

## David A. Fike

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### Professional preparation

#### *i) Education:*

2001 B.S. in *Engineering Physics* (minor: *German*), University of Illinois at Urbana-Champaign  
2001 B.S. in *Astronomy* (minor: *Math*), University of Illinois at Urbana-Champaign  
2001 B.S. in *Geology* (minor: *Classic Civilizations*), University of Illinois at Urbana-Champaign  
2002 M. Phil in *Polar Studies*, Churchill College, Cambridge University, UK  
2007 Ph.D. in *Geochemistry*, Massachusetts Institute of Technology

#### *ii) Postdoctoral experience:*

2007 – 2008 Division of Geological & Planetary Sciences, California Institute of Technology

### Appointments

2020 – Interim Director, International Center for Energy, Environment, and Sustainability (InCEES), Washington University in St. Louis (WUSTL)  
2018 – InCEES Professor, Earth & Planetary Sciences, WUSTL  
2017 – Member, Oncologic Imaging Program, Siteman Cancer Center  
2016 – 2020 Associate Director, InCEES, WUSTL  
2014 – Director, Environmental Studies Program, WUSTL  
2014 – 2018 Associate Professor, WUSTL  
2009 – 2014 Assistant Professor, WUSTL  
2007 – 2008 O.K. Earl Postdoctoral Fellow, California Institute of Technology

### Honors & Awards

2016 Royal Society International Exchange Fellow  
2011 Outstanding Contribution Award, Geological Soc. of America, Geobiology Div.  
2011 – 2012 Hanse-Wissenschaftskolleg Fellow  
2010 – 2015 Packard Fellowship in Science and Engineering  
2009 U.S. National Academy of Sciences Kavli Fellow  
2005 MIT Global Habitability & Longevity Award  
2003 NSF Graduate Research Fellowship  
2002 NASA Planetary Biology Internship  
2001 Churchill Scholarship  
1999 Goldwater Scholarship

### Performance

Fike has many years of experience in the collection, measurement, and interpretation of sulfur isotope data, both in bulk measurements (>18 years) and on the micro-scale by SIMS (> 13 years), including managing an IRMS laboratory for bulk isotope analyses (e.g., for  $\delta^{34}\text{S}_{\text{pyr}}$ ) for the last 11 years and managing the 7f-geo SIMS lab at Washington University since its creation in 2013. He has published >90 peer-reviewed publications (as well as 18 manuscripts currently in review, under revision, or in press) and has managed research grant funding over \$8.1M since he becoming a professor.

## Selected Publications [\*author who is/was a student or postdoc working with Prof. Fike]

Liu, X., Li, A., **Fike, D. A.**, Dong, J., Xu, F., Zhuang, G., Rendle-Bühring, R., Yang, Z., Wang, & H. 2020. “Depositional constraints on pyrite sulfur contents and isotopes inferred from the East China Sea sedimentary record since the last deglaciation”, *Marine & Petroleum Geology*, **accepted**.

\*Metzger, J. G., Ramezani, J., Bowring, S. A., & **Fike, D. A.** 2020. “New K-bentonite age constraints on the duration and origin of the Late Ordovician Guttenberg  $\delta^{13}\text{C}_{\text{carb}}$  excursion”, *Geological Society of America Bulletin*, **in press**. Available on line 28 July 2020. DOI: 10.1130/B35688.1

Lu, G.-S., LaRowe, D. E., **Fike, D. A.**, Druschel, G. K., Gilhooly, W. P., Price, R. E., & Amend, J. P. 2020. “Bioenergetic characterization of a shallow-sea hydrothermal vent system: Milos Island, Greece”, *PLOS One*, **15(6)**: e0234175. DOI: 10.1371/journal.pone.0234175

\*Houghton, J. L., Jones, C., Dawson, K. S., Orphan, V. J., \*Gomes, M., & **Fike, D. A.** 2020. “Resolving micron-scale heterogeneity in porewater  $\delta^{34}\text{S}_{\text{H}_2\text{S}}$  by combining films for in-situ sulfide capture and secondary ion mass spectrometry”, *Marine Chemistry*, **223**: 103810: DOI: 10.1016/j.marchem.2020.103810

Zhang, T., Myrow, P. M., **Fike, D. A.**, McKenzie, N. R., Yuan, J., Zhu, X., Li, W., Tian, X., & Chen, J. 2020. “Sedimentology, stratigraphy, and detrital zircon geochronology of Mesoproterozoic strata in the northern Helan Mountains, western margin of the North China Block”, *Precambrian Research*, **343**: 105730. DOI: 10.1016/j.precamres.2020.105730

Gangidine, A., Havig, J. R., **Fike, D. A.**, Jones, C., Hamilton, T. L., & Czaja, A. D. 2020. “Trace element concentrations in hydrothermal silica deposits as a potential biosignature”, *Astrobiology*, **20(4)**: 525 – 536. DOI: 10.1089/ast.2018.1994

Shelton, K. L., Cavender, B. D., Perry, L. E., Schiffbauer, J. D., Appold, M. S., & **Fike, D. A.**, 2020. “Stable isotope and fluid inclusion studies of deep Zn-Cu-(Ni-Co)-rich ores of the Brushy Creek mine, Viburnum Trend MVT district, Missouri, U.S.A.: Products of multiple sulfur sources and metal-specific fluids”, *Ore Geology Reviews*, **118**: 103358. DOI: 10.1016/j.oregeorev.2020.103358

\*McClelland, H.-L. O., Jones, C., Chubiz, L. M., **Fike, D. A.**, & Bradley, A. S. 2020. “Direct observations of the dynamics of single-cell metabolic activity during microbial diauxic growth”, *mBIO*, **11(2)**: e01519-19. DOI: 10.1128/mBio.01519-19

\*Jones, D. S., Brothers, R. W., Ahm, A.-S. C., Slater, N., Higgins, J. A. & **Fike, D. A.** 2020. “Sea level, carbonate mineralogy, and early diagenesis controlled the magnitude of positive  $\delta^{13}\text{C}$  excursions in Upper Ordovician”, *Geology*, **48(2)**: 194 – 199. DOI: 10.1130/G46861.1

Pruss, S. B., Smith, E. J., Leadbetter, O., Nolan, R. A., Hicks, M., & **Fike, D. A.** 2019. “Palaeoecology of the uppermost archaeocyathan reefs in the western United States and their

extinction: New evidence from the Harkless Formation, southern Nevada”, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **536**: 109389. DOI: 10.1016/j.palaeo.2019.109389

\*Richardson, J. A., Newville, M., Lanzirrotti, A., Webb, S. M., Rose, C. V., Catalano, J. G., & **Fike, D. A.** 2019. “The source of sulfate in biogenic calcite: insights from  $\mu$ -XRF imaging and XANES spectroscopy”, *Chemical Geology*, **529**: 119328. DOI: 10.1016/j.chemgeo.2019.119328

\*Edwards, C. E., **Fike, D. A.**, & Saltzmann, M. R. 2019. “Testing carbonate-associated sulfate (CAS) extraction methods for sulfur isotope stratigraphy: a case study on a Lower–Middle Ordovician carbonate succession, Shingle Pass, Nevada, USA”, *Chemical Geology*, **529**: 119297. DOI: 10.1016/j.chemgeo.2019.119297

\*Rose, C. V., Webb, S. M., Newville, M., Lanzirrotti, A., Catalano, J. C., \*Richardson, J. & **Fike, D. A.** 2019. “Micron-scale spatial distribution and speciation of sulfate in sedimentary carbonates”, *Geology*, **47**(9): 833 – 837. DOI: 10.1130/G46228.1

\*Houghton, J. L., Foustoukos, D. L., & **Fike, D. A.** 2019. “The effect of O<sub>2</sub> and pressure on thiosulfate oxidation by *Thiomicrospira thermophila*”, *Geobiology*, **17**: 564 – 576. DOI: 10.1111/gbi.12352

\*Richardson, J., Newville, M., Lanzirrotti, A., Webb, S. M., \*Rose, C. V., Catalano, J. C., & **Fike, D. A.** 2019. “Depositional and Diagenetic Constrains on the Abundance and Spatial Variability of Carbonate-Associated Sulfate”, *Chemical Geology*, **523**: 59 – 72. DOI: 10.1016/j.chemgeo.2019.05.036

Chavrit, D., Moreira, M. A., **Fike, D. A.**, & Moynier, F. 2019. “Unusual neon isotopic composition in Neoproterozoic sedimentary rocks: fluorine bearing mineral contribution or impact event?”, *Chemical Geology*, **520**: 52 – 59. DOI: 10.1016/j.chemgeo.2019.04.025

Pruss, S. B., Jones, D. S., **Fike, D. A.**, Tosca, N. J., & Wignall, P. B. 2019. “Marine Anoxia and Sedimentary Mercury Enrichments During the Late Cambrian SPICE Event”, *Geology*, **47** (5): 475 – 478. DOI: 10.1130/G45871.1

Myrow, P. M., **Fike, D. A.**, Malmskog, B., Leslie, S., Zhang, T., Singh, B. P., Chaubey, R. S., & Prasad, S. K. 2019. “Ordovician–Silurian boundary strata, Spiti Valley region of the Indian Himalaya: Record of the latest Ordovician Boda Event”, *Geological Society of America Bulletin*, **131** (5-6): 881-898. DOI: 10.1130/B31860.1

\*Raven, M. R., **Fike, D. A.**, Gomes, M. L., & Webb, S. M. 2019. “Chemical and isotopic evidence for organic matter sulfurization in redox gradients around mangrove roots”, *Frontiers in Earth Science*, **7**: 98. DOI: 10.3389/feart.2019.00098

Lockmiller, K. A., Wang, K., **Fike, D. A.**, & Hasenmuller, E. A. 2019. “Using multiple tracers to distinguish between municipal drinking water and wastewater inputs to urban streams”, *Science of the Total Environment*, **671**: 1245-1256. DOI: 10.1016/j.scitotenv.2019.03.352

Guzman, M. S., Rengasamy, K., Binkley, M. M., Jones, C., Ranivoarisoa, T. O., Singh, R., **Fike, D. A.**, Meacham, J. M. & Bose, A. 2019. “Extracellular electron uptake is linked to the electron transport chain, carbon dioxide fixation, and intracellular redox in phototrophic bacteria”, *Nature Communications*, **10**: 1-13. DOI: 10.1038/s41467-019-09377-6

Buongiorno, J., Kah, L. C., Gomez, F. J., & **Fike, D. A.** 2019. “Mineralized microbialites as archives of environmental evolution, Laguna Negra, Catamarca Province, Argentina”, *Geobiology*, **17**(2): 199 – 202. DOI: 10.1111/gbi.12327

\*Richardson, J. A., Keating, C., Lepland, A., Hints, O., Bradley, A. S., & **Fike, D. A.** 2019. “Silurian Records of Carbon and Sulfur Cycling from Estonia: The Importance of Depositional Environment on Isotopic Trends”, *Earth & Planetary Science Letters*, **512**: 71 - 82. DOI: 10.1016/j.epsl.2019.01.055

\*Bryant, R. N., Jones, C., Raven, M. R., Gomes, M. L., Berelson, W. M., Bradley, A. S., & **Fike, D. A.** 2019. “Sulfur isotope analysis of microcrystalline iron sulfides using SIMS imaging: Extracting local paleo-environmental information from modern and ancient sediments”, *Rapid Communications in Mass Spectrometry*, **33**: 491 - 502. DOI: 10.1002/rcm.8375

\*Raven, M. R., **Fike, D. A.**, Bradley, A. S., Gomes, M. L., Owens, J. D., & Webb, S. M. 2019. “Paired organic matter and pyrite  $\delta^{34}\text{S}$  records reveal mechanisms of carbon, sulfur, and iron cycle disruption during Ocean Anoxic Event 2”, *Earth & Planetary Science Letters*, **512**: 27 - 38. DOI: 10.1016/j.epsl.2019.01.048

\*Jones, C. **Fike, D. A.**, & Meyer, K. 2019. “SIMS methodology for isotopic ratio analysis of micro-grains in thin sections: true grain size estimation and deconvolution of inter-grain size gradients and intra-grain radial gradients”, *Geostandards & Geoanalytical Research*, **43**(1): 61-76. doi: 10.1111/ggr.12247.

\*Houghton, J. L., Gilhooly, W. P., Kafanataris, F.-C. A., Druschel, G. K., Lu, G-S., Amend, J. A., Godelitsas, A. & **Fike, D. A.** 2019. “Spatially and temporally variable sulfur cycling in shallow-sea hydrothermal vents, Milos, Greece”, *Marine Chemistry*, **208**: 83 – 94. DOI: 10.1016/j.marchem.2018.11.002.

Liu, X., Li, A., Dong, J., **Fike, D. A.**, Xu, F., Wan, S., & Zhuang, G. 2019. “Extreme variation in pyrite sulfur isotopic composition coupled with sedimentation regime on the East China Sea shelf since the late Pleistocene”, *Chemical Geology*, **505**: 66–75. DOI: 10.1016/j.chemgeo.2018.12.014.

\*Rose, C. V., Fischer, W. W., Finnegan S. & **Fike, D. A.** 2019. “Carbon and sulfur cycling during the Silurian Ireviken event: Insights from Gotland, Sweden”, *Geochimica et Cosmochimica Acta*, **246**: 299 – 316. DOI: 10.1016/j.gca.2018.11.030

Dekas, A. E., **Fike, D. A.**, Chadwick, G. L., Green-Saxena, A., Fortney, J., Connon, S. A., Dawson, K., & Orphan, V. J. 2018. “Widespread nitrogen fixation in sediments from diverse deep-sea habitats” *Environmental Microbiology*, **20**(12): 4281 – 4296. DOI: 10.1111/1462-2920.14342

\*Raven, M. R., Gomes, M. L., Webb, S. M., McClelland, H.-L. O., Bradley, A. S., & **Fike, D. A.** 2018. “Impact of Organic Matter Sulfurization on Carbon Burial: Evidence from Ocean Anoxic Event 2”, *Nature Communications*, **9**: 3409. DOI: 10.1038/s41467-018-05943-6.

\*Gomes, M., **Fike, D. A.**, Bergmann, K, Jones, C. & Knoll, A. H. 2018. “Environmental insights from high-resolution (SIMS) sulfur isotope data in multiple generations of sulfides in Proterozoic microbialites with diverse mat textures”, *Geobiology*, **16**: 17 – 34, DOI: 10.1111/gbi.12265

\*Bryant, R. N., Pasteris, J. D., & **Fike, D. A.** 2018. “Resolving variability in the Raman spectrum of pyrite”, *Applied Spectroscopy*, **72**(1): 37 – 47.

\*Edwards, C. T., Saltzman, M. R., Royer, D. L. & **Fike, D. A.** 2017. “Oxygenation as a driver of the Great Ordovician Biodiversification Event”, *Nature Geoscience*, doi:10.1038/s41561-017-0006-3.

**Fike, D. A.**, \*Houghton, J. L., \*Moore, S. E., \*Gilhooly, W. P., Dawson, K., Druschel, G. K., Amend, J. A. & Orphan, V. J. 2017. “Spatially resolved capture of hydrogen sulfide from the water column and sedimentary pore waters for abundance and stable isotopic analysis”, *Marine Chemistry*, **197**: 26 – 37: doi.org/10.1016/j.marchem.2017.10.004

\*Edwards, C. T., **Fike, D. A.**, Saltzman, M. R., & Lu, Z. 2017. “ $\delta^{13}\text{C}$ ,  $\delta^{34}\text{S}$ , and I/Ca evidence for anoxia at an Early Ordovician (Tremadocian) mass extinction”, *Earth & Planetary Science Letters*, **481**: 125 - 135.

\*Pasquier, V., Sansjofre, P., Rabineau, M., Revillon, S., Houghton, J. & **Fike, D. A.** 2017. “Pyrite sulfur isotopes reveal glacial-interglacial environmental changes”, *PNAS*, **114**(23): 5941 – 5945: doi:10.1073/pnas.1618245114.

\*Jones, D. S., Martini, A. M., **Fike, D. A.**, & Kaiho, K. 2017. “A volcanic trigger for the Late Ordovician mass extinction”, *Geology*, **45** (7): 631 – 634.

Myrow, P. M., Chen, J., Snyder, Z., Leslie, S., **Fike, D. A.**, Fanning, M., Yuan, J., & Tang, P. 2017. “Depositional history, tectonics, and provenance of the Cambrian–Ordovician succession in the western margin of the North China Block: Reply”, *Geological Society of America Bulletin*, **129** (7-8): 1022 – 1024; doi:10.1130/B31835.1

Vlahos, P., Warren, J. K., Houghton, J. L., & **Fike, D. A.** 2017. “A novel in-situ sulfate sampler for aquatic systems”, *ACS Earth & Space Chemistry*, **1**(3): 130 – 141; doi:10.1021/acsearthspacechem.7b00012.

\*Meyer, N. R., Zerkle, A. L., & **Fike, D. A.** 2017. “Sulphur Cycling in a Neoproterozoic Microbial Mat”, *Geobiology*, **15**: 353 - 365. doi:10.1111/gbi.12227.

\*Jones, C., **Fike, D. A.**, & Peres, P. 2017. “Investigation of the Quasi-Simultaneous Arrival (QSA) Effect on a CAMECA IMS 7f-GEO”, *Rapid Communications in Mass Spectrometry*, **31** (7): 623 – 630. doi: 10.1002/rcm.7828.

Schiffbauer, J. D., Huntley, J. W., **Fike, D. A.**, Jeffrey, M. J., Gregg, J. M., & Shelton, K. L. 2017. “Decoupling Biogeochemical Records, Extinction, and Environmental Change in the Cambrian SPICE Event”, *Science Advances*, **3**: e1602158.

\*Houghton, J. L., Foustoukos, D., Flynn, T. M., Vetriani, C., Bradley, A. S., & **Fike, D. A.** 2016. “Thiosulfate oxidation by *Thiomicrospira thermophila*: metabolic flexibility in response to ambient geochemistry”, *Environmental Microbiology*, **18**(9): 3057 – 3072.

Pruss, S. B., Castagno, K. A., **Fike, D. A.**, & Hurtgen, M. T. 2016. “Carbon isotope ( $\delta^{13}\text{C}_{\text{carb}}$ ) heterogeneity in deep-water Cambro-Ordovician carbonates, western Newfoundland”, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **458**: 52 - 62.

**Fike, D. A.**, Bradley, A. S., & \*Rose, C. V. 2015. “Rethinking the Ancient Sulfur Cycle”, *Annual Review of Earth & Planetary Sciences*, **43**: 20.1-20.30.

Lyons, T. W., **Fike, D. A.**, Zerkle, A. 2015. “Emerging Biogeochemical Views of Earth's Ancient Microbial Worlds”, *Elements*, 11(6): 415-421.

**Fike, D. A.**, Bradley, A. S. & Leavitt, W. D. 2015. “Geomicrobiology of Sulfur”, in *Ehrlich's Geomicrobiology*, 6<sup>th</sup> edition, ed. H. E. Ehrlich, D. K. Newman & Y. A. Gorby (CRC Press, Taylor & Francis Group), 479 – 515.

Munoz, S. E., Gruley, K. E., **Fike, D. A.**, Schroeder, S., & Williams, J. W. 2015. “Reply to Baires et al.: Shifts in Mississippi River flood regime remain a contributing factor to Cahokia's emergence and decline”, *PNAS*, **112**(29): E3754-E3754.

Myrow, P. M., Chen, J., Snyder, Z., Leslie, S., **Fike, D. A.**, Fanning, M., Yuan, J., & Tang, P. 2015. “Depositional history, tectonics, and provenance of the Cambrian–Ordovician succession in the western margin of the North China Block”, *Geological Society of America Bulletin*, **127**: 1174-1193.

Myrow, P. M., Cole, D., Johnston, D. T., **Fike, D. A.**, & Hakim, A. 2015. “Passive transgression: Remarkable preservation and spatial distribution of uppermost Devonian (Famennian) nearshore marine facies and fauna of western Laurentia”, *Palaios*, **30**: 490-502.

Cole, D., Myrow, P. M., **Fike, D. A.**, Hakim, A. & Gehrels, G.E. 2015. “Uppermost Devonian (Famennian) to Lower Mississippian events of the western U.S.: Stratigraphy, sedimentology, chemostratigraphy, and detrital zircon geochronology”, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **427**: 1-19.

Munoz, S. E., Gruley, K. E., Massie, A., **Fike, D. A.**, Schroeder, S., & Williams, J. W. 2015. “Cahokia's emergence and decline coincided with shifts in flood frequency on the Mississippi River”, *PNAS*, **112**(20): 6319-6324.

Wu., N., Farquhar, J., & **Fike, D. A.** 2015. “Ediacaran sulfur cycle: Insights from sulfur isotope measurements ( $\delta^{34}\text{S}$  and  $\Delta^{33}\text{S}$ ) on paired sulfate-pyrite in the Huqf Supergroup of Oman”, *Geochimica et Cosmochimica Acta*, **164**: 352-364.

Condon, D. J., Boggani, P., **Fike, D.**, Halverson, G. P., Kasemann, S., Knoll, A., Macdonald, F. A., Prave, A. R. and Zhu, M. 2015. “Accelerating Neoproterozoic Research through Scientific Drilling” *Scientific Drilling*, **19**: 17-25.

Metzger, J. G., **Fike, D. A.**, Osburn, R., Guo, C., & Addison, A. 2015. “The source of sulfur in gypsum in Mammoth Cave, KY”, *Geology*, **43**(2): 187 - 190.

Wilbanks, E. G., Jaekel, U., Salman, V., Humphrey, P. T., Eisen, J. A., Facciotti, M. T., Buckley, D. H., Zinder, S. H., Druschel, G. K., **Fike, D. A.** & Orphan, V. J. 2014. “Microscale sulfur cycling in the phototrophic pink berry consortia of the Sippewissett salt marsh”, *Environmental Microbiology*, **16**(11): 3398 – 3415.

\*Houghton, J. L., **Fike, D. A.**, Druschel, G. K., Orphan, V. J., Hoehler, T. M., & Des Marais, D. J. 2014. “Spatial variability in organic and carbonate  $\delta^{13}\text{C}$  linked to sulfur cycling in hypersaline microbial mats”, *Geobiology*, **12**(6): 557 – 574.

\*Gilhooly, W., P., **Fike, D. A.**, Druschel, G. K., Kafantaris, F.-C. A., Price, R. E., & Amend, J. P. 2014. “Sulfur and oxygen isotope insights into sulfur cycling in shallow-sea hydrothermal vents, Milos, Greece”, *Geochemical Transactions*, **15**: 12 (12 August 2014).

Munoz, S. E., Schroeder, S., **Fike, D. A.** & Williams, J. W. 2014. “A record of sustained and widespread prehistoric land use from the Cahokia region”, *Geology*, **42**(6): 499 - 502.

\*Metzger, J. G., **Fike, D. A.**, & Smith, L. B. 2014. “Applying C-isotope Stratigraphy using Well Cuttings for High-Resolution Chemostratigraphic Correlation of the Subsurface”, *AAPG Bulletin*, **98**(8): 1551-1576.

Cummins, R. C., Finnegan, S., **Fike, D. A.**, Eiler, J. M., & Fischer, W. W. 2014. “Carbonate clumped isotope constraints on Silurian ocean temperature and  $\delta^{18}\text{O}$ ”, *Geochimica et Cosmochimica Acta*, **140**: 241 - 258.

Fischer, W. W., **Fike, D. A.**, Johnson, J. E., Raub, T. D., Guan, Y., Kirschvink, J. L., & Eiler, J. M. 2014. “SQUID–SIMS is a useful approach to uncover primary signals in the Archean sulfur cycle”, *PNAS*, **111**(15): 5468-5473 (DOI: doi:10.1073/pnas.1322577111).

\*Ampleman, M. D., \*Crawford, K. M. & **Fike, D. A.** 2014. “Differential Carbon Sequestration by Forb- and Grass-Dominated Plant Communities at a 33-year Tallgrass Prairie Restoration”, *Plant & Soil*, **374** (1): 899 – 913.

Myrow, P. M., Hanson, A., Phelps, A. S., Creveling, J. R., Strauss, J. V., **Fike, D. A.**, & Ripperdan, R. L. 2013. “Latest Devonian (Famennian) Global Events in Western Laurentia: Variations in the Carbon Isotopic Record Linked to Diagenetic Alteration Below Regionally Extensive

Unconformities”, *Palaeogeography, Palaeoclimatology, Palaeoecology*, **386**: 194 – 209. (doi: 10.1016/j.palaeo.2013.05.021.)

\*Jones, D. S. & **Fike, D. A.** 2013. “Dynamic sulfur and carbon cycling through the end-Ordovician extinction revealed by paired sulfate-pyrite  $\delta^{34}\text{S}$ ”, *Earth & Planetary Science Letters*, **363**: 144-155. (doi: 10.1016/j.epsl.2012.12.015)

\*Metzger, J. G. & **Fike, D. A.** 2013. “Techniques for assessing spatial heterogeneity of carbonate  $\delta^{13}\text{C}$ : Implications for craton-wide isotope gradients”, *Sedimentology*, **60**(6): 1405 – 1431. (doi: 10.1111/sed.12033)

Lee, C., **Fike, D. A.**, Love, G. D., Sessions, A. L., Grotzinger, J. P., Summons, R. E., & Fischer, W. W. 2013. “Carbon isotopes and lipid biomarkers from organic-rich facies of the Shuram Formation, Sultanate of Oman”, *Geobiology*, **11**: 406 – 419.

Rohrssen, M., Love, G. D., Fischer, W. W., Finnegan, S., **Fike, D. A.** 2013. “Lipid biomarkers record fundamental changes in the microbial community structure of tropical seas during the Late Ordovician Hirnantian glaciation”, *Geology*, **41**(2): 127 – 130.

Finnegan, S., **Fike, D. A.**, \*Jones, D. S., & Fisher, W. W. 2012. “A temperature-dependent positive feedback on the magnitude of carbon isotope excursions”, *Geoscience Canada*, **39**(3): 122-131.

\*Gorjan, P., Kaiho, K., **Fike, D. A.**, & Xu, C. 2012. “Carbon and sulfur isotope geochemistry of the Hirnantian (Late Ordovician) Wangjiawan (Riverside) section, South China: global correlation and environmental event interpretation” *Palaeogeography, Palaeoclimatology, Palaeoecology*, **337-338**: 14-22.

\*Jones, D. S., **Fike, D. A.**, Finnegan, S., Fischer, W. W., Schrag, D., & \*McCay, D. 2011. “Terminal Ordovician carbon isotope stratigraphy and glacioeustatic sea level change across Anticosti Island (Québec, Canada)”, *Geological Society of America Bulletin*, **123**: 1645 - 1664.

Grotzinger, J. P., **Fike, D. A.**, Fischer, W. W. 2011 “Enigmatic Origin of the Largest Known Carbon Isotope Excursion in Earth’s History”, *Nature Geoscience*, **4**: 285 - 292.

Finnegan, S., Bergmann, K., Eiler, J. M., \*Jones, D. S., **Fike, D. A.**, Eisenman, I., Hughes, N. C., Tripathi, A., and Fischer, W. W., 2011. “The duration and magnitude of Late Ordovician-Early Silurian glaciation”, *Science*, **331**: 903-906.

**Fike, D. A.** & Grotzinger, J. P. 2010. “A  $\delta^{34}\text{S}_{\text{SO}_4}$  approach to reconstructing biogenic pyrite burial in carbonate-evaporite basins: an example from the Ara Group, Sultanate of Oman”, *Geology*, **38**(4): 371 - 374.

Li, C., Love, G. D., Lyons, T. W., **Fike, D. A.**, Sessions, A. L., & Chu, X. 2010. “A Stratified Redox Model for the Ediacaran Ocean”, *Science*, **328**: 80 - 83.

**Fike, D. A.** 2010. Earth’s redox evolution. *Nature Geoscience*, **3**: 453 – 454.



Maloof, A. C., Porter, S. M., Moore, J. L., Dudas, F. O., Bowring, S. A., **Fike, D. A.**, Higgins, J. A. & Eddy, M. P. 2010. "The earliest Cambrian record of animals and ocean geochemical change", *Geological Society of America Bulletin*, **122**: 1731 – 1774.

Maloof, A. C., Ramezani, J., Bowring, S. A., **Fike, D. A.**, Porter, S. M. & Mazouad, M. 2010. "Constraints on early Cambrian carbon cycling from the duration of the Nemakit-Daldynian—Tommotian boundary  $\delta^{13}\text{C}$  shift, Morocco", *Geology*, **38**(7): 623 - 626.

**Fike, D. A.**, Finke, N., Zha, J., Blake, G., Hoehler, T. M., & Orphan, V. J. 2009. "The effect of sulfate concentration on (sub)millimeter-scale sulfide  $\delta^{34}\text{S}$  in hypersaline cyanobacterial mats over the diurnal cycle", *Geochimica et Cosmochimica Acta*, **73** (20): 6187 - 6204.

Ries, J. B., **Fike, D. A.**, Pratt, L. M, Lyons, T. W., & Grotzinger, J. P., 2009. Super-heavy pyrite ( $\delta^{34}\text{S}_{\text{pyr}} > \delta^{34}\text{S}_{\text{CAS}}$ ) in the terminal Proterozoic Nama Group, Southern Namibia: A consequence of low seawater sulfate at the dawn of animal life. *Geology*, **37** (8): 743 – 746.

Moynier, F., Pichat, S., Pons, M.-L., **Fike, D.A.**, Balter, V., & Albarede, F. 2009. "Isotopic fractionation and transport mechanisms of Zn in plants" *Chemical Geology*, **267**: 125 – 130.

Love, G. D., Grosjean, E., Stalvies, C., **Fike, D. A.**, Bradley, A. S., Kelly, A. E., Bhatia, M., Meredith, W., Snape, C. E., Bowring, S. A., Condon, D. J., Grotzinger, J. P., & Summons, R. E. 2009. Fossil steroids record the appearance of Demosponges during the Cryogenian Period. *Nature*, **475**: 718 - 721.

Grosjean, E., Love, G. D., Stalvies, C., **Fike, D. A.**, Newall, M., Taylor, P. N., & Summons, R. E. 2009. "Origin of petroleum in the Neoproterozoic-Cambrian South Oman Salt Basin", *Organic Geochemistry*, **40** (1): 87 - 110.

**Fike, D. A.**, Gammon, C. L., Ziebiz, W., & Orphan, V. J. 2008. "Micron-scale mapping of sulfur cycling across the oxycline of a cyanobacterial mat: a paired nanoSIMS and CARD-FISH approach", *ISME Journal*, **2** (7): 749 – 759.

**Fike, D. A.** & Grotzinger, J. P. 2008. "A paired sulfate–pyrite  $\delta^{34}\text{S}$  approach to understanding the evolution of the Ediacaran–Cambrian sulfur cycle", *Geochimica et Cosmochimica Acta*, **72** (11): 2636 – 2648.

Maloof, A.C., Kopp, R.E., Grotzinger, J.P., **Fike, D.A.**, Bosak, T., Vali, H., Poussart, P.M., Weiss, B.P., & Kirschvink, J.L. 2007. "Sedimentary iron cycling and the origin and preservation of magnetization in platform carbonate muds, Andros Island, Bahamas", *Earth and Planetary Science Letters*, **259**(3-4): 581 - 598.

**Fike, D. A.**, Grotzinger, J. P., Pratt, L. M., & Summons, R. E. 2006. "Oxidation of the Ediacaran Ocean", *Nature*, **444**: 744 - 747.

Cabrol, N., McKay, C. P., Grin, E., Kiss, K. T., Acs, E., Toth, B., Grigorsky, I., Szabo, K., **Fike, D. A.**, Hock, A. N., Demergasso, C., Escudero, L., Galleguillos, P., Chong, G., Roman, J. Z.,

Grigsby, B., & Tambley, C. 2007. "Signatures of habitats and life in Earth's high-altitude lakes: clues to Noachian aqueous environments on Mars", *The Geology of Mars: Evidence from Earth-Based Analog*, 1: 349.

Jerolmack D. J., Mohrig, D., Grotzinger, J. P., **Fike, D. A.**, & Watters, W. A. 2006. "Spatial grain size sorting in eolian ripples and estimation of wind conditions on planetary surfaces: Application to Meridiani Planum, Mars", *Journal of Geophysical Research*, 111: E03S90.

Cockell, C. S., **Fike, D. A.**, Osinski, G. R., & Lee, P. 2006. "Geomicrobiology of Impacted Altered Rocks" In: Cockell, C. S.; Koeberl, C. and Gilmour, I. eds. *Biological Processes Associated with Impact Events*. Impact Studies. Berlin: Springer, pp. 21–40.

McLennan, S. M., Bell, J. F., Calvin, W. M., Christensen, P. R., Clark, B. C., de Souza, P. A., Farmer, J., Farrand, W. H., **Fike, D. A.**, Gellert, R., Ghosh, A., Glotch, T. D., Grotzinger, J. P., Hahn, B., Herkenhoff, K. E., Hurowitz, J. A., Johnson, J. R., Johnson, S. S., Jolliff, B., Klingelhofer, G., Knoll, A. H., Learner, Z., Malin, M. C., McSween, H. Y., Pocock, J., Ruff, S. W., Soderblom, L. A., Squyres, S. W., Tosca, N. J., Watters, W. A., Wyatt, M. B., Yen, A. 2005. "Provenance and diagenesis of the evaporite-bearing Burns formation, Meridiani Planum, Mars", *Earth and Planetary Science Letters*, 240(1): 95-121

Sullivan, R., Banfield, D., Bell, J. F., Calvin, W., **Fike, D. A.**, Golombek, M., Greeley, R., Grotzinger, J., Herkenhoff, K., Jerolmack, D., Malin, M., Ming, D., Soderblom, L. A., Squyres, S. W., Thompson, S., Watters, W. A., Weitz, C. M., Yen, A. 2005. "Aeolian processes at the Mars Exploration Rover Meridiani Planum landing site" *Nature*, 436(7047): 58-61

Grotzinger, J. P., Arvidson, R. E., Bell, J. F., Calvin, W., Clark, B. C., **Fike, D. A.**, Golombek, M., Greeley, R., Haldemann, A., Herkenhoff, K. E., Jolliff, B. L., Knoll, A. H., Malin, M., McLennan, S. M., Parker, T., Soderblom, L., Sohl-Dickstein, J. N., Squyres, S. W., Tosca, N. J., Watters, W. A. 2005. "Stratigraphy and sedimentology of a dry to wet eolian depositional system, Burns formation, Meridiani Planum, Mars", *Earth and Planetary Science Letters*, 240(1): 11-72.

Soderblom, L. A., Anderson, R. C., Arvidson, R. E., Bell, J. F., Cabrol, N. A., Calvin, W., Christensen, P. R., Clark, B. C., Economou, T., Ehlmann, B. L., Farrand, W. H., **Fike, D. A.**, Gellert, R., Glotch, T. D., Golombek, M. P., Greeley, R., Grotzinger, J. P., Herkenhoff, K. E., Jerolmack, D. J., Johnson, J. R., Jolliff, B., Klingelhofer, G., Knoll, A. H., Learner, Z. A., Li, R., Malin, M. C., McLennan, S. M., McSween, H. Y., Ming, D. W., Morris, R. V., Rice, J. W., Richter, L., Rieder, R., Rodionov, D., Schroder, C., Seelos, F. P., Soderblom, J. M., Squyres, S. W., Sullivan, R., Watters, W. A., Weitz, C. M., Wyatt, M. B., Yen, A., Zipfel, J. 2004 "Soils of eagle crater and Meridiani Planum at the Opportunity Rover landing site", *Science*, 306 (5702): 1723 – 1726.

Cabrol, N., Grin, E., Carr, M., Sutter, B., Moore, J., Farmer, J. D., Greeley, R., Kuzmin, R. O., Des Marais, D. J., Kramer, M. G., Newsom, H., Barber, C., Thorsos, I., Tanaka, K. L., Barlow, N. G., **Fike, D. A.**, Urquhart, M. L., Grigsby, B., Grant, F. D. & de Goursac, O. 2003. "Exploring Gusev Crater with Spirit: Review of science objectives and testable hypotheses", *Journal Geophysical Research*, 108 (E12): 8076 – 8097.

**Fike, D. A.,** Cockell, C., Lee, P., & Pearce, D. 2002. “Heterotrophic Microbial Colonization of Impact-Shocked Rocks from the Houghton Impact Structure, Devon Island, Nunavut, Canadian High Arctic”, *International Journal of Astrobiology*, 1(4): 311-323.

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### **Synergistic activities**

Founding Board Member, International Geobiology Society (2017-present)

Theme Co-chair, 2018 Goldschmidt Conference

Co-chair, Organizing Comm., 2017 Japan-America-Germany Frontiers of Science symposium

Founding Chair, Geobiology Gordon Research Conference 2016

Editorial Board, *Geobiology* (2015 - present)

Reviewer: *Science*, *Nature*, *Nature Geoscience*, *Nature Communications*, *PNAS*, *Geology*, Co-chair, Organizing Committee, 2015 Korean-American Kavli Frontiers of Science symposium

Co-organizer, 2014 Agouron Institute Sulfur Biogeochemistry Meeting (Palos Verdes, CA)

Co-organizer, 2013 Korean-American Kavli Frontiers of Science Conference

Founder & Co-organizer, 2012 Midwest Geobiology Conference

Co-organizer, 2010 Chinese-American Kavli Frontiers of Science Conference

Session Chair, Annual Goldschmidt Conference (2009/2011/2013/2015/2017)

Session Chair, Fall AGU Meeting (2008/2010/2012/2014)

Member, 2009/2013 Goldschmidt Geochemistry Organizing Committee

Participant, MSL Landing Site Selection Workshops

*Geochimica et Cosmochimica Acta*, *Earth & Planetary Science Letters*, *Frontiers in Microbiology*, *Marine Chemistry*, *Precambrian Research*, *Terra Nova*, *Chemical Geology*, and *Geobiology*; NSF Sedimentology & Paleobiology; NSF Geobiology & Low Temperature Geochemistry; NSF Instrumentation & Facilities; NSF Postdoctoral Fellowship; NASA Exobiology; ACS Petroleum Research Fund; SSRL Beamline Access proposals; DOE Graduate Student Fellowships