

Curriculum Vitae

Jeffrey L. Bada

Distinguished Research Professor of Marine Chemistry
Distinguished Professor of Marine Chemistry, Emeritus
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RELEVANT EXPERIENCE

Jeffrey L. Bada is professor of Marine Chemistry and former Director of the NASA Specialized Center of Research and Training (NSCORT) in Exobiology at the Scripps Institution of Oceanography, University of California at San Diego. Prof. Bada's research deals with the geochemistry of amino acids, organic cosmochemistry, the sources and stability of organic compounds on the primitive Earth and other solar system bodies, the origin of homochirality on Earth and the detection of possible remnants of life on solar system bodies both by in situ analyses and from the study of meteorites. Dr. Bada has played a pioneering role in the development of the Mars Organic Detector (MOD) instrument package that is designed to search for amino acids and other organic compounds directly on the surface of Mars during future ESA and NASA missions. He has been PI and Co-PI on several NASA grants for the development of space-craft based in situ instrumentation. Dr. Bada was PI for the development and design of the Urey instrument that is designed to search for evidence of both extinct and extant life on Mars.

EDUCATION:

B.S. Chemistry, 1965, San Diego State University
Ph.D. Chemistry, 1968, University of California, San Diego

PROFESSIONAL EXPERIENCE:

2010-present: Distinguished Research Professor of Marine Chemistry,
Scripps Institution of Oceanography, University of California at San
Diego
2009-2010: Distinguished Professor of Marine Chemistry, Scripps
Institution of Oceanography, University of California at San Diego
1980-2009: Professor of Marine Chemistry, Scripps Institution of
Oceanography, University of California at San Diego
1995-2007: Director, NASA Specialized Center of Research and
Training in Exobiology, UCSD
1974-1980: Associate Professor of Marine Chemistry, SIO, UCSD
1969-1974: Assistant Professor of Marine Chemistry, SIO, UCSD
1969-1970: Research Fellow, Harvard University
1968-1969: Instructor, Department of Chemistry, UCSD
1967-1968: NASA Fellow

PROFESSIONAL ACTIVITIES:

Member, American Association for the Advancement of Science

Member, American Chemical Society

Fellow, International Society for the Study of the Origin of Life

SELECTED 2003-2013 PUBLICATIONS (Dr. Bada has published over 200 papers)

Bada, J. L. 2013. New insights into prebiotic chemistry from Stanley Miller's spark discharge experiments. *Chemical Society Reviews*.

Bennett, R. V., Cleaves, H. J., Davis, J. M., Sokolov, D., Orlando, T. M., Bada, J. L., & Fernandez, F. M. (2013). Desorption Electrospray Ionization Imaging Mass Spectrometry as a Tool for Investigating Model Prebiotic Reactions on Mineral Surfaces. *Analytical Chemistry*.

Elsila, J. E., Glavin, D. P., Dworkin, J. P., Martins, Z., & Bada, J. L. 2012. Inconclusive evidence for nonterrestrial isoleucine enantiomeric excesses in primitive meteorites. *Proceedings of the National Academy of Sciences of the USA*, 109(48), E3288.

Bada, J. L. 2012. The Origin of Life on Earth and Mars (?). *LPI Contributions*, 1680, 7091.

Bada, J. L. 2012. Curiosity and Contamination. *Science* 337, 1604.

Cleaves, H. J., & Bada, J. L. (2012). The Prebiotic Chemistry of Alternative Nucleic Acids. *Genesis-In The Beginning*, 3-33.

Kua, J., & Bada, J. L. 2012. Primordial ocean chemistry and its compatibility with the RNA world. *Origins of Life and Evolution of Biospheres*, 1-6.

Rosa, C., Zeh, J., Craig George, J., Botta, O., Zauscher, M., Bada, J., & O'Hara, T. M. 2012. Age estimates based on aspartic acid racemization for bowhead whales (*Balaena mysticetus*) harvested in 1998–2000 and the relationship between racemization rate and body temperature. *Marine Mammal Science*.

Parker, E. T., Cleaves, H. J., Callahan, M. P., Dworkin, J. P., Glavin, D. P., Lazcano, A., & Bada, J. L. 2012. Enhanced Synthesis of Alkyl Amino Acids in Miller's 1958 H₂S Experiment. *Origins of Life and Evolution of Biospheres*, 1-6.

Parker Eric T.; Cleaves H. James; Callahan Michael P.; Dworkin, JP; Glavin, DP; Lazcano, A; Bada, JL 2011. Prebiotic Synthesis of Methionine and Other Sulfur-Containing Organic Compounds on the Primitive Earth: A Contemporary Reassessment

Based on an Unpublished 1958 Stanley Miller Experiment. *Origins of Life and Evolution of the Biosphere* 41: 201-212.

Parker, ET; Cleaves, HJ; Callahan, MP; Dworkin, JP; Glavin, DP; Lazcano, A; Bada, JL. 2011. Primordial synthesis of amines and amino acids in a 1958 Miller H₂S-rich spark discharge experiment. *Proc Natl, Acad. Sci. USA* 108; 5526-5531.

Grew, ES, Bada, JL and Hazen, RM. 2011. Borate Minerals and Origin of the RNA World. 2011. *Origins of Life and Evolution of the Biosphere* 41, 307-316.

Biemann, K., & Bada, J. L. (2011). Comment on “Reanalysis of the Viking results suggests perchlorate and organics at midlatitudes on Mars” by Rafael Navarro-González et al. *J. Geophys. Res.*, 116, E12001.

Glavin, D. P., Dworkin, J. P., Aubrey, A., Botta, O., Doty, J. H., Martins, Z., & Bada, J. L. 2010. Amino acid analyses of Antarctic CM2 meteorites using liquid chromatography-time of flight-mass spectrometry. *Meteoritics & Planetary Science*, 41(6), 889-902.

Glavin, D. P., Aubrey, A. D., Callahan, M. P., Dworkin, J. P., Elsila, J. E., Parker, E. T., & Shaddad, M. H. 2010. Extraterrestrial amino acids in the Almahata Sitta meteorite. *Meteoritics & Planetary Science*, 45(10-11), 1695-1709.

Kminek, G., Bada, J. L., Pogliano, K., & Ward, J. F. 2009. Radiation-dependent limit for the viability of bacterial spores in halite fluid inclusions and on Mars.

Peretó, J., Bada, J. L., & Lazcano, A. (2009). Charles Darwin and the origin of life. *Origins of Life and Evolution of Biospheres*, 39(5), 395-406.

Johnson, A. P., Cleaves, H. J., Dworkin, J. P., Glavin, D. P., Lazcano, A. and Bada, J. L. 2008. The Miller Volcanic Spark Discharge Experiment, *Science* **322**, 404.

Kminek, G. and J. L. Bada, 2006. The effect of ionizing radiation on the preservation of amino acids on Mars. *Earth Planet. Sci. Letters* 245, 1-5.

Skelley, M., H. J. Cleaves, C. N. Jayarajah, J. L. Bada and R. A. Mathies, 2006. Application of the Mars Organic Analyzer to Nucleobase and Amine Biomarker Detection, *Astrobiology* 6, 824-837.

Aubrey A, H. J. Cleaves, J. H. Chalmers, A. M. Skelley, R. A. Mathies, F. J. Grunthaner, P. Ehrenfreund and J. L. Bada, 2006 Sulfate minerals and organic compounds on Mars. *Geology* 34, 357-360.

Bada, J. L., 2005 The living universe - NASA and the development of astrobiology. *Science* **307**, 46-46.

Glavin D. P., G. Matrajt and J. L. Bada, 2004 Re-examination of amino acids in Antarctic micrometeorites *Advances in Space Research* **33**, 106-113.

Bada, J. L. 2004. How life began on Earth: a status report. *Earth Planet. Science Lett.* **226**, 1-15.

Kminek, G., J. L. Bada, K. Pogliano and J. F. Ward, 2003. Radiation-dependent limit for the viability of bacterial spores in halite fluid inclusions and on Mars, *Rad. Res.* **159**, 722-729.

Lazcano A, and J. L. Bada 2003. The 1953 Stanley L. Miller experiment: Fifty years of prebiotic organic chemistry *Origins of Life and Evolution of the Biosphere* **33**. 235-242.

Bada, J. L, and A. Lazcano 2003 Prebiotic soup - Revisiting the Miller experiment *Science* **300**, 745-746.