

Phil J.A. McCausland

Assistant Professor & Curator, meteorites
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Research interests

Paleomagnetism; Tectonics of supercontinents, terranes and orogens; Precambrian and Paleozoic paleogeography; Meteoritics: X-ray CT and Laser imaging; Physical properties and petrography of planetary materials; Shock metamorphism; Cosmic ray exposure; ⁴⁰Ar-³⁹Ar Geochronology and geothermobarometry; Meteorite fall investigation and history

Education

Ph.D., Geophysics, University of Western Ontario, 2002.

“Geotectonic motions of the Yukon-Tanana terrane, northern Cordillera: Paleomagnetism and geobarometry of Mesozoic and Cenozoic intrusions” (advisors D. T. A. Symons, H.C. Palmer)

M.Sc., Geophysics, Memorial University of Newfoundland, 1998.

“Palaeomagnetism of the Skinner Cove Formation of Western Newfoundland and the birth of the Iapetus Ocean” (advisor J.P. Hodych)

B.Sc. Honours, Geology, Memorial University of Newfoundland, 1995.

“Palaeomagnetism and U-Pb Zircon Age of the Skinner Cove Volcanics of Western Newfoundland” (advisor J.P. Hodych)

Honours and Awards

W.F. James Professor of Pure and Applied Sciences, 2012, St. Francis Xavier University

CPSX Postdoctoral Fellow, 2009 – 2011, Centre for Planetary Science & Exploration, University of Western Ontario

APICS-AGS Distinguished Lecturer, 2006 – 2007,
Atlantic Geoscience Society & the Atlantic Provinces Council on the Sciences

Turner Postdoctoral Fellowship, 2002 – 2005, Department of Geological Sciences, University of Michigan

Robert and Ruth Lumsden Graduate Award, 2001, University of Western Ontario

Fellow of the School of Graduate Studies, 1997, Memorial University of Newfoundland

H.R. Peters Award (Best honours thesis), 1995, Earth Sciences, Memorial University

APEGN Best B.Sc. Honours thesis, 1995, Association Professional Engineers and Geoscientists of Newfoundland

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Research Experience

Assistant Professor September 2012 – present
Department of Earth Sciences, University of Western Ontario
Meteoritics; paleomagnetism as applied to tectonics

W.F. James Professor of Pure and Applied Sciences May – August 2012
St. Francis Xavier University
Paleogeography of Avalonia and the assembly of Pangea

Postdoctoral Fellow (P. Brown, G. Osinski) January – April 2012
Department of Earth Sciences, University of Western Ontario
Meteorite physical properties; curation best practices

NSERC Engage Postdoctoral Fellow (D.T.A. Symons) November 2011 – February 2012
Department of Earth & Environmental Sciences, University of Windsor
Paleomagnetic investigation of the timing of dolomitization and ore-forming events at the Pine Point Zn-Pb mine, NWT

Research Fellow (B. Murphy) September – October 2011
Department of Earth Sciences, St. Francis Xavier University
Paleomagnetic investigation of mid-Paleozoic volcanics and redbeds related to the development of the Gulf of St. Lawrence basin

CPSX Postdoctoral Fellow May 2009 – June 2011
(P. Brown, R. Flemming & A. Hildebrand [U. Calgary])
Centre for Planetary Science & Exploration, University of Western Ontario
Tagish Lake carbonaceous chondrite bulk properties and parent body alteration; Micro XRD measurement of shock metamorphism; X-ray Micro-CT imaging of meteorites; Lead investigator of the recovery and description of the September, 2009 Grimsby meteorite fall

Research Fellow (B. Murphy and S. Pisarevsky) August 2006 – July 2007
Department of Earth Sciences, St. Francis Xavier University
Paleomagnetic, geochronologic and geochemical fieldwork and research conducted on Late Neoproterozoic rocks of eastern Laurentia and Avalonia

Postdoctoral Fellow (P. Brown and R. Flemming) August 2005 – May 2008
Department of Earth Sciences, University of Western Ontario
Solar system processes via bulk material properties (bulk density, porosity, magnetic properties) and mineralogy of meteorites; Curator of UWO meteorite collection

Turner Postdoctoral Fellowship (R. Van der Voo) July 2002 – June 2005
Department of Geological Sciences, University of Michigan
Paleomagnetic and geochronologic research on the Late Neoproterozoic to Cambrian paleogeography of Laurentia and the opening of the Iapetus Ocean; Paleozoic motions and deformation of the Kazakhstan continental elements during the assembly of Eurasia

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Teaching experience

University of Western Ontario, Earth Sciences (present)

ES 4490E Senior Thesis class (2013-2014)

PS 9603A Lecturer for Astromaterials Module, Planetary Science Graduate Course (Sept 2013)

ES 2040G "Catastrophic Events in Earth History" –online offering (2013)

ES 1081a "Resources, Environment and Sustainability in a Material Society" (2012)

St. Francis Xavier, Earth Sciences (September – November 2011)

Lead lecturer, Graduate course on "Paleomagnetic Methods and Tectonic Applications."

Carleton University, Earth Sciences (January – April 2009)

Sessional Lecturer: 2nd year "Mineralogy to Petrology" and 1st year "Dynamic Earth."

University of Windsor, Earth & Environmental Sciences (May, 2008)

Co-led 2nd year Field School: Geological field camp in North Bay region

University of Western Ontario, Earth Sciences (September – December 2007)

Sessional Lecturer 2nd yr Earth Sciences course "Stratigraphy & Sedimentology: From Beds to Basins"

University of Michigan, Department of Geological Sciences (January 2004 – April 2005)

Lecturer of 2nd year "Dynamic Earth" (Winter 2005)

Co-lecturer of 2nd year "Environmental Geology" (Fall 2004)

Lecturer of 1st-year "Plate Tectonics" to non-Earth Science majors (Winter 2004).

Service

Curator, Western meteorite collection (September 2012 – present)

Coordinator of ASTRO (Astromaterials Training and Research Opportunities) Cluster, Canadian Space Agency (September 2012 – present)

Member, Executive Council, Centre for Planetary Science and Exploration (March 2013 – present)

Earth Sciences Departmental Committees:

Colloquium (September 2012 – present)

Appointments (Elected July 2013 – present)

Coordinator of Planetary Sciences Research Group (2007-2008), including administrative activities for the UWO Graduate and Undergraduate Planetary Science Programs, public outreach, conference organization. Curator, UWO Earth Sciences meteorite collection.

Students

Sridhar, Jayashree (September 2013 – present)

M.Sc. Geophysics, University of Western Ontario: "Quantification of shock metamorphic textures in martian meteorites and achondrites"

Uribe, Diego (B.Sc. Geology in progress): "Investigation of the mineralogical record of fireball fragmentation events in meteorite fusion crust"

Bramble, Michael (B.Sc. Planetary Science in progress, co-supervised with R. Flemming): "Quantification of grain size by 2D micro-XRD"

Pol, Joshua (B.Sc. Geology in progress, co-supervised with C. Tsujita): “Analysis of Middle Devonian coral growth ridges by means of quantitative visual based methods”

Rupert, Alexandra (B.Sc. Geology in progress, co-supervised with R. Flemming):
“Quantification of ordinary chondrite shock metamorphism using micro-XRD”

Bramble, Michael (summer 2013)

Undergraduate NSERC USRA / Planetary Science, University of Western Ontario

Uribe, Diego (summer 2013)

Undergraduate CSA-ASTRO Research Award, University of Western Ontario

Round, Stephanie (finished 2010; co-supervised with Roberta Flemming)

B.Sc. Geology Honours, University of Western Ontario; “Classification of meteorites by olivine unit cell using micro X-ray diffraction” –currently M.Sc. student, University of Calgary

Brown, Ross L. (finished 2006; co-supervised with Lalu Mansinha)

B.Sc. Geophysics Honours, University of Western Ontario; “Locating subsurface structures by means of Ground Penetrating Radar and Magnetometer Surveys”

Thesis examinations

Battler, Melissa (Dec 2012) Ph.D. Planetary Sciences, supervised by Banerjee and Osinski
Shankar, Bhairavi (Mar 2013) Ph.D. Planetary Sciences, supervised by Osinski

Scholarly and Professional Activities

- President, Solid Earth Section of the Canadian Geophysical Union (2013-present)
- Secretary-Treasurer, Geophysics Division of the GAC (2013-present)
- Central Rep, Planetary Division of the Geological Association of Canada (2012-present)
- Junior Representative for Canada to IAGA (International Association of Geomagnetism and Aeronomy; 2010-present)
- President, Geophysics Division of the Geological Association of Canada (2006-2013)
- Secretary, Solid Earth Section of the Canadian Geophysical Union (2009-2013)

- Guest Editor of the January 2013 special issue of the Canadian Journal of Earth Sciences, in “Planetary Geology and Geophysics: Canadian Contributions” (with Marie-Claude Williamson, Paul Sylvester, Steve Grasby, and Richard L veill )
- Guest Editor, Precambrian Research special issue “Endings and Beginnings: Paleogeography of the Precambrian-Cambrian transition,” July 2006 (with B. Murphy and C. MacNiocail)

- Submission of several new meteorite descriptions to the Meteoritical Society for official recognition, including Grimsby (H5), Wood Lake (H4), Lovina (ataxite), NWA 2221 (Ureilite), NWA 2202 (Polymict Eucrite), NWA 1685 (LL4 polymict breccia).

- 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 participants.
- Convenor of a session for the Winnipeg GAC-MAC meeting (May, 2013) entitled: “Paleogeodynamics of the Earth Before Pangea.”
- Co-convenor of session for the CGU meeting (May, 2011) with Claire Samson (Carleton) entitled: “Meteorites and planetary materials.”
- Co-convenor of four sessions at the Toronto Joint AGU-GAC-MAC-CGU meeting (May, 2009): two in tectonophysics and two in planetary science.

- Convenor of a session for the CGU meeting (Banff, May 2008) with P. Audet (UBC) entitled: “Solid Earth Geophysics Review.”
- Organizer of the Planetary Science Research Symposium (London, Ontario, Nov 2007) with P. Brown (UWO), a one-day meeting of Planetary Scientists from across Canada.
- Convenor of a session for the CGU-CMOS-AMS Joint meeting (St. John’s, May 2007) with J. P. Hodych (Memorial U): “Paleomagnetism, rock magnetism and geomagnetism.”
- Convenor of a session for the AGU-CGU Joint meeting (Montreal, 2004) with B. Murphy (St. Francis Xavier) and Conall MacNiocaill (Oxford) called: “Endings and beginnings: Paleogeography, life and climate of the terminal Neoproterozoic through Cambrian time.” Also at same meeting co-chair of the AGU Union session: “Extreme environments of the Precambrian Earth.”
- Judge for Student best paper awards for the GAC Geophysics Division at the GAC/MAC annual meetings 2004-2013; for CGU Solid Earth Section at 2010-2013 meetings, and for various student best presentation and paper awards at the Atlantic Universities Geological Conference (AUGC-undergraduate) in 2005 and 2006.
- Numerous public lectures and “Open House” activities; Outreach contributions include articles, public presentations and school visits on the Grimsby meteorite, the Tagish Lake meteorite as well as lectures on other meteorite and planetary studies (see below).
- Mentorship of graduate students: C. Fry (with C. Sampson and R. Herd, Carleton); C. Charles (with D. Davis, U of T); M.R.M. Izawa (with R. Flemming and N. Banerjee, Western); A. Singleton (with G. Osinski and D. Moser, Western); K. van Dronghelen, (with K. Tait, U of T).
- Tagish Lake meteorite “sidebar” chapter contribution to the Canadian-version textbook: “Earth, An Introduction to Physical Geology,” by Tarbuck, Lutgens and Tsujita (2004).

Contributions to Research

...by the Numbers...	Total	Lead AU	citations (McCausland PJ*)
Refereed Journal articles:	37	10	total ~570; H=9
Refereed other publications:	5	3	
Articles submitted / in revisions:	1	0	
Conference abstracts:	80	37	

Refereed Journal Publications

2013

Fry, C., Melanson, D., Samson, C., McCausland, P.J.A., Herd, R.K., Ernst, R.E., Umoh, J. and Holdsworth, D.W. 2013. Physical characterization of a suite of Buzzard Coulee H4 chondrite fragments. *Meteoritics and Planetary Science* v 48, pp 1-13, doi: 10.1111/maps.12130

Jin, J., Harper, D.A.T., Cocks, L.R.M., McCausland, P.J.A., Rasmussen, C.M.Ø. and Sheehan, P.M. 2013. Locating the Late Ordovician equator in Laurentia using palaeobiological and palaeomagnetic data. *Geology* v 41, pp 107-110; doi:10.1130/G33688.1 [highlighted in: Editor’s Choice, *Science* Dec 14, 2012]

McCausland P.J.A., Flemming, R.L., Wilson, G.C., Renaud, J., Dillon, D. and Holdsworth, D.W. 2013. The Wood Lake, Ontario H4 ordinary chondrite, a new Canadian meteorite. *Canadian Journal of Earth Sciences* v 50, pp 32-43.

Wilson, G.C. and McCausland, P.J.A. 2013. Canadian meteorites: a brief review. *Canadian Journal of Earth Sciences* v 50, pp 4-13.

2012

Bazhenov, M.L., Levashova, N.M., Degtyarev, K.E., Van der Voo, R., Abrajevitch, A.V. and McCausland, P.J.A. 2012. Unravelling the Early-Middle Paleozoic paleogeography of Kazakhstan on the basis of Ordovician and Devonian paleomagnetic results. *Gondwana Research* v. 22, pp. 974 – 991.

Torsvik, T.H., Van der Voo, R., Preeden, U. and ten others. 2012. Phanerozoic Polar Wander, Paleogeography and Dynamics. *Earth Science Reviews* v. 114, pp 325-368.

Pisarevsky, S.A., McCausland, P.J.A., Hodych, J.P., O'Brien, S., Tait, J.A. and Murphy, J.B. 2012. Paleomagnetic study of the Late Neoproterozoic Bull Arm and Crown Hill Formations (Musgravetown Group) of eastern Newfoundland: implications for Avalonia and West Gondwana paleogeography. *Canadian Journal of Earth Sciences* v. 49, 308-327.

2011

Singleton, A.C., Osinski, G.R., McCausland, P.J.A., Moser, D. 2011. Shock induced changes in density and porosity in shock metamorphosed crystalline rocks, Haughton impact structure, *Meteoritics and Planetary Science* v. 46, pp 1774-1786, doi: 10.1111/j.1945-5100.2011.01290.x

McCausland, P.J.A., Samson, C. and McLeod, T. 2011. Meteorite Small Fragment Bulk Density via Visible Light 3D Laser Imaging, *Meteoritics and Planetary Science* v. 46, pp 1097-1109, doi: 10.1111/j.1945-5100.2011.01217.x

Brown, P.G., McCausland, P.J.A., Fries, M., Silber, E., Edwards, W.N., Wong, D.K., Wiegert, P., Weryk, R.J., Fries, J. and Krzeminski, Z. 2011. The Fall of the Grimsby Meteorite - I: Fireball dynamics and orbit from radar, video and infrasound records. *Meteoritics and Planetary Science* v. 46, pp 339-363, doi: 10.1111/j.1945-5100.2010.01167.

McCausland, P.J.A., Hankard, F., Van der Voo, R. and Hall, C.M. 2011. Ediacaran paleogeography of Laurentia: Paleomagnetism and ⁴⁰Ar-³⁹Ar geochronology of the 583 Ma Baie des Moutons syenite, Quebec. *Precambrian Research*, v. 187, pp 58-78, doi: 10.1016/j.precamres. 2011.02.004.

Izawa, M.R.M., Flemming, R.L., Banerjee, N.R. McCausland, P.J.A. 2011. Micro X-ray diffraction (μ XRD) assessment of shock stage in enstatite chondrites, *Meteoritics and Planetary Science*, v. 46, pp 638-651, doi: 10.1111/j.1945-5100.2011.01180.x

2010

Izawa, M.R.M., Flemming, R.L., King, P.L., Peterson, R.C. and McCausland, P.J.A. 2010. Mineralogical and spectroscopic investigation of the Tagish Lake carbonaceous chondrite by X-ray diffraction and infrared reflectance spectroscopy, *Meteoritics and Planetary Science*, doi: 10.1111/j.1945-5100.2010.01043.

Izawa, M.R.M., Flemming, R.L., McCausland, P.J.A., Southam, G., Moser, D.E. and Barker, I.R. 2010. Multi-technique investigation reveals new mineral, chemical and textural heterogeneity in the Tagish Lake C2 chondrite. *Planetary and Space Science*, v. 58, pp 1347-1364.

van Drongelen, K., Tait, K., Clark, G. and McCausland, P.J.A. 2010. Petrographic and geochemical analysis of the Shelburne meteorite, an L5 ordinary chondrite fall. *Journal of the Royal Astronomical Society of Canada*, v. 104, pp 132-141.

Izawa, M.R.M., King, P.L., Flemming, R.L., Peterson, R.C. and McCausland, P.J.A. 2010. Mineralogical and spectroscopic investigation of enstatite chondrites by X-ray

diffraction and infrared reflectance spectroscopy, *Journal of Geophysical Research – Planets*, v. 115. doi:10.1029/2009JE003452

2009

McCausland, P.J.A. and Plotkin, H. 2009. The 1904 Shelburne (Ontario) L5 chondrite fall, revisited. *Journal of the Royal Astronomical Society of Canada*, v. 103, pp 181-188.

Symons, D.T.A., Kawasaki, K. and McCausland, P.J.A. 2009. The Yukon-Tanana terrane: Part of North America at ~215 Ma from paleomagnetism of the Taylor Mountain batholith, Alaska. *Tectonophysics*, v. 465, pp 60-74.

Beech, M., Coulson, I.M., Nie, W. and McCausland, P.J.A. 2009. The thermal and physical characteristics of the Gao Guenie (H5) Meteorite, *Planetary and Space Science*, v. 57, pp 764-770.

2008

Murphy, J.B., McCausland, P.J.A., O'Brien, S.J., Pisarevsky, S. and Hamilton, M.A. 2008. Age, geochemistry and Sm-Nd isotopic signature of the 0.76 Ga Burin Group: Compositional equivalent of Avalonian basement? *Precambrian Research*, v. 165, 37-48.

Abrajevitch, A., Van der Voo, R., Bazhenov, M.L., Levashova, N.M. and McCausland, P.J.A. 2008. The role of the Kazakhstan orocline in the late Paleozoic amalgamation of Eurasia. *Tectonophysics*, v. 455, pp 61-76.

2007

McCausland, P.J.A., Van der Voo, R. and Hall, C.M. 2007. Circum-Iapetus paleogeography of the Precambrian-Cambrian transition with a new paleomagnetic constraint from Laurentia. *Precambrian Research*, v. 156, pp 125-152.

Edwards, W.N., Eaton, D.W., McCausland, P.J.A., ReVelle, D.O. and Brown, P.G. 2007. Calibrating infrasonic to seismic coupling using the Stardust Sample Return Capsule shockwave: Implications for seismic observations of meteors. *Journal of Geophysical Research - Planets*, v. 112, doi:10.1029/2006JB004621.

Levashova, N., Mikolaichuk, A.V., McCausland, P.J.A., Bazhenov, M.L. and Van der Voo, R. 2007. Devonian paleomagnetic results from the North Tien Shan and their implications for the paleogeography of Kazakhstan's tectonic units with respect to Baltica. *Earth and Planetary Science Letters*, v. 257, pp 104-120.

2006

McCausland, P.J.A., Symons, D.T.A., Hart, C.J.R., and Blackburn, W.H. 2006. Assembly of the northern Cordillera: New paleomagnetic evidence for coherent, moderate Jurassic to Eocene motion of the Intermontane Belt and Yukon-Tanana terranes. In *Geological Association of Canada Special Paper 46: Paleogeography of the North American Cordillera: Evidence For and Against Large-Scale Displacements*, pp 145-168.

Symons, D.T.A., and McCausland, P.J.A. 2006. Paleomagnetism of the Fort Knox stock, Alaska, and rotation of the Yukon-Tanana terrane after 92.5 Ma. *Tectonophysics*, v. 419, pp 13-26.

McCausland, P.J.A., Murphy, J.B., and MacNiocaill, C. 2006. Preface: Endings and beginnings: Paleogeography of the Precambrian-Cambrian transition. *Precambrian Research*, v. 147, pp 187-192; doi:10.1016/j.precamres.2006.01.014.

McCausland, P.J.A., Brown, P.G., and Wilson, G.C. 2006. The Dresden (Ontario) H6 chondrite, Part II: Classification, estimated fireball trajectory, and possible origin. *Journal of the Royal Astronomical Society of Canada*, v. 100, pp 104-113.

Hildebrand, A.R., McCausland, P.J.A., Brown, P.G., Longstaffe, F.J., Russell, S.D.J., Tagliaferri, E., Wacker, J.F., and Mazur, M.J. 2006. The fall and recovery of the Tagish Lake meteorite. *Meteoritics and Planetary Science*, v. 41, pp 407-431.

2005 & before

McCausland, P.J.A., Symons, D.T.A., and Hart, C.J.R. 2005. Rethinking "Yellowstone in Yukon" and Baja British Columbia: Paleomagnetism of the Late Cretaceous Swede Dome stock, northern Canadian Cordillera. *Journal of Geophysical Research – Solid Earth*, v. 110, B12107, doi:10.1029/2005JB003742.

Symons, D.T.A., Harris, M.J., McCausland, P.J.A., Blackburn, W.H., and Hart, C.J.R. 2005. Mesozoic-Cenozoic Paleomagnetism of the Intermontane and Yukon-Tanana Terranes, Canadian Cordillera. *Canadian Journal of Earth Sciences*, v. 42, pp 1163-1185.

Symons, D.T.A., Hart, C.J.R., Harris, M.J., and McCausland, P.J.A. 2004. Paleomagnetism of the Eocene Flat Creek Pluton, Yukon: Tectonics of the Intermontane Terrane and Mackenzie Mountains. In Sussman, A.J, and Weil, A.B., eds. *Orogenic Curvature: Integrating paleomagnetic and structural analyses*, *Geological Society of America Special Paper 383*, pp 187-204.

Symons, D.T.A., Erdmer, P., and McCausland, P.J.A. 2003. A new cratonic North American paleomagnetic pole from the Yukon shows post-Eocene mobility of the Canadian Cordilleran terranes. *Canadian Journal of Earth Sciences*, v. 40, pp 1321-1334.

Cawood, P.A., McCausland, P.J.A., and Dunning, G.R. 2001. Opening Iapetus: Constraints from the Laurentian margin in Newfoundland. *Geological Society of America Bulletin*, v. 113, pp 443-453.

Symons, D.T.A., Williams, P.R., McCausland, P.J.A., Harris, M.J., Hart, C.J.R., and Blackburn, W.H. 2000. Paleomagnetism and geobarometry of the Big Creek batholith suggests that the Yukon-Tanana terrane has been a parautochthon since Early Jurassic. *Tectonophysics*, v. 326, pp57-72.

Brown, P.G., and 21 others. 2000. The Fall, recovery, orbit, and composition of the Tagish Lake meteorite: A new type of Carbonaceous Chondrite. *Science*, v. 290, pp 320-325.

McCausland, P.J.A., and Hodych, J.P. 1998. Paleomagnetism of the 550 Ma Skinner Cove volcanics of western Newfoundland and the opening of the Iapetus Ocean. *Earth and Planetary Science Letters*, v. 163, pp 15-29.

Refereed Government & Other Publications

Plint, A.G., Tyagi, A., McCausland, P.J.A., Krawetz, J.R., Zhang, H., Roca, X., Hu, G., Varban, B., Kreitner, M.A. and Hay, M.J. 2011. Dynamic relationship between subsidence, sedimentation, and unconformities in middle Cretaceous, shallow-marine strata of the Western Canada Foreland Basin and their possible tectonic causes, in: *Recent Advances in Tectonics of Sedimentary Basins*, C. Buxby and A. Azor, Eds. Wiley-Blackwell, Oxford.

McCausland, P.J.A. 2006. Fine-scale remanence carriers within granitoid rocks. *Institute for Rock Magnetism Quarterly*, v. 16 (1), pp 2,11.

Symons, D.T.A., Harris, M.J., Hart, C.J.R., and McCausland, P.J.A. 2006. Paleomagnetism of the ~91 Ma Deadman pluton: Post-mid-Cretaceous tectonic motion in central Yukon. *Yukon Exploration and Geology 2005*, pp 299-313.

McCausland, P.J.A., Symons, D.T.A., Hart, C.J.R., and Blackburn, W.H. 2002. Paleomagnetism and geobarometry of the Granite Mountain batholith, Yukon: Minimal

geotectonic motion of the Yukon-Tanana Terrane relative to North America. *Yukon Exploration and Geology* 2001, pp 163-177.

McCausland, P.J.A., Symons, D.T.A., Hart, C.J.R., and Blackburn, W.H. 2001. Paleomagnetic study of the Late Cretaceous Swede Dome stock, Yukon: Minimal geotectonic motion of the Yukon-Tanana Terrane. *Yukon Exploration and Geology* 2000, pp 207-216.

Articles Submitted to Refereed Journals

Samson, C., Butler, S., Fry, C., McCausland, P.J.A., Herd, R.K., Sharomi, O., Spiteri, R.J. and Ralchenko, M. *in revisions*. 3-D Laser images of splash-form tektites and their use in aerodynamic numerical simulations of tektite formation. *Meteoritics and Planetary Science*

Conference and Extended Abstracts (Presenter)

2013

Flemming, R.L. and McCausland, P.J.A. 2013. In situ Micro-XRD Study of the Chelyabinsk LL5 Chondrite. Meteoritical Society 76th Annual Meeting, Edmonton, AB, August 2013.

Fry, C., Ralchenko, M., McLeod, T., Samson, C., McCausland, P.J.A. and Herd, R.K. 2013. Non-destructive density measurements of five iron meteorite suites. Meteoritical Society 76th Annual Meeting, Edmonton, AB, August 2013.

Wilson, G.C., McCausland, P.J.A. and Plotkin, H. Canadian Meteorites: A Brief History. Meteoritical Society 76th Annual Meeting, Edmonton, AB, August 2013.

Jin, J., Harper, D.A.T., Cocks, L.R.M., McCausland, P.J.A., Rasmussen, C.M.Ø. and Sheehan, P.M. 2013. Locating the Late Ordovician equator in Laurentia using palaeobiological and palaeomagnetic data. Abstract: GAC-MAC annual meeting, Winnipeg, MB, May, 2013.

Ibrahim, M., McCausland, P.J.A., Brown, P.G., Umoh, J. and Holdsworth, D.W. Micro-Porosity Distribution in the Tagish Lake C2 Carbonaceous Chondrite. Abstract: GAC-MAC annual meeting, Winnipeg, MB, May, 2013.

Edey, D.R., McCausland, P.J.A., Holdsworth, D.W. and Flemming, R.L. 2013. Extended Dynamic Range Micro-Computed Tomography of Meteorites Using a Biomedical Scanner. Lunar and Planetary Science Conference XLIV, Houston, TX. March 2013.

Fry, C., Samson, C., Butler, S., McCausland, P.J.A. and Herd, R.K. 2013. 3D Laser Imaging of Tektites. Lunar and Planetary Science Conference XLIV, Houston, TX. March 2013.

2012

Charles, C.R.J., McCausland, P.J.A., Flemming, R.L. and Davis, D.W. 2012. Evaluating meteorites using LA-ICPMS: 'Lovina' test case. Abstract: V.M. Goldschmidt Conference, Montreal, QC, June, 2012.

Wilson, G.C. and McCausland, P.J.A. 2012. Canadian meteorites: a brief review. Abstract: GAC-MAC annual meeting, St. John's, NF, May, 2012.

Melanson, D., Samson, C., Herd, R.K., Fry, C., McCausland, P.J.A., Umoh, J. and Holdsworth, D.W. 2012. X-ray micro computed tomography imaging of the Buzzard Coulee chondrite. Abstract: Lunar and Planetary Science Conference XLIII, Houston, TX. March 2012.

Fry, C., Samson, C., McCausland, P.J.A. and Herd, R.K. 2012 3D Laser imaging of iron meteorites. Abstract: Lunar and Planetary Science Conference XLIII, Houston, TX. March 2012.

2011

McCausland, P.J.A. 2011. Laurentia - West Gondwana relations in the Late Neoproterozoic. Abstract: Gondwana 14, Buzios, Brazil, Sept. 2011.

Jakuboswki, T., Ott, U., Herrmann, S. and McCausland, P.J.A. Solar noble gases in Tagish Lake. Abstract: Goldschmidt 2011 Conference, Prague, August, 2011.

Charles, C.R.J., McCausland, P.J.A., Umoh, J., Holdsworth, D., Davis, D.W., Gregory, D., Tait, K. and Nicklin, I. 2011. Textures of single chondrules in CR2 chondrite NWA 801 by medical X-Ray microcomputed tomography. Abstract: Meteoritical Society 74th Annual meeting, Greenwich, UK, July, 2011.

McCausland, P.J.A. 2011. Paleogeographic setting for Laurentia's Late Neoproterozoic lapetan rifting. Abstract: GAC-MAC Annual meeting, Ottawa, May, 2011.

Fry, C., McCausland, P.J.A., Herd, R.K. and Samson, C. 2011. Physical characterization of the Buzzard Coulee H4 chondrite. Abstract: CGU Annual meeting, Banff, AB, May 2011.

McCausland, P.J.A. 2011. Magnetic susceptibility variation in the Tagish Lake C2 chondrite. Abstract: CGU Annual meeting, Banff, AB, May 2011.

McCausland, P.J.A., Flemming, R.L., and Izawa, M.R.M. 2011. Shock stage determination from the measurement of olivine and pyroxene crystalline mosaicity by in situ micro-XRD. CGU Annual meeting, Banff, AB, May 2011.

Cartwright, J.A., Herzog, G.F., Herrmann, S., Shankar, N., McCausland, P.J.A. and Ott, U. 2011. The Grimsby H chondrite: Combined noble gas and radionuclide analysis. Abstract #2686, Lunar and Planetary Science Conference XLII, Houston, TX. March 2011.

Strait M.M., Lipman M.A. and McCausland P.J.A. 2011. Visualization of porosity. Abstract #2052, Lunar and Planetary Science Conference XLII, Houston, TX. March 2011.

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McCausland, P.J.A., Flemming, R.L. and Izawa, M.R.M. 2010. Shock stage measurement in ordinary chondrites and achondrites by in situ micro-XRD. Abstract: Meteoritical Society 73rd Annual meeting, New York, July, 2010.

Izawa, M.R.M., Flemming, R.L., Banerjee, N.R., McCausland, P.J.A., Moser, D.E., Barker, I.R., Craig, M.E., Cloutis, E.A. and Matveev, S. 2010. Multimethod study of E chondrite shock. Abstract: Meteoritical Society 73rd Annual meeting, New York, July, 2010.

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McCausland, P.J.A., Brown, P.G., Holdsworth, D.W. 2010. Rapid, Reliable acquisition of meteorite volumes and internal features by laboratory X-ray Micro-CT scanning. Abstract #2584, Lunar and Planetary Science Conference XLI, Houston, TX. March 2010.

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McCausland, P.J.A. 2009. Neoproterozoic Laurentia, the elusive keystone. GSL Fermor Meeting: Rodinia –Supercontinents, Superplumes and Scotland, Edinburgh, UK, September, 2009.

Pisarevsky, S., Tait, J. and McCausland, P.J.A. 2009. Ediacaran Paleogeography: Paleomagnetic Constraints and Alternative Models. Toronto AGU-GAC-MAC-CGU Joint Assembly, May 2009.

McCausland, P.J.A., Pisarevsky, S., Jourdan, F. and Higgins, M. 2009. Laurentia at 571 Ma: Preliminary paleomagnetism and Ar-Ar age of the Ediacaran St Honore alkali intrusion, Quebec. Toronto AGU-GAC-MAC-CGU Joint Assembly, May 2009.

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McCausland, P.J.A., Smirnov, A., Evans, D.A.D., Izzard, C. and Raub, T. 2009. Low-latitude Laurentia at 615 Ma: Paleomagnetism of the Long Range Dykes and Coeval Lighthouse Cove Formation, Northern Newfoundland and SE Labrador. Toronto AGU-GAC-MAC-CGU Joint Assembly, May 2009.

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McCausland, P.J.A. 2008. Rodinia's offspring? Laurentia tectonics and paleogeography during the Precambrian-Cambrian transition Abstract, Canadian Geophysical Union Annual meeting, Banff, AB. May, 2008.

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Murphy, J.B., McCausland, P.J.A., O'Brien, S.J., Pisarevsky, S.A. and Hamilton, M.A. 2008. Geochemistry and Sm-Nd isotopic signature of the 0.76 Ga Burin Group: A compositional equivalent of the basement for Late Neoproterozoic Avalonian magmatism? Abstract, NE GSA meeting, Buffalo, NY, GSA Abstracts with Programs Vol. 40, No. 2

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2007

Plotkin, H. and McCausland, P.J.A. 2007. The L5 Shelburne meteorite revisited Abstract, Planetary Science Research Symposium 2007, London, ON. Nov. 2007

Izawa, M.R.M., Flemming, R.L. and McCausland, P.J.A. 2007. Investigation of matrix mineralogy in the Tagish Lake and Gao Guenie B carbonaceous chondrites by micro X-ray diffraction Abstract, Planetary Science Research Symposium 2007, London, ON. Nov. 2007

Brown, P.G., Sukara, E.A., Eaton, D.W., Edwards, W.N., ReVelle, D.O. and McCausland, P.J.A. 2007. The Desaguadero, Peru meteorite crater Abstract, Planetary Science Research Symposium 2007, London, ON. Nov. 2007

Kissin, S.A., Flemming, R.L., Corcoran, P., McCausland, P.J.A., and Biesinger, M. 2007. "Lovina," a new ataxite from Bali, Indonesia Abstract, Planetary Science Research Symposium 2007, London, ON. Nov. 2007

McCausland, P.J.A., Samson, C. and DesLauriers, A. 2007. Bulk densities of meteorites via visible light 3D laser imaging. Meteoritical Society 70th Annual meeting, Tucson, AZ. Aug 2007

Edwards, W.N., Eaton, D.W., McCausland, P.J.A., ReVelle, D.O. and Brown, P.G. 2007. Observations of infrasonic-seismic coupling for an artificial meteor-analog: STARDUST sample return capsule re-entry Abstract, Meteoroids 2007, Barcelona, Spain. July 2007

McCausland, P.J.A. 2007. Low-latitude Laurentia during early Ediacaran time: Preliminary paleomagnetic results from the 615 Ma Lighthouse Cove volcanics, Newfoundland Abstract, CGU-CMOS-AMS joint meeting 2007, St. John's, NFLD. June 2007

McCausland, P.J.A., Gower, C., Hodych, J.P., Patzold, R. and Tubrett, M. 2007. End of the Grenville: A new Laurentian paleopole from the 974 Ma Gilbert Bay dykes, southeastern Labrador Abstract, GAC/MAC Annual meeting 2007, Yellowknife NWT. May 2007

McCausland, P.J.A. and Flemming, R.L. 2007. Mission to planet "meteorite:" Reconnaissance sampling of the Solar System without a spacecraft Abstract, GAC/MAC Annual meeting 2007, Yellowknife NWT. May 2007

Flemming, R.L., McCausland, P.J.A., Izawa, M. and Jacques, N. 2007. Reconnaissance micro-XRD studies of meteorites: Rapid in situ mineral identification and textural information Abstract #2363, Lunar and Planetary Science Conference XXXVIII, Houston, TX. March 2007.

Izawa, M.R.M., Flemming, R.L. and McCausland, P.J.A. 2007. Investigation of the Tagish Lake carbonaceous chondrite by X-ray microdiffraction Abstract #1923, Lunar and Planetary Science Conference XXXVIII, Houston, TX. March 2007.

McCausland, P.J.A. 2007. Where was the Iapetus Ocean born? Tectonics and paleogeography of the Precambrian-Cambrian transition Abstract, GAC Newfoundland Section meeting, St. John's, NFLD, February 2007.

2006

McCausland, P.J.A. 2006. Where was the Iapetus Ocean born? Abstract, Northeastern Section, Geological Society of America, 41st Annual Meeting, Harrisburg, PA. March 2006.

McCausland, P.J.A., and Flemming, R.L. 2006. Preliminary bulk and grain density measurements of Martian, HED and other achondrite meteorites. Abstract #1574, Lunar and Planetary Science Conference XXXVII, Houston, TX. March 2006.

2005 & before

McCausland, P.J.A., Bazhenov, M.L., Van der Voo, R., Degtyarev, K.E., and Levashova, N. 2005. Paleozoic assembly of Eurasia ...with a twist: Carboniferous paleomagnetism of Zhemanty, Kandyktas block, Kazakhstan. AGU Fall meeting, San Francisco, CA. December 2005.

McCausland, P.J.A., and Van der Voo, R. 2004. Rapid, coherent Apparent Polar Wander in the terminal Neoproterozoic –Early Cambrian? Abstract, AGU Fall meeting, San Francisco, CA.

McCausland, P.J.A., Van der Voo, R., and Hall, C.M. 2004. Paleomagnetic confirmation of a low-latitude Laurentia by 534 Ma. Abstract, AGU-CGU Joint meeting, Montreal, QC.

McCausland, P.J.A., and Symons, D.T.A. 2003. Paleomagnetic constraints from six intrusions on the Mesozoic and Cenozoic geotectonic motions of the Yukon-Tanana Terrane: Key to the assembly of the northern Cordillera. Abstract, GAC/MAC 2003, Vancouver, B.C.

Symons, D.T.A., Erdmer, P., and McCausland, P.J.A. 2003. New 42 Ma cratonic North American paleomagnetic pole: Another Cordilleran Paleomagnetism-geology conundrum!. Abstract, GAC/MAC Annual meeting 2003, Vancouver, B.C.

McCausland, P.J.A., Van der Voo, R., and Brandenburg, J.P. 2003. Preliminary paleomagnetic results from Late Neoproterozoic intrusions in Quebec, Canada: Rapid apparent latitudinal motion of Laurentia. Abstract, EGU-AGU-EUG Joint meeting, Nice, France.

McCausland, P.J.A., Symons, D.T.A., and Harris, M.J. 2003. Paleomagnetic constraints on Mesozoic and Cenozoic terrane motions during the assembly of the northern Cordillera, Canada: A synthesis including new results from the pericratonic Yukon-Tanana terrane. Abstract, EGU-AGU-EUG Joint meeting, Nice, France.

McCausland, P.J.A., Symons, D.T.A., Hart, C.J.R., and Blackburn, W.H. 2001. Preliminary paleomagnetism and geothermobarometry of the Granite Mountain batholith: Minimal geotectonic motion of the Yukon-Tanana terrane relative to North America. Extended abstract, LITHOPROBE SNorCLE workshop, Victoria, BC.

McCausland, P.J.A., Harris, M.J., Symons, D.T.A., and Blackburn, W.H. 2001. A test for uplift remanence in granitoids using the Al-in-hornblende geothermobarometer. Abstract, European Geophysical Society XXVI General Assembly, Nice, France.

McCausland, P.J.A., Symons, D.T.A., Hart, C.J.R., and Blackburn, W.H. 2001. Preliminary paleomagnetism and geothermobarometry of the Granite Mountain batholith, Yukon: Uplift remanence implies minimal geotectonic motion for the Yukon-Tanana terrane. Abstract, GAC/MAC Annual meeting 2001, St. John's, Nfld.

McCausland, P.J.A., Symons, D.T.A., Hart, C.J.R., and Blackburn, W.H. 2000. Minimal geotectonic motion of the Yukon-Tanana Terrane relative to North America: Preliminary paleomagnetic results from two Late Cretaceous intrusions. Abstract # 756, Geocanada 2000, Calgary.

Cawood, P.A., McCausland, P.J.A., and Dunning, G.R. 1999. Rift-related magmatism associated with Rodinian breakup and opening Iapetus in the northeastern Appalachians. Abstract, European Union of Geosciences annual meeting, Strasbourg, France, March 1999.

McCausland, P.J.A., and Hodych, J.P. 1998. Rapid northward movement of Laurentia in the latest Neoproterozoic? Paleomagnetism of the Skinner Cove Formation of western Newfoundland. Abstract, GSA Annual meeting, Toronto, p A-111.

McCausland, P.J.A., Hodych, J.P., and Dunning, G.R. 1997. Evidence from western Newfoundland for the final breakup of Rodinia? U-Pb age and paleolatitude of the Skinner Cove volcanics. Abstract, GAC/MAC Annual meeting, Ottawa, v.22, p A-99.

McCausland, P.J.A., Hodych, J.P., and Dunning, G.R. 1996. Paleomagnetism and U-Pb age of the Skinner Cove volcanics of western Newfoundland: Implications for the late Neoproterozoic breakup of Rodinia. Abstract, Proterozoic Evolution in the North Atlantic Realm (IGCP 371) conference proceedings, p. 122.

Reviewer for:

- Geological Society of America Bulletin
- Precambrian Research
- Canadian Journal of Earth Sciences
- Geophysical Journal International
- Meteoritics and Planetary Science
- Geology
- Gondwana Research
- Economic Geology
- American Journal of Science
- Lithos
- Journal of Geochemical Exploration
- Canadian Aeronautics and Space Journal
- Journal of Volcanology and Geothermal Research
- Geological Association of Canada Special Paper "Baja BC"
- National Science Foundation

Professional Affiliations

- Canadian Geophysical Union (President, Solid Earth Section)
- Geological Association of Canada (Sec-Treas., Geophysics Division)
- Fellow, Royal Astronomical Society (Geophysics)
- American Geophysical Union (Geomagnetism and Paleomagnetism)
- Meteoritical Society
- Geological Society of America
- Mineralogical Association of Canada
- Royal Astronomical Society of Canada
- Atlantic Geoscience Society

Invited Presentations and Colloquia

2013

March 12, 2013, UWO Senior Alumni speaker series (invitation from Frank Bennett): "Topsy-turvy: Reversal of the Earth's geomagnetic poles" talk to about 270 alumni at McKellar Hall, UWO + Q&A session

2012

Nov 2, 2012: Colloquium presentation with Dr. Jisuo Jin, "Precisely locating the Ordovician equator in Laurentia using fossil and paleomagnetic data." Department of Earth Sciences, Western University

Oct 26, 2012: "Canadian meteorites: A brief review." Centre for Planetary Science & Exploration Research Forum, Western University

July 30, 2012: [Invited] "Magnetism in rocks records the motion of continents and the birth of ancient oceans: an example from the dawn of animal life" W.F. James Chair Lecture, St. Francis Xavier University

2011

March 1, 2011: [Invited] "Paleogeodynamics of the Precambrian-Cambrian transition" Department of Geology, University of Toronto

2010

Oct 1, 2010: Colloquium presentation, "Orbit and Fall of the Grimsby meteorite; Arrival of an (extra) ordinary chondrite!" Department of Earth Sciences, Western University

Outreach activities

2013

Nov 16-17, 2013, London Gem & Mineral Show: Co-organizer (with R. Flemming) of Western display booth.

October 30, 2013, Western University, Centre for Planetary Science and Exploration outreach event to Grades 5-6: "Mission to Meteorite" Event organized by N. Banerjee for 50 students from University Heights.

October 18, 2013, St. Paul's Junior High, St. John's, NFLD: "Meteorites: Falls and finds!" Guest class for 27 Grade 7 Science students.

October 16, 2013, Royal Astronomical Society of Canada, St. John's Centre: "Stalking the wild meteorite of Oman: 2013"

October 11, 2013, Oxford County Geological Society: "Reversals of the Earth's geomagnetic field: Fantastic discovery and an enduring problem"

May 3, 2013, Kitchener-Waterloo Gem & Mineral Club: "Meteorites as Essential Planetary Materials"

Feb 6, 2013, Watford Cubs (invitation from Mellissa Joris): "Meteorites and the starry sky!" Group of 25 children 5 to 9 years old.

2012

Nov 17, 2012, London Gem & Mineral Show: "Canadian Meteorites: A brief review" – two talks on Saturday and Sunday

Sept 22, 2012, International Observe the Moon Night (InOMN), Cronyn Observatory, UWO: "Observing the moon up close: Meteorites and lunar samples!" talk to over 40 people at sundown before lunar observing.

August 3, 2012, Invited talks at Gemboree! Bancroft Gem and Mineral show: "Meteorites as Essential Planetary Materials" two talks Friday & Saturday to 50+ people each time

March 16, 2012, Brantford Lapidary & Mineral Society: "Meteorites as Essential Planetary Materials"

2011

Nov 15, 2011, The Science Café series panel discussion of "Living in Space: Reaching the Final Frontier," on Wednesday at Canada South Science City, Windsor, ON.

2010

Oct 2-3, 2010: Ancaster Gem & Mineral show, two presentations "Grimsby meteorite fall" to 40+ people each time

May, 2010: Rainbow's End Metal Detecting Association, Hamilton, ON "Finding meteorites like Grimsby" meeting of 35 members.

Achievements as a student

Teaching Assistantships

Earth Sciences, University of Western Ontario

- 2nd yr field camp [mapping; Precambrian geology] G. Young, D. Lescinsky (2001)
- 3rd yr field camp [Sudbury geophysics, mapping] D. Eaton, W. Church, N. Duke (2000)
- Tectonic settings (2nd year): W. Church (1999-2001)
- Introductory geology for Engineers (1st-2nd year): R. Schincariol (1998-2000)

Earth Sciences, Memorial University of Newfoundland

- Structural Geology (2nd year): T. Calon (1997)
- Paleontology (3rd year): S.H. Williams, E. Burden (1996)
- Introductory geology (1st year): J. Hodych, G. Dunning (1995-1996)

Academic Scholarships & Awards

Ontario Graduate Scholarship (2001-2002)

Robert and Ruth Lumsden Graduate Award, University of Western Ontario (2001)

Ontario Government Scholarships for Science and Technology (1999-2000; 2000-2001)

Fellow of the School of Graduate Studies, Memorial University of Newfoundland (1997)

Best B.Sc. (Hon) thesis -Assoc. Prof. Engineers and Geoscientists of Newfoundland (1995)

H.R. Peters Award (Best honours thesis), Earth Sciences, Memorial University (1995)

Work experience

University of Western Ontario

Tagish Lake meteorite field party: Fieldwork in northwestern British Columbia to document and collect carbonaceous chondrite meteoritic material -concerning fireball interviews, field logistics, meteorite search & recovery, and field documentation (April 2000- May 2000).

University of Windsor

Research assistant: Paleomagnetic laboratory and field collection of samples in Wisconsin and Manitoba (David T.A. Symons, 1998-2000).

Geological Survey Branch, Newfoundland Department of Mines and Energy

Junior Field Assistant: Labrador -Hunt River Archean greenstone belt 1:50 000 mapping project (Project Geologist: Don James; summer 1996).

Memorial University of Newfoundland

Contract: Lab-based rock-magnetic work for Archean Resources (G. Murthy, 1996).

Research assistant: Paleomagnetic laboratory and field collection of samples in eastern Newfoundland (J.P. Hodych, 1994-1995).

Council of the Student Union: Layout and advertising design for student newspaper, *the muse*, and other publications (1994).

Afterwords Bookstore: Clerk and book buyer (A.J. McCausland, 1987-1994).