

Jung-Fu “Afu” Lin

Curriculum Vita and List of Publications

Department of Geological Sciences, Jackson School of Geosciences

The University of Texas at Austin

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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

Positions Held

- 2013-current **Associate Professor**, Department of Geological Sciences, Jackson School of Geosciences, The University of Texas at Austin
2013-current **Affiliated Faculty**, Texas Materials Institute, The University of Texas at Austin
2012-2014 **Visiting Professor**, Institute for Study of the Earth’s Interior, Okayama University at Misasa
2008-2013 **Assistant Professor**, Department of Geological Sciences, Jackson School of Geosciences, The University of Texas at Austin
2005-2008 **Lawrence Livermore Fellow**, Lawrence Livermore National Laboratory
2003-2005 **Research Scientist**, Carnegie-DOE Alliance Center (CDAC)
Geophysical Laboratory, Carnegie Institution of Washington
2002-2003 **Carnegie Postdoctoral Fellow**, Carnegie Institution of Washington
1997-2002 **Research and Teaching Assistant**, The University of Chicago
1996-1997 **Research Assistant**, Inst. of Earth Sciences, Academia Sinica, Taiwan
1992-1994 **Research and Teaching Assistant**, Department of Earth Sciences,
National Cheng-Kung, Taiwan

Memberships in Professional Societies

- COMPRES since 2008
American Geophysical Union since 1997
American Institute of Physics since 1997
Mineralogical Society of America since 1997
Honor Member of Phi Tao Phi Society, Taiwan, 1993

Graduate Students Supervised

7. Jason Kim, PhD student in Electrical Engineering (Co-Supervisor: D. Akinwande)
Service: The student works on high-pressure Raman, optical, and electrical conductivity research on phosphorene for his PhD dissertation in the Mineral Physics Lab

6. Sean Grant, PhD student in Physics Department (Co-Supervisor: T. Ditemire)
Service: The student works on high-pressure electrical conductivity and sound velocity of mantle and core materials using shockwave experiments for his PhD dissertation. I advise him on science directions and geophysical implications
5. Avinash Nayak, PhD student in Electrical Engineering (Co-Supervisor: D. Akinwande)
Service: The student works on high-pressure Raman, optical, and electrical conductivity research on photodetectors with me for his PhD dissertation in the Mineral Physics Lab
4. Dennis Tong, master student
Period: 08/2012-06/2014
Research Title: Transport properties of mantle minerals
3. Jin “Jeff” Liu, PhD candidate in Department of Geological Sciences
Period: 07/2010-current (passed qualification exam in November 2011)
Research Title: Sound velocities of iron alloys in the Earth’s core
Committee members: Jung-Fu Lin, Steve Grand, John Lassiter, Elaine Li, Luc Lavier
2. Jing “Jill” Yang, PhD student in Department of Geological Sciences
Period: 07/2011-current
Research Title: Elasticity of mantle minerals at high pressures and temperatures
1. Chang “James” Lu, Department of Geological Sciences
Period: 06/2012-current (internal transferred to a PhD student; co-supervised with S. Grand)
Period: 07/2010-05/ 2012 (Master degree)
Project: Elasticity of pyrope in the upper mantle by Brillouin Light Scattering
Committee members: Jung-Fu Lin, Steve Grand, John Lassiter

Other Advising and Related Student Service

PhD Student Committee and Supervising Service:

- 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 Purevjavn, PhD student in Mineral Physics at Okayama University at Misasa (Supervisor: Takuo Okuchi)
Service: external committee member for the qualification (03/2014) and defense.
- 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 since 10/2012
- Adam Goldsmith, PhD student in Department of Geological Sciences (Supervisor: D. Stockli)
Service: Member of the PhD Qualification Examination Committee since 2012
- Yu Xia, PhD student in Department of Geological Sciences (Supervisor: S. Grand)
Service: Permanent member of the PhD Defense Examination Committee since 2011
- Yang Wang, PhD student in Department of Geological Sciences (Supervisor: S. Grand)
Service: Permanent member of the PhD Defense Examination Committee since 2010
- 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 since 07/2010

Undergraduate Advising and Service:

Sam Moran

Period: 01/2014-current

Research Project: Transition metal dichalcogenides at high pressures

Megan Matheney, undergraduate research assistant

Period: 01/2014-current

Research Project: CO₂-H₂O clathrate hydrate in extreme environments funded by NSF

Research Experience for Undergraduates (REU)

Current status: Undergraduate student in the Jackson School of Geosciences

Jennifer Beam, undergraduate research assistant

Period: 01/2014-current

Research Project: Methane clathrate hydrate in extreme environments funded NSF

Research Experience for Undergraduates (REU) and Burke Undergraduate Scholarship
Fund.

Current status: Undergraduate Honors Program in the Jackson School of Geosciences

Nikki Seymour, undergraduate research assistant

Period: 03/2012-05/2013

Research Project: NSF Research Experience for Undergraduates (REU)

Current status: Graduate student in the Jackson School of Geosciences

Caleb Jacobs, undergraduate research assistant

Period: 09/2009-05/2012

Research Project: NSF Research Experience for Undergraduates (REU)

Current status: Master student in the Geoscience Graduate Program at Texas Christian
University

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

Research Project: NSF Research Experience for Undergraduates (REU)

Served as a faculty judge on Critical Thinking Contest in the Jackson School of Geosciences

Postdoctoral Fellows and Visiting Scholar Supervised

7. Dr. Junjie Wu (Visiting postdoc scholar from HPSTAR)

Period: 3/2014-2/2015

Dr. Wu works 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

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. Fan 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-current

Research Project: Deep-Earth mineral physics

Note: Dr. Fan is an assistant 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

Note: The Youth Project of the Recruitment Program of Global Experts in China has awarded Dr. Zhu Mao a professorship position at the University of Science and Technology in China (USTC). This award is the most prestigious professorship program to recruit world-leading young scientists to work in China.

Synergistic Activities

- 2013-current Adjunct Faculty at Texas Materials Institute, University of Texas at Austin
- 2012-current 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-current Facilities Committee Member, COMPRES
- 2012-current Visiting Professorship, Okayama University at Misasa, Japan
- 2012-2013 Visiting scientist, High Pressure Synergetic Consortium at the Advanced Photon Source (HPSynC), Argonne National Laboratory
- 2012-current Academic member, Texas Center for High Intensity Laser Science, The University of Texas at Austin
- 2012-current Academic partner, Instrument Development Team of the Spallation Neutrons and Pressure Diffractometer (SNAP), Oakridge National Laboratory
- 2010-current 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-current 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: *Frontiers and Grand Challenges in Mineral Physics of the Deep Mantle*

2007 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, Scientific Reports, Physical Review Letters, Physical Review B, National Science Foundation (Geophysics/Petrology, Instrumentation and Facility, Postdoc Fellowship), NERC (National Environment Research Council of UK), U.S. Civilian Research & Development Foundation (CRDF), Petroleum Research Fund of the American Chemical Society, Advanced Light Source, Geophysical Research Letters, Journal of the Geophysical Research-Solid Earth, American Mineralogist, Physics of the Earth and Planetary Interiors, Earth and Planetary Science Letters, Journal of Chemical Physics, Proc. Natl. Acad. Sci. USA, Journal of Applied Physics, Journal of Physics and Chemistry of Solids, Mineralogy and Petrology, American Geophysical Union Monograph.

Active Collaborators in the Last 3 Years

UT Austin Collaborators

Steve Grand (Professor in Geological Sciences; Deep-Earth geophysics, NSF Frontier in Earth System Dynamics), James Gardner (Professor in Geological Sciences; Acquisition of piston-cylinder apparatus from NSF Instrumentation and Facility, Deep carbon observatory), Danny Stockli/Adam Goldsmith (Professor/PhD student in Geological Sciences; Raman study of radiation-damaged zircon), Elaine Li (Assistant Professor in Department of Physics; Brillouin light scattering and ultrafast laser spectroscopy), Jianshi Zhou (Research Professor in Department of Mechanical Engineering; properties of superconductors using X-ray and neutron diffraction), Todd Ditmire (Associate Director in Department of Physics; co-PI for Center for High Energy Science funded by DOE), Aaron Bernstein (Associate Director in Department of Physics; shock wave experiments on iron alloys at Sandia National Lab), Jinguang Cheng (Postdoc Research Fellow in Department of Mechanical Engineering; material science research at high pressures), Avinash Nayak (PhD student) and Deji Akinwande (Professor) at the Department of Electrical Engineering.

Collaborators at Other Affiliations

Ercan E. Alp (Argonne National Lab), Paul Chow (Carnegie Institution), Tom Duffy (Princeton University), Przemek Dera (University of Chicago), Leonid Dubrovinsky (Universität Bayreuth), Alexander G. Gavriliuk (Russian Academy of Sciences), Alex Goncharov (Carnegie Institution), Steven Jacobsen (Northwestern University), Jennifer Jackson (California Institute of Technology), Ignace Jarrige (SPring-8), Changqing Jin (Chinese Academy of Sciences), Michael Lerche (Argonne National Lab), Igor Lyubutin and S. G. Ovchinnikov (Russian Academy of Sciences), Takuo Okuchi (Okayama University), Vitali Prakapenka (University of Chicago), Henry Scott (University of Indiana-South Band), Sergio Speziale (GeoForschungsZentrum Potsdam), Viktor Struzhkin (Carnegie Institution), György Vankó (KFKI, Hungary), Taku Tsuchiya (Ehime University), Heather Watson (Northern Illinois University), Rudy Wenk (University of California at Berkeley), Yuming Xiao (Carnegie Institution), Wenge Yang (HPSync, Argonne National Lab), Jiyong Zhao (Argonne National Lab)

List of Publications

Researcher ID: B-4917-2011

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.

Journal and Book Chapter Publications

2015 (in submission and preparation)

Y. Wu, X. Wu, **J. F. Lin**, C. A. McCammon, Y. Xiao, P. Chow, T. Yoshino, S.M. Zhai, S. Qin, V. B. Prakapenka, Electronic spin transition of ferric iron in the NAL phase in the Earth's lower mantle, in prep. for submission to Earth Planet. Sci. Lett., 2015.

J. Liu, **J. F. Lin**, A. Alatas, M. Hu, J. Zhao, L. Dubrovinsky, Elasticity of Fe-Ni-Si Alloy in the Earth's Inner Core, in prep. to Earth Planet. Sci. Lett., 2015.

- Z. Mao, D. Fan, **J. F. Lin**, J. Yang, S. N. Tkachev, and V. B. Prakapenka, Elasticity of Single-Crystal Olivine at High Pressures and Temperatures, submitted to *Earth Planet. Sci. Lett.*, 2015.
- J. Yang, X. Tong, J. F. Lin, N. Tomioka, T. Okuchi, and V. B. Prakapenka, Spin transition induced elastic softening in the lower-mantle ferroperricite, in prep., 2015.
- D. Fan, Zhu Mao, J. Yang, and **J. F. Lin**, Determination of the full elastic moduli of single crystals using shear wave velocities by Brillouin spectroscopy, submitted to *Am. Miner.*, 2015.
- Z. Mao, **J. F. Lin**, J. Yang, T. Inoue, and V. B. Prakapenka, Dense Stratified Lower Mantle across the Spin Transition in Perovskite and Ferroperricite", submitted to *Sci. Reports*, 2015.

2015 (and articles in press)

112. L. Xiong, 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. W. Bi, 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.*, 2015 (in press).
110. A. F. Goncharov, 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. T. Okuchi, 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 deep-mantle hydrous minerals by slow cooling quenching at transition zone to lower deep-mantle pressures, *Am. Miner.*, 2015 (in press).
108. J. Liu, and **J. F. Lin**, Abnormal acoustic velocities in compressed (Fe,Al)-bearing and basaltic silicate glasses, 41, 8832-8839, *Geophys. Res. Lett.*, 2015.
107. J. Liu, **J. F. Lin**, and V. B. Prakapenka, High-pressure orthorhombic ferromagnesite as a potential deep-mantle carbon carrier, *Scientific Reports*, 5, 7640, DOI: 10.1038/srep07640, 2015.

2014

106. A. P. Nayak, 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, D. Akinwande, Pressure-dependent optical and vibrational properties of the monolayer molybdenum disulfide, *Nano Lett.*, 10.1021/nl5036397, 2014.
105. L. Xiong, 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. **J. F. Lin**, 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, *Scientific Reports*, 2, 6282, 2014.
103. H. Yamaoka, 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. Z. Mao, **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. J. Liu, **J. F. Lin**, A. Alatas, and W. Bi, Sound velocities of bcc-Fe and Fe_{0.85}Si_{0.15} alloy at high pressure and temperature, *Phys. Earth Planet. Inter.*, 233, 24-32, 2014.
100. A. P. Nayak, S. Bhattacharyya, J. Zhu, J. Liu, X. Wu, T. Pandey, A. K. Singh, D. Akinwande, **J. F. Lin**, Pressure-Induced Electronic Transition in Multilayered MoS₂, *Nature Communications*, 5, 3731, 2014.
99. Y. Zekko, 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_{1-x}Fe_x)₂Al₁₀ studied by resonant x-ray emission spectroscopy, *Phys. Rev. B.*, 89, 125108, 2014.
98. A. J. E. Rettie, K. C. Klavetter, **J. F. Lin**, A. Dolocan, H. Celio, A. Ishiekwene, H. L. Blton, K. N. Pearson, N. T. Hahn, C. B. Mullins, Improved Visible Light Harvesting of WO₃ by Incorporation of Sulfur or Iodine: A Tale of Two Impurities, *Chemistry of Materials*, 26, 1670-1677, 2014.
97. W. D. Chemelewski, 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. **J. F. Lin**, 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, Oxford: Elsevier (2014).
95. J. Yang, 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, 2014.
94. J. J. Wu, **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 SrFe₂As₂ parent compound at high pressures and low temperatures, *Scientific Reports*, 4, 3685, DOI: 10.1038/srep03685, 2014.
93. Z. Mao, **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. H. Sato, 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 YbNiGe₃ investigated by resonant x-ray emission spectroscopy at Yb L₃ edge, *Phys. Rev. B*, **89**, 045112, 2014.
91. J. Liu, **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, 2014.

2013

90. J.-G. Cheng, 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, J.B.

- Goodenough, Anomalous perovskite PbRuO_3 stabilized under high pressure, *Proc. Natl. Acad. Sci.*, 110, 20003-20007, 2013.
89. C. L. Lin, 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.
 88. J. J. Wu, **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 BaFe_2As_2 , *Proc. Natl. Acad. Sci.*, 110, 17263-17266, 2013.
 87. Y.-Y. Chang, 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 Fe^{3+} in Al-bearing dense hydrous magnesium silicate phase D, *Earth Planet. Sci. Lett.*, 382, 1-9, 2013.
 86. A. J. E. Rettie, 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 BiVO_4 single crystals: intrinsic behavior of a complex metal oxide, *J. Am. Chem. Soc.*, 135, 11389-11396, 2013.
 85. I. S. Lyubutin, **J. F. Lin**, A. G. Gavriiliuk, A. A. Mironovich, A. G. Ivanova, and V. V. Roddatis, and A.L. Vasiliev, Spin transition of 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. **J. F. Lin**, S. Speziale, Z. Mao, and H. Marquardt, Effects of the electronic spin transitions of iron in lower-mantle minerals: implications to deep-mantle geophysics and geochemistry, *Rev. Geophys.*, 51, 244-275, 2013.
 83. H. P. Scott, V. M. Doczy, M. R. Frank, M. Hasan, **J. F. Lin**, and J. Yang, Magnesite formation from MgO and CO_2 at the pressures and temperatures of Earth's mantle, *Am. Miner.*, 98, 1211-1218, 2013.
 82. I. S. Lyubutin, V. V. Struzhkin, A. A. Mironovich, A. G. Gavriiliuk, 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 ferropericlaase, *Proc. Natl. Acad. Sci.*, 110, 7142-7147, 2013.
 81. I. Jarrige, 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, Pressure-induced valence transitions in lanthanide monochalcogenides: The prominent role of the *d* band, *Phys. Rev. B*, 87, 115107, 2013.
 80. Z. Mao, **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. C. Lin, 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. H. Yamaoka, 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 YbCuAl as a function of temperature and pressure, *Phys. Rev. B*, 87, 205120, 2013.
 77. L. R. Hunter, 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. **J. F. Lin**, Z. Mao, 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. L. Xiong, 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. C. Lu, 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

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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

- 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 7th 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)
 Geophysical and Geochemical Consequences of the Spin Transition in Earth's Deep Mantle
- The 17th 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 86th 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 3rd 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 H₂O (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

H₂O and SiO₂ 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 Magnesiowüstite-(Mg,Fe)O: Applications to the Earth's Lower Mantle

National Synchrotron Radiation Research Center, Taiwan (2006; invited)

Hot dense H₂O 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 H₂O 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 and Proposals Submitted

16. 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
Sponsor Name: NSF-EAR in Cooperative Studies of the Earth's Deep Interior (CSEDI)
Project Period: 04/01/2015-3/31/2018 (NSF EAR-)
Funding Amount: \$226,275
Funding Status: Approved

15. Project Title: Elasticity and Spin Transitions of Iron in the Earth's Lower Mantle
Sponsor Name: NSF-EAR in Geophysics, Petrology/Geochemistry
Project Period: 01/01/2015-12/31/2017 (NSF EAR-1446946)
Funding Amount: \$372,273
Funding Status: Approved

14. Project Title: Thermodynamics of Planetary Ices in Extreme Conditions of Icy Satellites
Sponsor Name: Seed Grant Program of the Jackson School of Geosciences
Project Period: 01/01/2014-12/31/2014
Funding Amount: \$19,911
Funding Status: Approved

13. Project Title: REU: Phase Diagrams and Elasticity of Iron Alloys in the Earth's Core
Sponsor Name: NSF REU (Research Experience for Undergraduates)
Project Period: 9/01/2013-08/31/2013 (NSF EAR-1056670)
Funding Amount: \$10,400
Funding Status: Approved

12. Project Title: Physics and Chemistry of Carbon at Extreme Conditions
Sponsor Name: Deep Carbon Observatory (DCO), Alfred P. Sloan Foundation
Project Period: 10/01/2013-9/30/2015
Funding Amount: \$56,000
Funding Status: Approved

11. Project Title: 7th North American Mössbauer Symposium
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
Funding Status: Approved

10. 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
Funding Status: Approved
9. Project Title: Acquisition of a Piston Cylinder Apparatus for Research in Experimental Petrology and 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
Co-PIs: James Gardner (lead PI in experimental petrology); Lin (co-PI; mineral physics)
Funding Status: Approved
8. Project Title: Workshop: Dynamic Phenomena under Extremes
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
Funding Status: Approved
7. Project Title: REU: Phase Diagrams and Elasticity of Iron Alloys in the Earth's Core
Sponsor Name: NSF REU (Research Experience for Undergraduates)
Project Period: 10/01/2011-09/30/2012 (NSF EAR-1056670)
Funding Amount: \$12,000
Funding Status: Approved
6. Project Title: CAREER: Phase Diagrams and Elasticity of Iron Alloys in the Earth's Core
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
Funding Status: Approved
5. Project Title: Electronic Spin Transition of Iron in the Earth's Lower Mantle
Sponsor Name: NSF-EAR in Geophysics, Petrology/Geochemistry
Project Period: 01/01/2009-12/31/2012 (NSF EAR-0838221)
Funding Amount: \$299,955
Funding Status: Approved
4. Project Title: NSF-REU: Electronic Spin Transition of Iron in the Earth's Lower Mantle
Sponsor Name: NSF REU (Research Experience for Undergraduates)
Project Period: 01/2009-12/2012 (NSF EAR-0838221)
Funding Amount: \$9,488
Funding Status: Approved

3. Project Title: Energy Frontier Research in Extreme Environments (EFree)
 Sponsor Name: Energy Frontier Research Centers (EFRCs), Department of Energy (DOE)
 Project Period: 08/01/2009-07/31/2014
 Funding Amount: \$300,000
 Funding Status: Approved
 (EFree also provides additional infrastructure supports)

2. Project Title: Transition Metal Oxides and f-band Metals under Extreme Environments
 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)
 Funding Status: Approved
 (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
 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
 Funding Status: Approved

Honors, Awards and Fellowships

2012-current	Visiting Professorship, Okayama University at Misasa, Japan
2011-2015	NSF-EAR Early Career Award in Geophysics/Petrology/Geochemistry
2014	Total E&P USA Petroleum Faculty Fellowship of the Department of Geological Sciences, Jackson School of Geosciences, University of Texas at Austin
2010-2013	John A. and Katherine G. Jackson Centennial Teaching Fellowship, Jackson School of Geosciences, University of Texas at Austin
2005-2008	Lawrence Livermore Fellowship, Lawrence Livermore National Laboratory
2005	Annual Excellent Research Paper, Advanced Photon Source Argonne National Laboratory
2002	Carnegie Fellowship, Carnegie Institution of Washington
2000	Excellence in Teaching Award, Division of Physical Science, Univ. of Chicago
1993	Excellence in Scientific Research, Member, Phi Tao Phi Society, Taiwan
1992	Outstanding Student Poster Award, Geological Society of China, Taiwan

Courses Taught

09/2014-05/2015 Academic Year

Mineral Physics, GEO 391, Fall 2014

Sabbatical leave, Spring 2015

09/2013-2014 Academic Year

Earth Materials, GEO 416K, Fall 2013

Physics of the Earth's Interior, GEO 391, Spring 2014

09/2012-2013 Academic Year

Physical Geology, GEO 401, Spring 2013

Mineral Physics, GEO 391, Spring 2013

Technical Sessions, GEO 193, Fall 2012 and Spring 2013 (co-teach 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

Undergraduate Individual Course in 2008

Research Keywords

Mineral physics, planetary interiors, 2D materials, iron alloys in Earth's core, solid-Earth geophysics and geochemistry, mineralogy, spin and phase transitions in Earth's mantle, silica and silicate glasses and melts, water and water chemistry, materials synthesis, transition metal compounds, pnictides, diamond anvil cell, high pressure-temperature technique, optical spectroscopy, synchrotron radiation in the Earth sciences, X-ray diffraction, X-ray emission spectroscopy, nuclear resonant inelastic X-ray scattering, synchrotron Mossbauer spectroscopy, X-ray Raman spectroscopy.