

Joseph Moysiuk, PhD – *Curriculum Vitae*

Contact

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Profile

I am a palaeontologist and evolutionary biologist, with research interests in macroevolution, evolutionary developmental biology, and the origin of animal body plans. I have taken part in field work across Canada, notably including major expeditions to the Burgess Shale in B.C. that have unearthed troves of new soft-bodied fossil species from the dawn of animal life. At the Manitoba Museum, I am expanding my research to other rare fossil deposits exhibiting soft tissue preservation.

Professional Appointments

2023 to present – Curator of Palaeontology and Geology, The Manitoba Museum, Canada

Education

2018 to 2023 – *PhD*

Department of Ecology and Evolutionary Biology (EEB), University of Toronto,
& Department of Natural History, Royal Ontario Museum (ROM), Canada

Advisor: Dr. J.-B. Caron

Supervisory committee: Drs. S. Kvist, M. Laflamme

Thesis: Origin and evolvability of the arthropod body plan: integrating exceptional Cambrian radiodont fossils and new approaches

2014 to 2018 – *BSc Honours, with High Distinction*

Majors in Ecology & Evolutionary Biology and Geoscience, University of Toronto
(Victoria College), Canada

Cumulative GPA of 3.82

Awards and Grants

Major Research Grants and Fellowships

2023 – [Declined] *Newton International Fellowship*, UK's most prestigious postdoctoral fellowship for international early career researchers, offered to about 30 candidates per year (**378,065.23 GBP**)

2023 – [Declined] *Royal Commission for the Exhibition of 1851 Research Fellowship in Science or Engineering*, a postdoctoral fellowship offered to 8 candidates per year (**ca. 150,000 GBP**)

- 2023 – [Declined] *Natural Sciences and Engineering Research Council of Canada (NSERC) Postdoctoral Fellowship (90,000 CAD)*
- 2022 – *Ontario Graduate Scholarship*, for outstanding research achievement (**15,000 CAD**)
- 2019 – *Vanier Canada Graduate Scholarship*, the most prestigious and valuable graduate research scholarship in Canada; was ranked 12 of 55 students who received the award, from across all science disciplines (**150,000 CAD**)
- 2019 – [Declined] *NSERC Alexander Graham Bell Canada Graduate Scholarship-Doctoral, (105,000 CAD)*
- 2018 – *NSERC Canada Graduate Scholarship-Master's*, a highly competitive award to support research of scholars early in their graduate studies (**17,500 CAD**)

Other Research Awards

- 2023 – *Peter Abrams Prize, honorable mention*, for sustained research excellence of a senior PhD student in the department of EEB (**250 CAD**)
- 2022 – *Martin Scholarship*, for research excellence in the department of EEB (**5,000 CAD**)
- 2022 – *Ramsay Wright Award*, for a 3rd or 4th year PhD student who has succeeded in research and made substantial contributions to the department of EEB (**750 CAD**)
- 2019 – *Thomas E. Bolton Award*, for best talk at the Canadian Paleontology Conference (**250 CAD**)
- 2018 – *Palaeontological Association Undergraduate Prize (University of Toronto)*, an award offered to only one student per university, based on institutional nomination for academic and research achievement
- 2016 – *Palaeontological Association Annual Meeting Poster Prize*, for best research poster at the Annual Meeting, one of the largest conferences in the field of palaeontology (**200 GBP**)

Teaching Awards

- 2021 – *National Association of Geoscience Teachers Outstanding TA Award*, from departmental nomination for teaching the course ESS261 (Earth System Evolution).

Publications

Total citations = 253 *h-index* = 6

- [10] Rochin-Banaga, H., Davis, D. W., **Moysiuk, J.** (2023) U-Pb dating of belemnites and rugose corals: the potential for absolute dating of calcitic invertebrate fossils. *Chemical Geology*, 121862.
- [8] **Moysiuk, J.**, & Caron, J.-B. (2023). A quantitative assessment of ontogeny and moulting in a Cambrian radiodont and the evolution of arthropod development. *Paleobiology*, 50(1), 54-69.
- [9] Moon, J., Caron, J.-B., & **Moysiuk, J.** (2023) A macroscopic free-swimming medusa from the middle Cambrian Burgess Shale. *Proceeding of the Royal Society B*, 290(2004), 20222490.
- [7] **Moysiuk, J.**, & Caron, J.-B. (2022). A three-eyed radiodont with fossilized neuroanatomy informs the origin of the arthropod head and segmentation. *Current Biology*, 32(15), 3302-3316.
- [6] **Moysiuk, J.**, Izquierdo-López, A., Kampouris, G. E., Caron, J.-B. (2022). A new marrellomorph arthropod from southern Ontario and the potential for soft tissue preservation on late Ordovician open marine shelves. *Journal of Paleontology*, 96(4), 859-874.

- [5] Caron, J.-B., **Moysiuk, J.** (2021). A giant nektobenthic radiodont from the Burgess Shale and the significance of hurdiid carapace diversity. *Royal Society Open Science*, 8(9), 210664.
- [4] **Moysiuk, J.**, & Caron, J.-B. (2021). Exceptional multifunctionality in the feeding apparatus of a mid-Cambrian radiodont. *Paleobiology*, 47(4), 704-724.
- [3] **Moysiuk, J.**, & Caron, J.-B. (2019). A new hurdiid radiodont from the Burgess Shale evinces the exploitation of Cambrian infaunal food sources. *Proceedings of the Royal Society B*, 286(1908), 20191079.
- [2] **Moysiuk, J.**, Caron, J.-B. (2019). Burgess Shale fossils shed light on the agnostid problem. *Proceeding of the Royal Society B*, 286(1894), 20182314.
- [1] **Moysiuk, J.**, Smith, M. R., Caron, J.-B. (2017). Hyoliths are Palaeozoic lophophorates. *Nature*, 541(7637), 394-397.

Research Presentations

International/National

- 2023 – *Canadian Paleontology Conference* (Mississauga, Canada) – Integration and modularity in the Cambrian diversification of arthropods (oral)
- 2023 – *Palaeontological Association Annual Meeting* (Cambridge, UK) – Integration and modularity in the Cambrian diversification of arthropods (oral)
- 2022 – *Canadian Paleontology Conference* – Ontogeny and moulting in the Cambrian radiodont *Stanleycaris* (oral)
- 2022 – *GAC-MAC Annual Conference* – Cambrian three-eyed radiodonts with fossilized neuroanatomy illuminate the origin of the arthropod head and segmentation (oral)
- 2021 – *Palaeontological Association Annual Meeting* – A new marrellomorph arthropod from southern Ontario and the potential for soft tissue preservation on late Ordovician open marine shelves (oral)
- 2021 – *Pal(a)eo EarLy Career Seminar* – From weird wonders to spaceships: How new Burgess Shale discoveries are illuminating the origin of arthropods (invited, oral)
- 2019 – *Palaeontological Association Annual Meeting* (Valencia, Spain) – The body of *Stanleycaris* and the origin of hurdiid radiodonts (poster)
- 2019 – *Canadian Paleontology Conference* (Mississauga, Canada) – A new hurdiid radiodont from the Burgess Shale evinces the exploitation of Cambrian infaunal food sources (oral; **prize winner**)
- 2019 – *North American Paleontology Convention* (Riverside, CA, USA) – Hurdiid radiodontans and the exploitation of Cambrian infaunal food sources (oral)
- 2018 – *International Palaeontological Congress 5* (Paris, France) – Burgess Shale fossils shed light on the agnostid problem (oral)
- 2017 – *Canadian Paleontology Conference* (Calgary, Canada) – Confronting the agnostid problem: new morphology revealed by exceptional Burgess Shale fossils (oral)
- 2016 – *Palaeontological Association Annual Meeting* (Lyon, France) – Hyoliths are Palaeozoic lophophorates (poster; **prize winner**)

Institutional

- 2024 – *William A. S. Sarjeant Seminar Series in Palaeobiology, University of Saskatchewan* (Saskatoon, Canada) – Tales from the Burgess Shale: New Fossil Discoveries from the dawn of animal life (invited, oral)

- 2024 – *Earth Sciences Departmental Seminar, University of Manitoba* (Winnipeg, Canada) - From weird wonders to spaceships: How new Burgess Shale discoveries are illuminating the origin of arthropods (invited, oral)
- 2023 – *Atwood Colloquium, U of T* (Toronto, Canada) – Integration and modularity in the Cambrian diversification of arthropods (oral)
- 2023 – *ROM Incubator* (Toronto, Canada) – Exceptional Burgess Shale fossils prompt a rethink of the origin of the arthropod head (invited, oral)
- 2022 – *PaleoClub, University of Lausanne* (Switzerland) – Ontogeny and moulting in the Cambrian radiodont *Stanleycaris* (invited, oral)
- 2022 – *Rockfest, Earth Sciences Department, U of T* (Toronto, Canada) – A new marrellomorph arthropod from southern Ontario and the potential for soft tissue preservation on late Ordovician open marine shelves (oral)
- 2021 – *Canadian Museum of Nature Virtual Seminar Series* – From weird wonders to spaceships: How new Burgess Shale discoveries are illuminating the origin of arthropods (invited, oral)
- 2019 – *ROM Incubator* (Toronto, Canada) – *Cambroraster falcatus*: a new radiodont arthropod from the Burgess Shale (invited, oral)
- 2017 – *ROM Research Colloquium* (Toronto, Canada) – Uncovering the secrets of a small, conical-shelled fossil (invited, oral)
- 2017 – *Rockfest, Earth Sciences Department, U of T* (Toronto, Canada) – Uncovering the secrets of a small, conical-shelled fossil (oral)

Symposium Chairing and Organization

- 2024 – *Canadian Society of Vertebrate Paleontology, Annual Meeting* (Winnipeg, Canada) – Conference co-organizer.
- 2022 – *Canadian Paleontology Conference* (virtual) – Chaired session for one day.
- 2019 – *North American Paleontology Convention* (Riverside, CA, USA) – Organized the symposium “Arthropod Evolution Through Deep Time: A Tribute to Richard Fortey”. Co-organizers: Dr. J. Ortega-Hernández (Harvard University, USA), Dr. J. Esteve (Los Andes University, Colombia), A. Izquierdo López (U of T / ROM, Canada).

Peer Review

I have reviewed articles in the following journals: *Acta Paleontologica Polonica*; *Current Biology*, *Geology*; *Journal of Paleontology*; *Journal of the Geological Society*; *Palaeogeography*, *Palaeoclimatology*, *Palaeoecology*; *Palaeontology*; *Royal Society Open Science*.

Teaching

I have been invited to present guest lectures for the following courses: *PBIO 205: Palaeontology* (University of Saskatchewan, 2024), *GEOL 3310: Paleontology* (University of Manitoba, 2024), *EEB 466: Approaches to the Study of Biodiversity* (University of Toronto, 2019).

In addition, I have taught the following courses and workshops:

2019 to 2023 – ***U of T ESS261 Earth System Evolution:*** As a teaching assistant for this undergraduate course, I co-conceived of and taught weekly labs (3 hours each, 15-50 students). Topics included fossil diversity throughout Earth's history (with hands-on learning), phylogenetics, morphometrics, biostratigraphy, biogeography, and biomechanics. My roles were leading the lab activities, one-on-one mentorship of students during office hours, and providing detailed feedback on and grading research reports. This role also included extensive course development and activity content creation involved in switching to virtual lab delivery in 2021. Students consistently indicated that the TA(s) created an atmosphere conducive to learning (rated average of 4.6/5) and explained topics and concepts clearly (4.4/5). Course instructors: Drs. C. Bank, A. Farhadich.

2021 – ***Overcoming disciplinary boundaries and expanding the use of biological and social science analyses: A methodological exchange workshop:*** I was invited to create and teach a 2.5 hr session on phylogenetics in R in this interdisciplinary workshop. Coleaders: Drs. M. Cadotte, D. Silver, A. Eads, E. Fosse.

Mentorship and Service

2023 to present – Geological Association of Canada-Palaeontology Division, Executive Committee Member

2022 to 2023 – UTGSU ROM Graduate Students Caucus, co-creator and inaugural Chair (took a leading role in the formation of this new group, intended to provide collective representation to ROM students across all departments at U of T)

2021 to 2023 – EEB Graduate Students Association, ROM Rep (elected)

2021 to 2023 – ROM Journal Club, Leader

2020 to 2021 – Graduate Peer Mentor (Dept. of EEB)

2019 to 2020 – MSc Scientific Content Advisor for S. Cappelli (Biomedical Communications)

Media Communication

My work has received exceptional media attention, being featured in news around the world, including on the website homepage of *Nature*. I have extensive experience in communicating research with science reporters and the public, including through live radio and tv broadcasts. Over 3700 news items showcasing my research have been released in at least 65 countries, including articles in the *New York Times*, *Guardian*, *BBC*, *Wall Street Journal*, *New Scientist*, *Reuters*, *Nature* and *Science*. I was also interviewed, both at ROM and during fieldwork, for an episode of *CBC's The Nature of Things*, First Animals, which aired in October 2019.

Radio/TV/Podcast Interviews

680 CJOB – Tyndall stone as Manitoba provincial stone, Dec. 8, 2023

CBC Fresh Air – Oldest jellyfish, Aug. 5, 2023

CBC Radio Kelowna – Oldest jellyfish, Aug. 4, 2023

CBC Radio Calgary (Calgary Eyeopener) – Oldest jellyfish, Aug. 3, 2023

ABC Southern Queensland Breakfast Radio – Brain of *Stanleycaris*, Jul. 13, 2022

CBC TV Vancouver News at 6 – Brain of *Stanleycaris*, Jul. 11, 2022

CBC Radio Ontario Morning – Soft bodied fossil find in Ontario, May 18, 2022

Palaeocast podcast, episode 139 – Marrellomorphs, May 16, 2022

CBC Metro Morning – Soft bodied fossil find in Ontario, May 2, 2022

CBC As It Happens – *Titanokorys* description, Sept. 8, 2021

CBC Radio Kelowna – *Cambroraster* description, Aug. 1, 2019.

CBC Radio Calgary (Calgary Eyeopener) – *Cambroraster* description, Jul. 31, 2019.

CBC TV Calgary (Calgary News) – *Cambroraster* description, Jul. 30, 2019.

CBC Metro Morning – Royal Ontario Museum Palaeontology, Mar. 12, 2018.

BBC Radio 5 – Hyolith research, Jan. 13, 2017.

German Public Radio (Forschung aktuell) – Hyolith research, Jan 12, 2017.

CBC Kelowna – Hyolith research, Jan. 11, 2017.

Science Outreach Activities

Gallery Design

At the Manitoba Museum, I am involved in the conception of major planned upgrades to three galleries: *Earth History* (Curatorial lead), *Arctic/Subarctic*, and *Boreal Forest*. Previously, I have been involved in the design and planning of ROM's new permanent gallery, the *Willner-Madge Gallery, Dawn of Life* (2021), which showcases Earth's history before the age of dinosaurs. Activities included:

- Leveraging my relationships with the amateur fossil collecting community to facilitate acquisitions of specimens from private collections and make connections with skilled fossil preparators.
- Leading the design of a temporary display case in the Preview Gallery, focusing on the research published in paper [3].
- Acting as a scientific content advisor for labels, display panels, and artwork.
- Selecting and identifying specimens for display.
- Donations of personally collected fossil material.

I also acted as a content advisor for an outdoor Burgess Shale-themed exhibit consisting of several sign boards in Field, British Columbia.

Blogs and Outreach Publications

2024 to present – Manitoba Museum Stories, Palaeontology and Geology (lead contributor). [Link](#)

2023 – ROM Burgess Shale website (contributed several new and updated species pages). [Link](#)

2022 – Three-eyed Cambrian fossils shed new light on arthropod head evolution. The Conversation. Jul. 25. [Link](#)

2021 – Reconstructing a Cambrian Swiss army knife: The claws of *Stanleycaris*. Cambridge Core Blog. May 19. [Link](#)

2019 – Huge cache of fossils from the Burgess Shale reveals a new species of large predator. Royal Ontario Museum Blog. Aug. 1. [Link](#)

2019 – A new branch in the tree of life? Proceedings B Publishing Blog (Royal Society). Feb 6. [Link](#)

2017 – Mystery of conical fossils solved, after 175 years. Royal Ontario Museum Blog. Jan. 11. [Link](#)

2014 – Etobicoke flooding uncovers ancient life. Toronto & Region Conservation, Etobicoke & Mimico Watersheds Creek Time Newsletter. Apr. 14. [Link](#)

Public Workshops, Presentations, and Museum Tours

2023 – ROM gallery tour for a science literacy course run by the Royal Conservatory of Music
2023 – American Scientific Affiliation, ROM gallery tour
2023 – Zoom interview with Grade 7 student
2023 – Friends of the University of Michigan Museum of Paleontology (Ann Arbor, MI)
2022 – Nature Guelph, (Guelph, ON)
2022 – Vancouver Paleontological Society (Vancouver, BC)
2022 – Department of Museum Volunteers, ROM
2022 – Friends of the University of Michigan Museum of Paleontology (Ann Arbor, MI)
2022 – Thorah Central Public School, kindergarten class (Beaverton, ON)
2022 – Philip J. Currie Dinosaur Museum (Wembley, AB)
2021 – Department of Museum Volunteers, ROM
2021 – Sunnylea Junior School, Grade 2 class (Toronto, ON)
2021 – Kitchener Waterloo Gem and Mineral Club (Kitchener, ON)
2020 – ROM U workshop: Fantastic Fossils of Prehistoric Ontario; full day program including lectures, gallery tour, and activity; 25 participants; co-designed with A. Izquierdo López
2020 – The Gem and Mineral Club of Scarborough (Toronto, ON)
2019 – Niagara Peninsula Geological Society (St. Catharines, ON)
2019 – Brantford Lapidary and Mineral Society (Brantford, ON)
2019 – ROM Galley Donor Collections Tour
2018 – ROM Friends of Palaeontology, preview tour of the Dawn of Life Gallery
2018 – London Gem and Mineral Society (London, ON)
2017 – Department of Museum Volunteers, ROM
2016 – ROM Summer Program Instructor: Led two hikes to the Humber River and Mimico Creek in Toronto, showcasing the local fossils and geology. About 30 attendees.
2014 – ROM Centennial Celebrations, behind-the-scenes collections tour

Booths at Special Museum Events

Mar. 2023 – March Break (booth: New Research)
Dec. 2021 – Dawn of Life Gallery opening events (booth: Research)
Mar. 2019 – March Break (booth: Museum Secrets)
Jan. 2019 – ‘Fossil Fest’ (booth: Invertebrate armor, featuring agnostids)
Oct. 2018 – ‘Friday Night Live’ (booth: Toronto Fossil Fact or Fiction)
Sept. 2018 – ‘Family Funday’ (booth: Fossil Spider Relatives)
Jan. 2018 – ‘Fossil Fest’ (booth: *Habelia* and the Burgess Shale)
Jan. 2017 – ‘ROM for the Holidays’ (booth: ‘Fire and Ice’)
Jan. 2017 – ‘Fossil Fest’ (booth: Research Highlights)
May 2016 – ‘Friday Night Live’ (booth: Trilobite Activity)
Mar. 2016 – March Break (booth: ‘Curious Cambrian Creatures’)
Jan. 2016 – ‘Escape to Planet ROM’ (booth: ‘Earthbound Aliens’)
Jan. 2016 – ‘Dinos Rule the ROM Big Weekend’ (booth: ‘Palaeo Beyond Dinosaurs’)

Fieldwork

2014 to 2018, 2022 – ***Burgess Shale Expeditions:*** Extensive remote fieldwork experience on ROM-led expeditions in Kootenay and Yoho National Parks and to related Cambrian localities near Cranbrook, British Columbia. Work included exploration, on foot and by

helicopter, and construction of small quarry sites for in-situ collection of fossils. Field teams included top scientists from Canada, the United States, Sweden, and China.

Related Experience

2015 – ***ROM Contract Technician:*** Trained as one of the very few preparators of highly significant Burgess Shale fossils at the ROM.

2012 to 2018 – ***ROM Collections Assistant:*** Over the course of several part time placements, I assisted with the management of the collection of invertebrate fossils at the ROM.

Memberships

2019 to present – Geological Association of Canada (Paleontology Division)

2017 to present – Paleontological Society (USA)

2016 to present – Palaeontological Association (UK)

Certifications

2024 – *X-ray Fluorescence Operator Level 2*, Natural Resources Canada

2023 – *Field Firearm Safety Course*, Royal Ontario Museum

2022 – *Wilderness Advanced First Aid*, Wilderness Medical Associates

2014, 2018 – *Wilderness & Remote First Aid, CPR Level C, and AED*, Canadian Red Cross