

Brent Craig Christner

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Birth date: July 31, 1970
Citizenship: U.S.A.

Home:



Education:

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

National Science Foundation Antarctic Biology Course, January 2001. McMurdo Station, Antarctica.

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

Professional Experience:

Associate Professor, August 2011-present. Department of Biological Sciences, Louisiana State University, Baton Rouge, Louisiana.

Assistant Professor, August 2006-2011. 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.

Graduate Research Assistant, June 1997-March 2002. Laboratories of John N. Reeve, Ellen Mosley-Thompson, and Lonnie Thompson, Department of Microbiology and Byrd Polar Research Center, 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:

Peer-reviewed articles:

23. Brown, J.R., J.D. Seymour, T.I. Brox, M.L. Skidmore, C. Wang, **B.C. Christner**, B.-H. Luo, and S.L. Codd. Using nuclear magnetic resonance to characterize the unfrozen vein network structure in ice and detect recrystallization inhibition by Antarctic bacterial ice binding proteins. *Journal of Glaciology* (submitted).
22. Priscu, J.C., A.M Achberger, J. Cahoon, **B.C. Christner**, R.L Edwards, W. Jones, A. Michaud, M.L. Skidmore, R.H. Spigel, G. Switzer, S. Tulaczyk, and T. Vick. A microbiologically clean strategy for access to the Whillans Ice Stream subglacial environment. *Antarctic Science* (in revision).
21. Lee, Jun Hyuck, H.Y. Koh, SG. Lee, S.M. Doyle, **B.C. Christner**, and H.J. Kim. 2012. Draft genome sequence of *Paenisporosarcina* sp.TG-20, a psychrophilic bacterium isolated from sediment-laden stratified basal ice from Taylor Glacier, McMurdo Dry Valleys, Antarctica. *Journal of Bacteriology* (accepted).
20. Lee, Jun Hyuck, H.Y. Koh, SG. Lee, S.M. Doyle, **B.C. Christner**, and H.J. Kim. 2012. Draft genome sequence of *Paenisporosarcina* sp.TG-14, a psychrophilic bacterium isolated from sediment-laden stratified basal ice from Taylor Glacier, McMurdo Dry Valleys, Antarctica. *Journal of Bacteriology* (accepted).
19. **Christner, B.C.**, G.G. Montross, and J.C. Priscu. 2012. Dissolved gases in frozen basal water from the NGRIP borehole: implications for biogeochemical processes beneath the Greenland Ice Sheet. *Polar Biology*, 35:1735-1741. doi 10.1007/s00300-012-1198-z.
18. Achberger, A.M., T.I. Brox, M.L. Skidmore, and **B.C. Christner**. 2011. Expression and characterization of an ice-binding protein from a bacterium isolated at a depth of 3,519 meters in the Vostok ice core, Antarctica. *Frontiers in Microbiology*, 2:255. doi: 10.3389/fmicb.2011.00255.
17. Amato, P., S.M. Doyle, J.R. Battista, and **B.C. Christner**. 2010. Implications of subzero metabolic activity on long-term microbial survival in terrestrial and extraterrestrial permafrost. *Astrobiology*, 10:789-798.
16. **Christner, B.C.** 2010. Bioprospecting for microbial products that affect ice crystal growth and formation. *Applied Microbiology and Biotechnology*, 85:481-489.

15. 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.
14. Amato, P., S.M. Doyle, and **B.C. Christner**. 2009. Macromolecular synthesis by yeasts under frozen conditions. *Environmental Microbiology*, 11:589-596.
13. 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.
12. **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.
11. 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.
10. Raymond, J.A., **B.C. Christner**, and S.C. Schuster. 2008. A bacterial ice-binding protein from the Vostok Ice Core. *Extremophiles*, 12:713-717.
9. **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.
8. **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.
7. 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.
6. **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.
5. **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.
4. **Christner, B.C.**, E. Mosley-Thompson, L.G. Thompson, and J.N. Reeve. 2003. Bacterial recovery from ancient ice. *Environmental Microbiology* 5:433-436.

3. **Christner, B.C.** 2002. Incorporation of DNA and protein precursors into macromolecules by bacteria at -15°C. *Applied and Environmental Microbiology* 68:6435-6438.
2. **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.
1. **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.

Book chapters and conference proceedings:

11. Doyle, S.M., M. Dieser, E. Broemsen, and **B.C. Christner**. 2012. General characteristics of cold-adapted microorganisms. In L. Whyte and R.V. Miller (eds), *Polar and Sub-Polar Microbiology*. American Society of Microbiology Press, Washington, D.C, pp. 103-125.
10. Fricker, H.A., R. Powell, J. Priscu, S. Tulaczyk, S. Anandakrishnan, **B. Christner**, D. Holland, H. Horgan, R. Jacobel, J. Mikucki, A. Mitchell, R. Scherer, and J. Severinghaus. 2011. Siple Coast Subglacial Aquatic Environments: The Whillans Ice Stream Subglacial Access Research Drilling (WISSARD) project. In M. Siegert and M. Kennicutt (eds), *Proceedings of the Chapman Conference on the Exploration and Study of Antarctic Subglacial Aquatic Environments*. American Geophysical Union, Washington, D.C, pp. 199-220.
9. Junge, K., **B.C. Christner**, and J.T. Staley. 2011. Diversity of psychrophilic bacteria from sea ice and glacial ice communities. In K. Horikoshi, G. Antranikian, A. Bull, F. Robb, and K. Stetter (eds), *Extremophiles Handbook*. Springer, Heidelberg, Germany, pp. 793-816.
8. Amato, P., S.M. Doyle, and **B.C. Christner**. 2009. Microbial survival in the cold subsurface. *Geochimica et Cosmochimica Acta*, 73(13):A35.
7. Skidmore, M., C. Bakermans, T. Brox, **B. Christner**, and S. Montross. 2009. Microbial respiration at subzero temperatures in laboratory ices. *Geochimica et Cosmochimica Acta*, 73(13):A1234.
6. 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.
5. **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.

4. Priscu, J.C., **B.C. Christner**, C.F. Foreman, and G. Royston-Bishop. 2007. Biological material in ice cores. In S.A. Elias (ed.), *Encyclopedia of Quaternary Science*, Volume 2, pp. 1156-1166. Elsevier, UK.
3. **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.
2. 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.
1. **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.

Other publications:

8. **Christner, B.C.** 2012. Cloudy with a chance of microbes (cover article). *Microbe*, 7:70-75.
7. **Christner, B.C.** 2010. Subglacial Antarctic environments: the *other* deep biosphere. In-Depth (Newsletter of the National Ice Core Laboratory - Science Management Office, USA), 5(2):3-5.
6. Hallar, A.G., C. Wiedinmyer, I.B. McCubbin, R.B. Bowers, N. Fierer, L. Mazzoleni, **B. Christner**, D. Obrist, and X. Fain. 2009. A High Altitude Interdisciplinary Field Campaign - The Storm Peak Aerosol and Cloud Characterization Study (SPACCS08). SPACC article Mountain Research Newsletter.
5. **Christner, B.C.** and J.C. Priscu. 2008. Antarctica: a last frontier for microbial exploration. *Microbiology Today*, 35:70-73.
4. 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.
3. **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.
2. **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.

1. **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: (>50 in last 5 years; *italics* denote presenting author)

Choquette, K., B. Hagedorn, R.S. Sletten, Z. Harrold, L. Liu, M. Dieser, K. Cameron, **B.C. Christner**, and K. Junge. 2012. Seasonal and regional variability in dissolved and particulate iron fluxes via glacial runoff along the West Greenland coast. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 3-7, 2012.

Cameron, K., M. Dieser, K. Choquette, **B.C. Christner**, B. Hagedorn, Z. Harrold, L. Liu, R.S. Sletten, and K. Junge. 2012. Geomicrobiology of subglacial meltwater samples from Store Landgletscher and Russell Glacier, West Greenland. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 3-7, 2012.

Broemsen, E.L., K.D. Webster, M. Dieser, L.M. Pratt, and **B.C. Christner**. 2012. Analysis of methanogenic and methanotrophic activity at the western margin of the Greenland Ice Sheet. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 3-7, 2012.

Liu, L., R.S. Sletten, B. Hagedorn, K. Choquette, K. Cameron, M. Dieser, **B.C. Christner**, Z. Harrold, and K. Junge. 2012. Understanding of silicate weathering in subglacial environment by inverse modeling of West Greenland glacial meltwater. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 3-7, 2012.

Hagedorn, B., K. Choquette, R.S. Sletten, M. Dieser, K. Cameron, L. Liu, Z. Harrold, **B.C. Christner**, and K. Junge. 2012. Seasonal changes of chemical, isotopic and microbiological signatures in meltwater outflows of the West Greenland Ice Sheet. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 3-7, 2012.

Brox T. I., J.R. Brown, J.D. Seymour, M.L. Skidmore, C. Wang, B.-H. Luo, A.M. Achberger, **B.C. Christner**, and S.L. Codd. 2012. NMR investigation of the impact of ice binding proteins on polycrystalline ice. Oral presentation at the 11th International Bologna Conference on Magnetic Resonance in Porous Media. University of Surrey, Guildford, UK, 9-13 September 2012.

B. Christner. 2012. Meteorological, climatic, and ecological roles of airborne biological ice nucleators: moving beyond the hype. Oral presentation at the Bioaerosol Effects on Clouds Workshop. Steamboat, CO, 5-6 August 2012.

B. Christner, J. Priscu, M. Skidmore, S. Tulaczyk, R. Edwards, and R. Bolsey. 2012. The WISSARD Project strategy for microbiologically clean drilling and subglacial access. Oral presentation at the XXXII Scientific Committee for Antarctic Research Open Science Conference. Portland, OR, 11-14 July 2012.

Adkins, W.P., and **B.C Christner**. 2012. Enrichment of iron and sulfur oxidizing microbes from polar environments. Poster presentation at the 2012 General Meeting for the American Society of Microbiology. San Francisco, CA, 16-19 June 2012.

Skidmore, M.L., T.I. Brox, S.J. Vogt, J.R. Brown, J.D. Seymour, S.L. Codd, C. Wang, B-H. Luo, A.M. Achberger, and **B.C. Christner**. 2012. Investigating the impact of an ice binding protein on the liquid vein network in polycrystalline ice using magnetic resonance techniques. Oral presentation at the 2012 General Meeting for the American Society of Microbiology. San Francisco, CA, 16-19 June 2012.

Christner, B.C., A.M. Achberger, T.I. Brox, and M.L. Skidmore. 2011. Expression and Characterization of an Ice Binding Protein from a Bacterium Isolated at a Depth of 3,519 Meters in the Vostok Ice Core, Antarctica. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 4-9, 2011.

Montross, S.N., M.L. Skidmore, **B.C. Christner**, R. Griggs, J. Tison, and T.A. Sowers. Microbial activity in debris-rich basal ice; adaption to sub-zero, saline conditions. Oral presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 4-9, 2011.

Christner, B.C., S.M. Montross, M.L. Skidmore, P. Amato, S.M. Doyle, and A.M. Achberger. 2011. Microbial processes relevant to survival in ice of the englacial and basal zones of polar glaciers. Invited oral presentation at the 4th International Conference on Polar and Alpine Microbiology. Ljubljana, Slovenia, 4-8 September 2011.

Christner, B.C. 2011. Cloudy with a chance of microbes – Lingering questions about the nature and role of biological ice nucleators in the atmosphere. Invited oral presentation at the 2011 General Meeting for the American Society of Microbiology. New Orleans, LA, 21-24 May 2011.

Adkins, W.P., N. Bryan, **B.C. Christner**, T.G. Guzik, M.F. Stewart, and J.R. Giammanco. 2011. High altitude microbiological sampling with a latex sounding balloon. Poster presentation at the 2011 General Meeting for the American Society of Microbiology. New Orleans, LA, 21-24 May 2011.

Achberger, A.M., T. Brox, M.L. Skidmore, and **B.C Christner**. 2011. Temperature independent expression of an ice binding protein in an Antarctic bacterium. Poster presentation at the 2011 General Meeting for the American Society of Microbiology. New Orleans, LA, 21-24 May 2011.

Doyle, S., S. Montross, M. Skidmore, and **B. Christner**. 2011. Evidence for a metabolically active microbial assemblage in a subglacial habitat. Outstanding student poster selection at the 2011 General Meeting for the American Society of Microbiology. New Orleans, LA, 21-24 May 2011.

Christner, B.C. 2011. Subglacial environments: the *other* deep biosphere. Invited Astrobiology Program Research Seminar, University of Washington, Department of Earth and Space Sciences, 5 April 2011.

Christner, B.C. 2011. The lower temperature limit for life. Invited presentation for the Committee on Planetary Protection Standards for Icy Bodies in the Outer Solar System, Space Studies Board, National Research Council, 31 January-2 February 2011.

Christner, B.C., S.M. Doyle, S.N. Montross, M.L. Skidmore, D. Samyn, R. Lorrain, J. Tison, and S. Fitzsimons. 2010. A subzero microbial habitat in the basal ice of an Antarctic glacier. Invited oral presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 13-17, 2010.

Christner, B.C., P. Amato, J.R. Battista, and S.M. Doyle. 2010. Implications of subzero metabolism on long-term microbial survival in ice. Invited poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 13-17, 2010.

Montross, S.N., M.L. Skidmore, **B.C. Christner**, S.M. Doyle, J. Tison, D. Samyn, and T.A. Sowers. 2010. Determining the importance of microbial processes on gas composition in debris-rich Antarctic basal ice using isotope geochemistry. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 13-17, 2010.

Adkins, W.P., N. Bryan, **B.C. Christner**, T.G. Guzik, M.F. Stewart, J.R. Giammanco. 2010. Microbiological sampling of the atmosphere using a latex sounding balloon. Poster presentation at the American Geophysical Union Fall Meeting. San Francisco, California, December 13-17, 2010.

Christner, B.C. 2010. Microbial life in subglacial Antarctic environments. Charles C. Randall Award Lecture, American Society for Microbiology South Central Branch Meeting, Hattiesburgh, MS, 29-30 October 2010.

Christner, B.C. 2010. Microbiological context for life in a Titanian Ocean. Invited presentation for the Committee on the Origin and Evolution of Life, Space Studies Board – Board on Life Sciences, National Research Council, 13-15 October 2010.

Bryan, N., P. Adkins, J. Giamannco, M. Stewart, G. Guzik, and **B. Christner**. 2010. High Altitude Biological Testing of the ATmosphere (HABITAT): determining the upper boundaries of the biosphere. Poster presentation at the 2010 LaSPACE Council Meeting. Dillard University, Louisiana, 17-18 September 2010.

Priscu, J.C., **B.C. Christner**, J.L. Wadham, M. Tranter, and S. Tulaczyk. 2010. Antarctic subglacial water: habitats for life and sites of biogeochemical transformations. Oral presentation at the XXXI SCAR and Open Science Conference. Buenos Aires, Argentina, 3-6 August, 2010.

Doyle, S., J. Allison, A. Achberger, S. Montross, M. Skidmore, and **B. Christner**. 2010. Evidence for a metabolically active microbial assemblage in Antarctic basal ice. Poster presentation at the XXXI SCAR and Open Science Conference. Buenos Aires, Argentina, 3-6 August, 2010.

Junge, K., B. Nunn, B. Christner, and B.D. Swanson. 2010. Examination of Immersion Freezing of Polar Marine Bacteria and Snow through Novel Techniques with Implications for Sea- and Tropospheric-Ice Formation and Life in Frozen Environments. Poster presentation at the 2010 General Meeting for the American Society of Microbiology. San Diego, CA, May 23-27, 2010.

Christner, B.C., J.C. Priscu, J.A. Mikucki, M. Gerasimoff, R. Bolsey, D. Lebar, and C.R. Bentley. 2010. Biologically and Chemically Clean Subglacial Access Drilling. Poster presentation at the 2010 Chapman Conference on the Exploration and Study of Antarctic Subglacial Aquatic Environments (SAE). Baltimore, Maryland USA, 15–17 March 2010.

Achberger, A.M., T. Brox, J.A. Raymond, S.M. Doyle, B.C Christner, M.L. Skidmore. 2010. Expression of a Bacterial Ice Binding Protein from 3,519 m in the Vostok Ice Core. Poster presentation at the 2010 Chapman Conference on the Exploration and Study of Antarctic Subglacial Aquatic Environments (SAE). Baltimore, Maryland USA, 15–17 March 2010.

Doyle, S.M., A.M. Achberger, S.M. Montross, T. Brox, K. Suematsu, M.L. Skidmore, and B.C. Christner. 2010. Evidence for Microbial Metabolism at -15°C in an Antarctic Subglacial Environment. Poster presentation at the 2010 Chapman Conference on the Exploration and Study of Antarctic Subglacial Aquatic Environments (SAE). Baltimore, Maryland USA, 15–17 March 2010.

Tulaczyk, S. S. Anandkrishnan, 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.

Bryan, N., P. Adkins, M. Stewart, T.G. Guzik, and B. Christner. 2009. High Altitude Biological Testing of the ATmosphere (HABITAT): determining the upper boundaries of the biosphere. Oral presentation at the South Central Branch of the American Society of Microbiology, Nicholls State University, Thibodaux, LA, November 6-7, 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.

Membership in Professional Societies:

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

Grants:

Principal Investigator on National Science Foundation, Dimensions of Biodiversity proposal (1/13-12/16). Dimensions: Collaborative Research: Research on Airborne Ice Nucleating Species (RAINS). Funding: \$446,103.

Co-Investigator on proposal for the NASA Astrobiology Science and Technology for Exploring Planets (ASTEP) Program (1/11 – 12/14). VALKYRIE 2 (Very-deep Autonomous Laser-powered Kilowatt-class Yo-yoing Robotic Ice Explorer). Funding: \$196,327 (LSU subcontract).

Principal Investigator on National Science Foundation, Arctic Research Opportunities grant (8/10 - 7/13). Collaborative Research: Greenland melt water geomicrobiology. Funding: \$291,353.

Principal Investigator on NASA EPSCoR grant (7/10 - 6/13). Modes of Adaptation, Resistance, and Survival for Life Inhabiting a Freeze-dried-radiation-bathed Environment (MARS LIFE). Total award: \$1,410,000 (Christner funding: \$405,174).

Principal Investigator on grant from the NASA, Astrobiology: Exobiology and Evolutionary Biology Program (6/10 - 5/14). DNA repair under frozen conditions: implications for the longevity of microorganisms in terrestrial and extraterrestrial ices. Funding: \$353,351.

Principal Investigator on grant from the National Science Foundation, Office of Polar Programs (9/09 - 8/15). Collaborative research: WISSARD (Whillans Ice Stream Subglacial Antarctic Research Drilling): Geobiology of Antarctic subglacial environments beneath the Whillans Ice Streams. Funding: \$380,906.

Principal Investigator on grant from the Louisiana Space Consortium (5/09 - 8/10). High Altitude Biological Testing of the Atmosphere (HABITAT): Developing a Sampling Platform to Measure the Upper Boundaries of the Biosphere. Funding: \$38,653 (initial grant of \$33,030 + \$5,623 in supplemental funding).

Principal Investigator on grant from the 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.

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

Co-Investigator on grant from the National Science Foundation, Research in Biogeosciences (1/06 - 12/09). Microbial Activity in Solid Ice: Implications for Modifying the CO₂ Record in Ice Cores. Funding: \$133,225 (LSU subcontract).

Pending:

Principal Investigator on National Science Foundation, Collaborative Research: Grounding Line Dynamics and Environments of the Ross Embayment (GLiDE) - Their Role in Marine Ice Sheet Stability and Associated Sub-Ice Geomicrobiology (6/13-5/18). Requested funding: \$553,397.

Principal Investigator on National Science Foundation, Arctic Research Opportunities proposal (6/13-5/18). Collaborative Research: NEEM Biogeophysical Observatory: Basal Boundary Conditions for Subglacial Microbial Habitats and Ice Sheet Motion, NEEM Ice Core Drill Site, Greenland. Requested funding: \$401,507.

Awards:

Recipient of the 2011 College of Science Research Award, Louisiana State University.

Recipient of the 2010 Charles C. Randall Lectureship Award from the South Central Branch of the American Society for Microbiology.

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.

Discover Magazine named research on biological ice nuclei in precipitation as one of the "Top 100 stories of 2008".

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

Other awards:

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.

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.

Peer Review:

Journals:

Annals of Glaciology, Antarctic Science, Applied and Environmental Microbiology, Applied Soil Ecology, Archives of Microbiology, Astrobiology, Canadian Journal of Microbiology, Earth and Planetary Science Letters, Environmental Microbiology,

Environmental Research Letters, Extremophiles, FEMS Microbiology Ecology, Frontiers in Microbiology, Gene, Genomics, Geobiology, Geophysical Research Letters, Global Biogeochemical Cycles, International Society for Microbial Ecology Journal, Journal of Geophysical Research - Biogeosciences, Journal of Sedimentary Research, Limnology and Oceanography-Methods, Microbial Ecology, Nature Geosciences, Nature Reviews Microbiology, Planetary and Space Science, PLoS ONE, Polar Biology, Polar Record, Polar Research, Proceedings of the National Academy of Science (USA), and Reviews in Environmental Science and Biotechnology, and Science.

Grant applications:

Australian Antarctic Division, British Antarctic Survey, National Aeronautics and Space Administration (Astrobiology: Exobiology and Evolutionary Biology Program, Astrobiology Science and Technology for Exploring Planets, Earth and Space Science Fellowship Program, Graduate Fellowship Program, and NASA Postdoctoral Program), National Science Foundation (Arctic Sciences, Biogeosciences, Biological Oceanography, Environmental Genomics, GSTEP, Microbial Observatory/Microbial Interactions and Processes, Ocean Sciences, and Office of Polar Programs), Natural Environment Research Council (UK), Swiss National Science Foundation, and Washington Sea Grant.

Member of the editorial review board for *Gene* (2010-), *Frontiers in Extreme Microbiology* (2010-), and *Frontiers in Evolutionary and Genomic Microbiology* (2010-).

Scientific Workshops and Committees:

Chair of “Analog” group for the 2012 NASA Astrobiology: Exobiology and Evolutionary Panel, 14-17 August 2012, Washington D.C.

Invited participant to the National Research Council’s Planetary Protection Dissemination Workshop, 9-10 July 2012, Washington D.C.

NASA Astrobiology Science and Technology for Exploring Planets panel reviewer, 16-18 January 2012, Washington D.C.

Chair of session “Microbial Diversity and Evolution”. Fourth International Conference on Polar and Alpine Microbiology. Ljubljana, Slovenia, 4-8 September 2011.

Member of the Life Sciences Research Development Group (RDG) at Louisiana State University, which advises the LSU Council on Research on matters related to their respective areas of scholarship or research (2011-).

Chair of the Science and Technical Liaison Subcommittee for the WISSARD project (2009-2015).

Member of the US Ice Core Working Group (ICWG) 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.

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.

NSF Antarctic Organisms and Ecosystems panel reviewer, 23-25 September, 2009

NASA Astrobiology: Exobiology and Evolutionary Biology panel reviewer, 13-16 January, 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. 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: (see <http://brent.xner.net/outreach.html>)

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, Ivanhoe Newswire, La Presse, LiveScience, 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, WVLA, and Yahoo News.

Scientific presentation and participant at the annual Sally Ride Science Festival (<https://www.sallyridescience.com/node/2879>), LSU, 22 September 2012.

Featured scientist in audio segments for Hear the Answer, a media platform produced in partnership with PBS and WETA/Washington, D.C. as a premier science, environmental and technology educational resource for teachers, students, and the public. Segment 1: Why study microbial life in ice? Segment 2: How does life exist when there is no sunlight? Segment 3: What's an internship like in Antarctica? Segment 4: What is it like to camp in Antarctica?

Featured scientist in "Invisible", a documentary special for the History Channel, Flight 33 Productions.

Featured scientist in April 2012 cover story of Discover Magazine, "The clouds are alive".

MARSLIFE project hosted an interactive presentation and demonstration for the Sally Ride Science Festival, 22 September 2012 on the LSU campus. The festival was designed to encourage 5th-8th grade girls in science.

Participant in the EnvironMentors program, a national college access initiative that prepares at-risk high school juniors and seniors for college degree programs in environmental and related science fields, 2011-2013.

Featured scientist in 2011 Simon & Schuster popular science book "First Contact: The Glorious Science of Life Beyond Earth", authored by Washington Post science writer Marc S. Kaufman.

Saturday Science at LSU lecture, "Cool Microbes", 7 May 2011. An outreach program run by the LSU Department of Physics and Astronomy, featuring a monthly lecture series targeting high school students, teachers, and open to the public.

Hosted laboratory tours for the LSU BIOS program August 2007-2010, a 1 week intensive biology "bootcamp" for incoming freshmen at LSU.

National Science Teachers Association Web Seminar, "Under The Ice: Studying One of the Last Unexplored Aquatic Environments on Earth", 27 May 2010. Sponsored by NASA, NOAA, and NSF as an extension of the last International Polar Year (http://learningcenter.nsta.org/products/symposia_seminars/IPY/webseminar3.aspx).

Antarctic research featured on LiveScience.com and National Science Foundation website during June 2010.

Science presentation/demonstration for Louisiana high school students at the Louisiana Junior Science and Humanities Symposia, 14-16 January 2010.

Graduate student Shawn Doyle developed an outreach program with Sulphur High School AP Biology students consisting of an interactive online Antarctic field blog (glacialmicrobes.blogspot.com) and experimentation module.

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/expeditions/microorganisms-in-antarctic-glacier-ice>).

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 and Kindergarten outreach program at University Methodist Preschool and South Boulevard Magnet, Baton Rouge, LA, 2009-10.

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, March 2008.

Participant in POLAR/PLANET-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) 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". McMurdo Station, Antarctica, January-February, 2006.

Participant (2003-2005) in the American Indian Research Opportunities (AIRO) program, 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.

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.

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 (2008-2010), William (Peyton) Adkins (2009-), Josh Allison (2010), Brianna Arnold (2003-2005), Ryan Blair (2001-2002), Noelle Bryan (2009-2010), Timothy Brox (2007-2011), Mark Clark (2005-2006), Shawn Doyle (2007-2008), Aubrey Gilliland (2012-), Sahiti Kilaru (2010-2012), Brian Kvitko (2001-2002), Michelle Nguyen (2007-2010), Erin Oliver (2012-), Min So (2009), Charles Taggart (2008), and Christina Tran (2011).

Graduate Students:

Amanda Achberger (Ph.D., 2010-), Runa Antony (Visiting PhD Fellow, 2012), Erik Broemsen (Ph.D., 2009-), Noelle Bryan (Ph.D., 2010-), Rongman Cai (M.Ap.Stat., 2006-2007), Shawn Doyle (Ph.D., 2009-), and Syed Jilani (Ph.D., 2012-).

Postdoctoral researchers:

Pierre Amato (2007-2008) and Markus Dieser (2010-).

Graduate Student Committees:

Apu Borcar (2009-), Kelley Gwin (2010-), Brittany Hinyard (2012-), Sarah Hird (2011-), Caitlin King (2009-), Chang Liu (2010-), Karine Posbic (2011-), Jana Robins (2008-2011), Udayabharathi (Bharathi) Vallalar (2011-2012), and Carolyn Weber (2007-2009).