

Jung-Fu “Afu” Lin

Department of Earth and Planetary Sciences, Jackson School of Geosciences
The University of Texas at Austin
1 University Station C1100, Austin, TX 78712, USA
Tel: (512) 471-5172; Fax: (512) 471-0959
Email: afu@jsg.utexas.edu

Education

2002 Ph.D. Geophysical Sciences, The University of Chicago, Chicago, Illinois, USA
1994 M.S. Earth Sciences, National Cheng-Kung University, Taiwan
1992 B.S. Earth Sciences, National Cheng-Kung University, Taiwan

Primary Positions Held

09/2023-current **Dave P. Carlton Centennial Professor in Geology**, Jackson School of Geosciences, The University of Texas at Austin
09/2019-08/2023 **Professor**, Department of Earth and Planetary Sciences, Jackson School of Geosciences, The University of Texas at Austin
09/2013-08/2019 **Associate Professor**, Department of Geological Sciences, Jackson School of Geosciences, The University of Texas at Austin
07/2008-08/2013 **Assistant Professor**, Department of Geological Sciences, Jackson School of Geosciences, The University of Texas at Austin
07/2005-06/2008 **Lawrence Livermore Fellow**, Lawrence Livermore National Laboratory
07/2003-06/2005 **Research Scientist**, Carnegie-DOE Alliance Center (CDAC), Carnegie Institution for Science
07/2002-06/2003 **Carnegie Postdoctoral Fellow**, Geophysical Laboratory, Carnegie Institution for Science

Honors and Awards

2023-current Dave P. Carlton Centennial Professorship in Geology, Jackson School of Geosciences, The University of Texas at Austin
2021-2022 Fulbright Scholarship, US Department of State
2016 Outstanding Young Alumni Award of the National Cheng-Kung University
2015 Fellow of the Mineralogical Society of America
2014-2018 Faculty Investment Initiative Award of the University of Texas at Austin
2011-2015 NSF-EAR Early Career Award in Geophysics/Petrology/Geochemistry

Professional Society Memberships

09/1997-current American Geophysical Union
09/2008-current Mineralogical Society of America

Narrative of Research Experience

My research focuses on understanding the physical and chemical properties of Earth and planetary materials under extreme pressure–temperature conditions, with broad implications for

Jung-Fu Lin · The University of Texas at Austin

deep Earth and planetary processes. Using advanced high-pressure experiments, synchrotron techniques, and interdisciplinary approaches, I investigate mineral physics, deep carbon cycling, and the structure and dynamics of planetary interiors. My work integrates laboratory measurements with geophysical observations to address fundamental questions about Earth's mantle and core, as well as the interiors of terrestrial planets. Through collaborations across institutions and countries, I have advanced insights into material behavior at extreme conditions and their role in planetary evolution.

Key Publication List

- Zhang, Y., J. Tsuchiya, C.C. Li, Z. Ye, W. Yan, T. Okuchi, S.-i. Karato, J. Kung, and **J.F. Lin**, Hydrogen Dissolution Mechanisms in Bridgmanite by First-Principles Calculations and Infrared Spectroscopy, *J. Geophys. Res.: Solid Earth*, 130, e2024JB030403, 2025.
- Zhang, Y., Y. Wang, Y. Huang, J. Wang, L. Hao, Z. Gao, J. Li, Q. Wu, Y. Liu, J. Sun, and **J.F. Lin**, Collective motion in hcp-iron at Earth's inner core conditions, *Proc. Natl. Acad. Sci.*, 120, 41, e2309952120, 2023.
- Zhang, Y., and **J.F. Lin**, Molten iron in Earth-like exoplanet cores, 375, 146-147, DOI: 10.1126/science.abn2051, *Science*, 2022.
- Zhang, Y., K. Luo, M. Hou, P. Driscoll, N.P. Salke, J. Minár, V.B. Prakapenka, E. Greenberg, R. Hemley, R.E. Cohen, and **J.F. Lin**, Thermal conductivity of Fe-Si alloys and thermal stratification in Earth's core, *Proc. Natl. Acad. Sci.*, 119, 1, e2119001119, <https://doi.org/10.1073/pnas.2119001119>, 2022.
- Zhang, Y., S. Fu, B. Wang, and **J.F. Lin**, Elasticity of a Pseudo-proper Ferroelastic Transition from Stishovite to Post-Stishovite at High Pressure, *Phys. Rev. Lett.*, 126, 025701, 10.1103/PhysRevLett.126.025701, 2021.
- Zhang, Y., M. Hou, G. Liu, C. Zhang, V.B. Prakapenka, E. Greenberg, Y. Fei, R.E. Cohen, and **J.F. Lin**, Reconciliation of experiments and theory on transport properties of iron and the geodynamo, *Phys. Rev. Lett.*, 125, 078501, 2020.
- Lin, J.F.**, Z. Mao, J. Yang, and S. Fu, Elasticity of the Lower-Mantle Bridgmanite, *Nature (Communications Arising)*, 564, E18-E26, 2018.
- Fu, F., J. Yang, Y. Zhang, T. Okuchi, C. McCammon, H.-I. Kim, S.K. Lee, and **J.F. Lin**, Abnormal elasticity of Fe-bearing bridgmanite in the Earth's lower mantle, *Geophys. Res. Lett.*, 45, 2018.
- Yang, J., **J.F. Lin**, S.D. Jacobsen, N.M. Seymour, S.N. Tkachev, and V.B. Prakapenka, Elasticity of ferropericlasite and seismic heterogeneity in the Earth's lower mantle, *J. Geophys. Res.*, 10.1002/2016JB013352, 2016.
- Lin, J.F.**, S. Speziale, Z. Mao, and H. Marquardt, Effects of the electronic spin transitions of iron in lower-mantle minerals: implications to deep-mantle geophysics and geochemistry, *Rev. Geophys.*, 51, 244-275, 2013.
- Lin, J.F.**, G. Vankó, S.D. Jacobsen, V. Iota, V.V. Struzhkin, V.B. Prakapenka, A. Kuznetsov, and C.-S. Yoo, Spin transition zone in Earth's lower mantle, *Science*, 317, 1740-1743, 2007.
- Lin, J.F.**, V.V. Struzhkin, S.D. Jacobsen, M. Hu, P. Chow, J. Kung, H. Liu, H.K. Mao, and R.J. Hemley, Spin transition of iron in magnesiowüstite in Earth's lower mantle, *Nature*, 436, 377-380, 2005.
- Lin, J.F.**, W. Sturhahn, J. Zhao, G. Shen, H.K. Mao, and R.J. Hemley, Sound velocities of hot dense iron: Birch's law revisited, *Science*, 308, 1892-1894, 2005.