

DIONYSIS FOUSTOUKOS

Education:

- B.Sc. 1997 Aristotle University of Thessaloniki, Greece, Geology
Ph.D. 2005 University of Minnesota, Minneapolis, Geology – Chemistry

Current Professional Appointments:

- 2010- Adjunct Prof., Dept. of Atm., Oceanic & Earth Sciences, George Mason University
2009- Research Scientist, Carnegie Institution of Washington

Professional Society Memberships:

Mineralogical Society of America, American Society for Microbiology

Research Interests:

Experimental and theoretical aqueous geochemistry applied to phase equilibria relationships between fluids and melts/crystalline phases in the Earth's interior. Experimental geomicrobiology applied to metastable equilibria of redox species and biomolecules, bioenergetics, pressure effects on microbial metabolism, microbial adaptability and evolution of life evolution/habitability at extreme environments. Geochemical processes and microbial activities at deep-sea hydrothermal vents.

Other Scientific Activities – Field Expeditions:

- 2014 R/V Atlantis, EPR, 9-10°N
2012 Shallow-water hydrothermal vents at Milos Island, Greece
2005 R/V Atlantis, Galapagos Rift (1) and Juan de Fuca Ridge (2)
2002, 2004 R/V Atlantis, EPR, 9-10°N and 21°N

Synergistic Activities:

Dr. Foustoukos has developed experimental apparatus (high pressure bioreactor) to facilitate the investigation of microbial growth and metabolic rates of piezophile/tolerant extremophiles at *in-situ* pressure conditions, and constrain the limits of the subsurface biosphere in the Earth's crust. He is graduate-faculty at the Dept. of Atmospheric, Oceanic and Earth Sciences at George Mason University teaching Marine Geology, Chemical Oceanography and Biogeochemistry. He is Associate Editor for the American Mineralogist.

Active Awards: NASA-Emerging Worlds (14-EW14_2-0070), NSF-MCB 1517560, NSF-EAR 1347970, NSF-OCE 153861.

US Patent: PCT International application 61/946,057 – “High Pressure Bioreactor”

Recent Publications:

- Foustoukos D.I. (2016) On the ionic strength and electrical conductivity of crustal brines (in review, *Chemical Geology*)
Foustoukos D.I. (2016) On the solvation properties of supercritical electrolyte solutions (in review, *Chemical Geology*)
Foustoukos, D.I., Pérez-Rodríguez I. (2015) A continuous culture system for assessing activities in the piezosphere, *Applied and Environmental Microbiology*, 81, 6850-6856.
Foustoukos, D.I., Mysen, B.O. (2015) The structure of water-saturated carbonate melts, *American Mineralogist, Special Collection “Fluids in the Crust”*, 100, 35-46.
Foustoukos, D.I., Bizimis, M., Frisby, C., Shirey, S.B. (2015) Redox controls on Ni–Fe–PGE mineralization and Re/Os fractionation during serpentinization of abyssal peridotite, *Geochimica et Cosmochimica Acta*, 150, 11-25.

- Foustoukos, D.I, Mysen, B.O (2013) H/D methane isotopologues dissolved in magmatic fluids: Stable hydrogen isotope fractionations in the Earth's interior, *Amer. Mineral.*, 98, 946-954.
- Foustoukos D.I. (2012) Metastable equilibrium in the C-H-O system: Graphite deposition in crustal fluids *American Mineralogist*, 97, 1373-1380.

Other publications:

- Foustoukos, D. I., Stern, J.C. (2012) Oxidation pathways for formic acid under low temperature hydrothermal conditions: Implications for the chemical and isotopic evolution of organics on Mars, *Geochimica et Cosmochimica Acta*, 76, 14-28.
- Foustoukos, D.I., Mysen, B.O. (2012) D/H isotopic fractionation in the H₂-H₂O system at supercritical water conditions: Composition and hydrogen bonding effects, *Geochimica et Cosmochimica Acta*, 86, 88-102.
- Foustoukos D.I., Houghton J.L., Seyfried W.E. Jr., Sievert S.M. and Cody G.D. (2011) Kinetics of H₂-O₂ redox equilibria and formation of metastable H₂O₂ under low temperature hydrothermal conditions, *Geochimica et Cosmochimica Acta*, 75, 1594-1607.
- Foustoukos D.I., Seyfried W.E., Jr., Ding K. and Pester, N.J. (2009) Dissolved carbon species in associated diffuse and focused flow hydrothermal vents at the Main Endeavour Field, northern Juan de Fuca ridge *Geochemistry, Geophysics, Geosystems*, 10, Q10003, doi:10.1029/2009GC002472
- Foustoukos D.I., Savov I. and Janecky D. (2008) Chemical and isotopic constraints on water/rock interactions at the Lost City hydrothermal field, 30°N Mid-Atlantic Ridge. *Geochimica et Cosmochimica Acta* 72, 5457-5474.
- Foustoukos D.I., Seyfried W.E., Jr. (2007) Trace element partitioning between vapor, brine, and halite under extreme supercritical phase separation. *Geochimica et Cosmochimica Acta*, 71, 2056-2071
- Foustoukos D.I., Seyfried W.E., Jr. (2007) Fluid phase separation processes in submarine hydrothermal systems *Reviews in Mineralogy and Geochemistry "Fluid-Fluid Equilibria in the Crust"* eds.A. Liebscher and Ch. Heinrich, 65, 213-239
- Foustoukos D.I. and Seyfried W.E., Jr. (2005) Redox and pH constraints in the seafloor root zone of the TAG hydrothermal System, 26°N Mid-Atlantic Ridge. *Earth and Planetary Science Letters* 235, 497-510
- Foustoukos D.I. and Seyfried W.E., Jr. (2004) Hydrocarbons in hydrothermal vent fluids: The role of chromium-bearing catalysts. *Science* 304 (5673), 1002-1005
- Foustoukos D.I., James R.H., Berndt M.E. and Seyfried W.E., Jr. (2004) Lithium isotopic systematics of hydrothermal vent fluids at the Main Endeavour Field, Northern Juan de Fuca Ridge. *Chemical Geology* 212 (1-2), 17-26

Advised Undergraduate Students:

2003	James Peter Saenz (MIT/WHOI)	2004	Becky Lundquist (Carleton College)
2005	Nick Pester (UMN)	2008	Greg Pelkey (GL-CIW)
2009	Niya Grozeva (Stony Brook)	2010	Rachael Hoover (UCB)
2012	Joe Maloney (GMU)	2013	Matt Rawls, Marques Hatfield (GMU)
2014	Matt Rawls, Brooke Sherman (GMU)	2016	Clark Spenser (GMU), Kapp Singer (Lick-Wilmerding High School)

Advised Graduate Students: Carl Frisby (University of South Carolina), Namhey Lee (Johns Hopkins University), Joe Maloney (GMU)

Mentored Postdoctoral Fellows: Dr. Ileana Perez – Rodríguez (CIW)