

Aviv Bachan *Curriculum Vitae*

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RESEARCH AND Geology, Geochemistry, Geochemical Modeling, Carbon Cycle, Carbonates, Climate,
TEACHING Geobiology, Paleobiology, Sedimentology, Stratigraphy, Extinctions.
INTERESTS

PROFESSIONAL Data scientist. Argyle Data, San Mateo, CA. March 2017 to present.
EXPERIENCE

Postdoctoral Researcher, The Stanford Paleobiology Laboratory, Stanford University, Stanford, CA. March 2015 to March 2017.

Canadian Institute for Advanced Research Post-Doctoral Research Fellow, the Pennsylvania State University, University Park, PA. Host: Lee R. Kump. February 2013 to February 2015.

EDUCATION Stanford University, Stanford, California

Ph.D. Geological and Environmental Sciences, September 2007 to April 2013
Dissertation Title: *The carbon cycle perturbation associated with the end-Triassic mass extinction*
Advisor: Jonathan L. Payne

Ben-Gurion University, Be'er Sheva, Israel

Dual B.Sc.: Life Sciences and Geological & Environmental Sciences, *Cum Laude*
September 2004 to July 2007
Honors Thesis: *Towards a new proxy for algal symbiosis in planktonic foraminifera: stable carbon isotopes in foraminiferal organic matter.*
Advisors: Sigal Abramovitch and Jonathan Erez

PUBLICATIONS 2017

Havig, J.R., Hamilton, T.L., **Bachan**, A, and Kump, L.R. 2017. Sulfur and carbon isotopic evidence for metabolic pathway evolution and a four-stepped Earth system progression across the Archean and Paleoproterozoic. *Earth-Science Reviews* v. 174C, pp. 1-21

Jost, A.B., **Bachan**, A., Van de Schootbrugge, B., Lau, K.V., Weaver, K.L., Maher, Maher, K., Payne, J.L. 2017. Uranium isotope evidence for an expansion of marine anoxia during the end-Triassic extinction, *Geochemistry, Geophysics, Geosystems*, 18, doi:10.1002/2017GC006941.

Bachan, A., Lau, K.V. Saltzman, M.R., Thomas, E. Kump, L.R., and Payne, J.L. 2017. A model for the decrease in amplitude of carbon isotope excursions

throughout the Phanerozoic. *American Journal of Science*, v. 317 pp. 641-676. doi:10.2475/06.2017.01

Halevy, I., **Bachan**. 2017. A. The Geologic History of Seawater pH. *Science*, 355(6329), pp. 1069-1071. DOI: 10.1126/science.aal4151

2016

Jost, A.B., **Bachan**, A., Van de Schootbrugge, B., Brown, S.T., DePaolo, D.J., Payne, J.L. 2016. Additive effects of acidification and mineralogy on calcium isotopes in Triassic/Jurassic boundary limestones. *Geochemistry, Geophysics, Geosystems*. Accepted for publication. Chosen to be featured as a Research Spotlight on Eos!

2015

Bachan, A., Kump, L.R. 2015. The rise of oxygen and siderite oxidation during the Lomagundi Event. *Proceedings of the National Academy of Sciences* 112 (21), pp 6562–6567. doi: 10.1073/pnas.1422319112

Bachan, A., Payne, J.L. 2015. Modeling the impact of pulsed CAMP volcanism on pCO₂ and δ¹³C at the end of the Triassic and earliest Jurassic. Invited submission to special volume in honor of Anthony Hallam, *Geological Magazine*, pp 1–19. doi: 10.1017/S0016756815000126

2014

Bachan, A., van de Schootbrugge, B., Payne, J.L. 2014. The end-Triassic negative δ¹³C_{carb} excursion: a lithological test. *Palaeogeography, Palaeoclimatology, Palaeoecology*, pp 177–186. doi: 10.1016/j.palaeo.2014.07.027

2013

Rigo, M., Mcroberts, C., Ciarapica, G., Giordano, N., and **Bachan**, A. 2013. New stratigraphic, paleontologic, and geochemical data around the Triassic-Jurassic boundary at Portovenere (Northern Apennines), Italy. In: Tanner, L.H., Spielmann, J.A. and Lucas, S.G., eds., 2013, *The Triassic System*. New Mexico Museum of Natural History and Science, Bulletin 61

Van de Schootbrugge, B., **Bachan**, A., Suan, G., Richoz, S., Payne, J.L. 2013. Microbes, mud and methane: cause and consequence of recurrent Early Jurassic anoxia following the end-Triassic mass extinction. *Palaeontology* 56 (4), pp 685–709. doi: 10.1111/pala.12034

2012

Bachan, A., van de Schootbrugge, B., Fiebig, J., Mcroberts, C.A., Ciarapica, C., Payne, J.L. 2012. Carbon cycle dynamics following the end-Triassic mass extinction: Constraints from paired δ¹³C_{carb} and δ¹³C_{org} records. *Geochemistry, Geophysics, Geosystems*

Geosystems 13, pp Q09008. doi: 10.1029/2012GC004150

CONFERENCE 2016
PRESENTATIONS

Payne, J.L, **Bachan**, A., Lau, K.V., Meyer, K.M., Schaal, E.K., Kelley, B.M. The oxygen minimum zone as a key control on excursions, recovery, and environmental change following the end-Permian extinction. Geological Society of America, Denver. October, 2016. Oral Presentation.

Bachan, A., Payne, J.L., Saltzman, M.R., Thomas, E., Kump, L.R. A model for the decrease in amplitude of carbon isotope excursions throughout the Phanerozoic. Geological Society of America, Denver. October, 2016. Oral Presentation.

2015

Bachan, A., Payne, J.L., Saltzman, M.R., Thomas, E., Kump, L.R. Understanding oscillations of the geological carbon cycle. American Geophysical Union, San Francisco, CA. December, 2015. Oral Presentation.

Jost, A.B., **Bachan**, A., van de Schootbrugge, B., Lau, K.V., Weaver, K.L., Maher, K., Payne, J.L. An increase in the extent of global ocean anoxia at the end-Triassic from uranium isotopes. American Geophysical Union, San Francisco, CA. December, 2015. Oral Presentation.

Payne, J.L. , Jost, A.B. , Lau, K.V., **Bachan**, A., Meyer, K.M., Altiner, D., Lehrmann, D.J., Yu, M., van de Schootbrugge, B., Kump, L.R., Maher, K. The role of ocean anoxia in modulating Earth System recovery following mass extinction event. Geological Society of America, Baltimore. November, 2015. Oral Presentation.

Halevy., I. & **Bachan**, A. The evolution of ocean pH. Goldschmidt Geochemical Conference, Prague, Czech Republic. August, 2015. Oral Presentation

Jost, A.B., **Bachan**, A., van de Schootbrugge, B., Weaver, K.L., Lau, K.V., Maher, K., Payne, J.L. An Increase in the extent of global anoxia at the End-Triassic inferred from uranium isotopes. Goldschmidt Geochemical Conference, Prague, Czech Republic. August, 2015. Oral Presentation

Austermann, J., **Bachan**, A., Eyster, A. Geophysical modeling of the impact of Central Atlantic Magmatic Province emplacement on sea-level changes at the Triassic-Jurassic boundary. European Geophysical Union, Vienna, Austria. April 2015. Oral Presentation.

2014

Bachan, A., Jost A.B., van de Schootbrugge, B., Payne J.L. Cooling after warming: $p\text{CO}_2$ undershoot forced by organic carbon burial following the end-Triassic mass extinction. American Geophysical Union, San Francisco, CA. December 2014. Poster.

Bachan, A., Payne, J.L., Saltzman, M.R., Thomas, E., Kump, L.R. Statistical signal analysis of the Phanerozoic $\delta^{13}\text{C}$ curve: implications for Earth system evolution. American Geophysical Union, San Francisco, CA. December 2014. Poster.

Havig J.R., McCormick, M., **Bachan**, A., Kump, L.R. Behavior of dissolved manganese and other trace elements across the oxic/euxinic transition of a meromictic lake, Fayetteville Green Lake, New York, USA. American Geophysical Union, San Francisco, CA. December 2014. Poster.

Jost, A.B., **Bachan**, A., Van de Schootbrugge, B., Depaolo, D.J., Payne, J.L. A calcium isotope excursion associated with the end-Triassic mass extinction: implications for ocean acidification and carbon cycle dynamics. Geological Society of America. October 2014. Oral presentation.

Bachan Cooling after warming: $p\text{CO}_2$ undershoot following the end-Triassic mass extinction. Canadian Institute for Advanced Research, Earth Systems Evolution Program interaction meeting, Whistler, BC. September 2014. Oral presentation.

Bachan, A., Kump, L.R. Isotopic Consequences of the Great Oxidation Event. Goldschmidt Geochemical Conference, Sacramento, CA. June 2014. Oral presentation.

Havig J., Hamilton T., **Bachan**, A. Interpreting the ancient sulfur-isotopic signal from a metabolic pathway perspective. Goldschmidt Geochemical Conference, Sacramento, CA. June 2014. Poster.

Havig, J., McCormick, M., **Bachan**, A., Kump L.R. High resolution sampling reveals a complex geochemical environment at Fayetteville Green Lake, N.Y. Goldschmidt Geochemical Conference, Sacramento, CA. June 2014. Poster.

Jost A.B., **Bachan**, A., van der Schootbrugge, B., DePaolo, D.J., Payne, J.L. Calcium isotope evidence for end-Triassic ocean acidification. Goldschmidt Geochemical Conference, Sacramento, CA. June 2014. Poster.

2013

Bachan, A., Payne, J.L. Multi-proxy modeling of the end-Triassic environmental perturbation. Geological Society of America, Denver, CO. October 2013. Oral presentation.

Bachan, A., Kump, L.R. Modeling the isotopic consequences of the Great Oxidation Event. Canadian Institute for Advanced Research, Earth Systems Evolution Program Interaction Meeting, Toronto, Canada. September 2013. Oral presentation.

2011

Bachan, A., van de Schootbrugge, B., Payne, J.L. Coupled organic and carbonate $\delta^{13}\text{C}$ records of the late Triassic and early Jurassic in northern Italy: implications for carbon cycling during the aftermath of the end-Triassic mass extinction. American

Geophysical Union, San Francisco, CA. December 2011. Poster.

Srinivasan P.S., **Bachan**, A. Determining the Central Atlantic Magmatic Province (CAMPS)'s Role in the Increased Flux of CO₂ in the end-Triassic Mass Extinction. American Geophysical Union, BRIGHT STaRS, San Francisco, CA. December 2011. Poster.

Bachan, A., van de Schootbrugge, B., Payne, J.L. Coupled organic and carbonate $\delta^{13}\text{C}$ records of the late Triassic and early Jurassic in northern Italy: implications for carbon cycling during the aftermath of the end-Triassic mass extinction. Geological Society of America, Minneapolis, MN. October 2011. Oral presentation.

Bachan, A., van de Schootbrugge, B., Fiebig, J., Payne, J.L.. The end-Triassic mass extinction: new isotope constraints from Italy. European Geophysical Union, Vienna, Austria. April 2011. Oral presentation.

2010

Bachan, A., van de Schootbrugge, B., Fiebig, J., Payne, J.L. Carbon cycle dynamics and environmental change at the Triassic-Jurassic boundary. Geological Society of America, Denver, CO. November 2010. Poster.

HONORS, GRANTS, AND AWARDS

Post Doctoral Fellowship, Earth Systems Evolution Program, Canadian Institute for Advanced Research (Administered by Penn State). 100,000\$.

The Sir Harold Kroto Award for outstanding overall poster presentation at the 2013 Carbon Earth Conference, Penn State.

Certificate of Achievement in Mentoring in the School of Earth Sciences, Stanford University 2012

Levorsen Research Fund, School of Earth Sciences, Stanford University, 2010. 3000\$.

National Science Foundation Graduate Research Fellowship, 2008-2011. 150,000\$.

The Lewis and Clark Fund for Exploration and Field Research, 2008. 3000\$.

McGee Research Fund, School of Earth Sciences, Stanford University, 2008. 3000\$.

Departmental award for excellence, Department of Geological and Environmental sciences, Ben Gurion University, 2005.

Departmental award for excellence, Department of Life Sciences, Ben Gurion University, 2005.

Kreitman Entrance Prize for Exceptional Applicants, Ben Gurion University.

FIELD EXPERIENCE

Namibia, Neoproterozoic, 2 weeks, July, 2015

Wyoming, Paleoproterozoic, 1 week, August 2014

Italy, Triassic-Jurassic boundary, 2 weeks, April 2011

Italy, Triassic-Jurassic boundary, 6 weeks, July-August 2009

Italy, Triassic-Jurassic boundary, 8 weeks, July-August 2008

Israel, Mesozoic Carbonates, approximately 3 weeks total, 2004 – 2007

TEACHING EXPERIENCE Spring 2015. GS 225A: Fundamentals of geochemical modeling, Instructor, Graduate level, Stanford University.

 GEOSC 597C Seminar on Deep Time Biogeochemistry, Co-instructor, Graduate level, Penn State University.

 GES 264 Math Modeling in Biogeochemistry, Teaching Assistant, Graduate level, Stanford University.

 GES 254 Carbonate Sedimentology, Teaching Assistant, Advanced Undergraduate and Graduate level, Stanford University.

 GES 1 Introduction to Geology, Teaching Assistant, Introductory Undergraduate level, Stanford University.

PROFESSIONAL SERVICE Reviewer for Science 2016

 Reviewer for Nature Geoscience 2016

 Reviewer for Geochemistry, Geophysics, Geosystems 2016

 Reviewer for Gondwana Research 2016

 Reviewer for Geophysical Research Letters 2016

 Reviewer for Earth and Planetary Science Letters 2015

 Reviewer for Palaeogeography, Palaeoclimatology, Palaeoecology 2014

 Reviewer for National Science Foundation 2014

 Reviewer for American Journal of Science 2014

 Reviewer for Chemical Geology 2013

 Reviewer for Earth and Planetary Science Letters 2013

CONFERENCE SYMPOSIA Co-convener: Can carbon isotopes solve global carbon cycle conundrums? European Geoscience Union, Vienna, 2011

OTHER DOB: May 11, 1980. Israel.

 Israeli Society for the Protection of Nature: Jul 1998 - Nov 1999

 Israeli Defense Forces: Nov 1999- Nov 2002

 Fluent English, Hebrew.

 American-Israeli dual citizenship.

 Member (2007–present): AGU, GSA, SEPM, and the Geochemical Society.