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Professional Preparations:

Jilin University, P. R. China	Physics	B.S. 1984
Jilin University, P. R. China	Condensed Matter Physics	M.S. 1987
Japan Graduate University for Advanced Studies	Physics	Ph.D. 1994
State University of New York at Stony Brook	High Pressure Phys	Postdoc 1994-1996

Appointments:

	Florida International University	
Professor	Mech. & Mater. Eng. Dept.	2012- present
Director	CeSEMC	2016-present
Deputy Director	CeSMEC	2007- 2016
Associate Professor	Mech. & Mater. Eng. Dept.	2007 - 2012
Graduate Program Director	Mech.& Mater. Eng. Dept	2008 – 2009
	Stony Brook University	
Adjunct Professor	Geosciences Department	2007 - 2012
Adjunct Associate Professor	Geosciences Department	2004 - 2007
Associate Dean	University Admissions	2006 - 2007
Assistant Dean	University Admissions	2005 - 2006
Associate Research Professor	Mineral Physics Institute	2001- 2007
Assistant Research Professor	Mineral Physics Institute	1996 - 2001
Associate Director	Mineral Physics Institute	2002 - 2007
Acting Director	Mineral Physics Institute	2004 - 2005
Guest Professor	Center for High Pressure Science and Technology Advanced Research	2013-present
Research Associate	Changchun Institute of Applied Chemistry	1987-1990

Products:

(i) UP to five publications most related to the project:

1. Chen, J., Lower-mantle materials under pressure, *Science* (2016) Vol. 351, Issue 6269, pp. 122-123, DOI: 10.1126/science.aad7813
2. Girard, J., Jiuhua Chen, Paul Raterron, Caleb W. Holyoke III (2013) “Hydrolytic weakening of olivine at mantle pressure: Evidence of [100](010) slip system softening from single-crystal deformation experiments”, *Physics of the Earth and Planetary Interiors* 216 12–20
3. Chen, Jiuhua, Haozhe Liu and Jennifer Girard (2011), “Comparative *in situ* X-ray diffraction study of San Carlos olivine: Influence of water on the 410 km seismic velocity jump in Earth’s mantle” *American Mineralogist*, 96 (5-6), 697-702; DOI:10.2138/am.2011.3602.

4. Chen, J., D. J. Weidner, and M. T. Vaughan (2002), “Strength of $\text{Mg}_{0.9}\text{Fe}_{0.1}\text{SiO}_3$ Perovskite at High Pressure and Temperature” *Nature*, 419, 824-826
5. Chen, J., T. Inoue, H. Yurimoto, D. J. Weidner (2002), “Effect of Water on Olivine-Wadsleyite Equilibrium in $(\text{Mg,Fe})_2\text{SiO}_4$ System”, *Geophys. Res. Lett.*, 29(18), 1875, doi:10.1029/2001GL014429.

(ii) *Up to five other significant publications:*

6. Chen, J., T. Inoue, D. J. Weidner, Y. Wu and M. T. Vaughan (1998), “Strength and Water Weakening of Mantle Minerals, Olivine, Wadsleyite and Ringwoodite”, *Geophysical Research Letters*, 25, 575-578 & 1103-1104.
7. Chen, J., Tony Yu, Shu Huang, Jennifer Girard, Xiaoyang Liu (2014), “Compressibility of liquid FeS measured using x-ray radiograph imaging”, *Physics of the Earth and Planetary Interiors*, 228, 294-299.
8. Huang, S., and Chen, J. (2014), “Equation of state of pyrope–almandine solid solution measured using a diamond anvil cell and in situ synchrotron X-ray diffraction”, *Physics of the Earth and Planetary Interiors*, 228, 88-91
9. Girard, J., J. Chen, P. Raterron (2012), “Deformation of periclase single crystals at high pressure and temperature: Quantification of the effect of pressure on slip-system activities”, *Journal of Applied Physics*, 111, 112607; doi: 10.1063/1.4726200
10. Oganov, AR. J. Chen, C. Gatti, YZ. Ma, YM. Ma, C. W. Glass, ZX. Liu, T. Yu, O.O. Kurakevych, and V. L. Solozhenko (2009), “Ionic high-pressure form of elemental boron” *Nature* 457, 863-867

Synergistic Activities (up to five)

Organized training/learning workshops “High Pressure Technique for Everyone” (at the Users Meeting of National Synchrotron Light Source), “NSLS X-ray High Pressure Research” and “Challenges in the study of materials at extreme conditions using DAC at NSLS-II” (Consortium of Materials Properties Research for Earth Sciences workshop).

Initialized and supervised out-of-state/international student recruitment for undergraduate program at Stony Brook University to increase the campus diversity. Created video materials and printed materials for promoting the diverse participation of the undergraduate program. Doubled international enrollment in two years.

Developed state-of-the-art time-resolved high-pressure monochromatic x-ray diffraction system and melts density measurement technique using x-ray radiography. Awarded as Promising Inventor by the Research Foundation of State University of New York

Served as the Representative of High Pressure Special Interest Group at the National Synchrotron Light Source and Spokesperson for the high pressure facilities at the X17B3 and X17C beamlines of NSLS, responsible for organizing teaching and training new users and students at the facilities. Served as a founding editor of *Earth Probe*, the Newsletter of the NSF Consortium of Materials Properties Research for Earth Sciences for high pressure research community.

John B. Parise

Distinguished Professor, Geosciences Department and Department of Chemistry, Stony Brook University, Stony Brook, NY 11794-2100; Joint Photon Sciences Institute and Photon Sciences Division, Brookhaven National Laboratory, Upton NY 11973.

Professional Preparation

James Cook University, Chemistry, Australian Atomic Energy Commission, Sydney, PhD fellowship (Australian Nuclear Science and Engineering), 1981

Visiting Pre-doctoral student, Institute of Scientific and Industrial Research, Osaka University, Japan, 1976-77

Post-doctoral, Research School of Chemistry, Australian National University, 1983-85

Visiting Scientist DuPont Chemical, Wilmington, Delaware. 1981-1983; 1986, 1989

Appointments

Director, Joint Photon Sciences Institute, 2012 -

Distinguished Professor, joint-appointment in Chemistry/Geology, Stony Brook, 2010-

Research Scientist, Photon Sciences, Brookhaven National Laboratory, 2010-

Professor of Geoscience, joint-appointment in Chemistry, Stony Brook, 1996-2010

Assistant/Associate Professor, State University of New York Stony Brook, 1989-96

Lecturer (Assistant Professor), Chemistry, University of Sydney, Australia, 1987-89

Lecturer, Chemistry, New South Wales Institute of Technology, Australia 1985-86

Awards and Honors

Fulbright Senior Scholar, Edinburgh University, 2009-10

Chancellor's Award of Excellence in Scholarship and Creative Activities from State University of New York, 2008

Kriedel Memorial Lecturer, 2008

Japan Business Co-operation Committee Fellowship 1977-78

Products

Five closely related to proposed project:

1. Woerner, W.R., Qian, G.-R., Oganov, A.R., Stephens, P.W., Dharmagunawardhane, H.A.N., Sinclair, A.L., and Parise, J.B. (2016) Combined theoretical and in situ scattering strategies for optimized discovery and recovery of high-pressure phases. *Inorg Chem*, 55, 3384-3392.
2. Dharmagunawardhane, H.A.N., Woerner, W.R., Wu, Q.Y., Huang, H.F., Chen, X.Y., Orlov, A., Khalifah, P.G., and Parise, J.B. (2014) Photocatalytic hydrogen evolution using nanocrystalline gallium oxynitride spinel. *J Mat Chem A*, 2: 19247-19252.
3. Ehm, L., Borkowski, L.A., Parise, J.B., Ghose, S., and Chen, Z. (2011) Evidence of tetragonal nanodomains in the high-pressure polymorph of BaTiO₃. *App Phys Lett*, 98: 021901.
4. Banerjee, D.; Simon, C. M.; Plonka, A. M.; Motkuri, R. K.; Liu, J.; Chen, X. Y.; Smit, B.; Parise, J. B.; Haranczyk, M.; Thallapally, P. K. Metal-organic framework with optimally selective xenon adsorption and separation *Nature Commun.* 2016, 7, article 11831
5. Jina, H., Plonka, A. M., Parise, J.B. and Goroff, N. S. (2013) Pressure induced topochemical polymerization of diiodobutadiyne: a single-crystal to single-crystal transformation. *CrystEngComm*, 15, 3106-3110

Five other publications:

6. Lee, Y., Vogt, T., Hriljac, J. A., Parise, J. B., Hanson, J., and Kim, S.-J (2002) Non-framework cation migration and irreversible pressure-induced hydration, *Nature*, 420, 485-489
7. Skinner, L.B., Benmore, C.J., Weber, J.K.R., Williamson, M.A., Tamalonis, A., Hebden, A., Wiencek, T., Alderman, O.L.G., Guthrie, M., Leibowitz, L., and Parise, J.B. (2014) Molten uranium dioxide structure and dynamics. *Science*, 346: 984-987
8. Yeganeh-Haeri, A., Weidner, D. J. and Parise, J. B. (1992) Elasticity of Cristobalite, *Science*, 257, 650-652.
9. Parise, J. B. (1991) An Antimony Sulfide with a Two-Dimensional, Intersecting System of Channels, *Science*, 251, 293-294.
10. Skinner, L.B., C.J. Benmore, J.K.R. Weber, J. Du, J. Neuefeind, S.K. Tumber, and J.B. Parise (2014) Low Cation Coordination in Oxide Melts. *Physical Review Letters*, 112: 157801

Synergistic Activities

- Neutron Advisory Board, Oak Ridge National Laboratory, 2011 – present
- Chair, Neutron Powder Diffraction review, 2016
- Co-chair, NSF CHESS-U synchrotron site visit and review, 2016
- Director, Joint Photon Sciences Institute. The institute is established as a Brookhaven-Stony Brook collaboration to broaden participation in synchrotron research. The institute will conduct education and outreach activities in coordination with SBU and BNL departments. 2010 - present
- Beamline Advisory Team XPD beamline NSLS-II.
- PI Instrument Design Team, SNAP beamline, Spallation Neutron Source.
- Co-organizer of the Erice School on High Pressure Crystallography, summer 2016. PI on application to NATO Advanced Institute Grant to fund this meeting
- Advisory committee, Center for Science at Extreme Conditions, Edinburgh (2010-).
- Scientific Advisory Committee, Diamond Light Source, UK, 2005-10
- Scientific Advisory Committee, Advanced Light Source, Berkeley, CA, 2005-10
- Chair, National Synchrotron Light Source Users Executive Committee, 1998-99, member NSLS-II committee 2014-15

KANANI K. M. LEE

Professional Preparation

University of San Francisco	San Francisco, CA	Physics	BS, 1999
University of California, Berkeley	Berkeley, CA	Geophysics	PhD, 2003
California Institute of Technology	Pasadena, CA	Mineral Physics	Postdoc, 2004-2005

Appointments

Associate Professor of Geophysics	Yale University	2014-present
Assistant Professor of Geophysics	Yale University	2008-2014
Assistant Professor of Physics	New Mexico State University	2006-2008
Alexander von Humboldt Fellow	Bayerisches Geoinstitut	2005-2008
O. K. Earl Postdoctoral Fellow	California Institute of Technology	2004-2005
NSF Graduate Research Fellow	University of California, Berkeley	2000-2003

Products

Five Publications Closely Related to Proposed Project (undergraduate advisee^{*}, graduate student advisee[^], and postdoc advisee[#])

T. Gu[#], M. Li, C. McCammon and K. K. M. Lee, “Redox-induced lower mantle density contrast and effect on mantle structure and primitive oxygen,” *Nature Geoscience*, 9, doi:10.1038/ngeo2772 (2016).

K. Glazyrin[#], N. Miyajima, J. Smith and K. K. M. Lee, “Compression of a multiphase mantle assemblage: Effects of undesirable stress and stress annealing on the iron spin state crossover in ferropericlase,” *Journal of Geophysical Research: Solid Earth*, 121, doi:10.1002/2015JB012321 (2016).

K. Daviau[^] and K. K. M. Lee, “Decomposition of silicon carbide at high pressures and temperatures,” *Physical Review B*, 96, 174102, doi: 10.1103/PhysRevB.96.174102 (2017).

K. Daviau[^] and K. K. M. Lee, “Zinc-blende to rocksalt transition in SiC in a laser-heated diamond-anvil cell,” *Physical Review B*, 95, 134108, doi: 10.1103/PhysRevB.95.134108 (2017).

L. Miyagi[#], W. Kanitpanyacharoen, P. Kaercher, K. K. M. Lee, H.-R. Wenk, “Slip Systems in MgSiO₃ Post-Perovskite: Implications for D” Anisotropy,” *Science*, 329, 1639 (2010).

Five Other Significant Publications

J. Deng[^] and K. K. M. Lee, “Viscosity jump in the lower mantle inferred from melting curves of (Mg, Fe)O ferropericlase,” *Nature Communications*, doi: 10.1038/s41467-017-02263-z (2017).

Z. Du[^], C. Jackson, N. Bennett, P. Driscoll, Y. Fei, J. Deng[^], K. K. M. Lee, E. Greenberg and V. B. Prakapenka, “Insufficient energy by MgO exsolution to power early geodynamo,” *accepted, Geophysical Research Letters*, 44, doi: 10.1002/2017GL075283 (2017).

J. Deng[^], Z. Du, L. R. Benedetti and K. K. M. Lee, “Wavelength-dependent absorption and temperature correction in the laser-heated diamond-anvil cell,” *Journal of Applied Physics*, 121(1), doi: 10.1063/1.4973344 (2017).

Z. Du[^], G. Amulele, L. R. Benedetti and K. K. M. Lee, “Mapping Temperatures and Temperature Gradients during Flash Heating in a Diamond-Anvil Cell,” *Review of Scientific Instruments*, 84, 075111 (2013).

Y. Wang[#], J. E. Panzik[^], B. Kiefer and K. K. M. Lee, “Crystal structure of graphite under room-temperature compression and decompression,” *Scientific Reports*, 2, 520 (2012).

Synergistic Activities

2017-present Organizing Committee, Cooperative Institute for Dynamic Earth Research (CIDER) 2018

2017-present Secretary of the Study of Earth’s Deep Interior (SEDI) focus group of the American Geophysical Union (<http://sites.agu.org/leadership/sections-focus-groups/sedi/>).

2017 Organizing Committee, Workshop on Challenges in the Study of Materials at Extreme Conditions using DACs at NSLS-II (<http://compres.us/workshop/workshop-challenges-study-materials-extreme-conditions-using-dac-nsls-ii>)

2015-2016 COMPRES Distinguished Lecturer

2013-present COMPRES Facilities Committee Member

2012-present Co-author of “The Adventures of GEO” comic book series developed for middle school aged students: <http://www.adventuresofgeo.com>

2008-present New Haven Science Fair mentor and judge. Mentored middle school students at local public schools for the annual science fair.

2007-2011 AGU SEDI Focus Group Executive Committee Member