

# Rod Ray

Birthplace	Portland, Oregon
Education	<p>Ph.D. in chemical engineering, University of Colorado, Boulder, Colorado, 1983.</p> <p>M.S. in chemical engineering, University of Colorado, Boulder, Colorado, 1981.</p> <p>B.S. in chemical engineering, Oregon State University, Corvallis, Oregon, 1979.</p> <p>Registered Professional Engineer, Colorado and Oregon, 1986.</p>
Employment	<p>Bend Research Inc., Bend, Oregon</p> <p>CEO and Chairman, 2008 - 2014</p> <p>President and Chief Operating Officer, 2002 - 2008</p> <p>Vice President and Chief Operation Officer, 1988 - 2002</p> <p>Director of Engineering, 1985 - 1988</p> <p>Research Chemical Engineer, 1983 - 1985</p>
Professional	<p>Oregon University System's Engineering and Technology Industry Council (ETIC), 2007-2010.</p> <p>Oregon State University Foundation Board of Trustees, 2009-present.</p> <p>Oregon State University College of Engineering Advisory Board, 2007-present, (chair 2012-present).</p> <p>Montana State University Engineering Advisory Council, 2007-present.</p> <p>Oregon State Executive Commercial Advisory Council (ECAC), 2014 - present</p> <p>Oregon State University Executive Commercial Advisory Council (OSU Accelerator), 2013 - present</p> <p>Montana State University Chemical and Biological Engineering Department Advisory Board, 2003-present.</p> <p>North American Membrane Society Board of Directors, 1992-1995, cochair of Sixth National Meeting.</p>

# Rod Ray

## Professional (Continued)

Element 1 Corp. Advisory Board, Bend, Oregon, 2012present.

Element 1 is a startup company focused on production of hydrogen generators designed to meet global hydrogen requirements for fuelcell systems providing telecommunications backup power and continuous power for offgrid or remote telecommunications sites.

GeoSpatial Solutions Inc. (GSS) Board of Directors, Bend, Oregon, 2011present. GSS is a startup company that provides globalpositioning technologies and services for waterresource management at water districts and public and private organizations.

NovaTech Corp. Board of Directors, Quakertown, Pennsylvania, 2012present. NovaTech designs and manufactures power measurement, communication, and automation technologies for the electric utility transmission and distribution, smart power distribution, agriculture, brewing, pharmaceutical, biosourced and specialty chemicals, plastics, metals, and other essential industries.

## Civic

Volunteers in Medicine (VIM) Clinic of the Cascades Board of Directors, 2003-present (vice chair 2003-2010, chair 2010-2012).

Oregon Adaptive Sports (OAS) Board of Directors, 2013-present.

Central Oregon's Higher Education Assessment Team, 2010.

Mount Bachelor Ski Education Foundation (MBSEF) Board of Directors and Executive Committee, 1999-2010.

Oregon Interscholastic Ski Racing Association (OISRA) League "Chief of Race," 2006 & 2007.

Deschutes County Rodeo Committee, 2004-present.

Rim Rock Riders, President, 2002 - 2004.

Family Resource Center Board of Directors, 1998-2005 (chair 2001-2003).

Bend Metro Parks and Recreation Budget Committee, 1990-1994.

Deschutes County Mental Health Advisory Board, 1986-1995 (chair 1988-1989).

Looking Forward Entrepreneurial Team, 2014 - present.

Selection Committee - Bend LaPine School District, Bend High School Principal, 2014.

## Honors

Montana State University College of Engineering Honorary Alumni, 2013.

National Fallen Firefighter Foundation Excellence Award, 2012.

Bend High School Hall of Fame Award, 2010.

Economic Development of Central Oregon (EDCO) Private Person of the Year Award, 2010.

Bend Chamber of Commerce Large Business of the Year Award, Bend Research Inc., 2010.

Oregon State University Oregon Stater Award, Academy of Distinguished Engineers, 2007.

Oregon MATHCOUNTS Foundation Award, 2006-2007.

Mount Bachelor Ski Education Foundation (MBSEF) Alpine Volunteer Award, 1999-2000; Skyliner Award, 2001-2002; Barney Duberow Award, 2011.

Outstanding Graduate Student Paper Award, American Association for the Advancement of Science (AAAS), 1981.

Tau Beta Pi, National Engineering Honor Society, 1982.

Memberships	<p>American Institute of Chemical Engineers</p> <p>American Chemical Society</p> <p>American Association for the Advancement of Science</p> <p>Society of Automotive Engineers</p> <p>Aircraft Owners and Pilots Association</p>
Other	<p>Professional Association of Diving Instructors (PADI) Rescue Diver Certification, 1986.</p> <p>Federal Aviation Administration (FAA) Commercial Instrument Multiengine Pilot License.</p> <p>U.S. Ski Association (USAA) Club Coach Certification.</p>
Hobbies	Sailing, flying, diving, ranching, shooting, archery, hiking, climbing.
U.S. Patents	23 patents
Publications	See selected list
Presentations	57 presentations

# Rod Ray

## Patents<sup>\*</sup>

Beyerinck, R.A., H.L.M. Deibele, D.E. Dobry, R.J. Ray, D.M. Settell, and K.R. Spence, "Method for Making Homogeneous Spray-Dried Solid Amorphous Drug Dispersions Utilizing Modified Spray-Drying Apparatus," U. S. Patent No. 8,343,550 (2013).

Friesen, D.T., M.D. Crew, R.J. Ray, and L.E. Appel, "Method of Making Pharmaceutical Multiparticulates," U.S. Patent No. 7,951,403 (2011).

Appel, L.E., R.J. Ray, D.K. Lyon, J.B. West, S.B. McCray, M.D. Crew, D.T. Friesen, S.M. Herbig, and J.B. Lo, "Multiparticulate Crystalline Drug Compositions Having Controlled Release Profiles," U.S. Patent No. 7,887,844 (2011).

Appel, L.E., M.D. Crew, D.T. Friesen, and R.J. Ray, "Multiparticulate Compositions With Improved Stability," U.S. Patent No. 7,736,672 (2010).

Ray, R.J., L.E. Appel, D.D. Newbold, D.T. Friesen, S.B. McCray, D.K. Lyon, J.B. West, M.D. Crew, and J.R. Shockey, "Extrusion Process for Forming Chemically Stable Drug Multiparticulates," U.S. Patent No. 7,625,507 (2009).

Friesen, D.T., R.P. Barss, S.B. McCray, K.R. Pearson, R.J. Ray, D.R. Sidwell, and J.B. West, "SolventResistant Microporous Polybenzimidazole Membranes and Modules," U.S. Patent No. 6,986,844 (2006).

Beyerinck, R.A., H.L.M. Deibele, D.E. Dobry, R.J. Ray, D.M. Settell, and K.R. Spence, "Method for Making SprayDried Solid Amorphous Drug Dispersions Utilizing Modified SprayDrying Apparatus," U.S. Patent No. 6,973,741 (2005).

Beyerinck, R.A., H.L.M. Deibele, D.E. Dobry, R.J. Ray, D.M. Settell, and K.R. Spence, "Method for Making SprayDried Solid Amorphous Drug Dispersions Utilizing Modified SprayDrying Apparatus," U.S. Patent No. 6,763,607 (2004).

Friesen, D.T., D.R. Sidwell, R.P. Barss, K.R. Pearson, J.B. West, S.B. McCray, and R.J. Ray, "SolventResistant Microporous Polybenzimidazole Membranes," U.S. Patent No. 6,623,639 (2003).

Beyerinck, R.A., R.J. Ray, D.E. Dobry, and D.M. Settell, "Method for Making Homogeneous Drug Dispersions Using Pressure Nozzles," U.S. Patent No. 7,780,988 (2003).

Ray, R.J., D.T. Friesen, S.B. McCray, and D.D. Newbold, "Solvent Resistant Hollow Fiber Vapor Permeation Membranes and Modules," U.S. Patent No. 5,753,008 (1998); EP0753337 B1 (2003).

Ray, R.J., D.D. Newbold, D.T. Friesen, S.B. McCray, and L.A. Ray, "Ultrapurification of Organic Solvents," U.S. Patent No. 6,059,857 (2000).

Ray, R.J., D.T. Friesen, S.B. McCray, and D.D. Newbold, "Vapor Permeation System," U.S. Patent No. 5,843,209 (1998).

---

Foreign counterparts to U.S. patents may exist.

Ray, R.J., D.D. Newbold, S.B. McCray, and D.T. Friesen, "Organic and Inorganic Vapor Permeation by Countercurrent Condensable Sweep," U.S. Patent No. 5,611,842 (1997).

# Rod Ray

## \* Patents

Friesen, D.T., D.D. Newbold, S.B. McCray, and R.J. Ray, "Membrane Dehydration of Vaporous Feeds by Countercurrent Condensable Sweep," U.S. Patent No. 5,681,433 (1997).

Friesen, D.T., D.D. Newbold, S.B. McCray, and R.J. Ray, "Pervaporation by Countercurrent Condensable Sweep," U.S. Patent No. 5,464,540 (1995).

Friesen, D.T., D.D. Newbold, and R.J. Ray, "Countercurrent Dehydration by Hollow Fibers," U.S. Patent No. 5,002,590 (1991).

Iacobucci, G.A., D.J. Brose, R.J. Ray, and P. van Eikeren, "Enzymatic Membrane Method for the Synthesis and Separation of Peptides," U.S. Patent No. 5,350,681 (1994).

Ray, R.J., and D.D. Newbold, "Hybrid Membrane Separation System," U.S. Patent No. 4,944,882 (1990); European Patent EP0393843B1 (1994).

Schofield, R.W., D.D. Newbold, S.B. McCray, D.T. Friesen, and R.J. Ray, "MembraneBased Removal of Condensable Vapors," U.S. Patent No. 5,236,474 (1993).

Friesen, D.T., R.J. Ray, D.D. Newbold, and S.B. McCray, "Countercurrent Dehydration by Hollow Fibers," U.S. Patent No. 5,108,464 (1992).

van Eikeren, P., D.J. Brose, and R.J. Ray, "Selective Aqueous Extraction of Organics Coupled with Trapping by Membrane Separation," U.S. Patent No. 5,041,227 (1991).

Ray, R.J., "Potable Water from Internal Combustion Engines," U.S. Patent No. 4,725,359 (1988).

# Rod Ray

## Publications

Baumann, J.M., D.E. Dobry, R.J. Ray, and D.T. Vodak, "Amorphous Dispersion Formulation Development: Phase-Appropriate Integrated Approaches to Optimizing Performance, Manufacturability, Stability & Dosage Form," *Drug Dev. Deliv.*, 13:6(2013)30-36.

Ray, R.J., "Addressing Challenges with LowSolubility Compounds: The Importance of Functional Excipients in the Formulation of Amorphous Dispersions," *Drug Dev. Delivery*, 12:8(2012)2634.

Ray, R.J., "Bioavailability Enhancement. Addressing Solubility Challenges: Using Effective Technology & ProblemSolving for Delivery Solutions," *Drug Dev. Delivery*, 12:6(2012)2629.

Ray, R.J., "Bend Research: Problem Solving in the Pharmaceutical Industry," *Drug Dev. Delivery*, 12:4(2012)5059.

Dobry, D.E., D.M. Settell, J.M. Baumann, R.J. Ray, L.J. Graham, and R.A. Beyerinck, "A ModelBased Methodology for SprayDrying Process Development," *J. Pharm. Innovation*, 4:3(2009)133142.

Friesen, D.T., S.B. McCray, R.J. Ray, L.A. Ray, and D.D. Newbold, "Dehydration of Solvents Using VapourPermeation Systems," *Chem. Tech.*, May/June 1999, pp. 2124.

Newbold, D.D., S.B. McCray, D.L. Millard, and R.J. Ray, "Performance of a MembraneBased CondensateRecovery Heat Exchanger," SAE Technical Paper Series, Paper No. 961356, Society of Automotive Engineers, Warrendale, Pennsylvania (1996).

Ray, R.J., S.B. McCray, D.T. Friesen, D.D. Newbold, and D.L. Millard, "Module and System Designs with SolventResistant HollowFiber Modules for Vapor Permeation," in *Proceedings of the Seventh International Conference on Pervaporation Processes in the Chemical Industry*. Bakish Materials Corporation, Englewood, New Jersey (1995) pp. 432442.

McCray, S.B., D.T. Friesen, D.D. Newbold, R.J. Ray, and D.L. Millard, "TubeSideFeed HollowFiber Modules for Pervaporation," in *Proceedings of the Seventh International Conference on Pervaporation Processes in the Chemical Industry*. Bakish Materials Corporation, Englewood, New Jersey (1995) pp. 422432.

McCray, S.B., D.L. Millard, R.J. Ray, D.D. Newbold, K. Pickering, and C.E. Verostko, "Design of an Ultrafiltration/Reverse Osmosis Prototype Subsystem for the Treatment of Spacecraft Wastewaters," SAE Technical Paper Series, Paper No. 951738. Society of Automotive Engineers, Warrendale, Pennsylvania (1995).

McCray, S.B., N.B. Gallagher, D.D. Newbold, and R.J. Ray, "Integrated Model of a MembraneBased Subsystem for Atmosphere Control in HumanHabitat and PlantGrowth Chambers," in *Proceedings of the Second International Conference on Life Support and Biosphere Sciences*. Cognizant Communications Corp., Elmsford, New York (1994).

McCray, S.B., D.D. Newbold, R. Ray, and K. Ogle, "Preliminary Analysis of a MembraneBased AtmosphereControl Subsystem," SAE Technical Paper Series, Paper No. 932088. Society of Automotive Engineers, Warrendale, Pennsylvania (1993).



McCray, S.B., R.J. Ray, D.D. Newbold, D.L. Millard, D.T. Friesen, and S. Foerg, "Operation of Breadboard LiquidSorbent/MembraneContactor System for Removing Carbon Dioxide and Water Vapor from Air," SAE Technical Paper Series, Paper No. 921321. Society of Automotive Engineers, Warrendale, Pennsylvania (1992).

# Rod Ray

## Publications (continued)

McCray, S.B., R.J. Ray, D.D. Newbold, D.T. Friesen, and M. Kliss, "A Novel Membrane Device for the Removal of Water Vapor and Water Droplets from Air," SAE Technical Paper Series, Paper No. 921322. Society of Automotive Engineers, Warrendale, Pennsylvania (1992).

Ray, R.J., "Guest Editorial," *J. Membrane Sci.*, 62:3(1991)237238.

Ray, R.J., R. Wright Wytcherley, D.D. Newbold, S.B. McCray, D.T. Friesen, and D.J. Brose, "Synergistic MembraneBased Hybrid Separation Systems," *J. Membrane Sci.*, 62:3(1991)347369.

Ray, R.J., D. Bhattacharyya, S.B. McCray, and M.E. Williams, "Reverse Osmosis: Design," and "Reverse Osmosis: Selected Applications," in *Membrane Handbook*, K.K. Sirkar and W.S. Ho (eds.). Van Nostrand Reinhold, New York, New York (1991) Chapters 23 and 24.

Ray, R.J., "Reverse Osmosis: Cost Estimates," in *Membrane Handbook*, K.K. Sirkar and W.S. Ho (eds.). Van Nostrand Reinhold, New York, New York (1991) Chapter 25.

Ray, R.J., S.B. McCray, and D.D. Newbold, "SmallScale Membrane Systems for the Recovery and Purification of Water," *Sep. Sci. Tech.*, 26(1991)11551176.

Ray, R.J., D.D. Newbold, R.H. Colton, and S.B. McCray, "Water Vapor Recovery from Plant Growth Chambers," SAE Technical Paper Series, Paper No. 911502. Society of Automotive Engineers, Warrendale, Pennsylvania (1991).

McCray, S.B., R.J. Ray, and D.D. Newbold, "The Use of Membranes in LifeSupport Systems for LongDuration Space Missions," SAE Technical Paper Series, Paper No. 911537. Society of Automotive Engineers, Warrendale, Pennsylvania (1991).

Schofield, R.W., S.B. McCray, R.J. Ray, and D.D. Newbold, "Opportunities for Pervaporation in the WaterTreatment Industry," in *Proceedings of the Fifth International Conference on Pervaporation Processes in the Chemical Industry*. Bakish Materials Corporation, Englewood, New Jersey (1991) pp. 409420.

Ray, R.J., S.B. McCray, D.D. Newbold, and D.F. Price, "Operation of a TwoStage Membrane System for the Treatment of Wash Water in Spacecraft," *Chem. Eng. Comm.*, 92(1990)8194.

McCray, S.B., R. Wright Wytcherley, D.T. Friesen, and R.J. Ray, "Preliminary Evaluation of a MembraneBased System for Removing CO<sub>2</sub> From Air," SAE Technical Paper Series, Paper No. 901295. Society of Automotive Engineers, Warrendale, Pennsylvania (1990).

McCray, S.B., R.J. Ray, and J.K. Gienger, "Operation of a Membrane/SorptionBed Hybrid WaterReclamation Posttreatment Unit," in *Proceedings from the Life Support Systems Research Conference*, Texas A&M University, College Station, Texas, February 1415, 1989.

# Rod Ray

## Publications (continued)

McCray, S.B., and R.J. Ray, "Concentration of Synfuel and Refinery Process Condensates by Reverse Osmosis," *Sep. Sci. Tech.*, 22(1987)745762.

Böddeker, K.A., A.G. Fane, and R.J. Ray, "Book Review: Fluid Mixture Separation Technologies for Cost Reduction and Process Improvement," *J. Membrane Sci.*, 32:1(1987)117118.

Ray, R.J., J.K. Gienger, and S.E. Retzlaff, "MembraneBased Hybrid Processes for EnergyEfficient WasteWater Treatment," *J. Membrane Sci.*, 26(1986)87106.

Krantz, W.B., R.J. Ray, R.L. Sani, and K.J. Gleason, "Theoretical Study of the Transport Processes Occurring During the Evaporation Step in Asymmetric Membrane Casting," *J. Membrane Sci.*, 29(1986)1136.

Ray, R.J., "MembraneBased Water and EnergyRecovery Systems for the Manned Space Station," SAE Technical Paper Series, Paper No. 851345. Society of Automotive Engineers, Warrendale, Pennsylvania (1985).

Ray, R.J., W.B. Krantz, and R.L. Sani, "Linear Stability Theory Model for Finger Formation in Asymmetric Membranes," *J. Membrane Sci.*, 23:2(1985)155182.

Ray, R.J., W.C. Babcock, R.P. Barss, and E.D. LaChapelle, "A Novel ReverseOsmosis Wash Water Recycle System for Manned Space Stations," SAE Technical Paper Series, No. 840933. Society of Automotive Engineers, Warrendale, Pennsylvania (1984).

Babcock, W.C., E.K.L. Lee, R.J. Ray, and C.A. Speckman, "EnergyEfficient Membrane Separations in the Sweetener Industry," Abstract No. 13301 in *Energy Res. Abstr.*, 10:8(1984).

Ray, R.J., "Interfacial Instabilities Arising from Excess Intermolecular Potential Gradients: Application to Asymmetric Membrane Morphology," Ph.D. dissertation, University of Colorado, Boulder, Colorado (1983).

Ray, R.J., W.B. Krantz, T.N. Caine, and R.D. Gunn, "A Model for Sorted Patterned Ground Regularity," *J. Glaciology*, 29:102(1983).

Ray, R.J., W.B. Krantz, T.N. Caine, and R.D. Gunn, "A Mathematical Model for Patterned Ground: Sorted Polygons and Stripes, and Underwater Polygons," in *Proceedings of the Fourth International Conference on Permafrost*, Fairbanks, Alaska (1983).

Ray, R.J., presentation/panel speaker at "Taking Care of BusinessWhy Children are a Smart Investment," sponsored by the Deschutes County Commission on Children & Families Commission and St. Charles Medical Center, Bend, Oregon, April 4, 2011.

Ray, R.J., "Bend Research Restart," presentation at Oregon State University Product Innovation Course, Corvallis, Oregon, May 20, 2010.

Ray, R.J., "An Integrated Model for Pharmaceutical Process Development," presentation at Montana State University School of Chemical Engineering, Bozeman, Montana, February, 18, 2010.

Ray, R.J., testimony in support of the Oregon State University Cascades Campus, State of Oregon Ways and Means Committee Meeting, Bend, Oregon, April 29, 2009.

# Rod Ray

## Presentations

Ray, R.J., presentation to the Central Oregon Medical Society, Bend, Oregon, February 9, 2009.

Ray, R.J., "Thoughts on Higher Education," presentation at the 2008 Joint Engineering Conference, Professional Engineers of Oregon, Bend, Oregon, April 25, 2008.

Ray, R.J., "Process Quantitation: An Engineering Initiative in the Pharmaceutical Industry," presentation at the Montana State University College of Engineering Seminar Series, Bozeman, Montana, February 8, 2008.

Ray, R.J., "Bend Research Inc.: A 30YearOld Startup," presentation at the Oregon Business and Bioscience Symposium, Portland, Oregon, May 17, 2006.

Bormann, B.J., H.S. Ormsbee, R.J. Ray, and J. Watson, "Dos and Don'ts on the Path of Licensing to Big Pharma," panel presentation at the Licensing Executives Society 2006 annual meeting, New York, New York, September 11, 2006.

Ray, R.J., "Central Oregon Success Stories: Bend Research Inc.," presentation at the 2006 Bend Venture Capital Conference, October 14, 2005.

Ray, R.J., "Engineering Applications In The Pharmaceutical Industry," presentation at Montana State University School of Chemical Engineering, Bozeman, Montana, March 25, 2003.

Ray, R.J., "Building a cGMP Facility—Project Management Learnings and Organizational Challenges," presentation to the Central Oregon Engineering Summit, Bend, Oregon, May 31, 2002.

Ray, R.J., "Development and Commercialization of Separations Processes: Some Lessons Learned," presentation at the GANN Symposium, University of Colorado, Boulder, Colorado, April 12, 1999.

Ray, R.J., "A Novel Hybrid System for the Recovery and Concentration of Oxygen," presentation at Kennedy Space Center, National Aeronautics and Space Administration, Cocoa Beach, Florida, March 1999.

Ray, R.J., "R&D to Commercialization: A SmallBusiness Perspective," paper presented at the 13th Membrane Conference on Technology/Planning, Boston, Massachusetts, October 23, 1995.

Ray, R.J., "InsideSkinned HollowFiber Modules for Chemical Process and Industrial Separations," presentation at Montana State University, Bozeman, Montana, March 21, 1995.

Ray, R.J., "Graduate Engineering Degrees: Maximizing Your Options," presentation at Montana State University, Bozeman, Montana, March 21, 1995.

Ray, R.J., "Generic HollowFiber Modules for Membrane Separations," paper presented at the Sixth National Meeting of the North American Membrane Society, Breckenridge, Colorado, May 23, 1994.

Ray, R.J., "A Novel HollowFiber Membrane System for Treating Oily Wastewaters," paper presented at the Summer National Meeting of the American Institute of Chemical Engineers, Seattle, Washington, August 16, 1993.

Ray, R.J., D.D. Newbold, S.B. McCray, J.R. Pledger, and A.C. Malkin, "Control of Temperature and Relative Humidity in PlantGrowth Chambers," paper presented at the World Space Conference, Washington, D.C., September 13, 1992.

Ray, R.J., D.D. Newbold, S.B. McCray, J.R. Pledger, and A.C. Malkin, "WaterVapor and Energy Recovery From PlantGrowth Chambers," paper presented at the Fifth National Meeting of the North American Membrane Society, Lexington, Kentucky, May 1720, 1992.

Ray, R.J., D.T. Friesen, D.J. Edlund, and D.D. Newbold, "Maximizing the Utility of MembraneBased Unit Operations: Hybrid Systems," poster paper presented at the Fourth International Conference on Separations Technology, Kona, Hawaii, October 2025, 1991.

Ray, R.J., S.B. McCray, D.T. Friesen, and D.D. Newbold, "TubeSideFeed ReverseOsmosis Membranes: Characteristics and Performance," paper presented at the International Congress on Membranes and Membrane Processes, ICOM '90, Chicago, Illinois, August 2024, 1990.

Ray, R.J., "A MembraneBased Subsystem for Very High Recoveries of Spacecraft Waste Waters," paper presented at the 16th Intersociety Conference on Environmental Systems, San Diego, California, July 1416, 1986.

Ray, R.J., "Mathematical Modeling of the Formation Mechanisms of Asymmetric Membranes," paper presented at the Gordon Research Conference, New London, New Hampshire, June 2227, 1986.

Ray, R.J., "MembraneBased EnergyEfficient Drying Process," paper presented at the 1985 National Meeting of the American Institute of Chemical Engineers, Seattle, Washington, August 2528, 1985.

Ray, R.J., W.B. Krantz, and R.L. Sani, "Linear Stability Theory Model for Finger Formation in Asymmetric Membranes," paper presented at the American Chemical Society meeting, Pittsburgh, Pennsylvania, June 1984.

Ray, R.J., "RayleighConvection, Compliant IceFront Model for the Formation of Sorted Patterned Ground," paper presented at the 57th Annual Meeting of the American Association of the Advancement of Science, Greeley, Colorado, March 24, 1981.