

## CURRICULUM VITAE

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### EDUCATION

**Ph.D., University of California, Riverside:** Riverside, CA, September 2010–December 2013

Program: Paleobiology, Geological Sciences

Dissertation Topic: Exceptional Preservation and Substrate Evolution in Early Paleozoic Marine Shelfal Environments

Advisor: Dr. Mary Droser

Funding: NSF Graduate Research Fellowship (2010-2013)

**M.S., University of California, Riverside:** Riverside, CA, September 2008–June 2010

Program: Paleobiology, Geological Sciences

Master's Thesis Topic: New Morphological Diversity or Preservational Variability? Resolving the Taphonomic Context of Ediacaran Assemblage-Scale Heterogeneity

Advisor: Dr. Mary Droser

**B.A., *magna cum laude*, with distinction, Amherst College:** Amherst, MA, September 2004–May 2008

Majors: Geology (concentration in Paleontology) and English

Honors Thesis Topic: Taphonomy and Anatomy of Unusually-Preserved Fossilized Medusae of the Late Cambrian Elk Mound and Potsdam Groups

Advisor: Dr. James Hagadorn

**Geology Field Camp:** Indiana University Geologic Field Station (IUGFS), Cardwell, MT, June–August 2007

### POSITIONS HELD

- **Assistant Professor:** Yale University (Department of Geology and Geophysics), July 2019–
- **NSF EAR Postdoctoral Fellow:** Yale University (Department of Geology and Geophysics), January 2016–December 2017
- **Postdoctoral Associate:** Yale University (Department of Geology and Geophysics), January 2014–December 2015, January 2018–June 2019

### PROFESSIONAL EXPERIENCE

- **A Career Development Workshop for NSF Geoscience Postdoctoral Researchers** (NCAR-UCAR, Boulder; March 2016): NSF-sponsored career preparation workshop for NSF-funded postdoctoral fellows in the geosciences.
- **Preparing for an Academic Career in the Geosciences Workshop** (University of Colorado, Boulder; July 2013): NSF-, NAGT- and On the Cutting Edge-sponsored workshop for late-stage graduate students and postdoctoral fellows.
- **Participant, NSF-NSFC Workshop: Critical Transitions in the History of Life** (Natural History Museum, Los Angeles; March 2012).
- **Science Writing Internship with Office of Strategic Communications** (University of California, Riverside, CA; Winter-Spring 2010).
- **GSA GeoCorps Field Paleontologist, Bryce Canyon National Park** (Bryce Canyon National Park, UT; Tropic, UT; May-August 2008): Inventory of known fossil-bearing sites in Bryce Canyon National Park and paleontological prospecting for, collection and processing of vertebrate, invertebrate and plant macrofossil and microfossil material.

- **Dean of Faculty Summer Research Fellow, Amherst College Geology Department** (Amherst College, Amherst, MA; Fieldwork: Wisconsin; May-August 2007): Lab and field paleontological work conducting preliminary research for honors thesis on late Cambrian fossilized medusae.
- **Howard Hughes Medical Institute Summer Research Fellow, Amherst College Geology Department** (Amherst College, Amherst, MA; Fieldwork: Wisconsin, New York, Quebec, Ontario; June-August 2005): Lab and field paleontological work researching late Cambrian shoreline environments and the taphonomy and morphology of trace fossils, especially *Climactichnites wilsoni*.

## TEACHING AND MENTORING

### *Teaching*

- **Instructor** (Yale University): “Earth-Surface Processes” (Spring 2020); “Topics in Geobiology” (Fall 2019)
- **Guest Lecturer and Laboratory Instructor** (Yale University): “History of Life” (Spring 2019, Spring 2018, Spring 2017)
- **Guest Lecturer** (Yale University): “Invertebrates” (Fall 2019, Fall 2016); “Earth, Resources, Energy and the Environment” (Fall 2019); “Extraordinary Glimpses of Past Life” (Fall 2018, Fall 2015); “Earth-Surface Processes” (Spring 2018); “Productivity” (Fall 2015)
- **Co-Instructor** (Yale University): “History of Life” (Spring 2015)
- **Field Trip Co-Instructor, Spain** (Yale University): “Earth-Surface Processes” (Spring 2018)
- **Field Trip Co-Instructor, Barbados** (Yale University): “Paleoenvironments” (Spring 2015)
- **Field Trip Co-Leader, Death Valley, CA** (Yale University): “Paleoenvironments” (Spring 2014)
- **University Teaching Certificate** (University of California, Riverside), Winter-Spring 2012 (awarded June 2012): University-sponsored instructional and professional development program.
- **Teaching Assistant** (University of California, Riverside): “Headlines in the History of Life” (Spring 2010, Spring 2009), “Earth’s Climate through Time” (Winter 2010), “The Earth’s Crust and Interior” (Introductory Geology; Fall 2009), “Earthquake Country” (Winter 2009).
- **Teaching Assistant** (Amherst College): “Principles of Geology” (Introductory Geology; Fall 2006, Fall 2005, Spring 2005).

### *Mentoring*

- **Ph.D. Committee Member** (Yale University): Jack Shaw (Ph.D. ’22), Roxanne Armfield (Ph.D. ’24), Alexander Ruebenstahl (Ph.D. ’24), Brian Beaty (Ph.D. ’24), Tom Reershemius (Ph.D. ’24)
- **Minor PhD Dissertation Project** (Yale University): Sophie Westacott (Ph.D. ’21; Cambrian bioturbation), Brian Beaty (Ph.D. ’25; Permo-Triassic bioturbation), Tom Reershemius (Ph.D. ’25; Cambrian fossilization)
- **PhD Dissertation Project** (2016-present) on taphonomy of Ediacaran microfossils: Xiao Min (Northwest University, Ph.D. student)
- **Summer Research Fellowship** (2016) on Devonian bioturbation and the stratigraphic record of *Rusophycus*: Yasmeen Erritouni (Dartmouth College, A.B. ’17)
- **“Extraordinary Glimpses of Past Life” term research project** modeling fossil phosphatization (2015): Tess Maggio (Yale College, B.S. ’16)
- **“Extraordinary Glimpses of Past Life” term research project** on experimental silicification of *Metasequoia*, *Nematostella* and cyanobacterial mats (2015): Adrien Gao (Yale College, B.S. ’17)
- **Undergraduate research supervisor and fieldwork mentor** (2011-2013): Cyntia Andres (UC Riverside, B.S. ’13), Evelyn Conrado (UC Riverside, B.S. ’13), James Minor (UC Riverside, B.S. ’13), Mouna Nonu (UC Riverside B.S. ’13), Alexandra Ruiz (UC Riverside, B.S. ’13)
- **First-year advisor**: Bella Rosado (Yale College ’22), Nicholas Famularo (Yale College ’22), Liam Curtis (Yale College ’23), Kwaku Acquah (Yale College ’22)
- **Second-year advisor**: Bella Rosado (Yale College ’22)

## FELLOWSHIPS, HONORS AND AWARDS

### *Yale University*

- National Science Foundation (NSF) Earth Sciences Postdoctoral Fellowship (2016-2017)
- Yale University Postdoctoral Associateship (2014-2015, 2018-2019)

#### ***University of California, Riverside***

- National Science Foundation (NSF) Graduate Student Research Fellowship (2010-2013)
- “Best Student Talk,” 2012 California Paleontology Conference (2012)
- Dr. Janet M. Boyce Memorial Endowed Fund for Women Majoring in the Sciences (2012-2013)
- Dr. Janet Boyce Memorial Scholarship (2009-2010)
- Chancellor’s Distinguished Fellowship (2008-2009)

#### ***Amherst College***

- John Mason Clarke Fellowship for the study of Geology and Paleontology (2008-2011)
- Walter F. Pond Prize in Geology (2008) (awarded annually to the senior who prepares the most-distinguished geology thesis)
- Phi Beta Kappa (2008)
- Sigma Xi Student Membership (2008)
- Belt-Brophy Prize in Geology (2007) (awarded annually to the junior determined to have shown the greatest promise for success as a geologist)
- Dean of Faculty Summer Research Fellowship (2007)
- Howard Hughes Medical Institute (HHMI) Summer Research Fellowship (2005)

#### **FUNDED GRANTS**

2019-2021: **NASA Exobiology Program**, “Did the small inherit the Earth? Analysis of mm-scale Ediacara body and trace fossils (South Australia) with implications for the early evolution of animals” (Co-I and Institutional PI)

2014-2018: **NASA Exobiology Program**, “Catching the ‘Second Wave’ of the Ediacara Biota: Assessing the Role of Environment, Ecology and Diagenesis” (co-author and grant personnel)

2014: **National Geographic Society** (co-author and grant personnel), **American Philosophical Society** Lewis and Clark Fund for Exploration and Field Research in Astrobiology

2013: **Desert Legacy Fund** (The Community Foundation) Student Research Grant, **Paleontological Society** (PS) Student Research Grant, **Society for Sedimentary Geology** (SEPM) Student Research Grant, **Evolving Earth Foundation** Research Grant, **American Museum of Natural History** (AMNH) Roosevelt Memorial Fund, **Sigma Xi** Student Grant-in-Aid of Research

2012: **Society for Sedimentary Geology** (SEPM) Student Research Grant, **Ed Picou Fellowship Grant** for Graduate Studies in Earth Science (GCSSEPM), **American Association of Petroleum Geologists** (AAPG) David Worthington Grant, **InfoQuest Foundation** Student Field Research Grant

2011: **Society for Sedimentary Geology** (SEPM) Student Research Grant, **Geological Society of America** (GSA) Student Research Grant, **American Association of Petroleum Geologists** (AAPG) John E. Kilkenny Memorial Grant

2009: **Society for Sedimentary Geology** (SEPM) Student Research Grant, **Geological Society of America** (GSA) Student Research Grant

2007: **Amherst College Dean of Faculty** Doelling Undergraduate Research Grant

#### **PROFESSIONAL SERVICE AND COMMUNITY OUTREACH**

- **Reviewer:** *Alcheringa*; *Current Biology*; *Geobiology*; *Geochimica et Cosmochimica Acta*; *Geology*; *GSA Bulletin*; *GSA Today*; *Ichnos*; *Journal of the Geological Society*; *Journal of Sedimentary Research*; *Lethaia*; *Nature Communications*; *Nature Ecology and Evolution*; *Palaeogeography*, *Palaeoclimatology*, *Palaeoecology*; *Palaeontology*; *Palaios*; *PNAS*; *Precambrian Research*; *Science*; *Science Advances*; *Scientific Data*; *Scientific Reports*; *Sedimentary Geology*; *Terra Nova*.
- **Grant Proposal Reviewer:** NSF, NSERC, American Philosophical Society, Palaeontological Association
- **Associate Editor:** *Geobiology*; *Palaeogeography*, *Palaeoclimatology*, *Palaeoecology*
- **Editor, *Ediacaran Environments and Ecosystems***, Special Issue in *Palaeogeography*, *Palaeoclimatology*, *Palaeoecology* (v. 434, 2015).

- **Yale Campus Representative for Geological Society of America** (2019–)
- **Co-organizer, 2019 Second Geobiology Society Conference** (June 2019)
- **Symposium Convener and Chair, Goldschmidt 2019** (Session 7a: Co-evolution of Earth’s Continents, Atmosphere, Oceans and Biosphere from the Neoproterozoic through the Paleozoic) (August 2019)
- **Symposium Convener and Chair, 2019 North American Paleontological Convention** (Symposium 1: Behavioral Innovations and Environmental Feedbacks: Insights from the Trace Fossil Record and Other Archives) (June 2019)
- **Conference Field Trip Leader, 2019 North American Paleontological Convention** (Ediacaran-Cambrian Transition of the Southwestern USA) (June 2019)
- **Symposium Convener and Chair, 2018 5<sup>th</sup> International Palaeontological Congress** (Session S9: Coevolution of Life and Environments: Integrating the Palaeoecological, Sedimentological and Geochemical Records).
- **Symposium Chair, 2018 5<sup>th</sup> International Palaeontological Congress** (Session S12: Early Animal Life).
- **Symposium Convener and Chair, 2017 Annual Meeting of the Geological Society of America** (Session T66: Exceptionally Preserved Proterozoic–Early Paleozoic Fossils).
- **Volunteer, Peabody Museum ‘Dinosaur Days’ (‘Meet the Scientist’), February 2015.**
- **Guest Lecturer for Institute of Learning in Retirement, May 2014** (Peabody Museum Extension Course 101, Session 3, “Fossils: How they form, why they matter and the changing face of the seafloor”).
- **Symposium Convener and Chair, 2014 North American Paleontological Convention** (Symposium S01: Ediacaran Environments and Ecosystems).
- **Session Chair, 2012 California Paleontology Conference** (Session No. 3; University of California, Riverside).
- **Organizer, 2012 California Paleontology Conference** (University of California, Riverside): California-wide paleontological conference, with an emphasis upon student research and development.
- **Session Chair, 2011 Annual Meeting of the Geological Society of America** (Session No. 120, Paleontology II: Paleobotany and Behavior).
- **Treasurer, Earth Sciences Graduate Student Association (ESGSA)** (Department of Earth Sciences, University of California, Riverside), 2011-2013.
- **Organizer and volunteer, 2011 Climate Change Fair** (University of California, Riverside): Educational outreach event to Riverside community on the science, teaching and communication of climate change.
- **Participant, Geology Education Outreach Program (GEOP), 2008-2013** (Department of Earth Sciences, University of California, Riverside): Educational, hands-on geology presentations in Riverside Unified School District (RUSD) K-12 schools.

#### **INTERNAL (YALE) COMMITTEE SERVICE**

- Colloquium Committee, Department of Geology and Geophysics (Fall 2019–)
- Flint Postdoctoral Fellowship Committee, Department of Geology and Geophysics (Fall 2019–)
- PhD Qualifying Examination Committee, Department of Geology and Geophysics (Spring 2020–)

#### **SCIENTIFIC CONSULTANT/INTERVIEWEE FOR POPULAR NEWS**

*New York Times, Nature News, Science News, The Atlantic, New Scientist, Yale News*

#### **FIELD AREAS**

2009-present – Death Valley region and Great Basin, western USA (Proterozoic-Lower Paleozoic)  
 2009-present – South and central Australia (Ediacaran)  
 2010-present – Bahamas (Modern)  
 2012-present – Newfoundland, Canada (Lower Paleozoic)  
 2012-present – Appalachian Basin (Lower-Middle Paleozoic)  
 2015-present – Georgia, USA (Modern)  
 2016-present – Connecticut and Long Island Sound, USA (Modern)  
 2018 – Svalbard (Permian-Triassic)

2016 – South China (Neoproterozoic-Lower Paleozoic)  
2016 – Rocky Mountain region, USA (Lower Paleozoic)  
2016 – Zimbabwe and Botswana (Archean-Paleoproterozoic)  
2015 – Barbados (Cenozoic and Modern)  
2011 – Central Spain (Lower Paleozoic)  
2008, 2013 – Central Utah, USA (Mesozoic)  
2007 – Southwestern Montana, USA (Proterozoic-Quaternary)  
2005, 2007-2008 – Midwestern and Northeastern USA and Canada (Lower Paleozoic)  
2012-2014: National Park Service Scientific Research and Collecting Permit (Study #DEVA-00344): Exceptional preservation and the evolution of seafloor colonization in early Paleozoic marine shelfal environments (Death Valley National Park)  
2014-2016: National Park Service Scientific Research and Collecting Permit (Study #DEVA-00393): The evolution of seafloor colonization and exceptional preservation in early Paleozoic marine shelfal environments (Death Valley National Park)  
2016-2019: National Park Service Scientific Research and Collecting Permit (Study #DEVA-00393): The evolution of seafloor colonization and exceptional preservation in early Paleozoic marine shelfal environments (Death Valley National Park)  
2019-2022: National Park Service Scientific Research and Collecting Permit (Study #DEVA-00393): The evolution of seafloor colonization and exceptional preservation in early Paleozoic shallow marine environments (Death Valley National Park)

### **PROFESSIONAL MEMBERSHIPS**

- Geological Society of America (GSA)
- Society for Sedimentary Geology (SEPM)
- The Paleontological Society (PS)
- The Palaeontological Association (PalAss)
- Sigma Xi, The Scientific Research Society
- American Chemical Society (ACS)
- National Association of Geoscience Teachers (NAGT)
- Association for Women Geoscientists (AWG)
- Society for Integrative and Comparative Biology (SICB)

### **SCIENTIFIC PUBLICATIONS**

#### ***In review:***

SLAGTER, S., **TARHAN, L.G.**, HAO, W., PLANAVSKY, N.J. and KONHAUSER, K., In review, Experimental evidence supports early silica cementation of the Ediacara Biota.

FAKHRAEE, M., PLANAVSKY, N.J., **TARHAN, L.G.**, REINHARD, C.T., BAUER, A. and CROWE, S., In review, Earth's surface oxygenation and the rise of eukaryotic life.

ZHAO, M., **TARHAN, L.G.**, ZHANG, Y., HOOD, A., ASAEL, D., REID, R.P. and PLANAVSKY, N.J., In review, Evaluation of shallow-water carbonates as a seawater zinc isotope archive.

WEI, G.-Y., PLANAVSKY, N.J., WEI, W., WANG, D., HE, T., **TARHAN, L.G.** and LING, H.-F., In revision, Early Cambrian dynamic marine redox landscapes and biotic innovations.

WEI, G.-Y., PLANAVSKY, N.J., **TARHAN, L.G.**, LI, D. and LING, H.-F., In revision, Demise of dolomite-aragonite sea in the early Cambrian linked to oceanic oxygenation?

#### ***Published, in press or accepted:***

36. DROSER, M.L., **TARHAN, L.G.**, EVANS, S.D., SURPRENANT, R.K. and GEHLING, J.G., In press, Biostratigraphy of the Ediacara Member (Rawnsley Quartzite, South Australia): implications for depositional environments,

ecology and biology of Ediacara organisms: *Interface Focus.*, v. 10, article 20190100, doi.org/10.1098/rsfs.2019.0100.

35. **TARHAN, L.G.**, MYROW, P.M., SMITH, E.F., NELSON, L.L. and SADLER, P.M., In press, Infaunal augurs of the Cambrian Explosion: an Ediacaran trace fossil assemblage from Nevada, USA: *Geobiology*, doi.org/10.1111/gbi.12387.

34. PLANAVSKY, N.J., HOOD, A. v. S., **TARHAN, L.G.**, SHEN, S. and JOHNSON, K., 2020, Store and share ancient rocks: *Nature*, v. 581, p. 137-139

33. ZHAO, M., ZHANG, S., **TARHAN, L.G.**, REINHARD, C. and PLANAVSKY, N.J., 2020, The role of calcium in regulating marine phosphorus burial and atmospheric oxygenation: *Nature Communications*, v. 11, article 2232.

32. SMITH, E.F., **TARHAN, L.G.** and NELSON, L.L., 2019, Ediacaran–Cambrian transition of the southwestern USA: *PaleoBios*, v. 36, Supplement 2, p. 1–31.

31. **TARHAN, L.G.**, HOOD, A.V.S., DROSER, M.L., GEHLING, J.G., BRIGGS, D.E.G., GAINES R.R., ROBBINS, L.J. and PLANAVSKY, N.J., 2019, Comment on “Petrological evidence supports the death mask model for the preservation of Ediacaran soft-bodied organisms in South Australia”: *Geology*, doi.org/10.1130/G46326C.1.

30. KONHAUSER, K.O., HAO, W., LI, Y., VON GUNTEN, K., BISHOP, B.A., ALESSI, D.S., **TARHAN, L.G.**, O’CONNELL, B., ROBBINS, L.J., PLANAVSKY, N.J. and GINGRAS, M.K., 2019, *Diopatra cuprea* worm burrow parchment: a cautionary tale of infaunal surface reactivity: *Lethaia*, doi.org/10.1111/let.12335.

29. DROSER, M.L., GEHLING, J.G., **TARHAN, L.G.**, EVANS, S.D., HALL, C.M.S., HUGHES, I.V., HUGHES, E.B., DZAUGIS, M.E., DZAUGIS, M.P., DZAUGIS, P.W. and RICE, D., 2019, Piecing together the puzzle of the Ediacara Biota: excavation and reconstruction at the Ediacara National Heritage site Nilpena (South Australia): *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 513, p. 132-145.

28. **TARHAN, L.G.**, 2018, Phanerozoic shallow marine sole marks and substrate evolution: *Geology*, v. 46, p. 755-758.

27. **TARHAN, L.G.**, DROSER, M.L., COLE, D.B. and GEHLING, J.G., 2018, Ecological expansion and extinction in the late Ediacaran: weighing the evidence for environmental and biotic drivers. *Integrative and Comparative Biology*, v. 58, p. 688-702 (invited contribution).

26. WEI, G.-Y., PLANAVSKY, N.J., **TARHAN, L.G.**, CHEN, X., WEI, W., LI, D. and LING, H.-F., 2018, Marine redox fluctuation as a potential trigger for the Cambrian explosion: *Geology*, v. 46, p. 587-590.

25. **TARHAN, L.G.**, 2018, The early Paleozoic development of bioturbation—evolutionary and geobiological consequences: *Earth-Science Reviews* (invited review), v.178, p. 177-207.

24. **TARHAN, L.G.**, PLANAVSKY, N.J., WANG, X., BELLEFROID, E.J., DROSER, M.L. and GEHLING, J.G., 2018, Late-stage ‘ferruginization’ of the Ediacara Member (Rawnsley Quartzite, South Australia): insights from uranium isotopes: *Geobiology*, v. 16, p. 35-48.

23. DROSER, M.L., **TARHAN, L.G.** and GEHLING, J.G., 2017, The rise of animals in a changing environment: global ecological innovation in the late Ediacaran: *Annual Review of Earth and Planetary Sciences*, v. 45, p. 593-617.

22. **TARHAN, L.G.**, 2017, Meiofauna mute the Cambrian Explosion: *Nature Ecology and Evolution*, doi: 10.1038/s41559-017-0324-2.

21. MCMAHON, S., **TARHAN, L.G.** and BRIGGS, D.E.G., 2017, Decay of the sea anemone *Metridium* (Actiniaria): implications for the preservation of soft-bodied diploblast-grade animals: *Palaios*, v. 32, p. 388-395.
20. **TARHAN, L.G.**, DROSER, M.L., GEHLING, J.G. and DZAUGIS, M.P., 2017, Microbial mat sandwiches and other anactualistic sedimentary features of the Ediacara Member (Rawnsley Quartzite, South Australia): implications for interpretation of the Ediacaran sedimentary record: *Palaios*, v. 32, p. 181-194.
19. SAPPENFIELD, A.D., **TARHAN, L.G.** and DROSER, M.L., 2017, Earth's oldest jellyfish strandings: a unique taphonomic window or just another day at the beach?: *Geological Magazine*, v. 154, p. 859-874.
18. **TARHAN, L.G.**, HOOD, A.V.S., DROSER, M.L., GEHLING, J.G. and BRIGGS, D.E.G., 2017, Delusions of dirt: Ediacara organisms were not soil dwellers—Reply: *Geology*, doi:10.1130/G38858Y.1.
17. **TARHAN, L.G.**, HOOD, A.V.S., DROSER, M.L., GEHLING, J.G. and BRIGGS, D.E.G., 2016, Exceptional preservation of soft-bodied Ediacara Biota promoted by silica-rich oceans: *Geology*, v. 44, p. 951-954.
16. ANDERSON, R.P., **TARHAN, L.G.**, CUMMINGS, K.E., PLANAVSKY, N.P. and BJØRNERUD, M., 2016, Macroscopic structures in the 1.1 Ga continental Copper Harbor Formation: concretions or fossils?: *Palaios*, v. 31, p. 327-338.
15. **TARHAN, L.G.**, HADDAD, E., HALL, C.M.S., DAHL, R.M., HANCOCK, L.G., HENRY, S.E., JOEL, L.V., THOMSON, T.J. and DROSER, M.L., 2016, Seafloor colonization in the earliest Paleozoic: evidence from the Cambrian of Death Valley: *Proceedings of the Death Valley Natural History Association*, p. 355-379 (Invited contribution).
14. DARROCH, S., LOCATELLI, E., MCCOY, V., CLARK, E., ANDERSON, R., **TARHAN, L.** and HULL, P., 2016, Taphonomic disparity in foraminifera as a paleo-indicator for seagrass: *Palaios*, v. 31, p. 242-258.
13. MCCOY, V.E., SAUPE, E.E., LAMSDALL, J.C., **TARHAN, L.G.**, MCMAHON, S., LIDGARD, S., MAYER, P., WHALEN, C.D., SORIANO, C., FINNEY, L., VOGT, S., CLARK, E.G., ANDERSON, R.P., PETERMANN, H., LOCATELLI, E.R. and BRIGGS, D.E.G., 2016, The Tully Monster is a vertebrate: *Nature*, v. 532, p. 496-499.
12. LI, C., PLANAVSKY, N.J., SHI, W., ZHANG, Z., ZHOU, C., CHENG, M., **TARHAN, L.G.**, LUO, G. and XIE, S., 2015, Ediacaran marine redox heterogeneity and early animal ecosystems: *Scientific Reports*, v. 5, doi: 10.1038/srep17097.
11. **TARHAN, L.G.**, DROSER, M.L., PLANAVSKY, N.J. and JOHNSTON, D., 2015, Protracted development of bioturbation through the early Palaeozoic Era: *Nature Geoscience*, v. 8, p. 865-869.
10. PLANAVSKY, N.J., **TARHAN, L.G.**, BELLEFROID, E.J., EVANS, D.A.D., REINHARD, C.T., LOVE, G. and LYONS, T.W., 2015, Late Proterozoic transitions in climate, oxygen, and tectonics, and the rise of complex life: *The Paleontological Society Papers*, v. 21, p. 47-82.
9. **TARHAN, L.G.**, and LAFLAMME, M., 2015, An examination of the evolution of Ediacaran paleoenvironmental and paleoecological research: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 434, p. 1-3.
8. **TARHAN, L.G.**, DROSER, M.L. and GEHLING, J.G., 2015, Depositional and preservational environments of the Ediacara Member, Rawnsley Quartzite (South Australia): assessment of paleoenvironmental proxies and the timing of 'ferruginization': *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 434, p. 4-13.
7. **TARHAN, L.G.**, DROSER, M.L., GEHLING, J.G. and DZAUGIS, M.P., 2015, Taphonomy and morphology of the Ediacara form genus *Aspidella*: *Precambrian Research*, v. 257, p. 124-136.

6. **TARHAN, L.G.**, DROSER, M.L. and HUGHES, N., 2014, Mixed layer development and exceptional trace fossil preservation in Cambro-Ordovician siliciclastic strata: *Cambro-Ordovician Studies V*, Memoirs of the Association of Australasian Palaeontologists (ed. Laurie, J.), v. 45, p. 71-88.
5. **TARHAN, L.G.** and DROSER, M.L., 2014, Widespread delayed mixing in early to middle Cambrian marine shelfal settings: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 399, p. 310-322.
4. **TARHAN, L.G.**, HUGHES, N.C., MYROW, P.M., BHARGAVA, O.N., AHLUWALIA, A.D. and KUDRYAVTSEV, A.B., 2014, Precambrian–Cambrian boundary interval occurrence and form of the enigmatic tubular body fossil *Shaanxilithes ningqiangensis* from the Lesser Himalaya of India: *Palaeontology*, v. 57, p. 283-298.
3. **TARHAN, L.G.**, PLANAVSKY, N.J., LAUMER, C.E., STOLZ, J.F. and REID, R.P., 2013, Microbial mat controls on infaunal abundance and diversity in modern marine microbialites: *Geobiology*, v. 11, p. 485-497.
2. **TARHAN, L.G.**, JENSEN, S. and DROSER, M.L., 2012, Furrows and firmgrounds: evidence for predation and implications for Palaeozoic substrate evolution in *Rusophycus* “hunting burrows” from the Silurian of east-central New York: *Lethaia*, v. 45, p. 329-341.
1. **TARHAN, L.G.**, DROSER, M.L. and GEHLING, J.G., 2010, Taphonomic controls on Ediacaran diversity: uncovering the holdfast origin of morphologically variable enigmatic structures: *Palaios*, v. 25, p. 823-830.

#### **INVITED SEMINARS**

**2020:** Yale University (Yale Institute for Biospheric Studies)

**2019:** Princeton University (Department of Geosciences); Yale University (Department of Geology and Geophysics);

**2018:** University of British Columbia (Department of Earth, Ocean and Atmospheric Sciences); University of Texas at Austin (Department of Geological Sciences).

**2017:** Amherst College (Five College Geology Seminar Series); Pomona College (Geology Department); University of California, Riverside (Alternative Earths Astrobiology Seminar Series).

**2016:** Northwest University (Department of Geology; Xi'an, China); Chinese Academy of Geological Sciences (Beijing, China); Colorado College (Geology Department).

**2015:** Lamont-Doherty Earth Observatory (Biology and Paleoenvironment Seminar Series).

**2013:** Dartmouth College (Department of Earth Sciences).

**2012:** Dartmouth College (Department of Earth Sciences).

#### **CONFERENCE PRESENTATIONS**

**TARHAN, L.G.**, MYROW, P.M., SMITH, E.F., NELSON, L.L. and SADLER, P.M., 2019, Infaunal augurs of the Cambrian Explosion: an Ediacaran trace fossil assemblage from Mount Dunfee (Nevada, USA): International Meeting on the Ediacaran System and the Ediacaran-Cambrian Transition (Talk).

**TARHAN, L.G.**, 2019, Reconstructing the preservation, paleoenvironments and paleoecology of Earth's earliest complex communities: Selwyn Symposium—Coevolution of Life and Precambrian Environments (Invited talk).

**TARHAN, L.G.**, 2019, Early Phanerozoic shallow marine substrate evolution: the sole mark record: Geological Society of America Abstracts with Programs: Paper No. 293-12, v. 51 (Talk).

**TARHAN, L.G.**, 2019, The rise of bioturbation: tracking and modelling the development of the sedimentary mixed layer: Royal Society Meeting—The Origin and Rise of Complex Life: Integrating Models, Geochemical and Palaeontological Data (Invited talk).

**TARHAN, L.G.**, ZHAO, M. and PLANAVSKY, N., 2019, The biogeochemical impact of early Paleozoic bioturbation: Goldschmidt 2019, Session 7A (Talk).



WEI, G., PLANAVSKY, N., **TARHAN, L.**, LI, D., CHEN, X. and LING, H., 2019, Demise of dolomite-aragonite sea in the early Cambrian coincided with stabilization of oceanic oxygenation: Goldschmidt 2019, Session 7A (Talk given by G. Wei).

**TARHAN, L.G.**, 2019, The evolution of bioturbation: timing and geobiological consequences: 2019 North American Paleontological Convention (Invited talk).

**TARHAN, L.G.**, ZHAO, M. and PLANAVSKY, N., 2019, The biogeochemical impact of early Paleozoic bioturbation: 2<sup>nd</sup> Geobiology Society Conference (Poster).

**TARHAN, L.G.**, 2019, A long fuse for the Cambrian Explosion: a ‘Cambrian-style’ trace fossil assemblage from the Ediacaran of Nevada: Women of Geology and Geophysics Symposium (Talk).

**TARHAN, L.G.**, ZHAO, M. and PLANAVSKY, N., 2019, Early Paleozoic bioturbation and its influence on the global marine phosphorus cycle: Northeastern Geobiology Symposium (Poster).

**TARHAN, L.G.**, ZHAO, M. and PLANAVSKY, N., 2018, The impact of early Paleozoic bioturbation upon phosphorus cycling: Goldschmidt 2018, Session 10D (Invited talk).

ZHAO, M., PLANAVSKY, N., **TARHAN, L.**, ZHANG, S. and REINHARD, C., 2018, Significant influence of seawater calcium concentration on marine phosphorus burial: Goldschmidt 2018, Session 3L (Talk given by M. Zhao).

WEI, G., PLANAVSKY, N., **TARHAN, L.**, CHEN, X., WEI, W., LI, D. and LING, H., 2018, Environmental fluctuation triggered the Cambrian Explosion?: Goldschmidt 2018, Session 7B (Talk given by G. Wei).

**TARHAN, L.G.**, DROSER, M.L. and GEHLING, J.G., 2018, The importance of substrate for Ediacara paleoecology, paleoenvironment and taphonomy: 5<sup>th</sup> International Paleontological Congress (Talk).

**TARHAN, L.G.**, DROSER, M.L. and GEHLING, J.G., 2018, Ecological innovation in the late Ediacaran: Society for Integrative and Comparative Biology 2018 Annual Meeting (Invited symposium talk).

**TARHAN, L.G.**, HOOD, A.V.S., DROSER, M.L., GEHLING, J.G. and BRIGGS, D.E.G., 2017, A silica driver of Ediacara-style fossilization: Geological Society of America Abstracts with Programs: Paper No. 198-5, v. 49 (Talk).

DROSER, M.L., GEHLING, J.G., EVANS, S.D., **TARHAN, L.G.**, HALL, C.M.S., DZAUGIS, M.E., DZAUGIS, M.P., DZAUGIS, P., HUGHES, I.V., HUGHES, E.B. and RICE, D., 2017, Snapshots and long exposures: Picturing life in the Ediacaran: Geological Society of America Abstracts with Programs: Paper No. 100-1, v. 49 (Talk given by M.L. Droser).

**TARHAN, L.G.**, 2017, Development of bioturbation and implications for early Paleozoic biogeochemical cycling: Goldschmidt 2017, Session 14D (Invited talk).

**TARHAN, L.G.**, 2017, The Protracted development of bioturbation through the early Paleozoic: 5<sup>th</sup> Nereis Park Conference—Biological Modification of the Seabed: Biogeochemical and Ecological Processes in a Changing World, Session 1, p. 8-9 (Talk).

**TARHAN, L.G.**, HOOD, A.V.S., DROSER, M.L., GEHLING, J.G. and BRIGGS, D.E.G., 2017, Exceptional preservation of soft-bodied Ediacara Biota promoted by silica-rich oceans: 2017 International Symposium on the Ediacaran-Cambrian Transition, Session 7B, p. 115 (Talk).

**TARHAN, L.G.**, 2017, Development of bioturbation and implications for early Palaeozoic biogeochemical cycling: Geobiology Society Conference 2017 (Invited talk).

**TARHAN, L.G.**, DROSER, M.L., GEHLING, J.G. and Dzaugis, M.P., 2017, Microbial mat sandwiches and other anactualistic sedimentary features of the Ediacara Member (Rawnsley Quartzite, South Australia): Implications for interpretation of the Ediacaran sedimentary record: Lyell Meeting 2017: Sticking Together. The Geological Society London, p. 67 (Talk).

**TARHAN, L.G.**, 2017, Preservation and paleoecology of the Ediacara Biota—Earth's earliest complex communities: Women of Earth Science Symposium. Yale University, Department of Geology and Geophysics (Talk).

**TARHAN, L.G.**, HOOD, A.V.S., DROSER, M.L., GEHLING, J.G. and BRIGGS, D.E.G., 2016, Exceptional preservation of the soft-bodied Ediacara Biota promoted by silica-rich oceans: Geological Society of America Abstracts with Programs: Paper No. 183-3, v. 48 (Talk).

**TARHAN, L.G.**, 2016, Protracted development of bioturbation and implications for global biogeochemical cycling through the early Paleozoic: Geological Society of America Abstracts with Programs: Paper No. 224-2, v. 48 (Invited talk).

HALL, C.M.S., **TARHAN, L.G.**, EVANS, S.D., DZAUGIS, M.P., HUGHES, E.B., HUGHES, I.V., DROSER, M.L. and GEHLING, J.G., 2016, Picking out the fabric of the Ediacara seafloor: Evidence of widespread, heterogeneous textured organic surfaces: Geological Society of America Abstracts with Programs: Paper No. 184-8, v. 48 (Talk given by C.M.S. Hall).

**TARHAN, L.G.**, HOOD, A.V.S., DROSER, M.L., GEHLING, J.G. and BRIGGS, D.E.G., 2016, Taphonomic history of the Ediacara Member, Rawnsley Quartzite (South Australia): Palaeo Down Under (Talk).

**TARHAN, L.G.**, HOOD, A.V.S., DROSER, M.L., GEHLING, J.G. and BRIGGS, D.E.G., 2016, A new model for Ediacara-style preservation: Northeastern Geobiology Symposium (Talk).

**TARHAN, L.G.**, PLANAVSKY, N.J., DROSER, M.L. and GEHLING, J.G., 2015, Depositional and preservational environments of the Ediacara Member, Rawnsley Quartzite (South Australia): Assessing the timing of 'ferruginization': Annual Meeting of the Palaeontological Association—Programme, Abstracts and AGM Papers, p. 45 (Talk).

**TARHAN, L.G.**, PLANAVSKY, N.J., DROSER, M.L. and GEHLING, J.G., 2015, Depositional and preservational environments of the Ediacara Member, Rawnsley Quartzite (South Australia): Assessing the timing of 'ferruginization': Geological Society of America Abstracts with Programs: Paper No. 338-10, v. 47 (Talk).

**TARHAN, L.G.**, DROSER, M.L., GEHLING, J.G. and BRIGGS, D.E.G., 2015, Puckered, woven and grooved: the importance of substrate for Ediacara paleoecology, paleoenvironment and taphonomy: Northeastern Geobiology Symposium (Poster).

**TARHAN, L.G.**, DROSER, M.L. and GEHLING, J.G., 2014, Puckered, woven and grooved: the importance of substrate for Ediacara paleoecology, paleoenvironment and taphonomy: Annual Meeting of the Palaeontological Association—Programme, Abstracts and AGM Papers, p. 48 (Talk).

**TARHAN, L.G.**, DROSER, M.L. and JOHNSTON, D., 2014, Protracted development of bioturbation and implications for global sulfur cycling in early Paleozoic marine shelfal environments: Geological Society of America Abstracts with Programs: Paper No. 158-4, v. 46, p. 399 (Talk).

**TARHAN, L.G.** and DROSER, M.L., 2014, Protracted development of infaunal sediment mixing: implications for substrate evolution and exceptional trace fossil preservation in early Paleozoic marine shelfal environments:

Fourth International Palaeontological Congress: Symposium 12 (“Using Trace Fossils to Understand Evolutionary Trends”), p. 244 (Poster).

**TARHAN, L.G.** and DROSER, M.L., 2014, Protracted development of the mixed layer: implications for substrate evolution and exceptional preservation in early Paleozoic marine shelfal environments: Northeastern Geobiology Symposium 2014, Oral Session 2-4, p. 12 (Talk).

**TARHAN, L.G.**, DROSER, M.L., GEHLING, J.G. and DZAUGIS, M.P., 2014, Taphonomy and morphology of the Ediacaran form genus *Aspidella* (Ediacara Member, Rawnsley Quartzite, South Australia): 10<sup>th</sup> North American Paleontological Convention, The Paleontological Society Special Publications, Session 36-7, v. 13, p. 160-161 (Talk).

EVANS, S.D., DROSER, M.L., GEHLING, J.G. and **TARHAN, L.G.**, 2014, *Dickinsonia* lifts off: evidence of current-derived morphologies: 10<sup>th</sup> North American Paleontological Convention, The Paleontological Society Special Publications, Session 36-7, v. 13, p. 162 (Talk given by S.D. Evans).

**TARHAN, L.G.**, HADDAD, E., SOLON, C.M., DAHL, R.M., HANCOCK, L.G., HENRY, S.E., JOEL, L.V., THOMSON, T.J. and DROSER, M.L., 2013, Seafloor colonization in the earliest Paleozoic: evidence from the Cambrian of Death Valley: First Annual Conference of the Death Valley Natural History Association (Talk).

**TARHAN, L.G.** and DROSER, M.L., 2013, Protracted development of the mixed layer: implications for substrate evolution and exceptional preservation in early Paleozoic marine shelfal environments: Geological Society of America Abstracts with Programs, Paper No. 297-12, v. 45, p. 686 (Talk).

EVANS, S.D., DROSER, M.L., GEHLING, J.G., **TARHAN, L.G.** and DZAUGIS, M.P., 2013, Turning back the clock: deciphering time averaging and reconstructing colonization histories of Ediacara communities: Geological Society of America Abstracts with Programs, Paper No. 186-11, v. 45, p. 455 (Talk given by S.D. Evans).

**TARHAN, L.G.**, PLANAVSKY, N.J., REID, R.P. and DROSER, M.L., 2012, Microbial mat controls on infaunal abundance and diversity in modern marine microbialites: Geological Society of America Abstracts with Programs, Paper No. 61-2, v. 44, p. 169 (Talk).

DAHL, R.M., **TARHAN, L.G.** and DROSER, M.L., 2012, Gastropod-dominated shellbeds from the Middle Ordovician Antelope Valley Limestone (Ikes canyon, Toquima Range, NV): Geological Society of America Abstracts with Programs, v. 44, p. 397 (Poster presented by R.M. Dahl).

**TARHAN, L.G.**, DROSER M.L., GEHLING, J.G., DZAUGIS, M.P., DZAUGIS, M.E. and RICE, D., 2012, Taphonomic variability of the Ediacaran form genus *Aspidella* (Ediacara Member, South Australia): Geological Association of Canada-Mineralogical Association of Canada Joint Annual Meeting, v. 35, p. 48 (Talk).

**TARHAN, L.G.** and DROSER, M.L., 2012, Exceptional trace fossil preservation and mixed layer development in Cambrian siliciclastic strata of the Great Basin (western USA) and central Spain: California Paleontology Conference, Session No. 3-3, p. 20-21 (Talk).

**TARHAN, L.G.**, PLANAVSKY, N.J., REID, R.P. and DROSER, M.L., 2012, Microbial mat controls on infaunal abundance and diversity in modern marine microbialites: Ninth Annual Southern California Geobiology Symposium, p. 24 (Poster).

**TARHAN, L.G.** and DROSER, M.L., 2011, Exceptional trace fossil preservation and enigmatic substrate conditions in the Cambrian of the Great Basin, western USA: Geological Society of America Abstracts with Programs, Paper No. 120-1, v. 43, p. 310 (Talk).

**TARHAN, L.G.** and DROSER, M.L., 2011, Cambrian ichnofabrics in fine-grained siliciclastic strata of the Great Basin (Utah and Nevada), western USA: Abstract Book of the XI International Ichnofabric Workshop, p. 96-97 (Talk).

**TARHAN, L.G.**, JENSEN, S. and DROSER, M.L., 2010, Furrows and firmgrounds: evidence for predation and implications for Paleozoic substrate evolution in *Rusophycus* “hunting burrows” from the Silurian of east-central New York: Geological Society of America Abstracts with Programs, v. 42, p. 320 (Talk).

DZAUGIS, M.P., GEHLING, J.G., DROSER, M.L., **TARHAN, L.G.**, DZAUGIS, M.E. and RICE, D., 2010, Size distributions, morphology and taphonomy of the form genus *Aspidella*: Ediacara Member, South Australia: Geological Society of America Abstracts with Programs, v. 42, p. 96 (Poster).

**TARHAN, L.G.**, DROSER, M.L. and GEHLING, J.G., 2010, Microbes and mops: elucidating the Ediacaran substrate: SEPM Field Conference: Microbial mats in siliciclastic settings (Archean to today) (Poster).

**TARHAN, L.G.**, DROSER, M.L. and GEHLING, J.G., 2009, Puckers and pull-throughs: an Ediacaran action shot: Geological Society of America Abstracts with Programs, v. 41, p. 31 (Talk).

**TARHAN, L.G.** and HAGADORN, J.W., 2009, Taphonomy and classification of Late Cambrian medusae of central Wisconsin and northeastern New York: problems of preservation: Abstracts – North American Paleontological Convention, v. 9, p. 346 (Poster).

**TARHAN, L.G.** and HAGADORN, J.W., 2008, Taphonomy and classification of Late Cambrian medusae of central Wisconsin and northeastern New York: problems of preservation: 29<sup>th</sup> Annual Five College Geology Undergraduate Research Symposium (Poster).

**TARHAN, L.G.** and HAGADORN, J.W., 2008, Taphonomy and classification of medusae from the Late Cambrian of Wisconsin and New York: Geological Society of America (Northeastern Section) Abstracts with Programs, v. 40, p. 80 (Poster).

**TARHAN, L.G.** and HAGADORN, J.W., 2005, Paleoecology of an unusually-preserved set of *Climactichnites wilsoni* trackways from the Upper Cambrian of central Wisconsin: Howard Hughes Medical Institute Summer Research Symposium (Poster).

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