

# Jung-Fu “Afu” Lin

*Curriculum Vitae and List of Publications*

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## 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

- 09/2019-current    **Professor**, Department of Geological 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

## Other Affiliations

- 09/2021-08/2022    **Fulbright Scholar**, Adam Mickiewicz University, Poland
- 07/2020-04/2021    **Visiting Professor**, Institute of Earth Sciences, Academia Sinica, Taiwan
- 09/2016-current    **Affiliated Faculty**, Materials Science and Engineering (MS&E) Graduate Programs, The University of Texas at Austin
- 09/2013-current    **Affiliated Faculty**, Texas Materials Institute, The University of Texas at Austin
- 07/2012-08/2019    **Visiting Professor**, Institute for Planetary Materials, Okayama University at Misasa
- 06/2019-07/2019    **Visiting Professor**, Guiyang Institute of Geochemistry, Chinese Academy of Science
- 06/2017-08/2019    **Lecturer (summer short course)**, Department of Earth Sciences, National Cheng-Kung University, Taiwan
- 05/2014-08/2018    **Visiting Scientist**, Center for High Pressure Science and Technology Advanced Research, Shanghai, China

07/1997-06/2002 **Research and Teaching Assistant**, Department of Geophysical Sciences,  
The University of Chicago  
07/1996-06/1997 **Research Assistant**, Inst. of Earth Sciences, Academia Sinica, Taiwan  
09/1992-06/1994 **Research and Teaching Assistant**, Department of Earth Sciences,  
National Cheng-Kung University, Taiwan

### **Honors, Awards, Fellowships and Lectureships**

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  
2014 William T. Smith Lecturer, University of Michigan at Ann Arbor, Department of  
Earth and Environmental Sciences  
2012-2015 Visiting Professorship, Okayama University at Misasa, Japan  
2011-2015 NSF-EAR Early Career Award in Geophysics/Petrology/Geochemistry  
2014-current Total E&P USA Petroleum Faculty Fellowship of the Department of Geological  
Sciences, Jackson School of Geosciences, University of Texas at Austin  
2005-2008 Lawrence Livermore Fellowship, Lawrence Livermore National Laboratory  
2002-2004 Carnegie Fellowship, Carnegie Institution for Science

### **Synergistic Activities**

2022-current Peer Assessment Coordinator, Department of Geological Sciences, UT Austin  
2022-current Fulbright Faculty Committee Member, UT Austin  
2022-current Member of Disabled Faculty Equity Council & Diversity, Equity, and Inclusion,  
UT Austin  
2022-current Safety contact of the Department of Geological Sciences, UT Austin  
2015-current Editor, Nature Scientific Reports  
2021-2022 Panel Member of the Grant Proposal Review Panel for Matters at Extremes,  
National Nuclear Security Administration (NNSA), Stockpile Stewardship  
Academic Alliance (SSAA)  
2021 Peer teaching evaluation member, Department of Geological Sciences  
2019 Geophysics Faculty Search Committee, Department of Geological Sciences  
2019, 2020 Member of the LDE Faculty Annual Evaluation Committee, UT Austin  
2019 Convener, Goldschmidt Meeting 2019, Deep Volatiles Session  
2018 Member of the Earth Sciences Proposal Review Panel for Geophysics, NSF  
2018-2019 Lecturer for Summer Short Course at National Cheng-Kung University (How to  
build a habitable planet?), Tainan, Taiwan  
2018 Lecturer for High-School Science Course (2 days) for Gifted and Talent Program  
at Tainan First Boys and Girls High Schools, Tainan, Taiwan  
2017-2020 Guest Editor, Carbon in Earth's Interior, AGU Monography Series (co-editors:  
Craig Manning and Wendy Mao)  
2017 Convener, American Geophysical Union Fall Meeting, Deep Carbon session  
2017 Faculty Search Committee, Lithosphere Dynamics, UT Austin  
2017 Convener, Goldschmidt Meeting, Paris, Deep Carbon session

2017-2019 Chair of the External Awards Committee, Department of Geological Sciences, University of Texas at Austin

2017-current Member, DeFord Lecture Seminar Committee, Department of Geological Sciences, University of Texas at Austin

2016-2019 Engagement Advisory Committee, Deep Carbon Observatory, Sloan Foundation

2015 Strategic Planning Committee, Department of Geological Sciences

2015 Faculty Search Committee, Geophysics

2014 Faculty Search Committee, Petrology

2012-2016 Discipline Group Leader, Petrology and Mineral Physics, Department of Geological Sciences, The University of Texas at Austin

2012 Convener, Fall AGU session: “Electronic structure and elasticity of deep Earth minerals”

2012-2015 Facilities Committee Member, COMPRES

2012-2013 Visiting scientist, High Pressure Synergetic Consortium at the Advanced Photon Source (HPSynC), Argonne National Laboratory

2012-2017 Academic member, Texas Center for High Intensity Laser Science, The University of Texas at Austin

2012-2015 Academic partner, Instrument Development Team of the Spallation Neutrons and Pressure Diffractometer (SNAP), Oakridge National Laboratory

2010-2019 Lecturer for UTeach Outreach Program participants, The University of Texas at Austin

2011-2013 Panel member, General User Proposal Review Panel, Advanced Photon Source, Argonne National Laboratory

2011-2013 Coordinator, Departmental Technical Sessions Seminar, Department of Geological Sciences, The University of Texas at Austin

2011 Convener, Fall AGU special session “MR11: Physical and Chemical States of the Earth”

2011 Local Organizer, Workshop on “Dynamic Phenomena under Extreme Environments” at University of Texas at Austin in Jan. 24-28th, 2011.

2010 Committee Member, Departmental Tech Session Seminar, Department of Geological Sciences, The University of Texas at Austin

2010-2014 Academic partner, Center for Energy Frontier Research in Extreme Environments (EFree), Energy Frontier Research Centers of the DOE

2009-2014 Academic partner, Carnegie/DOE Alliance Center (CDAC): A Center of Excellence for High Pressure Science and Technology, Energy Frontier Research Centers of the DOE

2010-2012 Member, Editorial Advisory Board, EoS Transactions of the American Geophysical Union (The Newspaper of the Earth and Space Sciences)

2004-2012 Member, Executive Committee of Mineral and Rock Physics American Geophysical Union

2008-current Elector to COMPRES, University of Texas at Austin

2008 Convener, Fall AGU special session “DI08 Chemical Heterogeneities in the Earth’s Mantle: Their Roles in the Early Earth Differentiation, Mantle Dynamics and Geochemistry”

2004-2008 Selection Committee, Student Presentation Award, American Geophysical Union

2007-2008 Guest Editor, Physics of the Earth and Planetary Interiors, Special Issue:

- 2007 *Frontiers and Grand Challenges in Mineral Physics of the Deep Mantle*  
Convener, Fall AGU special session “*Behavior of Iron in the Deep Earth and New Views of the Mantle and Core*” and “*Structures and Properties of Earth’s Interior Probed Using Advanced Radiation, Laboratory Tools and Seismic Waves*”
- 2006 Convener, Fall AGU special session “*Composition and Dynamics of Earth’s Mantle: Current Frontiers and Grand Challenges in Elasticity, Phase Transitions, and Rheology Studies*”
- 2005 Convener, AGU special session “*Behavior and Consequences of Iron in the Earth’s Mantle*”
- Reviewer Nature, Science, Nature Geoscience, Nature Communications, Science Advances, Scientific Reports, Physical Review Letters, Physical Review B, National Science Foundation (Geophysics/Petrology, Instrumentation and Facility, Postdoc Fellowship, CSEDI), NERC (National Environment Research Council of UK), Department of Energy (Basic Energy Science), Advanced Science, U.S. Civilian Research & Development Foundation (CRDF), Deutsche Forschungsgemeinschaft (DFG) German Research Foundation, Petroleum Research Fund of the American Chemical Society, Advanced Light Source, Geophysical Research Letters, Journal of the Geophysical Research-Solid Earth, American Mineralogist, Applied Physics Letters, Physics of the Earth and Planetary Interiors, Earth and Planetary Science Letters, Journal of Chemical Physics, The Journal of Physical Chemistry, Journal of Physics: Condensed Matters, Nanoscale Advances, Proc. Natl. Acad. Sci. USA, Journal of Applied Physics, Journal of Physics and Chemistry of Solids, Mineralogy and Petrology, 2D Materials, American Geophysical Union Monograph, Chemical Engineering Science, Swiss National Science Foundation, Angewandte Chemie

### **List of Publications**

Researcher ID: B-4917-2011

Google Scholar: <http://scholar.google.com/citations?user=EzOjD4gAAAAJ&hl=en>

ORCID: 0000-0002-0163-5329

### **Edited Volumes**

- J.F. Lin**, S.-i. Karato, J. Bass, E. Ohtani, and C. Prewitt (Eds.), 2, Volume 170, Issues 3-4, pp. 151-282, Phys. Earth Planet. Inter., 2008.
- C. Manning, W. Mao, and **J.F. Lin**, Carbon in Earth’s Interior, AGU Monography Series 249, 384 pages, ISBN: 978-1-119-50826-7, 2020.

### **Journal and Book Chapter Publications**

#### **2023 (in submission/under review)**

- Chen, J., J. He, Y. Zhang, S. Chariton, V. Prakapenka, K. Yamaura, **J.-F. Lin**, J.B. Goodenough, and J.-S. Zhou, In-situ structural determination of 3d and 5d perovskite oxides under high Pressure by synchrotron X-ray Diffraction, submitted to Phys. Rev. B, 2023.

- Zhang, Y., **J.-F. Lin**, S. Chariton, V.B. Prakapenka, B. Wang, T. Okuchi, Decomposition of Bridgmanite with Water Produces Excess Stishovite in Subducting Slabs at the Topmost Lower Mantle, in prep., 2023.
- Fu, S., S. Chariton, Y. Zhang, T. Okuchi, V.B. Prakapenka, and **J.-F. Lin**, Single-Crystal X-ray Diffraction on the Structure of (Al,Fe)-bearing Bridgmanite in the Lower Mantle, *Am. Miner.* (in review), 2023.
- Su, X., J. Liu, M. Roskosz, and **J.-F. Lin**, Sound velocities of basaltic glass at Earth's lower-mantle pressures, *J. Geophys. Res.: Solid Earth* (in prep.), 2023.
- Hsieh, W.-P., F. Deschamps, Y.-C. Tsao, T. Yoshino, and **J.F. Lin**, A thermally-conductive Martian core and implications for its dynamo cessation, submitted to *Science Advances*, 2023.
- Lin, C.M., D.Y. Lin, T. Huang, D.Z. Zhang, J.S. Kim, J.K. Tang, S.R. Jian, **J.F. Lin**, J.Y. Juang, Early-onset of pressure-induced metallization in iron-doped multilayered molybdenum disulfide, *2D Materials* (in submission), 2023.
- Okuchi, T., Purevjav, N., N. Tomioka, S. Yamashita, K. Shinoda, S. Kobayashi, K. Shimizu, M. Ito, S. Fu, J. Gu, C. Hoffmann, and **J.F. Lin**, Hydrogen incorporation mechanism into aluminous-ferrous bridgmanite, *Am. Miner.* (submitted), 2023.
- 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 near melting softens Earth's solid inner core, *Phys. Rev. Lett.* (under review), 2023.
- Zhang, Y., **J.F. Lin**, S. Chariton, V.B. Prakapenka, B. Wang, and T. Okuchi, Decomposition of bridgmanite with water into stishovite and ferropericlasite: implications for understanding water influence on mineralogy and seismic profiles in subduction regions in the shallow lower mantle, *Earth Planet. Sci. Lett.* (in prep.), 2023.
- Hsu, W.T., J. Quan, P.-J. Chen, C.-R. Pan, M.-Y. Chou, W.-H. Chang, A.H. MacDonald, X. Li, **J.F. Lin**, and C.-K. Shih, Quantitative determination of interlayer electronic coupling at various critical points in bilayer MoS<sub>2</sub>, submitted to *Phys. Rev. Lett.*, 2023.

## 2023 (and articles in press)

222. Fu, F., Y. Zhang, T. Okuchi, and **J.F. Lin**, Single-Crystal Elasticity of (Al,Fe)-bearing Bridgmanite up to 82 GPa, *Am. Miner.*, 108 (4), 719-730, doi.org/10.2138/am-2022-8435, 2023.
221. Zhang, Y., S. Chariton, J. He, S. Fu, V.B. Prakapenka, **J.F. Lin**, Atomistic insights into the ferroelastic post-stishovite transition mechanism by high-pressure single-crystal X-ray diffraction refinements, *Am. Miner.*, 108, 110-119, 10.2138/am-2022-8458, 2023.
220. Liu, J., Y. Sun, C. Lv, F. Zhang, S. Fu, V.B. Prakapenka, C.-Z. Wang, K.-M. Ho, **J.F. Lin**, and R.M. Wentzcovitch, Iron-rich Fe-O compounds at Earth's core pressures, *The Innovation*, 4(1), 100354, doi.org/10.1016/j.xinn.2022.100354, 2023.

## 2022

219. Wang, B., Y. Zhang, S. Fu, W. Liang, L. Li, E. Takahashi, S.N. Tkachev, V.B. Prakapenka, **J.F. Lin**, and M. Song, Single-crystal elasticity of phase E at high pressure and

- temperature: Implications for the low-velocity layer atop the 410-km depth, 127, e2022JB025274, *J. Geophys. Res.*, doi.org/10.1029/2022JB025274, 2022.
218. Kim, J.S., N. Maity, M. Kim, S. Fu, R. Juneja, A.K. Singh, D. Akinwande, and **J.F. Lin**, Strain-Modulated Interlayer Charge and Energy Transfers in MoS<sub>2</sub>/WS<sub>2</sub> Heterobilayer, *ACS Applied Materials and Interfaces*, 14, 41, 46841-46849, https://doi.org/10.1021/acsami.2c10982, 2022.
217. Zhou, Y., W.-P. Hsieh, X. Meng, F. Tian, Z. Ren, L. Shi, **J.F. Lin**, and Y. Wang, Defect Modulated Thermal Behavior of BAs under High Pressure, *App. Phys. Lett.*, 121, 121902, DOI: 10.1063/5.0113007, 2022.
216. Sun, N., Z. Mao, X. Zhang, S.N. Tkachev and **J.F. Lin**, Hot Dense Silica Glass with Ultrahigh Elastic Moduli, *Sci. Rep.*, *Sci. Rep.*, 12, 13946, 2022.
215. Li, L., N. Sun, W. Shi, Z. Mao, Y. Yu, Y. Zhang, and **J.F. Lin**, Elastic Anomalies across the  $\alpha$ - $\beta$  Phase Transition in Orthopyroxene: Implication for the Metastable Wedge in the Cold Subduction Slab, *Geophys. Res. Lett.*, 49, e2022GL099366, 10.1029/2022GL099366, 2022.
214. Wiesner, M., R.H. Roberts, R. Ge, L. Mennel, T. Mueller, **J.F. Lin**, D. Akinwande, and J. Jenczyk, Signatures of bright to dark exciton conversion in corrugated MoS<sub>2</sub> monolayers, *Applied Surface Sci.*, 600, 154078, 2022.
213. Zhang, Y., S. Fu, T. Okuchi, and **J.F. Lin**, Elasticity of hydrated Al-bearing Stishovite and Post-Stishovite at High Pressure: Implications for Understanding Seismic Scatterers in the Lower Mantle, *J. Geophys. Res.*, 127, e2021JB023170, 10.1029/2021JB023170, 2022.
212. Hsieh, W.P., E. Marzotto, Y.C. Tsao, T. Okuchi, and **J.F. Lin**, High thermal conductivity of stishovite promotes rapid warming of a sinking slab in the shallow lower mantle, *Earth Planet. Sci. Lett.*, 584, 117477, doi.org/10.1016/j.epsl.2022.117477, 2022.
211. Yang, C., Y. Zhang, N.P. Salke, A. Ahmet, S.H. Ayman, J. Hong, and **J.F. Lin**, Kohn anomaly and elastic softening in single-crystal molybdenum under at high pressures, *Phys. Rev. B*, 105, 094105, 10.1103/PhysRevB.105.094105, 2022.
210. Meyer, D.W., W.-P. Hsieh, H. Hsu, C.-Y. Kuo, and **J.F. Lin**, Thermal conductivity and compressional velocity of methane at high pressure: Insights into thermal transport properties of icy planet interiors, *J. Geophys. Res. – Planets*, e2021JE007059, 10.1029/2021JE007059, 2022.
209. Zhang, Y., and **J.F. Lin**, Molten iron in Earth-like exoplanet cores, 375, 146-147, DOI: 10.1126/science.abn2051, *Science*, 2022.
208. 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.
207. Wang, B., Y. Zhang, S. Fu, W. Yan, E. Takahashi, L. Li, M. Song, and **J.F. Lin**, Single-crystal elasticity of phase Egg AlSiO<sub>3</sub>OH and  $\delta$ -AlOOH by Brillouin spectroscopy, *Am. Miner.*, 107, 147-152, 10.2138/am-2022-8056, 2022.

## 2021

206. Bishop, J.L., S. J. King, M. D. Lane, A. J. Brown, B. Lafuente, T. Hiroi, R. Roberts, G. A. Swayze, **J.F. Lin**, and M. Sánchez Román, Spectral Properties of Anhydrous Carbonates and Nitrates, *Earth and Space Science*, 8, e2021EA001844,

<https://doi.org/10.1029/2021EA001844>, 2021.

205. Y. Yamamoto, H. Yamaoka, T. Uozumi, A. Hariki, S. Onari, J. Yamaura, K. Ishii, T. Kawai, M. Yoshida, M. Taguchi, K. Kobayashi, **J.F. Lin**, N. Hiraoka, H. Ishii, K.-D. Tsuei, H. Okanishi, S. Iimura, S. Matsuishi, H. Hosono, and J. Mizuki, Electronic and crystal structures of  $\text{LnFeAsO}_{1-x}\text{Hx}$  ( $\text{Ln} = \text{La}, \text{Sm}$ ) studied by x-ray absorption spectroscopy, x-ray emission spectroscopy, and x-ray diffraction (part I: carrier-doping dependence), *J. Phys.: Condens. Matter* 33, 255602, DOI: <https://doi.org/10.1088/1361-648X/abf9b9>, 2021.
204. Yamamoto, Y., H. Yamaoka, T. Kawai, M. Yoshida, J. Yamaura, K. Ishii, S. Onari, T. Uozumi, A. Hariki, M. Taguchi, K. Kobayashi, **J.F. Lin**, N. Hiraoka, H. Ishii, K.-D. Tsuei, H. Okanishi, S. Iimura, S. Matsuishi, H. Hosono, and J. Mizuki, Electronic and crystal structures of  $\text{LnFeAsO}_{1-x}\text{Hx}$  ( $\text{Ln} = \text{La}, \text{Sm}$ ) studied by x-ray absorption spectroscopy, x-ray emission spectroscopy, and x-ray diffraction (part II: pressure dependence), *J. Phys.: Condens. Matter* 33, 255603, DOI: <https://doi.org/10.1088/1361-648X/abfaf4>, 2021.
203. Lobanov, S.S., S. Speziale, **J.F. Lin**, L. Schifferle, and Anja Schreiber, Radiometric temperature determination in nongray bridgmanite: applications to melting curve and post-perovskite transition boundary in the lower mantle, *J. Geophys. Res.*, 126, e2021JB021723. <https://doi.org/10.1029/2021JB021723>, 2021.
202. Lobanov, S.S., F. Soubiran, N. Holtgrewe, J. Badro, **J.F. Lin**, and A.F. Goncharov, Contrasting opacity of bridgmanite and ferropericlasite in the lowermost mantle: Implications to radiative and electrical conductivity, *Earth Planet. Sci. Lett.*, 562, 116871, [10.1016/j.epsl.2021.116871](https://doi.org/10.1016/j.epsl.2021.116871), 2021.
201. Sun, N., H. Bian, Y. Zhang, **J.F. Lin**, V.B. Prakapenka, and Z. Mao, High-Pressure Experimental Study of Tetragonal  $\text{CaSiO}_3$ -Pervoskite to 200 GPa, *Am. Miner.*, DOI: <https://doi.org/10.2138/am-2021-7913>, 2021.
200. Grant, S.C., T. Ao, C.T. Seagle, A.J. Porwitzky, J.-P. Davis, K.R. Cochrane, D.H. Dolan, **J.F. Lin**, T. Ditmire, and A.C. Bernstein, Equation of State Measurements on Iron Near the Melting Curve at Planetary Core Conditions by Shock and Ramp Compression, *J. Geophys. Res.*, 126, e2020JB020008, [10.1029/2020JB020008](https://doi.org/10.1029/2020JB020008), 2021.
199. Zhou, Y., N. Maity, **J.F. Lin**, A. Singh, Abhishek, and Y. Yaguo, Nonlinear Optical Absorption of  $\text{ReS}_2$  Driven by Stacking Order, *ACS Photonics*, 8, 405-411, <https://doi.org/10.1021/acsp Photonics.0c01225>, 2021.
198. Salke, N.P., K. Xia, S. Fu, Y. Zhang, E. Greenberg, V.B. Prakapenka, J. Liu, J. Sun, and **J.F. Lin**, Tungsten hexanitride with single-bonded armchair-like hexazine structure at high pressure, *Phys. Rev. Lett.*, 126, 065702, <https://doi.org/10.1103/PhysRevLett.126.065702>, 2021.
197. 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](https://doi.org/10.1103/PhysRevLett.126.025701), 2021.
196. Wang, W., J. Liu, H. Yang, S.M. Dorfman, M. Lv, J. Li, F. Zhu, J. Zhao, M.Y. Hu, W. Bi, E.E. Alp, Y. Xiao, Z. Wu, and **J.F. Lin**, Iron Force Constants of Bridgmanite at High Pressure: Implications for Iron Isotope Fractionation in the Deep Mantle, *Geochimica et Cosmochimica Acta*, 294, 215-231, <https://doi.org/10.1016/j.gca.2020.11.025>, 2021.
195. Gu, J.T., S. Fu, J.E. Gardner, S. Yamashita, T. Okuchi, and J.F. Lin, Non-linear Effects of Hydration on Sound Velocities of Rhyolitic Glasses up to 3 GPa, *Am. Miner.*, 106, 1143-1152, <https://doi.org/10.2138/am-2021-7597>, 2021.
194. Zhang, Y., M. Hou, P. Driscoll, N.P. Salke, J. Liu, E. Greenberg, V.B. Prakapenka, and **J.F.**

**Lin**, Transport properties of Fe-Ni-Si alloys at Earth's core conditions: Insight into the viability of thermal and compositional convection, *Earth Planet. Sci. Lett.*, 553, 116614, <https://doi.org/10.1016/j.epsl.2020.116614>, 2021.

## 2020

193. Zhang, Y., Y. Tan, H.Y. Geng, N.P. Salke, Z. Gao, J. Li, T. Sekine, Q. Wang, E. Greenberg, V.B. Prakapenka, and **J.F. Lin**, Melting curve of vanadium up to 256 GPa: Consistency between experiments and theory, *Phys. Rev. B*, 102 (21), 214104, DOI: 10.1103/PhysRevB.102.214104, 2020.
192. Meng, X., A. Singh, R. Juneja, Y. Zhang, F. Tian, Z. Ren, A. Singh, L. Shi, **J.F. Lin**, Y. Wang, Pressure Dependent Behavior of Defect-modulated Band Structure in BAs, *Advanced Materials*, 2001942, <https://doi.org/10.1002/adma.202001942>, 2020.
191. 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, DOI: 10.1103/PhysRevLett.125.078501, 2020.
190. Gao, J.-J., S.-Y. Fu, K. Yamaura, **J.F. Lin**, and J.-S. Zhou, Room-temperature polar metal phase of LiOsO<sub>3</sub> stabilized under high pressure, 101, 22010 (R), *Phys. Rev. B (Rapid Comm.)*, <https://doi.org/10.1103/PhysRevB.101.220101>, 2020.
189. Hsieh, W.-P., A.F. Goncharov, S. Labrosse, N. Holtgrewe, S.S. Lobanov, J. Badro, F. Deschamps, and **J.F. Lin**, Low thermal conductivity of iron-silicon alloys at Earth's core conditions: implications for the geodynamo, 11, 3332, <https://doi.org/10.1038/s41467-020-17106-7>, *Nature Comm.*, 2020.
188. Zhou, Y., N. Maity, A. Rai, R. Juneja, X. Meng, A. Roy, **J.F. Lin**, S. Banerjee, A.K. Singh, Y. Wang, Stacking Order Driven Optical Properties and Carrier Dynamics in ReS<sub>2</sub>, <https://doi.org/10.1002/adma.201908311>, *Advanced Materials*, 2020.
187. Lee, S.K., K.Y. Mun, Y.-H. Kim, J. Lhee, T. Okuchi, and **J.F. Lin**, The Degree of Permanent Densification in Oxide Glasses upon Extreme Compression up to 24 GPa at Room Temperature, 11, 8, 2917-2924, <https://doi.org/10.1021/acs.jpcclett.0c00709>, *The Journal of Physical Chemistry Letters*, 2020.
186. Salke, N.P., M.M.D. Esfahani, N. Yedukondalu, Y. Zhang, I.A. Kruglov, J. Zhou, E. Greenberg, V.B. Prakapenka, J. Liu, A.R. Oganov, and **J.F. Lin**, Prediction and synthesis of dysprosium hydride phases at high pressure, 59, 8, 5303–5312, *Inorganic Chemistry*, 10.1021/acs.inorgchem.9b03078, 2020.
185. Lobanov, S.S., N. Holtgrewe, G. Ito, J. Badro, H. Piet, F. Nabiei, **J.F. Lin**, L. Bayarjargal, R. Wirth, A. Schreiber, and A.F. Goncharov, Blocked radiative heat transport in the hot pyrolytic lower mantle, 537, 116176, <https://doi.org/10.1016/j.epsl.2020.116176>, *Earth Planet. Sci. Lett.*, 2020.
184. Liu, J., S. Fu, and **J.F. Lin**, Spin transition of iron in deep-mantle ferromagnesite, Chapter 12, 115-125, 12, in *Carbon in Earth's Interior*, AGU Monograph Series 249, 384 pp, ISBN: 978-1-119-50826-7, <https://doi.org/10.1002/9781119508229.ch12>, 2020.
183. Fan, D., S. Fu, C. Lu, J. Xu, Y. Zhang, S.N. Tkachev, V.B. Prakapenka, and **J.F. Lin**, Elasticity of single-crystal Fe-enriched diopside at high pressure conditions: Implications for the cause of upper mantle low-velocity zones, 104, 262-275, 10.2138/am-2020-7075, *Am. Miner.*, 2020.



2019

182. Zhang, Y., P. Nelson, N.J. Dygert, J.S. Jordan, and **J.F. Lin**, Fe alloy slurry and compacting cumulate pile across Earth's inner-core boundary, 124, 10,954-10,967, <https://doi.org/10.1029/2019JB017792>, *J. Geophys. Res.*, 2019.
181. Porwitzky, A., B.T. Hutzel, C.T. Seagle, T. Ao, S. Grant, A. Bernstein, **J.F. Lin**, and T. Ditmire, Large time-varying inductance load for studying power flow on the Z machine, *Phys. Rev. Accel. Beams*, 22, 090401, 2019.
180. Salke, N.P., M.D. Esfahani, Y. Zhang, I.A. Kruglov, J. Zhou, Y. Wang, E. Greenberg, V.B. Prakapenka, J. Liu, A.R. Oganov, and **J.F. Lin**, Synthesis of clathrate cerium superhydride CeH<sub>9</sub> at 80-100 GPa with atomic hydrogen sublattice, *Nature Comm.*, 10:4453, <https://doi.org/10.1038/s41467-019-12326-y>, 2019.
179. Fu, S., J. Yang, S.-c. Karato, A. Vasiliev, M.Yu. Presniakov, A.G. Gavrilliuk, A.G. Ivanova, E.H. Hauri, T. Okuchi, N. Purevjav, and **J.F. Lin**, Water concentration in single-crystal (Al,Fe)-bearing bridgmanite grown from the hydrous melt: implications for dehydration melting at the topmost lower mantle, *Geophys. Res. Lett.*, 10.1029/2019GL084630, 2019.
178. Yamamoto, Y., H. Yamaoka, S. Onari, M. Yoshida, N. Hirao, S. Kawaguchi, Y. Oishi, X. Miao, Y. Kubozono, **J.F. Lin**, N. Hiraoka, H. Ishii, Y.-F. Liao, K.-D. Tsuei, and J. Mizuki, Study of the Pressure-Induced Second Superconducting Phase of (NH<sub>3</sub>)<sub>y</sub>Cs<sub>0.4</sub>FeSe with Double-Dome Superconductivity, *J. Phy. Soc. Japan*, 88, 074704, 2019.
177. Zhang, Y., C. Yang, J. Hong, A. Alatas, A. H. Said, N.P. Salke, J. Yang, and **J.F. Lin**, Pressure effect on Kohn anomaly and electronic topological transition in single-crystal tantalum, *Phys. Rev. B*, 100, 075145, 2019.
176. Fu, S., J. Yang, N. Tsujino, T. Okuchi, N. Purevjav, and **J.F. Lin**, Single-crystal elasticity of (Al,Fe)-bearing bridgmanite and seismic anisotropy at the topmost lower mantle, *Earth Planet. Sci. Lett.*, 518, 116-126, <https://doi.org/10.1016/j.epsl.2019.04.023>, 2019.
175. Liu, J., W. Wang, H. Yang, Z. Wu, M. Y. Hu, J. Zhao, W. Bi, E. E. Alp, N. Dauphas, W. Liang, B. Chen, and **J.F. Lin**, Carbon isotopic signatures of diamond formation mediated by iron redox chemistry, *Geochemical Prospective Letters*, 10, 51-55, doi: 10.7185/geochemlet.1915, 2019.
174. Wiesner, M., R. Roberts, **J.F. Lin**, D. Akinwande, T. Hesjedal, L.B. Duffy, S. Wang, Y. Song, J. Jenczyk, S. Jurga, and B. Mroz, The effect of substrate and surface plasmons on symmetry breaking at the substrate interface of the topological insulator Bi<sub>2</sub>Te<sub>3</sub>, *Sci. Rep.*, 9, 6147, 2019.
173. Meng, X., T. Pandey, S. Fu, J. Yang, J. Jeong, K. Chen, A. Singh, F. He, X. Xu, A. K. Singh, **J.F. Lin**, and Y. Wang, Thermal conductivity enhancement in MoS<sub>2</sub> under extreme strain, *Phys. Rev. Lett.*, 122, 155901, <https://doi.org/10.1103/PhysRevLett.122.155901>, 2019.
172. Jeong, J., X. Meng, A.-K. Rockwell, S.R. Bank, W.-P. Hsieh, **J.F. Lin**, and Y. Wang, Picosecond transient thermoreflectance technique for measuring thermal conductivity in thin-films, *Nanoscale and Microscale Thermophysical Engineering*, 23:3, 211-221 <https://doi.org/10.1080/15567265.2019.1580807>, 2019.
171. Fan, D., S. Fu, S.N. Tkachev, V. B. Prakapenka, and **J.F. Lin**, Elasticity of single-crystal periclase (MgO) at high pressure and temperature: application to the effect of iron on seismic parameters of ferropericlase in the lower mantle, *Am. Miner.*, 104 (2), 262-275, 2019.
170. Yang, H., **J.F. Lin**, M.Y. Hu, M. Roskosz, W. Bi, J. Zhao, E.E. Alp, J. Liu, J.C. Liu, R.M.

Wentzcovitch, T. Okuchi, and N. Dauphas, Iron isotopic fractionation in mineral phases from Earth's lower mantle: Did terrestrial magma ocean crystallization fractionate iron isotopes?, *Earth Planet. Sci. Lett.*, 506, 113-122, 2019.

## 2018

169. Guo, S., X. Huang, S. Tkachev, X. Fu, **J.F. Lin**, X. Li, Z. Mao, Q. Zhou, F. Li, and T. Cui, Elastic Stability of CO<sub>2</sub> phase I under High Temperature and High Pressure, 98, 134107, *Phys. Rev. B*, 2018.
168. Zhu, W., L. Liang, R. Roberts, **J.F. Lin**, and D. Akinwande, Anisotropic electron-phonon interactions in angle-resolved Raman study of strained black phosphorus, *ACS Nano*, 12, 12512-12522, 2018.
167. **Lin, J.F.**, Z. Mao, J. Yang, and S. Fu, Elasticity of the Lower-Mantle Bridgmanite, *Nature (Communications Arising)*, 564, E18-E26, <https://doi.org/10.1038/s41586-018-0741-7>, 2018.
166. Fu, S., J. Yang, Y. Zhang, J. Liu, E. Greenberg, V.B. Prakapenka, T. Okuchi, and **J.F. Lin**, Melting behavior of the lower-mantle ferropericlase across the spin crossover: Implication for the ultra-low velocity zones at the lowermost mantle, *Earth Planet. Sci. Lett.*, 503, 1-9, <https://doi.org/10.1016/j.epsl.2018.09.014>, 2018.
165. Dauphas, N., M.Y. Hu, E.M. Baker, J. Hu, Francois L.H. Tissot, E.E. Alp, M. Roskosz, J. Zhao, W. Bi, J. Liu, **J.F. Lin**, N. X. Nie, and A. Heard, SciPhon: a Data Analysis Software for Nuclear Resonant Inelastic X-ray Scattering with Applications to Fe, Kr, Sn, Eu and Dy, *J. Sync. Rad.*, 25, 1581-1599, 2018.
164. 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, <https://doi.org/10.1029/2018GL077764>, 2018.
163. Zhang, C.W., **J.F. Lin**, Y. Liu, S. Feng, C. Jin, M. Hou, and T. Yoshino, Electrical conductivity of Fe-C alloy at high pressure: effects of carbon as a light element on the thermal conductivity of the Earth's core, *J. Geophys. Res.*, 123, <https://doi.org/10.1029/2017JB015260>, 2018.
162. Meng, X., Y. Zhou, K. Chen, W. Wu, **J.F. Lin**, R.T. Chen, X. Xu, and Y. Wang, Anisotropic Saturable and Excited-State Absorption in Bulk ReS<sub>2</sub>, *Ad. Optical Mat.*, 1800137, <https://doi.org/10.1002/adom.201800137>, 2018.
161. Fu, X., F. Li, **J.F. Lin**, Y. Gong, X. Huang, Y. Huang, H. Gao, Q. Zhou, and T. Cui, Coupling-Assisted Renormalization of Excitons and Vibrations in Compressed MoSe<sub>2</sub>-WSe<sub>2</sub> Heterostructure, *J. Phys. Chem. C*, DOI: 10.1021/acs.jpcc.8b01453, 2018.
160. Hsieh, W.-P., F. Deschamps, T. Okuchi, and **J.F. Lin**, Effects of iron on the lattice thermal conductivity and dynamics of Earth's deep mantle, *Proc. Natl. Acad. Sci.*, 115 (16), 4099-4104, [doi/10.1073/pnas.1718557115](https://doi.org/10.1073/pnas.1718557115), 2018.
159. Kim, J.-S., R. Juneja, N.P. Salke, W. Palosz, V. Swaminathan, S. Trivedi, A.K. Singh, D. Akinwande, and **J.F. Lin**, Structural, Vibrational, and Electronic Topological Transitions of Bi<sub>1.5</sub>Sb<sub>0.5</sub>Te<sub>1.8</sub>Se<sub>1.2</sub> under Pressure, *J. App. Phys.*, 123, 115903, <https://doi.org/10.1063/1.5018857>, 2018.
158. Zhang, Y., T. Sekine, **J.F. Lin**, H. He, F. Liu, M. Zhang, T. Sato, W. Zhu, and Y. Yu, Shock compression and melting of an Fe-Ni-Si alloy: implications for the temperature profile of the Earth's core and the heat flux across the core-mantle boundary, *J. Geophys. Res.*, 123, 1314-1327, [10.1002/2017JB014723](https://doi.org/10.1002/2017JB014723), 2018.

157. Li, X., Z. Zhang, **J. F. Lin**, H. Ni, V.B. Prakapenka, and Z. Mao, New high pressure phase of  $\text{CaCO}_3$  at the topmost lower mantle: Implication for the Deep Mantle Carbon Transportation, *Geophys. Res. Lett.*, 10.1002/2017GL076536, 2018.
156. Yamaoka, H., N. Tsujii, Y. Yamamoto, **J.F. Lin**, N. Hiraoka, H. Ishii, K.-D. Tsuei, and J. Mizuki, Reentrant valence transition in  $\text{YbCu}_{4.5}$  under pressure, *Phys. Rev. B*, 97, 085106, 2018.
155. Befus, K.S., **J.F. Lin**, M. Cisneros, and S. Fu, Feldspar Raman shift and application as a magmatic thermobarometer, *Am. Miner.*, 103, 600-609, 10.2138/am-2018-6157, 2018.
154. Kim, J.-S., R. Ahmad, T. Pandey, A. Rai, S. Feng, J. Yang, M. Terrones, S.K. Banerjee, A. K. Singh, D. Akinwande, and **J.F. Lin**, Towards Band Structure and Band Offset Engineering of Monolayer Transition Metal Disulfides via Strain and Composition, *2D Materials*, 5, 015008, 2018.

## 2017

153. Zhao, J., W. Bi, S. Sinogiekien, M. Hu, E. Alp, X.C. Wang, C. Jin, and **J.F. Lin**, A compact membrane-driven diamond anvil cell and cryostat system for nuclear resonant scattering at high pressure and low temperature, *Rev. Sci. Instrum.*, 88, 125109, <https://doi.org/10.1063/1.4999787>, 2017.
152. Dygert, N., **J.F. Lin**, E.W. Marshall, Y. Kono, and J.E. Gardner, A low viscosity lunar magma ocean forms a stratified anorthitic flotation crust with mafic poor and rich units, *Geophys. Res. Lett.*, 44, <https://doi.org/10.1002/2017GL075703>, 2017.
151. Lobanov, S.S., N. Holtgrewe, **J.F. Lin**, and A.F. Goncharov, Radiative conductivity and abundance of post-perovskite in the lowermost mantle, *Earth Planet. Sci. Lett.*, 479, 43-49, 2017.
150. Yamaoka, H., Y. Yamamoto, **J.F. Lin**, J.J. Wu, X. Wang, C. Jin, M. Yoshida, S. Onari, S. Ishida, Y. Tsuchiya, N. Takeshita, N. Hiraoka, H. Ishii, K.-D. Tsuei, P. Chow, Y. Xiao, and J. Mizuki, Electronic structures and spin states of  $\text{BaFe}_2\text{As}_2$  and  $\text{SrFe}_2\text{As}_2$  probed by x-ray emission spectroscopy at Fe and As K-absorption edges, 96, 085129, *Phys. Rev. B*, 2017.
149. Fu, X., F. Li, **J.F. Lin**, Y. Gong, X. Huang, Y. Huang, B. Han, Q. Zhou, and T. Cui, Pressure-dependent light emission of charged and neutral excitons in monolayer  $\text{MoSe}_2$ , *J. Phys. Chem. Lett.*, 8, 3556-3563, DOI: 10.1021/acs.jpcclett.7b01374, 2017.
148. Hsieh, W.-P., F. Deschamps, T. Okuchi, and **J.F. Lin**, Reduced lattice thermal conductivity of (Fe,Al)-bearing bridgmanite in Earth's deep lower mantle, *J. Geophys. Res. Solid Earth*, 122, 4900-4917, doi:10.1002/2017JB014339, 2017.
147. Yamaoka, H., N. Tsujii, M.-T. Suzuki, Y. Yamamoto, I. Jarrige, H. Sato, **J.F. Lin**, T. Mito, J. Mizuki, H. Sakurai, O. Sakai, N. Hiraoka, H. Ishii, K.-D. Tsuei, M. Giovannini, and E. Bauer, Pressure-induced anomalous valence crossover in cubic  $\text{YbCu}_5$ -based compounds, *Sci. Rep.*, 7, 5846, 2017.
146. Chen, K., R. Ghosh, X. Meng, A. Roy, J.-S. Kim, F. He, S.C. Mason, X. Xu, **J.F. Lin**, D. Akinwande, S.K. Banerjee, and Y. Wang, Experimental evidence of exciton capture by mid-gap defects in CVD grown monolayer  $\text{MoSe}_2$ , *npj 2D Materials and Applications*, 1:15, doi:10.1038/s41699-017-0019-1, 2017.
145. Lobanov, S.S., H. Hsu, **J.F. Lin**, T. Yoshino, and A.F. Goncharov, Optical signatures of low spin  $\text{Fe}^{3+}$  in the Earth's lower mantle, *J. Geophys. Res.*, 10.1002/2017JB014134, 2017.

144. Xu, S.Z., **J.F. Lin**, and D. Morgan, Iron partitioning between ferropericlasite and bridgmanite in the Earth's lower mantle, *J. Geophys. Res. Solid Earth*, 122, doi:10.1002/2016JB013543, 2017.
143. Wu, X., **J.F. Lin**, P. Kaercher, Z. Mao, J. Liu, H.-R. Wenk, and V. Prakapenka, Seismic anisotropy of the D'' Layer induced by (001) deformation of post-perovskite, *Nature Comm.*, 8, 14669, DOI: 10.1038/ncomms14669, 2017.
142. Fu, S., J. Yang, and **J.F. Lin**, Abnormal elasticity of single-crystal magnesiosiderite across the spin transition in Earth's lower mantle, *Phys. Rev. Lett.*, <https://doi.org/10.1103/PhysRevLett.118.036402>, 118, 036402, 2017.
141. Liu, J., Dauphas, N., M. Roskosz, M. Hu, H. Yang, W. Bi, J. Zhao., E.E. Alp, J.Y. Hu, and **J.F. Lin**, Iron isotopic fractionation between silicate mantle and metallic core under high-pressure conditions, *Nature Comm.*, 8, 14377, DOI:10.1038/ncomms14377, 2017.
140. Kaminsky, F.V., and **J.F. Lin**, Iron partitioning in natural lower-mantle minerals: Toward a chemically heterogeneous lower mantle, *Am. Miner.*, 102, 824-832, 2017.
139. Mao, Z., F. Wang, **J.F. Lin**, S. Fu, J. Yang, X. Wu, T. Okuchi, N. Tomioka, V. Prakapenka, Y. Xiao, and P. Chow, Equation of state and hyperfine parameters of high-spin bridgmanite in the Earth's lower mantle by synchrotron X-Ray diffraction and Mossbauer spectroscopy, *Am. Miner.*, 102, 357-368, 2017.

## 2016

138. Liu, J., **J.F. Lin**, V. Prakapenka, C. Prescher, and T. Yoshino, Phase relations of Fe<sub>3</sub>C and Fe<sub>7</sub>C<sub>3</sub> up to 185 GPa and 5200 K: Implication for the stability of iron carbide in the Earth's core, *Geophys. Res. Lett.*, 43, 12,415–12,422, 10.1002/2016GL071353, 2016.
137. Lu, P., J.-S. Kim, J. Yang, H. Gao, J. Wu, D. Shao, B. Li, D.W. Zhou, J. Sun, D. Akinwande, D. Xing, and **J.F. Lin**, Origin of superconductivity in the Weyl semimetal WTe<sub>2</sub> under pressure, *Phys. Rev. B*, 94, 224512, 2016.
136. Wu, X., Y. Wu, **J.F. Lin**, J. Liu, Z. Mao, X. Guo, T. Yoshino, C.A. McCammon, V. Prakapenka, and Y. Xiao, Two-stage spin transition of iron in FeAl-bearing phase D at lower mantle, *J. Geophys. Res.*, doi:10.1002/2016JB013209, 2016.
135. 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.
134. Yamaoka, H., Y. Yamamoto, E.F. Schwier, N. Tsujii, M. Yoshida, Y. Ohta, H. Sakurai, **J.F. Lin**, N. Hiraoka, H. Ishii, K.-D. Tsuei, M. Arita, K. Shimada, and J. Mizuki, Pressure-induced phase transition in LaCoS studied by x-ray emission spectroscopy, x-ray diffraction and density functional theory, *Phys. Rev. B*, 94, 165156, DOI: 10.1103/PhysRevB.94.165156, 2016.
133. Li, Z.-Y., X. Li, J.-G. Cheng, L.G. Marshall, X.-Y. Li, A.M. dos Santos, W.-G. Yang, J.J. Wu, **J.F. Lin**, G. Henkelman, T. Okada, Y. Uwatoko, H.B. Cao, H.D. Zhou, J.B. Goodenough, and J.-S. Zhou, Anomalous bulk modulus in vanadate spinels, *Phys. Rev. B.*, 94, 165159, <https://doi.org/10.1103/PhysRevB.94.165159>, 2016.
132. Wu, Y., J. Yang, X. Wu, M. Song, T. Yoshino, S. Zhai, S. Qin, H. Huang, and **J.F. Lin**, Elasticity of single-crystal NAL phase at high pressure: A potential source of the seismic anisotropy in the lower mantle, *J. Geophys. Res.*, DOI: 10.1002/2016JB013136, 2016.
131. Li, X., Z. Mao, N. Sun, Y. Liao, S. Zhai, Y. Wang, H. Ni, J. Wang, S.N. Tkachev, and **J.F. Lin**, Elasticity of Single-crystal superhydrous phase B at simultaneous high pressure-

- temperature conditions, *Geophys. Res. Lett.*, DOI: 10.1002/2016GL070027, 2016.
130. Yamamoto, Y., H. Yamaoka, M. Tanaka, H. Okazaki, T. Ozaki, Y. Takano, **J.F. Lin**, H. Fujita, T. Kagayama, K. Shimizu, N. Hiraoka, H. Ishii, K.-D. Tsuei, and J. Mizuki, Origin of pressure-induced superconducting phase in  $K_xFe_{2-y}Se_2$  studied by synchrotron X-ray diffraction and spectroscopy, *Sci. Rep.*, 6, 30946, 2016.
  129. Wang, Y.Q., P.C. Lu, J.J. Wu, J. Liu, J.Y. Zhao, W. Bi, E.E. Alp, C.Y. Park, D. Popov, C.Q. Jin, J. Sun, and **J.F. Lin**, Phonon density of states of single-crystal  $SrFe_2As_2$  across the collapsed phase transition at high pressure, *Phys. Rev. B*, 94, 014516, 2016.
  128. **Lin, J.F.**, Z. Mao, J. Yang, J. Liu, Y. Xiao, P. Chow, and T. Okuchi, High-spin  $Fe^{2+}$  and  $Fe^{3+}$  in single-crystal aluminous bridgmanite in the lower mantle, *Geophys. Res. Lett.*, 10.1002/2016GL069836, 2016.
  127. Chen, K., M.N. Yogeesh, Y. Huang, S. Zhang, F. He, X. Meng, S. Fang, N. Sheehan, T. H. Tao, S. R. Bank, **J.F. Lin**, D. Akinwande, P. Sutter, T. Lai, and Y. Wang, Non-destructive measurement of photoexcited carrier transport in graphene with ultrafast grating imaging technique, DOI: 10.1016/j.carbon.2016.05.075, *CARBON* 11039, 2016.
  126. Sun, N., Z. Mao, S. Yan, X. Wu, and V.B. Prakapenka, **J.F. Lin**, Confirming a pyrolytic lower mantle using self-consistent pressure scales and new constraints on  $CaSiO_3$ -Perovskite, *J. Geophys. Res.*, 121, 4876-4894, doi:10.1002/2016JB013062, 2016.
  125. Pandey, T., A.P. Nayak, J. Liu, S. T. Moran, J.-S. Kim, L.-J. Li, **J.F. Lin**, D. Akinwande, and A.K. Singh, Pressure-induced charge transfer doping of monolayer graphene/MoS<sub>2</sub> heterostructure, *Small*, 12, 4063-4069, DOI: 10.1002/sml.201600808, 2016.
  124. Chen, B., **J.F. Lin**, J.H. Chen, H.Z. Zhang, and Q.S. Zeng, Synchrotron-based high-pressure research in materials science, *MRS Bulletin*, 41, 473-478, 2016.
  123. Beam, J., J. Yang, J. Liu, C. Liu, and **J.F. Lin**, Elasticity of methane clathrate phases at high pressures, *J. Chem. Phys.*, 144, 154501, 2016.
  122. Kim, J.-S., S. Moran, A.P. Nayak, S. Pedahzur, I. Ruiz, G. Ponce, D. Rodriguez, J. Henny, J. Liu, **J.F. Lin**, and D. Akinwande, High pressure phonon and Raman scattering study of  $Mo_{0.5}W_{0.5}S_2$  ternary compound, *2D Materials*, 3, 025003, 2016.
  121. Liu, J., **J.F. Lin**, A. Alatas, M. Hu, J. Zhao, and L. Dubrovinsky, Seismic parameters of hcp-Fe alloyed with Ni and Si in the Earth's inner core, *J. Geophys. Res.*, 10.1002/2015JB012625, 2016.
  120. Wu, Y., X. Wu, **J.F. Lin**, C.A. McCammon, Y. Xiao, P. Chow, T. Yoshino, S.M. Zhai, S. Qin, and V.B. Prakapenka, Spin transition of ferric iron in the NAL phase: implications for the seismic heterogeneities of subducted slabs in the lower mantle, *Earth Planet. Sci. Lett.*, 434, 91-100, 2016.
  119. Rettie, A.J.E., W.D. Chemelewski, B.R. Wygant, J. Lindemuth, **J.F. Lin**, D. Eisenberg, C. S. Brauer, T.J. Johnson, T.N. Beiswenger, R.D. Ash, X. Li, J. Zhou, and C.B. Mullins, Synthesis, electronic transport and optical properties of Si: $\alpha$ - $Fe_2O_3$  single crystals, *J. Mater. Chem. C*, 4, 559, DOI: 10.1039/c5tc03368c, 2016.

## 2015

118. Yamaoka, H., Y. Yamamoto, E.F. Schwier, F. Honda, Y. Zekko, Y. Ohta, **J.F. Lin**, M. Nakatake, H. Iwasawa, M. Arita, K. Shimada, N. Hiraoka, H. Ishii, K.-D. Tsuei, and J. Mizuki, Pressure and temperature dependence of the Ce valence and c-f hybridization gap in  $CeT_2In_5$  (T=Co, Rh, Ir) heavy fermion superconductors, *Phys. Rev. B*, 92, 235110, 2015.

117. Yang, J., X. Tong, **J.F. Lin**, N. Tomioka, T. Okuchi, and V. B. Prakapenka, Elasticity of ferropericlasite across the spin crossover in the Earth's lower mantle, *Sci. Rep.*, 5, 17188, DOI: 10.1038/srep17188, 2015.
116. Nayak, A.P., Z. Yuan, B. Cao, J. Liu, J. Wu, S. T. Moran, T. Li, D. Akinwande, C. Jin, and **J.F. Lin**, Pressure-modulated conductivity, carrier density, and mobility of multilayered tungsten disulfide, *ACS Nano*, 9, 9117-9123, 2015.
115. Fan, D., Z. Mao, J. Yang, and **J.F. Lin**, Determination of the full elastic tensor of single crystals using shear wave velocities by Brillouin spectroscopy, *Am. Miner.*, 100, 2590-2601, 2015.
114. Mao, Z., D. Fan, **J.F. Lin**, J. Yang, S.N. Tkachev, and V.B. Prakapenka, Elasticity of single-crystal olivine at high pressures and temperatures, *Earth Planet. Sci. Lett.*, 426, 204-215, 2015.
113. Mao, Z., **J.F. Lin**, J. Yang, T. Inoue, and V.B. Prakapenka, Effects of the Fe<sup>3+</sup> spin transition on the equation of state of bridgmanite, *Geophys. Res. Lett.*, 42, 4335-4342, 10.1002/2015GL064400, 2015.
112. Xiong, L., J. Liu, L.G. Bai, C.L. Lin, D. W. He, X.X. Zhang, and **J.F. Lin**, Strength of tungsten triboride under pressure up to 86 GPa from radial X-ray diffraction, 621, 116-120, *Journal of Alloys and Compounds*, 2015.
111. Bi, W., J. Zhao, **J.F. Lin**, Q. Jia, M. Hu, C. Jin, R. Ferry, W. Yang, V. Struzhkin, and E.E. Alp, Nuclear resonant inelastic X-ray scattering at high pressure and low temperature, *J. Synchrotron Radiat.*, 22, 760-765, 2015.
110. Goncharov, A.F., S.S. Lobanov, X. Tan, Gregory T. Hohensee, D.G. Cahill, **J.F. Lin**, S.-M. Thomas, T. Okuchi, and N. Tomioka, Experimental study of thermal conductivity at high pressures: implications for the Deep Earth's interior, *Phys. Earth Planet. Inter.*, <http://dx.doi.org/10.1016/j.pepi.2015.02.004>, 2015.
109. Okuchi, T., N. Purevjav, N. Tomioka, **J.F. Lin**, T. Kuribayashi, L. Schoneveld, H. Hwang, N. Sakamoto, N. Kawasaki, and H. Yurimoto, Synthesis of large and homogeneous single crystals of water-bearing minerals by slow cooling at deep-mantle pressures, *Am. Miner.*, 100, 1483-1492, 2015.
108. Liu, J., **J.F. Lin**, and V.B. Prakapenka, High-pressure orthorhombic ferromagnesite as a potential deep-mantle carbon carrier, *Sci. Rep.*, 5, 7640, DOI: 10.1038/srep07640, 2015.
107. Nayak, A.P., T. Pandey, D. Voiry, J. Liu, S. T. Moran, A. Sharma, C. Tan, C.-H. Chen, L.-J. Li, M. Chhowalla, **J.F. Lin**, A. Singh, and D. Akinwande, Pressure-dependent optical and vibrational properties of the monolayer molybdenum disulfide, 15, 346-353, *Nano Lett.*, 2015.

## 2014

106. Liu, J., and **J.F. Lin**, Abnormal acoustic velocities in compressed (Fe,Al)-bearing and basaltic silicate glasses, *Geophys. Res. Lett.*, 41, 8832-8839, doi:10.1002/2014GL062053 2014.
105. Xiong, L., J. Liu, L. Bai, X. Li, C. Lin, and **J.F. Lin**, Strength and structural phase transitions of gadolinium at high pressure from radial x-ray diffraction, *J. Appl. Phys.*, 116, 243503, 2014.
104. **Lin, J.F.**, J. Wu, J. Zhu, Z. Mao, A. H. Said, B. M. Leu, J. Cheng, Y. Uwatoko, C. Jin, and J. Zhou, Abnormal elastic and vibrational behaviors of magnetite at high pressures, *Sci. Rep.*, 2, 6282, 2014.

103. Yamaoka, H., Y. Ikeda, I. Jarrige, N. Tsujii, Y. Zekko, Y. Yamamoto, J. Mizuki, **J.F. Lin**, N. Hiraoka, H. Ishii, K.-D. Tsuei, T.C. Kobayashi, F. Honda, and Y. Onuki, Role of valence fluctuations in the superconductivity of Ce122 compounds, *Phys. Rev. Lett.*, 113, 086403, 2014.
102. Mao, Z., **J.F. Lin**, J. Yang, H. Bian, J. Liu, H.W. Watson, S. Huang, J. Chen, V.B. Prakapenka, Y. Xiao, and P. Chow, (Fe,Al)-bearing post-perovskite in the Earth's lower mantle, *Earth Planet. Sci. Lett.*, 403, 157-165, 2014.
101. Liu, J., **J.F. Lin**, A. Alatas, and W. Bi, Sound velocities of bcc-Fe and Fe<sub>0.85</sub>Si<sub>0.15</sub> alloy at high pressure and temperature, *Phys. Earth Planet. Inter.*, 233, 24-32, 2014.
100. Nayak, A.P., S. Bhattacharyya, J. Zhu, J. Liu, X. Wu, T. Pandey, A.K. Singh, D. Akinwande, and **J.F. Lin**, Pressure-induced electronic transition in multilayered MoS<sub>2</sub>, *Nature Comm.*, 5, 3731, 2014.
99. Zekko, Y., Y. Yamamoto, H. Yamaoka, F. Tajima, T. Nishioka, Y. Ikeda, F. Strigari, A. Severing, **J.F. Lin**, N. Hiraoka, H. Ishii, K.-D. Tsuei, and J. Mizuki, Correlation of Ce valence state to magnetic transition in Ce(Ru<sub>1-x</sub>Fe<sub>x</sub>)<sub>2</sub>Al<sub>10</sub> studied by resonant x-ray emission spectroscopy, *Phys. Rev. B.*, 89, 125108, 2014.
98. Rettie, A.J.E., K.C. Klavetter, **J.F. Lin**, A. Dolocan, H. Celio, A. Ishiekwene, H. L. Blton, K. N. Pearson, N. T. Hahn, and C.B. Mullins, Improved visible light harvesting of WO<sub>3</sub> by incorporation of sulfur or iodine: A tale of two impurities, *Chemistry of Materials*, 26, 1670-1677, 2014.
97. Chemelewski, W.D., H.-C. Lee, **J.F. Lin**, A. J. Bard, and C.B. Mullins, Amorphous FeOOH oxygen evolution reaction co-catalyst for photoelectrochemical water splitting, *J. Am. Chem. Soc.*, **136**, 2843-2850, 2014.
96. **Lin, J.F.**, E.E. Alp, and A.F. Goncharov, Raman and Nuclear Resonant Spectroscopy in Geosciences. In: Holland H.D. and Turekian K.K. (eds.) Treatise on Geochemistry, Second Edition, vol. 15, pp. 195-211, <http://dx.doi.org/10.1016/B978-0-08-095975-7.01414-5>, Oxford: Elsevier (2014).
95. Yang, J., Z. Mao, **J.F. Lin**, and V.B. Prakapenka, Single-crystal elasticity of the deep-mantle magnesite at high pressure and temperature, *Earth Planet. Sci. Lett.*, 392, 292-299, <http://dx.doi.org/10.1016/j.epsl.2014.01.027>, 2014.
94. Wu, J.J., **J.F. Lin**, X.C. Wang, Q.Q. Liu, J.L. Zhu, Y.M. Xiao, P. Chow, and C.Q. Jin, Magnetic and structural transitions of the iron-based superconductor SrFe<sub>2</sub>As<sub>2</sub> parent compound at high pressures and low temperatures, *Sci. Rep.*, 4, 3685, DOI: 10.1038/srep03685, 2014.
93. Mao, Z., **J.F. Lin**, J. Yang, J. Wu, H. C. Watson, Y. Xiao, P. Chow, and J. Zhao, Spin and valence state of iron in Al-bearing silicate glass at high pressures studied by synchrotron Mössbauer and X-ray emission spectroscopy, *Am. Miner.*, 99, 415-423, 2014.
92. Sato, H., H. Yamaoka, Y. Utsumi, H. Nagata, M. A. Avila, R. A. Ribeiro, K. Umeo, T. Takabatake, Y. Zekko, J. Mizuki, **J.F. Lin**, N. Hiraoka, H. Ishii, K. D. Tsuei, H. Namatame, and M. Taniguchi, Pressure-induced valence change in YbNiGe<sub>3</sub> investigated by resonant x-ray emission spectroscopy at Yb L<sub>3</sub> edge, *Phys. Rev. B*, 89, 045112, 2014.
91. Liu, J., **J.F. Lin**, Z. Mao, and V.B. Prakapenka, Thermal equation of state and spin transition of magnesiosiderite at high pressure and temperature, *Am. Miner.*, 99, 84-93, doi: 10.2138/am.2014.4553, 2014.

90. Wu, J.J., **J.F. Lin**, X.C. Wang, Q.Q. Liu, J.L. Zhu, Y. Xiao, P. Chow, and C. Jin, Pressure-decoupled magnetic and structural transitions of the parent compound of iron-based 122 superconductors  $\text{BaFe}_2\text{As}_2$ , *Proc. Natl. Acad. Sci.*, 110, 17263-17266, 2013.
89. Cheng, J.-G., J.-S. Zhou, K. Kweon, J.A. Alonso, Y. Liu, C.-Q. Jin, J.J. Wu, **J.F. Lin**, W.-G. Yang, G. Shen, S. Larregola, A. MacDonald, A. Manthiram, G. Hwang, and J.B. Goodenough, Anomalous perovskite  $\text{PbRuO}_3$  stabilized under high pressure, *Proc. Natl. Acad. Sci.*, 110, 20003-20007, 2013.
88. Lin, C.L., Y.C. Li, X.D. Li, R. Li, **J.F. Lin**, and J. Liu, Pressure-induced structural evolution and amorphization in  $\text{Eu}_3\text{Ga}_5\text{O}_{12}$ , *J. App. Phys.*, 114, 163521, 2013.
87. Chang, Y.-Y., S.D. Jacobsen, **J.F. Lin**, C.R. Bina, S.-M. Thomas, J. Wu, G. Shen, Y. Xiao, P. Chow, D.J. Frost, C.A. McCammon, and P. Dera, Spin transition of  $\text{Fe}^{3+}$  in Al-bearing dense hydrous magnesium silicate phase D, *Earth Planet. Sci. Lett.*, 382, 1-9, 2013.
86. Rettie, A.J.E., H.-C. Lee, L.G. Marshall, **J. F. Lin**, C. Capan, J. Lindemuth, J.S. McCloy, J. Zhou, A.J. Bard, and C.B. Mullins, Combined charge carrier transport and photoelectrochemical characterization of  $\text{BiVO}_4$  single crystals: intrinsic behavior of a complex metal oxide, *J. Am. Chem. Soc.*, 135, 11389-11396, 2013.
85. Lyubutin, I.S., **J.F. Lin**, A.G. Gavriliuk, A.A. Mironovich, A.G. Ivanova, and V.V. Roddatis, and A.L. Vasiliev, Spin transition of  $\text{Fe}^{2+}$  in Earth's transition-zone ringwoodite  $(\text{Mg,Fe})_2\text{SiO}_4$  at high pressures, *Am. Miner.*, 98, 1803-1810, 2013.
84. **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, DOI: 10.1002/rog.20010, 2013.
83. Scott, H.P., V.M. Doczy, M.R. Frank, M. Hasan, **J.F. Lin**, and J. Yang, Magnesite formation from  $\text{MgO}$  and  $\text{CO}_2$  at the pressures and temperatures of Earth's mantle, *Am. Miner.*, 98, 1211-1218, DOI: 10.2138/am.2013.4260, 2013.
82. Lyubutin, I.S., V.V. Struzhkin, A.A. Mironovich, A.G. Gavriliuk, P.G. Naumov, **J.F. Lin**, S. G. Ovchinnikov, S. Sinogeikin, P. Chow, Y. Xiao, and R.J. Hemley, Quantum critical point and spin fluctuations in the lower-mantle ferropericlase, *Proc. Natl. Acad. Sci.*, 110, 7142-7147, 2013.
81. Jarrige, I., H. Yamaoka, J.-P. Rue, **J.F. Lin**, M. Taguchi, N. Hiraoka, H. Ishii, K.D. Tsuei, K. Imura, T. Matsumura, A. Ochiai, and A. Kotani, Unified understanding of the valence transition in the rare-earth monochalcogenides under pressure, *Phys. Rev. B*, 87, 115107, 2013. <https://doi.org/10.1103/PhysRevB.87.115107>
80. Mao, Z., **J.F. Lin**, S. Huang, J. Chen, Y. Xiao, and P. Chow, Synchrotron Mössbauer study of Fe-bearing pyrope at high pressures and temperatures, *Am. Miner.*, 98, 1146-1152, 2013.
79. Lin, C., J. Liu, **J.F. Lin**, X. Li, Y. Li, Q. Zhang, L. Xiong, R. Li, Garnet-to-perovskite transition in  $\text{Gd}_3\text{Sc}_2\text{Ga}_3\text{O}_{12}$  at high pressure and high temperature, *Inorganic Chemistry*, 52, 431-434, 2013.
78. Yamaoka, H., N. Tsujii, Y. Utsumi, H. Sato, I. Jarrige, Y. Yamamoto, **J.F. Lin**, N. Hiraoka, H. Ishii, K.-D. Tsuei, and J. Mizuki, Valence transitions in the heavy fermion compound  $\text{YbCuAl}$  as a function of temperature and pressure, *Phys. Rev. B*, 87, 205120, 2013.
77. Hunter, L.R., J.E. Gordon, S. Peck, D. Ang, and **J.F. Lin**, Using the Earth as a polarized electron source to search for long-range spin-spin interactions, *Science*, 339, 928-932, 2013.
76. **Lin, J.F.**, Z. Mao, and E.E. Alp, Mössbauer Spectroscopy in studying electronic spin and valence states of iron in the Earth's lower mantle, *Mossbauer Spectroscopy: Applications in*



Chemistry, Biology, Industry, and Nanotechnology, Edited by V. K. Sharma, G. Klingelhofer and T. Nishida, Wiley STM, DOI: 10.1002/9781118714614.ch02, 2013.

75. Xiong, L., J. Liu, L.G. Bai, Y.C. Li, C.L. Lin, D.W. He, F. Peng, and **J.F. Lin**, Radial X-ray diffraction of tungsten tetraboride to 86 GPa under nonhydrostatic compression, *J. App. Phys.*, 113, 033507, 2013.
74. Lu, C., Z. Mao, **J.F. Lin**, K.K. Zhuravlev, S. Tkachev, and V.B. Prakapenka, Elasticity of single-crystal iron-bearing pyrope to 20 GPa and 750 K, *Earth Planet. Sci. Lett.*, 361, 134-142, 2013.

## 2012

73. Yamaoka, H., Y. Zekko, A. Kotani, I. Jarrige, N. Tsujii, **J.F. Lin**, J. Mizuki, N. Hiraoka, H. Ishii, and K.-D. Tsuei, Electronic transition in high-pressure low temperature CePd<sub>2</sub>Si<sub>2</sub> studied by resonant x-ray emission spectroscopy, *Phys. Rev. B*, 86, 235131, 2012.
72. Yamaoka, H., Y. Zekko, I. Jarrige, **J.F. Lin**, N. Hiraoka, H. Ishii, K.-D. Tsuei, and J. Mizuki, Ruby pressure scale in a low-temperature diamond anvil cell, *J. Appl. Phys.*, 112, 1-5, 2013.
71. Gavriluk, A.G., V.V. Struzhkin, S.G. Ovchinnikov, Y. Yu, M.M. Korshunov, A.A. Mironovich, **J.F. Lin**, and C.Q. Jin, P-T phase diagram of iron arsenide superconductor NdFeAsO<sub>0.88</sub>F<sub>0.12</sub>, *Eur. Phys. J.*, 100, 46005, 2012 (arXiv:1110.4909).
70. Mao, Z., **J.F. Lin**, J. Liu, A. Alatas, L. Gao, J. Zhao, and H.K. Mao, Sound velocities of Fe and Fe-Si alloys in the Earth's core, *Proc. Natl. Acad. Sci.*, 109, 10239-10244, 2012.
69. Mao, Z., **J.F. Lin**, S.D. Jacobsen, T.S. Duffy, Y.-Y. Chang, J. Smyth, D. J. Frost, E. Hauri, and V.B. Prakapenka, Sound velocities of hydrous ringwoodite to 16 GPa and 673 K, *Earth Planet. Sci. Lett.*, 331-332, 112-119, 2012.
68. **Lin, J.F.**, E.E. Alp, Z. Mao, T. Inoue, C. McCammon, Y. Xiao, P. Chow, and J. Zhao, Electronic spin states of ferric and ferrous iron in the lower-mantle silicate perovskite, *Am. Miner.*, 97, 592-597, 2012.
67. **Lin, J.F.**, J. Liu, C. Jacobs, and V.B. Prakapenka, Vibrational and elastic properties of ferromagnesite across the electronic spin-pairing transition of iron, *Am. Miner.*, 97, 583-591, 2012.
66. **Lin, J.F.**, and A.J. Wheat, Electronic spin transition of iron in Earth's lower mantle by Mössbauer spectroscopy, *Hyperfine Interactions*, 207, 81-88, DOI 10.1007/s10751-011-0420-7, 2012.

## 2011

65. Mao, Z., **J.F. Lin**, J. Liu, and V.B. Prakapenka, Thermal equation of state of lower-mantle ferropericlase across the spin crossover, *Geophys. Res. Lett.*, 38, L23308, 2011.
64. Yamaoka, H., I. Jarrige, N. Tsujii, A. Kotani, **J.F. Lin**, S. Tsutsui, F. Honda, R. Settai, Y. Onuki, N. Hiraoka, H. Ishii, and K.D. Tsuei, On the link between valence fluctuations and the suppression of superconductivity in CeIrSi<sub>3</sub> under pressure: A resonant x-ray emission spectroscopy study, *J. Phys. Soc. Jpn.*, 80, 124701, 2011.
63. Yamaoka, H., I. Jarrige, N. Tsujii, **J.F. Lin**, T. Ikeno, Y. Isikawa, K. Nishimura, R. Higashinaka, H. Sato, N. Hiraoka, H. Ishii, and K.D. Tsuei, Strong coupling between 4f valence instability and 3d ferromagnetism in Yb<sub>x</sub>Fe<sub>4</sub>Sb<sub>12</sub> studied by resonant x-ray emission spectroscopy, *Phys. Rev. Lett.*, 107, 177203, 2011.

62. Mao, Z., **J.F. Lin**, H.P. Scott, H. Watson, V.B. Prakapenka, Y. Xiao, and P. Chow, Stiff iron-rich silicate perovskite in the large low shear velocity provinces, *Earth Planet. Sci. Lett.*, 309, 179-184, 2011.
61. **Lin, J.F.**, J.S. Tse, E.E. Alp, J. Zhao, M. Lerche, W. Sturhahn, Y. Xiao, and P. Chow, Phonon density of states of Fe<sub>2</sub>O<sub>3</sub> across high-pressure structural and electronic transitions, *Phys. Rev. B*, 84, 064424, 2011.
60. Yamaoka, H., I. Jarrige, N. Tsujii, M. Imai, **J.F. Lin**, M. Matsunami, R. Eguchi, M. Arita, K. Shimada, H. Namatame, M. Taniguchi, M. Taguchi, Y. Senba, H. Ohashi, N. Hiraoka, H. Ishii, and K. D. Tsuei, Electronic structure of YbGa<sub>1.15</sub>Si<sub>0.85</sub> and YbGa<sub>x</sub>Ge<sub>2-x</sub> probed by resonant x-ray emission and photoelectron spectroscopies, *Phys. Rev. B*, 83, 104525, 2011.
59. Mao, Z., S.M. Dorfman, S. Shieh, **J.F. Lin**, V.B. Prakapenka, Y. Meng, and T.S. Duffy, Equation of state of a high-pressure phase of Gd<sub>3</sub>Ga<sub>5</sub>O<sub>12</sub>, *Phys. Rev. B*, 83, 054114, 2011.

## 2010

58. Dubrovinsky, L., **J.F. Lin**, and N. Dubrovinskaia, Mineral physics of Earth core: iron alloys at extreme condition, *High-Pressure Crystallography*, 0, 35-41, 2010.
57. Mao, Z., **J. F. Lin**, C. Jacobs, H. Watson, Y. Xiao, P. Chow, E.E. Alp, and V.B. Prakapenka, Electronic spin and valence states of Fe in CaIrO<sub>3</sub>-type post-perovskite in the Earth's lowermost mantle, *Geophys. Res. Lett.*, 37, L22304, 2010.
56. Yamaoka, H., I. Jarrige, A. Ikeda-Ohno, S. Tsutsui, **J.F. Lin**, N. Takeshita, K. Miyazawa, A. Iyo, H. Kito, H. Eisaki, N. Hiraoka, H. Ishii, and K.D. Tsuei, Hybridization and suppression of the superconductivity in CeFeAsO<sub>1-y</sub>: pressure and temperature dependences of the electronic structure, *Phys. Rev. B*, 82, 125123, 2010.
55. **Lin, J.F.**, Z. Mao, H. Yavas, J. Zhao, and L. Dubrovinsky, Shear wave anisotropy of textured hcp-Fe in Earth's inner core, *Earth Planet. Sci. Lett.*, 298, 361-366, 2010.
54. **Lin, J.F.**, Z. Mao, I. Jarrige, Y. Xiao, P. Chow, T. Okuchi, N. Hiraoka, and S.D. Jacobsen, Resonant X-ray emission study of the lower-mantle ferropericlase at high pressures, *Am. Miner.*, 95, 1125-1131, 2010.
53. Yamaoka, H., I. Jarrige, N. Tsujii, **J.F. Lin**, N. Hiraoka, H. Ishii, and K.-D. Tsuei, Temperature and pressure-induced valence transitions in YbNi<sub>2</sub>Ge<sub>2</sub> and YbPd<sub>2</sub>Si<sub>2</sub>, *Phys. Rev. B*, 82, 035111, 2010.
52. **Lin, J.F.**, S. Speziale, V.B. Prakapenka, P. Dera, B. Lavina, and H.C. Watson, X-ray diffraction and X-ray emission studies on iron-bearing silicate perovskite under high pressures, *High Pres. Res.*, 30, 230-237, 2010.

## 2009

51. Lyubutin, I.S., A.G. Gavriluk, K. V. Frolov, **J.F. Lin**, and I. A. Troyan, High-spin low-spin transition in Mg<sub>0.75</sub>Fe<sub>0.25</sub>O magnesiowüstite at high pressures under hydrostatic conditions, *J. Exp. Theor. Phys. Letters*, 90, 617-622, 2009.
50. **Lin, J.F.**, H.-R. Wenk, M. Voltolini, S. Speziale, J. Shu, and T. Duffy, Deformation of the lower-mantle ferropericlase across the electronic spin transition, *Phys. Chem. Miner.*, 36, 582-592, 2009.
49. **Lin, J.F.**, A.G. Gavriluk, W. Sturhahn, S. D. Jacobsen, J. Zhao, M. Lerche, and M. Hu, Synchrotron Mössbauer spectroscopic study of ferropericlase at high pressures and temperatures, *Am. Miner.*, 94, 594-599, 2009.

48. **Lin, J.F.**, H.P. Scott, R.A. Fischer, Y.-Y. Chang, I. Kantor, and V.B. Prakapenka, Phase relations of Fe-Si alloy in Earth's core, *Geophys. Res. Lett.*, 36, L06306, 2009.
47. Dubrovinsky, L., and **J. F. Lin**, Mineral Physics Quest to the Earth's Core, *Eos. Trans. American Geophysical Union*, **90**, 3, pages 21,28, 2009.

## 2008

46. Jacobsen, S.D., C.M. Holl, K. Adams, R. Fischer, E. Martin, C. Bina, **J.F. Lin**, V.B. Prakapenka, A. Kubo, and P. Dera, Compression of single-crystal magnesium oxide to 118 GPa and a ruby pressure gauge for helium pressure media, *Am. Miner.*, 93, 1823-1828, 2008. <https://doi.org/10.2138/am.2008.2988>
45. **Lin, J.F.**, H.C. Watson, G. Vankó, E.E. Alp, V.B. Prakapenka, P. Dera, V.V. Struzhkin, A. Kubo, J. Zhao, C. McCammon, and W.J. Evans, Intermediate-spin ferrous iron in lowermost mantle post-perovskite and perovskite, *Nature Geoscience*, 1, 688-691, 2008.
44. Lee, S.K., **J.F. Lin**, Y.Q. Cai, N. Hiraoka, P.J. Eng, T. Okuchi, H.-K. Mao, Y. Meng, M. Y. Hu, P. Chow, J. Shu, B. Li, H. Fukui, B. Lee, H. Kim, and C.-S. Yoo, X-ray Raman scattering study of MgSiO<sub>3</sub> glass at high pressure: implication for triclustered MgSiO<sub>3</sub> melt in Earth's mantle, *Proc. Natl. Acad. Sci.*, 105, 7925-7929, 2008. <https://doi.org/10.1073/pnas.0802667105>
43. **Lin, J.F.**, and T. Tsuchiya, Spin transition of iron in the Earth's lower mantle, *Phys. Earth Planet. Inter.*, 170, 248-259, 2008.

## 2007

42. Struzhkin, V.V., M.I. Eremets, I.M. Eremets, **J.F. Lin**, W. Sturhahn, J. Zhao, and M.Y. Hu, Synchrotron Mössbauer spectroscopy and resistivity studies of iron oxide under high pressure, in *Materials Research at High Pressure*, M. R. Manaa et al., eds., pp. 161-166, Symposium Proceedings Vol. 987, Materials Research Society, Warrendale, Pennsylvania, 2007.
41. Zhao, J., W. Sturhahn, M. Lerche, **J.F. Lin**, and E.E. Alp, A new experimental capability for nuclear resonant scattering under simultaneous high pressure and high temperature at 3-ID, APS, *Synchrotron Radiation Instrumentation*, 879, 894-897, 2007.
40. Speziale, S., V.E. Lee, S.M. Clark, **J.F. Lin**, M.P. Pasternak, and R. Jeanloz, Effects of Fe spin transition on the elasticity of (Mg,Fe)O magnesiowüstites and implications for the seismological properties of the Earth's lower mantle, *J. Geophys. Res.*, 112, B10212, 2007.
39. **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.
38. **Lin, J.F.**, S.T. Weir, D.D. Jackson, W.J. Evans, and C.S. Yoo, Electrical conductivity of the low-spin ferropericlase in the Earth's lower mantle, *Geophys. Res. Lett.*, 34, L16305, 2007.
37. **Lin, J.F.**, V.V. Struzhkin, and A.G. Gavriluk, Comment on "Spin crossover in (Mg,Fe)O: A Mössbauer effect study with an alternative interpretation of x-ray emission spectroscopy data", *Phys. Rev. B*, 75, 177102, 2007.
36. **Lin, J.F.**, S.D. Jacobsen, and R.M. Wentzcovitch, Electronic spin transition of iron in the Earth's deep mantle, *Eos. Trans. American Geophysical Union*, **88**, 2, pages 13,17, 2007.
35. **Lin, J.F.**, H. Fukui, T. Okuchi, Y.Q. Cai, N. Hiraoka, C.S. Yoo, A. Trave, P. Eng, M.Y. Hu, and P. Chow, Electronic bonding transition in compressed SiO<sub>2</sub> glass, *Phys. Rev. B*, 75, 012201, 2007.

## 2006

34. **Lin, J.F.**, S.D. Jacobsen, W. Sturhahn, J.M. Jackson, J. Zhao, and C.S. Yoo, Sound velocities of ferropericlase in Earth's lower mantle, *Geophys. Res. Lett.*, 33, L22304, 2006.
33. **Lin, J.F.**, E. Schwegler, and C.S. Yoo, Phase diagram and physical properties of H<sub>2</sub>O at high pressures and temperatures: applications to planetary interiors, in American Geophysical Union Monograph 168, Earth's Deep Water Cycle, eds. by S. D. Jacobsen and S. van der Lee, pp. 159-169, American Geophysical Union, Washington, DC, 2006.
32. Li, J., W. Sturhahn, J.M. Jackson, V.V. Struzhkin, **J.F. Lin**, J. Zhao, H.-K. Mao, and G. Shen, Pressure effect on the electronic structure of iron in (Mg,Fe)(Al,Si)O<sub>3</sub> perovskite: A combined synchrotron Mössbauer and x-ray emission spectroscopy study up to 100 GPa, *Phys. Chem. Miner.*, 33, 575-585, 2006.
31. Chellappa, R., D. Chandra, S. Gramsch, R. J. Hemley, **J.F. Lin**, and Y. Song, Pressure-induced phase transformations in LiAlH<sub>4</sub>, *J. Phys. Chem. B.*, 110, 11088-11097, 2006.
30. Gavriluk, A.G. **J.F. Lin**, I.S. Lyubutin, and V.V. Struzhkin, Optimization of the conditions of synchrotron Mössbauer experiment for studying electron transitions at high pressures by the example of (Mg,Fe)O magnesiowüstite, *J. Exp. Theor. Phys. Letters*, 84, 161-166, 2006.
29. **Lin, J.F.**, A.G. Gavriluk, V.V. Struzhkin, S.D. Jacobsen, W. Sturhahn, M.Y. Hu, P. Chow, and C.S. Yoo, Pressure-induced electronic spin transition of iron in magnesiowüstite-(Mg,Fe)O, *Phys. Rev. B*, 73, 113107, 2006.
28. Struzhkin, V.V., H.K. Mao, **J.F. Lin**, R.J. Hemley, J.M. Tse, M. Hu, P. Chow, and C.C. Kao, Valence band X-ray emission spectra in compressed germanium, *Phys. Rev. Lett.*, 96, 137402, 2006.

## 2005

27. **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.
26. **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.
25. **Lin, J.F.**, E. Gregoryanz, V.V. Struzhkin, M. Somayazulu, H.K. Mao, and R.J. Hemley, Melting behavior of H<sub>2</sub>O at high pressures and temperatures, *Geophys. Res. Lett.*, 32, L11306, 2005.
24. **Lin, J.F.**, W. Sturhahn, J. Zhao, G. Shen, H.K. Mao, and R.J. Hemley, Nuclear resonant inelastic X-ray scattering and synchrotron Mössbauer spectroscopy with laser-heated diamond anvil cells, in *Advances in High-Pressure technology for Geophysical Applications*, eds. by J. Chen, Y. Wang, T. Duffy, G. Shen, and L. Dobrzhinetskaya, pp. 397-411, Elsevier B. V., Amsterdam, Netherlands, 2005.
23. Santoro, M., **J.F. Lin**, H.K. Mao, and R.J. Hemley, *In situ* Raman spectroscopy with laser-heated diamond anvil cells, in *Advances in High-Pressure technology for Geophysical Applications*, eds. J. Chen, Y. Wang, T. Duffy, G. Shen, and L. Dobrzhinetskaya, pp. 413-423, Elsevier B. V., Amsterdam, Netherlands, 2005.
22. Sturhahn, W., J.M. Jackson, and **J.F. Lin**, The spin state of iron in Earth's lower mantle minerals, *Geophys. Res. Lett.*, 32, L12307, 2005.

21. Jacobsen, S.D., **J.F. Lin**, G. Shen, V. Prakapenka, P. Dera, R.J. Angel, H.K. Mao, and R.J. Hemley, Single-crystal synchrotron X-ray diffraction study of wüstite and magnesiowüstite at lower mantle pressures, *J. Synchrotron Rad.*, 12, 577-583, 2005.
20. **Lin, J.F.**, V.V. Struzhkin, S.D. Jacobsen, G. Shen, V.B. Prakapenka, H.K. Mao, and R.J. Hemley, X-ray emission spectroscopy in a laser-heated diamond anvil cell: probing spin state of transition metals in the Earth's interior, *J. Synchrotron Rad.*, 12, 637-641, 2005.

## 2004

19. Zhao, J., W. Sturhahn, **J.F. Lin**, G. Shen, and H.K. Mao, Nuclear Resonant Scattering at High Pressure and High Temperature, *High Pressure Res.*, 24, 447-457, 2004.
18. **Lin, J.F.**, V. V. Struzhkin, H.K. Mao, R.J. Hemley, P. Chow, M. Hu, and J. Li, Magnetic transition in compressed Fe<sub>3</sub>C from X-ray emission spectroscopy, *Phys. Rev. B*, 70, 212405, 2004.
17. **Lin, J.F.**, B. Militzer, V.V. Struzhkin, E. Gregoryanz, H.K. Mao, and R.J. Hemley, High Pressure-Temperature Raman Measurements of H<sub>2</sub>O Melting to 22 GPa and 900 K, *J. Chem. Phys.*, 121, 8423-8427, 2004.
16. **Lin, J.F.**, M. Santoro, V. V. Struzhkin, H.K. Mao, and R.J. Hemley, *In situ* high pressure-temperature Raman spectroscopy technique with laser-heated diamond anvil cells, *Rev. Sci. Instrum.*, 75, 3302-3306, 2004.
15. **Lin, J.F.**, Y. Fei, W. Sturhahn, J. Zhao, H.K. Mao, and R.J. Hemley, Magnetic transition and sound velocities of Fe<sub>3</sub>S at high pressure: applications for Earth and planetary cores, *Earth Planet. Sci. Lett.*, 226, 33-40, 2004.
14. **Lin, J.F.**, W. Sturhahn, J. Zhao, G. Shen, H.K. Mao, and R.J. Hemley, Absolute temperature measurement in a laser-heated diamond anvil cell, *Geophys. Res. Lett.*, 31, L14611, doi:10.1029/2004GL020599, 2004.
13. **Lin, J.F.**, O. Degtyareva, C. Prewitt, P. Dera, E. Gregoryanz, H.K. Mao, and R.J. Hemley, Crystal structure of a high pressure-temperature phase of alumina by *in situ* X-ray diffraction study, *Nature Materials*, 3, 389-393, doi:10.1038/nmat1121, 2004.
12. M. Santoro, **J. F. Lin**, H.K. Mao, R.J. Hemley, *In situ* high P- T Raman spectroscopy and laser heating of carbon dioxide, *J. Chem. Phys.*, 121, 2780-2787, 2004.

## 2003

11. **Lin, J.F.**, V.V. Struzhkin, W. Sturhahn, E. Huang, J. Zhao, M. Y. Hu, E. Alp, H.K. Mao, N. Boctor, and R.J. Hemley, Sound velocities of iron-nickel and iron-silicon alloys in the Earth's core, *Geophys. Res. Lett.*, 30(21), 2112, 2003.
10. **Lin, J.F.**, J. Shu, H.K. Mao, R. J. Hemley, G. Shen, Amorphous boron gasket in diamond anvil cell research, *Rev. Sci. Instrum.*, 74, 11, 4732-4736, 2003.
9. **Lin, J.F.**, D.L. Heinz, H.K. Mao, R.J. Hemley, J.M. Devine, J. Li, and G. Shen, Stability of magnesiowüstite in the Earth's lower mantle, *Proc. Natl. Acad. Sci.*, 100, 4405-4408, 2003.
8. **Lin, J.F.**, A.J. Campbell, and D.L. Heinz, Static compression of iron-silicon alloys: implications for silicon in the Earth's core, *J. Geophys. Res.*, 108, 2045, 2003.

## 2002

7. **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, 10, 2002.

6. **Lin, J.F.**, D.L. Heinz, A.J. Campbell, J. M. Devine, and G. Shen, Iron-silicon alloy in the Earth's core?, *Science*, 295, 313-315, 2002.

#### **1995-2001**

5. Huang, E., J.A. Xu, **J.F. Lin**, and J.Z. Hu, Pressure-induced phase transitions in gypsum, *High Pressure Res.*, 17, 57-75, 2000.
4. Huang, E., **J.F. Lin**, J.A. Xu, Y.C. Jean, and H.S. Sheu, Compression studies of gibbsite and its high-pressure polymorph, *Phys. Chem. Miner.*, 26, 576-583, 1999.
3. Xu, J.A., E. Huang, **J.F. Lin**, and L.Y. Xu, Raman study at high pressure and the thermodynamic properties of corundum: Application of Kieffer's model, *Am. Mineral.*, 80, 1157-1165, 1995.
2. **Lin, J.F.**, E. Huang, and J.A. Xu, Raman Spectroscopic study of H<sub>2</sub>O at room temperature up to 24 GPa, *J. Geol. Soc. China*, 38, 1, 37-48, 1995.
1. Huang, E., **J. F. Lin**, J.A. Xu, and S.C. Yu, Raman spectroscopic study of diasporite up to 25 GPa, *J. Geol. Soc. China*, 38, 1, 25-26, 1995.

#### **News/Newsletters**

- J. F. Lin, Understanding electronic spin states of iron in the Earth's lower mantle, COMPRES Newsletter, Vol.5 No.3 and Vol.6 No.1, 1-3, January, 2007.

### **Scholarly Presentations and Meeting Organizations**

- Goldschmidt Conference 2023**, Lyon, USA (7/10/2022; talk)  
Hydrated Silica and Bridgmanite in Lower-Mantle Subducting Slabs
- Adam Mickiewicz University**, Faculty of Physics (5/31/2023; invited)  
Compressive Strain Engineering of 2D Materials
- Center for Matter at Atomic Pressures (CMAP)**, University of Rochester (4/5/2023; invited)  
Transport Properties of Iron Alloys and Dynamo Scenarios in Planetary Cores
- American Geophysical Union Fall Meeting 2022**, Chicago (12/2022; invited)  
Probing Properties of the Deep Earth Materials by High-Pressure Time-Resolved Laser and X-Ray Spectroscopies
- National Cheng-Kung University**, Tainan, Taiwan (9/2/2022; remote)  
Single-Crystal X-ray Diffraction Study of Earth's Lower Mantle Minerals
- Rice University**, Department of Earth, Environmental and Planetary Sciences (9/1/2022)  
Mineralogy and Water in Earth's Lower Mantle
- Goldschmidt Conference 2022**, Honolulu, USA (7/14/2022)  
Transport Properties of Iron Alloys and the Geodynamo
- Adam Mickiewicz University**, Institute of Geology (6/1/2022)  
Energy Sources Powering Planetary Dynamos
- Center for Planetary Systems Habitability**, University of Texas at Austin (9/13/2021)  
Energy Sources Powering the Geodynamo
- meV-Resolved Inelastic X-ray Scattering**, Argonne National Laboratory (9/7/2021)  
Phonon dispersions and elasticity of d-block transition metal single crystals at high pressure
- Advances in Synchrotron-Based Research Towards Understanding the Structure, Evolution, and Dynamics of Earth and Planetary Interior, Advanced Photon Source** (9/2/2021; invited)  
Understanding planetary dynamos by X-ray and laser spectroscopic techniques

**Chicago-DOE Alliance Center (CDAC)**, University of Illinois at Chicago (6/9/2021; invited)  
 Transport Properties of Iron Alloys and the Geodynamo

**National Changhua University of Education** (3/12/2021; invited)  
 Compressive Strain Engineering of 2D Material Properties

**National YangMing ChaioTung University**, Hsingchu, Taiwan (3/11/2021; invited)  
 Exploring Condensed Matter Physics at Extreme Pressure

**MRS Fall Meeting, Tutorial Program, USA (11/19/2020; invited)**  
 Compressive Strain Tuning of 2D Material Properties in a High-Pressure Diamond Cell

**National Synchrotron Radiation Research Center**, Hsingchu, Taiwan (9/24/2020)  
 High-Pressure Single-Crystal Research: A User's Viewpoint

**National Tsinghua University**, Hsingchu, Taiwan (9/23/2020)  
 Exploring Condensed Matter Physics at Extreme Pressure

**National Cheng-Kung University**, Tainan, Taiwan (9/18/2020)  
 Evidence for a Chemically Layered Mantle

**National Central University**, Taoyun, Taiwan (9/15/2020)  
 Exploring Physics and Chemistry of Matter at Extremes

**Institute of Earth Sciences, Academia Sinica**, Taipei, Taiwan (9/10/2020)  
 Energy Sources Powering the Geodynamo

**American Geophysical Union Fall Meeting 2019**, New Orleans (12/2019; talk)  
 Water Concentration in Single-Crystal (Al,Fe)-bearing Bridgmanite and its Possible  
 Implications for the Dehydration Melting below 660 km Depth

**Lamont-Doherty Earth Observatory**, Columbia University (11/2019) (Invited)  
 Evidence for a Chemically Layered Mantle

**Deep Carbon Observatory Meeting, Carnegie Institution for Science (10/2019)**  
 Water Transport across the Mantle Transition Zone and Lower Mantle Boundary

**AIRAPT Conference 2019**, Rio de Janeiro, Brazil (8/5/2019)  
 Electrical and thermal conductivities of Fe at Earth's core conditions: Insight into the  
 thermal energy contribution to the evolution of the geodynamo

**Guiyang Institute of Geochemistry**, Chinese Academy of Sciences (08/2019) (Invited)  
 Lower-Mantle Mineralogy and Water/Iron Chemistry

**Guangzhou Institute of Geochemistry**, Chinese Academy of Sciences (08/2019) (Invited)  
 New Insights into Lower-Mantle Mineralogy and Water/Iron Chemistry

**Okayama University at Misasa**, Institute for Planetary Materials, Japan (5/9/2019; invited)  
 Electrical and thermal conductivities of Fe in Earth's core: Insight into the thermal energy  
 contribution to the evolution of the geodynamo

**Joint symposium of Misasa 2019 and Core-Mantle Coevolution**, Institute for Planetary  
 Materials, Okayama University at Misasa, Japan (3/20/2019; invited)  
 Internally-consistent multiple constraints on the mineralogy and seismology of Earth's  
 lower mantle

**Seoul National University**, School of Earth and Environmental Sciences, Korea (01/2019;  
 invited)  
 Physical and chemical evolution of the Earth's deep interior

**Goethe-Universitaet Frankfurt**, CarboPaT Annual Meeting (10/2018; invited)  
 Physics and chemistry of methane hydrate in the Gulf of Mexico

**Universitaet Bayreuth**, Bayerisches Geoinstitut (10/2018; invited)  
 Iron partitioning and fractionation in the lower mantle

**Deutsches GeoForschungsZentrum (GFZ), Helmholtz-Zentrum Potsdam (09/2018)**  
 Unusual Physics and Chemistry of the Lower Mantle

**Exploring the Interiors of Exoplanets Workshop**, University of Science and Technology in China, Hefei, China (08/2018; invited)  
 New Frontier in Exploring Exoplanetary Interiors: Opportunities and Challenges

**Sichuan University, The Institute of Atomic and Molecular Physics, China (8/15/2018)**  
 Mineral Physics and High Pressure Techniques

**High-Pressure Equation of State and Phase Transition Workshop, Chinese Academy of Engineering Physics, China (5/25/2018)**  
 Hot Dense Iron: from Earth's Core to Super-Earths' Interiors

**American Geophysical Union Fall Meeting 2017**, New Orleans (12/2017; invited)  
 Elasticity of the Earth's Lower Mantle Minerals at High Pressures: Implications to Understanding Seismic Observations of the Deep Mantle

**Goldschmidt Conference 2017**, Paris, France (8/17/2017)  
 Velocity Profiles and Deformation of Silicate Post-Perovskite in the Lowermost Mantle  
 Iron isotopic fractionation in Earth's Lower Mantle and Core

**AIRAPT Conference 2017**, Beijing, China (8/19/2017)  
 Revealing iron isotopic fractionation in Earth's lower mantle and core by inelastic x-ray scattering

**Academia Sinica, Institute of Physics (8/1/2017; invited)**  
 Exploring Materials Properties at High Pressure

**Z Fundamental Science Workshop**, Albuquerque, New Mexico (7/17/2017)  
 Melting and Thermal Conductivity of Iron in the Earth's Core

**Nanjing University, School of Earth Sciences and School of Physics (7/14/2017)**  
 A New Spin on the Physics and Chemistry of the Earth's Deep Mantle  
 Tuning 2D Material Properties by Compressive Strain

**Argonne National Laboratory, Physics Division Colloquium (05/19/2017; invited)**  
 Revealing Physical and Chemical Nature of Earth's deep Iron by Inelastic X-ray Scattering

**University of Texas at Austin, Undergraduate Geology Society (4/19/2017)**  
 An Earth Scientist's Journey to Earth's Deep Interior

**Goldschmidt Conference 2017**, Paris, France (8/2017)  
 Deep Carbon (co-organizer)

**Deep Carbon Observatory International Science Meeting, St. Andrew University (3/2017)**  
 Characterization of methane hydrate reservoirs in the Gulf of Mexico

**American Geophysical Union Fall Meeting 2016**, San Francisco (12/2016)  
 Viscosity of a late lunar magma ocean liquid: Implications for the purity of ferroan anorthosites (co-authored with Nick Dygert et al.)

**Deep Carbon Observatory Workshop, Stanford University (12/2016)**  
 Thermal and Electrical Conductivity of Fe-C Alloy in the Earth's Core

**Jilin University, National Laboratory for Superhard Materials, Jilin University, China (9/29/16)**  
 Tuning 2D Material Properties by Compressive Strain

**Seoul National University, School of Earth and Environmental Sciences, Korea (09/27/2016)**  
 Deciphering the Physics and Chemistry of Planetary Interiors

**International Union of Crystallography (IUCr), Advanced Crystallography at High Pressure in Pohang, Korea (09/21/2016; invited)**  
 Exploring 2D Material Properties in Extreme Environments



**X-ray Echo Spectroscopy, Argonne National Laboratory, Advanced Photon Source (APS),**  
Chicago, (07/10/2016; invited)  
Understanding the physics and chemistry of earth materials in extreme environments by IXS

**The 18<sup>th</sup> Chinese High Pressure Meeting, Chengdu, China (7/2016)**  
Deciphering the Geophysics and Geochemistry of the Earth's Interior

**The Xinjiang Technical Institute of Physics and Chemistry, Urumuqi, China (7/7/2016)**  
Exploring 2D Materials Properties in Extreme Environments

**Goldschmidt Conference 2016, Yokohama, Japan (6/2016)**  
Elasticity and Phase Transitions of the Deep Mantle Ferromagnesite (Mg,Fe)CO<sub>3</sub>

**Taiwan Geological Society Annual Meeting, Taipei (5/17/2016)**  
Deciphering the Enigma of the Earth's Interior

**National Cheng-Kung University, Tainan, Taiwan (5/13/2016)**  
A New Spin on the Physics and Chemistry of the Earth's Deep Mantle

**Sandia National Laboratory, New Mexico (4/7/2016)**  
Deciphering the Enigma of the Earth's Core

**MISASA VI: Frontiers in Earth and Planetary Materials Research: Origin, Evolution and Dynamics, Institute for Study of Earth's Interior, Okayama University at Misasa, Japan (3/10/2016)**  
Deciphering Chemical and Seismic Heterogeneities of the Earth's Deep Mantle

**University of Texas at Austin, Planetary Organization for Space and Science Exploration (POSSE) (2/21/2016)**  
Exploring Planetary Interiors at Extreme Conditions

**National Synchrotron Radiation Research Center, Taiwan (12/23/2015)**  
2D Materials in Extreme Environments

**Synthesis Workshop of the Deep Carbon Observatory, U. Rhode Island (10/2015)**  
Extreme Physics and Chemistry of Deep Carbon in the Earth

**Institute of Geochemistry at Guiyang, Chinese Academy of Sciences, China (08/2015)**  
Deciphering the Mineralogy and Seismology of the Earth's Mantle

**Northwestern Polytechnical University, China (08/2015)**  
Exploring 2D Materials Properties in Extremes

**Annual Meeting of the Chinese Postdocs, China (8/2015) (Invited Plenary Talk)**  
Recent Advances in High-Pressure Physics

**Zhengzhou University of Light Industry, Zhengzhou, China (07/2015)**  
Exploring 2D Material Properties in Extremes (Invited)

**China University of Geology at Wuhan, China (06/2015)**  
A New Spin on Physics and Chemistry of the Earth's Deep Mantle  
Deciphering the Enigma of the Earth's Core using Mineral Physics Data

**High-Pressure Science & Advanced Technology for Research (HPSTAR), China (6/2015)**  
Deep Earth and Extreme Physics

**Huazhong University of Science and Technology, Wuhan, China (06/2015)**  
Exploring 2D Material Properties in Extremes (Invited)

**Japan Geoscience Union (JpGU) Annual Meeting, Makuhari, Japan (05/2015)**  
Recent Advanced in Understanding the Elasticity of the Lower Mantle (Invited)  
Ferromagnesite as a Potential Deep-Mantle Carbon Carrier

**APS User Workshop, Argonne National Laboratory (05/2015)**  
High-Pressure Acoustic Phonons and Elasticity of Iron Alloys and Oxides (Invited)

**Deep Carbon Observatory (DCO) Science Meeting, Munich, Germany (03/2015)**  
 Ferromagnetism in the Earth's Deep Mantle  
 Thermodynamics of planetary ices in extreme conditions of icy satellites  
 Physics of monolayer and bilayer graphene under hydrostatic pressure

**Study of Matter at Extreme Conditions (SMEC), Florida (03/2005; invited)**  
 Abnormal Elastic and Vibrational Behaviors of Magnetite at High Pressures  
 High-Pressure Properties of Transition Metal Dichalcogenides (TMDs)  
 Elasticity of the Earth's Mantle Minerals at High Pressure and Temperature

**2D van der Waals Materials Workshop, The University of Texas at Austin (01/2015)**  
 Physical Properties of 2D Materials in Extreme Environments (Invited)

**Guangzhou Institute of Geochemistry, Chinese Academy of Sciences (01/2015) (Invited)**  
 Geophysical and Geochemical Consequences of the Spin Transition in Earth's Deep Mantle  
 Understanding the Physics and Chemistry of the Earth's Core

**The 7<sup>th</sup> North America Mössbauer Symposium, Northeastern University (01/2015) (Invited; Co-organizer)**  
 Transition Metal Compounds in Extreme Environments

**Geophysical Laboratory, Carnegie Institution for Science (1/2015) (Invited, Lab Seminar Series)**  
 Geophysical and Geochemical Consequences of the Spin Transition in Earth's Deep Mantle

**American Geophysical Union Fall Meeting 2014, San Francisco (12/2014)**  
 Electronic Spin States of Iron in Phase D and NAL Phase at High Pressures (Oral, Contributed))

**Ulsan National Institute of Science and Technology, Multidimensional Carbon Center, Ulsan, South Korea (11/2014)**  
 Exploring Materials Properties at Extreme Environments

**University of Michigan at Ann Arbor, Department of Earth and Environmental Sciences, (10/2014) (William T. Smith Lecture Series)**  
 Undergraduate

**The 17<sup>th</sup> Chinese High Pressure Meeting, Yangzhou, China (9/2014) (Invited Plenary Talk)**  
 Recent Advances in Understanding Elasticity of the Earth's Mantle and Core

**Annual Meeting of the Chinese Academy of Mechanical Physics, Mianyang, China (8/2014) (Invited Plenary Talk)**  
 Exploring Frontier Material Properties in Extreme Pressure and Temperature:  
 Current States and Future Directions in High-Pressure Research

**International Union of Crystallography Workshop in Beijing (8/2014) (Invited)**  
 Transition Metal Compounds in Extreme Environments

**Lawrence Fellow Workshop, Lawrence Livermore National Laboratory (8/2014) (Invited)**  
 Transition Metal Compounds in Extreme Environments

**High-Pressure Science & Advanced Technology for Research (HPSTAR), Summer Camp Program, Shanghai, China (7/2014)**  
 Using Mineral Physics Experiments to Understand the Earth's Deep Interior (Invited)

**Chinese Academy of Sciences, Institute of Solid State Physics, Hefei, China (7/2014) (Invited)**  
 Transition Metal Compounds in Extreme Environments

**University of Science and Technology of China, Hefei, China (7/2014) (Invited)**  
 Recent Advances in Understanding Seismic Velocities of the Earth's Interior (at School of Earth and Space Science)

Transition Metal Compounds in Extreme Environments (at Hefei National Laboratory for Physical Sciences at the Microscale)

**Elastic Properties of Iron in Extreme Conditions via X-ray Scattering Workshop**, Japan (02/2014)

Elasticity of Polycrystalline and Single-Crystal Iron Alloys in the Earth's Core (Invited)

**Los Alamos National Laboratory, LANSCE School on Neutron Scattering**, Los Alamos (1/2014)

Mineral and Material Physics in Extreme Environments (Invited)

**American Geophysical Union Fall Meeting 2013**, San Francisco (12/2013)

Iron Partitioning and Elasticity across the Spin Transitions of Iron in the Lower Mantle (Invited)

**Deep Carbon Observatory Workshop**, Stanford University (12/2013)

Spin Transition of Iron in Ferromagnetite in the Earth's Mantle

**Amherst College**, Department of Physics, Seminar Series (10/2013)

Solid State Geophysics under Extreme Environments: from Electronic Spin Transitions to Earth's Interior (Invited)

**Inelastic X-ray Scattering Workshop at NSLS-II**, Brookhaven National Lab (10/2013)

Studying elasticity of materials in extreme environments using HERIX (Invited)

**Goldschmidt Conference 2013**, Florence, Italy (8/2013)

Electronic Spin Transitions of Iron and Geoelectrons in Earth's Mantle (Invited)

**Jilin University**, National Laboratory for Superhard Materials, Jilin University, China (7/13)

Using Advanced High-Pressure Techniques to Study Material Properties in Extreme Environments

**High-Pressure Science & Advanced Technology for Research (HPSTAR)**, China (7/2013)

A New Spin on Mineral Physics of the Earth's Mantle (Invited)

Transition Metal Iron Compounds in Extreme Environments (Invited)

Using Advanced High-Pressure Techniques to Study Earth's Deep Interior (Invited)

**American Geophysical Union Fall Meeting 2012**, San Francisco (12/2012)

Sound Velocities of the Earth's Transition Zone Minerals (Invited)

Electronic spin transitions of iron in Earth's lower-mantle: potential implications to deep-mantle geophysics and geochemistry (Contributed)

**National Synchrotron Radiation Research Center**, Taiwan (11/27/2012; invited)

Synchrotron X-ray Spectroscopic Studies of Transition Metal Iron Compounds in Extreme Pressures and Temperatures

**National Chiao-Tung University**, Department of Physics, Taiwan (11/28/12; invited)

Studying Material Properties in a High-Pressure and Low-Temperature Diamond Anvil Cell

**National Cheng-Kung University**, Department of Earth Sciences, Taiwan (11/29/12; invited)

A New Spin on Mineral Physics of Earth's Mantle

**High Pressure Interest Group Meeting**, Advanced Photon Source (11/13/2012)

Transition Metal Iron Compounds in Extreme Pressures and Temperatures (Invited)

**Institute for Study of Earth's Interior**, Okayama University at Misasa, Japan (9/25/2012)

Sound Velocities of the Earth's Mantle Minerals: Constraining the Physics and Chemistry of the Earth's Interior

**The 6th Asian Conference on High Pressure Research (ACHPR 6)**, Beijing, China (8/12/2012)

Transition metal iron compounds in extreme environments

**COMPRES Annual Meeting 2012**, Lake Tahoe (7/2012)  
 Sound Velocities of Iron Alloys in Earth's Core

**Superconductors and Strongly Correlated Materials, Energy Frontier Research in Extreme Environments (EFree) Workshop**, Geophysical Laboratory, Carnegie Institution of Washington, DC (4/21/2012)  
 Iron-based compounds in extreme environments

**Dynamics and Evolution of the Earth's Interior: special emphasis on the role of fluids**, "Joint Symposium of Misasa-2012 and Geofluid-2", Okayama University at Misasa, Japan (3/18/2012)  
 Electronic spin transitions of iron in Earth's lower-mantle

**Energy Frontier Research in Extreme Environments (EFree) Highlight Talk Series**, Geophysical Laboratory, Carnegie Institution of Washington, DC (1/11/2012)  
 Iron pnictide superconductors in extreme environments: The new iron era

**American Geophysical Union Fall Meeting 2011**, San Francisco (12/2011; invited)  
 Electronic spin and valence states of iron in lower-mantle silicate perovskite and post-perovskite

**Chinese Academy of Science**, Institute of High Energy Physics, Beijing Synchrotron Radiation Facility, Beijing (11/2011)  
 Synchrotron Inelastic X-ray Scattering at High Pressures: Probing Electronic, Magnetic, Elastic, and Phonon Properties

**Dynamic Properties of Earth and Planetary Materials Workshop, CECAM (Centre Européen de Calcul Atomique et Moléculaire)**, Lausanne, Switzerland (10/2011; invited)  
 Electronic and Elastic Properties of Iron-Containing Minerals in Earth's Interior

**The 31st International Conference on the Applications of the Mössbauer Effect (ICAME2011)**, Kobe, Japan (9/2011; invited speaker)  
 Electronic spin transition of iron in Earth's lower mantle

**Energy Frontier Research in Extreme Environments (EFree) Annual Meeting**, Geophysical Laboratory, Carnegie Institution of Washington, DC (09/2011)  
 Efficient energy transportation and generation: iron pnictide superconductors in extreme environments

**The Asia Oceania Geosciences Society (AOGS) Meeting**, Taipei, Taiwan (08/2011; invited)  
 Elasticity of iron alloys in Earth's inner core  
 Electronic spin and valence states of iron in the Earth's lower mantle

**APS User Meeting**, Argonne National Laboratory, Advanced Photon Source (APS), Chicago (05/2011; invited)  
 Elasticity of iron alloys in Earth's inner core

**Argonne National Laboratory**, Advanced Photon Source (APS), Chicago, (03/2011; invited)  
 APS Upgrade Science Case: High-Energy Resolution Inelastic X-ray Scattering (HERIX)

**Geophysical Laboratory**, Carnegie Institution of Washington (01/2011; invited)  
 Transition metal iron compounds in extreme environments

**Nassau-Argonne Mössbauer Symposium**, New York (01/2011; invited keynote speaker)  
 Electronic spin transitions of iron in the Earth's deep mantle

**American Geophysical Union Fall Meeting 2010**, San Francisco (12/2010)  
 1. Iron-rich perovskite and post-perovskite in the lower mantle (invited oral presentation)  
 2. Properties of the deep-mantle ferropericlase across the spin crossover (contributed oral presentation)

**Peking University**, School of Earth and Space Sciences (09/2010; invited)  
 A new spin on mineral physics of the Earth's interior

**Chinese Academy of Science**, Institute of Geochemistry (09/2010; invited)  
 A new spin on mineral physics of the Earth's interior

**Chinese Academy of Science**, Institute of Physics (09/2010; invited)  
 Solid state geophysics under extreme environments: from electronic structures to Earth's interior

**Argonne National Laboratory**, Advanced Photon Source, Chicago  
 High-Pressure Elasticity Study of Iron by High-Resolution Inelastic X-ray Scattering  
 (COMPRES Workshop on "On-line Brillouin Spectroscopy at GSECARS: Basic Principles and Application for High Pressure Research", 09/2009)

**University of Texas at Austin**  
 Solid state geophysics under extreme environments: from electronic structures to Earth's interior (Department of Physics, Condensed Matter Physics seminar series; 9/2010)  
 A pressing matter: Planetary interiors research under pressures (University Geology Society; 5/2010)  
 Laboratory journey to the Earth's core (Department of Geological Sciences; 4/2010)  
 Mineral physics research under extreme environments (Bureau of Economic Geology; 2/2010)

**Seoul National University**, School of Earth and Environmental Sciences, Korea (07/2009; invited)  
 Effects of the spin transitions of iron on mineral physics of the Earth's deep mantle

**International Union of Crystallography (IUCr)**, Advanced Crystallography at High Pressure in Harbin, China (07/2009; invited)  
 A new spin on understanding mineral physics of the Earth's deep mantle

**Chinese Academy of Science**, Institute of High Energy Physics, Beijing Synchrotron Radiation Facility, Beijing (07/2009; invited)  
 New synchrotron lights on the physics of the Earth's interior  
 Forum on energy frontier under extreme environments

**National Synchrotron Radiation Research Center**, Taiwan (06/2009; invited)  
 New Synchrotron Lights on the Physics of the Earth's Interior

**German Mineralogical Society (DMG)**, The 86<sup>th</sup> Annual Meeting, Berlin (10/2008; invited keynote speaker)  
 A new spin on understanding mineral physics of the Earth's deep mantle

**Universitaet Bayreuth**, Bayerisches Geoinstitut (09/2008; invited)  
 Spin transitions of iron in Earth's lower mantle  
 Hot dense iron, water, and silica

**Argonne National Laboratory**, Advanced Photon Source, Chicago  
 Inelastic X-ray scattering at high pressures and temperatures: applications to mineral physics of the Earth's interior (Workshop to "Introduce High-Resolution Inelastic X-ray Scattering on Earth Materials using Synchrotron Radiation", 2008)

**Okayama University at Misasa**, The 3<sup>rd</sup> Center of Excellence-21st International Symposium: Origin, Evolution and Dynamics of the Earth: a Tribute to Prof. Eiji Ito (03/2008; invited keynote speaker)  
 A New Spin on Mineral Physics of the Earth's Lower Mantle

**Washington State University, Pullman**, Institute for Shock Physics and School of Earth and Environmental Sciences (11/2007; invited)  
 A new spin on understanding mineral physics of the Earth's deep mantle

**University of Texas at Austin**  
 Spin transitions of iron in Earth's lower mantle (Department of Geological Sciences; 10/2007)  
 Mineral physics of iron and light elements in Earth's core (Institute of Geophysics; 10/2007)

**University of Minnesota**, Virtual Laboratory for Earth and Planetary Materials (08/2007; invited)  
 Geophysical implications of the spin transition in the Earth's lower mantle

**Lawrence Livermore National Laboratory**, Physics and Advanced Technology (invited)  
 Condensed matter geophysics: from electronic states to planetary interiors (2007)  
 New light on earth and planetary interiors: from the Earth's core to hot dense H<sub>2</sub>O (2005)  
 Recent advances in laser-heated diamond anvil cell techniques: Applications to planetary interiors (2004)

**Ehime University**, Geodynamics Research Center (03/2007; invited)  
 Electronic spin transition of iron in the Earth's deep mantle (17th GRC International Frontier Seminar)  
 Iron in Earth's core and water in planetary interiors

**Yale University**, Department of Geology and Geophysics (01/2007; invited)  
 Electronic spin transition of iron in the Earth's deep mantle  
 Hot dense iron and water in planetary interiors

**Tohoku University**, Center of Excellence (COE), Japan (07/2006; invited)  
 Iron in the Earth's interior  
 H<sub>2</sub>O and SiO<sub>2</sub> in planetary interiors

**Lawrence Berkeley National Laboratory**, Advanced Light Source (2006; invited)  
 New synchrotron lights on the Earth's core and mantle

**National Taiwan University**, Department of Geosciences, Taiwan (2006; invited)  
 Iron in the Earth's interior

**American Physical Society March Meeting**, Baltimore (03/2006; invited)  
 Effects of the Spin Transition of Iron in Magnesio-wüstite-(Mg,Fe)O: Applications to the Earth's Lower Mantle

**National Synchrotron Radiation Research Center**, Taiwan (2006; invited)  
 Hot dense H<sub>2</sub>O ices in planetary interiors  
 New synchrotron lights on the Earth's core and mantle

**Academia Sinica**, Institute of Earth Sciences, Taiwan (invited)  
 Iron as a new window into the Earth's core and lower mantle (2005)  
 Mineral physics of the Earth's lower mantle and the core (2003)

**National Cheng-Kung University**, Department of Earth Sciences, Taiwan (2005; invited)  
 Phase diagram of H<sub>2</sub>O under extreme conditions

**University of California-Berkeley**, Department of Earth and Planetary Science (2005; invited)  
 Iron in the Earth's interior: from sound velocities of iron in Earth's core to electronic transition of iron in Earth's mantle

**Argonne National Laboratory**, Advanced Photon Source, Chicago  
 New synchrotron lights on the Earth's core and mantle (APS review panel, 2007)  
 Iron as a new window into the Earth's core and lower mantle (2005)

Understanding Earth's mantle and core by state-of-the-art IXS techniques (APS review panel, 2004)

Understanding sound velocities in the Earth's core by Nuclear Resonant Inelastic X-ray Scattering" (Inelastic X-ray Scattering Workshop, 2004)

Nuclear resonant inelastic x-ray scattering and synchrotron Mössbauer spectroscopy with laser-heated diamond anvil cells (Nuclear Resonant Workshop, 2004)

Phase transitions of alumina and magnesiowüstite at megabar pressures (Megabar Pressures Workshop, 2004)

Using laser-heated diamond anvil cell to study planetary interiors (Laser Heating Workshop, 2004)

Understanding alloying effects of nickel and silicon on iron in the Earth's core (2002)

**Princeton University**, Department of Geosciences (2005; invited)

Iron as a new window into the Earth's core and mantle

**Jilin University**, National Laboratory for Superhard Materials, Jilin University, China

Recent and future advances in high-pressure research (2004)

Understanding mineral physics of planetary interiors under extremely high pressures and temperatures (2004)

New synchrotron lights on mineral physics of the Earth's interior (07/2009)

**National Taiwan Ocean University**, Institute of Geophysical Sciences, Taiwan (2004; invited)

Mineral physics of the Earth's lower mantle and the core under extreme pressures and temperatures

**University of Hawaii at Honolulu**, GEORAMAN Meeting, Honolulu (2004; invited)

In situ Raman spectroscopy in a laser-heated diamond cell: applications to materials in the planetary interiors

**American Geophysical Union Fall Meeting**, San Francisco

Iron in the Earth's Lower Mantle and Core (12/2006; invited)

Static compression of an iron-silicon alloy: implications for silicon in the core (12/2000)

Direct measurements of sound velocities of iron with nuclear resonant inelastic x-ray scattering under high pressure and temperature" at Spring AGU, Canada (Mineral physics perspective on the structure, composition, and dynamic of Earth's deep interior) (05/2004)

**Florida International University**, SMEC Conference (2003; invited)

Stability of magnesiowüstite in the Earth's lower mantle

**Stony Brook University**, Mineral Physics Institute (2003; invited)

Mineral stability and alloying effects in the Earth's mantle and the core: applications of laser heating DAC technique

**Geophysical Laboratory**, Carnegie Institution of Washington (2002; invited)

Alloying effects of silicon and nickel on iron in the Earth's core

**The University of Chicago**, Department of Geophysical Sciences, Chicago (2001)

Alloying effects of silicon and nickel on iron in the Earth's core

## **Research Grants**

26. Project Title: Collaborative Research: Tuning Thermal Transport in van der Waals Solids by Compressive Strain  
 PIs: Yaguo Wang, Jung-Fu Lin  
 Sponsor Name: NSF TTP

Project Period: 06/01/2022-5/31/2025 (FAIN: 2211660)  
Funding Amount: \$400,035

25. Project Title: Fixation of Single-Bonded Nitrogen Compounds

PIs: Jung-Fu Lin  
Sponsor Name: Welch foundation  
Project Period: 06/01/2022-5/31/2025 (F-2109-20220331)  
Funding Amount: \$300,000 (to Lin)

24. Project Title: EAGER: SUPER: Stabilization of Warm and Light Superconductors at Low Pressures by Chemical Doping

PIs: Jung-Fu Lin, Jianshi Zhou (UT Austin), Eva Zurek (SUNY Buffalo)  
Sponsor Name: NSF DMR CMMT  
Project Period: 08/01/2021-7/31/2023 (NSF 07-31-23)  
Funding Amount: \$100,000 (to Lin)

23. Project Title: Collaborative Research: Understanding Hydrogen Solubility Mechanisms in Bridgmanite Through Multifaceted Mineral Physics Studies

PIs: Jung-Fu Lin, Shun-ichiro Karato (Yale U), Bijaya Karki (LSU)  
Sponsor Name: NSF-EAR in Cooperative Studies of the Earth's Deep Interior (CSEDI)  
Project Period: 07/01/2020-6/30/2023 (NSF EAR-2001381)  
Funding Amount: \$241,000

22. Project Title: High Pressure-Temperature Single-Crystal Elasticity of the Lower-Mantle Bridgmanite

PIs: Jung-Fu Lin  
Sponsor Name: NSF-EAR Geophysics  
Project Period: 06/01/2019-5/31/2023 (NSF EAR-1916941)  
Funding Amount: \$408,161

21. Project Title: Collaborative project: CSEDI -Electrical and Thermal Transport in Iron and Iron Alloys at Core Conditions and its Effects on the Geodynamo and Thermal Earth History

PIs: Ron Cohen (CIW), Jung-Fu Lin, Alex Goncharov (CIW), Peter Driscoll (CIW)  
Sponsor Name: NSF-EAR in Cooperative Studies of the Earth's Deep Interior (CSEDI)  
Project Period: 04/01/2019-3/31/2024 (NSF EAR-1901801)  
Funding Amount: \$269,841

20. Project Title: Deep Carbon Observatory 2020 Legacy Project

PI: Jung-Fu Lin  
Sponsor Name: Sloan Foundation  
Project Period: 3/01/2018-12/31/2018  
Funding Amount: Total: \$10,001

19. Project Title: Characterization and modelling of methane hydrate reservoirs in the Gulf of Mexico

PI: Jung-Fu Lin, Co-PIs: Peter Flemings, Hugh Daigle, Kehua You



Sponsor Name: ExxonMobil-Energy Institute  
Project Period: 3/01/2017-2/28/2020  
Funding Amount: Total: \$942,900; Lin: \$305,699 (Task 1; PI)

18. Project Title: A multi-scale experimental investigation of flow properties in coarse-grained hydrate reservoirs during production  
PI: Peter Flemings, Co-PIs: David DiCarlo, Hugh Daigle, D Nicolas Espinoza, Jung-Fu Lin, Nicola Tisato  
Sponsor Name: Department of Energy  
Project Period: 10/01/2016-09/30/2019  
Funding Amount: Total: \$1,499,991; Lin: \$410,139 (Task 1)
17. Project Title: Stabilization of BCS Superconductivity near Room Temperature in Hydrides Under High Pressure and the Characterization with THz Spectroscopy  
PI: Jianshi Zhou, Co-PIs: Jung-Fu Lin, Yaguo Wang, Artem Oganov, Phillip Allen  
Sponsor Name: Army Research Office  
Project Period: 09/01/2016-08/31/2018  
Funding Amount: \$262,900
16. Project Title: EAGER: Coupled Opto-Electro-Mechanics in Semiconducting Phosphorene  
PI: Deji Akinwande, Co-PI: Jung-Fu Lin  
Sponsor Name: NSF Division of Electrical, Communications and Cyber Systems (ECCS)  
Project Period: 05/01/2016-04/30/2018 (no cost extension to 12/2018)  
Funding Amount: \$120,402
15. Project Title: In-situ nano-CT imaging of the pore network and organic matter evolution in shale rocks at high pressure-temperature conditions  
PIs: Sheng Peng, Jung-Fu Lin  
Sponsor Name: Seed Grant Program of the Jackson School of Geosciences  
Project Period: 01/01/2016-12/31/2016  
Funding Amount: \$17,376
14. Project Title: Understanding the Physics and Chemistry of Iron Alloys relevant to the Conditions of Planetary Cores  
PIs: Aaron Bernstein, Jung-Fu Lin  
Sponsor Name: Z Machine, Sandia National Laboratory  
Project Period: 04/01/2016-12/31/2019  
Funding Amount: 4 shots for the Z Machine
13. Project Title: Collaborative project: CSEDI -Understanding Si and Fe differentiation in Earth's mantle and core through experimental and theoretical research in geochemistry and mineral physics  
PIs: Nicolas Dauphas, Jung-Fu Lin, Renata Wentzcovitch  
Sponsor Name: NSF-EAR in Cooperative Studies of the Earth's Deep Interior (CSEDI)  
Project Period: 04/01/2015-3/31/2018 (NSF EAR-1502594) (no cost extension to 03/2020)  
Funding Amount: \$226,275

12. Project Title: Elasticity and Spin Transitions of Iron in the Earth's Lower Mantle  
 PI: Jung-Fu Lin  
 Sponsor Name: NSF-EAR in Geophysics, Petrology/Geochemistry  
 Project Period: 01/01/2015-12/31/2017 (NSF EAR-1446946) (no cost extension to 12/2018)  
 Funding Amount: \$372,273
  
11. Project Title: Thermodynamics of Planetary Ices in Extreme Conditions of Icy Satellites  
 PI: Jung-Fu Lin  
 Sponsor Name: Seed Grant Program of the Jackson School of Geosciences  
 Project Period: 01/01/2014-12/31/2014  
 Funding Amount: \$19,911
  
10. Project Title: Physics and Chemistry of Carbon at Extreme Conditions  
 PI: Jung-Fu Lin  
 Sponsor Name: Deep Carbon Observatory (DCO), Alfred P. Sloan Foundation  
 Project Period: 10/01/2013-9/30/2019  
 Funding Amount: \$56,000 (2013-2015); \$56,000 (2015-2017), \$50,400 (2017-2019)
  
9. Project Title: 7th North American Mössbauer Symposium  
 PI: Jung-Fu Lin  
 Sponsor Name and Funding Amount: \$5,000  
 (1). COMPRES, Argonne National Laboratory, and Corporate Sponsors  
 Project Period: 1/1/2013-1/31/2013 at the Jackson School of Geosciences, University of Texas at Austin
  
8. Project Title: Acquisition of an Impulsive Stimulated Light Scattering (ISLS) System for Elasticity and Thermal Conductivity Studies  
 Sponsor Name: Instrumentation and Facility, National Science Foundation  
 Project Period: 04/15/2012-3/31/2014  
 Funding Amount: \$168,000; additional \$168,000 JSG Matching Funding
  
7. Project Title: Acquisition of a Piston Cylinder Apparatus for Research in Experimental Petrology and Mineral Physics  
 PIs: James Gardner (lead PI in experimental petrology); Lin (co-PI; mineral physics)  
 Sponsor Name: Instrumentation and Facility, National Science Foundation  
 Project Period: 01/01/2011-12/31/2011 (EAR-1053889)  
 Funding Amount: \$40,355; additional \$40,355 JSG Matching Funding
  
6. Project Title: Workshop: Dynamic Phenomena under Extremes  
 PIs: Jung-Fu Lin, Vitali Prakapenka, Alex Goncharov  
 Sponsor Name and Funding Amount: \$27,000  
 (1). CDAC, Carnegie-DOE Alliance Center : \$9,000.  
 (2). COMPRES, the Consortium for Materials Properties Research in Earth Sciences: \$9,000  
 (3). Corporate Sponsors (Almax Industries, Princeton Instruments, Technodiamant): \$9,000  
 Project Period: 1/24/2011-1/28/2011 at the AT&T Center, University of Texas at Austin

5. Project Title: CAREER: Phase Diagrams and Elasticity of Iron Alloys in the Earth's Core  
 PIs: Jung-Fu Lin  
 Sponsor Name: NSF-EAR Early Career Award in Geophysics, Petrology/Geochemistry  
 Project Period: 01/15/2011-12/31/2015 (NSF EAR-1056670)  
 Funding Amount: \$538,914
4. Project Title: Electronic Spin Transition of Iron in the Earth's Lower Mantle  
 PIs: Jung-Fu Lin  
 Sponsor Name: NSF-EAR in Geophysics, Petrology/Geochemistry  
 Project Period: 01/01/2009-12/31/2012 (NSF EAR-0838221)  
 Funding Amount: \$299,955
3. Project Title: Energy Frontier Research in Extreme Environments (EFree)  
 PIs: Jung-Fu Lin (UT Austin)  
 Sponsor Name: Energy Frontier Research Centers (EFRCs), Department of Energy (DOE)  
 Project Period: 08/01/2009-07/31/2014  
 Funding Amount: \$300,000 (EFree also provides additional infrastructure supports)
2. Project Title: Transition Metal Oxides and f-band Metals under Extreme Environments  
 PIs: Jung-Fu Lin (UT Austin)  
 Sponsor Name: Carnegie/DOE Alliance Center (CDAC), Department of Energy (DOE)  
 Sponsor Period: 02/01/2009-02/28/2013  
 Funding Amount:  
 (1). \$44,742 (3/2010-2/2010)  
 (2). \$72,919 (03/2010-02/2011)  
 (3). \$90,158 (03/2011-02/2012) (additional \$60,000 from JSG Equipment Matching Fund for a Brillouin Light Scattering system)  
 (4). \$76,900 (03/2012-02/2013)  
 (CDAC also provides additional financial supports to Lin's students' travel expenses to the Advanced Photon Source, Argonne National Laboratory for experiments. It also allocates synchrotron beamtime access through partnership)
1. Project Title: Spin Transition of Iron in the Earth's Lower Mantle  
 PIs: Jung-Fu Lin  
 Sponsor Name: Summer Research Assignment (SRA), Faculty Development Review Committees, University of Texas at Austin  
 Sponsor Period: 06/01/2010-07/31/2010  
 Funding Amount: two-month summer salary

## **Courses Taught**

### ***09/2022-08/2023 Academic Year***

Physical Geology, GEO 401, Spring 2023

Physics and Chemistry of the Earth's Mantle, GEO 391, Fall 2022 (co-taught with S. Grand)

### ***09/2021-08/2022 Academic Year***

Materials of a Habitable Planet (at Adam Mickiewicz University as a Fulbright Scholar, 2-hr credit, 15 students, Spring 2022)  
Earth Materials, GEO 416K, Fall 2021  
Physical Geology, GEO 401, Spring 2022  
**09/2020-08/2021 Academic Year**  
On sabbatical  
**09/2019-08/2020 Academic Year**  
Earth Materials, GEO 416K, Fall 2019  
Physics and Chemistry of the Earth's Mantle, GEO 391, Fall 2019 (co-taught with S. Grand and T. Becker)  
**09/2018-08/2019 Academic Year**  
Physical Geology, GEO 401, Spring 2019  
Mineral Physics, GEO 391, Spring 2019  
Physics and Chemistry of a Habitable Planet, One-week summer course at National Cheng-Kung University, Taiwan, 07/2019  
**09/2017-08/2018 Academic Year**  
Earth Materials, GEO 416K, Fall 2017  
Methane Hydrates, GEO 391, Spring 2018 (co-taught with Dr. Flemings)  
**09/2016-08/2017 Academic Year**  
Physical Geology, GEO 401, Spring 2017  
Physics of the Earth's Interior, GEO 391, Spring 2017  
**09/2015-08/2016 Academic Year**  
Earth Materials, GEO 416K, Fall 2015  
Mineral Physics, GEO 391, Spring 2016  
**09/2014-08/2015 Academic Year**  
Mineral Physics, GEO 391, Fall 2014  
(Sabbatical semester in spring 2015)  
**09/2013-08/2014 Academic Year**  
Earth Materials, GEO 416K, Fall 2013  
Physics of the Earth's Interior, GEO 391, Spring 2014  
**09/2012-08/2013 Academic Year**  
Physical Geology, GEO 401, Spring 2013  
Mineral Physics, GEO 391, Spring 2013  
Technical Sessions, GEO 193, Fall 2012 and Spring 2013 (co-taught with Dr. Kyle Spikes)  
**09/2011-08/2012 Academic Year**  
Physical Geology, GEO 401, Spring 2012  
Technical Sessions, GEO 193, Fall 2011 and Spring 2012 (co-taught with Dr. Tim Shanahan)  
Physics of the Earth's Interior, GEO 391, Spring 2012 (co-taught with Dr. Steve Grand)  
**09/2010-08/2011 Academic Year**  
Physical Geology, GEO 401, Spring 2011  
Mineral Physics, GEO 391, Spring 2011  
**09/2009-08/2010 Academic Year**  
Physical Geology, GEO 401, Spring 2010  
Physics of the Earth's Interior, GEO 391, Spring 2010  
**09/2008-08/2009 Academic Year**  
Mineral Physics, GEO 391, Spring 2008

### **Graduate Students Supervised**

15. Chengwei Zhang, PhD student in Geological Sciences (Primary supervisor)  
Period: 08/2022-current
14. Thang Pham, PhD student in Materials Science Program (Primary supervisor, co-supovisor: Yaguo Wang)  
Period: 08/2022-current
13. Jacob Switek, PhD student in Geological Sciences (Primary supervisor)  
Period: 08/2021-08/2022  
Project: Water in the lower mantle stishovite
12. Yanyao Zhang, PhD student in Geological Sciences (Primary supervisor)  
Period: 08/2017-12/2022  
Project: Elasticity of stishovite in the subducting slabs of the lower mantle
11. Suyu Fu, PhD student in Geological Sciences (Primary supervisor)  
Period: 08/2014-06/2020  
Project: Elasticity of Earth's lower mantle minerals
10. Rusty Roberts, Master's degree in MS&E Program (Co-Supervisor; Primary supervisor: D. Akinwande)  
Period: 08/2016-08/2019  
Project: Properties of 2D materials under compressive strain
9. Xianghai Meng, PhD degree in Department of Mechanical Engineering (Co-Supervisor; Primary supervisor: Y. Wang)  
Period: 08/2015-12/2019  
Project: Strain Tuning of Thermal, Electrical and Optical Properties of Transition Metal Dichalcogenides
8. Skyler Tong, Masters student in Geological Sciences (Co-Supervisor: Primary supervisor: P. Flemings)  
Period: 08/2016-12/2020  
Project: Characterization of the physics and chemistry of methane hydrates in the Gulf of Mexico
7. Jason Kim, PhD degree in Electrical Engineering (Co-Supervisor; Primary supervisor: D. Akinwande)  
Period: 06/2014-08/2018 (now a postdoc fellow at Northwestern University)  
Project: Optoelectronic, Structural, and Topological Properties of van der Waals Layered Materials Under Extreme Conditions
6. Sean Grant, PhD student in Physics Department (Co-Supervisor; Primary supervisor: T. Ditemire)  
Period: 08/2014-06/2020  
Project: Electrical conductivity and equation of state and iron in the Earth's core investigated using Z Machine
5. Avinash Nayak, PhD degree in Electrical Engineering (Co-Supervisor; Primary supervisor: D. Akinwande)  
Period: 08/2012-05/2015 (now working at AMD)

- Project: Pressure Induced Structure-Property Tuning of Two-Dimensional Materials
4. Dennis Tong, master student in Department of Geological Sciences (Primary supervisor)  
 Period: 08/2012-06/2014 (now a PhD student at UT Austin)  
 Research Title: Transport properties of mantle minerals
  3. Jin “Jeff” Liu, PhD Degree in Department of Geological Sciences (Primary supervisor)  
 Period: 07/2010-05/2015 (now a staff scientist at HPSTAR, China)  
 Dissertation Title: The role of iron in the Earth’s Interior
  2. Jing “Jill” Yang, PhD student in Department of Geological Sciences (Primary supervisor)  
 Period: 07/2011-05/ 2017 (now a postdoc at Geophysical Lab with Dr. Y. Fei)  
 Research Title: Elasticity of mantle minerals at high pressures and temperatures
  1. Chang “James” Lu, Department of Geological Sciences (Primary supervisor)  
 Period: 07/2010-05/ 2012 (now working in the industry)  
 Project: Elasticity of pyrope in the upper mantle by Brillouin Light Scattering

### **Undergraduate Student Supervision and Service**

- Kyle Ma, undergraduate research assistant (Primary supervisor, JSG Honors Program)  
 Period: 01/2020-08/2021  
 Research Project: Elasticity of hydrated basaltic glasses at high pressure
- Jesse Gu, undergraduate research assistant (Primary supervisor, JSG Honors Program)  
 Period: 06/2017-05/2020 (now a PhD student at Harvard University)  
 Research Project: Elasticity of hydrated rhyolitic glasses at high pressure
- Stephen Armstrong, undergraduate research assistant  
 Period: 06/2016-08/2017 (now a PhD student at Caltech)  
 Research Project: Transition metal dichalcogenides at high pressures
- Sam Moran, undergraduate research assistant  
 Period: 01/2014-08/2016 (now working in the industry)  
 Research Project: Transition metal dichalcogenides at high pressures
- Megan Matheney, undergraduate research assistant  
 Period: 01/2014-05/2016 (finished a Master’s degree at University of Glasgow in 2017)  
 Research Project: CO<sub>2</sub>-H<sub>2</sub>O clathrate hydrate in extreme environments
- Laura Dafov, undergraduate research assistant  
 Period: 01/2014-05/2016 (PhD at Stanford University; now working for the industry)  
 Project: Earth materials for GEO416K
- Jennifer Beam, undergraduate research assistant  
 Period: 01/2014-05/2016 (now math2 teacher at Akins HS, Dallas)  
 Research Project: Methane clathrate hydrate in extreme environments
- Nikki Seymour, undergraduate research assistant  
 Period: 03/2012-05/2013 (PhD degree at University of Colorado Boulder; now a lecturer)  
 Project: Earth materials for GEO416K; elasticity of ferropericlasite in the lower mantle
- Caleb Jacobs, undergraduate research assistant  
 Period: 09/2009-05/2012 (now work for the energy industry)  
 Research Project: Raman study of ferromagnesite at high pressure
- Casey Corbin, Undergraduate Honors Thesis Committee 2010 (Supervisor: Bill Carlson)
- Casey Huff, Undergraduate Honors Thesis Committee 2009 (Supervisor: Jim Gardner)
- Andrea Wheat, undergraduate research assistant  
 Period: 07/2011-02/2012 (now a PhD student in Education at UT Austin)

Research Project: Spin transition of iron in the Earth's lower mantle  
Served as a faculty judge on Undergraduate Critical Thinking Contest in the Jackson School of Geosciences

## **Other Advising and Related Student Services**

### **PhD Student Committee and Supervising Service:**

Zefang Ye, PhD student in Department of Mechanical Engineering (Supervisor: Yaguo Wang)  
Service: Member of the PhD Examination Committee (2021-current)

Raul Montano, Masters degree in Department of Mechanical Engineering (Co-Supervisor;  
Primary supervisor: Y. Wang)  
Period: 08/2019-08/2021

Project: Strain Tuning of Thermal Properties of Two-Dimensional Materials  
Yongjian Zhou, PhD student in Department of Mechanical Engineering (Supervisor: Yaguo Wang)  
Service: Member of the PhD Defense Committee (2021)

Jihoon Jeong, PhD student in Department of Mechanical Engineering (Supervisor: Yaguo Wang)  
Service: Member of the PhD Defense Committee (2020)

Scott Eckley, PhD student in Department of Geological Sciences (Supervisor: R. Ketcham)  
Service: Member of the PhD Examination Committee (2019)

Justin Thompson, PhD student in Department of Geological Sciences (Supervisor: M. Young)  
Service: Chair of the PhD Examination Committee (2019)

Chujie Liu, PhD student in Department of Geological Sciences (Supervisor: S. Grand)  
Service: Member of the PhD Examination Committee (2017-current)

Sean Sullivan, PhD student in Department of Mechanical Engineering (Supervisor: L. Shi)  
Service: Member of the PhD Examination Committee (2017-2019)

Cullen Kortyna, PhD student in Department of Geological Sciences (Supervisor: D. Stockli)  
Service: Member of the PhD Examination Committee (2017)

Chang Lu, PhD student in Department of Geological Sciences (Supervisor: S. Grand)  
Service: Member of the PhD Examination Committee (2012-09/2018)

Adam Goldsmith, PhD student in Department of Geological Sciences (Supervisor: D. Stockli)  
Service: Member of the PhD Committee (2012-09/2018)

Peter Nelson, PhD student in Department of Geological Sciences (Supervisor: S. Grand)  
Service: Member of the PhD Examination Committee (2015-2020)

Ye Wu, Visiting PhD student from Peking University (Supervisor: Xiang Wu)  
Service: Supervising research project on “elasticity of subducted slabs in the Earth's mantle” in 2014

Narangoo Purevjav, PhD student in Mineral Physics at Okayama University at Misasa (Supervisor: Takuo Okuchi)  
Service: External committee member for the qualification (03/2014) and defense (01/2017).

Shu Huang, PhD in Mineral Physics at Florida International University (Supervisor: Jinhua Chen)  
Service: external committee member for the qualification and defense (03/2014).

Jie Zhu, Visiting PhD student from Chinese Academy of Science (Supervisor: C. Jin)  
Service: Supervising research project on “Energy Frontier Research in Extreme Environments” related to Lin's DOE grant (2012-2013)

Yu Xia, PhD student in Department of Geological Sciences (Supervisor: S. Grand)  
 Service: Member of the PhD Defense Examination Committee (2011-2012)

Yang Wang, PhD student in Department of Geological Sciences (Supervisor: S. Grand)  
 Service: Member of the PhD Defense Examination Committee (2010-2012)

Meijuan Jiang, Department of Geological Sciences (Supervisor: K. Spikes)  
 Service: External member of the Qualification Examination Committee in 2011

Yao You, Department of Geological Sciences (Supervisor: D. Mohrig)  
 Service: External member of the Qualification Examination Committee in 2009

Stephanie Moore, Department of Geological Sciences (Supervisor: W. Carlson)  
 Service: External member of the Qualification Examination Committee in 2009

Dan Birt, Department of Physics (Supervisor: E. Li)  
 Service: Member of the Qualification Examination Committee in 2010

Junjie “JJ” Wu, Visiting PhD student from Chinese Academy of Science (Supervisor: C. Jin)  
 Service: Supervising research project on “Energy Frontier Research in Extreme Environments” related to Lin’s DOE grant in 07/2010-2013

### **Postdoctoral Fellows and Visiting Scholar Supervised**

14. Maciej Wiesner, visiting scholar from Adam Mickiewicz University, Poland  
 Period: 2/15/2023-3/10/2023  
 Research Project: Properties of 2D materials under strain tuning
13. Rajesh Jana, postdoc fellow in the Department of Geological Sciences  
 Period: 1/17/2023-current  
 Research Project: Synthesis and characterization of single-bonded nitrogen compounds
12. Baoyun Wang (PhD student in Institute of Geochemistry, Chinese Academy of Sciences, China)  
 Period: 12/20/2018-7/31/2020  
 Research Project: Elasticity of the Earth’s mantle minerals
11. Dr. Wen Liang (Associate Research fellow in Geochemistry, Chinese Academy of Sciences, China, 2009)  
 Period: 2/1/2019-1/31/2020  
 Research Project: Deep-Earth mineral physics  
 His visit to Dr. Lin’s lab is sponsored by the International Exchange Scholarship Program of China for one year.
10. Dr. Seyedalireza Khatibi (PhD in Petroleum Engineering, University of North Dakota, USA, 2015)  
 Period: 09/2019-12/2019  
 Dr. Khatibi works on characterizations of methane hydrates from the Gulf of Mexico
9. Dr. Jiachao Liu (PhD in Geophysics, University of Michigan at Ann Arbor, USA, 2015)  
 Period: 5/2017-05/2019  
 Dr. Liu works on mineral physics and methane hydrates in extreme environments.
8. Dr. Youjun Zhang (PhD in Geophysics, University of Hiroshima, Japan, 2015)  
 Period: 11/2015-02/2017 (now an associate professor at Sichuan University)  
 Dr. Zhang works on properties of iron alloys in the Earth’s core.
7. Dr. Junjie Wu (PhD in Physics, Chinese Academy of Sciences, China, 2014)  
 Period: 3/2014-2/2015 (now works for the industry)  
 Dr. Wu worked on iron-based superconductors at extreme environments.



6. Dr. Maoshuang Song (Visiting Professor from the Institute of Geochemistry, Chinese Academy of Sciences)  
Period: 1/1/2014-12/31/2014  
Dr. Song's visit to Dr. Lin's lab is sponsored by the Chinese Academy of Sciences.
5. Dr. Xiang Wu (Visiting Professor from Peiking University)  
Period: 2/1/2013-7/31/2013 (now a professor at China University of Geology at Wuhan)  
Professor Wu was a visiting scholar to Dr. Lin's lab sponsored by the EFree project.
4. Dr. Shaomin Feng (PhD in Physics, Chinese Academy of Sciences)  
Period: 10/13/2012-12/20/2012  
Dr. Feng is an assistant research fellow at the Institute of Physics, Chinese Academy of Sciences. His visit to Dr. Lin's lab is sponsored by the Chinese Academy of Sciences.
3. Dr. Dawei Fan (Research fellow in Geochemistry, Chinese Academy of Sciences, China, 2009)  
Period: 8/25/2012-8/24/2013; 01/01/2018-12/31/2018  
Research Project: Deep-Earth mineral physics  
Dr. Fan is an associate research fellow at the Institute of Geochemistry, Chinese Academy of Sciences. His visit to Dr. Lin's lab is sponsored by the International Exchange Scholarship Program of China for one year.
2. Dr. Gopal Pradhan (PhD in Physics, JNCASR, India, 2010)  
Period: 7/1/2010-12/2010  
Research Project: Energy Frontier Research in Extreme Environments
1. Dr. Zhu Mao (PhD in Geophysics, Princeton University, USA, 2009)  
Period: 8/1/2009-7/31/2010 & 06/01/2011-03/2013  
Research Project: Deep-Earth mineral physics  
Dr. Mao is now a professor at the University of Science and Technology in China (USTC) as part of the Youth Project of the Recruitment Program of Global Experts in China.

### **Active Collaborators in the Last 3 Years**

#### **UT Austin Collaborators**

Prof. Deji Akinwande (Professor in the Department of Electrical Engineering; 2D materials)  
 Dr. Aaron Bernstein (Research scientist in Department of Physics; shock wave experiments on iron alloys at Sandia National Lab)  
 Prof. James Gardner (Professor in Geological Sciences)  
 Prof. Steve Grand (Professor in Geological Sciences; Deep-Earth geophysics)  
 Prof. Elaine Li (Professor in Department of Physics; 2D materials)  
 Prof. Yaguo Wang (Assistant Professor in Department of Mechanical Engineering; 2D materials, ultrafast laser spectroscopy, superconductivity in hydrides)  
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#### **Collaborators at Other Institutions**

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### **Research Keywords**

Mineral physics, Earth's interior, planetary interiors, high pressure, iron alloys in Earth's core, solid-Earth geophysics and geochemistry, mineralogy, spin and phase transitions in Earth's mantle, iron isotope fractionation, silica and silicate glasses and melts, water and water chemistry, materials synthesis, transition metal compounds, pnictides, methane hydrate, 2D materials, superconducting hydrides, diamond anvil cell, optical spectroscopy, synchrotron X-ray spectroscopy, X-ray diffraction, X-ray emission spectroscopy, nuclear resonant inelastic X-ray scattering, synchrotron Mossbauer spectroscopy, Brillouin light scattering, impulsive stimulated light scattering, Raman spectroscopy.