

Brent Craig Christner

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Birth date: July 31, 1970
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Education:

Ph.D., Microbiology, The Ohio State University, Columbus, Ohio, 2002.
Thesis advisors: John N. Reeve, Ellen Mosley-Thompson, and Lonnie G. Thompson

M.S., Microbiology, University of Dayton, Dayton, Ohio, 1996.
Thesis advisor: John J. Rowe

B.S., Molecular Biology and Biotechnology, Westminster College, New Wilmington, Pennsylvania, 1992.

Supplemental Coursework:

NSF Antarctic Biology Course, January 2001. McMurdo Station, Antarctica.

Microbial Diversity Course, June-July 1999. Marine Biological Laboratory, Woods Hole, Massachusetts.

Professional Experience:

Assistant Professor, August 2006-present. Department of Biological Sciences, Louisiana State University, Baton Rouge, Louisiana.

Assistant Research Professor, August 2004-2006. Department of Land Resources and Environmental Sciences, Montana State University, Bozeman, Montana.

Postdoctoral Researcher, June 2002-August 2004. Laboratory of John C. Priscu, Department of Land Resources and Environmental Sciences, Montana State University, Bozeman, Montana.

Teaching and Graduate Research Assistant, June 1997-March 2002. Laboratory of John N. Reeve, Department of Microbiology, The Ohio State University, Columbus, Ohio.

Teaching Assistant, January 1994-December 1995. Department of Biology, University of Dayton, Dayton, Ohio.

Research Associate in Molecular Biology, August 1992-August 1993. Laboratory of John R. Hassell, Eye and Ear Institute, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania.

Publications: (pdf versions available at <http://www.brent.xner.net/publications>)

Peer reviewed:

Amato, P., S.M. Doyle, J.R. Battista, and **B.C. Christner**. 2009. Implications of subzero metabolic activity on long-term microbial survival in terrestrial and extraterrestrial permafrost environments. *Astrobiology*, in preparation.

Christner, B.C. 2009. Bioprospecting for microbial products that affect ice crystal growth and formation. *Applied Microbiology and Biotechnology*, submitted.

Phillips, V.T.J., C. Andronache, **B.C. Christner**, C.E. Morris, D.C. Sands, A. Bansemer, A. Lauer, C. McNaughton, and C. Seman. 2009. Potential impacts from biological aerosols on ensembles of continental clouds simulated numerically. *Biogeosciences*, 6:987-1014.

Amato, P., S.M. Doyle, and **B.C. Christner**. 2009. Macromolecular synthesis by yeasts under frozen conditions. *Environmental Microbiology*, 11:589-596.

Amato, P., and **B.C. Christner**. 2009. Energy metabolism response to low temperature and frozen conditions in *Psychrobacter cryohalolentis*. *Applied and Environmental Microbiology*, 75: 711-718.

Christner, B.C., R. Cai, C.E. Morris, K.S. McCarter, C.M. Foreman, M.L. Skidmore, S.N. Montross, and D.C. Sands. 2008. Geographic, seasonal, and precipitation chemistry influence on the abundance and activity of biological ice nucleators in rain and snow. *Proceedings of the National Academy of Sciences USA*, 105:18854-18859.

Priscu, J.C., **B.C. Christner**, J.E. Dore, B.N. Popp, M.B. Westley, and K.L. Casciotti. 2008. Supersaturated N₂O in a perennially ice-covered lake: molecular and stable isotopic evidence for a biogeochemical relict. *Limnology and Oceanography*, 53:2439-2450.

Priscu, J.C., S. Tulaczyk, M. Studinger, M.C. Kennicutt II, **B.C. Christner**, and C.M. Foreman. 2008. Antarctic subglacial water: origin, evolution and microbial ecology. In W. Vincent and J. Laybourn-Parry (eds), *Polar Limnology*. Oxford University Press, pp. 119-135.

Raymond, J.A., **B.C. Christner**, and S.C. Schuster. 2008. An ice-adapted bacterium from the Vostok ice core. *Extremophiles*, 12:713-717.

Christner, B.C., C.E. Morris, C.M. Foreman, R. Cai, and D.C. Sands. 2008. Ubiquity of biological ice nucleators in snowfall. *Science*, 319:1214.

Christner, B.C., M.L. Skidmore, J.C. Priscu, M. Tranter, and C.M. Foreman. 2008. Bacteria in subglacial environments. In R. Margesin, F. Schinner, J.-C. Marx, and C. Gerday (eds), *Psychrophiles: From Biodiversity to Biotechnology*. Springer, New York.

Christner, B.C., G. Royston-Bishop, C.F. Foreman, B.R. Arnold, M. Tranter, K.A. Welch, W. B. Lyons, A.I. Tsapin, M. Studinger, and J.C. Priscu. 2006. Limnological conditions in Subglacial Lake Vostok, Antarctica. *Limnology and Oceanography*, 51:2485-2501.

Priscu, J.C., **B.C. Christner**, C.F. Foreman, and G. Royston-Bishop. 2006. Biological material in ice cores. In S. Elias (ed.), *Encyclopedia of Quaternary Science*, pp. 1156-1166. Elsevier, UK.

Royston-Bishop, G., J.C. Priscu, M. Tranter, **B.C. Christner**, M.J. Siegert, and V. Lee. 2005. Incorporation of particulates into accreted ice above Subglacial Lake Vostok, Antarctica. *Annals of Glaciology* 40:145-150.

Christner, B.C., J.A. Mikucki, C.M. Foreman, J. Denson, and J.C. Priscu. 2005. Glacial ice cores: a model system for developing extraterrestrial decontamination protocols. *Icarus*, 174:572-584.

Christner, B.C., E. Mosley-Thompson, L.G. Thompson, and J.N. Reeve. 2005. Recovery and identification of bacteria from polar and non-polar glacial ice. In S. O. Rogers and J. Castello (eds), *Life in Ancient Ice*, pp. 209-227. Princeton University Press, Princeton, New Jersey.

Priscu, J.C., and **B.C. Christner**. 2004. Earth's icy biosphere. In Bull, Alan T. (ed.), *Microbial Diversity and Bioprospecting*, pp. 130-145. American Society for Microbiology, Washington, D.C.

Christner, B.C., B.H. Kvitko, and J.N. Reeve. 2003. Molecular identification of bacteria and eukarya inhabiting an Antarctic cryoconite hole. *Extremophiles*, 7:177-183.

Christner, B.C., E. Mosley-Thompson, L.G. Thompson, and J.N. Reeve. 2003. Bacterial recovery from ancient ice. *Environmental Microbiology* 5:433-436.

Christner, B.C. 2002. Incorporation of DNA and protein precursors into macromolecules by bacteria at -15°C. *Applied and Environmental Microbiology* 68:6435-6438.

Christner, B.C., E. Mosley-Thompson, L.G. Thompson, V. Zagorodnov, K. Sandman, and J.N. Reeve. 2002. Isolation and identification of bacteria from ancient and modern ice core archives. In: *The Patagonian Ice Fields. A unique natural laboratory for environmental and climate change studies*, edited by G. Casassa, F.V. Sepúlveda, and R. Sinclair, Kluwer Academic / Plenum Publishers, New York.

Christner, B.C., E. Mosley-Thompson, L.G. Thompson, and J.N. Reeve. 2001. Isolation of bacteria and 16S rDNAs from Lake Vostok accretion ice. *Environmental Microbiology* 3:570-577.

Christner, B.C., E. Mosley-Thompson, L.G. Thompson, V. Zagorodnow, K. Sandman, and J.N. Reeve. 2000. Recovery and identification of viable bacteria immured in glacial ice. *Icarus* 144:479-485.

Other publications:

Christner, B.C. and J.C. Priscu. 2008. Antarctica: a last frontier for microbial exploration. *Microbiology Today*, 35:70-73.

Doyle, S.M., P. Amato, and **B.C. Christner**. 2008. Life in and under the Antarctic ice sheets (cover article). *Microscopy Today*, 16:6-9.

Christner, B.C., and J.C. Priscu. 2005. Subglacial Lake Vostok. Invited contributor to the *Encyclopedia of Water*, edited by Jay H. Lehr, John Wiley and Sons Publishing.

Christner, B.C. 2004. Cryoconite hole ecosystems in Antarctic glacier ice. Invited contributor to the *Encyclopedia of the Antarctic*, edited by Beau Riffenburgh, Routledge Reference.

Christner, B.C. 2002. Detection, recovery, isolation, and characterization of bacteria in glacial ice and Lake Vostok accretion ice. Ph.D thesis, Department of Microbiology, The Ohio State University.

Scientific Presentations: (last 5 years; *italics* denote presenting author)

Tulaczyk, S. S. Anandakrishnan, A. Behar, **B. Christner**, A. Fisher, H. Fricker, D. Holland, R. Jacobel, J. Mikucki, A. Mitchell, R. Powell, J. Priscu, R. Scherer, and J. Severinghaus. 2009. Whillans Ice Stream Subglacial Access Research Drilling (WISSARD): Integrative Study of Marine Ice Sheet Stability and Subglacial Life Habitats. Invited oral presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 14-18, 2009.

Mitchell, A., J.A. Mikucki, **B.C. Christner**, and J.C. Priscu. 2009. Subglacial biogeochemical weathering and the unexplored sub-Antarctic system. Presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 14-18, 2009.

Phillips, V., C. Andronache, D.C. Sands, C.E. Morris, and **B.C. Christner**. 2009. Effects from bacteria and other biological particles on mesoscale convective systems simulated numerically. Presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 14-18, 2009.

Raymond, J. **B.C. Christner**, S. Schuster, G. Gloeckner, and J. Raymond. An ice-adapted bacterium from the Vostok ice core. Oral presentation at Xth SCAR International Biology Symposium, Sapporo, Japan, July 26-31, 2009.

Christner, B.C., C.E. Morris, D.C. Sands, and V.T.J. Philips. Distribution and potential impacts of biological ice nucleators in the atmosphere. Invited oral presentation at Goldschmidt 2009, Davos, Switzerland, June 21-26, 2009.

P. Amato, S.M. Doyle, and **B.C. Christner**. Microbial survival mechanisms in the cold subsurface. Invited oral presentation at Goldschmidt 2009, Davos, Switzerland, June 21-26, 2009.

Montross, S.M., S.M. Doyle, D. Samyn, J.-L. Tison, **B.C. Christner**, and M.L. Skidmore. Sediment-rich Antarctic basal ice as a habitat for microorganisms. Invited oral presentation at Goldschmidt 2009, Davos, Switzerland, June 21-26, 2009.

Christner, B.C. Biological ice nucleation in the atmosphere: is there a bioprecipitation cycle? Invited oral presentation at the 2009 General Meeting for the American Society of Microbiology. Philadelphia, PA, May 18, 2009.

Christner, B.C. The Antarctic Cryoecosphere: A new paradigm for life on Earth. Invited speaker at the Hopkins Marine Institute of Stanford University, Pacific Grove, CA, April 10, 2009.

Christner, B.C. Cloudy with a chance of microbes: Potential role of biological ice nucleation in precipitation generation and microbial dissemination. Invited speaker at the Fralin Life Science Institute, MCBB seminar, Virginia Tech. Blacksburg, VA, March 6, 2009.

Christner, B.C. Biology and the hydrologic cycle: interplay with climate and life in Earth's frozen reservoirs. Invited oral presentation at the 2008 'Complex Systems and Changes: Water and Life' conference. Taormina, Italy, October 29-31, 2008.

Brox, T., M. Skidmore, and **B. Christner**. Microbial impacts on crystalline structure in laboratory ices: a cry-stage microscopic analysis. Oral presentation at the Northwest Glaciologist Meeting. Seattle, WA, 17-18 October 2008.

Montross, S.N., M.L. Skidmore, and **B.C. Christner**. Microbial Activity in Ice: Biogeophysics of the Cryosphere. Oral presentation at the AGU Chapman Conference on Biogeophysics, Portland, ME, 13-16 October 2008.

Christner, B.C., J. Raymond, T. Brox, S. Schuster, S. Doyle, and M. Skidmore. Bacterial alteration of the physical structure of ice. Oral presentation at the WAIS Divide Science Meeting 2008. Denver, CO, 1-3 October 2008.

Priscu, J.C., S. Tulaczyk, M. Studinger, M.C. Kennicutt II, **B.C. Christner**, C.M. Foreman. Antarctic Subglacial Water: Origin, Evolution and Ecology. Oral presentation at the 2008 Joint SCAR-IASC Open Science Conference. St. Petersburg, Russia, 5-7 July 2008.

Christner, B.C., P. Amato, J.A. Raymond, S.C. Schuster, and S.M. Doyle. Physiological and molecular adaptations to frozen conditions. Oral presentation at the

3rd International Conference on Polar and Alpine Microbiology. Banff, Alberta, 11-15 May 2008.

McCarter, K.S., R. Cai, and B.C. Christner. Using generalized linear mixed models analysis in the detection and classification of biological ice nucleators. Oral presentation at the 2008 Applied Statistics in Agriculture. Kansas State University, Manhattan, Kansas, 27-29 April 2008.

Priscu, J.C. and B.C. Christner. Lake Vostok: An earthly analogue for the geomicrobiology on Europa. Invited presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 10-14, 2007.

Amato, P., S. Doyle and B.C. Christner. Metabolism of bacteria and eukarya in ice. Poster presentation at the 2007 WAIS Divide Science meeting. Lake Tahoe, Nevada, 4-5 October 2007.

Montross, S.N., M.L. Skidmore, and B.C. Christner. Microbial respiration at sub-zero temperatures. Poster presentation at the 2007 WAIS Divide Science meeting. Lake Tahoe, Nevada, 4-5 October 2007.

Priscu, J.C., C.A. Foreman, J.A. Raymond, and B.C. Christner. Life in the wrong places: microorganisms in icy environments. Invited presentation at the 2007 Society for Industrial Microbiology annual meeting. Denver, Colorado, 29 July – August 2 2007.

Christner, B.C., C. Morris, R. Cai, M.L. Skidmore, S.N. Montross, C.A. Foreman, and D.C. Sands. Evidence for biological ice nucleating particles in snowfall. Oral presentation at the International Union of Geodesy and Geophysics XXIV General Assembly. Perugia, Italy, 2-13 July 2007.

Christner, B.C. Biological context for exploring subglacial lake environments. Invited presentation at the 3rd SCAR SALE meeting. Big Sky, Montana, 6-7 June 2007.

Christner, B.C., M.L. Skidmore, and S.N. Montross. Subzero realms for microorganisms: expanding the circumstellar habitable zone for life. Invited presentation at the American Society of Limnology and Oceanography 2007 Aquatic Sciences Meeting. Santa Fe, New Mexico, February 4-9, 2007.

Priscu, J.C., B.C. Christner, and J.A. Mikucki. What Antarctic lakes and rivers tell us about the astrobiological potential of other icy worlds. Invited presentation at the American Society of Limnology and Oceanography 2007 Aquatic Sciences Meeting. Santa Fe, New Mexico, February 4-9, 2007.

Christner, B.C. The Antarctic cryoecosphere. Invited presentation at the XXIX Symposium on Polar Meteorology and Glaciology Polar Biology, National Institute of Polar Research, Tokyo, Japan. November 20-22, 2006.

Christner, B.C. Biological context for exploring subglacial lake environments. Invited presentation at Principles of Environmental Stewardship for the Exploration and Study

of Subglacial Environments, Subglacial Lakes Meeting. The National Academies, February 13-14, 2006.

Skidmore, M.L., B.C. Christner, D. Samyn, and R. Lorrain. Taylor Glacier basal ice, Antarctica; a biogeochemical hot-spot in a glacial environment. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 4-9, 2005.

Christner, B.C., C.E. Morris, and D.C. Sands. Evidence for a bioprecipitation cycle in snow and glacier ice archives? Oral presentation at the 2005 Inland Northwest Research Alliance, Environmental and Subsurface Science Symposium. Big Sky, Montana, September 19-21, 2005.

Christner, B.C. Subglacial Antarctic lakes: a scientific frontier for the IPY and beyond. Invited oral presentation at the International Polar Year Education/Outreach Workshop. NASA Goddard Space Flight Center, Greenbelt, MD, September 8-9, 2005.

Priscu, J.C., B.C. Christner, C.M. Foreman, B. Arnold, and J.A. Mikucki. The limnology of Lake Vostok. Poster presentation at the IX SCAR International Antarctic Biology Symposium. Curitiba, Brazil, July 25-29, 2005.

Christner, B.C. Lake Vostok as a model system for developing extraterrestrial decontamination protocols. Invited oral presentation in panel: Engineering Challenges for Life Detection in the Universe, IEEE Aerospace Conference. Big Sky, Montana, March 5-12, 2005.

Christner, B.C., J.C. Priscu, J.E. Dore, B.N. Popp, W.B. Lyons, and K.L. Casciotti. Sources of extreme nitrous oxide levels in an Antarctic lake: evidence from geochemical and molecular data. Oral presentation at the American Society of Limnology and Oceanography 2005 Aquatic Sciences Meeting. Salt Lake City, Utah, February 20-25, 2005.

Priscu, J.C., B.C. Christner, C.F. Foreman, J.A. Mikucki, K.A. Welch, and W.B. Lyons. Physical and biological character of Subglacial Lake Vostok, Antarctica. Oral presentation at the American Society of Limnology and Oceanography 2005 Aquatic Sciences Meeting. Salt Lake City, Utah, February 20-25, 2005.

Foreman, C.F., B.C. Christner, J.A. Mikucki, and J.C. Priscu. Cryoconites: active assemblages entombed in glacial ice. Poster presentation at the American Society of Limnology and Oceanography 2005 Aquatic Sciences Meeting. Salt Lake City, Utah, February 20-25, 2005.

Arnold, B.R., B.C. Christner, and J.C. Priscu. Isolation and characterization of microorganisms in glacial and accreted ice from the Vostok ice core: is there life in Lake Vostok? Poster presentation at the American Society of Limnology and Oceanography 2005 Aquatic Sciences Meeting. Salt Lake City, Utah, February 20-25, 2005.

Membership in Professional Societies:

American Geophysical Union
American Society of Limnology and Oceanography
American Society for Microbiology

Grants:

Principal Investigator on proposal to the National Science Foundation Office of Polar Programs (9/09 - 8/14). Collaborative research: WISSARD (Whillans Ice Stream Subglacial Antarctic Research Drilling): Geobiology of Antarctic subglacial environments beneath the Whillans Ice Streams. Funding (unofficial): \$380,906.

Principal Investigator on proposal to the Louisiana Space Consortium (5/09 - 4/10). High Altitude Biological Testing of the Atmosphere (HABITAT): Developing a Sampling Platform to Measure the Upper Boundaries of the Biosphere. Funding: \$33,030.

Principal Investigator on National Science Foundation Office of Polar Programs grant award (7/07 - 6/10). Collaborative Research: Biogeochemistry and geomicrobiology of Taylor Glacier basal ice. Funding: \$190,806.

Co-Investigator on National Science Foundation Research in Biogeosciences grant award (1/06 - 12/08). Microbial Activity in Solid Ice: Implications for Modifying the CO₂ Record in Ice Cores. Funding: \$133,225 (LSU subcontract).

Principal Investigator on award from the Faculty Research Grant program, LSU Office of Sponsored Programs (6/07 - 5/08). Biological ice nuclei in precipitation. Funding: \$10,000.

Pending:

Co-Principal Investigator on proposal to the National Institute of Health, Microbiome of the Lung and Respiratory Tract in HIV-Infected Individuals and HIV-Uninfected Controls (9/09 – 8/14). Respiratory Microbiota, Inflammation, and HIV. Requested funding: \$379,263.

Principal Investigator on proposal to the National Science Foundation Directorate for Biological Sciences (9/09 - 8/12). MSB: LiT: Collaborative Research: Geobiology of Airborne Ice Nucleators (GAIN): Diversity, Identification, and Characterization of Biological Freeze Catalysts in Clouds. Requested funding: \$535,397.

Co-Investigator on proposal to National Science Foundation Office of Arctic Sciences (8/09 - 7/12). Collaborative Research: Biogeochemistry of meltwater from the Greenland Ice Sheet: Weathering processes, nutrient fluxes and bacterial communities in a subglacial environment. Requested funding: \$27,998.

Awards:

Research named by Discover Magazine as one of the “Top 100 stories of 2008”
<http://discovermagazine.com/2009/jan/088>.

Named a Louisiana State University "Rainmaker" for 2008 and 2009, an award that recognizes faculty who are nationally and internationally recognized for innovative research and creative scholarship, who compete for external funding at the highest levels and who attract and mentor exceptional graduate students. Awarded by the LSU Office of Research & Economic Development.

Travel award (\$1,000) from Louisiana State University Office of Research and Economic Development (Faculty Travel Grant program) to attend Goldschmidt 2009, Davos, Switzerland, July 21-26, 2009.

Travel award (\$1,200) from NSF EPSCoR sponsored Travel Grants for Emerging Faculty (TGEF) program to attend the 2009 General Meeting for the American Society of Microbiology. Philadelphia, PA, May 18, 2009.

Travel award (\$1,000) from National Science Foundation to attend the International Union of Geodesy and Geophysics XXIV General Assembly. Perugia, Italy, July 2007.

Travel award (\$1,000) from Louisiana State University Office of Research and Economic Development (Faculty Travel Grant program) to attend the International Union of Geodesy and Geophysics XXIV General Assembly. Perugia, Italy, July 2007.

Summer stipend award (\$5,000) from the Louisiana State University Office of Research and Economic Development, July 2007.

Travel award (\$2,000) from National Science Foundation to attend the Subglacial Antarctic Lake Exploration (SALE) Workshop. Grenoble, France, April 24-26, 2006.

Antarctic Service Medal of the United States of America from the National Science Foundation for scientific exploration and service in Antarctica. March 1, 2006.

Selection to the NSF Antarctic Biology Course, January 2001, McMurdo Station, Antarctica. Participation is highly competitively (20 students chosen from >300 international applicants) and the course trains young scientists for the rigors of fieldwork in Antarctica.

Award (\$5,000) from The Ohio State University, Department of Microbiology to participate in the Marine Biological Laboratory Microbial Diversity Course, Woods Hole, 1999.

Travel award (\$1,500) from the National Science Foundation to represent the U.S. science community at the NGRIP Basal Ice Meeting. Copenhagen, Denmark. November 29-30, 2004.

Travel award (\$2,500) from the National Science Foundation to attend the SCAR Open Science Conference. Bremen, Germany, July 25-31, 2004.

Student Travel Award (\$500), the American Society of Microbiology, 2001. Grant for travel to an American Society of Microbiology General Meeting.

Summer Research Fellowship (\$1,500), University of Dayton, 1994. Summer stipend awarded to graduate students on a competitive basis.

Summer Undergraduate Fellowship (\$3,000), University of Pittsburgh, 1992.
Department of Biological Sciences, laboratories of Roger Hendrix and Graham Hatfull.

Referee for Peer Reviewed Journals and Grant Applications:

Annals of Glaciology, Antarctic Science, Applied and Environmental Microbiology, Archives of Microbiology, Astrobiology, Australian Antarctic Division, Canadian Journal of Microbiology, Environmental Microbiology, Extremophiles, FEMS Microbiology Ecology, Gene, Genomics, Geobiology, Geophysical Research Letters, Global Biogeochemical Cycles, Journal of Geophysical Research - Biogeosciences, Journal of Sedimentary Research, Limnology and Oceanography - Methods, Microbial Ecology, National Aeronautics and Space Administration (Astrobiology and NASA Postdoctoral Program; sat on review panel for Astrobiology in January 2009), National Science Foundation (Arctic Sciences, Biogeosciences, Biological Oceanography, Environmental Genomics, GSTEP, Microbial Observatory/Microbial Interactions and Processes, and Office of Polar Programs), Natural Environment Research Council (British Antarctic Survey), Nature Geosciences, Nature Reviews Microbiology, Planetary and Space Science, Polar Biology, Proceedings of the National Academy of Science USA, Reviews in Environmental Science and Biotechnology, and Washington Sea Grant.

Scientific Workshops and Committees:

Member of the US Ice Core Working Group (http://nicl-smo.unh.edu/icwg_bylaws.htm) and Sample Allocation Committee (SAC), which provides oversight of the National Ice Core Laboratory, Denver, CO (2007-10).

United States Subglacial Antarctic Lake Environments (US-SALE) Science and Technology Steering Committee. Chair, committee on biology and genomics (http://salepo.tamu.edu/us_sale).

Chair of session "You Call This a Living?: The Microbial Ecology and Biogeochemistry of the Atacama Desert and Antarctic Dry Valleys". Goldschmidt 2009, Davos, Switzerland, July 21-26, 2009.

NASA Exobiology Panel Reviewer, January 13-16, 2009, Washington. D.C.

Participant at the WAIS Divide Ice Core Science and Executive Committee Meeting. Denver, CO, 1-3 October 2008.

Participant at the Subglacial Antarctic Lake Exploration (SALE) Workshop. Grenoble, France, April 24-26, 2006.

Invited participant at the Principles of Environmental Stewardship for the Exploration and Study of Subglacial Environments, Subglacial Lakes Meeting. The National Academies, February 13-14, 2006.

Invited US-SALE representative at the International Polar Year Education/Outreach Workshop (<http://esdepo.gsfc.nasa.gov/>). NASA Goddard Space Flight Center, Greenbelt, MD, September 8-9, 2005.

United States representative at the North Greenland Ice Core Project (NGRIP) Basal Ice Meeting. Niels Bohr Institute, Copenhagen, Denmark, November 29-30, 2004

Invited participant at the Antarctic Biology Course Workshop, University of California, Santa Cruz, October 2003.

Invited participant at the FASTDRILL Workshop: Polar Research Based on Fast Ice-Sheet Drilling, University of California, Santa Cruz, October 2002.

Participant at the Antarctic Program New Investigators Workshop, National Science Foundation, Washington, D.C., August 2002.

Participant at The Future of U.S. Ice Coring Science Workshop, National Science Foundation, Washington, D.C., March 2002.

Invited consultant for NASA Johnson Space Center, Acquisition and Curation Team. Technical seminar on microbiological contamination issues relevant to the recovery and curation of Martian samples. March 2001.

Outreach and Broader Impacts:

Research highlighted in a number of media articles and public broadcasts including: Astrobiology Magazine, BBC Worldwide, Bloomberg News, Chemical and Engineering News, CBC Radio, CBS Sunday Morning, CBS radio, CNN Radio, Discovery Magazine ("Top 100 stories of 2008"), Environmental Research Web, Forum, Geotimes, Globe and Mail, La Presse, KDKA Radio, Live Science, Microbiology Today, Microscopy Today, National Geographic, Nature, Nature Reviews Microbiology, New Scientist, Science Magazine, Science Podcast, Science Friday (NPR), Science Daily, Science Podcast, Scientific American, The Advocate, The Astrobiology Web, The Bozeman Chronicle, The New York Times, The Telegraph, The Washington Post, Time, Wired, and Yahoo News.

Participant in PolarTREC during the 2009-2010 Antarctic field season, which is an educational research experience, funded by the NSF and managed by the Arctic Research Consortium, in which K-12 teachers participate in a polar research experience (<http://www.polartrec.com/>).

Featured scientist in "Discovering Astrobiology", an Education and Public Outreach (E/PO) video project in collaboration with the Highland Road Park Telescope Observatory (Baton Rouge, LA). The overall project includes videos, hands-on activities development for use at the observatory and on the MARS (Mobile Astronomy Research Station) van, and supports student docents at the observatory.

Pre-K polar outreach program at University Methodist Preschool, Baton Rouge, LA. "From Louisiana to Antarctica", January 28, 2009.

Invited speaker for undergraduate student program and seminar in the Biology department at Trinity University, San Antonio, TX. Bioprecipitation and life in the cryoecosphere. November 10, 2008.

Participant in job shadow program with Baton Rouge high school student Torrey Fourrier, 18 March 2008.

Participant in POLAR/PLANET-PALOOZA (<http://passporttoknowledge.com/polar-palooza/>), Baton Rouge, LA, 15-17 November 2007.

Presented public science lecture at McMurdo station, Antarctica in October 2007 entitled "The Antarctic cryoecosphere: a new paradigm for life on Earth".

Invited keynote speaker for Project SCIENCE (Science Content and Investigations to Engage, Nurture and Challenge Educators; <http://cain.lsu.edu/projects-science.htm>) workshop, "Life on Earth... and Elsewhere? An Educator Resource Guide in Astrobiology" (September 2006).

Invited speaker for the Space Telescope Science Institute colloquium series, Baltimore, MD. Habitats for life in glacier environments. March 1, 2006.

Assistant instructor for the NSF-sponsored course "Integrative Biology and Adaptation of Antarctic Marine Organisms" (<http://antarctica.usc.edu/>). McMurdo Station, Antarctica, January-February, 2006.

Participant (2003-2005) in the American Indian Research Opportunities (AIRO) program (<http://www.montana.edu/~wwwai/>), which trains underrepresented high school students to conduct and present scientific research.

Public lectures given to middle school science classes (Centerville Middle School, Ohio) and public lectures at the COSI Institute (Toledo, OH) about the relevance of microbiological research in Antarctica.

Contributor to the Digital Educational Resources in Microbial Ecology, Evolution and Diversity (DERMEED-1) library, which is part of the larger Science Math Engineering and Technology Education (SMETE) digital library. (<http://serc.carleton.edu/microbelife/extreme/cold/advanced.html>)

Involved in the making of a film for high school science classes titled "Living Ice", which focuses on microbiological research in Antarctica. The film is accompanied by a hypothesis-based research project and addresses National Science Teaching Standards. (<http://bsi.montana.edu/web/web/template/ViewArticle.vm/articleid/17459>)

Supervision of Students and Postgraduate Scholars:

High School Students:

Leona Bird (summer 2003), Sierra Davis (summer 2004), Torrey Fourrier (winter 2008), and Sunny WhiteMan (summer 2005)

Undergraduate Students:

Syverine Abrahamson (2004-2005), Amanda Achberger (2008-present), Brianna Arnold (2003-2005), Ryan Blair (2001-2002), Noelle Bryan (2009-present), Timothy Brox (2007-present), Mark Clark (2005-2006), Shawn Doyle (2007-2008), Brian Kvitko (2001-2002), Michelle Nguyen (2007-present), Min So (2008-2009), and Charles Taggart (2008).

Graduate Students:

Rongman Cai (M.Ap.Stat., 2006-2007) and Shawn Doyle (Ph.D., 2009-current).

Postdoctoral researchers:

Pierre Amato (2007-2008)