

Tullis C. Onstott

A. PROFESSIONAL PREPARATION

California Institute of Technology, Geophysics, B.S., 1976
Princeton University, Geology, M.A., 1978
Princeton University, Geology, Ph.D., 1980
Princeton University/University of Toronto, $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology, 1980-1983

B. APPOINTMENTS

Full Professor, Princeton University, 2001-present
Associate Professor, Princeton University, 1991-2001
Assistant Professor, Princeton University, 1985-1991
Research associate, Princeton University, 1983-1985
Research Assistant at U.S.G.S. Flagstaff, Arizona, 1974-1976

C. PUBLICATIONS

C.1 Five related Publications:

Dylan Chivian, Eric J. Alm, Eoin L. Brodie, David E. Culley, Paramvir S. Dehal, Todd Z. DeSantis, Thomas M. Gihring, Alla Lapidus, Li-Hung Lin, Stephen R. Lowry, Duane P. Moser, Paul Richardson, Gordon Southam, Greg Wanger, Lisa M. Pratt, Gary L. Andersen, Terry C. Hazen, Fred J. Brockman, Adam P. Arkin, and Tullis C. Onstott. Environmental genomics reveals a single species ecosystem deep within the Earth. *Science* 322:275-278, 2008.

Mac Lean, L.C.W., Pray, T.J., Onstott, T.C. and Southam, G. High-resolution structural and chemical studies of framboidal pyrite formed within a bacterial biofilm. *Geobiology*, 6:471-480, 2008.

Wanger, G., Onstott, T.C. and Southam, G. Stars of the terrestrial deep subsurface: A novel 'star-shaped' bacterial morphotype from a South African platinum mine *Geobiology* 6:325-330, 2008.

Sherwood Lollar, B., Voglesonger, K., Lin, L.-H., Lacrampe-Couloume, G., Telling, J., Abrajano, T.A., Onstott, T.C. and Pratt, L.M. Hydrogeologic controls on episodic H_2 release from Precambrian fractured rocks - Energy for deep subsurface life on Earth and Mars. *Astrobiology Journal* 7:971-986, 2007.

Mac Lean, L.C.W., Pray, T.J., Onstott, T.C. and Southam, G. Mineralogical, Chemical and Biological Characterization of an Anaerobic Biofilm Collected from a Borehole in a Deep Gold Mine in South Africa. *Geomicrobiology Journal* 24:491-504, 2007.

C.2 Five other publications:

M. Elwood Madden, S. Ulrich, T.C. Onstott, and T. Phelps, Salinity-induced hydrate dissociation: a mechanism for recent methane release on Mars. *Geophys. Research Letters* 34, L11202, doi:10.1029/2006GL029156, 2007.

Mailloux, Brian J., Devlin, S., Fuller, M. E., Onstott, T. C., DeFlaun, M. F., Choi, K-H, Green-Blum, M., Swift, D. J. P., McCarthy, J. and Dong, H., The Limited Role of Aquifer Heterogeneity on Metal Reduction in an Atlantic Coastal Plain Determined by Push-Pull Tests. *Appl. Geochem.* 22:974-995, 2007.

Onstott, T. C., Lin, L.-H., Davidson, M., Mislouack, B., Borcsik, M., Hall, J., Slater, G., Ward, J., Sherwood Lollar, B., Lippmann-Pipke, J., Boice, E., Pratt, L. M., Pfiffner, S. M., Moser, D. P., Gihring, T. M., Kieft, T., Phelps, T. J., van Heerden, E., Lithaur, D., DeFlaun, M., Rothmel, R., Wanger, G. and Southam, G. The origin and age of biogeochemical trends in deep fracture water of the Witwatersrand Basin, South Africa. *Geomicrobiology Journal* 23:369-414, 2006.

Lin, L.H., Wang, P-L, Rumble, D., Lippmann-Pipke, J., Boice, E., Pratt, L. M., Sherwood Lollar, B., Brodie, Eoin, Hazen, T., Andersen, G., DeSantis, T., Moser, D. P., Kershaw, D. and Onstott, T. C. Long term biosustainability in a high energy, low diversity crustal biome. *Science* 314:479-482, 2006.

Onstott, T. C., McGown, D., Kessler, J., Sherwood Lollar, B., Lehmann, K. K. and Clifford, S. Martian CH₄: sources, flux and detection. *Astrobiology* 6:377-395, 2006.

D: OTHER PROFESSIONAL EXPERIENCES

U.S. representative to IGCP 108/144 "Correlation of West Africa and Eastern Brazil", 1980-1984.

Chairman, GSA Special Symposium on "Radiometric Calibration of thermal histories of rocks" GSA Nat. Mtg., 1985.

Chairman of U.S. working group for IGCP 204 "Precambrian Geology of the Amazonas Craton", 1987-1988.

Editor, Special Issue of *Precamb. Res.*, 42, 1988.

Associate editor for *Precambrian Research*, 1988-1994.

Editor, Special Issue of *Precamb. Res.*, "Precambrian Paleomagnetism, Paleogeography and Paleoclimates, 1994.

Co-Chairman of Deep Microbiology Working Group, Subsurface Science Program, U.S. Dept. of Energy, 1994-1996.

Co-Chairman of Special Session on Subsurface Microbial Processes, Fall Meeting of American Geophysical Union, 1996.

Member of Review Panel for Environmental Management Science Program, U.S. Dept. of Energy, 1996.

Program Committee Member for 1997 SPIE Conference for Investigation of Extraterrestrial Microorganisms.

Participant of NASA Workshop on Mars Drilling, NASA Ames, Dec. 1996

Participant of NASA Workshop on Mars Sample Return, NASA Ames, June 1997

Member of Athena Proposal Team in charge of Planetary Protection Issues, 06/97 to 04/98

Participant of NASA Workshop on Deep Drilling Mars Mission, Los Alamos, May, 1998.

Member of Review Panel for LExEn Program, NSF, May 2000.

Organized Workshop on Biogeochemical Processes at Lead, South Dakota as part of Underground Laboratory Conference, Jan. 2000.

Participated in three BEESA REU workshops for South African and American minorities from 2001 to 2003.

Presenter at NASA Workshop on Deep Drilling Mars Mission, NASA Ames, Feb., 2008.

Co-Chairman of Special Session on Underground Laboratories, Fall Meeting of American Geophysical Union, 2008.

E: AWARDS AND FELLOWSHIPS

Presidential Young Investigator Award, 1985-1989.

Jubilee Medal, Geological Society of South Africa, 1988.

Award for Meritorious Research in Subsurface Microbiology, U.S. Dept. of Energy, 1995.

Award for Meritorious Research in NABIR Program, U.S. Dept. of Energy, 1998.

Appreciation Award for Research Excellence Office of Science, U.S. Dept. of Energy, 2002.

TIME100 Most Influential People in the World, 2007.

F: SYNERGISTIC ACTIVITIES (up to 5 recent examples)

I was a member of S1 DUSEL and coauthor of Deep Science report, 2007, which outlined the scientific impact of an underground lab to the non-scientific community.

I participated in a public forum on life in the universe, hosted by the NASA Astrobiology Institute and held in St. Clara in April, 2008.

I was the author of the Earth Lab report to NSF, 2004, which provided for the first time a description of the type of science that could be performed within an underground laboratory.

I was one of three U.S. teaching Faculty for BEESA REU in South Africa, 2001-2003, which focused on under-represented undergraduates in the U.S.A. and South Africa.

I have given numerous lectures in K-12 institutions in the Princeton region including teacher training colloquiums and summer undergraduate workshops at Princeton University.

G. COLLABORATORS AND OTHER AFFILIATIONS

(i) Collaborators:

Alm, Eric J. (M.I.T.); Andersen, Gary L. (LBNL); Arkin, Adam Paul (Univ. California, Berkeley); Boice, E. (Exxon Mobil Research and Engineering); Brockman, Fred J. (PNNL); Brodie, Eoin L. (LBNL); Chivian, Dylan (LBNL); Choi, K-H (Old Dominion Univ.); Clifford, S. (LPI); Culley, D.E. (PNNL); DeFlaun, M.F. (Geosyntec Inc.); Dehal, Paramvir S. (LBNL); DeSantis, Todd Z. (LBNL); Devlin, Sarah (Cornell Univ.); Dong, H. (Miami Univ.); Fuller, Mark (Shaw Environmental); Gihring, Thomas M. (Florida State Univ.); Green-Blum, Marie (Old Dominion Univ.); Hazen, T.C. (LBNL); Kershaw, D. (Anglogold Ashanti); Kieft, T. (NMIT); Lacrampe-Couloume, G. (Univ. of Toronto); Lapidus, Alla (JGI); Lehmann, Kevin (Univ. of Virginia); Lippmann-Pipke, J. (Institute of Interdisciplinary Isotope Research); Litthaur, Derek (Free State Univ.); Lowry, Stephen R. (JGI); Mac Lean, L.C.W. (Univ. of Western Ontario); Madden, Megan Elwood, (ORNL); McCarthy, J. (Univ. of Tennessee, Knoxville); Pfiffner, S. (Univ. of Tennessee, Knoxville); Phelps, Tommy Joe (ORNL); Pratt, Lisa M. (Indiana Univ.); Reches, Zeches (Univ. of Oklahoma); Richardson, Paul (JGI); Rothmel, Randi (Shaw Environmental); Rumble, Donald (Carnegie Institute); Sherwood-Lollar, Barbara, (Univ. of Toronto); Slater, G. (McMaster Univ.); Southam, Gordon (Univ. of Western Ontario); Swift, Donald, (Old Dominion Univ.); Telling, John (Univ. of Toronto); Ulrich, Sarah (ORNL); van Heerden, Esta (Free State Univ.); Voglesonger, K. (Univ. of Toronto); Wang, P-L (NTU); Wanger, Greg (Craig Venter Institute)

(ii) Graduate and Post-doctoral advisors:

Robert H. Hargraves (died 2004), Ph.D. Advisor
D. York, (died 2007) Postdoctoral Advisor

(iii) Thesis advisor and post-graduate scholar sponsor:

Cohen, Harvey (unknown); Davidson, Cameron (University of Alaska, Fairbanks); Davidson, Mark (Geosyntec Inc.); Hall, James (Exxon Mobil Research and Engineering); Janek, Marion (unknown); Kessler, John (Texas A&M University); Lee, James (Queens University); Lemper, Chris (unknown); Lin, Lihung (National Taiwan University); Lo, Ching-Hua (National Taiwan University); Mailloux, Brian (Barnard College); McGown, Dan (Dept of Defense); Mislowack, Bianca (Exxon Mobil Research & Engr.); Moser, Duane (Desert Research Institute); Phillips, David (Australia National University); Thompson, Dan(unknown); Tronick, Shannon. Princeton University); Tseng, H-Y (Exxon Mobil Research & Engr.); Wang, P. (unknown)

Total number of graduate students advised is 16. Total number of postdoctoral scholars sponsored is 12.