

JOHN P. GROTZINGER

EDUCATION

- Ph.D., 1985. Virginia Polytechnic Institute and State University. Dissertation Title: Evolution of early Proterozoic passive-margin carbonate platform, Rocknest Formation, Wopmay Orogen, N.W.T., Canada. 225 pp.
- M.S., 1981. University of Montana. Thesis Title: Stratigraphy and Sedimentation of the Wallace Formation, northwest Montana and northern Idaho. 153 pp.
- B.S. (High Honors), 1979. Hobart College. Honors Thesis Title: Diffusion of Chloride in Seneca Lake sediments. 89 pp.

APPOINTMENTS

- 2007-: Project Scientist, Mars Science Laboratory Mission
- 2005-: Fletcher Jones Professor of Geology, California Institute of Technology
- 2001-2005: Robert E. Shrock Professor of Geology, Massachusetts Institute of Technology
- 1999 - 2003: Director, Earth Resources Laboratory, Massachusetts Institute of Technology
- 1998 -2001 : Waldemar Lindgren Distinguished Scholar, Massachusetts Institute of Technology
- 1995 - 2001: Professor: Massachusetts Institute of Technology
- 1991- 1995: Associate Professor: Massachusetts Institute of Technology
- 1988 -1991 : Assistant Professor: Massachusetts Institute of Technology
- 1988 -1992 : Adjunct Associate Research Scientist: Lamont-Doherty Geological Observatory
- 1987-1988: Associate Research Scientist: Lamont-Doherty Geological Observatory
- 1985-1987: Post-Doctoral Fellow: Lamont-Doherty Geological Observatory
- 1985-1988: Research Scientist (Field Party Chief): Geological Survey of Canada

INDIVIDUAL HONORS

- NASA Group Achievement Award, Mars Science Laboratory Mission (2013)
- NASA Outstanding Public Leadership Medal (2013)
- Doctor of Science honorary degree, Hobart College (2013)
- Roy Chapman Andrews Explorer Award (2013)
- Halbouty Award, American Association of Petroleum Geologists (2012)
- Lawrence Sloss Award, Geological Society of America (2011)
- Geobiology Division Award, Geological Society of America (2010)
- Charles Doolittle Walcott Medal, National Academy of Sciences (2007)
- NASA Group Achievement Award, Mars Exploration Rovers Science (2006)
- Distinguished Visiting Scientist, Jet Propulsion Laboratory (2004-2006)
- Jubilee Medal, Geological Society of South Africa (2004)
- Member, National Academy of Sciences (2002)
- Henno Martin Medal, Geological Society of Namibia (2002)
- Waldemar Lindgren Distinguished Scholar, Massachusetts Institute of Technology (1998-2001)
- Fellow, American Association for the Advancement of Science (1995)
- Senior Fellow, Geological Society of America (1992)
- Donath Medal, Geological Society of America (1992)
- Presidential Young Investigator Award of the National Science Foundation (1990)

TEAM HONORS (Mars Science Laboratory Project)

- Goddard Medal, National Aeronautics and Space Agency (2013)
- John L. Swigert Award for Space Exploration, Space Foundation. (2013)

National Air and Space Museum Trophy, Smithsonian Museum (2013)
Collier Trophy, United States National Aeronautic Association (2013)
American Institute of Aeronautics and Astronautics Foundation Award for Excellence (2013)
Popular Mechanics Breakthrough Award (2013)

GRADUATE STUDENTS

Current

Katie Stack (Ph.D. Candidate) Thesis Topic: Assessing the stratigraphic record of Mars using CRISM and HiRISE imaging data.
Daniel Stolper (Ph.D. Candidate) Thesis topic: Genesis of Athel Silicilyte, Ara Basin, Oman using oxygen isotope and organic biomarker data.
Ted Present (Ph.D. Candidate) Thesis topic: Diagenesis of carbonate rocks, west Texas, and massive sulfide ore deposits, Sheep Creek, Montana

Past

Julio Friedmann (M.Sc. 1990). Thesis title: Stratigraphy, sedimentology, and Tectonic Evolution of the 1.86 Ga El Sherana and Edith River Groups, Northern Territory, Australia. Employed as Group Leader for Carbon Storage Initiative, Lawrence-Livermore Laboratories.
Linda Kah (M.Sc. 1990). Thesis title: Early Proterozoic (1.9 Ga) Thrombolites of the Rocknest Formation, Northwest Territories, Canada. Employed as Full Professor, University of Tennessee.
David McCormick (Ph.D. 1992). Thesis title: Evolution of an Early Proterozoic alluvially-dominated foreland basin, Burnside Formation, Kilohigok Basin, N.W.T., Canada. Employed as Team Leader and Senior Research Scientist at Schlumberger-Doll Research Laboratory.
Roy Adams (Ph.D. 1993). Thesis title: Sequence-stratigraphic analysis of mixed carbonate-siliciclastic Cambrian sediments, Carrara Formation, southwest Basin and Range, California and Nevada. Employed as Research Scientist at Utah Geological Survey and Adjunct Assistant Professor at University of Utah.
Brad Ritts (M.S. 1994). Thesis title: Depositional facies and detrital composition of the Paleoproterozoic Et-Then Group, NWT, Canada. Employed as Senior Research Scientist, Chevron Energy Technology Company.
Dawn Sumner (Ph.D. 1995). Thesis title: Facies, paleogeography, and carbonate precipitation on the Archean (2520 Ma) Campbellrand-Malmani carbonate platform, Transvaal Supergroup, South Africa. Employed as Full Professor at University of California at Davis.
Beverly Saylor (Ph.D. 1996). Thesis title: Sequence stratigraphic and chemostratigraphic constraints on the evolution of the terminal Proterozoic to Cambrian Nama basin, Namibia. Employed as Full Professor, Case Western Reserve University.
Shane Pelechaty (Ph.D. 1996). Thesis title: The Vendian-Cambrian System of Siberia: Correlation, Tectonics and Petroleum Geology. Employed as Senior Research Scientist at Shell Exploration International.
Eliot Ibie (M.Sc. 1997). Thesis title: Seismic Stratigraphic Analysis in the Niger Delta: A Case History of the Benin River 3-D Seismic Cube. Employed as Exploration Geologist at Chevron Nigeria.
Jennifer Carlson (Ph.D. 1998). Thesis title: Analytical and Statistical Approaches Toward Understanding Sedimentation in Siliciclastic Depositional Systems.
Odin Smith (M.Sc. 1998). Thesis title: Terminal Proterozoic carbonate platform development: Stratigraphy and sedimentology of the Kuibis Subgroup (ca. 550-548 Ma), northern Nama basin, Namibia. Employed as environmental lawyer with Fire Island National Seashore, NY.
Kelvin Chan (M.Sc. 1999). Thesis title: Numerical simulation of stromatolite morphogenesis.
Clement Aina (M.Sc. 1999). Thesis topic: Well-log analysis of reservoir heterogeneity, Benin River field, Nigeria. Employed as Production Geologist at Chevron Nigeria.
Wes Watters (M.Sc. 2000). Thesis title: Digital reconstructions of Fossil Morphologies, Nama Group, Namibia. Currently in PhD program at MIT. Employed as Assistant Professor, Wellesley College.

Robert Flemings (M.Sc. 2000). Thesis title: Numerical simulation of turbidite sedimentation and submarine fan development. Employed at Earthworks Environmental, Redding, CT.

Steve DiBenedetto (M.Sc. 2002). Thesis Title: High-resolution facies architecture and sediment transport mechanisms on the terminal Proterozoic Kuibis carbonate ramp, Nama Group, Namibia. Employed as Environmental Geologist, Albany, NY.

Bill Lyons (Ph.D. 2004). Thesis Title: Experimental simulation of submarine fan architecture, and 3D seismic mapping of submarine fan evolution. Employed as Research Scientist at Shell USA, Houston

David Fike (Ph.D. 2007). Thesis Title: Biogeochemistry of the Precambrian-Cambrian boundary transition in Oman. Employed as Assistant Professor, Washington University.

Wes Watters (Ph.D. 2008). Thesis Title: Hypervelocity impacts and the evolution of planetary surfaces and interiors. Employed as Assistant Professor, Wellesley College.

Joannah Metz (Ph.D. 2010). Thesis Title: A study of the record of ancient sedimentary rocks on Mars using MER, HiRISE and CRISM images. Employed as Research Scientist at Shell USA, Houston.

Alex Hayes (Ph.D. 2011). Thesis topic: Reconstruction of ancient eolian bedforms and paleo-currents from crossbedded strata at Meridiani Planum. Employed as Assistant Professor, Cornell University.

Lauren Edgar (Ph.D. 2012). Thesis Title: Identifying and interpreting stratification in sedimentary rocks on Mars: insight from Rover and orbital observations and terrestrial field analogs. Currently employed as Post-Doctoral Fellow, Arizona State University.

Kristin Bergman (Ph.D. 2013). Thesis Title: Constraints on the carbon cycle and climate during the early evolution of animals. Currently employed as Post-Doctoral Fellow, Harvard University

Maggie Osborn (Ph.D. 2013). Thesis Title: Isotopic Proxies for Microbial and Environmental Change: Insights from Hydrogen Isotopes and the Ediacaran Khufai Formation. Currently employed as Assistant Professor, Northwestern University.

Postdoctoral Research Associates

Current

Melissa Rice (2012-) Research topic: Comparison of Mineral Spectra using COSI-CORR technique; operations for Mars Science Laboratory Mission

Jessica Creveling (2012-) Research topics: Neoproterozoic cap carbonate facies models

Past

Jennifer Carlson (1998 - 1999). Research topic: Turbidite stratigraphy, Karoo sequence, South Africa.

Mike Pope (1995 -1998). Research topics: Precambrian-Cambrian boundary stratigraphy, Turukhansk, Siberia; Paleoproterozoic carbonate and evaporite sedimentology, NWT, Canada. Currently in position of Full Professor, Texas A&M University.

Jeff Parsons (1997 -2000). Research topics: Experimental studies of sediment gravity flow triggering mechanisms and depositional scaling relationships.

Chris Nicholas (2000-2001). Research topic: The impact of terminal Proterozoic volcanicity on basin evolution and hydrocarbon exploration. Currently in position of Lecturer at Trinity College, Dublin.

Aileen McLeod (2000-2001) Research Topic: Interpretation of 3D and regional survey seismic data from the Namibian segment of the west African continental margin.

Jim Buttles (1999-2001) Research Topic: Experimental studies of submarine fan channel development, and acoustic imaging of experimentally-produced stratigraphy. Currently employed as Technician, University of Texas.

Stefan Schroeder (2000-2003) Research Topics: Trace element and Re-Os systematics of the Athel Silicilyte source rock event, terminal Proterozoic, Oman; and comparative analysis of thrombolite genesis and reef

- development in terminal Proterozoic carbonates in Namibia (outcrop) and Oman (subsurface). Currently employed as Lecturer, University of Manchester.
- Erwin Adams (2001 - 2004) Research Topic: Digital mapping of terminal Proterozoic carbonate platforms, Nama Group, Namibia. Currently employed by Shell exploration research company.
- Adam Maloof (2004 -2006) Research Topic: Magnetism of modern carbonates, Andros Island, Bahamas, and Paleomagnetism of terminal Proterozoic carbonates Oman. Currently in position as Associate Professor at Princeton University.
- Justin Ries (2006-2007) Research Topic: Sulfur isotope chemostratigraphy, Nama Group, Namibia. Currently in position as Associate Professor at University of North Carolina.
- Mike Tice (2005-2007) Research Topic: Experimental morphogenesis of microbial mats. Currently in position as Assistant Professor at Texas A&M University.
- Ralph Milliken (2006-2007) Research Topic: Analysis of CRISM data and interpretation of stratal geometries, Melas Chasma and Juventae Chasma, Mars. Currently employed as Assistant Professor., Brown University.
- Abby Allwood (2006-2009) Research topics: Early Archean stromatolite morphogenesis; Miocene carbonate-evaporite microbialite genesis. Currently employed as Research Scientist, Jet Propulsion Laboratory.
- Woody Fischer (2007-2009) Research Topics: Carbonate fabrics in P-T strata; Microborings in basalts; Biogeochemistry of the Duck Creek Dolomite. Currently employed as Assistant Professor, Caltech.
- Tom Bristow (2008-2011) Research topics: Clay minerals of Earth and Mars; application of clumped isotopes to understanding thermal evolution of Doshantuo cap carbonate, China. Currently employed as Research Scientist, NASA Ames.

REFEREED PAPERS

- (1) Grotzinger, J.P. and Read, J.F. 1983. Evidence for primary aragonite precipitation, early Proterozoic (1.9 Ga) Rocknest Dolomite, Wopmay Orogen, northwest Canada. *Geology*, v.11, n. 12, p. 710-713.
- (2) Read, J.F., Grotzinger, J.P., Bova, J.A., and Koerschner, W.F. 1986. Models for generation of carbonate cycles. *Geology*, v. 14, no. 2, p. 107 - 110.
- (3) Hofmann, H.J. and Grotzinger, J.P. 1986. Shelf-facies Microbiotas from the Odjick and Rocknest Formations (Epworth Group; 1.89 Ga), northwestern Canada. *Can. Jour. Earth Sci.*, V.22, p. 1781-1792.
- (4) Grotzinger, J.P. 1986. Cyclicity and paleoenvironmental dynamics of an early Proterozoic carbonate platform, Rocknest Formation, Wopmay Orogen, N.W.T., Canada. *Geol. Soc. Am. Bull.*, v. 97, p. 1208-1231.
- (5) Grotzinger, J.P. 1986. Shallowing-upward cycles of the Wallace Formation (Belt Supergroup), northwest Montana and northern Idaho, *in*, A Guide to the Belt, S. Roberts (ed.), Montana Bureau of Mines Spec. Pub. 94., p. 143-160.
- (6) Grotzinger, J.P. 1986. Upward shallowing platform cycles: A response to 2.2 billion years of low-amplitude, high-frequency (Milankovitch band) sea level oscillations. *Paleoceanography*, v. 1, no. 4, p. 403-416.
- (7) Grotzinger, J.P. 1986. Evolution of early Proterozoic passive-margin carbonate platform, Rocknest Formation, Wopmay Orogen, N.W.T., Canada. *Journal of Sedimentary Petrology*, v. 56, no. 6, p. 831-847.
- (8) Bond, G.C., Kominz, M.A. and Grotzinger, J.P. 1988. Cambro-Ordovician eustacy: Evidence from geophysical modeling of Cordilleran and Appalachian miogeoclines, *in*, New Perspectives in Basin Analysis, K. Kleinspehn and C. Paola (eds.), Springer-Verlag, New York, p.129-160.
- (9) Christie-Blick, N., Grotzinger, J.P., and von der Borch, C.C. 1988. Sequence stratigraphy in Proterozoic Successions. *Geology*, v. 16, p. 100-104.
- (10) Grotzinger, John P. and McCormick, David S. 1988. Flexure of the early Proterozoic lithosphere and the evolution of Kilohigok Basin (1.9 Ga), northwest Canadian Shield, *in*, New Perspectives in Basin Analysis, K. Kleinspehn and C. Paola (eds.), Springer-Verlag, New York, p. 405-430.
- (11) Pelechaty, S.M. and Grotzinger, J.P. 1989. Stromatolite bioherms of a 1.9 Ga foreland basin carbonate ramp, Beechey Formation, Kilohigok Basin, Northwest Territories, *in*, H.H.J. Geldsetzer et al. (eds.), Reefs of Canada and Adjacent Areas: Canadian Society of Petroleum Geologists Memoir 13, p. 93-104.

- (12) Hoffman, P.F. and Grotzinger, J.P. 1989. Abner/Denault reef complex (2.1 Ga), Labrador Trough, NE Quebec, *in*, H.H.J. Geldsetzer et al. (eds.), Reefs of Canada and Adjacent Areas: Canadian Society of Petroleum Geologists Memoir 13, p. 49-54.
- (13) Bond, G.C., Kominz, M.A., Steckler, M.S., and Grotzinger, J.P. 1989. Role of thermal subsidence, flexure and eustasy in the evolution of Early Paleozoic passive margin carbonate platforms, *in*, Crevello et al. (eds.), Controls on Carbonate Platform and Basin Development: Society of Economic Paleontologists and Mineralogists Special Publication 44, p. 39-62.
- (14) Grotzinger, J.P. 1989. Introduction to Precambrian Reefs, *in*, H.H.J. Geldsetzer et al. (eds.), Reefs of Canada and Adjacent Areas: Canadian Society of Petroleum Geologists Memoir 13, p. 9-12.
- (15) Grotzinger, J.P. 1989. Construction of early Proterozoic (1.9 Ga) Barrier reef complex, Rocknest Platform, Northwest Territories, *in*, H.H.J. Geldsetzer et al. (eds.), Reefs of Canada and Adjacent Areas: Canadian Society of Petroleum Geologists Memoir 13, p. 30-37.
- (16) Grotzinger, John P. 1989. Facies and evolution of Precambrian carbonate depositional systems: emergence of the modern platform archetype, *in*, P.D. Crevello et al. (eds.), Controls on Carbonate Platform and Basin Development: Society of Economic Paleontologists and Mineralogists Special Publication 44, p. 79-106.
- (17) Burdett, J.W., Grotzinger, J.P., and Arthur, M.A. 1990. Did major changes in the stable isotopic composition of Proterozoic seawater occur? *Geology*, v. 18, p. 227-230.
- (18) Grotzinger, J.P. 1990. Geochemical model for Proterozoic stromatolite decline. *American Journal of Science*, v. 290-A, p. 80-103.
- (19) Grotzinger, J.P. and Royden, L.H. 1990. Elastic strength of the Slave craton at 1.9 Gyr and implications for the thermal evolution of the continents. *Nature*, v. 347, p. 64-66.
- (20) Tirrul, R. and Grotzinger, J.P. 1990. Early Proterozoic collisional orogeny along the northern Thelon front, Northwest Territories, Canada: evidence from the foreland. *Tectonics*, v. 9, p. 1015 - 1036.
- (21) Pelechaty, S.M., James, N.P., Kerans, C., and Grotzinger, J.P. 1991. A Middle Proterozoic paleokarst unconformity and associated sediments, Elu Basin, northwest Canada. *Sedimentology*, v. 38, p. 775-797.
- (22) Kaufman, P., Grotzinger, J.P., and McCormick, D.S. 1991. A depth-dependent diffusion algorithm for simulation of sedimentation in shallow marine depositional systems. *In*, "Sedimentary Modeling: Computer Simulations and Methods for Improved Parameter Definition". Kansas Geological Survey Bulletin 233, p. 489-508.
- (23) Bowring, S.A., and Grotzinger, J.P. 1992. Implications of new chronostratigraphy for tectonic evolution of Wopmay Orogen, northwest Canadian Shield. *American Journal of Science*, v. 292, p. 1-20.
- (24) Walter, M. R., Grotzinger, J. P., and Schopf, J. W. 1992. Proterozoic Stromatolites, *in*, Schopf, J.W., and Klein, C., (eds.), The Proterozoic Biosphere. Cambridge University Press, p. 253-259.
- (25) Grotzinger, J.P., and Ingersoll, R. 1992. Evolution of Proterozoic sedimentary basins, *in*, Schopf, J.W., and Klein, C., (eds.), The Proterozoic Biosphere. Cambridge University Press, p. 47-50.
- (26) Heaman, L. M. and Grotzinger, J.P. 1992. Age and significance of gabbro sills in the Pahrump Group, California. *Geology*, v. 20, p. 637-640.
- (27) Kah, L.C. and Grotzinger, J.P. 1992. Fabrics and significance of early Proterozoic (1.9 Ga) thrombolites of the Rocknest Formation, Northwest Territories, Canada. *Palaios*, v. 7, p. 305-315.
- (28) Veizer, J., Plumb, K.A., Clayton, R.N., Hinton, R.W., and Grotzinger, J.P. 1992. Geochemistry of Precambrian carbonates: V. Late Proterozoic seawater. *Geochimica et Cosmochimica Acta*, V. 56, p. 2487-2501.
- (29) McCormick, D. S., and Grotzinger, J. P. 1993. Distinction of marine from alluvial facies in the early Proterozoic (ca. 1.9 Ga) Burnside Formation, Kilohigok Basin, N.W.T. *Journal of Sedimentary Petrology*, v. 63, p. 398-419.
- (30) McCormick, D. S., and Grotzinger, J. P. 1993. Evolution and significance of an overfilled alluvial foreland basin: Burnside Formation (1.9 Ga), Kilohigok Basin, N.W.T., Canada. *Basin Research*, v. 4, p. 253-278.
- (31) Hoffman, P.F., and Grotzinger, J. P. 1993. Orographic precipitation, erosion, and orogenic style. *Geology*, v. 21, p. 195-198.
- (32) Grotzinger, J.P. and Kasting, J. 1993. New constraints on Precambrian ocean composition. *Journal of Geology*, v. 101, p. 235-243.

- (33) Sumner, D. Y. and Grotzinger, J. P. 1993. Numerical modeling of ooid size and the problem of Neoproterozoic giant ooids. *Journal of Sedimentary Petrology*, v. 63, p. 974-982.
- (34) Bowring, S.A., Grotzinger, J.P., Isachsen, C., Knoll, H.A., Pelechaty, S., and Kolosov, P. 1993. Calibrating rates of early Cambrian Evolution. *Science*, v. 261, p. 1293-1298.
- (35) Grotzinger, J.P. 1993. New views of old carbonate sediments. *Geotimes*, v. 38, p. 12-15.
- (36) Rothman, D., Grotzinger, J. P., and Flemings, P. 1994. Scaling in turbidite sedimentation. *Journal of Sedimentary Research*, v. A64, p. 59-67.
- (37) Grotzinger, J. P. Trends in Precambrian carbonate sediments and their implication for understanding evolution. *in*, Bengtson, S. (ed.), *Early Life on Earth*, Columbia University Press, p. 245-258 .
- (38) Freidmann, J.S., and Grotzinger, J.P. Sedimentology, stratigraphy, and tectonic implications of a Paleoproterozoic continental extensional basin: the El Sherana/Edith River Groups. *Canadian Journal of Earth Science*, v. 31, p. 748-764.
- (39) Rothman, D., Grotzinger, J. P., and Flemings, P., 1994. Scaling in turbidite sedimentation - Reply. *Journal of Sedimentary Research*, v. A64, p. 934.
- (40) Ritts, B., and Grotzinger, J.P. 1994. Depositional facies and detrital composition of the Paleoproterozoic Et-Then Group, NWT, Canada: sedimentary response to intracratonic indentation. *Canadian Journal of Earth Science*, v. 31, p. 1763-1778.
- (41) Rothman, D. H. and Grotzinger, J. P. 1995. Scaling properties of gravity-driven sediments. *Non-linear Processes in Geophysics*, v. 2, p. 178-185.
- (42) Knoll, A.H., Grotzinger, J.P., Kaufman, A.J., and Kolosov, P. 1995. Integrated approaches to Terminal Proterozoic stratigraphy: an example from the Olenek Uplift, northeastern Siberia. *Precambrian Research*, v. 73, p. 251-270.
- (43) Saylor, B. Z., Grotzinger, J. P., and Germs, J. B. 1995. Sequence stratigraphy and sedimentology of the Neoproterozoic Kuibis and Schwarzrand Subgroups (Nama Group), southwestern Namibia. *Precambrian Research*, v. 73, p. 153-171
- (44) Sergeev, V., Knoll, A.H., and Grotzinger, J.P. 1995. Paleobiology of the Mesoproterozoic Billyakh Group, Anabar Uplift, Northeastern Siberia. *Journal of Paleontology*.
- (45) Grotzinger, J. P. and Knoll, A. H., 1995. Anomalous marine carbonate precipitates: Is the Precambrian the key to the Permian? *Palaios*, v. 10, p. 578-596.
- (46) Grotzinger, J. P., Bowring, S. A., Saylor, B. Z., and Kaufman, A. J., 1995. Biostratigraphic and geochronologic constraints on early animal evolution. *Science*, v. 270, p. 598-604.
- (47) Knoll, A. H., Kaufman, A. J., Semikhatov, M. A., Grotzinger, J. P., and Adams, W., 1995. Sizing up the sub-Tommotian unconformity in Siberia. *Geology*, v. 23, p. 823-850.
- (48) Sumner, D. Y., and Grotzinger, J. P. 1996. Herringbone calcite: petrography and environmental significance. *Journal of Sedimentary Research*, v. 66, p. 419-429.
- (49) Pelechaty, S. M., Kaufman, A. J., and Grotzinger, J. P., 1996. Evaluation of $\delta^{13}\text{C}$ isotope stratigraphy for intrabasinal correlation: Vendian strata of the Olenek uplift and Kharaulakh Mountains, Siberian platform, Russia. *Geological Society of America Bulletin*, v. 108, p. 992-1003.
- (50) Sumner, D. Y. and Grotzinger, J. P., 1996. Were kinetics of Archean calcium carbonate precipitation related to oxygen concentration? *Geology*, v. 24, p. 119-122.
- (51) Grotzinger, J. P. and Rothman, D. H., 1996. An abiotic model for stromatolite morphogenesis. *Nature*, v. 383, p. 423-425.
- (52) Pelechaty, S. M., Grotzinger, J. P., Kashirtsev, V.A., and Jerinovsky, V. P., 1996. Chemostratigraphic and sequence stratigraphic constraints on Vendian-Cambrian basin dynamics, northeast Siberian craton. *Journal of Geology*, v. 104, p. 543-564.
- (53) Adams, R.D., and Grotzinger J.P. 1996. Lateral continuity of facies and parasequences in Middle Cambrian platform carbonates, Carrara Formation, southeastern California, USA. *Journal of Sedimentary Research*, v. 66, p. 1079-1090.
- (54) Knoll, A. H., Bambach, R. K., Canfield, D. E., and Grotzinger, J. P., 1996. Comparative Earth history and Late Permian mass extinction. *Science*, v. 273, p. 452-457.
- (55) Flemings, P. B., and Grotzinger, J. P., 1996. STRATA: Freeware for analyzing classic stratigraphic problems. *GSA Today*, v. 6, p. 1-7.

- (56) Narbonne, G. M., Saylor, B. Z., Grotzinger, J. P., 1997. The youngest Ediacaran fossils from southern Africa. *Journal of Paleontology*, v. 71, p. 953-967.
- (57) Saylor, B. Z., Kaufman, A. J., Grotzinger, J. P., and Urban, F., 1998, The partitioning of terminal Proterozoic time: Constraints from Namibia. *Journal of Sedimentary Research*, v. 68, p. 1223-1235.
- (58) Grotzinger, J. P. and Knoll, A. H. 1999. Stromatolites: Evolutionary mileposts or environmental dipsticks? *Annual Reviews of Earth and Planetary Science*, v. 27, p. 313-358.
- (59) Grotzinger, J. P., Watters, W. and Knoll, A. H., 2000, Calcified metazoans in thrombolite-stromatolite reefs of the terminal Proterozoic Nama Group, Namibia. *Paleobiology*, v. 26, p. 334-359.
- (60) Pope, M., Grotzinger, J., and Schreiber, B. C., 2000, Evaporitic subtidal stromatolites produced by *in situ* precipitation: Textures, facies associations, and temporal significance. *Journal of Sedimentary Research*, v. 70, p. 1139-1151.
- (61) Myrow, P. and Grotzinger, J. P., 2000, Chemostratigraphic proxy records: Forward modeling the effects of unconformities, variable sediment accumulation rates, and sampling-interval bias, *in*, SEPM Special Publication - Carbonate Sedimentation and Diagenesis in the Evolving Precambrian World, J. Grotzinger and N. James (eds), p. 43-58.
- (62) Pope, M. C., and Grotzinger, J. P., 2000, Controls on fabric development and morphology of tufa and stromatolites, uppermost Pethei Group (1.8 Ga), Great Slave Lake, northwest Canada, *in*, SEPM Special Publication - Carbonate Sedimentation and Diagenesis in the Evolving Precambrian World, J. Grotzinger and N. James (eds), p. 103-122.
- (63) Grotzinger, J. P. and James, N. P., 2000, Precambrian Carbonates: Evolution of Understanding, *in*, SEPM Special Publication #67 - Carbonate Sedimentation and Diagenesis in the Evolving Precambrian World, J. Grotzinger and N. James (eds), p. 3-22.
- (64) Sumner, D. Y. and Grotzinger, J. P., 2000, Evidence for Late Archean aragonite precipitation: Petrography, facies associations, and environmental significance, *in*, SEPM Special Publication - Carbonate Sedimentation and Diagenesis in the Evolving Precambrian World, J. Grotzinger and N. James (eds), p. 123-144.
- (65) Bartley, J. K., Knoll, A. H., Grotzinger, J. P., Sergeev, V. N., 2000, Lithification and fabric genesis in precipitated stromatolites and associated peritidal carbonates, Mesoproterozoic Billyakh Group, Siberia, *in*, SEPM Special Publication - Carbonate Sedimentation and Diagenesis in the Evolving Precambrian World, J. Grotzinger and N. James (eds), p. 59-74.
- (66) Laval, B., Cady, S. L., Pollack, J. C., McKay, C. P., Bird, J. S., Grotzinger, J. P., Ford, D. C., and Bohm, H. R., 2000, Modern freshwater microbialite analogues for ancient dendritic reef structures. *Nature*, v. 407, p. 626-629.
- (67) Grotzinger, J.P. 2000. Facies and paleoenvironmental setting of Thrombolite-Stromatolite Reefs, Terminal Proterozoic Nama Group (ca. 550-543 Ma), central and southern Namibia. *Communications of the Geological Survey of Namibia*, v. 12, p. 221-233.
- (68) Watters, W. A., and Grotzinger, J. P., 2001. Digital reconstruction of calcified early metazoans, terminal Proterozoic Nama Group, Namibia. *Paleobiology*, v. 27, p. 159-xxx.
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