helmholtz Centre for Geosciences** GFZ Potsdam (2018)

Member **American Geophysical Union Fellows Selection Committee** for Biogeosciences (2017-2018)

Canadian Institute for Advanced Research (CIFAR) Presidents' Research Advisory Council (2016-2018)

Chair, NSERC Panel for E.W.R. Steacie Memorial Fellowships 2016, and 2018

Mentor and Reviewer. IDEAS Lab workshop jointly sponsored by NASA Astrobiology and National Science Foundation. Cambridge MD Sept. 2016.

Technical Advisor for the United Nations **International Atomic Energy Agency** Water Resources Program (2016) Impacts of hydraulic fracturing on groundwaters identified using geochemical and isotopic tracers. Vienna. Austria.

Board Member (2014-2018) **Zuckerberg Institute for Water Research**, Sede Boqer, Israel - dedicated to interdisciplinary research in water and resource development of the Middle East through sustained supply of usable water for all countries of the region who share the regional and trans-boundary water resources of this drylands region.

Geological Society of America Nominations Committee (2016)

International Advisory Board Member **Earth-Life Science Institute Origins Network at the Tokyo Institute of Technology**

External Review Committee Origins Institute McMaster University 2015

Technical reviewer: Report of the Mars 2020 Organic Contamination Panel (2014) report of the Mars Exploration Program Analysis group (MEPAG)

Member Search committee for Vice-President Research Grants and Scholarships for NSERC (2013) Canada's national Natural Sciences and Engineering Research Council (the national funding agency for research and scholarships in science and engineering).

U.S. National Academy of Sciences Space Studies Board Committee on Astrobiology and Planetary Sciences (2012-2015)

Space Exploration Planetary Consultation Committee (PCC) for Canadian Space Agency (2012)

Executive Committee - Sloan Foundation - Carnegie Institution of Washington Deep Carbon Observatory (2011-2013)

NASA/ESA Joint Science Working Group (JSWG) 2018 Joint Rover Mission to identify and prioritize scientific objectives for 2018 Joint Mars Rover Mission. (David Beaty NASA Mars Program Office -JPL and Gerhard Kminek, ESA-ESTEC) Co-chairs. (2011-2012)

NASA Mars Exploration Program Advisory Group (MEPAG) E2E-iSAG committee) to identify and prioritize scientific objectives for 2018 Mars Rover Mission. Scott McLennan (Stonybrook, NY) and Mark Sephton, (Imperial College, UK) Co-chairs. (2010-2011)

Geochemical Society – The V.M. Goldschmidt Career Award Selection Committee 2010-2012

Advisory Board and Visiting Scientist for European Union Marie Curie Training Network in Isotope forensics and biogeochemistry -“CSI: Environment” 2010-2014.

NSERC Strategic Program Sub-Topic Focus Group Chair 2010

NASA Mid-Range Rover Science Analysis Group (MRR-SAG 2009) working under MEPAG (Mars Exploration Program Science Group) to identify and prioritize scientific objectives for 2018-2020 next generation Mars Rover

Canadian Space Agency (CSA) Mars Sample Return Analogue Mission Definition Team 2009

Ontario Science Centre Weston Youth Innovation Award Prize Committee 2009-2013

Royal Society of Canada - Committee for Selection of New Fellows 2008-2010

Geochemical Society - Organic Geochemical Division Treibs Award Selection Committee 2008-2011

Ontario Science Centre Board of Trustees 2007-2014; Chair of Long-term Experience Committee (2008-2010; 2012-2014)

Council of Canadian Academic Expert Panel on Groundwater 2007-2008

Executive Program Committee Co-Chair - Goldschmidt 2008 Vancouver, BC July 2008

Natural Sciences and Engineering Council of Canada (NSERC) Council 2003-2010

NSERC Executive Committee 2005-2006 and 2007-2010

NSERC Committee on Research Grants and Scholarships 2006-2010 (Chair 2008-2010)

NSERC Chair of Committee on Research Integrity (2008-2010)

Canadian Space Agency - Space Exploration Advisory Committee 2006-2009

Partnership Group for Science and Engineering (Royal Society of Canada) 2006-2007

Communications Committee correspondent-at-large for *Bacon and Eggheads* Lecture Series for Parliament

CAMIRO (Canadian Mining Industry Research Organization) Geochemistry Expert Committee 2006-2009

United States National Research Council National Academies of Science 2005-2012

Committee on the Origin and Evolution of Life (Space Studies Board/Life Sciences Board)

Canadian Water Network Expert Panel Review - Jan. 2007

U.S. Strategic Environmental Research and Development Program (SERDP)/ Environmental Security Technology Certification Program

(ESTCP) and the US EPA Summit on Future Research Directions on Biogeochemical Processes in the Degradation of Chlorinated Solvents. San Antonio TX April 2007

Chair, NSERC Prize Committee - Herzberg Gold Medal 2005

Chair, NSERC Prize Committee - Brockhouse Prize 2005

NASA Astrobiology Review Panel for NAI Cooperative Agreement Notice (CAN-4) Sub-Panel Chair 2005

International Atomic Energy Agency panelist (one of 5) on White Paper for the use of Compound Specific Isotope Analysis (CSIA) October 2005 (jointly published with U.S. Environmental Protection Agency)

U.S. Strategic Environmental Research and Development Program (SERDP)/ Environmental Security Technology Certification Program (ESTCP) Workshop on Molecular Biological Tools
Charlottesville VA Aug. 2005

Board of Directors - Centre for Environmental Science and Technology - University of Notre Dame 2003-2006

International Geochemical Society C.C. Patterson Medal Selection Committee 2002-2004

Nomination Committee for Henry Darcy Distinguished Lecture Series for 1999-2002

Selection Committee for Geological Society of America Meinzer Award 1999-2001

Nominations Committee for the Organic Geochemistry Division
The Geochemical Society 1997-2000 (Chair for 1999); 2004-2006

IsoTrace Accelerator Mass Spectrometry Laboratory - University of Toronto
Executive Committee - Board of Directors 1995-2002

Natural Sciences and Engineering Council of Canada (NSERC)
Review Panel for NSERC Strategic Partnerships Program
1997-1999

Natural Sciences and Engineering Council of Canada (NSERC)
Review Panel for NSERC Multi-Facilities Access Program 1999

U.S. Department of Energy Stocktaking Panel - Natural Accelerated Bioremediation Research
Oyster Stocktaking Meeting - Virginia Beach, VA - 1999

Organizing Committee for Geological Society of America Annual Meeting 1998 - Toronto

External Scientific Review 1995 - Environmental Protection Agency
National Exposure Research Laboratory - Ecosystems Research Division - Internal Grants Program

Scientific Review Panel 1994 - U.S. Dept. of Energy - Subsurface Science Program
Deep Microbiology and Microbial Ecology Subprogram

Public Consultation and Technology Transfer

Philips, E., Ojeda, A.S., Mancini, S.A. (GeoSyntec), and Sherwood Lollar, B. Unravelling sources and in situ processes of contaminant remediation using multi-element CSIA. Free webinar to 80 consulting practitioners from GeoSyntec

Incorporated. April 9 2020.

Science@Massey Co-Organizer of 4th Annual Franklin Forum on Science, Public Policy and Society on “Trust in Science and Engineering/ Trust in Scientists and Engineers - Issues of Data-driven decision making, policy issues and data sharing” Massey College, University of Toronto. March 4 2020

National Academies of Sciences Astro2020 Decadal Survey Sub-Committee on Exoplanets, Astrobiology and the Solar System – Briefing on the NAS Astrobiology Strategy for the Search for Life in the Universe report commissioned by NASA (B. Sherwood Lollar, Chair). Oct 22 2019.

National Academies of Sciences Astro2020 Decadal Survey Steering Committee – Briefing on the NAS Astrobiology Strategy for the Search for Life in the Universe report commissioned by NASA (B. Sherwood Lollar, Chair). Sept. 5 2019.

CIFAR Celebration of Global Call for Ideas. “The critical role of long time horizons in research discovery”. Invited Talk. May 22 2019. Toronto ON.

Fall 2018 Led Presentations and Q&A for 2019 United States National Academies of Sciences Space Studies Board “An Astrobiology Strategy for the Search for Life in the Universe for NASA to:

NASA Associate Administrator and Deputy Associate Administrator for Research Science Mission Directorate

NASA Chief Scientist and Deputy Chief Scientist

United States Senate Commerce, Science and Transportation Subcommittee on Space, Science and Competitiveness

House Science, Space and Technology Subcommittee on Space

House Appropriations Committee, Commerce Subcommittee Jurisdiction

NASA Astrophysics Advisory Committee

National Academies Divisional Advisory Committee (DEPSCOM)

Science@Massey Co-Organizer of 3rd Annual Franklin Forum on Science, Public Policy and Society on “Confronting Climate Change Challenges – what can we do?” Massey College, University of Toronto. Feb 6 2019

Eni FEEM International Workshop on Global Change Impacts on Climate and Water. University of Palermo, Italy. June 2018

Science@Massey Co-Organizer of Panel “Can Canada embrace a renewable energy future”. Massey College, University of Toronto. March 19 2018

Science@Massey Co-Organizer of 2nd Annual Franklin Forum on Science, Public Policy and Society on “Artificial Intelligence”. Massey College, University of Toronto. Feb 7 2018

Science@Massey Co-Organizer of Public Lecture “Gravitational waves - new frontiers” Massey College, University of Toronto. November 14 2017

GeoSyntec Consultants (S. Mancini, C. Cheyne and M. Davidson) and University of Toronto sponsored workshop on Commercialization readiness of compound specific isotope analysis. Audience including academic and commercial laboratories, consultants, corporate representatives from DuPont and Chemours, and Ontario Ministry of Environment and Climate Change. Guelph, ON Canada Sept. 7 2017.

Working Group meeting – University of Toronto, Helmholtz Institute (UFZ Leipzig) and DuPont Corporate Remediation – extending compound specific hydrogen isotope analysis to chlorinated contaminants at DuPont and Chemours sites internationally. Toronto, ON Canada. Sept. 2017.

T. Gilevska, B. Sherwood Lollar, A. Horst, G. Lacrampe-Couloume, E.J. Lutz, S.W. Norcross, S.A. Morgan, K.A. West. High resolution compound specific isotope analysis contributions to conceptual site model development at the Deatailed Study Area, Chambers Work Site. **University-Industry Consortium on Field-focused Groundwater Contamination Research.** University of Guelph, Guelph ON. June 2017.

Organizing committee member of the National Academies of Sciences Engineering Medicine – America’s Future in Civil Space – A symposium organized by the Aeronautics and Space and Engineering Board and the Space Studies Board. National Academies Keck Centre, Washington, DC. May 2017

J. McIntosh, B. Sherwood Lollar, M.J. Hendry – **International Atomic Energy Agency (IAEA)** Expert Panel on Identifying the occurrence, origin and migration of fugitive gases using Environmental Isotopes. Vienna, Austria. November 2016

T. Gilevska, B. Sherwood Lollar, A. Horst, E. Passeport, G. Lacrampe-Couloume. Insights from high resolution CSIA for chlorinated aromatics. Scientific Advisory Board **DuPont Corporate Remediation Centre**. Philadelphia, PA. Jan. 2017.

Authored Wiki page on Compound Specific Isotope Analysis invited by United States Strategic Environmental Research and Development Program (SERDP)/ Environmental Security Technology Certification Program (ESTCP).

Participant Roundtable in Global Science Excellence for the Federal Innovation Agenda. Invitee of Minister of Science and Minister of Innovation. Aug. 2016 Saskatoon SK.

B. Sherwood Lollar and S. Mancini. Integrating compound specific isotope analysis into conceptual site model development- Contributions to costs savings and risk reduction. Free webinar to 80 consulting practitioners from **GeoSyntec Incorporated**. Aug. 10 2016.

B. Sherwood Lollar. Presentations on deep subsurface research opportunities to City of Timmins Economic Development Corporation and Glencore. May 11 and July 11 2016.

B. Sherwood Lollar, T. Gilevska, A. Horst, E. Passeport, G. Lacrampe-Couloume. Insights from high resolution CSIA profiles. **University-Industry Consortium on Field-focused Groundwater Remediation Research**. June 13-15 2016.

B. Sherwood Lollar – Presentation of Compound Specific Isotope Analysis of chlorinated aromatics and CFCs at Chambers Works, DE. Scientific Advisory Board **DuPont Corporate Remediation Centre**. Wilmington DE. March 2016.

M.J. Hendry, B. Sherwood Lollar Organizers – **International Atomic Energy Agency (IAEA)** Expert Panel on Identifying the occurrence, origin and migration of fugitive gases and fluids from Shale Gas development and Carbon Capture and Sequestration using Environmental Isotopes. Vienna, Austria. March 2016

B. Sherwood Lollar – Science on the Hill Event. **Research presentation/discussion on Parliament Hill** with MPs, Senators, Speaker of the House, Minister K. Duncan, Prime Minister J. Trudeau. Feb. 16 2016

B. Sherwood Lollar – Integration of CSIA for chlorinated aromatic hydrocarbons, CF and CFCs at field sites - **GeoSyntec Consultants Ltd.** Guelph Ontario. Sept. 2015

B. Sherwood Lollar – New lines of research in environmental remediation at contaminated field sites – **SiRem Ltd.** Guelph Ontario. March 2015

B. Sherwood Lollar and E. Passeport – Novel determining of rates of bioremediation for chlorinated aromatic hydrocarbons and CFCs – **Dupont Remediation Research Center**, Wilmington DE. Nov. 2014

S.A. Mancini, E. Passeport, B. Sherwood Lollar Application of CSIA to understand sources and Biodegradation of Chlorobenzenes- Consortium on Goundwater Remediation. Denver, CO. Oct. 2014

B. Xu, B.E. Sleep, B. Sherwood Lollar- Modelling Isotope Fractionation Induced by Aqueous Phase Diffusion- SYNRRS 2014 and 3rd Integrate Annual Meeting on Innovative Technology Combination for Groundwater Remediation. Toronto, ON. Sept. 2014

S. Mancini and B. Sherwood Lollar – Presentation on CSIA – **Ontario Ministry of Environment** October 2013.

B. Sherwood Lollar – Plenary. Challenges in Water reuse, recycling and remediation. Water-Energy Nexus – Industry Research Forum.

Eni Research Institute Milan Italy. March 2013

On the Water Front: the Science of Canadian water research. NSERC Scientific Poster session for **Federal MP and Senators**.
Centre Block. Capital Hill Ottawa. Oct 2012.

Sherwood Lollar, B. Compound Specific Isotope Analysis of Organic Contaminants in Water. **Eni Research Institute** Novara, Italy. June 2012.

Member External Advisory Committee Alberta – Canada Collaboratory in Cleaner Oil Sands Development (2011-2012)

B. Sherwood Lollar – Guest Speaker at DuPont Forum: Breaking the carbon-fluorine bond. DuPont Environmental Education Center. Wilmington DE. April 23-25, 2012.

B. Sherwood Lollar and T. Buscheck (Chevron) Co-Chairs and Organizers - Special session on **Compound Specific Isotope Investigations at Contaminated Field Sites**. Battelle International Symposium on Bioremediation and Sustainable Environmental Technologies, Reno, NV. June 2011.

B. Sherwood Lollar. Panelist. **Biogeochemical Transformation Processes**. Battelle International Symposium on Bioremediation and Sustainable Environmental Technologies, Reno, NV. June 2011.

B. Sherwood Lollar. **Extending the reach for monitoring microbial activity with CSIA**. REMTEC Remediation Technology Transfer Workshop. Keynote. Chicago. May 2011.

B. Sherwood Lollar. **CSIA for Forensic Investigations: Potential, Practicalities and Pitfalls**. Presentation to ENVIRON Corporation. Mississauga ON. April 2011

B. Sherwood Lollar. **Lessons from the Earth on Carbon Capture and Storage**. Presentation to CIBC Wood Gundy. April 2011. Toronto ON

Groundwater Resources Association Conference on Environmental Forensics. Presentation S. Mancini (Golder Associates), B. Sherwood Lollar and G. Lacrampe-Couloume (University of Toronto). Differentiating multiple sources of organic contaminants using compound specific carbon and hydrogen isotope analysis. April 2011. California.

B. Sherwood Lollar. **Emerging Research in Astrobiology in Canada**. Council of Ontario Universities. Canada Research Chairs 10th Year Anniversary Symposium. Toronto ON. Nov. 2010

Natural Sciences and Engineering Research Council of Canada “Maximizing Opportunities” Increasing Women’s Participation in Science and Engineering – A Summit. Ottawa ON. Nov. 2010

B. Sherwood Lollar and P. Philp. Compound Specific Isotope Analysis for Forensic Investigations and Environmental Clean-up. **United States Environmental Protection Agency (EPA) Technology Innovation and Field Services Division "Contaminated Site Clean-up Information" Web-based Internet Seminar**. October 2010.

B. Sherwood Lollar. **Isotopic constraints on chlorobenzene biodegradation and remediation at contaminated field sites**. **Presentation** to Chambers Works Science Advisory Board. DuPont. Wilmington DE. March 2010.

B. Sherwood Lollar. Compound Specific Analysis for Forensic Investigations: Potential, Practicalities and Pitfalls. Invited Presentation. **United States Air Force Restoration and Technology Transfer Workshop** on Groundwater Contamination. San Antonio TX. April 2010.

Minister of Natural Resources Honourable L. Raitt Invited Round Table on **Clean Energy Research and Development - Fossil Fuels**. Invited Panelist for discussion. Nov. 6, 2009. Calgary AB.

Canada Research Chairs Secretariat and University of Western Ontario Invitational Meeting and Round Table - **Canada's Energy Future**. Invited Panelist and Speaker on Long-term Viability/Sustainability of Conventional Energy Sources - Carbon Capture and

Storage Options - October 20, 2009 - Ottawa ON.

Munk Centre of International Studies at the University of Toronto - Program on Water Issues - **Burying Carbon Dioxide in Underground Saline Aquifers: Political Folly or Climate Change Fix?** Invited Panelist for discussion. Sept. 23, 2009. Toronto ON.

Public Policy Forum - **Science Day in Canada** - Invited Panelist for discussion on release of the Science, Technology and innovation Council (STIC) of Canada report on the State of Science, Technology and innovation in Canada. May 27, 2009. Ottawa ON.

B. Sherwood Lollar and X. Liang - "Potential Role of Compound Specific Isotope Analysis (CSIA) and Other Tools in Measuring In *Situ* Biogeochemical Transformation". **In Situ Biogeochemical Transformation Workshop U.S.E.P.A.** Environmental Protection Agency Workshop. Dallas Texas. Nov. 2009.

M. Davidson (GeoSyntec International), D. Major (GeoSyntec International), B. Sherwood Lollar (U. of Toronto) and E.A. Edwards (U. of Toronto). Webinar for General Electric on "Compound Specific Isotope Analysis: A primer for applications to contaminant remediation". Sept. 2009.

B. Sherwood Lollar, and S. Hirschorn. "Compound Specific Isotope Analysis: A primer for applications to contaminant remediation". One day workshop for GeoSyntec Consultants Inc. and Sirem Ltd. Toronto Ontario. June 2006.

B. Sherwood Lollar and C.M. Aelion "Tools/Techniques for Chlorinated Solvent Sites". Half day workshop at Battelle 8th International In Situ and On Site Bioremediation Symposium Baltimore, MD. June 2005.

B. Sherwood Lollar. "Use of stable isotopes to evaluate contaminant degradation". One day workshop for Central New York Association of Professional Geologists Symposium on Isotopic Geochemistry. Skeneatales NY. April 2005.

B. Sherwood Lollar, R. Meckenstock, T. Schmidt, J. Wilson and D. Hunkeler. Applications of Compound Specific Isotope Analysis (CSIA) to contaminant biodegradation. Workshop and white paper development for IAEA International Atomic Energy Agency and U.S. Environmental Protection Agency. Vienna Austria. October 2005.

B. Sherwood Lollar. "Use of Compound Specific Stable Isotope Techniques for Quantification of Biodegradation Rates". UNESCO Workshop on Transport and Fate of Diffuse Organic Contaminants in Catchments. GSF-Research Centre for Environment and Health, Munich Germany. Dec. 2004

B. Sherwood Lollar. "Stable Isotope Forensics: Promise and Pitfalls". Golder Associates Inc. Symposium on Innovative Strategies for Management of Contaminated Sites. Toronto, ON. Nov. 2004.

Activities as Editor

International Editorial Board **Origins of Life and Evolution of Biospheres** (April 2015 to April 2018)

Editor-in-Chief **Chemical Geology** (Jan 2010 to Jan. 2013) - One of the top most highly cited disciplinary journals in field of isotope geochemistry.

Editorial Board **Earth Planetary Science Letters** (2011 to 2015)

Member of Advisory Board for **ELEMENTS**: International Magazine of Mineralogy, Geochemistry and Petrology. (2010-2016)

Volume Editor for **Volume 9: Environmental Geochemistry** of 10 volume series *Treatise in Geochemistry* by Elsevier Scientific Publishing. Published 2003. Second Edition 2013.

Editors-in-Chief - Dr. H.D. Holland (Harvard University) and Dr. K. Turekian (Yale University)

May 2005 paperback Edition of *Treatise on Geochemistry Volume 9: Environmental Geochemistry* published and over 1200 copies

sold. Revised second edition of web version work completed April 2006.

Editor of Special Volume 30 in **Organic Geochemistry**

"Compound-Specific Isotope Analysis: Tracing Organic Contaminant Sources and Processes in Geochemical Systems" October 1999.

Associate Editor (1998-2003) **Ground Water** - Scientific Journal with one of largest circulations of any of the hydrogeology, hydrogeochemistry journals. Subscription circulation of over 19,000, 20% of which is outside North America.

Visiting Scientist

2012 University of Stockholm, Sweden (2 weeks)

2012 Institut du Physique and Geochemie du Globe, Universite de Paris, Paris France (2 months)

2014 Helmholtz Institute Leipzig, Germany (3 months)

2019 Institut du Physique and Geochemie du Globe, Universite de Paris, Paris France

RESEARCH GRANTS AND FUNDING

Held as Principal Investigator

| | TOTAL AMOUNT | DATE/DURATION |
|---|-----------------------------|---------------|
| Canadian Institute for Advanced Research (CIFAR) Catalyst Program | \$15,000 | 2020-2021 |
| Title: Novel radiogenic physical-chemical reactions define in the deep subsurface PI: B. Sherwood Lollar Co-I: C.J. Ballentine (Oxford); N. Smith (SNOLab); Warr (Toronto) | | |
| NWMO (Nuclear Waste Management Organization) Research Grant | \$600,000 | 2020-2023 |
| Title: Assessment of biogeochemical processes in the deep subsurface – translating from case studies to low permeability sites relevant to a deep geological repository for used nuclear fuel PI: B. Sherwood Lollar | | |
| NSERC Gerhard Herzberg Gold Medal Award | \$530,000 (\$106,000 pa) | 2019-2023 |
| Title: Controls on distribution and preservation of Habitability from water-rock reactions in the Earth's deep crust PI: B. Sherwood Lollar | | |
| Canadian Institute for Advanced Research (CIFAR) Global Call for Ideas Program | ~\$3.5 million | 2019-2024 |
| Title: Earth 4D - Subsurface Science and Exploration Co-Directors PI: B. Sherwood Lollar and J.F. Mustard (Brown) | | |
| NSERC Discovery Grant | \$470,000 (\$94,000 pa) | 2018-2023 |
| Title: Follow the water: Controls on distribution and preservation of Habitability from water-rock reactions in the Earth's deep crust PI: B. Sherwood Lollar | | |
| Canadian Institute for Advanced Research (CIFAR) | \$50,000 | 2017 |
| Title: Earth 3D - International Workshop on Subsurface Science and Exploration PI: B. Sherwood Lollar Co-PIs: N. Smith (SNOLab); C.J. Ballentine, Oxford; V. Orphan, Caltech) | | |

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| TOTAL SA Oil & Gas | \$750,000 | 2018-2020 |
| Title: Hydrogen/Helium generation through water/rock interactions in the Neoproterozoic sedimentary basin of Sao Francisco, State of Minas Gerais, Brazil | | |
| Co-PIs: C.J. Ballentine (Oxford) and B. Sherwood Lollar (Toronto) | | |
| E.I. DuPont Canada Company | \$228,837 | 2016-2021 |
| Research Grant | | |
| Title: Integration of modelling and experimental program to develop hydrogen isotope CSIA to determine processes and biodegradation rates for chlorinated aromatic hydrocarbons in field sites. | | |
| PI: B. Sherwood Lollar | | |
| NWMO (Nuclear Waste Management Organization) | \$600,000 | 2016-2020 |
| Research Grant | | |
| Title: Assessment of biogeochemical processes in the deep subsurface- Case studies relevant to a deep geological repository for used nuclear fuel. | | |
| PI: B. Sherwood Lollar | | |
| NSERC John C. Polanyi Award | \$250,000 | 2016-2020 |
| SERDP | \$20,534 | 2016-2020 |
| Title: Abiotic Transformation of Chloroethenes in low permeability formations | | |
| PI: B. D. Freedman (Clemson University) | | |
| Co-PI: B. Sherwood Lollar | | |
| NSERC Collaborative Research Development Grant | \$237,350 | 2015-2017 |
| Title: Optimization of sampling, detection and characterization of subsurface microbial life in systems with low permeability and low biomass-sedimentary and crystalline settings. (Industry partner: Nuclear Waste Management Organization) | | |
| PI: B. Sherwood Lollar (Toronto) | | |
| Co-PI: G.F. Slater (McMaster), J. McKelvie (NWMO), P. Keech (NWMO), S. Hirchorn (NWMO) | | |
| * match to industry partner funding below | | |
| Chemours Canada | \$295,000 USD | 2015-2019 |
| Title: Determination of rates of degradation of halogenated hydrocarbons (chlorinated benzenes and CFCs) via an integrated field and experimental program | | |
| PI: B. Sherwood Lollar (Toronto) | | |
| Co-PI: E. Passeport (Civ Eng U Toronto) | | |
| Deep Life Directorate of Sloan Foundation Deep Carbon Observatory | \$15,680 USD | 2015 |
| Title: Temporal suite of microbiology samples from ancient Canadian Shield fracture fluids | | |
| PI: B. Sherwood Lollar (Toronto) | | |
| Co-PIs: T.C. Onstott (Princeton) and T. Kieft (NMT) | | |
| *Nuclear Waste Management Organization Research Grant | \$185,000 | 2014-2017 |
| Title: Microbiological and Geochemical investigation of fluids and core from the Grimsel Underground Research Laboratory | | |
| PI: B. Sherwood Lollar (Toronto) and G.F. Slater (McMaster) | | |
| Co-PI: G.F. Slater (McMaster), J. McKelvie (NWMO), P. Keech (NWMO), S. Hirchorn (NWMO) | | |
| Keck Institute for Space Studies | \$40,000 USD | 2015-2016 |
| Title: Methane on Mars Study Program | | |
| PIs: Y.Yung (CalTech), P. Chen (Jet Propulsion Labs), K. Nealson (USC) | | |
| Co-PI: B. Sherwood Lollar and 19 others | | |

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| NSERC Collaborative Research Development Grant Title: Use of stable isotopes to evaluate in situ attenuation of aromatics and chlorinated aromatics in anaerobic and aerobic field locations: Laboratory and field studies (Industry Partner DuPont Canada see * below) PI: B. Sherwood Lollar (Toronto) | \$248,853 | 2014-2017 |
| NSERC Discovery Grant Title: Isotopic and geochemical tracers of fracture fluids in Precambrian cratons: Time capsules for the deep biosphere PI: B. Sherwood Lollar | \$490,000 (\$98,000 pa) | 2013-2017 |
| Sloan Foundation Deep Carbon Observatory Title: Field Investigations in Deep Carbon PI: B. Sherwood Lollar (Toronto) | \$50,000 USD | 2014-2016 |
| NSERC Accelerator Award Title: Isotopic and geochemical tracers of fracture fluids in Precambrian cratons: Time capsules for the deep biosphere PI: B. Sherwood Lollar | \$120,000 | 2013-2015 |
| Cenovus Energy Title: Characterization of Gases from Mississippian to Surface Western Canadian Sedimentary Basin PI: B. Sherwood Lollar | \$150,000 | 2012-2014 |
| DuPont Canada Research Grant* Title: CSIA to determine conceptual model and evaluate potential for bioremediation of chlorinated aromatic hydrocarbons PI: B. Sherwood Lollar | \$424,000 | 2011-2017 |
| Canadian Space Agency Title: Constraints on Trace Gas and Reduced Gas Flux from Analog Environments PI: B. Sherwood Lollar | \$69,800 | 2012-2013 |
| NWMO (Nuclear Waste Management Organization) Research Grant Title: Characterization of Subsurface Biogeochemical Processes relevant to a Deep Geologic Repository PI: B. Sherwood Lollar Co-PIs: G.F. Slater (McMaster) and D. Moser (Desert Research Institute) | \$420,000 | 2011-2014 |
| NWMO (Nuclear Waste Management Organization) Research Grant Title: State of Science: Far-field Microbiological Considerations relevant to a Deep Geological Repository for used nuclear fuel PI: B. Sherwood Lollar | \$75,000 | 2009-2010 |
| GeoSyntec Ltd. Title: Investigations for potential for in situ biodegradation at a contaminated field sites using CSIA PI: B. Sherwood Lollar | \$7,200 | 2010-2011 |
| NSERC Strategic Grant Title: Investigation of CSIA as an Innovative Quantitative Tool for Performance Assessment of Groundwater Remediation at Contaminated Sites PI: B.. Sherwood Lollar | \$450,000 | 2009-2012 |

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| Co-PIs: E. Edwards (Chem. Eng) and B. Sleep (Civ Eng) | | |
| S. Desrocher (ENVIRON Canada Inc.) and S. Dworatzek (SiREM Inc.) | | |
| Industry Partner Matching funds: | | |
| ENVIRON Canada Inc. | \$10,000 | 2009-2011 |
| SiRem Ltd. | \$18,000 | 2009-2011 |
| NSERC Discovery Accelerator Grant | \$120,000 | 2008-2011 |
| Title: H ₂ and CH ₄ from Precambrian Shield Rocks and Microbiological Sinks for Gases produced by Water-Rock Interactions: Energy for the Deep Biosphere | | |
| NSERC Discovery Grant | \$257,750 (\$51,550 pa) | 2008-2013 |
| Title: H ₂ and CH ₄ from Precambrian Shield Rocks and Microbiological Sinks for Gases produced by Water-Rock Interactions: Energy for the Deep Biosphere | | |
| NSERC Special Research Opportunities Grant | \$350,000 | 2006-2008 |
| Title: Tracers in the Deep: Testing for chemoautotrophic microbial communities in the Precambrian Shield deep subsurface | | |
| PI: B. Sherwood Lollar | | |
| Co-PIs: G.F. Slater (McMaster), E. Edwards (Chem-Eng, Toronto) | | |
| GeoSyntec Consultants International Ltd. Research Grant | \$21,000 | 2007-2008 |
| Title: Use of stable carbon isotope analysis to evaluate in situ biodegradation of chlorobenzenes | | |
| PI: B. Sherwood Lollar | | |
| Co-PI: E.A. Edwards (Univ. of Toronto) | | |
| NSERC CRD Grant | \$26,000 | 2007-2008 |
| Title: Application of stable isotope analysis as a quantitative tracer of bioremediation of aromatic hydrocarbons in heterogeneous aquifers | | |
| Co-investigator: E.A. Edwards (Univ. of Toronto) | | |
| Industry partner: NOVA Chemicals (see below) | | |
| NOVA Chemicals Research Grant | \$36,720 | 2006-2008 |
| Title: Use of stable carbon and hydrogen isotope analysis to evaluate the performance of biostimulation of benzene | | |
| PI: B. Sherwood Lollar | | |
| NSERC Research Tools and Instruments | \$39,515 | 2006 |
| Title: Purge and Trap Concentrator for detection of hydrogen and oxygen compound specific isotope analysis | | |
| Co-PIs: M. Simpson (UTSC), A. Simpson (UTSC), Edwards (Chem-Eng) | | |
| Canadian Space Agency Analogue Site Studies | \$39,750 | 2006-2008 |
| Title: Deep crustal fluids in the Canadian Shield: analogs for deep subsurface habitats on Mars | | |
| Co-PIs: G.F. Slater (McMaster); E. Edwards (Toronto) | | |
| NSERC Research Tools and Instruments | \$129,422 | 2005 |
| Title: Dedicated nuclear magnetic resonance probe for the detection of site-specific natural isotopic fractionation (SNIF) | | |
| Co-PIs: M. Simpson (UTSC), A. Simpson (UTSC) | | |
| NSERC Collaborative Research Development Grant | \$52,000 | 2005-2007 |
| Title: Use of Stable Isotopes to Evaluate the Performance of | | |

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| Nanoparticulate Iron in Remediation of Chlorinated Hydrocarbon Contamination: Field and Laboratory Studies *Matching funds to Golder Associates Ltd. Grant | | |
| *Golder Associates Ltd. Research Grant Title: Use of Stable Isotopes to Evaluate the Performance of Nanoparticulate Iron in Remediation of Chlorinated Hydrocarbon Contamination: Field and Laboratory Studies | \$30,000 | 2005-2007 |
| Canadian Space Agency Advanced Studies Title: Biosustainable Energy and Nutrient Cycles in the Deep Subsurface of Earth and Mars PI: B. Sherwood Lollar | \$350,000 | 2003-2008 |
| NSERC Discovery Grant Title: Hydrocarbons in transition zones in dynamic field settings includes \$10,000 Northern Supplement for 2006-2008 | \$262,750 | 2003-2008 |
| FNX Mining Inc. Title: Investigation of isotopic analysis of fluid inclusions | \$17,000 | 2003-2005 |
| GeoSyntec Consultants International - Boston, MA Title: MTBE biodegradation investigated through the use of stable carbon isotopes | \$11,520 | 2003-2004 |
| GeoSyntec Consultants International - Boston, MA Title: Environmental isotopes as tracers of contaminant degradation - VC | \$16,000 | 2002-2003 |
| NSERC Collaborative Research Development Grant Title: Applications of stable carbon isotopes to monitoring intrinsic bioremediation of aromatic hydrocarbons Co-investigators: B. Sleep (Civ. Eng. U. of Toronto) E. Edwards (Chem. Eng. U of Toronto) | \$ 50,660 | 2001-2003 |
| American Association of Petroleum Geologists Grants-in-Aid of Field Research Support to J. Gray | \$2,000 | 2002-2003 |
| NSERC Strategic Grant Title: Environmental Isotope as Tracers of Contaminant Degradation - Integration of an Innovative New Technology, Compound Specific Hydrogen Isotope Analysis Co-investigators: B. Sleep (Civ. Eng. - U. of Toronto) E. Edwards (Chem. Eng. - U of Toronto) S. Mabury (Chemistry - U. of Toronto) * Grants indicated * below are the industry matching funds for this Strategic Project | \$459,150 | 2001-2005 |
| Geosyntec Consultants International Ltd. *Industry research matching funds for NSERC Strategic Project 2001-2005 | \$ 24,000 | 2001-2005 |
| United Technologies Corporation *Industry research matching funds for NSERC Strategic Project 2001-2005 | \$ 18,000 | 2001-2003 |

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| Environmental Science and Technology Alliance Canada Title: Use of carbon isotope signatures as tracers of intrinsic remediation of aromatic hydrocarbons Co-investigators: B. Sleep (Civ. Eng. U. of Toronto) E. Edwards (Chem. Eng. U of Toronto) | \$111,460 | 2000-2002 |
| Applied Groundwater Research Ltd. *Industry research matching funds for NSERC Strategic Project 2001-2005 | \$ 5,000 | 2001-2002 |
| Envirometal Inc. *Industry research matching funds for NSERC Strategic Project 2001-2005 | \$ 12,000 | 2001-2002 |
| TAUW Research and Development Department The Netherlands Title: Application of isotope analysis for soil pollution research | \$31,000 | 2000-2001 |
| NSERC Individual Research Grant Title: Isotopic constraints on the source, transport and transformation of natural and contaminated compounds in shallow and deep groundwaters | \$160,000 | 1999-2003 |
| NSERC EWR Steacie Fellowship Supplement Title: New developments in hydrogen isotope geochemistry applied to shallow and deep groundwater systems | \$193,900 | 1999-2001 |
| NSERC Major Equipment Grant Title: Gas Chromatograph Isotope Ratio Mass Spectrometer (GC/C/IRMS) for continuous flow high sensitivity analysis of H and N isotopes PI: B. Sherwood Lollar Co-investigators: B. Sleep (Civ. Eng. U. of Toronto) E. Edwards (Chem. Eng. U of Toronto) S. Mabury (Chemistry, U. of Toronto) J. Brenan (Geology, U. of Toronto) J. Stix (Geologie, U. of Montreal) D. Muir (Canadian Centre for Inland Waters) R. Therrien (Geologie, Laval) | \$257,015 | 1999-2000 |
| NSERC Equipment Grant Title: Gas Chromatograph for low level H ₂ compositional analysis | \$34,456 | 1999-2000 |
| Imperial Oil University Research Grant Title: Stable Carbon Isotopes: Tracers of Intrinsic Bioremediation of Aromatic Hydrocarbons | \$30,200 | 1998-2001 |
| NSERC Strategic Grant - University Industry Partnerships Title: Tracing Organic Contaminants in Groundwater - A New Environmental Methodology using Compound Specific Isotope Analysis Co-investigator: B. Sleep (Civil Engineering, Univ. of Toronto) * Grants indicated * below are the industry matching funds for the 1997-2000 Strategic Project | \$290,000 | 1997-2000 |
| NSERC Industrially Oriented Research Grant | \$8,000 | 1998-99 |

Title: Natural hydrocarbon gas concentrations in near-surface groundwaters
 Industrial Partner: Imperial Oil Ltd.

RTDF Consortium on Groundwater Contamination \$18,000 1998-99

Title: Isotopic constraints on chlorinated hydrocarbon contamination at Dover Air Force Base, USA.

***United Technologies Research Grant** \$13,000 1997-98

Title: Collaborative research on fractionation associated with degradation of toluene in field settings

***General Electric Research Grant** \$36,000 1997-99

Title: Collaborative research on fractionation associated with degradation of TCE
 Co-investigator: J. Spivack (General Electric Research Division, Schenectady, NY)

NSERC Operating Grant \$118,800 1995-99

Title: Inorganic/organic controls on production and flux of carbon gases from deep and shallow groundwaters and wetlands - Isotopic and geochemical characterization.

***Centre for Groundwater Research - U. of Waterloo** \$50,000 1995-99

Solvents-in-Groundwater Research Funding

Title: Evaluation of GC-IRMS techniques to identify multi-sources of organic contaminants in groundwater systems

Imperial Oil University Research Grants \$28,000 1995-98

Title: Natural hydrocarbon gas concentrations in near-surface groundwaters
 Implications for assessment of contamination due to gas migration and leakage

Ontario-Quebec Academic Exchange Program \$ 3,700 1997-98

Title: Environmental implications of methane gas and brine occurrences in mines on the Canadian Shield.
 Co-Investigator: J. Guha, Dept. des Sciences de la Terre, Univ. du Quebec à Chicoutimi.

NSERC Equipment Grant \$42,334 1994-95

Title: Automated Multiport Manifold for Mass Spectrometer
 Co-investigators: F.G. Ferris (Geology, Toronto); D. Wedin; R. Jefferies and J. Coleman (Botany, Toronto); J. Gerits (Geography, Toronto); N. Roulet (Geography, McGill); J. Stix (Geologie, Montreal), R. Knowles (Microbiology, McGill).

Falconbridge Ltd. Research Grant \$30,000 1994-96

Title: Occurrences of explosive gas and saline groundwater in Kidd Creek Mine, Timmins, Ont.

American Association of Petroleum Geologists \$2,000 1995-96

Grants-in-Aid of Field Research Support to S. Taylor
 Title: Natural hydrocarbon gas concentrations in near-surface groundwaters
 Implications for assessment of contamination due to gas migration and leakage

Ontario-Quebec Academic Exchange Program \$ 2,420 1995-96

Title: Environmental implications of methane gas and brine occurrences in mines on the Canadian Shield.
 Co-Investigator: J. Guha, Dept. des Sciences de la Terre, Univ. du Quebec à Chicoutimi.

Research Contract

Atmospheric Environment Service \$10,000 1994-95

Title: Geochemical controls on production mechanism and isotopic signature of CH₄ from low boreal wetlands.

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| NSERC Operating Grant | \$71,220 | 1992-95 |
| Title: Geochemical and isotopic controls on the origin and migration of gases in the hydrogeological environment | | |
| Ontario Geoscience Research Grant | \$56,000 | 1992-94 |
| Ministry of Northern Development and Mines | | |
| Title: The role of N ₂ and H ₂ in inorganic methanogenesis in the crystalline rocks of the Canadian Shield | | |
| AES/NSERC Science Subvention Program | \$10,000 | 1993-94 |
| Atmospheric Environment Service - Environment Canada | | |
| Title: CH ₄ inputs to the atmosphere from bogs in the Great Lakes Basin | | |
| Possible geochemical controls on production mechanisms and isotopic signature | | |
| Research Agreements Program | \$6000 | 1992-93 |
| Energy Mines and Resources | | |
| Title: Migration and mixing of helium within the Southwest Ontario Sedimentary Basin | | |
| Implications for hydrocarbon gas reservoirs | | |
| Co-Investigators: S.M. Weise (Institut fuer Hydrologie, Munich, Germany); | | |
| S.K. Frape (Univ. of Waterloo); J.F. Barker (Univ. of Waterloo) | | |
| Connaught Phase I New Staff Grant | \$10,000 | 1992-93 |
| Connaught New Staff Matching Grant | \$11,000 | 1993-95 |
| University of Toronto | | |
| Title: Environmental applications of GC-IRMS - Production and transport of carbon-bearing compounds in the hydrological environment | | |
| Operating Grant | \$35,000 | 1992-93 |
| University of Toronto | | |
| Equipment Grant - Stable Isotope Laboratory | \$400,000 | 1992-93 |
| University of Toronto | | |
| As co-investigator: | | |
| Canadian Institute for Advanced Research (CIFAR) | | |
| Global Call for Ideas Program | \$15,000 | 2020-2022 |
| Title: Evolution of WATER on Earth and Mars over Planetary TIME-scales | | |
| PI: J. McIntosh (Arizona) | | |
| Co-I: B. Sherwood Lollar (Toronto), J.F. Mustard (Brown), C.J. Ballentine (Oxford); V. Stamenkovic (NASA – JPL) | | |
| NFoLD NASA Astrobiology Team Grant | | Unfunded foreign collaborator |
| Title: Agnostic Biosignatures for Extant Life | | |
| PI: S.S. Johnson (Georgetown); H. Graham (NASA Goddard Space Flight Centre) | | |
| Co-Is: E. Anslyn & T.A. Ellington (U Texas Austin); P. Conrad & A. Steele (Carnegie) | | |
| L. Cronin (Glasgow); J. Elsila, P. Mahaffy (NASA Goddard Space Flight Centre) | | |
| C. House (Penn State); P. Girguis (Harvard); M.R. Rwebangira (Howard) | | |
| C. Kempes & E. Libby (Santa Fe Institute); J. Nadeau (Portland State) | | |
| B. Sherwood Lollar (Unfunded Foreign Co-investigator) | | |
| NSERC Collaborative Research and Development | \$315,104 | 2019-2021 |
| Title: Field testing of novel technologies for restoring challenging contaminated sites | | |
| | | (Total to BSL \$58,000) |

PI: J. Gerhard (UWO)
 Co-PIs: C.E. Robinson and J. Herrera (UWO)
 B. Sleep, E.A. Edwards and B. Sherwood Lollar (Toronto)
 P. Weber (RMC)

Sloan Foundation Deep Carbon Observatory \$1,200,000 USD 2015-2017
 Title: Reduced Carbon in Earth: (BSL portion \$75,000 USD)
 III. Origins, Forms, Quantities and Movement
 PI: E. Young (UCLA) and I. Danielle (Lyons)
 Subteam PI: B. Sherwood Lollar (Toronto)

Sloan Foundation Deep Carbon Observatory \$1,200,000 2013-2015
 Title: Reduced Carbon in Earth's Crust and Mantle: (BSL portion \$285,000)
 II. Deep Energy and Reduced Gas Flux
 PI: D. Cole and I. Danielle
 Subteam PI: B. Sherwood Lollar (Toronto) and C.J. Ballentine (Oxford)

NSERC CREATE Grant
 Title: Remediation Education Network (RENEW) \$1,650,000 2014-2020
 PI: B. Sleep
 Co-PIs: E. Acosta (Toronto), E. Edwards (Toronto), J. Gerhard (Western),
 J. Herrera (Western), D. O'Carroll (Western), C. Robinson (Western),
 N. Thomson (Waterloo), K. Mumford (Queen's), K. Novakowski (Queen's)
 Collaborator: B. Sherwood Lollar (Toronto)

Sloan Foundation Deep Carbon Observatory \$1,500,000 2011-2013
 Title: Reduced Carbon in Earth's Crust and Mantle: (BSL portion \$320,000)
 I. Abiogenic versus Biogenic Origins
 PI: D. Cole and C.J. Ballentine
 Subteam PI: B. Sherwood Lollar (Toronto)
 Co-PIs: E. van Heerden (Univ. of Free State, SA); T.C. Onstott (Princeton); M. Itavaara (VTT, Finland)

NSERC CREATE Grant 2011-2016
 Title: Multidisciplinary Applied Geochemistry Network (MAGNET)
 PI: D. Weis (Univ. of British Columbia)
 Co-PIs: S. J. Barnes (Univ. du Quebec), B. Bergquist (Univ. of Toronto), I. Clark (Univ. of Ottawa),
 R. Francois (Univ. of British Columbia), C. Hillaire-Marcel (UQAM), B. Sherwood Lollar (Univ. of Toronto)
 J. Stix (Univ. of McGill)

NSERC Networks of Centers for Excellence \$5 million 2010-2013
 Title: Carbon Management Canada BSL portion \$209,800 over 3 years
 PI: S. Larter (U. Calgary)
 Co-PI: B. Mayer (Calgary), J. Grace (UBC), B. Rostron (Alberta), J. Shaw (Alberta), G. Dipple (UBC)
 D. Lawton (Calgary), J. Meadowcraft (Calgary), B. Sherwood Lollar (Toronto), C. Mims (Toronto)

National Science Foundation \$700,000 2010-2012
 Title: Collaborative Research ETBC – Deep Crustal Biosphere BSL portion: \$57,576 over three years
 Microbial Cycling of Carbon
 PI: T.C. Onstott (Princeton)
 Co-PIs: T. Kieft (NMT); B. Sherwood Lollar (Toronto); G.F. Slater (McMaster); K. Hinrichs (Bremen)

CFI Leaders Opportunity Fund \$218,143
Canadian Foundation for Innovation

Title: Biozone: A Modern Collaborative Bioengineering Research Facility

PI: E. Edwards (Chem. Eng.)
 Co-PIs: E. Masters and R. Mahadevan (Chem Eng)
 Co-Investigators: B. Sherwood Lollar, B. Sleep, M. Shoichet and others

NSERC CREATE Program \$1.6 million 2009-2014

Canadian Astrobiology Training Program

PI: L. Whyte (McGill)
 Co-investigators: B. Sherwood Lollar (Toronto)
 N. Banerjee, G. Osinski (UWO)
 R. Pudritz, G. Slater (McMaster)
 W. Pollard, H. Vali, J. Nadeau, B. Wing (McGill)
 E. Cloutis (Winnipeg)
 Collaborators: NASA Ames, NASA JPL, Canadian Space Agency,
 MDA Space Missions, MPA Communications

Canadian Space Agency Canadian Analogue Research Network \$50,000 2010-2011

CARN 08-01

BSL portion: \$5000
 Title: Life in Ice: The detection of microbial activity at Mars analogue sites (cold Saline springs, permafrost/ground ice in the high Arctic)
 PI: L. Whyte (McGill)
 Co-investigators: B. Sherwood Lollar (Toronto)
 T.C. Onstott (Princeton)

Genome Canada and Ontario Genomics Institute \$10 million 2009-2018

BEEM: Bioproducts and Enzymes from Environmental Metagenomics BSL unfunded collaborator
 PI: E.A. Edwards (Dept of Chemical Engineering Toronto) and D.W. Major (GeoSyntec Inc).
 Co-pi: B. Sherwood Lollar and others

Canadian Space Agency Canadian Analogue Research Network \$30,000 2007-2008

CARN 07-01

BSL portion: \$2000
 Title: Life in Ice: The detection of microbial activity via in situ measurements of CH₄ and CO₂:
 High Arctic field testing of a Cavity Ring Down Spectrometer (CRDS) for future use on the Martian surface
 PI: L. Whyte (McGill)
 Co-investigators: B. Sherwood Lollar (Toronto)
 T.C. Onstott (Princeton)

Canadian Space Agency Canadian Analogue Research Network \$20,000 2007-2008

CARN 07-02

BSL portion: \$2000
 Title: Planetary protection - The survivability of Earth microbes from Canadian High Arctic Mars analogue sites under Martian environmental conditions
 PI: L. Whyte (McGill)
 Co-investigators: B. Sherwood Lollar (Toronto) T.C. Onstott (Princeton)

U.S. Strategic Environmental Research and Development Program

Title: Elucidation of the mechanisms and environmental relevance of cis-DCE and VC biodegradation \$1,250,000 2007-2011
 (BSL portion \$35,000 per year)
 PI: E. Cox(GeoSyntec)
 Co-PIs: C. Aziz (GoeSyntec), J. Gossett (Cornell), J. Spain (Georgia Tech)
 E.A. Edwards (Toronto), B. Sherwood Lollar (Toronto)

NASA ASTID (Astrobiology Science and Technology Development And Mission Concept Studies)

\$1.5 million USD 2008-2011
 Title: A CRDS for isotopic measurement of Martian CH₄
 BSL unfunded collaborator
 PI: T.C. Onstott, Dept. of Geosciences, Princeton University

Co-investigators: K.K. Lehmann (U. of Virginia)
 P. Mahaffy (Mars Science Lab PI - NASA Goddard Space Flight Center)
 H. Riris, I. Kate, J. Burris (all of NASA Goddard Space Flight Center)
 Collaborator: B. Sherwood Lollar (Toronto)

NASA Astrobiology Institute (NAI) - DDF Fund \$253,075 USD 2007-2008
 Title: Mars Environmental Simulator Studies of Forward Contamination and Biogeochemical Processes (no direct funds to BSL as major portion of funds for mounting a Mars Simulator workshop)
 PI: T.C. Onstott (Princeton)
 L.M. Pratt, D. Bish, A. Schimmelmann (Indiana Univ.)
 S.M. Pfiffner (Tennessee)
 B. Sherwood Lollar (Toronto)
 T.C. Hazen (Lawrence Berkeley National Lab;)R. Mancinelli, L. Rothschild (SETI); J. Bishop (NASA Ames); P. Todd (SHOT Inc.)
 P. Kounaves (Tufts); K. Zacny (Honeybee Robotics); P. Mahaffy (NASA MSL PI); A. Schuerger (U of Florida); J. Bada (UCSD); L. Becker (UCSB); C. Omelon, W. Pollard (McGill)

NASA Astrobiology Research Institute (NAI) \$5,000,000 USD 2003-2008
 Detection of Biosustainable Energy and Nutrient Cycles in the Deep Subsurface of Earth and Mars (BSL portion after overhead approximately \$60,000 Canadian per year)
 PI: L. Pratt (Chemistry, Indiana U.)
 Co-PI's: T.C. Onstott (Princeton), B. Sherwood Lollar (Toronto)
 J.K. Fredrickson (PNNL); S. Pfiffner (U. Tennessee);
 T. Phelps (ORNL); F. Brockman (PNNL); T. Hazen (LBNL);
 S. Clifford (Lunar Planetary Institute)

NSERC Research Tools and Instruments \$86,204 2006
 Title: Microarray Equipment to detect differential gene expression in biodegrading microbial communities
 PI: Edwards (Chem-Eng) Co-PIs: Sherwood Lollar (Geology), M. Simpson (UTSC)

Canadian Space Agency Analogue Site Studies \$20,000 2006
 Title: High Arctic Springs as Mars analogue sites
 PI: L. Whyte (McGill)
 Co-PIs: W. Pollard (McGill); N. Perreault (McGill);
 B. Sherwood Lollar (Toronto); D. Andersen (SETI)

NSERC Research Tools & Instruments - Category I \$72,995 2003
 Title: Application of Quantitative Molecular Techniques in Subsurface Bioremediation
 PI: E. Edwards (Chemical Engineering and Applied Chemistry)
 Co-PIs: B. Sherwood Lollar (Geology); B. Sleep (Civil)

NSERC Collaborative Research Development Grant \$266,244 2000-2003
 Title: Biogeochemical Mechanisms for Chlorinated Ethane Transformation in Groundwater
 PI: E. Edwards (Chem. Eng. U of Toronto)
 Co-investigators: B. Sherwood Lollar (Geology - U. of Toronto)
 B. Sleep (Civ. Eng. U. of Toronto)

Canadian Chlorine Coordinating Council \$75,000 1999-2001
 Title: Source Identification of Chloroacetic Acids (CAA) in the Environment by GC-C-IRMS
 PI: S.A. Mabury (Chemistry, University of Toronto)
B. Sherwood Lollar (Geology, University of Toronto)
 D.Muir (CCIW, Environment Canada)

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| National Science Foundation | \$1,275,000 | 1999-2003 |
| Title: South African Ultradeep Mines - Long Term Sites for Interdisciplinary Studies (LSLIS) into the Extreme Environment of the Deep Subsurface | | |
| PI: T.C. Onstott, Dept. of Geosciences, Princeton University | | |
| Co-investigators: D. Balkwill (FSU); D. Boone (PSU); Brockman (PNNL); J.K. Fredrickson (PNNL); Kieft (NMIT); Pfiffner (UTenn); T.Phelps (ORNL); L. Pratt (IU); <u>B. Sherwood Lollar</u> (Toronto); G. Southam (NAU); M. Stute (Lamont-Doherty); G. Wallfaardt (Univ. Stellenbosch); D. White (UTenn) | | |
| National Geographic Society | \$17,707 | 1998-99 |
| Title: A Window into the Extreme Environment of Deep Subsurface Microbial Communities: The Witwatersrand Deep Microbiology Project | | |
| PI: T.C. Onstott, Dept. of Geosciences, Princeton University | | |
| Co-investigators: J.K. Fredrickson (PNNL); K. Pedersen (Goteborg Univ.); <u>B. Sherwood Lollar</u> | | |
| U.S. Dept of Energy - Office of Energy Research | \$200,000 | 1995-1998 |
| Title: Combined Noble Gas and Stable Isotope Constraints on Nitrogen Gas Source within Sedimentary Basins | | |
| PI: C.J. Ballentine, Dept. of Geological Sciences, Univ. of Michigan | | |
| Co-investigators: <u>B. Sherwood Lollar</u> ; A.N. Halliday, Dept. of Geological Sciences, Univ. of Michigan | | |
| Special University Linkage Consolidation Program AUCC-CIDA | \$750,000 | 1996-2001 |
| Title: Geo-environment and its impact on socio-economic development - Guizhou Province, in alliance with the Pearl River Delta, P.R. of China | | |
| PI: J. Guha (Univ. du Quebec a Chicoutimi) | | |
| Faculty of Arts and Sciences - One Time Only Funds | \$10,000 | 1992-93 |
| Field Gas Chromatograph for Environmental Geosciences Teaching Initiative | | |
| Co:investigator: F.G. Ferris (Univ. of Toronto) | | |
| NSERC Equipment Grant | \$90,301 | 1991-92 |
| Title: Phase contrast-fluorescence microscope, spectrophotometer, and anaerobic chamber needed to undertake microbial geochemistry research | | |
| PI: F.G. Ferris (Univ. of Toronto) | | |

PEER REVIEWED SCHOLARLY PUBLICATIONS

All co-authors who are students, postdoctoral fellows or research associates directly under Sherwood Lollar's supervision take first-authorship for their work and are noted *in italics* in the publication list below. **Sherwood Lollar's name is underlined where she is first, or senior author, as different disciplines have different assumptions concerning where the senior author's name should be listed (i.e. second, or last).** Journals are selected for breadth of readership, the quality of the submission and review process and impact. The majority of publications are in journals such as *Science*, the *Nature family*, and in disciplinary journals such as *Geochimica Cosmochimica acta*, *Chemical Geology*, *Organic Chemistry*, *Applied and Environmental Microbiology*, and *Environmental Science and Technology* that have among the highest rated impact factors in geochemistry.

183. Sherwood Lollar, B., Heuer, V.B., McDermott, J., Tille, S., Warr, O., Moran, J.J., Telling, J., and Hinrichs K.-U. A window into the abiotic carbon cycle – volatile fatty acids in fracture waters in 2.7 billion year old host-rocks of the Canadian Shield. Subm to

GCA.

182. Warr, O., Young, E.D., Giunta, T., Kohl, I.E., Ash, J.L. and Sherwood Lollar, B. High-resolution, long-term isotopic and isotopologue variation identifies the sources and sinks of methane in a deep subsurface carbon cycle. Subm to **GCA**.
181. Tarnas, J., Mustard, J.F., Sherwood Lollar, B., Stamenkovic, V., Cannon, K.M., Lorand, J.-P., Onstott, T.C., Michalski, J.R., Warr, O., Palumbo, A.M. and Plesa A.-C. Earth-like habitable environments in the subsurface of Mars. Subm. to **Nature Geoscience**.
180. Sader, J.A., Harrison, A.L., McClenaghan, B., Hamilton, S.M., Clark, I.D., Sherwood Lollar, B. and Leybourne, M. (2020) Generation of high pH groundwaters and H₂ gas by groundwater-kimberlite interaction, northeastern Ontario, Canada. *Can. Mineralogist* (in press).
179. Labidi, J., Barry, P.H., Bekaert, D.V., Broadley, M.W., Marty, B., *Giunta, T.*, Warr, O., Sherwood Lollar, B., Fischer, T.P., Avice, G., Caracausi, A., Ballentine, C.J., Halldorsson, S., Stefansson, Kurz, M., Kohl, I. and Young, E.D. (2020). Hydrothermal ¹⁵N/¹⁵N abundances constrain the origins of mantle nitrogen. **Science**. 580:367-371.
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177. *Gilevska, T.*, *Ojeda, A.S.*, Renpenning, J., Kümmel, S., Gehre, M., Nijenhuis, I., and Sherwood Lollar, B. (2020) Requirements for chromium reactors for use in determination of H isotopes in CSIA of chlorinated compounds. **Analytical Chemistry** 92(3): 2383-2387.
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156. Chen, G., Shouakar-Stash, O., *Phillips, E.*, Justicia-Leon, S.D., *Gilevska, T.*, Sherwood Lollar, B., Mack, E.-E., Seger, E.S. and Löffler, F.E. (2018) Dual carbon-chlorine isotope analysis indicates distinct anaerobic dichloromethane degradation pathways in two members of the Peptococcaceae. **Environmental Science and Technology** **52(15):8607-8616**.
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Graves, D., Hecox, G.R., Kirschenmann, K. and Sherwood Lollar, B. In situ vinyl chloride biodegradation revealed through carbon isotope composition. 6th International Symposium on In Situ and On-Site Bioremediation. June 4-7, 2001, San Diego CA.

Onstott, T.C., Moser, D.P., DeFlaun, M., Pratt, L.M., and Sherwood Lollar, B. Geohydrological and biogeochemical subsurface environments within the Witwatersrand Basin, South Africa. ASM Annual Meeting. May 2001. Orlando FL.

Sherwood Lollar, B., Lacrampe-Couloume, G., Ward, J.A. and Slater, G.F. Compound specific hydrogen isotope analysis: New insights into geochemical and biogeochemical reaction mechanisms. American Chemical Society Annual Meeting. April 1-5, 2001, San Diego CA.

Lacrampe-Couloume, G., Ward, J.A.M, Mancini, S., Slater, G.F., Edwards, E. and Sherwood Lollar, B. Hydrogen and carbon isotope

fractionation during anaerobic biodegradation of BTEX: Potential for field verification of bioremediation. Biotechnological Remediation of Water Pollution by Acid Inorganic and Aromatic Chlorinated Compounds. March 21-23, 2001. Leipzig, Germany.

- Slater, G.F., Sherwood Lollar, B., Sleep, B. and Edwards, E.* Variation in stable carbon isotopic fractionation during reductive dechlorination of PCE. Geological Society of America Annual Meeting, Nov. 12-16, 2000, Reno, NV.
- Ward, J.A.M., Ahad, J.M.E., Lacrampe-Couloume, G., Slater, G.F., Edwards, E.A. and Sherwood Lollar, B.* Hydrogen isotope fractionation during methanogenic degradation of toluene: Potential for direct verification of bioremediation. Geological Society of America Annual Meeting, Nov. 12-16, 2000, Reno, NV.
- Westgate, T. and Sherwood Lollar, B.* Evidence for abiogenic synthesis of C1-C4 hydrocarbons in crystalline rock environments. Geological Society of America Annual Meeting, Nov. 12-16, 2000, Reno, NV.
- Wong, C.S., Mabury, S.A., Sherwood Lollar, B., Lacrampe-Couloume, G., Muir, D.C.G.* Isotopic analysis of haloacetic acids using gas chromatography/combustion/isotope ratio mass spectrometry (GC/C/IRMS). Society of Environmental Toxicology and Chemistry 21st Annual Meeting, Nov. 12-16 2000, Nashville, TN.
- Ward, J.A.M., Ahad, J.M.E., Lacrampe-Couloume, G., Slater, G.F., Edwards, E.A. and Sherwood Lollar, B.* Hydrogen isotope fractionation during methanogenic degradation of toluene: Potential for direct verification of bioremediation. Goldschmidt 2000 - International Conference for Geochemistry. Oxford, UK, Sept. 2000.
- Slater, G.F., B. Sherwood Lollar, R. Allen-King and S. O'Hannesin.* Carbon isotopic fractionation by zero-valent iron: Influence of surface pre-treatment. Goldschmidt 2000 - International Conference for Geochemistry. Oxford, UK, Sept. 2000.
- Wong, C.S., Mabury, S.A., Sherwood Lollar, B., Lacrampe-Couloume, G., and Muir, D.* Stable isotope as a marker of environmental sources and processes of haloacetic acids. International Symposium on Haloacetic Acids and Shortchain Halocarbons: Sources and Fate in the Environment. Toronto, Ont. Aug. 27-29. 2000.
- Slater, G.F., B. Sherwood Lollar, E. Edwards, B. Sleep, M. Witt, G.M. Klecka, M. Harkness, J. Spivack.* Carbon isotopic fractionation of chlorinated ethenes during biodegradation: Field applications. Second International Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds. Monterey, CA. May 2000.
- Slater, G.F., B. Sherwood Lollar, E. Edwards, B. Sleep.* Stable isotope tracers of intrinsic biodegradation. Second International Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds. Monterey, CA. May 2000.
- Ahad, J., B. Sherwood Lollar, E. Edwards, Slater, G.F. and B. Sleep.* Carbon isotopic fractionation during anaerobic biodegradation of BTEX: Implications for intrinsic bioremediation. Geological Society of America Annual Meeting. Denver, CO, Oct. 1999.
- Slater, G.F., B. Sherwood Lollar, B. Sleep, E. Edwards, and R.W. Lee.* Isotopic Characterization of the Subsurface Fate of Chlorinated Ethenes. Geological Society of America Annual Meeting. Denver, CO, Oct. 1999.
- Ahad, J.M.E., Sherwood Lollar, B., Edwards, E.A., Slater, G.F. and Sleep, B.E.* (1999) Monitoring the biodegradation of toluene using stable carbon isotopes: Implications for contaminated site assessment. 14th International Symposium on Environmental Biogeochemistry. Sept. 26-30, 1999. Deerhurst, Ontario, Canada.
- Slater, G.F., Sherwood Lollar, B., Edwards, E., Sleep, B.E. and Brown, A.* (1999) Isotopic fractionation during reductive dechlorination by several microbial consortia. 14th International Symposium on Environmental Biogeochemistry. Sept. 26-30, 1999. Deerhurst, Ontario, Canada.
- Onstott, T.C., Moser, D.P., Sherwood Lollar, B., Slater, G.F., Deflaun, M.F., Hoek, J., and Pratt, L.M.* (1999) The Witwatersrand Deep Microbiology Project: Groundwater geochemistry and potential biogeochemical processes. International Society for Subsurface Microbiology. Aug. 22-27, 1999. Vail, Colorado.

Reysenbach, A.-L., Fredrickson, J.K., Southam, G., Kotelnikova, S., Omar, G., Slater, G.F., Pratt, L.M., Boone, D., Pedersen, K. and Sherwood Lollar, B. (1999). The Witwatersrand Deep Microbiology Project: A Window Into The Extreme Environment Of Deep Subsurface Microbial Communities. International Society for Subsurface Microbiology. Aug. 22-27, 1999. Vail, Colorado.

Sherwood Lollar, B. and Ballentine, C.J. (1999) Nitrogen in the Hugoton/Panhandle Gas Field: Understanding its Origin and Isotopic Character by Combining Stable and Noble Gas Isotopes. American Association of Petroleum Geologists Hedburg Research Conference "Natural Gas Formation and Occurrence" June 6-11, 1999 Durango, Colorado.

Ballentine, C.J. and Sherwood Lollar, B. The origin of helium associated nitrogen in mid-continent U.S. natural gases: The Hugoton/Panhandle Giant gas field. Geological Society of America Annual Meeting. Toronto. (Oct. 1998)

Westgate, T. and Sherwood Lollar, B. Carbon isotopic and compositional evidence for inorganic synthesis of hydrocarbon gases. American Geophysical Union Spring Meeting, Boston, MA (May 1998).

Slater, G.F., Dempster, H.D., Sherwood Lollar, B., Spivack, J., Brennan, M. and MacKenzie, P. (1998) Isotopic tracers of degradation of dissolved chlorinated solvents. First International Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds. Monterey, CA (May 1998).

Sherwood Lollar, B., Ballentine, C., and O'Nions, R.K. (1998) Non-hydrocarbon gases in sedimentary systems - Evidence for mantle-derived CO₂ in the Pannonian Basin based on stable isotope signatures and C/He ratios. American Chemical Society Spring Meeting. Dallas, Tx. (March 1998).

Ballentine, C., Sherwood Lollar, B., and Halliday, A. (1998) Non-hydrocarbon gases in sedimentary systems - Nitrogen gas sources in sedimentary basins of the western U.S. American Chemical Society Spring Meeting. Dallas, Tx. (March 1998).

Taylor, S., Sherwood Lollar, B., Wassenaar, L. and J.M. Hendry. Bacterial hydrocarbon production in shallow bedrock aquifers and surficial till aquitards, Saskatchewan, Canada. Geological Society of America Annual Meeting. Salt Lake City (Oct. 1997).

Slater, G.F., Dempster, H., Sherwood Lollar, B., Spivack, J., Brennan, M. and P. Mackenzie. Isotopic investigation of TCE degradation using GC/C/IRMS coupled with headspace analysis. Geological Society of America Annual Meeting. Salt Lake City (Oct. 1997).

Ferris, F.G., Gerits, J.P., Sherwood Lollar, B., Schultze-Lam, S. Carbonate and silicate mineral deposition in a saline-alkaline lake microbial mat. XIII International Symposium on Environmental Biogeochemistry, Monopoli (Bari) Italy. (Sept. 1997).

Slater, G. F., Dempster, H. and Sherwood Lollar, B. Technical developments in applications of GC/C/IRMS to ¹³C analysis of low level dissolved chlorinated compounds. University of Waterloo Continuous Flow Isotopic Analysis (CFIRMS) Workshop, Waterloo (Aug. 1997).

INVITED LECTURES AND KEYNOTES

Sherwood Lollar, B. Opening Pandora's box – challenges and promise of a multi-element isotopologue future in organic geochemistry. **Keynote Gordon Research Conference** on Organic Geochemistry Holderness NH. Aug. 2020. (postponed due to COVID crisis)

Sherwood Lollar, B. Microbial minimalism: electron donors and acceptors and metabolic strategies in the deep terrestrial biosphere. **Invited.** 4th International Workshop on Microbial Life under extreme energy limitation. Organic Geochemistry Sandbjerg Denmark. Sept. 6-10 2021.

Sherwood Lollar, B., *Warr, O.,* Ballentine, C.J., Tarnas, J.D., Mustard, J.F. Stamenkovic, V., Ferguson, G., Kim, J., McIntosh, J.C., McDonnell, J. To impermeable, and beyond: Expanding conceptual models for the hidden hydrogeosphere. **Invited.** American Geophysical Union Fall Meeting. San Francisco, CA. Dec. 7-11, 2020.

- Warr, O., Giunta, T., Onstott, T.C., Kieft, T.L., Harris, R.L., Nisson, D.M., Sherwood Lollar, B. Oxygen exchange in the hidden hydrogeosphere: Towards a new equilibrium? Geological Society of America 2020 Montreal, QC. virtual meeting, Oct. 26-30, 2020.
- Sherwood Lollar, B., Phillips, E., Ojeda, A.S., Chen, W., Gilevska, T. Quantification of transformation and transport across biogeochemical boundaries by multi-element CSIA. **Invited C.C. Patterson Medalist 2019.** Goldschmidt Annual Meeting 2020, Honolulu HI, June 21-26, 2020.
- Sherwood Lollar, B., Exploration of Subsurface Habitability and Microbial Life in Deep Fracture Waters of the Precambrian Continents **Invited Speaker** Gallagher Colloquium Series, University of Calgary, Calgary AB. Jan. 16 2020.
- Sherwood Lollar, B. Exploration of the deep hydrogeosphere in crystalline rocks. Implications for resources and for life. **Keynote.** United States Geologic Survey 27th Hubbert Quorum. Menlo Park CA. Dec. 8, 2019.
- Sherwood Lollar, B. Multiple Isotope Patterns within Organic Compounds **Invited Panelist.** American Geophysical Union Annual Meeting San Francisco CA. Dec. 2019.
- Sherwood Lollar, B. Looking Up (and Down) to the Stars: Adventures in exploration of the deep hydrogeosphere and deep subsurface biosphere. **Keynote.** 2019 BioZone Research Symposium. University of Toronto. Toronto ON. Nov. 2019
- Sherwood Lollar, B. Exploration of Subsurface Habitability and Microbial Life in Deep Fracture Waters of the Precambrian Continents **Invited Speaker** Delaware Biotechnology Institute, University of Delaware. Oct. 2019.
- Sherwood Lollar, B. Exploring the Earth's Deep Biosphere and Hydrogeosphere. **Keynote** Deep Carbon Observatory Final Symposium. Washington DC. Oct. 2019.
- Ballentine, C.J., Cheng, A., Sherwood Lollar, B. and Warr, O. Release the Juice. **Keynote** Deep Carbon Observatory Final Symposium. Washington DC. Oct. 2019.
- Warr, O., Sherwood Lollar, B., Fellows, J., Sutcliffe, C.N., McDermott, J.M., Holland, G., Mabry, J.C. and Ballentine, C.J. Using noble gases to investigate the carbon-rich ancient fluids of the deep subsurface. **Invited** Deep Carbon Observatory Final Symposium. Washington DC. Oct. 2019.
- Cheng, A., Sherwood Lollar, B., Warr, O., Ferguson, G., and Ballentine, C.J. Determining the helium flux from the deep crystalline basement and the processes controlling its transport in overlying Paleozoic sedimentary basins. Geological Society of America Annual Meeting. Phoenix AZ. Sept. 2019.
- Sherwood Lollar, B. Earth 4D - A deep dive into the Earth's deep biosphere and hydrogeosphere. **Keynote** 24th International Symposium on Environmental Biogeochemistry 2019, Potsdam Germany. Sept. 23-27, 2019.
- Sherwood Lollar, B. Evolving perspectives on rock-hosted deep biospheres: Earth and Mars. **Invited Talk** AbSciCon 2019, Bellevue, Washington. June 24-28, 2019.
- Sherwood Lollar, B. Biogeochemical processes in the deep subsurface – Progress in case studies relevant to a deep geologic repository for used nuclear fuel. **Invited Talk** Nuclear Waste Management Organization 17th Annual Geoscience Seminar. Toronto ON. June 4-5, 2019.
- Sherwood Lollar, B. Subsurface habitability in the Earth's deep hydrosphere: Implications for planetary science and astrobiology. **Keynote** GAC-MAC Annual Meeting, Quebec City, QC. May 12-15, 2019.
- Sherwood Lollar, B. Novel insights and emerging questions on the deep CH₄ methane from investigations in the world's oldest rocks. **Invited Lecture.** Methane on Earth: Global distribution, processes and importance. Hanse-Wissenschaftskolleg, Institute for

Advanced Study (HWK) Delmenhorst, Germany. April 1-3, 2019.

Sherwood Lollar, B. Lessons from the Deep Earth for the Search for Life in the Solar System and Beyond. **Invited Talk** John's Hopkins Applied Physics Lab. Laurel, MD. Feb. 26 2019.

Sherwood Lollar, B. Exploration of the Earth's deep hydrogeosphere and subsurface microbial life. **Invited** Departmental Seminar University of Western Ontario, London, ON. Feb 7, 2019.

Sherwood Lollar, B., Atreya, S.K., Boss, A.P., Falkowski, P.G., Farmer, J.D., Guyon, O., Joyce, G.F., Kasting, J.F., Meadows, V.S., Neches, P.M., Pilcher, C.B., Renno, N.O., Rogers, K.L., Schmidt, B.E., Summons, R., Westall, F. and Wright, S.A. Astrobiology Science Strategy for the Search for Life in the Universe. **Invited Talk**. American Geophysical Union Fall Meeting. Washington, D.C. Dec 10-14, 2018.

Sherwood Lollar, B. Novel radiogenic end-members and chemolithotrophic ecosystems in the world's oldest rocks. **Invited Talk**. Princeton University. Princeton, NJ. Oct. 2018

Sherwood Lollar, B. Follow the carbon - Spatial and temporal constraints on habitability and carbon cycling in the Earth's continental lithosphere. **Keynote Gordon Research Conference** on Deep Carbon. Bryant College, Smithfield, RI. June 2018.

Sherwood Lollar, B. Exploration of subsurface habitability in deep fracture waters of the Precambrian continents – Analog studies for planetary sciences and astrobiology. **Invited Talk**. Brown University. Providence, RI. April. 2018

Sherwood Lollar, B. Habitability, microbial potential and activity in subsurface fracture fluids. **Keynote Gordon Research Conference** on Geobiology. Galveston, TX. Jan. 2018.

Sherwood Lollar, B. Exploration of Earth's Deep Subsurface Hydrosphere and Microbial Life. **Invited Departmental** University of Waterloo. Waterloo, ON. Jan. 2018

Sherwood Lollar, B. Exploration of subsurface habitability in deep fracture waters of the Precambrian continents – Analog studies for planetary sciences and astrobiology. **Invited Talk**. Applied Physics Laboratory, John's Hopkins University, Baltimore, MD. Jan. 2018

Warr, O., Giunta, T. and Sherwood Lollar, B. Exploring the ancient hydrosphere of the crystalline basement using geochemical footprints. **Invited Talk**. University of Innsbruck Seminar, Innsbruck, Austria. 11th January, 2018.

Sherwood Lollar, B. Exploration of Earth's Deep Subsurface Hydrosphere and Microbial Life. **Invited Colloquium** Oregon State University. Corvallis, OR Nov. 2017

Sherwood Lollar, B. Follow the Water: Exploration for habitability and microbial life in the Earth's deep subsurface. **Invited Colloquium** Department of Physics, University of Toronto. Toronto, ON. Sept. 2017

Lollar, G.S., Telling, J., Voglesonger, K., Warr, O. and Sherwood Lollar, B. Microbial metabolisms in ancient fracture fluids investigated via Most Probable Number Analysis. Goldschmidt Annual Meeting 2017, Paris, France, Aug. 13-18, 2017. (Invited poster)

Sherwood Lollar, B., Gilevska, T., Passetport, E., Lacrampe-Couloume, G. Effects of scale in high resolution compound specific stable isotope analysis. **Keynote** Isotopes 2017, Mt. Ascona, Switzerland. July 9-14, 2017.

B. Sherwood Lollar. Exploring the deep subsurface biosphere in the world's oldest rocks. **Keynote Gordon Research Conference** on Applied and Environmental Microbiology. South Hadley, MA. July 16-21, 2017.

B. Sherwood Lollar. "Follow the Water": Exploring the deep hydrogeosphere and the subsurface terrestrial biosphere. **Keynote** 67th Annual Conference of the Canadian Society of Microbiologists, Waterloo, Ontario, June 20-23, 2017.

Warr, O., Giunta, T., and Sherwood Lollar, B. *Using geochemical footprints to explore the ancient hydrosphere of the crystalline*

basement. APGO Networking Event, Timmins, Canada. 5th June, 2017.

Sherwood Lollar, B., *Li, L., Wing, B.A., Warr, O., Ballentine, C.J., Giunta, T., McDermott, J.M.M., Lollar, G.S., and Telling, J.* Novel isotope discoveries on the biogeochemistry of the deep Earth and the habitability of planetary subsurface environments. **Invited**. AbSciCon 2017, Mesa, Arizona. April 24-28, 2017.

B. Sherwood Lollar. Exploring the deep terrestrial hydrosphere and biosphere. **Invited** Annual Microbiology Society Meeting, Edinburgh, Scotland. April 3-6, 2017.

Sherwood Lollar, B. and Ballentine, C.J. A vision of global synthesis of hydrogen, methane and higher hydrocarbon production and distribution over time constrained via noble gases. **Invited** Third DCO International Science Meeting, St. Andrews, Scotland, March 23-25, 2017.

Warr, O., Sherwood Lollar, B., Fellowes, J., Sutcliffe, C., McDermott, J., Holland, G., Mabry, J. and Ballentine, C.J. The role of noble gases in interpreting deep carbon-rich systems in the crystalline basement. **Invited** Third DCO International Science Meeting, St. Andrews, Scotland, March 23-25, 2017.

Ladau, J., Magnabosco, C., Ruff, E., Colwell, F., D'Hondt, S., Gaidos, E., Grim, S., Kieft, T., Leon Zayas, R., Lloys, K., Onstott, T.C., Kiel Reese, B., Rogers, K., Schrenk, M., Sherwood Lollar, B., Soares, A., Sogin, M. Exploring ecological patterns of Earth's subsurface life. **Invited** Third DCO International Science Meeting, St. Andrews, Scotland, March 23-25, 2017. (poster)

Passeport, E., Landis, R., Lacrampe-Couloume, G., Lutz, E.J., Mack, E.E., West, K., Morgan, S., and Sherwood Lollar, B. Coupling of high resolution pore water sampling and Compound Specific Isotope Analysis to monitor sediment natural attenuation. **Invited** 2017 RemTEC Summit, Denver, CO, March 7-9, 2017.

B. Sherwood Lollar. Microbial Life in the world's oldest rocks: Potential preservation signals. **Invited** Mars Exploration Advisory Group Rock-Hosted Life Virtual Workshop. Feb. 8, 2017.

B. Sherwood Lollar. **Invited**. Departmental Seminar Series. California Institute of Technology, Pasadena CA. January 2017.

B. Sherwood Lollar. **Invited**. Captain Nemo was right – Exploring the deep biosphere. Royal Canadian Institute Lecture. Jan. 2017.

B. Sherwood Lollar. Exploration Frontiers for Deep Fluids and Deep Life in the World's Oldest Rocks? **Invited**. Departmental Seminar Series. Dept of Earth and Planetary Sciences Northwestern University, Evanston, IL. October 2016.

Onstott, T.C., Magnabosco, C., Lau, C.Y.M., Kieft, T.L., van Heerden, E., Dong, H., Lin, L-H, Pedersen, K., Ghiorse, W. and Sherwood Lollar, B. The biomass and biodiversity of the Continental subsurface biosphere. **Invited**. Goldschmidt 2016, Yokohama, Japan, June 26-July 1, 2016.

B. Sherwood Lollar. Follow the Water – time constraints of deep old groundwater and subsurface life. **Invited**. Origins and Movements of Subsurface Microbes Workshop. Deep Carbon Observatory Deep Life and C-DEBI sponsored workshop. USC Los Angeles CA. June 2016.

Musa, M. Sherwood Lollar, B., Onstott, T.C. and van Heerden, E. Seismic detection to map potential conduits for methane in deep gold mines in the Witwatersrand basin, South Africa **Invited**. European Association of Geoscientists and Engineers. Vienna Austria May 2016.

Ballentine, C.J., *Warr, O., Sutcliffe, C.N., McDermott, J.M., Fellowes, J., Holland, G., Mabry, J.C., and Sherwood Lollar, B.* **Invited**. Deep ancient fluids in the continental crust and their impact on near-surface economic, environmental and biological systems. European Geosciences Union (EGU) General Assembly 2016, Vienna, Austria April 17-22, 2016.

Sherwood Lollar, B., Wang, D., Gruen, D., Ono, S., Young, E., Rumble, D., McDermott, J., *Sutcliffe, C., Ballentine, C.J., Warr, O., Holland, G.* **Invited**. New developments in stable isotope investigations of fugitive gases. International Atomic Energy Agency Technical Consultants Meeting. Vienna, Austria. March 2016.

- Sherwood Lollar, B., *Sutcliffe, C., Glein, C., McDermott, J., Ballentine, C.J., Warr, O., Onstott, T.C., Moser, D. and Fisher, J.* **Invited.** Understanding the global distribution of ancient groundwater: Implications for subsurface life on Earth and Mars. Departmental Seminar. Dept of Chemical Engineering and Applied Chemistry. University of Toronto. March 2016.
- Sherwood Lollar, B., *Sutcliffe, C., Glein, C., McDermott, J., Ballentine, C.J., Warr, O., Onstott, T.C., Moser, D. and Fisher, J.* **Invited.** Exploration of the deep hydrosphere and subsurface life. Departmental Seminar. Dept of Chemistry. University of Toronto. January 2016.
- Sherwood Lollar, B. Quantifying the depth and volume of the Earth's deep hydrosphere. **Invited.** Royal Society (United Kingdom) Discussion Meeting "The origin, history and role of water in the evolution of the inner solar system" Royal Society Kavli Hall, Buckinghamshire, UK. Feb. 2016.
- Sherwood Lollar, B. Deep subsurface habitability of the Precambrian continents. **Invited Seminar.** Imperial College London, UK. Jan. 2016.
- Sherwood Lollar, B. Exploration of the deep hydrosphere and subsurface life in Precambrian continents. **Invited Seminar.** Oxford University, UK. Nov. 2015.
- Onstott, T.C. Lau, C.Y.M., Magnabosco, C., Slater, G.F., Sherwood Lollar, B., Kieft, T.L., Stepanauskas, R., van Heerden, E., Borgonie G. The deep continental biosphere: Abundance, diversity and activity. **Invited.** Geological Society of America Annual Meeting. Baltimore MD. Nov. 2015.
- Kieft, T.L., Onstott, T.C. Lau, C.Y.M., Magnabosco, C., Slater, G.F., Sherwood Lollar, B., Stepanauskas, R., van Heerden, E. Microbial carbon cycling in the deep biosphere of the Kaapval Craton, South Africa. **Invited.** Geological Society of America Annual Meeting. Baltimore MD. Nov. 2015.
- Sherwood Lollar, B. Recent advances in clumped isotopes for elucidating the origin of methane. **Invited.** INTRA Workshop on Position Specific Isotope Techniques. Aix-en-Provence, France. Oct. 2015
- Sherwood Lollar, B. Exploration of the Earth's Deep Hydrosphere and Biosphere. **Invited.** Departmental Lecture Series. SUNY Buffalo, NY. Sept. 2015.
- Sherwood Lollar, B., *Sutcliffe, C.N., McDermott, J.M., Glein, C.R., Warr, O., Onstott, T.C., Ballentine, C.J.* Contributions to abiotic and biological deep carbon cycling from H₂ sources in the Precambrian continental lithosphere. **Keynote.** Goldschmidt 2015. Prague, CZ. Aug. 16-21, 2015.
- Sherwood Lollar, B. *Sutcliffe, C., McDermott, J. Glein, C., Ballentine, C.J., Warr, O., Onstott, T.C., Lau, C.Y.M., Magnabosco, C., and Moser, D.P.* The Other Deep Biosphere: Deep fracture fluids of the Precambrian. Helmholtz Institute Potsdam Germany. June 23 2015
- Sherwood Lollar, B. *Sutcliffe, C., McDermott, J. Glein, C., Ballentine, C.J., Warr, O., Onstott, T.C., Lau, C.Y.M., Magnabosco, C., and Moser, D.P.* The Other Deep Biosphere: Deep fracture fluids of the Precambrian. MARUM Seminar Hinrichs Lab Bremen Germany. June 2 2015
- Sherwood Lollar, B. *Passeport, E., Horst, A. and Lacrampe-Couloume, G.* New developments in CSIA for halogenated organic hydrocarbons: from groundwater to surface water to atmosphere. Helmholtz Institute UFZ Leipzig, Germany. May 2015.
- Sherwood Lollar, B., *Sutcliffe, C., Ballentine, C.J., Onstott, T.C., Lau, C.Y.M., Magnabosco, C., Slater, G.F., and Moser, D.P.* Search for life in deep time and space: The role of Precambrian rocks in analogue research. **Invited.** American Geophysical Union Fall Meeting. San Francisco, CA. Dec. 14-19, 2014.
- Sherwood Lollar, B., *Sutcliffe, C., Ballentine, C.J. Warr, O., Li, L., Ono, S., and Wang, D.T.* Deep carbon cycling in the deep hydrosphere: Abiotic organic synthesis and biogeochemical cycling. **Invited.** American Geophysical Union Fall Meeting. San Francisco, CA.

Dec. 14-19, 2014.

Morrill, P.L., Rietze, A., Kohl, L., Miles, S., Cox, A., Cumming, E., Brazelton, W.J., Suzuki, S., Sherwood Lollar, B., Schrenk, M.O., Neelson, K.H., Ziegler, S., Lang, S.Q. Microbial substrate utilization at sites of continental serpentinization: The Tablelands, NL, CAN and the Cedars, CA, USA. **Invited.** American *Geophysical* Union Fall Meeting. San Francisco, CA. Dec. 14-19, 2014.

Sherwood Lollar, B. Twenty Year Legacy of CSIA in the Environment. **Invited.** European Union Marie-Curie Integrated Training Network CSI Environment Final Meeting. Obernai, France. Oct. 2014

Ballentine, C.J., Sherwood Lollar, B., *Lacrampe-Couloume, G., Sutcliffe, C.,* Holland, G., Zhou, Z., *Li, L.,* Fellowes, J., Warr, O. Determining the role of water in hydrocarbon-rich crustal systems. **Invited.** Pardee Keynote Symposia (GSA). Vancouver, B.C. October, 19-22, 2014.

Sherwood Lollar, B. Carbon-bearing Fluids in Precambrian Rocks: Deep Energy for Deep Life. **Invited.** Deep Carbon Short Course. Vancouver, B.C. October, 19-22, 2014.

Mancini, S.A., *Passeport, E.* and Sherwood Lollar, B. The Use of CSIA to investigate sources and degradation of chlorobenzenes. Consortium on Groundwater Remediation. **Invited.** Denver, CO. Oct. 2014

Onstott, T.C., Lau, M.C.Y., Magnabosco, C., Lindsay, M., Alleva, R., Tetteh, G., Kieft, T.L., Pullin, M.J., Hendrickson, S., Cameron, C., Schilkey, F.D., Grim, S., Morrison, H., Sogin, M., Kuloyo, O., Linage-Alvarez, B., Cason, E., Erasmus, M., van Heerden, E., Borgonie, Slater, G.F., *Simkus, D., Lacrampe-Couloume, G.,* Sherwood Lollar, B., Labonté, J. and Stepanauskas, R. Does Your Deep Biosphere differ from My Deep Biosphere? What Comparative Genomics Tells Us. **Invited.** 10th International Congress on Extremophiles. Saint Petersburg, Russia. Sept. 7-11, 2014.

Sherwood Lollar, B., Holland, G., *Li, L., Lacrampe-Couloume, G.,* Slater, G.F., Onstott, T.C. and Ballentine, C.J. Tracers in the Deep: Ancient waters and subsurface microbiology of the Precambrian Shields. **Invited.** Helmholtz Institute, Leipzig, Germany. Sept. 2014.

Ono, S., Wang, D., Gruen, D., Sherwood Lollar, B., McManus, B., Zahniser, M., Nelson, D. Measurements of clumped methane isotopologue (¹³CH₃D) by tunable mid-infrared laser direct absorption spectroscopy. **Invited.** The 7th International Symposium on Isotopomers. Tokyo, Japan. July 1-4, 2014.

Ono, S., Wang, D., *Gruen, D.,* Sherwood Lollar, B., McManus, B., Zahniser, M. and Nelson, D. Measurements of clumped methane isotopologue (¹³CH₃D) by tunable mid-infrared laser spectroscopy. **Keynote.** 24th Annual V.M. Goldschmidt Conference. Sacramento, CA. June 8-13, 2014.

Sherwood Lollar, B., Holland, G., *Li, L., Lacrampe-Couloume, G.,* Slater, G.F., Onstott, T. C., and Ballentine, C.J. Ancient waters of the Precambrian Shields: Implications for subsurface life and astrobiology. **Invited.** NSERC CREATE Canadian Astrobiology Training Program (CATP) Annual Meeting, Montreal, QC. June 2-4, 2014.

Sherwood Lollar, B. Exploring the Biotic/Abiotic Fringe: Integration of Deep Life and Deep Energy. **Keynote.** Deep Energy- Deep Life Joint Workshop Deep Carbon Observatory and Sloan Foundation, Lyon, France April 8, 2014

Sherwood Lollar, B. Insights into enzymatic transformation of organic contaminants using CSIA. **Invited.** Gordon Research Conferences on Isotopes in Chemical and Biological Sciences, Galveston, TX. Feb. 2-7, 2014.

Sherwood Lollar, B., Holland, G., *Li, L., Lacrampe-Couloume, G.,* Slater, G.F., Onstott, T. C., and Ballentine, C.J. **Invited.** Deep mining exploration reveals ancient waters of the Precambrian Shield. The Toronto Geological Discussion Group (TGDG), Toronto, ON. Jan 21, 2014.

Sherwood Lollar, B., Ballentine, C.J., Holland, G., *Li, L.,* Slater, G.F. and Moser, D.P. The deep cool Terrestrial Biosphere: Habitability of ancient fracture waters of the Canadian Shield. **Invited.** American Geophysical Union Annual Fall Meeting, San Francisco, CA. Dec. 9-13, 2013.

- Sherwood Lollar, B. Continental lithosphere doubles global hydrogen flux estimates for the deep biosphere. Massachusetts Institute of Technology **Invited** Seminar. Nov. 2013
- Sherwood Lollar, B. Ancient water of the Precambrian Shield: Implications for subsurface life and Astrobiology. **Invited.** NASA Astrobiology Institute Directors Seminar Series, Mountain View, CA. Nov. 25, 2013.
- Sherwood Lollar, B. New view of reduced gas flux from the Precambrian Continental Lithosphere. Centre for Global Change Science Distinguished Lecturer Series. **Invited.** University of Toronto, Toronto, Canada. Oct. 1, 2013.
- Sherwood Lollar, B. Ancient water of the Precambrian Shield: Implications for subsurface life and Astrobiology. **Invited.** Origins Institute Lecture Series, McMaster University, Hamilton, Canada. Sept. 30, 2013.
- Sherwood Lollar, B., *Brisco, T., Esen, B. and Lacrampe-Couloume, G.* Billion year old cratons provide clues for habitability of subsurface waters and reduced gases on Mars. **Keynote.** NASA Workshop on Analog Sites for Mars Missions II. Washington DC. Aug. 2013
- Sherwood Lollar, B., Onstott, T.C., van Heerden, E., Kieft, T. and Ballentine, C.J. Serpentinization in space and time; Hydrogen flux and energy budget from the terrestrial deep subsurface. Deep Carbon Observatory International Science Meeting– Sloan Foundation Symposium. National Academy of Sciences, Washington D.C., March 3-5, 2013
- Sherwood Lollar, B., Onstott, T.C., van Heerden, E., Kieft, T. and Ballentine, C.J. Serpentinization in space and time; A hydrogen energy budget for methane production. DCO Deep Energy Workshop– Sloan Foundation. University of Manchester, United Kingdom. Jan.31-Feb. 1, 2013
- Sherwood Lollar, B., Onstott, T.C., van Heerden, E., Kieft, T. and Ballentine, C.J. Life in Inner Space – Subsurface Microbiology Investigations in Underground Research Laboratories and Deep Mines **Invited.** American Geophysical Union Annual Fall Meeting, San Francisco, CA. Dec. 3-7, 2012.
- Sherwood Lollar, B. Emerging Trends in CSIA for Environmental Forensics and Bioremediation. University of Toronto, School of the Environment Seminar Series. Toronto Canada Nov. 21, 2012.
- Sherwood Lollar, B. Follow the Water - Exploration of the Deep Terrestrial Biosphere. Joint Seminar for the Dept. of Geosciences and Institute for Environmental and Engineering Sciences. University of Stockholm. Sweden. Oct. 2012
- Sherwood Lollar, B., Onstott, T.C., Kieft, T.L., *Li, L., van Heerden, E., Slater, G.F., Moser, D.P., Lacrampe-Couloume, G., Holland, G. and Ballentine, C.J.* **Invited.** Network of terrestrial subsurface sites in Precambrian Shields: Insights for early Earth and Mars. 22nd Annual V.M. Goldschmidt Conference, Montreal, Quebec, June 24-29, 2012.
- Sherwood Lollar, B. Compound Specific Isotope Analysis of Organic Contaminants in Water. Polytechnic University of Milan. Milan Italy. June 2012.
- Sherwood Lollar, B. Serpentinization in space ... and time. University of Lyon, France Departmental Seminar Series. May 2012.
- Sherwood Lollar, B. Tracers in the Deep. Isotopic insights into subsurface energy for life and microbial metabolism. **Invited.** Seattle, WA. Nov. 2011.
- Sherwood Lollar, B., van Heerden, E., Onstott, T.C., Kieft, T.M., Itavaara, M. (2011) Follow the water – an search strategy for exploration of the Earth’s deep biosphere. **Keynote.** Pardee Symposium, Geological Society of America Annual Meeting. Minneapolis, MN. Oct. 2011.
- Sherwood Lollar, B., van Heerden, E., Onstott, T.C., Kieft, T.M. (2011) Underground research laboratories and deep mines as a window into subsurface microbiology. **Keynote.** 12th International Conference on Topics in Astroparticle and Underground Physics. Munich, Germany. Sept. 5-9, 2011

- Sherwood Lollar, B. Tracers in the Deep. Isotopic insights into subsurface energy for life and microbial metabolism. **Keynote.** International Symposium on Subsurface Microbiology. Garmisch-Partenkirchen, Germany. Sept. 11-16, 2011.
- Sherwood Lollar, B. Emerging trends in contaminants research from CSIA. **Invited.** CSI-Environment Meeting. Prague CZ. Aug. 19-20, 2011
- Sherwood Lollar, B. Biosignatures and Clues to Life: Implications for Origins of Life and Bioastronomy. **Invited** Introductory Talk. Origins 2011 Joint Meeting of the ISSOL (International Astrobiology and Origins of Life Society) and Bioastronomy Society. Montpellier, FR. July 3-8, 2011.
- Sherwood Lollar, B. **Invited Panel Presentation** CSIA: Monitoring and Assessing Biogeochemical Processes. Battelle International Symposium on Bioremediation and Sustainable Environmental Technologies, Reno, NV. June 27-30, 2011.
- Mundle, S.O.C., Johnson, T., Lacrampe-Couloume, G., Duhamel, M., Perez-de-Mora, A., Edwards, E.A., Kluger, R., Sherwood Lollar, B., Tiedeman, C. R., Revesz, K., Imbriotta, T. E., Cox, E. Using ¹³C isotope signatures of ethene as a direct indicator to assess the accumulation of toxic daughter products of trichloroethene. **Invited.** Battelle International Symposium on Bioremediation and Sustainable Environmental Technologies, Reno, NV. June 27-30, 2011.
- Chan, C.H., Tang, S., Eckert, T., Lacrampe-Couloume, G., Edwards, E.A., Sherwood Lollar, B. Compound specific isotope analysis on biotic degradation of chloroform and implication for monitoring anthropogenic-sourced trichlorinated carbon compounds. **Invited.** Battelle International Symposium on Bioremediation and Sustainable Environmental Technologies, Reno, NV. June 27-30, 2011.
- Elsner, M., Lacrampe-Couloume, G., Mancini, S., Burns, L. and Sherwood Lollar, B. The use of compound specific isotope analysis (CSIA) to distinguish between biotic and abiotic degradation of chlorinated hydrocarbons in the field. **Invited.** Battelle International Symposium on Bioremediation and Sustainable Environmental Technologies, Reno, NV. June 27-30, 2011.
- Sherwood Lollar, B. Far Field Microbiological considerations relevant to a deep geological repository: Nuclear Waste Management Organization **Invited.** The 9th Annual NWMO Geoscience Seminar. Hockley Valley, ON. June 6-8, 2011.
- Sherwood Lollar, B. Insights into deep carbon and subsurface microbial life derived from noble gases. **Invited Departmental Seminar.** Institute de Physique du Globe (IPGP), Universite de Paris, Paris France. April 2011.
- Sherwood Lollar, B., Ballentine, C.J., and Shock, E. Deep Horizons: Research themes within the Deep Carbon Observatory and links to astrobiology. **Invited.** Webinar for Canadian Astrobiology Training Program (NSERC Create). March 2011.
- Sherwood Lollar, B., Ballentine, C.J., and Shock, E. Deep Horizons - Implications of the deep carbon cycle for life, energy and the environment. **Invited.** American Geophysical Union Annual Fall Meeting, San Francisco, CA. Dec. 13-17, 2010.
- Sherwood Lollar, B. and Ballentine, C.J. Moving beyond tracers: ¹³C insights into carbon sequestration. **Keynote.** Geological Society of America Annual Meeting Denver, CO. Oct. 31-Nov. 3, 2010.
- Sherwood Lollar, B. Noble gas-derived insights into carbon cycling into the deep biosphere. **Invited.** Washington University at St. Louis, Departmental Seminar St. Louis, Oct. 2010.
- Sherwood Lollar, B. Beyond the Deep Hot Biosphere: Subsurface Microbiology of the Deep Continents. **Invited.** Gordon Research Conference in Organic Geochemistry. Holderness NH. Aug. 1-6, 2010
- Sherwood Lollar, B. and Ballentine, C.J. Moving beyond tracers: ¹³C insights into carbon sequestration. **Keynote-1** 20th Annual V. M. Goldschmidt Conference, Knoxville TN June 21-25, 2010.
- Ballentine, C.J. and Sherwood Lollar, B. Noble gas isotope insights into the geological storage of carbon. **Keynote-2** 20th Annual V. M. Goldschmidt Conference, Knoxville TN June 21-25, 2010.

- Sherwood Lollar, B., McKelvie, J., *Elsner, M., Mancini, S., Johnson, T.*, Simpson, M., Simpson, A., Edwards, E., Gossett, J., Jennings, L., Spain, J. and Cox, E. **Invited.** New developments in forensic evaluation of contaminant sources and microbial degradation pathways using CSIA. Seventh International Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds. Monterey, CA. May 2010.
- Sherwood Lollar, B. Noble gas-derived insights into carbon cycling into the deep biosphere. **Invited.** Penn State Departmental Colloquium. April 2010. State College, PA.
- Sherwood Lollar, B., Morrill, P.L., Cody, G.D., Fogel, M.L., Lacrampe-Couloume, G., McCollom, T.M., Seewald, J.S., Weinberger, D. **Invited.** Bridging the gap between experimental and field investigations of abiotic hydrocarbon synthesis. ABSCICON 2010. Astrobiology Science Conference. League City Tx. April 26-29, 2010.
- McCollom, T.M., Sherwood Lollar, B., *Lacrampe-Couloume, G.*, and Seewald, J.S. **Invited.** The role of carbon source in abiotic hydrocarbon synthesis and isotope fractionation under hydrothermal conditions. ABSCICON 2010. Astrobiology Science Conference. League City Tx. April 26-29, 2010.
- Sherwood Lollar, B. **Invited.** Astrobiology: The Search for Signs of Life in Outer and Inner Space. Presentation to Canadian Institute for Advanced Research (CIFAR) Board. Petroleum Club. Calgary AB. Oct 2009.
- Sherwood Lollar, B. **Invited.** Astrobiology - the Study of Life in the Universe. Presentation to Canadian Institute for Advanced Research (CIFAR) Board. Toronto ON. June 2009.
- Ballentine, C.J., Gilfillan, S.M.V., Sherwood Lollar, B., Holland, G., Blagburn, D., Stevens, S., Schoell, M., Cassidy, M., Ding, Z., Zhou Z. and *Lacrampe-Couloume G.* **Invited.** Carbon dioxide gas fields: A science gold mine. The 10th International Conference on Gas Geochemistry (ICGG). Cluj-Napoca, Romania. Sept. 14-21, 2009.
- Sherwood Lollar, B., *Tille, S., Moran, J., Voglesonger, K., Lacrampe-Couloume, G.*, Onstott, T.C. and Slater, G.F. (2009) The deep cool terrestrial biosphere: Fracture waters and dissolved gases at > 2.5 km in the Canadian Shield. **Invited.** 19th Annual V. M. Goldschmidt Conference, Davos, Switzerland. June 21-26, 2009.
- Gilfillan, S.M.V., Sherwood Lollar, B., Holland, G., Blagburn, D., Stevens, S., Schoell, M., Cassidy, M., Ding, Z. *Lacrampe-Couloume, G.*, Zhou, Z. and Ballentine, C.J. CO₂ dissolution in formation water dominant sink in natural gas fields. **Invited.** 19th Annual V. M. Goldschmidt Conference, Davos, Switzerland. June 21-26, 2009.
- Sherwood Lollar, B., Tille, S., Moran, J., Voglesonger, K., Lacrampe-Couloume, G., Onstott, T.C., Pratt, L.M. and Slater, G.F. (2009). **Invited.** Hydrogeologic Controls on the Deep Terrestrial Biosphere - Chemolithotrophic Energy for Subsurface Life on Earth and Mars. American Geophysical Union Spring Meeting. May 24-27, 2009. Toronto, ON Canada.
- Sherwood Lollar, B. Earth subsurface analogues and relevance for Martian methane. **Invited Lecture** to CIFAR Astrobiology Workshop. Toronto ON. April 2009.
- Sherwood Lollar, B., Edwards, E., Hirschorn, S., Mancini, S., and Devine, C. Compound Specific Stable Isotope Fractionation to Distinguish Metabolic Pathways in Microbial Systems. **Invited Lecture.** REMTEC 09. Atlanta GA. March 3-5, 2009.
- Edwards, E. and Sherwood Lollar, B. Compound Specific Isotope Analysis as a natural reaction probe for delineation of microbial degradation pathways. **Invited.** REMTEC 09. Atlanta GA. March 3-5, 2009.
- Sherwood Lollar, B. Tracers in the deep: Isotopic and geochemical evidence for H₂ autotrophy and methanogenesis in the deep subsurface. **Invited Lecture.** Arizona State University. Tempe AZ March 2009.
- Sherwood Lollar, B. Tracing contaminant source and fate in groundwater using compound specific isotope analysis. University of Florida Hubbell **Distinguished Lecture.** Feb. 2009. Gainesville, FL.

- Sherwood Lollar, B. Stable isotopes to determine the origin of hydrocarbon gases. **Invited Lecture** to NWMO (Nuclear Waste Management Organization) Toronto ON. Jan. 2009
- Sherwood Lollar, B., McCollom, T., Seewald, J.S. and *Lacrampe-Couloume, G.* Abiotic Organic Hydrocarbon Chemistry of the Terrestrial Deep Subsurface: Isotopic Constraints on Reaction Mechanisms. **Invited.** American Geophysical Union Fall Meeting. San Francisco, CA. Dec. 15-19, 2008.
- McKelvie, J., Mackay, D., Scow, K., Kaiser, P. and Sherwood Lollar, B.* 2008. Quantification of *in situ* biodegradation rates of groundwater contaminants using laboratory-derived isotopic enrichment factors. **Invited.** Geological Society of America Annual Meeting. Houston TX. Oct. 5-9, 2008.
- Ballentine, C.J., Gilfillan, S., Holland, G., Zhou, Z., Sherwood Lollar, B. And Cassidy, M. 2008. The geological storage of CO₂: Quantification of natural gas/groundwater interaction. **Keynote.** 18th Annual V. M. Goldschmidt Conference, Vancouver BC July 13-18, 2008.
- Sherwood Lollar, B. Deep abiotic synthesis of organic molecules, and the abiotic-biotic controversy. **Keynote.** Deep Carbon Cycle Sloan Foundation Workshop. Carnegie Institute of Washington. May 15-17, 2008.
- Sherwood Lollar, B. Using stable carbon and hydrogen isotope analysis to characterize microbial degradation of organic contaminants in groundwater. Electron Transfer Processes at Biogeochemical Gradients Workshop. **Invited Keynote.** UFZ Leipzig, Germany. March 4-7, 2008.
- Sherwood Lollar, B. Compound Specific Isotope Geochemistry for Assessment and Quantification of Remedial Performance. **Invited.** Partners in Environmental Technology Technical Symposium and Workshop. SERDP-ESTCP. Washington DC. Dec. 4-7, 2007.
- Sherwood Lollar, B. *Mancini, S., Morrill, P., Elsner, M.E., VanStone, N., Chartrand, M.M.G., Hirschorn, S., McKelvie, J., Lacrampe-Couloume, G., Edwards, E.* The role of vital effects on stable carbon isotope fractionation during transformation of hydrocarbon contaminants in groundwater: Implications for identification of reaction pathways and quantification. **Keynote** International Workshop on Stable Isotope Tools for the Assessment of Chemical and Microbial Transformation Reactions in Complex Natural and Contaminated Environments. Swiss Federal Institute of Technology (ETH) Zurich Mt. Verita CH Nov. 18-23, 2007.
- Sherwood Lollar, B., *Chartrand, M.M.G., Hirschorn, S., Howlett, M., Bidleman, T., Jantunen, L., Mancini, S., McKelvie, J., Lacrampe-Couloume, G.* and Edwards, E.A. Compound Specific Stable Isotope Analysis: Research Frontiers in Isotope Hydrology and Water Resources Management. **Invited Keynote.** International Symposium on Advances in Isotope Hydrology and its Role in Sustainable Water Resources Management. Vienna Austria. May 21-25, 2007.
- Sherwood Lollar, B. Tracers in the Deep: Hydrogeologic controls on release of H₂ energy for deep subsurface life. **Invited.** Stanford University Oceans Seminar Series. Palo Alto, CA. April 2007.
- Elsner, M., Cwiertny, D.M., *Chartrand, M.M.G., Lacrampe-Couloume, G., Roberts, A.L. and Sherwood Lollar, B.* Probing oxide surface reactivity with organic contaminants: From kinetic and product studies to stable isotope fractionation. **Invited.** American Chemical Society Annual Spring Meeting. Chicago, IL. March 25-29, 2007. Awarded **American Chemical Society Division of Environmental Chemistry Certificate of Merit**
- Sherwood Lollar, B. Life's Chemical Kitchen: Support of deep terrestrial subsurface life by abiogenic hydrogen and hydrocarbons. **Invited.** United States Geological Survey Western Region Colloquim Seminar Series. Menlo Park, CA. March 19, 2007.
- Sherwood Lollar, B. Hydrogen-rich fluids in the deep earth: Potential for chemoautotrophy. **Royal Society of Canada - Science Council of Japan WISET Invited Lecture.** Tokyo Institute of Technology, Tokyo, Japan. Jan. 2007.
- Sherwood Lollar, B. Stable Isotope Geochemistry and Groundwater Remediation. **Royal Society of Canada - Science Council of Japan WISET Invited Lecture.** Ochanomizu University, Tokyo, Japan. Jan. 2007.

- Sherwood Lollar, B. Hydrogen-rich fluids in the deep earth: Potential for chemoautotrophy. **Royal Society of Canada - Science Council of Japan WISET Invited Lecture.** Japan Agency for Marine-Earth Science & Technology (JAMSTEC) Yokohama, Japan. Jan. 2007.
- Sherwood Lollar, B. Challenges for Women in Science and Engineering in Canada. **Royal Society of Canada - Science Council of Japan WISET Invited Lecture.** National Womens' Education Centre (NWECC) Saitama, Japan. Jan. 2007.
- Sherwood Lollar, B., Lacrampe-Couloume, G., Slater, G.F., Telling, J. and Voglesonger, K. H₂-rich fluids in the deep Earth: Potential for chemoautotrophic microbial ecosystems. Origins Institute **Invited Seminar.** McMaster University, Hamilton, ON. October 2006.
- Sherwood Lollar, B. Lacrampe-Couloume, G., Telling, J., Slater, G.F. and McCollom, T.M. Compound specific isotope analysis and the challenge for identifying life: the role of biosignatures and abiosignatures. **Invited.** 16th Annual V. M. Goldschmidt Conference, Melbourne Australia. Aug. 2006.
- Onstott, T.C., Pratt, L.M., Clifford, S.M., Sherwood Lollar, B. and Phelps, T.J. Martian subsurface biomes: How important is radiolysis? **Invited.** 16th Annual V. M. Goldschmidt Conference, Melbourne Australia. Aug. 2006.
- Sherwood Lollar, B. H₂-rich fluids in the deep earth - Role of abiogenic water-rock interactions and potential for chemolithoautotrophy. **Invited.** Gordon Research Conference on Organic Geochemistry Holderness School, NH. Aug. 2006.
- Sherwood Lollar, B. Isotopic constraints on habitability and activity of the deep biosphere - tales from 2-3.5 km in the deep Precambrian Shield groundwaters. **Invited.** University of Southern California International Geobiology Symposium on the Deep Biosphere. June 2006. Santa Catalina CA.
- Sherwood Lollar, B. Telling, J., Lacrampe-Couloume, G., Slater, G.F., Onstott, T.C. and Pratt, L.M. Distinguishing abiogenic versus biogenic sources of methane and implications for Mars exploration. **Invited Keynote.** American Geophysical Union Spring Meeting. Baltimore MD May 2006.
- Sherwood Lollar, B. Using stable carbon isotope analysis to identify source and degradation of chlorinated solvents in groundwater. **Invited talk.** Buckley Lecture in Environmental Geology. University of Illinois. Urbana, IL. April 2006
- Sherwood Lollar, B. Tracing contaminant source and fate in groundwater using stable carbon isotope analysis. **Invited talk.** Division of Earth and Ocean Sciences. Duke University. Durham NC. April 2006
- Sherwood Lollar, B. Tracers in the Deep: Isotopic and geochemical evidence for H₂ autotrophy and methanogenesis in the deep subsurface. **Invited talk.** University of Toronto at Mississauga. Feb. 2006
- Sherwood Lollar, B. Tracers in the Deep: Isotopic and geochemical evidence for H₂ autotrophy and methanogenesis in the deep subsurface. **Invited talk.** Centre for Applied Geosciences. University of Tuebingen. Tuebingen, Germany. Jan. 2006
- Sherwood Lollar, B. Contaminant source and fate in groundwater using stable carbon isotopes. **Invited talk.** Centre for Applied Geosciences. University of Tuebingen. Tuebingen, Germany. Jan. 2006
- Sherwood Lollar, B. Threats to Canadian Groundwater: Microbial Clean-up and the Challenge of Invisible Technology. **Special Invited Lecture on Technology.** Queen's University. Kingston, Ontario. Nov. 2005.
- Sherwood Lollar, B. Carbon and hydrogen isotope measurements in abiogenic hydrocarbon synthesis. **Invited talk.** Carnegie Institute of Washington, Washington DC. June 2005.
- Sherwood Lollar, B., Telling, J., Lacrampe-Couloume, G., Slater, G.F., Onstott, T.C. and Pratt, L.M. Resolving abiogenic versus biogenic sources of methane and implications for Mars exploration. **Invited Talk.** Methane on Mars NASA Astrobiology Institute Distributed Workshop. NASA Goddard Space Flight Centre, Greenbelt MD. May 18, 2005.

- Sherwood Lollar, B. Use of stable isotopes to evaluate contaminant degradation. **Invited.** 2005 CNYAPG Symposium on Isotopic Geochemistry. Skeneatales NY. April 2005.
- McKelvie, J., Sherwood Lollar, B., Lacrampe-Couloume, G., (University of Toronto), Mackay, D., de Sieyes N.R. and M.D. Einarson Assessing the impact of ethanol on MTBE and BTEX biodegradation using compound specific isotope analysis. **Invited Student Poster.** 2005 CNYAPG Symposium on Isotopic Geochemistry. Skeneatales NY. April 2005.
- Mancini, S., Ulrich, A. Sherwood Lollar, B., Lacrampe-Couloume, G., and E. Edwards. Elucidating Pathways of Benzene Biodegradation In Subsurface Environments Using Carbon and Hydrogen Isotope Analysis. **Invited Student Poster.** 2005 CNYAPG Symposium on Isotopic Geochemistry. Skeneatales NY. April 2005.
- Sherwood Lollar, B., Telling, J.P., Lacrampe-Couloume, G., Fu, Q., Seyfried, Jr., W., Horita, J. and T.M. McCollom. Carbon and hydrogen isotope measurements in abiogenic hydrocarbon synthesis. **Invited.** 15th Annual V. M. Goldschmidt Conference, Moscow, ID. May 2005.
- Sherwood Lollar, B. Threats to Canadian Groundwater: Canadian Solutions for Hydrocarbon Pollution. **Invited.** Bacon & Eggheads lecture series to Members of Parliament. Ottawa ON. May 2005.
- Sherwood Lollar, B. Slater, G.F., Moser, D.P., Gihring, T.M., Telling, J., Lacrampe-Couloume, G., Lin, L.-H., and T.C. Onstott. Abiogenic gases, H₂-based autotrophy and methanogens in the deep subsurface. **Keynote** for session on "Biogeochemistry at the Limits of Habitability", American Chemical Society Annual Meeting, San Diego CA. March 2005.
- Sherwood Lollar, B. Unravelling abiogenic and biogenic sources of methane - Implications for the Earth's deep biosphere and astrobiology. **Invited** Departmental Lecture. School of Geology and Geography. McMaster University. Hamilton ON. Feb. 2005
- Sherwood Lollar, B. Novel geochemical and isotopic techniques for delineating abiotic versus biotic sources of hydrocarbons in the subsurface. **Invited.** Canadian Mining Industry Research Organization (CAMIRO) - Exploration Division, Soil Gas Hydrocarbons Meeting. Toronto, ON. Dec. 2004
- Sherwood Lollar, B. Use of Compound Specific Stable Isotope Techniques for Quantification of Biodegradation Rates. **Keynote.** UNESCO Workshop on Transport and Fate of Diffuse Organic Contaminants in Catchments. GSF-Research Centre for Environment and Health, Munich Germany. Dec. 2004
- Sherwood Lollar, B. Stable Isotope Forensics: Promise and Pitfalls. **Invited.** Golder Associates Inc. Symposium on Innovative Strategies for Management of Contaminated Sites. Toronto, ON. Nov. 2004.
- Sherwood Lollar, B. Stable Isotope Environmental Geochemistry - Recent Advances. **Invited.** Fields Institute - Research in Mathematical Sciences Annual Conference for Fellows of the Royal Society Canada. Toronto, Ont. Oct. 2004.
- Sherwood Lollar, B. Geological and Geochemical Controls on the Earth's Deep Biosphere. **Invited.** Canadian Institute for Advanced Research (CIAR) - Earth Systems Evolution Program Annual Meeting. Toronto, Ont. Sept. 2004.
- Sherwood Lollar, B. Stable Isotope Environmental Geochemistry - Recent Advances. **Keynote.** Notre Dame Environmental Education and Research Symposium. Dept. of Civil Engineering and Geological Sciences. University of Notre Dame, Notre Dame IN. Nov. 12, 2003.
- VanStone, N., Prezpiora, A., Vogan, J., Hart, S. Lacrampe-Couloume, G., Mabury, S. and B. Sherwood Lollar. Using stable carbon isotope analysis to assess the performance of an iron PRB for the remediation of TCE. **Invited.** Remediation Technology Development Forum. Niagara Falls, NY. Oct. 2003
- Sherwood Lollar, B. The origin of hydrocarbon gases in Precambrian environments. **Invited.** Dept. of Geological Sciences Departmental lecture series, Harvard University, Cambridge MA. Nov. 25, 2002.

- Sherwood Lollar, B., G.F. Slater, Ward, J., Westgate, T. and G. Lacrampe-Couloume. **Invited.** Canadian Institute of Mining Ore Deposits at Depth 2003 - Challenges and Opportunities. Gases and Fluids in the Precambrian Shield: Implications for Deep Mining. Timmins, ON Sept. 2003
- Sherwood Lollar, B. Deep Crustal gases and Fluids: Interactions with the Deep Biosphere. Hubbert Quorum on Hydrogeology. **Invited.** United States Geological Survey, Menlo Park, CA. Dec. 5, 2002.
- Sherwood Lollar, B. Compound Specific Isotope Analysis: A Novel Method of Assessment and Quantification of In Situ Remediation Potential. **Invited.** American Geophysical Union Fall Meeting. San Francisco CA. Dec. 6-10, 2002.
- Onstott, T.C., Lin, L.-H., Fredrickson, J.K., Moser, D.P., Gihrig, T.M., Brockman, F.J., Phelps, T.J., Pfiffner, S., Peacock, A., White, D.C., Kieft, T., McCuddy, S., Sherwood Lollar, B., Ward, J., Slater, G., Pratt, L.M., Boice, E., Fong, J. The Witwatersand Deep Microbiology project: Observations pertaining to hypothetical microbial ecosystems beneath the surface of Mars. **Invited.** American Geophysical Union Fall Meeting. San Francisco CA. Dec. 6-10, 2002.
- Sherwood Lollar, B., Ward, J., Slater, G., Lacrampe-Couloume, G., Hall, J., Lin, L., Moser, D. and Onstott, T.C. Hydrogen and hydrocarbon gases in crystalline rocks: Implications for the deep biosphere. **Invited.** National Science Foundation Neutrinos and Subterranean Science Symposium, Washington D.C. Sept. 19-21, 2002.
- Sherwood Lollar, B. Deep crustal gases and fluids: Implications for the Deep Biosphere. **Invited.** Canadian Geoscience Council - Standing Committee on the International Continental Scientific Drilling Program - Scientific Drilling of the Sudbury Structure. Sept. 11-12, 2002.
- Sherwood Lollar, B. The origin of hydrocarbon gases in Precambrian environments. **Invited.** National Underground Science Laboratory Geomicrobiology Meeting. Lead, S.D. Nov. 29-30, 2001.
- Sherwood Lollar, B. **Key Note** New developments in isotopic tracers on contaminant degradation. **Key note.** The 3rd Asia-Pacific Symposium on Environmental Geochemistry. Guangzhou, China. Nov. 7-9, 2001.
- Sherwood Lollar, B. Applications of stable isotopes to investigate biodegradation of chlorinated ethenes. **Invited.** Department of Chemical Engineering and Chemistry. University of Toronto. Departmental Lecture Series. Oct. 2001
- Onstott, T.C., Moser, D.P., Pfiffner, S., White, D.C., Peacock, A., Phelps, T., Deflaun, M.F., Hoek, J., Ghiorse, W.C., Colwell, F., Kieft, T., Reysenbach, A.-L., Fredrickson, J.K., Southam, G., Kotelnikova, S., Omar, G., Slater, G.F., Pratt, L.M., Boone, D. and Sherwood Lollar, B. **Invited.** Do superplumes select for hyperthermophiles in the deep subsurface. Earth Systems Processes - Global Meeting. Edinburgh. June 24-28, 2001.
- Sherwood Lollar, B. and Westgate, T. **Invited.** Carbon isotopic evidence for abiogenic synthesis of C1-C4 hydrocarbons in crystalline rock environments. Symposium on "Abiotic formation of organic species in hydrothermal systems: Catalytic and mineral-fluid equilibria" 11th Annual V. M. Goldschmidt Conference. Roanoke, Virginia, May 20-24, 2001.
- Sherwood Lollar, B. **Key Note** New developments in isotopic tracers on contaminant degradation. Symposium on "The Geochemistry of Contaminated Aquifers" 11th Annual V. M. Goldschmidt Conference. Roanoke, Virginia, May 20-24, 2001.
- Sherwood Lollar, B. Stable isotopic tracers for contaminant biodegradation. **Invited lecture** at Meteorological Service of Canada. Downsview, Ontario. Feb. 2001
- Slater, G.F., Sherwood Lollar, B., Sleep, B. and Edwards, E. Variability in carbon isotopic fractionation during biodegradation of chlorinated ethenes. **Invited.** American Geophysical Union Annual Meeting. San Francisco, CA. Dec 15-19, 2000.
- Sherwood Lollar, B. Earth surface processes and environmental science: A geologist's perspective. **Invited.** Geo Canada 2000 Summit Session. Annual Meeting of Geological Association of Canada. Calgary Alberta, May 2000.

TC Onstott, DP Moser, H Dong, J.Fredrickson, FJ Brockman, TJ Phelps, SM Pfiffner, A Peacock, DC White, S Macnaughton, FS Colwell, DL Balkwill, MF DeFlaun, T Kieft, DR Boone, AL Reysenbach, J Hoek, GI Omar, WC Ghiorse, G Southam, *G Slater*, *B Sherwood Lollar*, S Kotelnikova, K Pedersen, L Pratt, J Fong, B Baker, C Wimpee, B MacGregor, S Fishbain, DA Stahl, M Stute, and R Hoover. (1999) The Witwatersrand Deep Microbiology Project: A Window Into the Extreme Environment of Deep Subsurface Microbial Communities. **Invited**. American Geophysical Union Fall Meeting. San Francisco CA. Dec.1999.

Sherwood Lollar, B., *Slater, G.F., Ahad, J.*, Sleep, B. and Edwards, E. (1999) Use of stable carbon isotope to trace bioremediation of organic contaminants. **Invited Plenary**. 14th International Symposium on Environmental Biogeochemistry. Sept. 26-30, 1999. Deerhurst, Ontario, Canada.

Sherwood Lollar, B., *Slater, G.F., Ahad, J.*, Sleep, B. M. Witt, G. Klecka, M. Harkness, J. Spivack (1999) Stable carbon isotope evidence for intrinsic bioremediation of tetrachloroethene (PCE) and trichloroethene (TCE) at Area 6, Dover Air Force Base. University Consortium on Solvents-in-Groundwater Fall Meeting. Hocley Valley Resort, Ontario (Sept. 1999). **Invited**.

Slater, G.F., Sherwood Lollar, B. Sleep, B. Edwards, E. and Lee, R.W. Isotopic fractionation associated with biodegradation of chlorinated hydrocarbons: laboratory and field results. University Consortium on Solvents-in-Groundwater Fall Meeting. Portland, Oregon (Oct. 1998). **Invited**.

Sherwood Lollar, B. Stable carbon isotopes - Tools for detection of the origin and fate of environmental contaminants. Geological Society of America Annual Meeting. Toronto. (Oct. 1998). **Invited**. (Oct. 1998)

Ballentine, C.J. and Sherwood Lollar, B. Origins of non-hydrocarbon gases in the Texas Panhandle and Hugoton gas fields. 8th Annual V.M. Goldschmidt Conference. **Invited**. Toulouse, France (Aug. 1998).

Invited Lectures for 1998 Henry Darcy Distinguished Lecture Series

Stable Carbon Isotopes: Tools for detection of the origin and fate of environmental contaminants

| | |
|--|----------------|
| University of Texas at Austin | Thurs. Jan 22 |
| Texas A&M | Fri. Jan. 23 |
| University of Virginia | Thurs Feb. 5 |
| University of California Santa Cruz | Weds. Feb 18 |
| University of California Davis | Thurs Feb 19 |
| United States Geological Survey Menlo Park | Fri. Feb 20 |
| Colorado School of Mines | Mon. Feb 23 |
| University of Florida | Weds. Mar 4 |
| Florida State University | Thus Mar 5 |
| Princeton University | Mon. Mar 9 |
| University of Toronto | Thurs March 12 |
| University of Tennessee | Thurs. Mar 19 |
| Queens University, Canada | Tues. Mar 24 |
| University of Michigan | Tues Apr. 7 |
| Laval University | Mon May 18 |
| Johns Hopkins University | Fri Oct 2 |
| United States Geological Survey Reston | Mon. Oct. 5 |
| Portland State University | Thurs. Oct. 15 |
| Washington State University | Fri Oct. 16 |
| Michigan State University | Thurs Nov 12 |
| University of Waterloo | Thurs Nov. 19 |
| University of Western Ontario | Weds Nov. 25 |
| NGWA National Meeting, Las Vegas | Tues. Dec 14 |

International Darcy Lectures

University of Brest, France
University of Rennes, France
Queens University - Belfast
University College London
Hebrew University of Jerusalem

Thurs April 23
Friday April 24
Mon. April 27
Tues April 28
Sun June 14

Plus 46 more invited and other lectures in the previous 10 years (not listed).

THESES SUPERVISED (I am primary supervisor for all those listed except where indicated with *, indicating joint supervision)

Totals: 28 undergraduate; 31 Masters (6 co-supervised); 13 PhD (5 co-supervised); 32 PDFs; 7 Research Associates/Technicians

High School Co-op Education Students

Mark Janelle Jan-June 2005
Logan Germain Summer 2015
L. Growski Sept-April 2017-2018

NSERC USRA Undergraduate Summer Students

S. Desrocher (Geology) (1994 and 1995)
C. Norcross (Geology) (1995)
J. Gray (Geology) (2000)
C. Hunter (Geology) (2000)
S. Hirschorn (Geology) (2001)
A. Pierce (Geology) (2002)
M. Chartrand (Chemistry) (2002)
J. Liu (Chemistry) (2008)
C. Chan (2009 and 2010)
S. Yang (2011) NSERC Create Scholarship via Canadian Astrobiology Training Program (CATP)
G. Lollar (Earth Science and Microbiology) (2015)
P. Watt (Earth Science) (2015)
G. Lollar (Earth Science and Microbiology) (2016)

Undergraduate Students

Crystal Beaudoin (2010)
Xia Zhu (2014-2015)
C. Sica (2015)
J. Manna (2016)

4th Year Research Theses:

Isotopic and geochemical constraints on the migration of CH₄ from Beare Rd Landfill Toronto, Ontario

S. Desrocher (1994-1995) Dept. of Geology

Isotopic and compositional effects of bacterial oxidation of volatile n-alkanes

C. Norcross (1994-1995) Dept. of Geology

Hydrogen isotope fractionation during anaerobic biodegradation of toluene

J. Ward (1999-2000) Dept. of Geology

Stable carbon isotopes as an indicator of natural attenuation of EDC

S. Mancini (1999-2000) Dept. of Geology

Analysis of surface and subsurface borehole sampled gases by a refined GC method able to detect low concentrations of hydrocarbons

P. Kral (2003-2004) Dept. of Geology

Development of GC-IRMS techniques for CSIA analysis of pesticides

C. Rose (2007-2008) Dept. of Chemistry

Diffusion Membrane Sampler for CSIA of Dissolved Methane in Porewaters

Adam Virani (2012-2013) Dept. of Earth Sciences

Most Probable Number Analysis of Microbial Metabolisms in Ancient Fracture Waters

Garnet Lollar (2016-2017) Dept. of Earth Sciences

Masters Students:

Bacterial methanogenesis in Canadian Shield groundwaters

F. Doig (1994)

An isotopic study of CH₄ and associated N₂ and H₂ gases in Canadian Shield mining environments

J. Montgomery (1994)

Carbon cycling in the microbial mats and bottom accumulations of selected lakes of the Cariboo Plateau: Isotopic constraints and implications for interpretation of the geologic record

G. Slater (1996) Holder of:

University of Toronto Open Scholarship 1994-95

Ontario Graduate Scholarship 1995-97.

NSERC PGS Scholarship 1997-99.

Bacterial hydrocarbon gases in surficial aquitards and shallow bedrock aquifers in the Western Canadian Sedimentary Basin

S. Taylor (1996) Holder of:

University of Toronto Open Scholarship 1995-96

American Association of Petroleum Geologists Grants in Aid of Field Work (\$2000)

Isotopic applications to contaminant hydrogeology: Using $\delta^{13}\text{C}$ analysis to investigate the origin and fate of dissolved organic contaminants

H. Dempster (1997) Holder of:

NSERC PGS Scholarship 1995-97

Travel Scholarship from American Geophysical Union Spring Meeting, Baltimore 1996.

CH₄ gas and associated groundwaters at Kidd Creek Mine, Timmins, Ont.

T. Westgate (1998) Holder of:

University of Toronto Open Scholarship 1997-98

Monitoring stable carbon isotopes during biodegradation of toluene: Implications for contaminated site assessment

J. Ahad (2000) Holder of:

NSERC PGS Scholarship 1998-2000

Endogenous decay sustaining PCE degradation and associated stable isotope effects

***A. Brown** (2000) Holder of:

OGSST Scholarship 1999-2000

Jointly supervised with Dr. B. Sleep of Dept. of Civil Engineering, University of Toronto

Hydrogen isotopic fractionation: Potential as an indicator of MTBE biodegradation at contaminated field sites

J. Gray (2002)

University of Toronto Open Graduate Scholarship 2000-2001

NSERC PGS Scholarship 2001-2002

Monitoring biodegradation of benzene in groundwater systems using carbon and hydrogen compound specific isotope analysis

S. Mancini (2002)

University of Toronto Open Graduate Scholarship 2000-2002

Identifying subsurface gas origins within the Witwatersrand Basin, South Africa

J. Ward (2000-2002)

Stable carbon isotope fractionation during aerobic and anaerobic biodegradation of ethene

Tiffany Johnson (2007-2008)

University of Toronto Entrance Scholarship 2007

NSERC PGS Scholarship 2008

Application of compound specific stable carbon and hydrogen isotope analysis to monitor biodegradation of monoaromatic compounds

Micheal Howlett (2007-2008)

OGSST Scholarship 2007-2008

Stephanie Tille 2006-2008 (all thesis work completed but student has not written up thesis)

Holder of Connaught International Student Scholarship for 2006-2007

Investigation of the anaerobic biodegradation of trichloroethane by the microbial consortium KB-1 using compound specific carbon isotope analysis

Lisa Douglas (2008-2010)

Carbon isotope fractionation during biodegradation of chloroform

Calvin Chan (2010-2012)

Explorer's Fund Scholarship

Ontario Graduate Scholarship

Massey College Junior Fellow

Development of two novel sampling techniques for compound specific isotope analysis of organic contaminants in the environment

Mathieu Morin (2011-2012)

Isotopic composition of methane in fluid inclusions from the Sudbury basin

Trevor Brisco (2012-2013)

NSERC Postgraduate Scholarship

Gas and fluid geochemistry of groundwater in kimberlite-hosted **deposits**

Berivan Esen (2012-2013)

Canadian Astrobiology Training Program CREATE Scholarship

Hydrogen isotope fingerprinting of South West Ontario hydrocarbons

Patrick Watt (2015-2016)

Multidisciplinary Applied Geochemistry Network NSERC CREATE Undergraduate Scholarship

Isotopic signatures of hydrocarbon containing fluid inclusions

Cheyenne Sica (2015-2016)

Multidisciplinary Applied Geochemistry Network NSERC CREATE Graduate Scholarship

Biodegradation and transport of chlorofluorohydrocarbons in the subsurface

Jesse Manna (2016-2017)

Multidisciplinary Applied Geochemistry Network NSERC CREATE Undergraduate Scholarship

Variable fractionation of CF and DCM in the environment

Elizabeth Phillips (2016-2017)

Multidisciplinary Applied Geochemistry Network NSERC CREATE Graduate Scholarship

Source differentiation of chlorofluorohydrocarbons

Camille Malcolm (2017-2018)

Riverine geochemistry and isotopic signatures in Southwestern Ontario

Joanna West (2017-2018)

Soil gas CO₂ emissions and carbon isotope signatures in Northern Ontario

Hamnah Majeed (2019-2020)

PhD Students:

Constraining the fate of chlorinated ethenes in groundwater systems using stable carbon compound specific isotope analysis

G. Slater (2000)

NSERC PGS Scholarship 1996-98

University of Toronto Open Graduate Scholarship 1998-2000

G. Slater won the **D.N. Chorafas Foundation Prize** for his PhD. He also won an **NSERC Postdoctoral Fellowship** and a prestigious **Woods Hole Oceanographic Institution Fellowship**. He is currently the **Canada Research Chair** in Environmental Isotope Geochemistry at McMaster University.

Investigation of stable carbon compound specific isotope analysis to monitor and quantify the biodegradation of chlorinated ethanes in groundwater systems

P. Morrill (2004)

University of Toronto Open Graduate Scholarship 1999-2001

OGSST Scholarship 2002-2004

Won the prestigious Carnegie Institute (Washington) DC Postdoctoral Fellowship and NSERC Postdoctoral Fellowship. Currently Assistant Prof. Memorial University of Newfoundland

Investigation of reductive dechlorination reactions of chlorinated ethenes and ethanes on zero-valent metals using compound specific isotopic analysis

***N. van Stone** (2005)

University of Toronto Open Graduate Scholarship 1999-2000

CresTECH Industrial Scholarship 2001-2003

Jointly supervised with Dr. S.A. Mabury of Dept. of Chemistry, University of Toronto

Investigating mechanisms of chlorinated ethane biotransformation using compound specific carbon isotope analysis

S. Hirschorn (2007)

University of Toronto Open Graduate Scholarship 2001-2002

NSERC PGS Scholarship 2003-2005

Canadian Society for Petroleum Geology Regional Graduate Award 2004-2005

Ontario Graduate Scholarship 2005-2006

Assessing mechanisms of isotopic fractionation during petroleum hydrocarbon biodegradation- Implications for evaluation of in-situ biodegradation

S. Mancini (2007)

NSERC PGS Scholarship 2002-2004

Mary H. Beatty Award 2003-2004 (Faculty of Arts & Science, University of Toronto)

American Petroleum Institute/National Ground Water Association Scholarship 2003-2004

Canadian Society for Petroleum Geology Regional Graduate Award 2003-2004

Ontario Graduate Scholarship 2005-2006

American Association of Petroleum Geologists Student Research Grant 2005

GSA Graduate Research Grant (Awarded Outstanding mention for the top 19 of 800 applications)

Assessing biodegradation pathways and in-situ biodegradation of gasoline constituents using stable isotopes and metabolic intermediates

J. Gray McKelvie (2006)

NSERC PGS 1 Scholarship 2002-2003

American Petroleum Institute/National Ground Water Association Scholarship 2002-2003

NSERC Canada Graduate Scholarship 2003-2005

2003 Institute for Environmental Studies Labatt Award for Excellence

American Petroleum Institute/National Ground Water Association Scholarship 2006

OGSST J.J. Fawcett Graduate Scholarship 2005-2006

Held 2007-2008 Ontario Post-Doctoral fellowship at UTSC, NSERC Postdoctoral Fellowship 2008-2010 and L'Oreal Postdoctoral Fellowship 2009-2010.

Verification of biodegradation, delineation of biodegradation mechanisms, and differentiation of sources of chlorinated contaminants using compound specific isotope analysis

M. Chartrand (2007)

NSERC PGS Scholarship 2002-2004

American Petroleum Institute/National Ground Water Association Scholarship 2004-2005

Current position Research Associate University of Ottawa

Co-inhibition effects of TCE and TCA biodegradation investigated using CSIA

Lisa Douglas (2015)

OGSST Scholarship 2010-2011

QE II Scholarship 2011-2012

Modelling carbon isotope fractionation associated with diffusive transport of contaminants in aquifers and aquitards

Bruce Xu (2016) (co-supervised with Dr. Brent Sleep Dept. of Civil Eng. U of Toronto)

Noble gas constraints on diffusion controlled transport of hydrocarbons in sedimentary basins

Anran Cheng (2020) (co-supervised with Dr. C.J. Ballentine Chair of Geochemistry (Oxford University UK)

Dual Isotope investigation of biodegradation of chlorohydrocarbons

Elizabeth Philips (started 2017)

NSERC PGS Scholarship 2018-2020

Postdoctoral Fellows:

Dr. J.M. Lansdown – 1992-1995.

Current position - Research Associate, University of Texas, Austin TX

Dr. Grace Aye - 1994.

Current position - Chemist - City of London, Ontario, Canada

***Dr. C. Wong** – 1999-2002

U.S. Environmental Protection Agency Bronze Medal for Commendable Service (2000).

Jointly supervised with Dr. S.A. Mabury of Dept. of Chemistry, University of Toronto

Current position - Dept. of Chemistry, Assist. Professor, University of Alberta

Dr. G.F. Slater - 2001

Radiocarbon dating of hydrocarbon gases from Witswatersrand Basin, South Africa

NSERC Postdoctoral Fellow and Woods Hole Oceanographic Institution Fellow, Woods Hole Oceanographic Institution

Falmouth, MA USA

Current position - Canada Research Chair in Environmental Isotope Geochemistry - McMaster University, Hamilton, ON

Dr. M. Elsner – 2004-2006

Modeling primary and secondary isotope effects during degradation of CT
Swiss National Science Foundation Postdoctoral Fellowship 2004-2006
Present Position Helmholtz Association Professorial Position
GSF National Research Center for Environment and Health, Munich Germany

Dr. J. Telling – 2004-2006

NASA Astrobiology Institute - Biosustainable Energy and Nutrient Cycles
in the Deep Subsurface of Earth and Mars
Current Position: Assistant Professor Newcastle University UK

Dr. K. Voglesanger – 2006-2008

NASA Astrobiology Institute - Biosustainable Energy and Nutrient Cycles
in the Deep Subsurface of Earth and Mars
Current Position: Assistant Professor Northwest Illinois University

Dr. I. Jabeen – 2007-2008

Isotopic analysis of carbon isotopes in methane from fluid inclusions - analytical development

Dr. J. Moran- 2007-2009 (co-supervised with Dr. G.F. Slater McMaster University)

NASA Astrobiology Institute - Biosustainable Energy and Nutrient Cycles
in the Deep Subsurface of Earth and Mars
Current Position: Pacific Northwest National Laboratory

Dr. X. Liang – 2009-2011

Abiotic and biotic fractionation comparison to reveal mechanisms of PCE degradation

Dr. Scott Mundle – 2010-2014

Compound specific isotopes as natural probe for reaction chemistry
Current Position: Assistant Professor, University of Windsor

Dr. Long Li 2009-2012

Nitrogen and sulfur cycling in the deep subsurface biosphere
NSERC CREATE PDF Fellowship through CATP (Canadian Astrobiology Training Program)
CRC Chair Tier II University of Alberta

Dr. Kenna Wilkie – 2012-2013

Sloan Foundation Deep Carbon Observatory Fellow
Fate of volatile fatty acids in deep subsurface microbial cycling

Dr. Elodie Passeport – 2012-2014

Biodegradation of aromatic hydrocarbons
Assistant Professor and **CRC Tier II** Dept. of Civil Engineering, and Dept. of Chemical Engineering
University of Toronto

Dr. Axel Horst (PhD Stockholm) – 2013-2016

Compound specific isotope analysis of CFCs
Current Position: Marie-Curie Postdoctoral Fellow at Helmholtz Institute Leipzig Germany

Dr. Nadine Chelsea Sutcliffe (PhD Oxford) – 2013-2015

Origin and residence time of deep crustal fluids in Precambrian Shield
Current Position: PDF University of Toronto

Dr. Jill McDermott (PhD MIT-WHOI Joint Program) – 2014-2016

NSERC CREATE (MAGNET) Postdoctoral Fellow

Carbon sources and geochemical cycling of volatile organic acids in deep subsurface microbial communities

Current position: Assistant Professor, Lehigh

Dr. Chris Glein (PhD Arizona) – 2014-2015

Experimental program in abiotic organic synthesis

University of Toronto Deane Fellowship

Current Position: Enceladus Mission Scientist SouthWest Research Institute San Antonio Texas

Dr. Lisa Douglas (PhD U of T) – 2015

CSIA pathway differentiation during TCE biodegradation

Dr. Thomas Giunta (PhD IGP Univ. de Paris) – 2016-2018

Conservative and stable isotopes in isolated aquifers

Current Position: Research Faculty Universite de Brest, IFREMER France

Dr. Christopher Charles (PhD Toronto) – 2016-2019

Current Position: Research Scientist TRUIMF Vancouver, B.C.

Dr. Aleksandra Mloszewska (PhD Alberta) – 2016-2018

NSERC CREATE (MAGNET) Postdoctoral Fellow

Dr. Mahsa Shayan (PhD Waterloo) – 2017

Current Position: Consultant AMEC Inc.

Dr. Tetyana Gilevska (PhD Leipzig) – 2016-2019

Compound specific isotope analysis of chlorobenzenes

Current Position: PDF Univ. de Strasbourg, France

Dr. Oliver Warr (PhD Oxford) – 2016-2019

Noble gas investigations of the deep hydrogeosphere

Dr. Ann Sullivan Ojeda (PhD Oklahoma) 2018-2019

Current Position: Assistant Professor Auburn University

Dr. Stephanie Flude started Nov 2018 co-supervised with Dr. Chris Ballentine Oxford University.

Dr. Nivea Magalhaes (PhD University of Maryland) 2019-2020.

Current Position: Laboratory Manager, University of St. Andrew's Scotland

Dr. Weibin Chen (PhD Trent University) started March 2019.

Dr. Joan de Vera (PhD University of Toronto) started Feb 2020.

Dr. Anran Cheng (PhD Oxford) started March 2020 co-supervised with Dr. Chris Ballentine Oxford University.

Dr. Jethro Sanz-Robinson (PhD McGill) starting April 2020.

Dr. Huan Cui (PhD University of Maryland) starting Sept. 2020.

Dr. Alero Gure (PhD University of Wyoming) starting Sept. 2020.

Co-supervised Graduate Students under NSERC CREATE Programs:

Carol Cheyne (co-supervised with Dr. Bridget Bergquist under NSERC Create MAGNET program)

University of Toronto MAsc 2013-2015

Lead isotopes as chronological markers and particulate contaminant tracers in lakes

Danielle Simkus (co-supervised with Dr. Greg Slater under NSERC CREATE-CATP)

McMaster University MSc 2011-2013

Characterization of PLFA in deep groundwaters

Raven Comery (co-supervised with Dr. Lyle Whyte under NSERC CREATE-CATP)

McGill University MSc. 2012 -2014

CH₄ generation and flux from high Arctic springs generation and flux from high Arctic springs

Guillaume Lamarche-Gagnon (co-supervised with Dr. Lyle Whyte under NSERC CREATE-CATP)

McGill University MSc. 2010 -2014

CH₄ generation and flux from high Arctic springs - generation and flux from high Arctic springs

Isabelle Raymond-Bouchard (co-supervised with Dr. Lyle Whyte under NSERC CREATE Canadian Astrobiology Program)

McGill University PhD 2012 to 2016

Molecular microbiology of perennial spring communities

Gregor Lucic (co-supervised with Dr. J. Stix McGill NSERC Create MAGNET program)

McGill University PhD. 2012 to 2015

An isotope study of volcanic CH₄, CO₂ and Helium

(current position Picarro Instruments)

Kalina Malowany (co-supervised with Dr. J. Stix McGill NSERC Create MAGNET program)

McGill University MSc. 2015

(current position Hydrogeochemist at Core6 Environmental Ltd.)

Research Associates:

Dr. G. Lacrampe-Couloume - Sept. 1999 to present Senior Research Associate

Dr. T. Eckert - Jan. 2009-March 2010 (current position Research Associate University of Guelph) Junior RA

K. Chu – Sept. 2011 to 2017 Junior Research Associate

Dr. O. Warr – Research Associate October 2019 to present

Laboratory Technician and Manager

M. Wong - Sept. 2004-Aug. 2005

J. Heidenheim - Sept. 2005-Aug. 2007

C. Heidorn - Jan. 2009-March 2010

Graduate Supervisory Committee member for:

L. Twible – (PhD Civil Engineering) Supervisor: L. Warren **2019 to present**

N. Rahman – (PhD Earth Sciences) Supervisor: B. Bergquist **2018 to present**

N. Spozar – (PhD Earth Sciences) Supervisor: B. Bergquist **2018 to present**

J. De Vera – (PhD Earth Sciences) Supervisor: B. Bergquist **2014-2019**

C. Cheyne – (MSc Earth Sciences) Supervisor: B. Bergquist **2013-2015**

G. Schudel – (MSc Earth Sciences) Supervisor: B. Bergquist **2013-2014**

A. Vandersteen - (PhD - Chemistry) Supervisor: R. Kluger **2009-2015**

P. Chandra (MSc - Geology) Supervisor: B. Bergquist **2009-2010**

P. Chandra (PhD - Geology) Supervisor: B. Bergquist **2011-2018**

C. Rose - (MSc - Geology) Supervisor: B. Bergquist **2008-2010**

J. Longstaffe - (PhD - Chemistry) Supervisor: A. Simpson **2008-2012**

S. Mundle - (PhD - Chemistry) Supervisor: R. Kluger **2007-2010**

S.J. Brown - (PhD - Chemistry) Supervisor: M. Simpson **2006-2010**

C. Washer - (PhD - Chemical Eng. And Applied Chemistry) Supervisor: E. Edwards **2006-2013**
K. Torayk - (PhD - Geology) Supervisor: F.G. Ferris **2006-2010**
T. Eckert - (PhD - Geology) Supervisor: U. Wortmann **2004-2009**
J. Dinglasan - (PhD - Chemistry) Supervisor: S. Mabury and E. Edwards **2002-2006**
Natasa Draculic – (PhD - Geology) Supervisor: M. Douglas **2002-2007**
Natalie Caciagli - (PhD - Geology) Supervisor: J. Brenan **2001-2009**
U. Basuki - (PhD - Geology) Supervisor: E. Spooner **2001-2006**
C. Shunthirasingham - (MSc - Chemistry) Supervisor: M. Simpson **2004-2005**
Yvonne Litwin - (PhD - Geology) Supervisor: F.G. Ferris **2001-2003**
Darlene Lim – (PhD - Geology) Supervisor: M. Douglas **1999-2003**
Jonathan Dupe – (PhD - Geology) Supervisor: J. Rucklidge **1996-2001**
Roger Moss - (PhD - Geology) Supervisor: S. Scott **1996-2000**
Rick Gerber (PhD - Geology) Supervisor: K.W.F. Howard **1995-98**
Richard Taylor (PhD - Geology) Supervisor: K.W.F. Howard **1995-97**
Xia Li (MSc - Geology) Supervisor: G. Anderson **1995-97**
Nurudin Ladah - (MSc - Geography) Supervisor: J. Gerits. **1995-97**

ADMINISTRATIVE ACTIVITIES

COMMITTEES AND ORGANIZATIONS WITHIN THE UNIVERSITY

Faculty of Arts and Science Internal Review University Professor Appointments (2020)
University of Toronto Internal Review Committee for CERC (2017)
Faculty of Arts and Science Internal Review University Professor Appointments (2017-2018)
Advisory Committee for the Dean of the Faculty of Applied Science and Engineering (2016)
Massey College, Corporation Board 2012-2022
Massey College, Science Activities Chair (2016-2022)
Massey College Governance Committee (2015)
Massey College Standing House Committee (2014-2015)
University of Toronto Advisory Committee on Fossil Fuel Divestment (2014-2015)
University of Toronto Internal Review Committee for CFI (2015)
University of Toronto Selection Committee for University Professors (2014, 2015, 2019)
University of Toronto Governing Council 2003-2007
University of Toronto Governing Council Executive Committee 2004-2007
University of Toronto Academic Appeals Committee 2006-2007
University of Toronto Academic Priorities and Planning 2004-2005
University of Toronto Academic Board 2001-2004
Faculty of Arts and Science Senior Promotions Committee 2002-2005
Faculty of Arts and Science Awards Advisory Committee 2011-2013

Natural Sciences and Engineering Panel of the Research Advisory Board, University of Toronto
Office the Vice-President, Research and International Relations (1999 to 2002)

Departmental Committees (1992-2020):

- Undergraduate Curriculum Renewal Committee
- Graduate Affairs Committee
- Graduate Awards and Admissions
- Undergraduate Affairs Committee
- Safety Committee
- Public Relations and Curriculum Advisory to Students Committee
- Promotions Committee
- Academic Appeals
- Space Committee

Workload Policy Committee

Member of Search Committees for:

Chairman - Department of Geology 1995
Tenure Stream Appointment in Environmental Geosciences (Geology) 1995
Tenure Stream Appointment in Mathematics - Dean's representative 1997
Tenure Stream Appointment in Structural Geology (Geology) 1999
Chairman - Department of Geology 2000
Canadian Research Chair Tier II Appointment in Climate Change 2002
Senior Lecturer Position 2002
Chairman - Department of Chemistry 2003
Chairman - Department of Physics 2004
Director - Dunlap Institute, University of Toronto 2009-2010
Chair, Department of Geology 2011
Graduate Three Campus Chair, Department of Geology 2011
Chairman - Department of Geology 2015
Graduate Three Campus Chair, Department of Geology 2015

Chair of Third Year Review for Dr. J. Mungall (Geology 2001) and Dr. J. Bollmann (Geology 2007)

Member of Third Year review Committee Dr. J. Murphy, Dept. of Chemistry (2009)

Member Reading Committee for Tenure for Dr. J. Bollmann (2010)

Member Reading Committee for Promotion to Full Professor for Dr. M. Simpson (2011)

Tenure Committee Member

M.S.V. Douglas Dept. of Geology (1999)
K. Strong, Dept. of Physics (2000)
J. Brenan Dept. of Geology (2002)
G. Srinivasan Dept of Geology (2008)
C.-J. Banks Dept. of Geology (2008)
B.A. Bergquist Dept. of Earth Sciences (2015)
M. LaFlamme UTSC (2018)

Dept. of Geology Coordinator on Planning Committee for 'Discover Science Day' 1993 and 1994
and for Take our Daughters to Work Day 1996-98

Faculty of Art and Science - Women in Science Committee Member 1994-96 and 1998-99.

Royal Canadian Institute - Joint Session with the University of Toronto
Panel Discussion: Women Scientists - Current Issues and Realities

Faculty of Arts and Science Women in Academe Annual Forum - Guest Speaker in 1997, 1999 and 2000.

COMMITTEES AND ORGANIZATIONS OUTSIDE THE UNIVERSITY

(see also **Professional Affiliations and Activities** p. 2-3)

Organizer of Special Theme Sessions:

1. **Geological Society of America Annual Meeting** 1997 (Salt Lake City, Utah)
"New isotopic tools for detection of the origin and fate of environmental contaminants"
Chairs: B. Sherwood Lollar and T.A. Abrajo
2. **Geological Society of America Annual Meeting** 1998 (Toronto, Ontario)
"Origin of non-hydrocarbon gases in sedimentary basin systems"
Chairs: B. Sherwood Lollar and C.J. Ballentine
3. **Geological Society of America Annual Meeting** 1998 (Toronto, Ontario)

Organic Geochemical Division (OGD) of the Geochemical Society (GS) Symposium:
"Research Issues in Petroleum and Environmental Organic Geochemistry"
Chairs: B. Sherwood Lollar and M. Lewan

4. **Goldschmidt 2000** (Oxford, UK)
"Chemistry and Microbiology of Pollution" Special Symposium
Chairs: B. Sherwood Lollar and A. Bath
5. **8th International In Situ and On Site Bioremediation Symposium June 2005** (Baltimore)
"Tools/Techniques for Chlorinated Solvent Sites" Session
Chairs: B. Sherwood Lollar and C.M. Aelion.
6. **9th International In Situ and On Site Bioremediation Symposium June 2007** (Baltimore)
"Microbial Ecology of Reductive Dechlorination and the pH Impact" Session
Chairs: B. Sherwood Lollar and C.M. Aelion
7. **Executive Program Committee Co-Chair - Goldschmidt 2008 Vancouver, BC July 2008**
Chairs: R. Carlson and B. Sherwood Lollar
8. **CIFAR** (Canadian Institute for Advanced Research) Workshop I on Astrobiology, Toronto ON. April 2009
Chairs: G.F. Slater, B. Sherwood Lollar, R. Pudritz, C. Suttle, L. Whyte
9. **International Program Committee Co-Convenor - Goldschmidt 2009** Davos CH June 2009
Theme: Earth's Resources I: Origin and Sustainable Exploitation of Oil/Water/Gas Systems
10. **Program Committee ABSCICON 2010** Galveston TX. April 2010.
11. **CIFAR** (Canadian Institute for Advanced Research) Workshop I on Astrobiology, Toronto ON. Oct. 2010
Chairs: G.F. Slater, B. Sherwood Lollar, R. Pudritz, C. Suttle, L. Whyte
12. **Sloan Foundation Deep Carbon Observatory Workshop**, Carbon Cycling in the Deep Crustal Biosphere
University of Free State, Bloemfontein South Africa, Jan. 2011
Organizers: B. Sherwood Lollar, T.C. Onstott, E. van Heerden and T. Kieft
13. **Battelle International Symposium on Bioremediation and Sustainable Environmental Technologies**, Reno, NV. June 2011.B.
Organizers: B. Sherwood Lollar and T. Buscheck (Chevron) Co-Chairs
Special session on **Compound Specific Isotope Investigations at Contaminated Field Sites.**
14. **Origins 2011 Joint Meeting of the ISSOL** (International Astrobiology and Origins of Life Society) and Bioastronomy Society.
Montpellier, FR. July 2011. Session Chair and Best Poster Judge.
15. **CIFAR** (Canadian Institute for Advanced Research) Workshop III on Astrobiology, Toronto ON. Feb. 2012
Chairs: G.F. Slater, B. Sherwood Lollar, R. Pudritz, C. Suttle, L. Whyte
16. **Gordon Research Conference on Organic Geochemistry** – Harkness, NH USA July 29-Aug.3, 2012
Session Organizer: B. Sherwood Lollar
17. **Goldschmidt 2013** (Florence, Italy) August 2013
Deep Subsurface Fluids, Habitability and Microbial Ecosystems
Chairs: M. Schrenk, B. Sherwood Lollar and C.J. Ballentine
18. **International Scientific Drilling Program Conference** – Potsdam Germany Nov. 11-14, 2013
Session Chairs: The Hidden Biosphere. B. Sherwood Lollar and J. Kallmeyer
19. **Gordon Research Conference on Isotopes of Chemical and Biological Sciences** - Galveston Tx USA Feb. 2013
Session Organizer – Environmental Isotope Frontiers: B. Sherwood Lollar and A. Kohen
20. **Battelle International Symposium on Bioremediation and Environmental Technologies**, Monterey CA. May 2013.
Special session on **Compound Specific Isotope Investigations at Contaminated Field Sites.**
Organizers: B. Sherwood Lollar and T. Kuder Co-Chairs
21. **Gordon Research Conference on Isotopes of Chemical and Biological Sciences** - Galveston Tx USA Jan. 2018
Session Chair – Limits to Life: B. Sherwood Lollar
22. **Goldschmidt 2018** (Boston, Mass) August 2018
Let there be light – Novel global resources in helium and hydrogen
Session Chairs: B. Sherwood Lollar, A. Prinzhofer, C.J. Ballentine
23. **American Geophysical Union** Annual Meeting (San Francisco, CA) Dec. 2019
A Deep Dive into the Habitability of the Blue Planet
Session Chairs: B. Sherwood Lollar, J.F. Mustard, M. Osburn
24. **Geological Society of America** Annual Meeting 2021 (Portland OR)
Exploration of Helium in Sedimentary Basins: The New "Gold" Rush?"
Session Chairs: D. Pintj, O. Warr, B. Sherwood Lollar

MEDIA AND PUBLIC OUTREACH AND LECTURES

PUBLIC LIAISON in 1999-2020 took the form of a number of popular articles/interviews that appeared in the press and highlighted my research in environmental geochemistry, storage and transport of carbon dioxide in the subsurface, and abiogenic hydrocarbon gas formation and deep subsurface microbiology in Precambrian rocks. These included:

- Nov. 2020 CBC Radio interview “Ideas”
- Sept. 2020 Faculty of Art and Sciences Bulletin <https://www.artsci.utoronto.ca/news/earth-sciences-barbara-sherwood-lollar-receives-royal-society-canadas-2020-willet-g-miller>
- June 2020 Rogers TV Ottawa – “Entre Nous” on Canada Council Killam Prize in Natural Sciences
- June 2020 French radio interview with Radio-Canada “Y a des matins” on Canada Council Killam Prize in Natural Sciences
- May 2020 Simons Foundation Quanta Magazine <https://www.quantamagazine.org/inside-deep-undersea-rocks-life-thrives-without-the-sun-20200513/>
- April 2020 Massey Dialogs – Public Lecture and Discussion on “A life’s career in exploration of the deep Earth” with Principal Nathalie Des Rosiers, Massey College, University of Toronto. April 1 2020.
- Feb. 2020 Preparation of public exhibit on deep water with staff of Ingenium at the Ottawa Science Centre.
- Feb. 2020 Third Age Learning Lecture Series – Burlington Arts Centre. “Microbial Life in the Deep Earth – What Captain Nemo got right, and wrong”.
- Jan. 2020 Public Lecture Massey College Monday Club. “Deep water and deep life in the Earth’s subsurface”.
- Aug. 2019 Publication by our lab’s undergraduate researcher is profiled in more than a dozen international news stories including Science (<https://www.sciencemag.org/news/2019/08/strange-microbes-found-earth-s-oldest-water>), NBC news (<https://www.nbcnews.com/mach/science/strange-life-forms-found-deep-mine-point-vast-underground-galapagos-ncna1050906>), The Scientist (<https://www.the-scientist.com/news-opinion/microbial-life-discovered-deep-in-canadian-mine-66333>), and others including selected links as follows.
<https://deepcarbon.net/worlds-oldest-groundwater-supports-life-through-water-rock-chemistry>
<https://interestingengineering.com/life-forms-found-deep-in-worlds-oldest-groundwater>
- May 2019 Interviews with the Globe and Mail, CBC (As it Happens), CBC North, and Radio-Canada regarding the NSERC Herzberg Gold Medal
- April 2019 UofTNews: www.utoronto.ca/news/three-u-t-researchers-named-fellows-uk-s-royal-society
- Mar. 2019 EOS American Geophysical Union Centennial Collection. “Looking Down to Reach the Stars”. A perspective on subsurface science, planetary science and astrobiology
- Feb. 2019 2019 C. Gordon Winder Memorial SCUGOG Public Lecture, University of Western Ontario London, ON.
- Jan. 2019 Radio-Canada Interview related to co-authored Nature publication on microbial methane discharge from base of glacial ice sheets – implications for climate change (*Lamarche-Gagnon, Wadham, Sherwood Lollar et al., 2019*)
- Dec. 2018 American Geophysical Union TownHall – US National Academies “Astrobiology Strategy for the Search for Life in the Universe”
- Dec. 2018 American Geophysical Union Podcast – “Third Pod from the Sun” – Deep subsurface exploration
- Dec. 2018 The Economist – Deep life in ancient waters
- Dec. 2018 University of Toronto Bulletin news story – Is there life beyond Earth?
- Dec. 2018 Edmonton Journal - Easting sulfur and breathing iron - Estimating the deep continental biosphere
- Oct. 2018 Interviews with Los Angeles Times, Scientific American, Globe and Mail, and web-based interviews on Science.com, Quartz, Astrobiology Today, Astronomy Magazine, Discover Magazine, NASA Astrobiology covered my role as Chair of the Astrobiology Science Strategy for the National Academies and NASA.
- 2018 Montreal Science Centre Exhibit on world’s oldest water – worked with curators on this permanent display
- Mar. 2018 Earth Hour Public Lecture Dept. of Astronomy and Astrophysics University of Toronto.
- Nov. 2017 61st Annual Thomas Condon Public Lecture Oregon State University
- 2017 Ontario Science Centre Exhibit on world’s oldest water – worked with curators on the 6 month display
- Dec. 2016 Television interview on Business network, Global TV National News, radio interviews with CBC, BBC, ABC, and print stories in Toronto Star and Canadian Press following our research on ancient water discoveries and implications for Mars exploration
- Nov. 2016 CBC documentary “The Nature of Things” with David Suzuki “Destination Mars” profiled our deep subsurface

- research.
- Oct. 2016 Science@Massey Co-organizer of Science, Public Policy and Society Panel on Fracking Impacts on Groundwater
- Oct. 2016 Research stories in Globe and Mail, Edmonton Journal Calgary Herald, CBC Radio "The Current", Sudbury CBC One radio, Timmins CTV, National Public Radio, BBC World Service covered our Nature Communications publication Li et al. (2016) documenting source of sulfate supporting deep subsurface life
- Sept. 2016 **BBC World Service.** Hour long radio interview for The Forum entitled "Underground"
- Aug. 2016 **Royal Society of Canada Bulletin** "The research of the Stable Isotope Laboratory University of Toronto"
- Aug. 2016 Cited in **New Scientist** cover article "Life, spontaneously" by Penny Sarchet Vol 20. 26-29 Aug. 20 2016
- July 2016 Interviews in Globe & Mail, Toronto Star, Kingston Whig Standard at time of appointment as Companion of Order of Canada.
- June 2016 Public Lecture (in French and English) at **Montreal Science Centre** – "Jules Verne was right – Journey to the Centre of the Earth"
- April 2016 **Nature of Things documentary (CBC TV – Radio-Canada)** featuring Stable Isotope Lab shoot and following Dr. Sherwood Lollar on Underground field trip in Sudbury, Ontario. 3 days filming for Nov. 2016 release
- Feb. 2016 NSERC Documentary, **Globe & Mail**, UofT Bulletin, **The National Evening News** – coverage of research on deep groundwaters resulting in NSERC John C. Polanyi Award to Sherwood Lollar
- Dec. 2015 **CBC Interview Quirks and Quarks, Globe & Mail** coverage of our discovery of first eukaryote in deep subsurface groundwaters up to 12,000 years in age (Borgonie et al., 2015)
- Sept. 2015 Interview with **Macleans Magazine** on our research on deep saline groundwaters and connection to Mars discovery of saline fluids <http://www.macleans.ca/society/science/theres-water-on-mars-but-is-there-life/>
- Dec. 2014 **Nature paper (Sherwood Lollar et al. 2014)** on reduced gas production in ancient crust published same day as Mars Curiosity confirmation of methane in Mars atmosphere. Related interview for BBC Radio 5, BBC International, The Toronto Star, Globe and Mail, Scientific American, Huffington Post, Science Daily, German National Radio and others news outlets worldwide. On day of publication our interview was most downloaded on BBC news site.
- Dec. 2014 **Profile published in Nature.** "Earth's deep crust could support widespread life"
- July 2014 **New Scientist** "Ancient water cache may be pristine primordial soup" profile of PDF C. Sutcliffe's Goldschmidt presentation on deep mines waters. <http://www.newscientist.com/article/mg22329762.600-ancient-water-cache-may-be-pristine-primordial-soup.html?full=true#.U7bNhi-61Cc>
- July 2014 Public lecture "**Chautauqua of the North series**" Thousand Island Park Corporation "The World's Oldest water"
- March 2014 **Global News Television Documentary** "Search for Life" highlights interview and footage from Stable Isotope Lab and Sudbury as well as interviews with NASA Rover team
- Dec. 2013 Billion year old water study published in **Nature** 497: 367-360 selected as one of **Top Ten Science Stories of 2013** by Fox News, Discovery and the Geochemical News.
- Dec. 2013 **Macleans Magazine List of Top Stories to Follow for 2014**
- Dec. 2013 Interviews in the **Independent (UK)** and **New Scientist** on topic of the Deep Carbon Observatory and deep subsurface microbial life
- Nov. 2013 Ancient waters of the Canadian Shield. Public Lecture, **Science North Science Centre.** Sudbury, Ontario.
- Oct. 2013 **Canadian Geographic** October Issue. Profiled in list of **Top Ten Canadians who are changing the world** along with director/deep sea explorer James Cameron; astronaut and Commander of the International Space Station Chris Hadfield, paleoclimatologist and Herzberg Medalist Dr. John Smol, and others.
- Sept. 2013 Toronto Science Festival. Life in the Universe. Panelist: Life in Extreme Environment along with NASA JPL Kevin Hand and oceanographer John Baross, University of Toronto, Toronto, Ontario.
- May-Oct. 2013 Billion year old water study published in **Nature** 497: 367-360. This study generated over 200 international news stories including profiles and interviews in Nature, National Public Radio, Popular Science, CBC Radio, CBC The National, CNN, Fox, Globe and Mail, Quirks and Quarks. The story in the LA Times alone garnered over 200,000 hits and 10,000 written responses.
- April 2013 Panelist on Judging Panel for **Weston Innovation Youth Award in Science** sponsored by Ontario Science Centre
- March 2013 U of T Bulletin "U of T geochemist joins the hunt for deep carbon" features Sherwood Lollar and deep subsurface research. Related stories ran in the Ottawa Citizen, Montreal Gazette and on-line stories on CTV and CBC.
- March 2013 Deep Carbon Observatory Symposium and Launch of "Carbon in the Earth" RiMG volume results in 21 stories on 13 international newswires including Reuters, Associated Press, Canadian Press, Agence France Press and Agencia EFE with DCO researchers interviewed on National Public radio, El Pais, EOS, CBS Smart Planet and stories on 500+ sites in 12 languages.
- Feb. 2013 **Canada Press Interview:** Deep Carbon Observatory

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| June 2012 | Interviews in European media re Eni Protection for the Environment Gold Medal Award ceremony in Rome Italy. |
| Jan. 2012 | Interview in "Source Code: the Methane Race" Earth Magazine p. 40-45 (Jan. 2012 edition) |
| Nov. 2011 | Convocation Address to 2012 Graduating Class School of Graduate Studies, University of Toronto |
| March 2011 | CBC radio Quirks and Quarks: World's Oldest Water - based on our recent publication on billion year old Neon in deep groundwaters. Day after interview the story had the record for most hits on CBC website. |
| March 2011 | Panelist on Judging Panel for Weston Innovation Youth Award in Science sponsored by Ontario Science Centre |
| Feb. 2011 | 44 stories in media on World's Oldest Water (based on our recent publication on billion year old Neon in deep groundwaters) including Speigel on-line, Norwegian broadcasting Corporation, Australian Broadcasting Corporation (radio interview) and story in MICROBE (popular science magazine) |
| Feb. 2011 | Panelist "Science without Borders" Press Breakfast. AAAS Annual Meeting. Washington D.C. Feb. 2011 |
| Dec. 2010 | CTV Evening News – Commentary on discovery of Weird Life – Mono Lake Arsenate bacterium |
| Nov. 2010 | Vancouver Institute . University of British Columbia. "Can Carbon Capture and Storage Solve (or Reduce) Global Climate Change: Lessons from Nature"? Vancouver BC. |
| May 2010 | Highlighted in University of Toronto's publication " Ideas that could Change the World " |
| March 2010 | Panelist on Judging Panel for Weston Innovation Youth Award in Science sponsored by Ontario Science Centre |
| Feb 2010 | Australian Broadcasting Corporation : Interview for Science Radio program on carbon sequestration |
| Nov. 2009 | Massey College University of Toronto Science and Medicine Round Table "Follow the Water". Toronto ON |
| Oct. 2009 | Royal Society of Canada International Year of Astronomy Symposium - The Universe and Our Place in it. Invited Presentation at Canada Museum of Science and Technology, Ottawa. "Astrobiology - Life on Earth and Beyond?" |
| April 2009 | Press related to Nature Cover story included Canada Press, Quirks and Quarks, CBC Radio morning shows in Calgary and Edmonton, and international coverage by the BBC, The Independent, Reuters, El Pais, Chemical Engineering News and News and Views piece in Nature |
| April 2009 | Introduction and Q&A for new IMAX film at Ontario Science Centre |
| March 2009 | Panelist on Judging Panel for Westin Innovation Youth Award in Science sponsored by Ontario Science Centre |
| Feb 2009 | Press related to publication of U.S. Environmental Protection Agency (EPA) White paper on Compound Specific Isotope Analysis Press included stories in U of T Bulletin; HazMat Journal and Chemical News |
| Jan. 2009 | Girls Rock Science - High School Outreach Program at U of Toronto "Astrobiology - Beyond the Men in Black" |
| Nov. 2008 | Public Lecture sponsored by U of T Alumni : "Threats to Canadian Groundwater" |
| May 2008 | Introduction and Q&A for new IMAX film at Ontario Science Centre |
| May 2008 | John Fisher Public School - 4th Grade presentation |
| Jan. 2008 | Girls Rock Science - High School Outreach Program at U of Toronto "Astrobiology - Beyond the Men in Black" |
| Nov. 2007 | Public Lecture at UTSC to Alumni on ancient microbial communities found at 2.8 kmbs in South Africa gold mine |
| Aug. 2007 | PBS - Sloan Foundation documentary film crew accompanies our field team in the deep subsurface Kidd Creek Mine (Timmins ON) |
| January 2007 | Public Lecture to Attached High School of Ochanomizu University of Tokyo, Japan. Royal Society of Canada - Science Council of Japan WISET Invited Lecture. |
| December 2006 | Ripley's "Believe it or not" Editorial cartoon runs throughout North American newspapers highlighting our <i>Science</i> paper by Lin et al., 2006 on ancient microbial communities found at 2.8 kmbs in South Africa gold mine |
| October 2006 | CBC radio Quirks and Quarks - Interview our <i>Science</i> paper by Lin et al., 2006 on ancient microbial communities found at 2.8 kmbs in South Africa gold mine |
| Aug. 2006 | Toronto Star feature on our research on deep subsurface biosphere and origin of methane |
| July 2006 | CBC Radio Interview - NASA searches for life on Mars deep in the Canadian Shield |
| July 2006 | Timmins Daily Press Kidd Creek Mine: NASA search for extraterrestrial life |
| April 2006 | Canadian Space Agency - New research on terrestrial analogue sites for space studies |
| April 2006 | Canadian Chemical News highlights our work "Countering the hydrocarbon threat - sources and remediation of Canada's groundwater contamination" |
| October 2005 | Geotimes - published by the American Geological Institute - interview and photo on our research on abiogenic hydrocarbons |
| April 4, 2005 | Chemical and Engineering News - Details of Sherwood Lollar American Chemical Society Invited Talk in Session of Biogeochemical Limits of Habitability highlighted |
| April 2005 | Coordinated 4 th grade visit to U of T - St. Bridget's Catholic School - Toronto District Separate School Board |
| April 2005 | 4 th grade talk on geology - John Fisher Public School - Toronto District School Board |
| March 2005 | Seminar on science careers - Linden School Toronto |

Feb. 2005 **BBC Radio** - Interview by lead author C.J. Ballentine on our research on neon isotopes and mantle-derived gases and related publication in *Nature*

Jan. 2005 **CBC Radio - Quirks and Quarks** - Interview on our research on neon isotopes and mantle-derived gases and related publication in *Nature* by Ballentine et al., 2005

Nov. 2004 **Geotimes** - published by the American Geological Institute - interview on abiogenic hydrocarbons p. 11 "Taking the fossil out of fuels"

Sept. 2004 **New York Times** interview - Petroleum from decay? Maybe not, study says (Tues. Sept. 14, 2004); additional interview on same topic for **ScienceOnline** (website for the leading scientific publication *Science*)

May 2003 **Scientists in Schools** - Toronto Separate School Board of Education

Nov. 2002 **American Association of Petroleum Geology Explorer** "Gas Origin Theories to be Studied"

July 2002 **Canadian Chemical News** - The Chemical Institute of Canada

Apr. 8, 2002 **U of T Bulletin** "Geochemist identifies origin of mysterious gases"

Apr. 6, 2002 **CBC Radio - Quirks and Quarks** - Interview on my research on abiogenic hydrocarbons and related publication in *Nature*

Apr. 5, 2002 **NATIONAL POST** - Article by J. Bryan "Canadian Shield Mystery Solved - U of T Mine Gas Study"

Apr. 5, 2002 Online german version **Scientific American** (<http://www.wissenschaft-online.de>) "Canadian Shield Mine gas study"

Apr. 5, 2002 **National GeographicWebsite** (<http://news.nationalgeographic.com/>) story by B. Trivedi "Earth gases may provide clues to evolution of life"

Apr. 5, 2002 **Radio CKTB Niagara** "Drive at Five" Interview

Apr. 4, 2002 **Discovery TV** - Interview on my research on abiogenic hydrocarbons and related publication in *Nature* on "@discovery.com" show

Feb. 2002 University of Toronto publication on research = "**The Edge**" - profiled in cover story on environmental research at University of Toronto

Sept. 5, 2001 **Globe and Mail** - - Natural Science and Engineering Council insert - "They don't walk on water but ..". NSERC research initiatives in environmental water research.

Sept. 5, 2001 **La Presse** - Natural Science and Engineering Council insert - "They don't walk on water but ..". NSERC research initiatives in environmental water research. French language version of same

Sept. 1999 **TIME Magazine** - Canada Edition - Profiled as one of 25 "Leaders for the 21st Century"

Sept. 1999 **CBC Radio Metro Morning** Interview

Sept. 1999 **CBC Radio Ontario Morning** Interview

Sept. 1999 S&T Post, the official newspaper of the Department of Science & Technology (DOST), Philippines.

Sept. 1999 Technology News section of **Pollution Engineering** magazine.

Sept. 1999 **Physics Today** (scientific periodical). Scientific profile of my research program

Sept. 1999 **Environment News** - Environmental Sciences newsletter of *Organic Geochemistry*

May 1999 NSERC Tribute to Research Excellence

Apr. 12, 1999 **University of Toronto Bulletin** "Process to benefit groundwater cleanup".

Mar. 31, 1999 **NATIONAL POST** article "A new technique measures bacteria's progress in pollution" by A. Lamey

Spring 1999 NSERC Issue of **Contact**