Dr. Phil J.A. McCausland *Curriculum Vitae*

Director, Western Paleomagnetic and Petrophysical Laboratory (WPPL); Adjunct Professor
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RESEARCH INTERESTS

Petrophysical properties and mineralogy of Earth & planetary materials as it relates to mineral exploration, meteoritics, and the evolution of the Earth and small bodies of the Solar System

Paleomagnetism and allied techniques applied to the study of supercontinent assembly and dispersal, paleogeography, geodynamics, terrane tectonics and orogeny

EDUCATION

Ph.D., Geophysics, University of Western Ontario, 2002.
M.Sc., Geophysics, Memorial University of Newfoundland, 1998.
B.Sc. Honours, Geology, Memorial University of Newfoundland, 1995.

PRESENT SCHOLARLY & PROFESSIONAL ACTIVITIES, AWARDS

Canadian Geophysical Union, Meritorious Service Award	2020
Senior Representative for Canada to IAGA (International Association of Geomagnetism and Aeronomy)	2015 – present
Past President, Solid Earth Section of the Canadian Geophysical Union	2017 – present
Secretary-Treasurer, Geophysics Division of the GAC	2013 – present
Meteorite Impact Advisory Committee – National Fireball Coordinator	2014 – present
President, London Gem, Mineral & Fossil Society	2022 – present

RESEARCH FUNDING – Awarded

2019 – 2025 $150,000 [100%]
Natural Sciences & Engineering Research Council – Discovery Grant
“Global paleogeography and geodynamics of the Proterozoic to Paleozoic transition”

2021 – 2024 $300,000 [5%]
Canadian Space Agency – FAST: Flights for the Advancement of Science and Technology
R.L. Flemming (PI) and eleven co-investigators: “Developing and Testing a Miniaturized In situ XRD for Mineralogical Characterization of Planetary Surfaces”

2018 – 2019 $175,000 [5%]
Canadian Space Agency – IS-XRD Concept study
R.L. Flemming (PI) and twelve co-investigators: “Miniaturized in situ X-ray diffractometer for mineralogical characterization of planetary surfaces”

2013 – 2019 $168,000 [100%]
Natural Sciences & Engineering Research Council – Discovery Grant
“Relationship between paleomagnetism and tectonics during signature events in the assembly and dispersal of supercontinents”

2015 – 2016 $24,970 [100%]
Natural Sciences & Engineering Research Council – Engage Grant, with industrial partner Stillwater Canada Inc.

2016 $144,985 [10%]
Natural Sciences & Engineering Research Council – Research Tools and Instruments (RTI)

R.L. Flemming (PI) and McCausland, P.J.A., deBruyn, J., Hutter, J., Osinski, G.R. and Schmidt, M.E.: “Upgrades to Bruker D8 Discover Micro X-ray Diffractometer”

RESEARCH EXPERIENCE since 2011

Associate Research Scientist October 2023 – present
Department of Earth and Planetary Sciences, Yale University

Director, Western Paleomagnetic and Petrophysical Laboratory, September 2013 – present
Adjunct Professor, Department of Earth Sciences, University of Western Ontario

Meteorite Research Associate October 2021 – August 2022; December 2022 – April, 2023
Royal Ontario Museum

Adjunct Professor September 2018 – present
Department of Earth Sciences, Brock University

Assistant Professor September 2017 – August 2018
Department of Earth Sciences, Brock University

Adjunct Professor September 2015 – present
Department of Earth and Environmental Sciences, University of Windsor

Assistant Professor September 2012 – August 2015
Department of Earth Sciences, University of Western Ontario
Coordinator of ASTRO (Astromaterials Training and Research Opportunities) Cluster, Canadian Space Agency

W.F. James Professor of Pure and Applied Sciences May – August 2012
St. Francis Xavier University

Postdoctoral Fellow (P. Brown, G. Osinski) January – April 2012
Department of Earth Sciences, University of Western Ontario

NSERC Engage Postdoctoral Fellow (D.T.A. Symons) November 2011 – February 2012
Department of Earth & Environmental Sciences, University of Windsor

STUDENT SUPERVISON & MENTORING

McCausland Group Graduate Students

Graduate Alumni

1. Li, Yaozhu (September 2018 – October 2023) co supervised with R. Flemming
   Ph.D. Geology (Planetary Science), University of Western Ontario “Deformation and Evolution of Achondrite Parent Bodies”
2. Louwerse, Lukas (September 2021 – August 2023) co supervised with R. Flemming
   M.Sc. Geophysics (Planetary Science), University of Western Ontario “Petrophysical Properties of the HED Meteorites and the Bushveld Igneous Complex: Implications for Future Asteroid Prospecting Missions”
3. Li, Yaozhu (September 2016 – August 2018) co supervised with R. Flemming
   M.Sc. Geology (Planetary Science), University of Western Ontario:
   “Ureilite meteorite record of shock metamorphism and parent body processes”
4. MacRae, Michelle (September 2015 – December 2017) co-supervised with J. Jin
   M.Sc. Geology, University of Western Ontario: “Ordovician continental paleogeography and paleoenvironment for the Michigan basin from paleomagnetic and faunal analysis”

5. Thomson, Andrew (Sept. 2014 – December 2017) co-supervised with C. Tsujita
   M.Sc. Geology, University of Western Ontario: “Quantitative analysis of Middle Devonian coral growth ridges for paleoenvironmental and geodynamic purposes”
6. Warsame, Halima (September 2015 – October 2017) co-supervised with C. Tsujita
   M.Sc. Geology, University of Western Ontario: “Paleogeography of Early Paleozoic Laurentia and Meguma, Avalonia terranes via paleomagnetism and faunal analysis”
7. Gunawardana, Hiruni (Sept. 2015 – October 2017) co-supervised with G. Pratt
   M.Sc. Geophysics, University of Western Ontario: “Petrophysical Properties and 3D modeling of sulphide mineralization distribution at the Marathon Cu-PGE deposit, Marathon, Ontario”
8. Uribe, Diego (Sept. 2014 – Aug.2017) co supervised M. Izawa and R. Flemming
   M.Sc. Planetary Science, University of Western Ontario: “Primitive enstatite achondrites as indicators of environments and processes during early planetary differentiation”
9. Sara, Sundeep (May 2016 – April 2017)
   Acc. M.Sc. Geology, University of Western Ontario: “Analysis of NI 43-101 effectiveness: Case study approach”
10. Fernandes, Earl (September 2014 – August 2015)
    Acc. M.Sc. Geology, University of Western Ontario: “Magnetic fabric study and the emplacement of sulfide deposits in the North Range offset dykes of the Sudbury Impact Structure, Ontario, Canada”

McCausland Group Honours B.Sc. students

B.Sc. Alumni

1. Benest, Olivia (B.Sc Geology, 2022): “Shatter Cones from Meteorite Impacts – Their Shape and Mineralogical Shock”
2. Brooks, Kate (B.Sc Geology, 2020, McMaster University): “Paleomagnetic Study of Devonian age Fountain Lake Group Volcanics, Cobequid Highlands, Nova Scotia”
3. Paterson, Rhys (B.Sc. Geology, 2018, Brock University): “Paleomagnetic and petrophysical analysis of Ordovician units sampled in the proposed Deep Geological Repository for nuclear waste, Kincardine, ON”
4. Deng, Mingzhen (Lindsay) (B.Sc. Geology, 2018, University of Western Ontario): “Chondrule shapes and fabric of the Tagish Lake ungrouped C2 chondrite by X-ray micro CT”
5. Siewnarine, Jordan (B.Sc. Geology, 2018, University of Western Ontario, co-supervised with C. Tsujita): “Analysis of Baculitid Ammonites and Fossiliferous Concretions Using Micro – CT”
6. Gunawardana, Hiruni (B.Sc. Geology, 2015, University of Western Ontario): “Devonian paleoposition of Avalonia and Laurentia using paleomagnetic data from the McAras Brook Formation, Nova Scotia”
7. Uribe, Diego (B.Sc. Geology 2014, University of Western Ontario): “Investigation of the mineralogical record of fireball fragmentation events in meteorite fusion crust”
8. Bramble, Michael (B.Sc. Planetary Science 2014, University of Western Ontario, co-supervised with R. Flemming): “Quantification of grain size by 2D micro-XRD”

9. Pol, Joshua (B.Sc. Geology 2014, University of Western Ontario, co-supervised with C. Tsujita): “Analysis of Middle Devonian coral growth ridges by means of quantitative visual based methods”
10. Rupert, Alexandra (B.Sc. Geology 2014, University of Western Ontario, co-supervised with R. Flemming): “Quantification of ordinary chondrite shock metamorphism using micro-XRD”
11. Round, Stephanie (B.Sc. Geology 2010; University of Western Ontario, co-supervised with R. Flemming): “Classification of meteorites by olivine unit cell using micro X-ray diffraction”
12. Brown, Ross L. (B.Sc. Geophysics 2006; University of Western Ontario, co-supervised with L. Mansinha): “Locating subsurface structures by means of Ground Penetrating Radar and Magnetometer Surveys”

Undergraduate employment and mentorships

1. Foggett, Claudia (December 2022 – April 2023; September 2023 – present)
   Research assistant, Paleomagnetic Laboratory
2. Currie, Bianca (December 2021 – April 2022; October 2022 – April, 2023)
   Research assistant, Paleomagnetic Laboratory
3. Cassidy, Paris (summer, 2021)
   Research assistant, Paleomagnetic Laboratory
4. Brooks, Kate (summer, 2019)
   NSERC USRA - University of Western Ontario
5. Deng, Mingzhen (Lindsay) (work study 2016-17; summer hire, 2017; 2018)
   Research assistant, Paleomagnetic Laboratory
6. Jenkins, Laura (summer 2016; co-supervised with R. Flemming)
   NSERC CREATE Fellowship – University of Western Ontario
7. Kosmala, Anna (work study 2015 – 2016)
   Research assistant, Paleomagnetic Laboratory
8. Sara, Sundeep (work study 2015 – 2016)
   Research assistant, Paleomagnetic Laboratory
9. Warsame, Halima (summer, 2015)
   Research assistant, Paleomagnetic Laboratory
10. Cunningham, Celeste (summer, 2015)
    NSERC USRA - University of Western Ontario
11. Houde, Victoria (summer, 2015; co-supervised with R. Flemming)
    CSA-ASTRO - University of Western Ontario
12. Gunawardana, Hiruni (summer 2014; summer 2015)
    Research assistant, Paleomagnetic Laboratory
13. Hoefs, Ryan (work study 2014 – 2015)
    Research assistant, Meteorite Laboratory
14. Bajwa, Courtney (work study 2014 – 2015)

Research assistant, Meteorite Laboratory

15. Uribe, Diego (summer 2014)
Research assistant, Meteorite Laboratory

16. O'Connor, Amanda (summer 2014; co-supervised with E. Webb)
Undergraduate CSA-ASTRO Research Award, University of Western Ontario

17. MacRae, Michelle (summer 2014; co-supervised with R. Flemming and G. Osinski)
Undergraduate CSA-ASTRO Research Award, University of Western Ontario

18. CoDyre, Sarah (summer 2014; co-supervised with R. Flemming)
Undergraduate CSA-ASTRO Research Award, University of Western Ontario

19. Nigim, Jamal (summer 2014; co-supervised with P. Simpson)
Undergraduate CAMBR Research Award, University of Western Ontario

20. Bramble, Michael (summer 2013)
NSERC USRA - University of Western Ontario

21. Uribe, Diego (summer 2013)
Undergraduate CSA-ASTRO Research Award, University of Western Ontario

Graduate Committees and Examinations

Member of thesis advisory committee for:

Guna, Ai Gusti (Ph.D. 2021-present), *McMaster University,* supervised by Alex Peace
Lloyd, Simon (Ph.D. 2022), *University of Liverpool*; supervised by Andy Biggin
Thallner, Daniele (Ph.D. 2022), *University of Liverpool*; supervised by Andy Biggin
Zylberman, William (Ph.D., 2017); supervised by Gordon Osinski and Yoann Quesnel
Anders, Denise (Ph.D., 2016); supervised by Gordon Osinski and Richard Grieve
Kouhi, Derek (M.Sc., 2016); supervised by Kristy Tiampo and Bob Linnen

Graduate Thesis examiner (at *University of Western Ontario*, unless otherwise noted)

Chinchalkar, Neeraja (Oct 2023) Ph.D. Planetary Science, supervised by G. Osinski
Clark, David (Sept 2023) Ph.D. Geophysics, supervised by P. Wiegert and G. Osinski
Tambakis, Luke (Aug 2023) MESc, supervised by Ken McIsaac
Freeborne, Sean (Aug 2022) M.Sc. Geology, *St. Francis Xavier University* (external examiner)
Lenhart, Eric (Aug 2021) M.Sc. Geophysics, supervised by R. Secco
Aviles, Mayling (July 2021) Ph.D. Geology, supervised by B. Cheadle and G. Plint
Dubois, Shawn (Nov 2020) M.Sc. Geology *St. Francis Xavier University* (external examiner)
Sacks, Leah (Oct 2020) M.Sc. Geology, supervised by G. Osinski, L. Tornabene
Hyde, Brendt (Feb 2020) Ph.D. Planetary Sciences, supervised by D. Moser, K. Tait
Farrell, Sarah (June 2019) M.Sc. Geophysics *Memorial University* (external examiner)
Morse, Zachary (Dec 2018) Ph.D. Planetary Sciences, supervised by G. Osinski
Vargas, Luis (Sept 2018) M.Sc. Geology *Brock University* (external examiner)
Werynski, Alyssa (July 2018) M.Sc. Geology, supervised by C. Neish
Marion, Kienan (June 2018) M.Sc. Geology, supervised by B. Cheadle
Gushulak, Cale (Aug 2016) M.Sc. Geology, supervised by J. Jin
Klein, Robert (March 2016) Ph.D. Geology *University of Helsinki* (external examiner)
Coulter, Adam (Dec 2015) M.Sc. Geology, supervised by G. Osinski
Bingham-Koslowski, Nikole (Aug 2015) Ph.D. Geology, supervised by C. Tsujita and J.Jin
Buitenhuis, Eric (Dec 2013) M.Sc. Geology, supervised by N.Duke and C. Finnegan
Shankar, Bhairavi (Mar 2013) Ph.D. Planetary Sciences, supervised by G. Osinski
Battler, Melissa (Dec 2012) Ph.D. Planetary Sciences, supervised by N. Banerjee, G. Osinski

CONTRIBUTIONS TO RESEARCH

	Total	Lead AU	citations (Web of Science)
Refereed Journal articles:	64	10	total 2496; H=19
Refereed other publications:	10	7	Google Scholar citations
Articles submitted / in revisions:	2	0	
Conference abstracts:	149	50	

My students listed in italics; mentored students (of collaborators) noted with asterisk*.

Refereed Journal Publications since 2017 (n=22)

1. Brown, P.G., McCausland, P.J.A., Hildebrand, A.R. and 26 others. 2023. The Golden meteorite fall: Fireball trajectory, orbit, and meteorite characterization. *Meteoritics and Planetary Science*, *doi.org/10.1111/maps.14100*
2. Flemming, R.L., Gao, S., Freckelton, C.N. and McCausland, P.J.A. *accepted.* Trends in unit cell parameter for kimberlitic versus non-kimberlitic and diamond-indicating chromite. *Canadian Journal of Mineralogy and Petrology.*
3. Domeier, M., Robert, B., Meert, J.G., Kulakov, E.G., McCausland, P.J.A., Trindade, R.I.F., and Torsvik, T.H. 2023. The enduring Ediacaran paleomagnetic enigma. *Earth Science Reviews.* v. 242, 104444. *doi:10.1016/j.earscirev.2023.104444*
4. *Li., Y.*, McCausland, P.J.A., Flemming, R.L. and Hetherington, C.J. 2023. Witness to Strain: Subdomain Boundary Length and the Apparent Subdomain Boundary Density in Large Strained Olivine Grains. *American Mineralogist,* v. 108 (10), pp 1897–1905.
5. Lloyd, S.J.*, Biggin, A.J., Paterson, G.A. and McCausland, P.J.A. 2022. Extremely weak early Cambrian dipole moment similar to Ediacaran: Evidence for long-term trends in geomagnetic field behaviour? *Earth and Planetary Science Letters,* v. 595, *doi: 10.1016/j.epsl.2022.117757*
6. Waldron, J.W.F., McCausland, P.J.A., Barr, S.M, Schofield, D.I., Reusch, D. and Wu, L. 2022. Terrane history of the Iapetus Ocean as preserved in the northern Appalachians and western Caledonides. *Earth Science Reviews,* v. 293, *doi: 10.1016/j.earscirev.2022.104163*
7. Charles, C.R.J., Ames, F., Kester, O. and 12 others. 2022. Production of Radioactive Molecular Ions in Radiofrequency Quadrupole Gas-Reaction Cells. Journal of Physics: Conference Series, v. 2244, *doi:10.1088/1742-6596/2244/1/012100*
8. *Li, Y.*, McCausland, P.J.A. and Flemming, R.L. 2021. Quantitative shock measurement of olivine in ureilite meteorites. *Meteoritics and Planetary Science* v. 56, pp 1422-1439. *doi.org/10.1111/maps.13706*
9. Thallner, D.*, Biggin, A.J., McCausland, P.J.A. and Fu, R.R. 2021. New palaeointensities of the Skinner Cove Formation, Newfoundland, suggest a changing state of the geomagnetic field at the Ediacaran-Cambrian transition. *Journal of Geophysical Research – Solid Earth* v 126, *doi.org/10.1029/2021JB022292*
10. Evans, D.A.D., Pesonen, L.J., Eglington, B.M. and 14 others. 2021. An expanding list of reliable paleomagnetic poles for Precambrian tectonic reconstructions, in Ancient Supercontinents and the Paleogeography of Earth, Elsevier (L.J. Pesonen, Ed.). p. 605-639.
11. *Brooks, K.I.,* McCausland, P.J.A. and Waldron, J.W.F. 2021. Paleomagnetic Study of the Early Carboniferous Fountain Lake Group, Cobequid Highlands, Nova Scotia, Canada. *Canadian Journal of Earth Sciences* v 59, *doi.org/10.1139/cjes-2020-0165*
12. *Warsame, H.S*, McCausland, P.J.A., White, C.E., Barr, S.M., Dunning, G.R. and Waldron, J.W.F. 2020. Meguma terrane orocline: U-Pb age and paleomagnetism of the Silurian Mavillette gabbro, Nova Scotia, Canada. *Canadian Journal of Earth Sciences* v 58, pp 315-331, *doi.org/10.1139/cjes-2020-0089*

13. *Rupert, A.N.,* McCausland, P.J.A. and Flemming, R.L. 2020. Ordinary Chondrite Shock Stage Quantification using in situ 2D X-Ray Diffraction of olivine. *Meteoritics and Planetary Science* v 55, pp 2224–2240. *doi.org/10.1111/maps.13572*
14. Wen, B., Evans, D.A.D., Anderson, R.P. and McCausland, P.J.A. 2020. Late Ediacaran paleogeography of Avalonia and the Cambrian assembly of West Gondwana. *Earth and Planetary Science Letters* v 552. *doi.org/10.1016/j.epsl.2020.116591*
15. *Li, Y.*, McCausland, P.J.A. and Flemming, R.L. 2020. Best Fit for Complex Peaks (BFCP) in Matlab® for quantitative analysis of in situ 2D X-Ray diffraction data and Raman spectra. *Computers and Geosciences. doi.org/10.1016/j.cageo.2020.104572*
16. Charles, C.R.J.*, McCausland, P.J.A. and Davis, D.W. 2020. LA-ICP-MS Pb isotope test of meteorite provenance: A Terrestrial Origin for Lovina. *Meteoritics and Planetary Science.* v 55. *doi.org/10.1111/maps.13492-3296*
17. van Staal, C.R., Barr, S.M., McCausland, P.J.A., Thompson, M.D. and White, C.E. 2020. Ediacaran-Early Cambrian interactions with Ganderia: an example of complex terrane transfer due to arc-arc collision. *Geological Society of London Special Publications.* v. 503, *doi.org/10.1144/SP503-2020-23*
18. *Jenkins, L.E.,* Flemming, R.L. and McCausland, P.J.A. 2019. Quantitative in situ XRD Measurement of Shock Metamorphism in Martian Meteorites Using Lattice Strain and Strain-Related Mosaicity in Olivine. *Meteoritics and Planetary Science* v 54, pp 902-918, *doi.org/10.1111/maps.13245*
19. Gauthier, M.S., Hodder, T.J., Ross, M., Kelley, S.E., Rochester, A.* and McCausland, P.J.A. 2019. Glacial record of the southwestern Hudson Bay region and its significance for long-term ice sheet behaviour. *Quaternary Science Reviews* v 214, pp 1-27.
20. Fry, C.*, Samson, C., McCausland, P.J.A., Herd, R.K., Ralchenko, M.* and McLeod, T.K.* 2018. Iron meteorite bulk densities determined via 3D laser imaging, *Meteoritics and Planetary Science* v 53, *doi.org/10.1111/maps.13067*
21. Oliver, P.*, Ralchenko, M.*, Samson, C., Ernst, R.E., McCausland, P.J.A. and West, G.F. 2018. Enhanced non-destructive characterization of ordinary chondrites using complex magnetic susceptibility measurements. *Meteoritics and Planetary Science* v 53, pp 433-447, *doi.org/10.1111/maps.13028*
22. Charles, C.R.J.*, Robin, P-Y., Davis, D.W. and McCausland, P.J.A. 2018. The 3D structure of metal shells in armoured chondrules from the NWA 801 CR2 chondrite. *Meteoritics and Planetary Science* v 53, pp 935-951, *doi.org/10.1111/maps.13038*

Articles Submitted to Refereed Journals

1. *Li., Y.*, McCausland, P.J.A., Flemming, R.L. and Osinski, G.R. *in revisions.* Hybrid Lunar Feldspathic Breccia Northwest Africa 11515. *Meteoritics and Planetary Science.*
2. *Li., Y.*, McCausland, P.J.A., Flemming, R.L., Hetherington, C.J. and Zhao, B. *submitted.* Microstructures constrain Ureilite parent body deformation. *Meteoritics and Planetary Science.*

Published Repository Data

1. *Li, Y.*, McCausland, P.J.A., Flemming, R.L. and Hetherington, C.J. 2022 Unit Segment Length for olivine EBSD single grain analysis", Mendeley Data, V1, doi: 10.17632/7kb9xhd4cz.1
2. Thallner, D.*, Biggin, A.J., McCausland, P.J.A. and Fu, R.R. 2021. New paleointensities of the Skinner Cove Formation suggest a changing state of the geomagnetic field at the Ediacaran-Cambrian transition. Magnetics Information Consortium (MagIC). doi:10.7288/V4/MAGIC/16971, *https://earthref.org/MagIC/16971*

3. *Li, Y.*, McCausland, P.J.A. and Flemming, R.L. 2019. Micro-X-ray diffraction data and codes for best fit for complex peaks (BFCP). Mendeley Data. *https://doi.org/10.17632/k2yhbng5dw.3*

Conference and Extended Abstracts since 2017 (n=41)

(Presenter; *my students listed in italics*; mentored students with asterisk*)

1. Robert, B., Domeier, M., Kjøll, H-J, Mills, A., McCausland, P.J.A., Silkoset, P. and Augeland, L. 2023. Etude des glaciations de l'Ediacarien (635-539 Ma) à partir du paléomagnétisme de séries sédimentaires en Avalon. Réunion des Sciences de la Terre, November 2023, Rennes, France. *Abstract*
2. McCausland, P.J.A., Di Cecco, V., Tait, K.T., Herd, C.D.K., Flemming, R.L.F. and Joy, B. 2023. A new, unusual IIE iron meteorite from an unusual iron parent body. GAC-MAC-SGA 2023, May, 2023, Sudbury, Canada. *Abstract*
3. *Louwerse, L.*, McCausland, P.J.A. and Flemming, R.L. 2023. Bushveld Igneous Complex as an Analogue for Mineralization on 4 Vesta and the V-Type Asteroids. GAC-MAC-SGA 2023, May, 2023, Sudbury, Canada. *Abstract*
4. Vida, D., Egal, A., Brown, P.G., Borovička, J., Spurný, P., Wiegert, P., Devillepoix, H.A.R., Colas, F., Šegon, D., McCausland, P.J.A. and McIntyre, M. 2023. Ground-based observations of 2022 WJ1 and 2023 CX1 asteroid entries. Asteroids, Comets, Meteorites Conference, Flagstaff, AZ, July, 2023, *Abstract*
5. Wiegert, P., Brown, P.G.B., Vida, D., McCausland, P.J.A., Mazur, M., Schmidt, M.E. and Rios, D. 2023. The 2022 WJ1 fireball event. Asteroids, Comets, Meteorites Conference, Flagstaff, AZ, July, 2023, *Abstract*
6. Brown, P., Vida, D., McCausland, P.J.A., Mazur, M., Wiegert, P. and Devillepoix, H. 2023. Atmospheric Breakup Behaviour of 2022 WJ1. Planetary Defense Conference 2023; International Acadamy of Astronautics, Vienna, Austria, April, 2023, *Abstract*
7. *Li, Y.*, McCausland, P.J.A., Flemming, R,L. and Kita, N. 2023. Thermal constraints on the ureilite parent body (UPB): Evidence from the refractory spinel in polymict ureilite EET 87720 using in situ SIMS. European Geosciences Union, General Assembly, Vienna, Austria, April, 2023, *Abstract*
8. *Louwerse, L.*, McCausland, P.J.A. and Flemming, R.L. 2023. Shock and regolith features in Howardite Northwest Africa 15199. 54th Lunar and Planetary Science Conference, Houston, TX. March, 2023, *Abstract*
9. McCausland, P.J.A. and Johnson, S.C. 2023. Overprint magnetization in the Ratcliffe Brook Formation, Caledonia terrane, New Brunswick and implications for paleomagnetic investigation of Appalachian orogenic evolution. Atlantic Geoscience Society 49th Annual Colloquium, Truro, Nova Scotia, February, 2023, *Abstract*
10. *Li, Y.*, McCausland, P.J.A., Flemming, R,L. and Hetherington, C.J. 2022. Shock effects observed and quantified in single crystals. Meteoritical Society 85th Annual meeting, Glasgow, UK, August, 2022, *Abstract*
11. *Li, Y.,* McCausland, P.J.A. and Flemming, R.L. 2022. Petrology of Northwest Africa 11515: Mg-suite and FAN suite breccia. 53rd Lunar and Planetary Science Conference, Houston, TX. March, 2022, *Abstract*
12. *Li, Y.,* Cao, F., Matterson, T.W., Flemming, R.L., Jaret, S.J., Johnson, J.R. and McCausland, P.J.A. 2022. Preliminary shock pressure calibration curve for experimentally shocked bytownite. 53rd Lunar and Planetary Science Conference, Houston, TX. March, 2022, *Abstract*
13. McCausland, P.J.A. 2021. Will the real Ediacaran paleopole please stand? GAC-MAC 2021, November, 2021, London, Canada. *Abstract*

14. Currie, B.G.*, Flemming, R.L., McCausland, P.J.A. and McNeil, A.G. 2021. Classifying Northwest Africa ordinary chondrite `SdB-06': Possible late stage mobilization of Ni and S and metasomatic reaction of Ni-bearing minerals. GAC-MAC 2021, November, 2021, London, Canada. *Abstract*
15. *Li, Y.*, McCausland, P.J.A., Flemming, R,L. and Hetherington, C.J. 2021. Shocked crystal misorientation quantified by 2D XRD strain-related mosaicity and EBSD unit segment length. GAC-MAC 2021, November, 2021, London, Canada. *Abstract*
16. Thallner, D.*, Biggin, A.J., Hill, M.J., Halls, H.C. and McCausland, P.J.A. Evaluating anomalous palaeomagnetic field behaviour in the Ediacaran with new palaeointensity data from Laurentia. GAC-MAC 2021, November, 2021, London, Canada. *Abstract [invited]*
17. McCausland, P.J.A. 2021. Northern Cordillera assembly over 200 Ma - revisiting the paleomagnetic record. GAC-MAC 2021, November, 2021, London, Canada. *Abstract*
18. Flemming, R.L., Sabarinathan, J., Pilles, E.A. and 15 others. 2021. In Situ X-ray Diffraction (ISXRD) for Exploring Mineralogy and Geology on Mars. GAC-MAC 2021, November, 2021, London, Canada. *Abstract*
19. Charles, C.R.J.*, Malbrunot, S., Ames, F., Flannigan, E., Alary, J-F., Kester, O., Kunz, P., Laxdal, A., McCausland, P.J.A. and Flemming, R.L.F. 2021. Production of Radioactive Molecules in a Radiofrequency Quadrupole Gas-Reaction Cell. International Conference on Ion Sources (ICIS2021), Vancouver, Sept 2021. *Abstract*
20. McCausland, P.J.A. 2021. Legacy Paleomagnetic Collections: The Need for Preservation and Archiving of Key Sample Sets. IAGA-IASPEI 2021, Hydrabad, India, August 21-27, 2021. *Abstract [invited]*
21. Flemming, R.L., Pilles, E.A., Sabarinathan, J., Osinski, G.R., McCausland, P.J.A., Tornabene, L.L., McIsaac, K.A., Gellert, R., McCraig, M.A., Schmidt, M.E., Veinberg, S.L. and Shaw, A. 2021. In situ X-ray Diffractometer for Mineralogical Characterization of the Lunar Surface. 2021 Canadian Lunar Workshop - June 14 - 16, 2021. *Abstract*
22. *Li, Y.*, McCausland, P.J.A. and Flemming, R.L. 2021. Investigation and Visualization of Shock Induced Strain in Olivine using In Situ Micro-X-Ray Diffraction and Electron Backscatter Diffraction. Goldschmidt, Lyon, France. July, 2021. *Abstract*
23. Waldron, J.W.F., Barr, S.M., McCausland, P.J.A., Schofield, D.I., Wu, L. and Reusch, D. 2021. Building kinematic models for Iapetus Ocean closure. Northeastern Section Geological Society of America, March, 2021, *Abstract*
24. *Li, Y.*, McCausland, P.J.A. and Flemming, R.L. 2021. Shock effects on olivine structure and slip systems in martian dunite Northwest Africa 2737. 52nd Lunar and Planetary Science Conference, Houston, TX. March, 2021, *Abstract*
25. Waldron, J.W.F., Schofield, D.I., McCausland, P.J.A., Barr, S.M., Wu, L. and Reusch, D. 2020. Towards a kinematic model for Iapetus Ocean closure. Geological Society of America, Montreal, QC. October, 2020. *Abstract*
26. Thallner D.*, Biggin A.J., Hill M., Halls H.C., McCausland P.J.A., Shcherbakova V., Shcherbakov V. and Bakhmutov V. 2020. Evaluating the anomalous palaeomagnetic field behaviour in the Ediacaran with new palaeointensity data from Laurentia and Baltica. European Geosciences Union, Vienna, Austria. May, 2020. *Abstract*
27. *Li, Y.*, McCausland, P.J.A., Flemming, R.L., Christoffersen, P. and Osinski, G.R. 2020. Investigation of a hybrid lunar feldspathic breccia Northwest Africa 11515: Mineralogy And Shock History. 51st Lunar and Planetary Science Conference, Houston, TX. March, 2020, *Abstract*
28. Flemming, R.L. and 28 others. 2020. In situ X-Ray diffraction for exploring Mars mineralogy and geology. 51st Lunar and Planetary Science Conference, Houston, TX. March, 2020, *Abstract*

29. Waldron, J.W.F., McCausland, P.J.A., Schofield, D.I. and Barr, S.M. 2020. A kinematic model for Iapetus Ocean closure. Northeastern Section Geological Society of America annual meeting, Reston, VA. March, 2020. *Abstract*
30. *Warsame, H.*, McCausland, P.J.A., White, C.E., Barr, S.M., Dunning, G.R. and Waldron, J.W.F. 2020. Paleomagnetic evidence for Late Carboniferous (or younger) counter-clockwise rotation of Meguma terrane. GAC Newfoundland & Labrador Section Spring meeting, St. John's, NL. February, 2020. *Abstract*
31. *Brooks, K.I.,* McCausland, P.J.A. and Waldron, J.W.F. 2020. Paleolatitude of the Devonian Fountain Lake Group Volcanics, Cobequid Highlands, Nova Scotia, as a new constraint on Laurentia paleogeography. GAC Newfoundland & Labrador Section Spring meeting, St. John's, NL. February, 2020. *Abstract*
32. *Brooks, K.I.,* McCausland, P.J.A. and Waldron, J.W.F. 2020. Paleomagnetic Study of the Devonian Fountain Lake Group Volcanics, Cobequid Highlands, Nova Scotia. Atlantic Geoscience Society 2020 Colloquium, Truro, NS. February, 2020. *Abstract*
33. Waldron, J.W.F., McCausland, P.J.A., Schofield, D.I. and Barr, S.M. 2020.Towards a kinematic model for Iapetus Ocean closure. Atlantic Geoscience Society 2020 Colloquium, Truro, NS. February, 2020. *Abstract*
34. *Gunawardana, H.*, McCausland, P.J.A. and Murphy, J.B. 2019. Paleomagnetism of the Devonian McAras Brook Formation, Nova Scotia. GAC Canadian Tectonics Group – GAC-NL Symposium, Deer Lake, NL. October, 2019. *Abstract*
35. *Li, Y.*, McCausland, P.J.A. and Flemming, R.L. 2019. Comparative micro-x-ray diffraction study of shock metamorphosed olivine and pyroxene in ureilite meteorites. Geological Society of America, Phoenix, AZ. September, 2019. *Abstract*
36. *Rupert, A.N.*, McCausland, P.J.A. and Flemming, R.L. 2019. Shock deformation classification of ordinary chondrites using in situ 2D XRD simple diffraction peak width measurement of olivine. Geological Society of America, Phoenix, AZ. September, 2019. *Abstract*
37. McCausland, P.J.A., Higgins, M., Pisarevsky, S., Jourdan, F. Hamilton, M., LeCheminant, A. and Murphy, J.B. 2019. Laurentia during the mid Ediacaran: Paleomagnetism and 580 Ma age of the Saint-Honoré alkali intrusion and dykes, Quebéc. GAC-MAC Annual meeting, Quebéc, May 2019. *Abstract*
38. Posnov, N.*, Osinski, G.R., Flemming, R.L., McCausland, P.J.A., Pontefract, A. and Crósta, A. 2019. Classification of shocked basalt from Vargeão dome and Vista Alegre: implication for the search for life on Mars. 50th Lunar and Planetary Science Conference, Houston, TX. March, 2019, *Abstract*
39. McCausland, P.J.A., Murphy, J.B., Pisarevsky, S.A., Hall, C.M., Flemming, R.L. and O'Brien, S.J. 2019. Early Avalonian arc paleogeography: Preliminary paleomagnetism and 40Ar/39Ar geochronology of Neoproterozoic units, Burin Peninsula, Newfoundland. GAC Newfoundland & Labrador Section Spring meeting, St. John's, NL. February, 2019
40. *Li, Y*, McCausland, P.J.A. and Flemming, R.L. 2018. Quantification of shock stages in ureilite olivine by in-situ micro-X-ray diffraction. Lunar and Planetary Science Conference XLIX, Houston, TX. March, 2018, *Abstract*
41. *Jenkins, L.E.,* Flemming, R.L. and McCausland, P.J.A. 2018. Quantitative in situ XRD Measurement of Shock Metamorphism in Martian Meteorites: Olivine Lattice Strain and Strain-Related Mosaicity. Lunar and Planetary Science Conference XLIX, Houston, TX. March, 2018, *Abstract*

Meteorite classification: Over 150 meteorite descriptions submitted to the Meteoritical Society for official recognition, including Golden (L/LL5), Grimsby (H5), Wood Lake (H4), NWA 2221 (ureilite), NWA 2202 (polymict eucrite), NWA 1685 (LL4 polymict breccia).

Invited Presentations since 2017

February 14, 2023 [*Invited*] “Paleomagnetism: What it does for us and how it is done” Lecture series, IGCP 683.

February 28, 2020 [*Invited*] “Tagish Lake meteorite fall and investigation: A unique messenger from the early solar system” Research Forum, Institute for Earth & Space Exploration, Western University, London, ON.

February 5, 2020 [*Invited*] “Tagish Lake meteorite fall and investigation: A unique messenger from the early solar system” St. Francis Xavier University, Earth Sciences colloquium, Antigonish, NS.

January 31, 2020 [*Invited*] “Tagish Lake meteorite fall and investigation: A unique messenger from the early solar system” University of Toronto, Scarborough, Centre for Planetary Sciences, Scarborough, ON.

April 2, 2017 [*Keynote*] “X-ray Micro CT Imaging of Meteorites: A New Frontier in Non-Destructive 3D Sample Analysis” Advances in Earth Sciences Research Conference 2017, London, ON.

SERVICE

Department of Earth Sciences Service

Curator, Western meteorite collection July 2007 – June 2015

Leader, “Georgian Bay Field Trip” along with G. Pratt and P. Corcoran September, 2014
Three days with 28 intro geology students in circum-Georgian Bay field excursion.

Chair for Thesis defences and Comprehensive Qualifying Exams for:
Gi, Caroline; MSc defence (July 2017)
Sweeney, Sarah; MSc defence (Nov 2014)
Clark, David; Ph.D comprehensive exam (July 2014)

Western Earth Sciences Departmental Committees:

Colloquium Committee (Chair, 2013 – 2015) September 2012 – June 2015
Appointments Committee (Elected) July 2013 – June 2015
Search Committee for Hazards & Earthquake Seismology position 2014 – 2015

University Service

Founding Member, Executive Council, Centre for Planetary Science and Exploration March 2013 – August 2015

Co-leader, *Sultanate of Oman* meteorite field search with students and PDFs, February, 2013

Coordinator, UWO Planetary Sciences Research Group 2007 – 2008
Administrative activities for the UWO Graduate and Undergraduate Planetary Science Programs, public outreach, conference organization. Curator, UWO meteorite collection.

Research Community Past Scholarly and Professional Service

Scientific Administration & Advocacy

• Councillor and Science Program Chair, Geological Assoc. Canada 2019 – 2022
• Science Program Chair, GAC-MAC 2021 Joint Annual meeting 2018 – 2022
• President, Solid Earth Section of the Canadian Geophysical Union 2013 – 2017
• Central Rep, Planetary Division of the Geological Association of Canada 2012 – 2015
• Junior Representative for Canada to IAGA (International Association of Geomagnetism and Aeronomy) 2010 – 2015
• President, Geophysics Division of the Geological Association of Canada 2006 – 2013
• Secretary, Solid Earth Section of the Canadian Geophysical Union 2009 – 2013
• Coordinator of awards judging for CGU and GAC annual meetings 2016 – 2019

Facilitating Scientific Communication (since 2011)

• Convenor of session in AGS 2023 Colloquium, Truro, NS (Feb, 2023) with Shawna White (*SMU*) and Deanne Van Rooyen (*Acadia*): "Tectonic interactions of Appalachian-Caledonide terranes and their host continents"
• Convenor of session in GAC-MAC 2021, London (Nov, 2021) with Zheng Gong (*Yale*): "Secular evolution of the Earth's paleogeography, geodynamic processes and geodynamo"
• Co-Convenor of session in GAC-MAC 2021, London (Nov, 2021) with Ian Ferguson (*U Manitoba*) entitled: "Geophysical imaging of the paleo- and present environment"
• Co-Convenor of session for the European Geosciences Union 2021 session (April, 2021) with Boris Robert (*U Oslo*), Mat Domier (*U Oslo*) and Ricardo Trindade (*U Sao Paolo*) entitled: "Paleogeography of the Neoproterozoic and links between the surface and deep Earth"
• Co-convenor of session for the CGU Banff meeting (May, 2020) with Claire Currie (*U Alberta*), Ian Ferguson (*U Manitoba*) and Katherine Boggs (*Mount Royal*) entitled: "Lithospheric Evolution of the Northern Cordillera and Environs" *[meeting cancelled]*
• Convenor of session for the GeoConvention 2020, Calgary (May, 2020) entitled: "Mineralogy and Crystallography" *[meeting cancelled]*
• Co-convenor of session for the AGS Annual Colloquium, Truro, NS (February, 2020) with Donnelly Archibald and James Braid (*St.FX*) entitled: "Structure, Tectonics, and Magmatism of the Appalachian-Caledonides from Iapetus to Pangea"
• Co-convenor of session for the GSA Phoenix Annual meeting (September, 2019) with Roberta Flemming (*UWO*) entitled: "T31. Deformation at Multiple Scales: From Atoms to Minerals to Rocks to Planets"
• Co-convenor of session for the GAC-MAC-CIM Vancouver meeting (June, 2018) with Ian Ferguson (*U Manitoba*) entitled: "Geophysical Constraints on Lithospheric Structures and Processes"
• Co-convenor of session for the CGU Niagara Falls meeting (June, 2018) with Claire Currie (*U Alberta*) and Fiona Darbyshire (*UQAM*) entitled: "Solid Earth Geophysics: All for one and one for all!"
• Guest Editor**,** *Canadian Journal of Earth Sciences* January 2013 special issue, "Planetary Geology and Geophysics: Canadian Contributions" (with Marie-Claude Williamson, Paul Sylvester, Steve Grasby, and Richard Léveillé)
• Participant in Nordic Paleomagnetic Workshop (Haraldvangen, Norway, 2014)
• Organizer of the CSA-ASTRO short course (London, Ontario, May 2013) with R. Flemming (*UWO*), a three-day meeting for astromaterials research and training for 60 particiapants.
• Convenor of a session for the Winnipeg GAC-MAC meeting (May, 2013) entitled: "Paleogeodynamics of the Earth Before Pangea."

Other contributions

• Participant, IGCP 683 "Pre-Atlantic geological connections among northwest Africa, Iberia and eastern North America" (2023-present)
Participant, IGCP 649 "Supercontinent Cycles & Global Geodynamics" (2017-2020)
• Participant, IGCP 628 "The Gondwana Map Project– the geological map and the tectonic evolution of Gondwana" (2015-2018)
• "Phil McCausland and the Grimsby meteorite" Human Focus chapter contribution (p. 402) to the Canadian-version textbook: "Natural Disasters" (2nd edition; McGraw-Hill Ryerson) by Abbot and Samson (2012).