Francis A. Macdonald

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Education

Ph.D. Earth and Planetary Sciences, Harvard University, Cambridge, MA, 2009.
B.S. Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA, 2001.

Experience

- Professor of Earth and Planetary Sciences, Harvard University, Cambridge, MA, 2017-present.
- John L. Loeb Associate Professor of the Natural Sciences, Harvard University, Cambridge, MA, 2014-2017.
- Associate Professor, Harvard University, Cambridge, MA, 2013-2014.
- Assistant Professor, Harvard University, Cambridge, MA, 2009-2013.
- Research Assistant, USGS Astrogeology, Flagstaff, AZ, 2004.
- Lab Manager, Paleomagnetics Laboratory, Caltech, Pasadena, CA, 2002-2004.
- Field Technician, Aguoron Paleoproterozoic Drilling Project, South Africa, 2002-2003.
- Field Technician, Geophysical cruise ship, South Pacific, 2000-2001.
- Research Assistant, Caltech, 1999-2000.

Awards

- Exceptional Reviewer, Geology, *for consistently prompt, insightful, meticulous, and tactful reviews*, 2015.
- Fellow, Geological Society of America, 2015.
- Geological Society of America Young Scientist Award (Donath Medal), *for outstanding achievement in contributing to geologic knowledge through original research that marks a major advance in the Earth Sciences*, 2014.
- Star Family Prize for Excellence in Advising Award, Harvard College, 2012.
- Ian Hamilton Golden Brunton Award, *for excellence in field mapping*, Caltech, June 2001.

Grants & Fellowships

- International Continental Drilling Program, 02-2017: *Geological Research through Integrated Neoproterozoic Drilling (GRIND): The Ediacaran-Cambrian Transition (ECT),* 2017-present.
- NSF Geophysics, EAR-1547434: *Collaborative Research: Testing proposed rapid true polar wander in the Neoproterozoic Zavkhan Volcanics of Mongolia and the Banxi Group of South China,* 2016-present.
- Harvard University Milton Fund, *Weathering the Snowball*, 2015.
- NSF Sedimentary Geology and Paleontology, EAR-1148058*: Collaborative Research: Calibrating the Cryogenian in the Yukon,* Oct 2012-Oct 2014.

- NASA Astrobiology: Exobiology and Evolutionary Biology, NNH10ZDA001N-EXO: *Exploring Cryogenian biological and environmental change in Mongolia,* Oct 2011-Oct 2013.
- NSF Tectonics, EAR-1049463*: Collaborative Research: Comparative Studies of Circum-Arctic Neoproterozoic-Paleozoic terranes,* Jan 2011-March 2013.
- MIT-NAI Astrobiology Node, Jan 2011-present.
- External Research Partner, Yukon Geological Survey: *Defining the Neoproterozoic margin in the Yukon*, 2010-2012.
- Presidents January Innovation Fund: *Mojave Map, developing a digital mapping project for EPS 74, Field Geology*, Jan 2011-Dec 2011.
- NSF Graduate Research Fellowship, July 2005-June 2008.
- Geological Society of America Research Grant: *Neoproterozoic strata of the North Slope of Alaska*, 2005.
- Barringer Family Fund: *The geology of impact structures in Australia*, 2003.
- Thomas J. Watson Fellowship: *The geology of impact structures in Australia*, July 2001-Aug 2002.
- Summer Undergraduate Research Fellowship: *Magnetics of the Martian Meteorite ALH84001*, Caltech, July-September 1999-2000.
- NASA Fellowship, Juneau Icefield Research Program, Juneau Icefield, AK, 1997.

Publications

[*author is or was a student or postdoc working with Macdonald]

Submitted

94. Liu, C., Wang, Z., and **Macdonald, F.**, submitted. Sr and Mg isotope geochemistry of limestones in Ol formation, Mongolia: Implications for carbonate diagenesis and post-'Snowball Earth' seawater chemistry, *Chemical Geology*.
93. Anderson, R.P., McMahon, S., **Macdonald, F.A.**, Jones, D.S., and Briggs, D.E.G., submitted. Paleobiology of latest Ediacaran phosphorites from the upper Khesen Formation, Khuvsgul Group, northern Mongolia, *Journal of Systematic Paleontology*.
92. *Bold, U., Schrag, D.P., Higgins, J.A., Erdenebayar, J., and **Macdonald, F.A.**, submitted. Effect of dolomitization on isotopic records from Neoproterozoic carbonates in southwestern Mongolia, *Geological Society of America Bulletin*.
91. *Strauss, J.V., **Macdonald, F.A.**, and McClelland, W.C., 2017. Pre-Mississippian stratigraphy and provenance of the North Slope subterrane of Arctic Alaska I: Platformal rocks of the northeastern Brooks Range and their significance in circum-Arctic evolution, *Geological Society of America Special Papers*, accepted.
90. *Nelson L.L., *Strauss, J.V., Crockford, P.W., Cox, G.M., Johnson, B.G., Ward, W., Colpron, M., McClelland, W.C., and **Macdonald, F.A.**, 2017. Geochemical constraints on the provenance of pre-Mississippian sedimentary rocks in the North Slope of Yukon and Alaska, *Geological Society of America Special Papers*, accepted.
89. *Rooney, A.D., Austermann, J., *Smith, E.F., Yang, L., Selby, D., Dehler, C.M., Schmitz, M.D., Karlstrom, K.E., and **Macdonald, F.A.**, 2017. Coupled Re-Os and U-Pb geochronology of the Neoproterozoic Chuar Group, Grand Canyon, *Geological Society of America Bulletin*, accepted.

2017

88. *Eyster, A.E., Ferri, F., Schmitz, M. D., and **Macdonald, F.A.**, 2017. One diamictite and two rifts: Stratigraphy and geochronology of the Gataga Volcanics of northern British Columbia, *American Journal of Science,* accepted.
87. Moore, K.R., Bosak, T., **Macdonald, F.A.**, Du, K., Newman, S., and Pruss, S., 2017. Pyritized Cryogenian cyanobacterial fossils from Arctic Alaska, *Palaios,* accepted.
86. Anderson, R.P., **Macdonald, F.A.**, Jones, D.S., McMahon, S., and Briggs, D.E.G., 2017. Exceptionally-preserved Doushantuo-type microfossils from latest Ediacaran phosphorites of northern Mongolia, *Geology*, accepted.
85. Cox, G.M., Halverson, G.P., Denyszyn, S., Foden, J., and **Macdonald, F.A.**, 2017. Cryogenian magmatism along the northwestern margin of Laurentia: plume or rift? *Precambrian Research*, accepted.
84. **Macdonald, F.A.**, Schmitz, M.D., *Strauss, J.V., Halverson, G.P., Gibson, T.M., *Eyster, A., Cox, G., Mamrol, P., and Crowley, J.C., 2017. Cryogenian of Yukon, *Precambrian Research*, accepted.
83. Hoffman, P.F., Abbot, D.S., Ashkenazy, Y., Benn, D.I., Cohen, P.A., Cox, G.M., Creveling, J.R., Donnadieu, Y. Erwin, D.H., Fairchild, I.J., Ferreira, D., Goodman, J.C., Halverson, G.P., Jansen, M.F., Le Hir, G., Love, G.D., **Macdonald, F.A.**, Maloof, A.C., Ramstein, G., Rose, G.E.J., Rose, C.V., Tziperman, E., Voigt, A., and Warren, S.G., 2017. Climate dynamics of Snowball Earth and Cryogenian geology–geobiology, *Science Advances,* accepted.
82. Pruss, S.B., Dwyer, C.H., *Smith, E.F., **Macdonald, F.A**, and Tosca, N.J., 2017. Early Cambrian phosphatized archaeocyathans and small shelly fossils (SSFs) of southwestern Mongolia, *Palaeogeography, Palaeoclimatology, Palaeoecology*, accepted.
81. Swanson-Hysell, N.L. and **Macdonald, F.A.**, 2017. Tropical weathering of the Taconic orogeny as a driver for Ordovician cooling, *Geology,* G38985. 1.
80. *Smith, E.F., **Macdonald, F.A.**, *Petach, T.A., and *Bold, U., 2017. Integrated stratigraphic, geochemical, and paleontological late Ediacaran to early Cambrian records from southwestern Mongolia: Reply, *Geological Society of America Bulletin*, doi:10.1130/B31763.1.
79. **Macdonald, F.A.**, Karabinos, P., Crowley, J.L., *Hodgin, E., Crockford, P.W., and Delano, J., 2017. Bridging the gap between the foreland and the hinterland II: Geochronology and tectonic setting of Ordovician magmatism and basin formation on the Laurentian margin of New England and Newfoundland, *American Journal of Science*, 371 (May), 555-596.
78. Karabinos, P., **Macdonald, F.A.**, and Crowley, J.L., 2017. Bridging the gap between the foreland and the hinterland I: Geochronology and tectonic setting of the hinterland of New England, *American Journal of Science*, 371 (May), 515-554.
77. Yang, J., Jansen, M.F., **Macdonald, F.A.,** and Abbot, D.S., 2017. Persistence of a freshwater layer in the surface ocean after Snowball Earth, *Geology*, doi:10.1130/G38920.1.
76. **Macdonald, F.A.** and Wordsworth, R., 2017. Initiation of Snowball Earth with volcanic sulfur aerosol emissions, *Geophysics Research Letters,* 44, doi:10.1002/2016GL072335.
75. Miller, A.J., *Strauss, J.V., Halverson, G.P., **Macdonald, F.A.**, Johnston, D.T., and Sperling, E.A., 2017. Tracking the onset of Phanerozoic-style redox-sensitive trace metal enrichment: New data from basal Ediacaran post-glacial strata in NW Canada, *Chemical Geology,* doi:10.1016/j.chemgeo.2017.03.010.

74. Moore, K.R., Bosak, T., **Macdonald, F.A.**, Lahr, D.J.G., Newman, S., Settens, C., and Pruss, S.B., 2017. Biologically agglutinated eukaryotic microfossils from Cryogenian cap carbonates, *Geobiology*, 1-17.
73. Lau, K.V., **Macdonald, F.A.**, Maher, K., and Payne, J.L., 2017. Uranium isotope evidence for temporary ocean oxygenation in the aftermath of the Sturtian Snowball Earth, *Earth and Planetary Science Letters*, 458, 282-292.

2016

72. Anderson, R.P., McMahon, S., *Bold, U., **Macdonald, F.A.**, and Briggs, D.E.G., 2016. Palaeobiology of the early Ediacaran Shuurgat Formation, Zavkhan Terrane, south-western Mongolia, *Journal of Systematic Paleontology*, 1-22.
71. *Pu, J., Bowring, S.A., Ramezani, J., Myrow, P., Landing, E., Raub, T.D., Mills, A., *Hodgin, E.B., and **Macdonald, F.A.**, 2016. Dodging Snowballs: Geochronology of the Gaskiers glaciation and the first appearance of the Ediacaran biota, *Geology*, 44 (11), 955-958.
70. *Smith, E.F., *Nelson, L.L., Strange, M.A., *Eyster, A.E., Roland, S.M., Schrag, D.P., and **Macdonald, F.A.**, 2016. The end of the Ediacaran: Two new exceptionally preserved body fossil assemblages from Mount Dunfee, Nevada, USA, *Geology,* 44 (11), 911-914.
69. *Bold, U., Crowley, J.L., *Smith, E.F., Sambuu, O., and **Macdonald, F.A.**, 2016. Neoproterozoic to early Paleozoic tectonic evolution of the Zavkhan terrane of Mongolia: Implications for continental growth in the Central Asian orogenic belt, *Lithosphere*, L549-1.
68. Kilian, T.M., Swanson-Hysell, N.L., *Bold, U., Crowley, J.L., and **Macdonald, F.A.**, 2016. Paleomagnetism of the Teel basalts from the Zavkhan terrane: Implications for Paleozoic paleogeography in Mongolia and growth of continental crust, *Lithosphere*, L552-1.
67. *Eyster, A.E., Fu, R., *Strauss, J.V., Weiss, B.P., Roots, C.F., Halverson, G.P., Evans, D.A.D., and **Macdonald, F.A.**, 2016. Paleomagnetic evidence for a large rotation of the Yukon block relative to Laurentia: Implications for a low-latitude Sturtian glaciation and the breakup of Rodinia, *Geological Society of America Bulletin*, B31425-1.
66. Cox, G. M., Halverson, G. P., Stevenson, R.S., Théou-Hubert, L., Vokaty, M., Poirier, A., Kunzmann, M., Li, Z-X, *Strauss, J.V., and **Macdonald, F.A.**, 2016. Conginental flood basalt weathering as a trigger for Neoproterozoic Snowball Earth, *Earth and Planetary Science Letters*, 446, p. 89-99.
65. Jagoutz, O., **Macdonald, F.A.**, and Royden, L., 2016. Low-latitude arc-continent collision as a driver for global cooling, *Proceedings of the National Academy of Sciences*, 113(18), p. 4935-4940.
64. *Bold, U., *Smith, E.F., *Rooney, A.D., Bowring, S.A., Dudás, F.Ö., Ramezani, J., Buchwaldt, R., Crowley, J.C., Schrag, D.P., and **Macdonald, F.A.**, 2016. Neoproterozoic stratigraphy of the Zavkhan terrane of Mongolia: The backbone for Cryogenian and early Ediacaran chemostratigraphic records, *American Journal of Science*, 316, p. 1-63.
63. Crockford, P.W., Cowie, B.R., Johnston, D.T., Hoffman, P.F., Sugiyama, I., Pellerin, A., Bui, T.-H., Hayles, J., Halverson, G.P., **Macdonald, F.A.**, and Wing, B.A., 2016. Triple oxygen and multiple sulfur isotope constraints on the evolution of the post-Marinoan sulfur cycle, *Earth and Planetary Science Letters*, 435, p. 74-83.
62. Sperling, E.A., Carbonne, C., *Strauss, J.V., Johnston, D.T., Narbonne, G.M., and **Macdonald, F.A.**, 2016. Oxygen, facies, and secular controls on the appearance of

Cryogenian and Ediacaran body and trace fossils in the Mackenzie Mountains of northwestern Canada, *Geological Society of America Bulletin,* 128(3-4), p. 558-575.

2015

61. *Smith, E.F., *Petach, T.A., *Bold, U., Schrag, D.P., and **Macdonald, F.A.**, 2015. Integrated stratigraphic, geochemical, and paleontological late Ediacaran to early Cambrian records from southwestern Mongolia, *Geological Society of America Bulletin*, 128(3-4), p. 442-468.
60. *Strauss, J.V., **Macdonald, F.A.**, Halverson, G.P., Tosca, N.J., Schrag, D.P., and Knoll, A.H., 2015. Stratigraphic evolution of the Neoproterozoic Callison Lake Formation: Linking the break-up of Rodinia to the Islay carbon isotope excursion, *Amercian Journal of Science*, 315, p. 881-944.
59. Condon, D.J., Boggani, P., Fike, D., Halverson, G.P., Kasemann, S., Knoll, A., **Macdonald, F.A.**, Prave, A.R., and Zhu, M., 2015. Accelerating Neoproterozoic Research through Scientific Drilling, *Scientific Drilling*, 19, p. 17-25.
58. Cohen, P.A., and **Macdonald, F.A.**, 2015. The Proterozoic record of eukaryotes, *Paleobiology*, 41(4), p. 610-632.
57. Sperling, E.A., Wolock, C., Morgan, A.S., Gill, B.C., Halverson, G.P., **Macdonald, F.A.**, Knoll, A.H., and Johnston, D.T., 2015. Statistical analysis of iron geochemical data suggests limited late Proterozoic oxygenation, *Nature*, 523(7561), p. 451-454.
56. *Rooney, A.D., *Strauss, J.V., Brandon, A.D., and **Macdonald, F.A.**, 2015. A Cryogenian chronology: Two long-lasting, synchronous Neoproterozoic glaciations, *Geology,* 43(5), p. 459-462.
55. **Macdonald, F.A.**, Ryan-Davis, J., Coish, R.A., Crowley, J.C., and Karabinos, P., 2015. Forum Reply, *Geology*, 42(6), p. 539-542.
54. Cox, G.M., *Strauss, J.V., Halverson, G.P., Stevenson, R.S., Schmitz, M.D., McClelland, W.C., and **Macdonald, F.A.**, 2015. Kikiktat Volcanics of Arctic Alaska – Melting of harzburgitic sub-continental lithospheric mantle associated with the Franklin Large Igneous Province, *Lithosphere*, L435-1.
53. Carbone, C., Narbonne, G.M., **Macdonald., F.A.**, and Boag, T., 2015. New Ediacaran fossils from the uppermost Blueflower Formation, northwest Canada: Disentangling biostratigraphy and paleoecology, *Journal of Paleontology*, 89(02): 281-291.
52. *Smith, E.F., **Macdonald, F.A.**, Crowley, J.C., and *Hodgin, E.B., 2015. Tectonostratigraphic evolution of the c. 780-730 Ma Beck Spring Dolomite: Basin Formation in the core of Rodinia, in: Li, Z. X., Evans, D.A.D. & Murphy, J. B. (eds) *Supercontinent Cycles Through Earth History*. Geological Society, London, Special Publications, SP424-6.
51. Cohen, P.A., **Macdonald, F.A.**, Pruss, S.B., Matys, E., and Bosak, T., 2015. Fossils of putative marine algae from the Cryogenian glacial interlude of Mongolia, *Palaios*, 30(3), p. 238-247.

2014

50. *Strauss, J.V., Roots, C.F., **Macdonald, F.A.**, Halverson, G.P., *Eyster, A.E., and Colpron, M., 2014. Geological map of the Coal Creek Inlier, Ogilvie Mountains (NTS 116B/10-15 and 116C/9,16) (1:100,000 scale), Yukon Geological Survey, Open File 2014-15.

49. Liu, C., Wang, Z., Raub, T., **Macdonald, F.A.**, and Evans, D.A.D., 2014. Neoproterozoic cap dolostone deposition in a stratified glacial meltwater plume, *Earth & Planetary Science Letters*, 404, p. 22-32.
48. *Strauss, J.V., *Rooney, A.D., **Macdonald, F.A.**, Brandon, A.D., and Knoll, A.H., 2014. 740 Ma vase-shaped microfossils from Yukon, Canada: Implications for Neoproterozoic chronology and biostratigraphy, *Geology*, 42(8), p. 659-662.
47. **Macdonald, F.A.**, Ryan-Davis, J., Coish, R.A., Crowley, J.C., and Karabinos, P., 2014. A newly identified Gondwanan terrane in the Northern Appalachian Mountains: Implications for the Taconic orogeny and closure of the Iapetus Ocean, *Geology*, 42(6), p. 539-542.
46. **Macdonald, F.A.**, Pruss, S.B., and *Strauss, J.V., 2014. Trace fossils with spreite from the late Ediacaran Nama Group, Namibia: Complex feeding patterns five million years before the Ediacaran-Cambrian boundary, *Journal of Paleontology*, 88(2), p. 299-308.
45. Kunzmann, M., Halverson, G.P., **Macdonald, F.A.**, Hodgskiss, M., Sansjofre, P.D., Schumann, D., and Rainbird, R.H., 2014. The early Neoproterozoic Chandindu Formation of the Fifteenmile Group in the Ogilvie Mountains. In: *Yukon Exploration Geology 2014*, MacFarlane, K.E., Nordling, M.G. and Sack, P.J., Editors, Yukon Geological Survey, p. 93-107.
44. *Rooney, A.D., **Macdonald, F.A.**, Dudás, F.Ö., Hallmann, C., *Strauss, J.V., and Selby, D., 2014. Re-Os geochronology and coupled Os-Sr isotope constraints on the Sturtian Snowball Earth, *Proceedings of the National Academy of Sciences,* 111(1): 51-56.

2013

43. *Bold, U., **Macdonald, F.A.**, *Smith, E.F., Crowley, J.L., and Minjin, C., 2013, Elevating the Neoproterozoic Tsagaan-Olom Formation to a Group, *Mongolian Geoscientist*, 39 (5): 1-6.
42. Cox, G. M., Halverson, G. P., Minarik, W. G., Le Heron, D. P., **Macdonald, F. A.**, Bellefroid, E. J., and *Strauss, J. V., 2013. Neoproterozoic Iron Formation: An evaluation of its temporal, environmental and tectonic significance, *Chemical Geology*, 362: 232-249.
41. Bosak, T., Mariotti, G., **Macdonald, F.A.**, Perron, J.T., and Pruss, S.B., 2013. Microbial sedimentology of stromatolites in Neoproterozoic cap carbonates, in: *Ecosystems Paleobiology and Geobiology, Paleontological Special Papers, v. 19,* Bush, A.M, Pruss, S.B., Payne, J.L., Editors, The Paleontological Society, 1-25.
40. *Strauss, J.V., **Macdonald, F.A.**, Taylor, J.F., Repetski, J.E., and McClelland, W.C., 2013. Laurentian origin for the North Slope of Alaska: Implications for the tectonic evolution of the Arctic, *Lithosphere*, 5 (5), 477-482.
39. Johnston, D.T., Poulton, S.W., Tosca, N.J., O'Brien, T.O., Halverson, G.P., Schrag, D.P., and **Macdonald, F.A.**, 2013. Searching for an oxygenation event in the fossiliferous Ediacaran of northwestern Canada, *Chemical Geology,* 362: 273-286.
38. **Macdonald, F.A.**, *Strauss, J.V., Sperling, E., Halverson, G.P., Narbonne, G.M., Johnston, D.T., Kunzmann, M., Schrag, D.P., and Higgins, J.A., 2013. The stratigraphic relationship between the Shuram carbon isotope excursion, the oxygenation of Neoproterozoic oceans, and the first appearance of the Ediacara biota and bilaterian trace fossils in northwestern Canada, *Chemical Geology,* 362: 250-272.
37. **Macdonald, F.A.**, Prave, A.R., *Petterson, R., *Smith, E.F., Pruss, S.B., Oates, K., *Waechter, F., *Trotzuk, D., and Fallick, A.E, 2013. The Laurentian record of

Neoproterozoic glaciation, tectonism, and eukaryotic evolution in Death Valley, California, *Geological Society of America Bulletin,* 125 (7-8): 1203-1223.

36. Sperling, E.A., Knoll, A.H., Halverson, G.P., **Macdonald, F.A.**, and Johnston, D.T., 2013. A basin redox transect at the dawn of animal life, *Earth and Planetary Science Letters*, 371-372: 143-155.
35. Gibson, T.M., Myrow, P., **Macdonald, F.A.**, and Minjin, C., 2013. Depositional history, tectonics, and detrital zircon geochronology of Ordovician and Devonian strata in southwestern Mongolia, *Geological Society of America Bulletin*, 125: 877-893.
34. Cox, G.M., Roots, C.F., Halverson, G.P., Minarik, W.G., **Macdonald, F.A.**, and Hubert-Theou, L., 2013. Mount Harper Volcanic Complex, Ogilvie Mountains: A far-flung occurrence of the Franklin Igneous Event?, in *Yukon Exploration Geology 2012*, MacFarlane, K.E., Nordling, M.G. and Sack, P.J., Editors. Yukon Geological Survey: Whitehorse, p. 19-36.
33. Ashkenazy, Y., Gildor, H., Losch, M., **Macdonald, F. A.**, Schrag, D. P., and Tziperman, E., 2013. Dynamics of a snowball ocean, *Nature*, 495: 90-93.
32. Dalton, L.A., Bosak, T., **Macdonald, F.A.**, Lahr, D.J.G., and Pruss, S.B., 2013. Preservational and morphological variability of assemblages of agglutinated eukaryotes in Cryogenian cap carbonates of northern Namibia. *Palaios,* 28: 67-79.
31. Schrag, D.P., Higgins, J.A., **Macdonald, F.A.**, and Johnston, D.T., 2013. Authigenic carbonate and the history of the global carbon cycle, *Science*, 239: 540-543.

2012

30. **Macdonald, F.A.**, Halverson, G.P., *Strauss, J.V., *Smith, E.F., Cox, G.M., Sperling, E.A., and Roots, C.F., 2012. Early Neoproterozoic basin formation in the Yukon, Canada: Implications for the make-up and break-up of Rodinia. *Geoscience Canada,* 39: 77-99.
29. Johnston, D.T., **Macdonald, F.A.**, Gill, B.C., Hoffman, P.F., and Schrag, D.P., 2012. Uncovering the Neoproterozoic carbon cycle, *Nature*, 483(7389): 320-323.
28. Halverson, G.P., **Macdonald, F.A.**, *Strauss, J.V., *Smith, E.F., Cox, G.M., and Hubert-Theou, L., 2012. Updated definition and correlation of the lower Fifteenmile Group in the central and eastern Ogilvie Mountains, in *Yukon Exploration Geology 2011*, MacFarlane, K.E., and Sack, P.J., Editors. Yukon Geological Survey: Whitehorse, 75-90.
27. Bosak, T., Lahr, D.J.G., Pruss, S.B., **Macdonald, F.A.**, Gooday, A.J., Dalton, L., and Matys, E., 2012. Possible early foraminiferans in post-Sturtian (716-635 Ma) cap carbonates, *Geology*, 40(1): 67-70.

2011

26. Bosak, T., **Macdonald, F.A.**, Lahr, D.J.G., and Matys, E., 2011. Putative Cryogenian ciliates from Mongolia, *Geology,* 39(12): 1123-1126.
25. Bosak, T., Lahr, D.J.G., Pruss, S.B., **Macdonald, F.A.**, Dalton, L., and Matys, E., 2011. Agglutinated tests in post-Sturtian cap carbonates of Namibia and Mongolia, *Earth and Planetary Science Letters*, 308: 29-40.
24. Cohen, P.A., Schopf, J.W., Butterfield, N.J., Kudryavtsev, A., and **Macdonald, F.A.**, 2011. Phosphate biomineralization in mid-Neoproterozoic protists, *Geology*, 39(6): 539-542.
23. Tosca, N.J., **Macdonald, F.A.**, *Strauss, J.V., Johnston, D.T., and Knoll, A.H., 2011. Sedimentary talc in Neoproterozoic carbonate successions. *Earth and Planetary Science Letters,* 306: 11-22.

22. **Macdonald, F.A.**, *Smith, E.F., *Strauss, J.V., Cox, G.M., Halverson, G.P., and Roots, C.F., 2011. Neoproterozoic and early Paleozoic correlations in the western Ogilvie Mountains, Yukon, in *Yukon Exploration and Geology 2010*, MacFarlane, K.E., Weston, L.H., and Relf, C., Editors, Yukon Geological Survey: Whitehorse, p. 161-182.
21. Hoffman, P.F., **Macdonald, F.A.**, and Halverson, G.P., 2011. Chemical sediments associated with Neoproterozoic glaciation: iron formation, cap carbonate, barite and phosphorite, Ch. 5, in *The Geologic Record of Neoproterozoic Glaciations*, Arnaud, E., Halverson, G.P. and Shields-Zhou, G., Editors, Geological Society of London: London.
20. **Macdonald, F.A.**, 2011. The Tsagaan Oloom Formation, southwestern Mongolia, Ch. 29 in *The Geological Record of Neoproterozoic Glaciations*, Arnaud, E., Halverson, G.P. and Shields-Zhou, G., Editors, Geological Society of London: London.
19. **Macdonald, F.A.** and Jones, D.S., 2011. The Khubsugul Group, northern Mongolia, Ch. 30 in *The Geological Record of Neoproterozoic Glaciations*, Arnaud, E., Halverson, G.P. and Shields-Zhou, G., Editors, Geological Society of London: London.
18. **Macdonald, F.A.**, 2011. The Hula Hula Diamictite and Katakturuk Dolomite, Arctic Alaska, Ch. 34 in *The Geological Record of Neoproterozoic Glaciations*, Arnaud, E., Halverson, G.P. and Shields-Zhou, G., Editors, Geological Society: London. p. 389-396.
17. **Macdonald, F.A.** and Cohen, P.A., 2011. The Tatonduk inlier, Alaska-Yukon border, Ch. 35 in *The Geological Record of Neoproterozoic Glaciations*, Arnaud, E., Halverson, G.P. and Shields-Zhou, G., Editors, Geological Society of London: London. p. 389-396.

2010

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13. **Macdonald, F.A.** and Roots, C.F., 2010. Upper Fifteenmile Group in the Ogilvie Mountains and correlations of early Neoproterozoic strata in the northern Cordillera, in *Yukon Exploration and Geology 2009*, MacFarlane, K.E., Weston, L.H., and Blackburn, L.R., Editors, Yukon Geological Survey: Whitehorse, YT. p. 237-252.
12. Hoffman, P.F. and **Macdonald, F.A.**, 2010. Sheet-crack cements and early regression in Marinoan (635 Ma) cap dolostones: Regional benchmarks of vanishing ice-sheets? *Earth and Planetary Science Letters*, 300: 374-384.
11. **Macdonald, F.A.**, Cohen, P.A., Dudás, F.Ö., and Schrag, D.P., 2010. Early Neoproterozoic scale microfossils in the Lower Tindir Group of Alaska and the Yukon Territory, *Geology*, 38: 43-146.

2009

10. **Macdonald, F.A.**, Jones, D.S., and Schrag, D.P., 2009. Stratigraphic and tectonic implications of a new glacial diamictite-cap carbonate couplet in southwestern Mongolia. *Geology*, 37: 123-126.

9. **Macdonald, F.A.**, Schrag, D. P., McClelland, W.C., and Macdonald, W. P., 2009. Neoproterozoic glaciation on a carbonate platform margin in Arctic Alaska and the origin of the North Slope subterrane. *Geological Society of America Bulletin*, 121: 448-473.
8. **Macdonald, F.A.**, Neoproterozoic stratigraphy of Arctic Alaska and Mongolia, Ph.D. Thesis, Department of Earth and Planetary Sciences, Harvard University, 2009: Cambridge, MA. p. 179.

2005

7. **Macdonald, F.A.**, Mitchell, K., and Stewart, A.J., 2005. Amelia Creek: A Proterozoic impact structure in the Davenport Ranges, Northern Territory. *Australian Journal of Earth Sciences*, 52: 631-640.
6. **Macdonald, F.A.**, Wingate, M.T.D., and Mitchell, K., 2005. Geology and age of the Glikson impact structure, Western Australia. *Australian Journal of Earth Sciences*, 52: 641-651.
5. Milton, D.L. and **Macdonald, F.A.**, 2005. Goat Paddock, Western Australia: An impact crater near the simple-complex transition. *Australian Journal of Earth Sciences*, 2005. 52: 691-698.
4. Shoemaker, C.S. and **Macdonald, F.A.**, 2005. The Shoemaker legacy to the Australian impact record, *Australian Journal of Earth Sciences*, 52: 477-479.
3. Shoemaker, E.M., **Macdonald, F.A.**, and Shoemaker, C.S., 2005. Geology of five small Australian impact craters, *Australian Journal of Earth Sciences*, 52: 529-544.

2003

2. **Macdonald, F.A.**, Bunting, J.A., and Cina, S.E., 2003. Yarabubba – a large, deeply eroded major impact structure in the Yilgarn Craton, Western Australia, *Earth and Planetary Science Letters*, 213: 791-795.

2000

1. Weiss, B.P., Kirschvink, J.L., Baudenbacher, F.J., Vali, H., Peters, N.T., **Macdonald, F.A.**, and Wikswo, J.P., 2000. A low temperature transfer of ALH84001 from Mars to Earth, *Science*, 290: 791-795.

Teaching

Undergraduate

- EPS 21: Dynamic Earth—Geology and Tectonics through time, Fall 2011, 2012, 2013, 2015
- EPS 74/174: Field Geology, January 2011, 2012, 2013, 2015, 2017
- EPS 182: Stratigraphy and Sedimentology, Spring 2010, 2012, 2013, 2015, 2017
- EPS 189: Analytical and Field Methods in Geobiology, Spring 2011

Graduate

- EPS 274: Advanced Field Geology, January 2013, 2015
- EPS 282: Topics in Stratigraphy and Earth History, Fall 2010, 2014, 2016

Field Trips Led (associated with EPS classes)

- Spain, March 2017, EPS 182
- San Juan River, March 2015, EPS 182

- New England Appalachians, October 2011-15, EPS 21; September 2014, EPS 282r
- Newfoundland, September 2014, EPS 282r
- Mojave Desert, January 2012-2013, 2015, 2017, EPS 74/174/274
- Italy, March 2010, 2012, 2013, EPS 182
- Riverside Mountains, January 2011, EPS 74

Synergistic Activities

Committee Service

- EPS co-head tutor for undergraduate curriculum, 2014-present
- EPS search committees, 2013-present
- NSF Sedimentary Geology and Paleontology panel, 2013
- EPS Undergraduate Curriculum Committee, 2010-present
- EPS Collections Committee, 2010-present
- EPS Colloquium Committee, 2010-2015

Field Trips Led (independent of those associated with EPS classes)

- Death Valley, AGU & Neoproterozoic Stratigraphic Subcommission, Dec 2014
- Death Valley, NASA MIT Astrobiology Node, Jan 2014, https://vimeo.com/98359223
- Hawaii, Harvard undergraduate field trip, Aug 2011
- Taconic Foreland, New York, Harvard graduate students, April 2011
- Maine, Harvard undergraduate Geoclub field trip, Oct 2005
- Northwest Australia, Caltech's Mike Scott field trip (with Joe Kirschvink), Aug 2004
- Meteor Crater, AZ, Caltech Planetary Science students, May 2004

Symposia and Sessions Organized

- Evaluating tectonic and volcanic forcing of Earth's climate, AGU, 2017
- Integrating complementary records of Paleozoic orogenies in the Appalachians: Bridging the foreland and hinterland, NEGSA, 2016
- Neoproterozoic glaciations, uniting data and models, AGU, 2014
- The Ediacaran-Cambrian ecosphere (r)evolution: Emerging records from Central and East Asia, GSA, 2014
- Paul Hoffman: A life in Earth History and Tectonics, GSA, 2013
- A world in transition: Geobiology of the Precambrian-Cambrian boundary, Harvard University, April 2008

Exchanges

- Exchange for Mongolian students to visit Harvard University, audit classes, and gain experience working in laboratories, 2007-2014

Public Outreach

- Curation of Snowball Earth exhibit at the Harvard Museum of Natural History, 2015
- LIP of the month, February 2015, http://www.largeigneousprovinces.org/
- NASA MIT NAI, https://vimeo.com/98359223
- MIT Museum Soapbox lecture, 2014
- Harvard Museum of Natural History Lecture Series, 2013
- Curation of Arctic Geology and Walk Through Time exhibits at the Harvard Museum of Natural History, 2013, http://vimeo.com/69910461

- Harvard University Research Journal Lecture Series, 2010
- MIT BLOSSOMS, educational video on geologic time, 2010, http://blossoms.mit.edu/video/geologic-time.html

Community Building
- Co-organized GRIND: Geological Research through Integrated Neoproterozoic Drilling

Invited Talks
- 2017: Colorado, UCLA, Penn State, Princeton
- 2016: Harvard, Chicago, Geological Survey of Canada Logan Lecture, Iowa
- 2015: Washington, Bridgewater State, UNLV, AGU
- 2014: Wisconsin, MIT, UC Santa Barbara, Stanford, GSA, AGU
- 2013: UC Berkeley
- 2012: Purdue, Proterozoic Symposium at St. Andrews, Durham, FERMOR at Geological Society of London, Boston University
- 2011: Iowa, Boston College, Chicago
- 2010: MIT, Yale, Connecticut, Rice, Vermont
- 2009: Yukon Geoscience Forum, Caltech, Boise State
- 2008: Harvard, McGill, MIT
- 2007: Yale Geobiology Symposium

Advising

Post-Doctoral Fellows
- Mathieu Lapotre: *The coevolution of land plants and rivers on Earth and the divergence of terrestrial and Martian fluvial systems*, 2017-present.
- Alan Rooney: *Cryogenian Osmium Isotope Stratigraphy,* 2012-2016 (Assistant Professor at Yale, 2017-present).
- Ryan Petterson: *Overlapping Unconformities in the Kingston Peak Formation,* 2010-2011 (Lecturer at Stanford).

Doctoral Theses
- Eliel Anttila: 2017-present.
- Judy Pu: 2016-present.
- Eben Hodgin: *Neoproterozoic to Paleozoic tectonostratigraphic evolution of the Arequipa Terrane, Peru,* 2014-present.
- Athena Eyster: *Inertial interchange true polar wander and paleomagnetism of Rodinia,* PhD 2017 (Crosby Postdoctoral Fellow at MIT, 2017-present).
- Uyanga Bold: *Neoproterozoic and Paleozoic geology of Mongolia,* PhD 2016 (Japanese Society for the Promotion of Science Postdoctoral Fellow, University of Tokyo, 2016-present).
- Emily Smith: *Constraints on global carbon cycling, basin formation, and early animal evolution during the Neoproterozoic and early Cambrian,* PhD 2015 (Assistant Professor at Johns Hopkins University, 2017-present).
- Justin Strauss: *Topics in Neoproterozoic and Paleozoic stratigraphy in the Northwestern Cordillera,* PhD 2015 (Assistant Professor at Dartmouth College, 2016-present).

Undergraduate Theses

- Sam LoBianco: *Mesozoic tectonostratigraphic evolution of Peru*, present.
- Rachel Hampton: *Neoproterozoic tectonic evolution of Avalon*, 2017 (PhD candidate at Oregon).
- Emma Mackie: *Neoproterozoic rifting and glaciaiont in Eastern Washington*, 2017 (PhD candidate at Stanford).
- Judy Pu (MIT): *Geochronology of the Trinity Formation and the Gaskiers Glaciation*, 2016 (PhD candidate at Harvard).
- Dan Skarsinski: *Os isotope constraints on the Ordovician weathering and climate change*, 2016 (lab tech at Yale).
- Sarah Moon: *Age and setting of the Mesoproterozoic Crystal Spring Formation, Death Valley,* 2015 (consultant and McKinsey).
- Lyle Nelson: *Epsilon Nd composition of shales in Arctic Alaska reflect the influx of Caledonian detritus*, 2015 (Awarded Hoopes Prize, PhD candidate at Johns Hopkins).
- Tanya Petach: *Sr isotope evolution of Early Cambrian seawater in Mongolia,* 2015 (PhD candidate at Cornell).
- Joe Schaffer (co-advisee with Dave Johnston and Charlie Langmuir): *Is the Utica Shale a Valid Estimator of Global Paleoredox Conditions?* 2015.
- William Thompson-Butler: *A Geochemical Assessment of the Utica Shale in the Mohawk Valley of New York: Evidence for Diachronous Deposition and Ramifications for Potential Hydrocarbon Systems*, 2013 (PhD candidate at Stanford).
- Esther Kennedy (co-advisee with Dave Johnston): *Sulfur Isotope Chemostratigraphy of the SPICE in Alaska Northwestern Canada*, 2013.
- Felix Waechter: *Chemostratigraphy of the Virgin Springs Limestone: Implications for stratigraphic correlation in Death Valley, CA,* 2012 (MSc candidate at Imperial College).
- Dylan Trotzuk: *The tectonic and climatic context of Neoproterozoic stratiform mineralization on the western margin of Laurentia,* 2012.
- Trevor Petach: *Neoproterozoic oxygenation seen through minor element analyses*, 2010 (Stanford PhD).