Jeffrey A. Karson

Professor of Geology

*Department of Earth Sciences, 204 Heroy Geology Laboratory*

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***Academic Degrees***

Ph.D. (Geology) State University of New York at Albany, 1977

M.S. (Geology) State University of New York at Albany (SUNYA), 1975

B.S. (Geology) Case Institute of Technology (Case Western Reserve University), 1972

***Academic Positions, Affiliations & Awards***

Professor, Department of Earth Sciences, Syracuse University, August 2006-present

Department Chair and Jessie Page Heroy Professor, Department of Earth Sciences, Syracuse University, 2007-2013

Professor, Division of Earth & Ocean Sciences, Nicholas School of the Environment & Earth Sciences, Duke University, 1996-2006

Department Chair, Department of Earth & Ocean Sciences, Duke University, 1996-2000

Research Fellow, Danish Lithosphere Center, 1994-2000

Adjunct Research Scientist, Lamont-Doherty Earth Observatory, 1992-2002

Professor, Department of Geology, Duke University, 1992-1996

Associate Professor, Department of Geology, Duke University, 1986-92

Associate Scientist, Department of Geology and Geophysics, Woods Hole Oceanographic Institution, 1984-86

Summer Faculty Fellow, Department of Geology & Planetology, Jet Propulsion Lab, California Institute of Technology, 1984 and 1985

Assistant Scientist, Department of Geology & Geophysics, Woods Hole Oceanographic Institution, 1980-84

Postdoctoral Scholar, Woods Hole Oceanographic Institution, 1979-80

Postdoctoral Fellow, University of Toronto, 1977-79

***Professional Service***

**Scientific Community**

GSA Decadal Strategic Program Planning Task Force (2018-2019)

National Science Foundation, Ocean Sciences Division, Committee of Visitors proposal review process review panel, June 2015

NOAA Ocean Exploration Review Panel (2012)

NOAA Ocean Exploration *R/V Nautilus* Advisory Board (2009-2017)

University National Oceanographic Laboratories (UNOLS), Deep Submergence Science Committee (2004-10)

Convener and Volume Editor, RIDGE Workshop on Magmatism and Faulting (1996)

Convener, Workshop on Remote Sensing of Ophiolites and the structure of oceanic crust (1986)

**University**

Postdoc Faculty Advisory Board, 2019-present

Co-sponsor (with VPR Gina Lee Glauser), Fast-Forward, Operational Excellence, Sponsored Programs Initiative, 2014-16

Syracuse University Recruiting Presentations (Pittsburgh & Cleveland), March 2016

Chief Human Resources Officer Search Committee, 2012

Syracuse University Lecture Series Advisory Board, 2007-15

Syracuse University Advance Program participant and supporter

North Carolina State University, Department of Marine, Earth & Atmospheric Sciences, External Review Committee, 2006

Union College, Department of Geology, External Review Committee, 2007

Duke University Fulbright Program Reviewer, 2004-06

Duke University Science and Engineering Library Committee, August 2004-06

Duke University Library Council, August 2004-06

Duke University Ad Hoc Committee on Scientific Misconduct, 1999

Nicholas School of the Environment & Earth Sciences Faculty Council, 1996-99

Nicholas School of the Environment/Geology Department Merger Task Force, 1996

Duke University Academic Tenure & Promotions Committee, Co-Chair, 1995-96

Duke University Study Abroad Program Committee, 1988-92

**College**

##### Syracuse University, College of Arts & Sciences, Science & Math Council, 2009-13

J.D. Steele Distinguished Chair (Physics Department) Review Committee, 2012

Chair, Dean’s Excellence Initiative Proposal Review Committee, 2011

**Department**

Acting Chair, Department of Earth Sciences, Syracuse University, 2019-present

Chair, Curriculum Committee, 2017-present

Member, Department Awards Committee, 2017-present

Chair, Department of Earth Sciences, Syracuse University, 2007-13

Chair, Division of Earth & Ocean Sciences, NSEES, Duke University, 1996-2000

Chair of faculty tenure & promotion and 3rd-year review committees

Chair or member of review committee for numerous promotion and tenure cases

***Research Experience***

• Field-based studies of faulting and magmatic construction in rift zones and transform faults in oceanic and continental terranes worldwide

• Extensive collaborations with geophysicists, petrologists and geochemists

• Oceanographic research cruises including extensive work with submarines (e.g., *DSRV Alvin*) and remotely operated vehicles; chief scientist on 10 major cruises

• Physical volcanology experiments with natural-scale experimental lava flows

• Imaging active and inactive lava flows and fault zones with Unmanned Aircraft Systems (drones)

• Active learning for students and public outreach with lava flow demonstrations

• Creation of large-scale lava sculptures for scientific and artistic displays

***Teaching Experience***

• Classes ranging from introductory- to upper-level undergraduate classes and graduate-level lecture and seminar classes Woods Hole-MIT Joint Program in Oceanography, Duke University, Syracuse University

• Invited short courses on seafloor spreading, extensional tectonics and experimental volcanology in educational and industrial programs

Recent Funding History (2013-present)

Overview of Icelandic Volcanic & Tectonic Processes, $20,000, Exxon Mobil Exploration Company, 8/1/19-10/1/19

Rift Propagation, Transform Migration, and Microplate Tectonics in Iceland, $380,025, NSF-OCE, 05/03/12-08/05/17

Analog lava flows for scientific and artistic displays, $10,000, The Center for Craft, Creativity & Design, with Robert Wysocki (SU Sculpture Program), 3/17-6/18

Lava Flow Demonstrations for SU Undergraduate Classes, $3000 per year, Co-curricular Funds, CAS Dean’s Office, 10/13-5/19

Environmental Monitoring and Geoscience Surveying Applications for UAS at Syracuse University, $35,322, NY Upstate Revitalization Initiative and SU Office of Research, 11/16-4/17 with faculty from The College of Arts & Sciences, LC Smith School of Engineering, and the Maxwell School of Citizenship & Public Affairs

Constraining Processes in Natural and Experimental Lava Flows, $44,000, Keck Geology Consortium, 6/12/15-6/11/16

RAPID Investigation of Active Fissure Eruptions, Holuhraun, Iceland, $16,506. NSF-EAR, Petrology & Geochemistry, 11/03/14-11/02/15

Calibrating Natural Basaltic Lava Flows with Large-Scale Lava Experiments, $44,000, Keck Geology Consortium, 6/15/14-6/14/15

Graduate & Postdoctoral Research Supervision

M.S. Theses Supervised: Duke University 12, Syracuse University 4

***Ph.D. Dissertations Supervised:*** *Duke University 7, Syracuse University 4*

Member of many M.S. thesis and Ph.D. dissertation committees at Duke and Syracuse Universities as well as numerous other geoscience departments in the US and abroad.

***Postdoctoral Investigators Supervised***

**James A. Farrell,** Syracuse University, 2019-2020

**Aisha R. Morris,** Syracuse University 2009-2011 (AAAS Congressional Fellow; Director RESSES, UNAVCO; currently NSF program manager), Supported by SU Alliance for Graduate Education and the Professoriate Postdoctoral Fellowship; Volcanic processes on Earth and Mars

**Daniel Curewitz,** Syracuse University, 2008-2011 (now Assoc. Teaching Prof., SU) Supported by NSF grants, Structural controls on hydrothermal systems in Iceland and the global mid-ocean ridge system

**Nicolas W. Hayman**, Duke University 2003-2007 (now Research Scientist, Univ. of TX, Institute for Geophysics, currently NSF Marine G&G Program) Supported by NSF; Faulting in oceanic crust, Pito Deep expedition

**Stephen D. Hurst,** Duke University 1995-2002 (now Senior Research Programmer, University of Illinois, ret.) Supported by grants from NSF, ODP, ONR;

Digital field trips, digital image analysis, Hess Deep expedition

***Online Resources*** *(last 5 years only)*

Janaki, N. and AGU staff, Support of AGU Austin Endowment for Student Travel Program <https://www.agu.org/lava?utm_source=aguniverse&utm_medium=email>

September-December, 2019.

Lupima, L. and D. Sollosi, *Homemade Lava Flows Fuse Science with Art on Video*, *Eos 98***,** Published on 29 June 2017.

<https://eos.org/articles/homemade-lava-flows-fuse-science-with-art-on-video>

Karson, J.A., D.S. Kelley, D.J. Fornari, M.J. Perfit, and T.M. Shank, *Discovering the Deep: A Photographic Atlas of the Seafloor and Oceanic Crust*, Cambridge University Press (electronic version, slide shows and video clips): [*http://www.cambridge.org/us/academic/subjects/earth-and-environmental-science/oceanography-and-marine-science/discovering-deep-photographic-atlas-seafloor-and-ocean-crust?format=HB*](http://www.cambridge.org/us/academic/subjects/earth-and-environmental-science/oceanography-and-marine-science/discovering-deep-photographic-atlas-seafloor-and-ocean-crust?format=HB)

*Orange is the new black (lava): The Syracuse University Lava Project*, AGU Volcanology, Petrology & Geochemistry Division Website, Spotlight on Research, 11/14-present: [*http://vgp.agu.org/orange-is-the-new-black-lava/*](http://vgp.agu.org/orange-is-the-new-black-lava/)

MOOC: *The Subject is Lava* (launched 4/14): [*http://syracuseU.coursesites.com*](http://syracuseu.coursesites.com)*.*

Syracuse University Lava Project: <http://lavaproject.syr.edu>

This website and associated Vimeo videos are used widely in classes ranging from introductory geology to petrology and volcanology worldwide. It has attracted *>300 million* visits and downloads in the past 3 years.

***Publications***

***Books and Edited Volumes***

Karson, J.A., D.S. Kelley, D.J. Fornari, M.J. Perfit, and T.M. Shank, *Discovering the Deep: A Photographic Atlas of the Seafloor and Oceanic Crust*, Cambridge University Press, 2015.

Buck, W.R., P.T. Delaney, J.A. Karson, and Y. Lagabrielle, *Faulting and Magmatism at Mid-Ocean Ridges*, 348 pp., American Geophysical Union, Geophysical Monograph 106, 1998.

Karson, J.A., M. Cannat, D.J. Miller, and D. Elthon, eds., *Proceedings of the Ocean Drilling Program, Scientific Results, 153*, 577 pp., Ocean Drilling Program, College Station, TX, 1997.

Cannat, M., J.A. Karson, D.J. Miller, et al., eds, *Proceedings of the Ocean Drilling Program, Initial Reports, 153*, 798 pp., Ocean Drilling Program, College Station, TX, 1995.

***Refereed Publications***

*Author or coauthor of~150 scientific journal publications and book chapters*

***2010-present***

Farrell, J.A., C.W. Hamilton, J.A. Karson and R.J. Wysocki, Predicting the locations of breakouts in basaltic lava flow experiments, *Geology, in review*, 2019.

Karson, J.A. Oceanic transform faults, in Elias, S.A. and D. Alderton, eds., *Encyclopedia of Geology, 2nd edition*, Elsevier, *in review*, 2019.

Worman, S.L., L.P. Pratson, J.A. Karson, W.H. Schlesinger, Box model of abiotic hydrogen (H2) sources and sinks near the Mid-Ocean Ridge (MOR) with implications for the sub-seafloor biosphere, *Geoch. Cosmoch. Acta, in review*, 2019.

Soldati, A., C.J. Sant, J.A. Farrell, R.J. Wysocki and J.A. Karson, The effect of bubbles on the rheology of lava flows: Insights from large-scale two-phase experiments, *Earth Planet. Sci. Lett*., *in review*, 2019.

Brown,T.C, M.J. Cheadle, B.E. John, L.A. Coogan, J.S. Gee, J.A.Karson and S.M. Swapp, Textural character of gabbroic rocks from Pito Deep: A record of magmatic processes and the genesis of upper plutonic crust at fast-spreading mid-ocean ridges, *J. Petrol., 60*, 5, 997–102, doi: 10.1093/petrology/egz022, 2019.

Karson, J.A., From ophiolites to oceanic crust: Sheeted dike complexes and seafloor spreading, *in* Srivastiva, R.K., R.E. Ernst and P. Peng, eds., *Dyke Swarms of the World: A Modern Perspective,* Springer Geology*,* <https://doi.org/10.1007/978-981-13-1666-1_13>, 2019.

Karson, J.A., B. Brandsdóttir, P. Einarsson, K. Sæmundsson, J.A. Farrell andA.J. Horst, Evolution of migrating transform faults in anisotropic oceanic crust: Examples from Iceland, *Can. J. Earth Sci.,* doi:10.1139/cjes-2018-0260, 2019.

Horst, A.J., J.A. Karson and R.J. Varga, Large rotations of crustal blocks in the Tjörnes Fracture Zone of northern Iceland, *Tectonics*, *37*, doi:10.1002/2016TC004371, 2018.

Farrell, J.A., Karson, J.A., Soldati, A. and Wysocki, R.J., Multiple-generation surface folding and non-coaxial strain of lava crusts, *Bull. Volc., 80,84,* https://doi.org/10.1007/s00445-018-1258-5, 2018.

Karson, J.A., J.A. Farrell, L.A. Chutas, A.F Nanfito, J.A. Proett, K.T. Runnals and K. Sæmundsson, Rift-parallel strike-slip faulting near the Iceland plate boundary zone: Implications for propagating rifts, *Tectonics*, 37, doi:10.1029/2018TC005206, 2018.

Voight, B., A. Clifton, A. Hjartarson, B. Steingrimsson, B. Brandsdóttir, F. Sigmundsson, G.Ó. Friðleifsson, G. Larsen, G. Jonsdottir, H. Noll, I. McDougall, I. Kaldal, I. Fridleifsson, J. Aronson, J. Karson, K. Gronvold, K. Young, L. Kristjansson, M. Sigurgeirsson, M.T. Gudmundsson, M. Jancin, O. Flovenz, P. Einarsson, R. Williams, S. Palmadóttir and W. L. Friedrich, A half-century of geologic and geothermic investigations in Iceland: The legacy of Kristján Sæmundsson, *J. Volc. Geoth. Res*., https://doi.org/10.1016/j.jvolgeores.2018.08.012, 2018.

Karson, J.A., Propagating rifts, migrating transform faults, and rift-parallel strike-slip faults in Iceland, *Geochemistry, Geophysics, Geosystems (G-cubed), 18*, 4043–4054, doi: 10.1002/2017GC007045, 2017.

Siler, D.L. and J.A. Karson, Segment-scale crustal accretion processes in Iceland, *Tectonics*, *36*, doi:10.1002/2017TC004629, 2017.

Szitkar, F., Tivey, M.A., Kelley, D.S., Karson, J.A., Früh-Green, G.L., and Denny, A., Magnetic exploration of a low-temperature ultramafic-hosted hydrothermal site (Lost City, 30°N, MAR), *Earth Planet. Sci. Lett., 461*, 40-45, 2017.

Karson, J. A., Crustal accretion of thick, mafic crust in Iceland: Implications for volcanic rifted margins, *Can. J. Earth Sci.*, *53*, 1-11, doi:10.1139/cjes-2016-0039, 2016.

Karson, J. A. and R.W. Hazlett, Constraining processes in natural and experimental basaltic lava flows, in Varga, R.J. ed., *Proceedings of the Twenty-Ninth Annual Keck Research Symposium in Geology*, *29*, 5 pp., 2016.

Worman, S.L., Pratson, L.F., Karson, J.A. and Klein, E.M., Global rate and distribution of H2 gas produced by serpentinization within oceanic lithosphere, *Geophys. Res. Lett.*, *43*, (12), 6435-6443, doi:10.1002/2016GL06906612, 2016.

Karson, J. A. and R.W. Hazlett, Calibrating natural basaltic lava flows with large-scale experiments, in Varga, R.J. ed., *Proceedings of the Twenty-Eighth Annual Keck Research Symposium in Geology*, *28*, 6 pp., 2015.

Horst, A. J., R. J. Varga, J. S. Gee, J. A. Karson, Diverse magma flow directions during construction of sheeted dike complexes at fast- to superfast-spreading centers, *Earth Planet Sci. Lett., 408,* 119-131, 2014.

Edwards, B.R., J.A. Karson, R.J. Wysocki, E. Lev, I. Bindemen and U. Kueppers, Insights on lava-ice/snow interactions from large-scale basaltic melt experiments, *Geology,* *41* (8), 851-854, doi:10.1130/G34305.1, 20, 2013.

Lev, E., M. Spiegelman, R.J. Wysocki, and J.A. Karson, Investigating lava flow rheology using video analysis and numerical flow models, *J. Volc. Geoth. Res., 247-248, 62-73*, <http://dx.doi.org/10.1016/j.jvolgeores.2012.08.002>, 2012.

Karson, J.A. and R.J. Wysocki, Do-it-Yourself Lava Flows: Science, art, and education in the Syracuse University Lava Project, *EARTH, 57, (9), 38-45*, 2012.

Karson, J.A., K.L.C. Bell, A.F. Nanfito, D. Joyce, M. Cunha, J. Cristobo and E. Manhon, In search of serpentinization on Gorringe Bank, in Bell, K.L.C., K. Elliot, C. Martinez and S.A. Fuller, eds., New Frontiers in Ocean Exploration: The *E/V Nautilus* and NOAA Ship *Okeanos Explorer* 2011 Field Season, *Oceanography, 25* (1), supplement, 38-39, 2012.

Siler, D.L. and J.A. Karson, Focused subsidence during Tertiary crustal construction in the magmatic rift zones of Iceland: Structure and stratigraphy of the Vatnsdalur Flexural Basin, *Geol. Soc. Amer. Bull.*, *124*, doi:10.1130/B30562.1, 2012.

Horst, A.J., R.J. Varga, J. Gee and J. Karson, Paleomagnetic constraints on constructional deformation of superfast-spread oceanic crust exposed at Pito Deep Rift, *J. Geophys. Res*., *116*, B12103, doi:10.1029/2011JB008268, 2011.

Christeson, G.L., J.A. Karson, and K.D. McIntosh, Mapping of seismic layer 2A/2B boundary above the sheeted dike unit at intermediate-spreading crust exposed near the Blanco Transform, *Geochemistry, Geophysics, Geosystems (G-Cubed), 11,* Q03015, doi:10.1029/2009GC002864,2010.

***2000-2009***

Hayman, N.W. and J.A. Karson, Faulting and hydrothermal alteration in superfast spread crust of the East Pacific Rise exposed at Pito Deep, *Geochemistry, Geophysics, Geosystems (G-Cubed), 10*, Q02013, doi:10.1029/2008GC002319, 2009.

Pollock, M.A., E.M. Klein, J.A. Karson and D.S. Coleman, Compositions of dikes and lavas from the Pito Deep Rift: Implications for accretion at superfast spreading centers, *J. Geophys. Res.* *114*, B03207, doi:10.1029/2007JB005436, 2009.

Siler, D.L. and J.A. Karson, Three-dimensional structure of inclined sheet swarms: Implications for crustal thickening and subsidence in the volcanic rift zones of Iceland, *J. Volc. Geoth. Res., 188*, 333–346, 2009.

Heft, K., K.M. Gillis, M.A. Pollock, J.A. Karson, E.M. Klein, Constraints on the nature of axial hydrothermal systems from the sheeted dike complex exposed at Pito Deep, *Geochemistry, Geophysics, Geosystems (G-Cubed), 9* (5), Q05O07, doi:10.1029/2007GC001926, 2008.

Varga, R.G., A. Horst, J.S. Gee and J.A. Karson, Direct evidence from anisotropy of magnetic susceptibility for lateral melt migration a superfast spreading centers, *Geochemistry, Geophysics, Geosystems (G-Cubed),* *9* (8), Q08008, doi:10.1029/2008GC002075, 2008.

Christeson, G.L., K.D. McIntoshand J.A. Karson, Inconsistent correlation of seismic layer 2a and lava layer thickness in oceanic crust, *Nature* *445*, doi:10.1038/nature05517, 2007.

Hayman, N.W. and J.A. Karson, Faults and damage zones in fast-spread crust exposed on the north wall of the Hess Deep Rift: Conduits and seals in seafloor hydrothermal systems, *Geochemistry, Geophysics, Geosystems (G-Cubed)*, *8*, 10, Q10002, doi:10.1029/2007GC001623, 2007.

Kelley, D.S., G.L. Früh-Green, J.A. Karson, and K.A. Ludwig, Lost City hydrothermal field revisited, *Oceanography* *20* (4), 90-99, 2007.

Perk, N.W., L.A. Coogan, J.A. Karson, J.A., E.M. Klein, and H.D. Hanna, The primitive lower oceanic crust from Pito Deep: Implications for the accretion of the lower crust at the southern east Pacific Rise, *Contrib. Min. Petrol. 154 (5)*, 575-590, doi:10.1007/ s00410-007-0210-z, 2007.

Boschi, C., G.L Früh-Green, A.G. Delacour, D.S. Kelley, and J.A. Karson, Mass transfer and fluid flow during detachment faulting and development of an oceanic core complex, Atlantis Massif (MAR 30°N), *Geochemistry, Geophysics, Geosystems (G-Cubed), 7(1),* doi:10.1029/2005GC001074, 2006.

Karson, J.A., G.L. Früh-Green, D.S. Kelley, E.A. Williams, D.R. Yoerger, and M. Jakuba, Detachment shear zone on the Atlantis Massif Core Complex, Mid-Atlantic Ridge 30°N, *G-Cubed* *7 (6),* doi:10.1029/2005GC001109, 2006.

Pratson, L., D. Cacchione, N. Driscoll, R. Burger, C. Fulthorpe, J. Fildelez, J. Karson, B. Mullenbach, D. O'Grady, D. Orange, C. Paola, G. Parker, M. Steckler, J. Swenson, and P. Wiberg, Seascape Evolution on Continental Shelves and Slopes, in *Continental-Margin Sedimentation: From Sediment Transport to Sequence Stratigraphy*, edited by C.A. Nittrouer, J.A. Austin Jr., M.E. Field, J.H. Kravitz, J.P.M. Syvitski, and P.L. Wiberg, International Association of Sedimentologists, Special Publication 37, Blackwell Publishing Ltd, Oxford, 2006.

Sæmundsson, K. and J. A. Karson, Stratigraphy and tectonics of the Húsavík-Western Tjörnes area, Unpublished Report, prepared for Alcoa and HRV Engineering, ÍSOR-2006/-32, 35 pp. and 1:20,000 Geological Map, 2006.

Stewart, M.A., J.A. Karson and E.M. Klein, Four-dimensional upper crustal construction at fast-spreading mid-ocean ridges: A perspective from an upper crustal cross-section at the Hess Deep Rift, *J. Volc. Geoth. Res*. *144*, 287-309, 2005.

Karson, J.A., J. Francheteau, J.S. Gee, K.M. Gillis, N.W. Hayman, R. Hékinian, R.N. Hey, S.D. Hurst, E.M. Klein, D.F. Naar, R.G. Varga and Pito Deep 2005 Scientific Party, Nested-scale investigation of tectonic windows into super-fast spread crust exposed at the Pito Deep Rift, Easter Microplate, SE Pacific, *InterRidge Newsletter, 14*, 5-8, 2005.

Kelley, D.S., J.A. Karson, G.L. Früh-Green, D.R. Yoerger, T.M. Shank, D.A. Butterfield, J.M. Hayes, M.O. Schrenk, E. Olson, G. Proskurowski, M. Jakuba, A. Bradley, B. Larson, K. Ludwig, D. Glickson, K. Buckman, A.S. Bradley, B. Brazelton, K. Roe, M.J. Eland, A. Delacour, S.M. Bernasconi, M.D. Lilley, J.A. Baross, R.E. Summons, and S.P. Sylva, Geological, biological, and hydrothermal processes at the Lost City Vent Field: A serpentinite-hosted ecosystem: The Lost City Hydrothermal Field, *Science* *307*, 1428-1434, 2005.

Pollock, M.A., E.M. Klein, J.A. Karson, and M. A. Tivey, Temporal and spatial variability in the composition of lavas exposed along the Western Blanco Transform Fault, *G-Cubed* *6 (11),* doi:10.1029/2005GC001026, 2005.

Furman, T., J. G. Bryce, J.A. Karson, and A. Iotti, East African Rift System (EARS) plume structure: Insights from Quaternary mafic lavas of Turkana, Kenya, *J. Petrol.* *45*, 1069-1088, 2004.

Hurst, S.D. and J.A. Karson, Side-scan processing and interpretation along the northern wall of the Hess Deep Rift: Texture analysis and geologic ground-truth, *J. Geophys. Res*. *109* (B02107, doi:10.1029/2002JB002116, 2004.

Rivizzigno, P.A. and J.A. Karson, Mid-ocean ridge fault zones preserved on Macquarie Island: Faulting, hydrothermal processes and magmatism in an oblique-spreading environment, *Geology* *32*, 125-128, 2004.

Varga, R.G., J.A. Karson and J.S. Gee, Paleomagnetic constraints on deformation models for oceanic crust exposed at the Hess Deep Rift: Implications for axial processes at the East Pacific Rise, *J. Geophys. Res*. *109* (B2102), doi:10.1029/2003JB002486, 2004.

Alt, J.C., G. Davidson, D.A.H. Teagle and J.A. Karson, The isotopic composition of gypsum in the Macquarie Island Ophiolite: Implications for sulfur cycle and the subsurface biosphere in oceanic crust, *Geology*, *31*, 549-552, 2003.

Früh-Green, G.L., D.S. Kelley, S.M. Bernasconi, J.A. Karson, C. Boschi, K.A. Ludwig, D.A. Butterfield, 30,000 Years of Hydrothermal Activity at the Lost City Hydrothermal Field, *Science 301*, 495-498, 2003.

Karson, J.A. and G.L. Christeson, Comparison of geologic and seismic structure of uppermost fast-spread oceanic crust: Insights from a crustal cross section at the Hess Deep Rift, in *Small-Scale Crustal Heterogeneity: Nature, Scaling, and Seismic Properties*, edited by J.A. Goff and K. Holliger, Kluwer/Plenum Publishing, NY, 99-129, 2003.

Stewart, M.A., E.M. Klein, J.A. Karson and J.G. Brophy, Geochemical relationships between dikes and lavas at the Hess Deep Rift: Implications for magma eruptibility, *J. Geophys. Res., 108 (B4),* 2184, doi:10.1029/2001JB001622, 2003.

Blackman, D.K., J.A. Karson, D.S. Kelley, J.R. Cann, G. L. Früh-Green, J.S. Gee, S.D. Hurst, B.E. John, J. Morgan, S.L. Nooner, D.K. Ross, T.J. Schroeder and E.A. Williams, Geology of the Atlantis Massif (Mid-Atlantic Ridge, 30°N): Implications for the evolution of an ultramafic oceanic core complex, *Mar. Geophys. Res. 23*, 443-469, 2002*.*

Hefferan, K.P., H. Admou, Hilal, R., J.A. Karson, S. Samson, A. Saquaque, and J.M. Kornprobst, Proterozoic blueschist-bearing mélange in the Anti-Atlas Mountains, Morocco, *Precambrian Res., 118, 179-194*, 2002.

Karson, J.A., Geologic structure of the uppermost oceanic crust created at fast- to intermediate-rate spreading centers, *Ann. Rev. Earth Planet. Sci*., 30, 347-384, 2002.

Karson, J.A., E.M. Klein, S.D. Hurst, C.E. Lee, P.A. Rivizzigno, D. Curewitz, A.R. Morris, and Hess Deep ‘99 Scientific Party, Structure of uppermost fast-spread oceanic crust exposed at the Hess Deep Rift: Implications for subaxial processes at the East Pacific Rise, *Geochemistry, Geophysics, Geosystems (G-Cubed), 3,* doi:10.1029/2001GC000155], 2002.

Karson, J.A., M.A. Tivey, and J.R. Delaney, Internal structure of uppermost oceanic crust along the western Blanco Transform Scarp: Implications for subaxial accretion and deformation at the Juan de Fuca Ridge, *J. Geophys. Res., 107*(B9), 2181, doi:10.1029/2000JB000051, 2002.

Lawrence, R.M., J.S. Gee, and J.A. Karson, Magnetic anisotropy of serpentinized peridotites from the MARK Area: Implications for the orientation of mesoscopic structures and major fault zones, *J. Geophys. Res*., *107* (B4), 2073, doi:10.1029/2000JB000007, 2002

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