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**Degrees**

**Ph.D., Geology, 1986**

University of California, Berkeley

**A.M., Geology, 1982**

Harvard University, Cambridge, MA

**B.S., Mathematics, 1980**

Beloit College, Beloit, WI

**Professional Positions**

1993-present	Associate Professor Department of the Geophysical Sciences and James Franck Institute University of Chicago
1989-present	Member, James Franck Institute University of Chicago
1985-1993	Assistant Professor Department of the Geophysical Sciences University of Chicago

**Memberships**

American Geophysical Union  
Mineralogical Society of America  
American Physical Society  
American Mathematical Society

**Related Activities**

2005-2013	Member of Board of Governors, CARS
2005-2008	Member of Proposal Review Panel (High Pressures) Advanced Photon Source, Argonne National Lab.
2002-2005	Associate Editor Geophysical Research Letters
1994-1996	Mineral and Rock Physics Committee,

1996-1997

American Geophysical Union  
Committee for the Study of the Earth's Deep Interior,  
American Geophysical Union

### Honors

Phi Beta Kappa  
Haven Fellow in Geology, Beloit College

### Graduate Students

Andrew Campbell: Professor University of Chicago  
Jeffrey Sweeney: SPSS software  
Suhithi Peiris: Army Research Laboratory  
Jung-Fu Lin: Professor, University of Texas at Austin  
Wendy Mao: Professor, Stanford University  
Christopher Seagle: Sandia National Laboratory

### Publications

- Bethany A. Chidester<sup>1</sup>, Olivia S. Pardo, Rebecca A. Fischer, Elizabeth C. Thompson, Dion L. Heinz, Clemens Prescher, Vitali B. Prakapenka and Andrew J. Campbell, High-pressure phase behavior and equations of state of ThO<sub>2</sub> polymorphs, *Am. Min.*, 103, 749-756, 2018.
- Thompson, E.C., Chidester, B.A., Fischer, R.A., Myers, G.I., Heinz, D.L., Prakapenka, V.B., Campbell, A.J., Equation of state of pyrite to 80 GPa and 2400 K, *Am. Min.*, 101, 1046-1051, 2016.
- Fischer, R.A., Campbell, A.J., Caracas, R., Reaman, D.M., Heinz, D.L., Dera, P., and Prakapenka, V.B., Equations of state in the Fe-FeSi system at high pressures and temperatures. *Journal of Geophysical Research* (119), 2810-2827, 2014.
- Fischer, R.A., Campbell, A.J., Reaman, D.M., Miller, N.A., Heinz, D.L., Dera, P., and Prakapenka, V.B., 2013 Phase relations in the Fe-FeSi system at high pressures and temperatures, *Earth and Planetary Science Letters*, 373, 54-64, DOI: 10.1016/j.epsl.2013.04.035.
- Seagle, C.T., D.L. Heinz, Z. Liu, and R.J. Hemley, Synchrotron infrared reflectivity measurements of iron at high pressures, *Applied Optics*, **48**, 545-552, 2009.
- Seagle, C.T., W. Zhang, D.L. Heinz, and Z. Liu, Far infrared dielectric and vibrational properties of non-stoichiometric wüstite at high pressure, *Physical Review B*, **79**, 014104, 2009.
- Mao, W. L., V. V. Struzhkin, A. Baron, S. Tsutsui, C. Tommaseo, H. R. Wenk, M. Hu, P. Chow, W. Sturhahn, J. Shu, R. J. Hemley, D. L. Heinz, and H. K. Mao, Experimental determination of Fe elasticity and implications to the Earth's inner core, *J. Geophys. Res.*, 113, B09213, doi:10.1029/2007JB005229, 2008.

Seagle C. T., Heinz D. L., Campbell A. J., Prakapenka V. and Wanless S. T. Melting and thermal expansion in the Fe - FeO system at high pressure. *Earth Planet. Sci. Lett.*, **265**, 655-665, 2008.

Campbell A. J., Seagle C. T., Heinz D. L., Shen G. and Prakapenka V. Partial melting in the iron-sulfur system at high pressure: A synchrotron X-ray diffraction study. *Phys. Earth Planet. Int.*, **162**, 119-128, 2007.

Seagle, C., A. J. Campbell, D. L. Heinz, G. Shen, V. Prakapenka, Thermal Equation of State of Fe<sub>3</sub>S and Implications for Sulfur in Earth's Core, *J. Geophys. Res.*, 111, B06209, doi:10.1029/2005JB004091, 2006.

W. Mao, A. J. Campbell, D.L. Heinz and G. Shen, Phase relations of Fe-Ni alloys at high pressure and temperature, *PEPI*, *155*, 146-151, 2006.

Mao, W. L., Meng, Y., Shen, G. Y., Prakapenka, V. B., Campbell, A. J., Heinz, D. L., Shu, J. F., Caracas, R., Cohen, R. E., Fei, Y. W., Hemley, R. J., Mao, H. K., Iron-rich silicates in the Earth's D " layer, *Proceedings Of The National Academy Of Sciences Of The United States Of America*, *102*, 9751-9753, 2005.

Lay, T., D. Heinz, M. Ishii, S.-H. Shim, J. Tsuchiya, T. Tsuchiya, R. Wentzcovitch, D. Yuen, Multidisciplinary Impact of the Deep Mantle Phase Transition in Perovskite Structure, *EOS*, *Trans. Amer. Geophys. Union*, 86, 1and5, 2005.

Mao, W. L., Shen, G. Y., Prakapenka, V. B., Meng, Y., Campbell, A. J., Heinz, D. L., Shu, J. F., Hemley, R. J., Mao, H. K., Ferromagnesian postperovskite silicates in the D " layer of the Earth, *Proceedings Of The National Academy Of Sciences Of The United States Of America*, *101*, 15867-15869, 2004.

Mao, W. L., W. Sturhahn, D. L. Heinz, H. K. Mao, J. Shu and R. J. Hemley, Nuclear resonant x-ray scattering of iron hydride at high pressure, *GRL*, *31*, L15618, doi:10.1029/2004GL020541, 2004.

Mao, W. L., H. K. Mao, P. J. Eng, T. P. Trainor, M. Newville, C. C. Kao, D. L. Heinz, J. Shu, Y. Meng and R. J. Hemley, Bonding changes in compressed superhard graphite, *Science*, **302**, 425-427, 2003.

Lin, J. F., D. L. Heinz, et al., "Stability of magnesiowustite in Earth's lower mantle." *PNAS* **100**(8): 4405-4408, 2003.

Lin, J. F., A. J. Campbell, et al., "Static compression of iron-silicon alloys: Implications for silicon in the Earth's core." *J. Geophys. Res.-Solid Earth* **108**(B1), 2003.

Lin, J-F., D. L. Heinz, A. J. Campbell, J. M. Devine, W. L. Mao and G. Shen, Iron-Nickel alloy in the Earth's core, *Geophys. Res. Lett.*, *29*, 109/1-109/3, 2002.

- Lin, J-F., D. L. Heinz, A. J. Campbell, J. M. Devine, and G. Shen, Iron-Silicon Alloy in Earth's Core? , *Science*, 295, 313-315, 2002.
- Duffy, T. S., G. Shen, D. L. Heinz, J. Shu, Y. Ma, R. J. Hemley and H. K. Mao, Lattice strains in gold and rhenium to 37 GPa, *Phys. Rev. B*, 60, 15063-15073, 1999.
- Duffy, T. S., G. Shen, D. L. Heinz, Y. Ma, R. J. Hemley, and H. K. Mao, Lattice strains in gold and rhenium under non-hydrostatic compression, in *High-Pressure Materials Research*, edited by R. M. Wentzcovitch, R. J. Hemley, W. J. Nellis, and P. Y. Yu, Materials Research Society Symp. Proc., vol. 499, 145-150, 1999.
- Shen, G., and D. L. Heinz, 1998, *High-Pressure Melting of Deep Mantle and Core Materials*, in *Ultrahigh-Pressure Mineralogy: Physics and Chemistry of the Earth's Deep Interior*, R. J. Hemley (editor), *Reviews in Mineralogy* vol. 37, P. H. Ribbe (series editor), Mineralogical Society of America, Washington D. C., 369-396.
- Sweeney, J.S., and D.L. Heinz, 1998, Laser-Heating Through a Diamond-Anvil Cell: Melting at High Pressures, in *Properties of Earth and Planetary Materials at High Pressure and Temperature*, edited by M.H. Manghnani, and T. Yagi, American Geophysical Union, Washington, D. C., 197-213.
- Peiris, S.M., and D.L. Heinz, 1998, Compression of Seven Vacancy-Ordered Phases of ScxS to 50 GPa, *Phys. Rev. B*, **58**, 6, 3003-3007.
- Peiris, S.M., T.T. Pearson, and D.L. Heinz, 1998, Compression of Klockmannite, CuSe, *J. Chem. Phys.*, **109**, 2, 634-636.
- Peiris, S.M., M.T. Green, D.L. Heinz, and J.K. Burdett, 1996 , Experimental and Theoretical Studies of ScS under Pressure, *Inorganic Chemistry*, **35**, 24, 6933-6936.
- Peiris, S.M., J.S. Sweeney, A.J. Campbell, and D.L. Heinz, 1996, Pressure-Induced amorphization of covellite, CuS, *J. Chem. Phys.*, **104**, 1, 11-16.
- Heinz, D. L., E. Knittle, J. S. Sweeney, Q. Williams, and R. Jeanloz, 1994, High-pressure melting of (Mg,Fe)SiO<sub>3</sub>-perovskite, *Science*, **264**, 279-280.
- Campbell, A. J., and D. L. Heinz, 1994, High-pressure acoustic wave velocities and equations of the alkali chlorides, *J. Geophys. Res.*, **99**, 11,765-11,774.
- Peiris, S. M., A. J. Campbell, and D. L. Heinz, 1994, Compression of MgS to 54 GPa, *J. Phys. Chem. Solids*, **55**, 413-419.
- Campbell, A. J., and D. L. Heinz, 1993, Equation of state and high pressure phase transition of NiS in the NiAs structure, *J. Phys. Chem. Solids*, **54**, 5-7.
- Sweeney, J. S., and D. L. Heinz, 1993, Compression of  $\square$ -MnS (alabandite) and a new

- high-pressure phase, *Physics and Chemistry of Minerals*, **20**, 63-68.
- Sweeney, J. S., and D. L. Heinz, 1993, Melting of iron-magnesium-silicate perovskite, *Geophys. Res. Lett.*, **20**, 855-858.
- Campbell, A. J., and D. L. Heinz, 1993, An amorphous phase on the anorthite hugoniot, *Geophys. Res. Lett.*, **20**, 237-240.
- Sweeney, J. S., and D. L. Heinz, 1993, Thermal analysis in the laser heated diamond anvil cell, *Pure and Applied Geophysics*, 141, 497-507.
- Campbell, A. J., D. L. Heinz, and A. M. Davis, 1992, Material transport in laser-heated diamond anvil cell melting experiments, *Geophys. Res. Lett.*, **19**, 1061-1064.
- Campbell, A. J., D. L. Heinz, 1992, A high-pressure test of Birch's law, *Science*, **257**, 66-68.
- Campbell, A. J., and D. L. Heinz, 1991, Compression of KCl in the B2 structure to 56 GPa, *J. Phys. Chem. Solids*, **52**, 495-499.
- Heinz, D. L., J. Sweeney, and P. Miller, 1991, A laser heating system that stabilizes and controls the temperature: Diamond anvil cell applications, *Rev. Sci. Instr.*, **62**, 1568-1575.
- Zhou, Y., A. J. Campbell, and D. L. Heinz, 1991, Equations of state and optical properties of the high pressure phase of zinc sulfide, *J. Phys. Chem. Solids*, **52**, 821-825.
- Seidler, G. T., T. F. Rosenbaum, D. L. Heinz, J. W. Downey, A. P. Paulikas, and B. W. Veal, 1991, Scaling of the irreversibility line with superconducting transition temperature in oxygen deficient  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ , *Physica C*, **183**, 333-338.
- Heinz, D. L., 1990, The effect of thermal pressure in the laser heated diamond anvil cell, *Geophys. Res. Lett.*, **17**, 1161-1164.
- Heinz, D. L., and R. Jeanloz, 1987, Temperature measurements in laser-heated diamond cells, *High Pressure Research in Mineral Physics*, eds. M. H. Manghnani, and Y. Syono, Terra Scientific, Tokyo, 113-127.

- Heinz, D. L., and R. Jeanloz, 1987, Measurement of the melting curve of  $\text{Mg}_{0.9}\text{Fe}_{0.1}\text{SiO}_3$  at lower mantle conditions and geophysical implications, *J. Geophys. Res.*, **92**, 11,437-11,444
- Jeanloz, R., and D. Heinz, 1986, Measurement of temperature distributions, in *CW-laser heated materials, Proc. Int. Congress Applications of Lasers Electro-Optics*, Laser Institute of America, Toledo, OH.
- Heinz, D., and R. Jeanloz, 1984, The equation of state of the gold calibration standard, *J. Appl. Phys.*, **55**, 885-893.
- Heinz, D., and R. Jeanloz, 1984, Compression of the B2 high-pressure phase of NaCl, *Phys. Rev. B*, **30**, 6045-6050.
- Jeanloz, R., and D. Heinz, 1984, Experiments at high temperature and pressure: Laser heating through the diamond cell, *J. de Physique-Colloque*, **45**, C8-83 to 92.
- Heinz, D., and R. Jeanloz, 1983, Inhomogeneity parameter of a homogeneous earth, *Nature*, **301**, 138-139.
- Heinz, D., R. Jeanloz, and R. J. O'Connell, 1982, Bulk attenuation in a polycrystalline earth, *J. Geophys. Res.*, **87**, 7772-7778.