

Kanani K. M. Lee

California Institute of Technology
Division of Geological & Planetary Sciences
1200 E. California Boulevard, MC 170-25
Pasadena, CA 91125
Phone: (626) 395-6239 Fax: (626) 568-0935
kanani@gps.caltech.edu
<http://www.gps.caltech.edu/~kanani/>

Research Interests

I employ high-pressure and -temperature tools to study their effects on the physical and chemical properties of Earth and planetary materials, namely the phase diagram of Lower-Mantle assemblages, the pressure-induced siderophile behavior of normally lithophile and atmophile elements, and pressure-induced changes to the decay constants of electron-capture radioisotopes.

Education

- 1999-2003 Ph.D., Geophysics
Department of Earth & Planetary Science
University of California, Berkeley
Thesis advisor: Raymond Jeanloz
Thesis: Exploring planetary interiors: Experiments at extreme conditions
- 1995-1999 Bachelor of Science, Physics, Magna Cum Laude
Department of Physics
University of San Francisco

Awards and Honors

- 2005-2007 Alexander von Humboldt Summer Fellow, Bayerisches Geoinstitut
2004 O. K. Earl Postdoctoral Fellow, California Institute of Technology
2003 Outstanding student paper award, 2003 Fall American Geophysical Union Meeting, Volcanology, Geochemistry & Petrology Section
2003 Sigma Xi Grants-In-Aid awardee
2000-2003 National Science Foundation Graduate Research Fellow

Teaching Experience

- 2006-present PHYS 451: Intermediate Mechanics, New Mexico State University, 9 students
2000-2003 Trained four graduate and three undergraduate students in the University of California, Berkeley's High-Pressure Mineral Physics group.
Spring 2000 Head Graduate Student Instructor, Geology/Astronomy 12 "The Planets," University of California, Berkeley, class size ~500 students, directly responsible for ~100 students. Developed homework and exam questions as well as led discussion sections.
1996-2003 Exploratorium (a science, art and human perception museum in San Francisco, CA; www.exploratorium.edu) "Physics of Toys" volunteer.

Publications

K. K. M. Lee, L. R. Benedetti, R. Jeanloz, J. H. Eggert, D. G. Hicks, P. M. Celliers, S. J. Moon, A. Mackinnon, G. W. Collins, E. Henry, M. Koenig, A. Benuzzi-Mounaix, "Forming conducting water: Implications for magnetic field generation in Icy Giant planets," *Journal of Chemical Physics*, under review.

K. K. M. Lee and G. Steinle-Neumann, "High-pressure alloying of iron and xenon: 'Missing' Xe in the Earth's Core," *Journal of Geophysical Research: Solid Earth*, 111, B02202, doi:10.1029/2005JB003781 (2006).

K. K. M. Lee, B. O'Neill, W. R. Panero, S.-H. Shim, L. R. Benedetti and R. Jeanloz, "Equations of state of the high-pressure phases of a natural peridotite and implications for the Earth's Lower Mantle," *Earth & Planetary Science Letters*, 223(3-4), 381-393, (2004).

K. K. M. Lee, B. O'Neill, R. Jeanloz, "Limits to resolution in composition and density in ultra high-pressure experiments on natural mantle-rock samples," *Physics of the Earth and Planetary Interiors*, 143-144, 241 (2004).

K. K. M. Lee, G. Steinle-Neumann and R. Jeanloz, "*Ab-initio* high-pressure alloying of iron and potassium: Implications for the Earth's Core," *Geophysical Research Letters*, 31(11), L11603 (2004).

K. K. M. Lee and R. Jeanloz, "High-pressure alloying of potassium and iron: Radioactivity in the Earth's Core?" *Geophysical Research Letters*, 30(23), 2212 (2003).

K. K. M. Lee, L. R. Benedetti, A. Mackinnon, D. Hicks, S. J. Moon, P. Loubeyre, F. Occelli, A. Dewaele, G. W. Collins, and R. Jeanloz, "Taking thin diamonds to their limit: Coupling static-compression and laser-shock techniques to generate dense water," *AIP Conference Proceedings* 620, 1363 (2002).

P. Loubeyre, P. M. Celliers, D. G. Hicks, E. Henry, A. Dewaele, J. Pasley, J. H. Eggert, M. Koenig, F. Occelli, K. K. M. Lee, R. Jeanloz, D. Neely, A. Benuzzi-Mounaix, D. Bradley, M. Bastea, S. Moon and G.W. Collins, "Coupling static and dynamic compressions: First measurements in dense hydrogen," *High Pressure Research*, 24(1), 25 (2004).

P. M. Celliers, G. W. Collins, D. G. Hicks, M. Koenig, E. Henry, A. Benuzzi-Mounaix, D. Batani, D. K. Bradley, L. B. DaSilva, R. J. Wallace, S. J. Moon, J. H. Eggert, K. K. M. Lee, L. R. Benedetti, R. Jeanloz, I. Masclet, N. Dague, B. Marchet, M. Rabec Le Gloahec, Ch. Reverdin, J. Pasley, O. Willi, D. Neely and C. Danson, "Electronic conduction in shock-compressed water," *Physics of Plasmas*, 11(8), L41 (2004).

Selected Recent Seminars (mid 2004 - present)

“Radioactivity in the Earth’s Core: Potassium possibilities,” New Mexico State University, Department of Geological Sciences, March 1, 2006.

“Radioactivity in the Earth’s Core?: Quantum theory and high-pressure experiments on iron-potassium alloying,” New Mexico State University, Physics Department, June 1, 2005.

“Phase assemblage and stability of pyroxenite at Lower-Mantle conditions,” American Geophysical Union Spring Meeting, May 26, 2005.

“Forming conducting water: Implications for magnetic field generation in Icy Giant planets,” Caltech, Division of Geological & Planetary Sciences, Planetary Science Seminar, May 3, 2005.

“Constraining the Earth’s Lower Mantle composition: Insights from mineral physics,” Caltech, Division of Geological & Planetary Sciences, Seismo Lab Seminar, January 7, 2005.

“High-pressure alloying of iron and xenon: ‘Missing’ Xe in the Earth’s core?,” American Geophysical Union Fall Meeting, December 16, 2004.

“Forming metallic water: Implications for magnetic field generation in Icy Giant planets,” Scripps Institute of Oceanography, IGPP Seminar, November 5, 2004.

“Constraining the Earth’s Lower Mantle composition: Insights from mineral physics,” UC Santa Barbara, Kavli Institute of Theoretical Physics, CIDER meeting, July 28, 2004.

References

Dr. Raymond Jeanloz

Professor
Earth & Planetary Science
Univ. of California, Berkeley
307 McCone Hall
Berkeley, CA 94720-4767

Phone: (510) 642-2639
Fax: (510) 643-9980
jeanloz@uclink.berkeley.edu

Dr. Gilbert W. Collins

Shock Physics group leader
Physics and Applied Technologies Directorate
Lawrence Livermore National Laboratory
7000 East Avenue
Livermore, CA 94550-9234

Phone: (925) 423-2204
Fax: (925) 423-6319
collins7@llnl.gov

Dr. Gerd Steinle-Neumann

Assistant Professor
Bayerisches Geoinstitut
Universität Bayreuth
D-95440 Bayreuth
Germany

Phone: +49(0) 921-553702
Fax: +49(0) 921-553769
g.steinle-neumann@uni-bayreuth.de

Dr. Geoffrey Marcy

Professor
Astronomy
Univ. of California, Berkeley
417 Campbell Hall
Berkeley, CA 94720

Phone: (510) 642-1952
Fax: (510) 642-3411
marcy@astron.berkeley.edu

Dr. Simon Clark

Beamline Scientist
Advanced Light Source
Lawrence Berkeley National Laboratory
1 Cyclotron Road
Berkeley, CA 94720

Phone: (510) 495-2442
Fax: (510) 495-2067
smclark@lbl.gov

Dr. Paul Asimow

Associate Professor
Division of Geological & Planetary Sciences
California Institute of Technology
1200 E. California Blvd., MC 170-25
Pasadena, CA 91125

Phone: (626) 395-4133
Fax: (626) 568-0935
asimow@gps.caltech.edu