Steven D. Jacobsen *Curriculum Vitae*
Department of Earth Science
University of Colorado Boulder
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Education

Ph.D. Geophysics, University of Colorado, 2001
M.S. Geology, University of Colorado, 1998
B.A. Geology, University of Colorado, 1995

Positions Held

Professor (2025-present) University of Colorado Boulder, Department of Earth
Professor (2016-2025) Northwestern University, Department of Earth and Planetary Sciences
Faculty Affiliate, Paula M. Trienens Institute for Sustainability and Energy
Faculty Affiliate, Center for Engineering Sustainability and Resilience
Faculty Member, Graduate Program in Applied Physics
Associate Professor (2011-2016); **Assistant Professor** (2006-2011)
Northwestern University, Department of Earth and Planetary Sciences
Research Scientist (2005-2006)
Carnegie Institution for Science, Earth and Planets Laboratory, Washington D.C.
Barbara McClintock Fellow, Postdoctoral Research Associate (2004-2005)
Carnegie Institution for Science, Earth and Planets Laboratory, Washington D.C.
Alexander von Humboldt Fellow, Postdoctoral Research Associate (2001-2003)
Bayerisches Geoinstitut, University of Bayreuth, Germany
CIRES Graduate Research Fellow (1999-2000)
Cooperative Institute for Research in Environmental Sciences, University of Colorado
Graduate Research Assistant (1995-2001)
University of Colorado, Department of Geological Sciences
Research Assistant (1994-1995 and 1997)
United States Geological Survey, National Ice Core Laboratory, Lakewood, Colorado
University of Nevada, Reno, Desert Research Institute, National Ice Core Laboratory

Research Statement

I am a mineralogist and materials scientist doing physical chemistry in extreme environments. Extremes may include high pressure or temperature, low temperature, radiation, and combinations found throughout the solar system. Applications span geophysical, planetary, chemical and materials sciences. I specialize in hydrogen in minerals and study role of minerals in cycling biocritical elements (like C, O, H, and N) in the Earth. The conditions found deep in planets are rich for discovery of new compounds with functional properties, such as novel intermetallic compounds or superhard materials for operation in extreme environments. I am currently involved in a study on electrodeposition of carbonates in marine soils and PI of a cooperative agreement with NASA/MSFC and industry for development of off-world construction technology from regolith on the lunar south pole.

Selected Publications

Amsler, M., V.I. Hegde, **S.D. Jacobsen**, and C. Wolverton (2018) Exploring the high-pressure materials genome. *Physical Review X* 8, 041021.

Crowhurst, J.C., J.M. Brown, A.F. Goncharov, and **S.D. Jacobsen** (2008) Elasticity of (Mg,Fe)O through the spin transition of iron in the lower mantle. *Science* 319, 451-453.

Demouchy, S., **S.D. Jacobsen**, F. Gaillard, and C.R. Stern (2006) Rapid magma ascent recorded by water diffusion profiles in mantle olivine. *Geology* 34, 429-432.

Jacobsen, S.D. and S. van der Lee (2006) (Editors) *Earth's Deep Water Cycle*, Geophysical Monograph 168, AGU, Washington D.C., 314 pages, ISBN: 978-0-87590-433-7.

Jacobsen, S.D., H.A. Spetzler, H.J. Reichmann and J.R. Smyth (2004) Shear waves in the diamond-anvil cell reveal pressure-induced instability in (Mg,Fe)O. *Proceedings of the National Academy of Sciences USA* 101, 5867-5871.

Palot, M., **S.D. Jacobsen**, J.P. Townsend, F. Nestola, K. Marquardt, N. Miyajima, J.W. Harris, T. Stachel, C.A. McCammon, and D.G. Pearson (2016) Evidence for H_2O-bearing fluids in the lower mantle from diamond inclusion. *Lithos* 265, 237-243.

Townsend, J.P., J. Tsuchiya, C.R. Bina, and **S.D. Jacobsen** (2016) Water partitioning between bridgmanite and postperovskite in the lowermost mantle. *Earth and Planetary Science Letters* 454, 20-27.

Wang, F., H.J. Bausch, L.L. Gardner, D. Zhang, K. Armstrong, A.S. Bell, J. Zhao, E.E. Alp, and **S.D. Jacobsen** (2025) Thermoelastic properties of iron-rich ringwoodite and the deep mantle aerotherm of Mars. *Geophysical Research Letters* 52, e2024GL109666.

Whitney, D.L. **S.D. Jacobsen**, and G. Gehrels (2020) All hands on deck: Implications of the recent NSF Earth Sciences decadal report for the mineral sciences. *Elements* 16, 228-230.

Honors

Friedrich Wilhelm Bessel Research Award, 2014
Alexander von Humboldt Foundation
Weinberg College Distinguished Teaching Award, 2013
Northwestern University, Weinberg College of Arts and Sciences
Presidential Early Career Award for Scientists and Engineers (PECASE), 2008
National Science Foundation, White House OSTP, Obama Administration
Packard Fellowship for Science and Engineering, 2008
David and Lucile Packard Foundation
Faculty Early Career Development Award (CAREER), 2008
National Science Foundation
Mineralogical Society of America Distinguished Lecturer, 2007
Mineralogical Society of America

Society Membership

AAAS, member since 2019
American Geophysical Union, member since 1996
American Physical Society, member since 2019
Mineralogical Society of America, member since 1996