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EDUCATION

University of Illinois at Urbana-Champaign
Ph.D. in *Mineral Physics*, Aug. 2014 Advisor: Professor *Jay D. Bass*

Nanjing University, Nanjing, Jiangsu, China
B.S. in *Geology*, Jun. 2008 Advisor: Professor *Rucheng Wang* GPA: 4.44/5.0 Rank: 1/104

PROFESSIONAL EXPERIENCE

COMPRES Technology Researcher, *Hawaii Institute of Geophysics and Planetology (HIGP), University of Hawai'i* **Nov. 2014 - present**

Postdoc Associate, *Department of Geology, University of Illinois* **Aug.2014 – Nov. 2014**

Undergraduate Mentor, *Department of Geology, University of Illinois* **Fall 2013- Nov. 2014**

- Co-advising undergraduate students: Andrea Vella, Vlad Iordache, and Soojinn Hyung

Research Assistant, *Department of Geology, University of Illinois* **Fall 2008-Aug.2014**

Teaching Assistant, *Department of Geology, University of Illinois*

- Lab Instructor of Geology 432: Mineralogy and Mineral Optics **Fall 2010 Fall 2011**

Assistant Guide, *Nanjing Museum of Paleontology, Nanjing Institute of Geology and Paleontology*, **2007 – 2008**

Undergraduate Research Assistant, *Department of Earth Sciences, Nanjing University*

- Origin of color in red orthoclase, EMPA and IR analysis of granite and pegmatite. **2007–2008**
- Petrology study on Baikal rift basalts, joint field trip with Irkutsk State Technological University. **Aug. – Nov. 2006**
- Geological survey and preliminary modeling of the folds in Phoenix Mountain district, Anhui, China. **Jun. – Sep. 2006**
- Paleontological study on *Globivalvulina* (foraminifera, Car.-Perm.), Shilin, Yunnan, China. **Mar. - May, 2006**

RESEARCH AREAS

Structure, composition, and dynamics of Earth's mantle and core
Structure, evolution and dynamic process of lithosphere and subduction slabs
Experimental mineral physics & petrology: phase transition, elasticity, crystallography, spectroscopy
Materials science: Phonon dispersions and phonic crystals

SKILLS

Experimental techniques & Instrumentation:

Synchrotron X-ray: Single-crystal/ powder X-ray diffraction, thermal diffused scattering (TDS), synchrotron Mossbauer spectroscopy

Light scattering spectroscopy : Brillouin and Raman spectroscopy

High-pressure high-temperature techniques: diamond-anvil cells, multi-anvil press, CO_2 Laser heating, resistance heating

Other analysis techniques: Electron probe micro-analyzer (EPMA); scanning electron microscope (SEM)

Major experimental efforts to date:

- Development of X-ray thermal diffused scattering technique for measuring single-crystal elastic properties of materials;
- Assembly and calibration of a Brillouin scattering system for single-crystal elasticity and diamond cell high-pressure elasticity measurements;
- Design and construction of a Brillouin facility for acoustic dispersion measurements;
- Design and construction of a CO_2 laser-heating system for high-temperature high-pressure Brillouin measurements with the diamond-anvil cell, integrated with Raman spectroscopy and spectro-radiometric temperature measurements.

Computer Tools:

- Programming skills:
  - Python: development of python code packages for thermal diffused scattering data analysis
  - LabVIEW (CLAD - NI Certified LabVIEW Associate Developer),
  - Other: C/C++, Matlab, html, etc.
- Single crystal X-ray diffraction analysis: GSE_ADA, GSE_rsv, Endeavor, etc.
- Spectral analysis and standard software tools: Office, Origin Pro… etc.

WORKSHOPS AND SUMMER SCHOOL

LabVIEW **CLAD Certification Training Workshop:** ***University of Illinois at Urbana-Champaign, Urbana, IL*** *May 2013*

SEM-FIB workshop: Carnegie Institution for Science, *Geophysical Lab, Washington, DC,* ***Feb. 2012***

Earth scope workshop: Lithosphere-asthenosphere boundary, *Oregon State University, Portland,* ***Sep. 2011***

X-ray & Neutron Scattering: 12th National School, *Argonne National Laboratory & Oak Ridge National Laboratory, Jun. 2010*

HONORS AND AWARDS

Harriett Wallace Award, for outstanding woman graduate student: *Department of Geology, University of Illinois* (2014)

R. James Kirkpatrick Award, for graduate student with outstanding research: *Department of Geology, University of Illinois* (2013)

Harriett Wallace Award, for outstanding woman graduate student: *Department of Geology, University of Illinois* (2012)

BP Fellowship Award, for graduate student with outstanding research: *Department of Geology, University of Illinois* (2011-2012)

Department Fellowship, for outstanding entering graduate student: *Department of Geology, University of Illinois* (2008)

10th Forum on Sciences and Arts for undergraduate research, discipline of astronomy and geosciences: *Nanjing University* (1st place 2007)

5.20 undergraduate research forum of Earth Sciences: *Department of Earth Sciences, Nanjing University* (1st place 2006)

People's Scholarship Award: *Department of Earth Sciences, Nanjing University* (1st place 2005, 2006; 2nd place 2007)

National Fundamental Research Student Award: *Nanjing University* (1st place 2005)

Invited Talks

Zhang, J. S., Xu, R., Zhang, D., Dera, P., Eng, P. and J. Stubbs, Thermal diffuse scattering as a new technique for determine single crystal elastic properties of materials at high-pressure. AGU Fall Meeting, 2015, San Francisco, CA

Zhang, J. S., P. Dera, B. Reynard, and J. D. Bass. Phase transformations of under extreme pressure temperature conditions: from atoms to Earth. MS&T15 conference, 2015, Columbus, OH

Zhang, J. S., New high-pressure phase transition in natural orthoenstatite system & sound velocity measurements at simultaneous high pressures and temperatures and variable q by Brillouin spectroscopy with laser heating, University of Illinois, 2014, Urbana, IL

Zhang, J. S., P. Dera, B. Reynard, G. Montagnac, and J. D. Bass Novel high pressure Pbca-P21/c phase transition an overview: Evidence from high pressure high temperature X-ray diffraction and Raman Spectroscopy. IUCr-High Pressure Annual Meeting, 2012, Mito, Japan

Zhang, J. S., P. Dera and J. D. Bass High pressure Single crystal diffraction of Fe-bearing orthoenstatite. Advanced Light Source Annual Meeting, 2011, Berkeley, CA

PUBLICATIONS

Journal Articles (peer reviewed)

1. **Zhang, J. S.** and J. D. Bass, High-pressure single crystal elasticity of San Carlos Orthoenstatite up to 12 GPa and evidence for the pressure-induced Pbca-P2_1/c phase transition (to be submitted)
2. **Zhang, J. S.** and J. D. Bass, Possibly stratified upper mantle suggested by single-crystal sound velocity measurements of San Carlos olivine at simultaneously high-pressure high-temperature conditions (to be submitted)
3. **Zhang, J. S.**, Bass, J.D. and G. Zhu (2015), Single-crystal Brillouin spectroscopy with laser-heating and variable **q**, Rev. Sci. Instrum. 86, 063905. doi: 10.1063/1.4922634
4. Liu, L. and **J. S. Zhang** (2015), Differential contraction of subducted lithosphere layers generates deep earthquake generation, Earth Planet. Sci. Lett. 421, 98. doi:10.1016/j.epsl.2015.03.053
5. **Zhang, J. S.**, Shieh, S., Bass, J.D., Dera, P. and V. Prakapenka (2014), High-pressure single-crystal elasticity study of CO_2 across phase I-III transition, Appl. Phys. Lett. 104, 141901. doi:10.1063/1.4870526
6. Wu, S., Zhu, G., **Zhang, J. S.**, Banerjee, D., Bass, J. D., Ling, C., Yano, K (2014), Anisotropic Lattice Expansion of Three dimensional Colloidal Crystals and Its Impact on Hypersonic Phonon Band Gaps, Phys. Chem. Chem. Phys.16, 8921-8926. doi: 10.1039/C4CP00498A
7. **Zhang, J. S.,** Reynard, B., Montagnac, G, and J. D.Bass (2014), Pressure-induced Pbca-P21/c phase transition of natural orthoenstatite: high temperature effect and its geophysical implications, Phys.Earth Planet. Int. 228, 150-159. doi: 10.1016/j.pepi.2013.09.008
8. Zhu, G., Swinteck, N.Z., Wu, S., **Zhang**, **J. S.,** Pan, H., Bass, J. D., Deymier, P. A., Banerjee, D. and K. Yano (2013), Direct observation of phononic dispersion of a three-dimensional solid/solid hypersonic colloidal crystal, Phys. Rev. B.88, 144307. doi: 10.1103/PhysRevB.88.144307
9. **Zhang, J. S.**, Reynard, B., Montagnac, G., Wang, R. and J. D.Bass (2013), Pressure-induced Pbca-P2_1/c phase transition of natural orthoenstatite: Compositional effect and its geophysical implications, Am. Mineral. 98, 986-992. doi:10.2138/am.2013.4345
10. **Zhang, J. S.**, P. Dera, and J. D. Bass (2012), A new high-pressure phase transition in natural Fe-bearing orthoenstatite, Am. Mineral. 97, 1070–1074. doi:10.2138/am.2012.4072
11. **Zhang, J. S.**, J. D. Bass, T. Taniguchi, A. F. Goncharov, Y.-Y. Chang and S. D. Jacobsen (2011), Elasticity of cubic boron nitride under ambient conditions, J. Appl. Phys. 109, 06352. doi:10.1063/1.3561496

Book Chapters

- Bass, J.D. and **J. S. Zhang** (2015), Techniques for measuring high P/T elasticity. In Price, G.D., Ed., Treatise on Geophysics (2nd edition) -Mineral Physics, Elsevier, Amsterdam.

Abstracts, Talks and Posters

- Talk (COMPRES Annual Meeting 2015)
  - **Zhang, J. S.**, Xu, R., Zhang, D., Dera, P., Eng, P. and J. Stubbs, Determine single crystal elasticity using Thermal Diffused Scattering (TDS), Colorado Springs, Colorado US
- Talk (Japan Geoscience Union Meeting 2015)

- **Zhang, J. S.**, Bass, J.D., Single-crystal Brillouin Spectroscopy with Laser Heating and Variable q: Design, Demonstration and Results on Olivine, Makuhari Messe, Japan

- Talk (AGU Fall Meeting, 2014)
  - **Zhang, J. S.**, Bass, J.D., Single-crystal Brillouin Spectroscopy with Laser Heating and Variable q: Design, Demonstration and New Results on Olivine, San Francisco, CA
- Talk (EHPRG 2014)
  - **Zhang, J. S.**, Bass, J.D., Single-crystal Laser Heating Brillouin Spectroscopy & Brillouin Spectroscopy with variable q: Design & Demonstration, Lyon, France
- Talk (COMPRES Annual Meeting 2014)
  - **Zhang, J. S.**, Bass, J.D., Sound velocity measurements at simultaneous high pressures and temperatures and variable q by Brillouin spectroscopy with laser heating, Stevenson, WA
- Talk (AGU Fall Meeting, 2013)
  - **Zhang, J. S.**, Bass, J.D., Sound velocity measurements at simultaneous high pressures and temperatures and variable q by Brillouin spectroscopy with laser heating, San Francisco, CA
- Abstract (the 3rd Global-COE International symposium of deep earth mineralogy in conjuction with TANDEM March 2013)
  - **Zhang, J. S.**, Bass, J.D., Reynard, B. and P. Dera. Elasticity and structure of mantle pyroxenes. Matsuyama, Japan
- Poster (COMPRES Annual Meeting 2012)
  - **Zhang, J. S.**, Reynard, B., Montagnac, G., Wang, R.C. and J. D. Bass Compositional effect to Pbca-$P2_1/c$ high pressure phase transition of orthoenstatite. Williamsburg, VA
- Abstract (AOGS - AGU (WPGM) Joint Assembly 2012 March)
  - Bass, J.D., **Zhang, J. S.** and P. Dera. High-Pressure Transition and Sound Velocities of Natural Enstatite. Singapore
- Talk (GSA Annual Meeting 2011)
  - **Zhang, J. S.**, P. Dera and J. D. Bass New imagine of Fe-bearing Orthoenstatite phase diagram and its geophysical significance. Minneapolis, MN
- Poster (COMPRES Annual Meeting 2011)
  - **Zhang, J. S.**, P. Dera and J. D. Bass High pressure phase transition of orthoenstatite. Williamsburg, VA
- Poster (AGU Fall Meeting, 2010)
  - **Zhang, J. S.**, J. D. Bass, T. Taniguchi, and A. F. Goncharov Elastic properties of cubic boron nitride under ambient conditions. San Francisco, CA
- Poster (AGU Fall Meeting, 2009)
  - **Zhang, J. S.** and J. D. Bass High pressure elastic properties of natural orthopyroxene up to 18 GPa. San Francisco, CA

PROFESSIONAL AFFILIATIONS

American Geophysical Union Mineralogical Society of America