Channon Visscher
Assistant Professor of Chemistry and Planetary Sciences
Dordt College • 498 4th Ave NE • Sioux Center IA 51250
712-722-6249 • channon.visscher@dordt.edu

Academic Background

- Ph.D., Earth & Planetary Sciences (2006), Washington University in St. Louis, St. Louis, MO.
- M.A., Earth & Planetary Sciences (2002), Washington University in St. Louis, St. Louis, MO.
- B.A., Chemistry (2000), Dordt College, Sioux Center, IA.

Professional Background

- Assistant Professor of Chemistry and Planetary Sciences, Dordt College (2013-present)
- Research Scientist, Southwest Research Institute (2011-2013), Boulder, CO.
- Postdoctoral Fellow, Lunar and Planetary Institute (2008-2011), Houston, TX.
- Instructor, Washington University in St. Louis, University College (2007), St. Louis, MO.
- Instructor, Southwestern Illinois College (2006) Belleville, IL
- Chemical Engineer, Allied Healthcare Products, Inc. (2006-2008), St. Louis, MO

Current Research Interests

My planetary chemistry research involves modeling physical and chemical processes in planetary and astrophysical environments. The goal of this work is to better understand the underlying chemistry responsible for the observed properties of planetary atmospheres, and to provide clues about the formation and evolution of planetary systems.

Classes Taught at Dordt College

- Chemistry 111: Chemical Principles, with laboratory.
- Chemistry 331: Thermodynamics and Statistical Mechanics.
- Astronomy 121 (CORE 224): Solar System Astronomy, with laboratory.
- Astronomy 122 (CORE 225): Stellar & Galactic Astronomy, with laboratory.
- Earth Science 201 (CORE 223, GEOG 201, ENVR 201): Introductory Geology and Physical Geography, with laboratory.
- Chem/Bio 180: First Semester Seminar

Selected Invited Talks

- *Incomplete Lunar Accretion and the Depletion of Volatile Elements in the Moon.* European Lunar Symposium, Amsterdam, The Netherlands, May 2016.
- *Chemistry of the Protolunar Disk and the Formation of the Moon.* Grinnell Physics Seminar, Grinnell College, April 2015.
- *Chemistry in impact-generated disks and planetary atmospheres*. LPL Colloquium, University of Arizona Lunar and Planetary Laboratory, Tucson, AZ, April 2013.
- *Clouds and Chemistry in Exoplanet Atmospheres.* Kleigel Lectures in Planetary Sciences, Caltech Department of Planetary Sciences, Pasadena, CA, April 2013.
- *Worlds Without End: Planets Inside and Outside of the Solar System.* Wonderful Wednesdays (Dream Big! Program), Mamie Doud Eisenhower Library, Broomfield, CO, July 2012.
- *Chemical Processes in Exoplanet Atmospheres*. Comparative Climatology of Terrestrial Planets, Boulder, CO, June 2012
- *Hot Jupiters: Planetary Science Outside of the Solar System*. Faculty Institute for NASA Earth & Space Science Education (FINESSE), June 2010.
- *Surface-Atmosphere Interactions on Venus: A Review*. Venus Geochemistry: Progress, Prospects, and New Missions Workshop, Houston, TX, February 2009.

Peer-Reviewed Publications

- Fortney, J.J., Marley, M.S., Laughlin, G., Nettelmann, N., Morley, C.V., Lupu, R.E., **Visscher, C.**, Jeremic, P., Khadder, W.G., and Hargrave, M. (2016) The Hunt for Planet Nine: Atmosphere, Spectra, Evolution, and Detectability. *Astrophysical Journal Letters*, 824, 2
- Kataria, T., Sing, D.K., Lewis, N.K., **Visscher, C.**, Showman, A.P., Fortney, J.J., and Marley, M.S. (2016) The atmospheric circulation of a nine-hot Jupiter sample: Probing circulation and chemistry over a wide phase space. *Astrophysical Journal*, 821, 9
- Skemer, A.J., … **Visscher, C.**, et al. (2015) The LEECH Exoplanet Imaging Survey: Characterization of the Coldest Directly Imaged Exoplanet, GJ 504 b, and Evidence for Super-Stellar Metallicity. *Astrophysical Journal* 817(2), 166
- Canup, R.M., **Visscher, C.**, Salmon, J. and Fegley, B., Jr. (2015) Lunar volatile depletion due to incomplete accretion within an impact-generated disk. *Nature Geoscience* 8, 918-921.
- Joy, K.H., **Visscher, C.**, Zolensky, M.E., Mikouchi, T., Hagiya, K., Ohsumi, K., and Kring, D. (2015) Identification of magnetite in lunar regolith breccia 60016: Evidence for oxidized conditions at the lunar surface. *Meteoritics & Planetary Science* 50(7), 1157–1172.
- Moses, J.I., Line, M.R., **Visscher, C.**, Richardson, M.R., Nettelmann, N., Fortney, J.J., Stevenson, K.B., and Madhusudhan, N. (2013) Compositional diversity in the atmospheres of hot Neptunes, with application to GJ 436b, *Astrophysical Journal*, 777, 34.
- Morley, C. V., Fortney, J. J., Kempton, E. M.-R., Marley, M. S., **Visscher, C.**, and Zahnle, K. (2013) Quantitatively Assessing the Role of Clouds in the Transmission Spectrum of GJ 1214b. *Astrophysical Journal*, 775, 33.
- **Visscher, C.** and Fegley, B., Jr. (2013) Chemistry of Impact-Generated Silicate Melt-Vapor Debris Disks. *Astrophysical Journal Letters*, 767, L12
- Leggett, S. K, Morley, C. V., Marley, M. S., Saumon, D., Fortney, J. J., and **Visscher, C.** (2012) A Comparison of Near-Infrared Photometry and Spectra for Y Dwarfs with a New Generation of Cool Cloudy Models. *Astrophysical Journal*, 763, 130.
- Moses, J.I., Madhusudhan, N., **Visscher, C.**, and Freedman, R.S. (2012) Chemical Consequences of the C/O Ratio on Hot Jupiters: Examples from WASP-12b, CoRoT-2b, XO-1b, and HD 189733b. *Astrophysical Journal*, 763, 25.
- **Visscher, C.** (2012) Chemical Timescales in the Atmospheres of Highly Eccentric Exoplanets. *Astrophysical Journal*, 757, 5
- Morley, C. V., Fortney, J. J., Marley, M. S., **Visscher, C.**, Saumon, D., and Leggett, S.K. (2012) Neglected Clouds in T and Y Dwarf Atmospheres. *Astrophysical Journal*, 765, 172
- Stevenson, K.B., Harrington, J., Lust, N.B., Lewis, N. K., Montagnier, G., Moses, J. I., **Visscher, C.**, Blecic, J., Hardy, R.A., Cubillos, C., Campo, C. J. (2012) Two nearby sub-Earth-sized exoplanet candidates in the GJ 436 system. *Astrophysical Journal*, 755, 9
- **Visscher, C.,** and Moses, J.I. (2011) Quenching of Carbon Monoxide and Methane in the Atmospheres of Cool Brown Dwarfs and Hot Jupiters. *Astrophysical Journal*, 738, 72.
- Moses, J.I., **Visscher, C.,** Fortney, J.J., Showman, A.P., Lewis, N.K., Griffith, C.A., Klippenstein, M., Shabram, M., Friedson A.J., Marley, M.S., Freedman, R.S. (2011) Disequilibrium Carbon, Oxygen, and Nitrogen Chemistry in the Atmospheres of HD 189733b and HD 209458b. *Astrophysical Journal*, 737, 15.
- Moses, J.I., **Visscher, C.,** Keane, T.C., and Sperier, A. (2010) On the abundance of non-cometary HCN on Jupiter. *Faraday Discussions*, 147, 103-136.
- **Visscher, C.,** Moses, J.I., and Saslow, S.A. (2010) The Deep Water Abundance on Jupiter: New Constraints from Thermochemical Kinetics and Diffusion Modeling. *Icarus*, 209, 602-615.
- **Visscher, C.,** Lodders, K., and Fegley, B., Jr. (2010) Atmospheric Chemistry in Giant Planets, Brown Dwarfs, and Low-Mass Dwarf Stars III. Iron, Magnesium, and Silicon. *Astrophysical Journal*, 716, 1060-1075.
- **Visscher, C.,** Lodders, K., and Fegley, B., Jr. (2006) Atmospheric Chemistry in Giant Planets, Brown Dwarfs, and Low-Mass Dwarf Stars II. Sulfur and Phosphorus. *Astrophysical Journal*, 648, 1181-1195.
- **Visscher, C.,** and Fegley, B., Jr. (2004) Chemical Constraints on the Water and Total Oxygen Abundances in the Deep Atmosphere of Saturn. *Astrophysical Journal*, 623, 1221-1227.