

International Workshop on Synchrotron High-Pressure Mineral Physics and Materials Science

Program (Final, 12/5/07)

Wednesday, December 5, 2007

Registration: 4:00 – 6:00 PM (Argonne Guest House Lobby)

Thursday, December 6, 2007

Registration: 8:00 – 9:00 AM (Lobby, Bldg. 402, APS Conference Center)

Session I. Synchrotron High-pressure Facilities and Related Developments

(Bldg. 402, Room E1100/E1200)

Time	Speaker	Affiliation	Title
9:00	Rivers, Mark	GSECARS, Univ. Chicago, USA	Welcome and introduction to APS
9:10	Prakapenka, Vitali	GSECARS, Univ. Chicago, USA	New developments in the diamond cell facilities at GSECARS
9:35	Ohishi, Yasuo	JASRI, SPring-8, Japan	Recently developed DAC technique at SPring-8 to study deep Earth materials
10:00	Shen, Guoyin	HPCAT, CIW, USA	New progress in high-pressure research at HPCAT
10:20	Coffee Break		
10:40	Wang, Yanbin	GSECARS, Univ. Chicago, USA	Recent developments at the LVP facility of GSECARS
11:00	Tange, Yoshinori	GRC, Ehime Univ., Japan	Development of Kawai-type MA with SD anvils and its application: Equation of state of MgSiO ₃ -perovskite
11:20	Leinenweber, Kurt	Arizona State Univ., USA	Development of a CsCl pressure standard and its use in testing a series of multi-anvil cells
11:40	Mueller, Hans	GeoForschungsZentrum Potsdam, Germany	Ultrasonic measurements in multi-stage multi-anvil devices
12:00	Lunch (Bldg. 402 Gallery, downstairs)		
13:00	Group photo and APS tour		

Section II. Neutrons and New Techniques

(Bldg. 402, Room E1100/E1200)

Time	Speaker	Affiliation	Title
14:00	Kagi, Hiroyuki	Tokyo Univ., Japan	Recent progress on high-pressure neutron beamline at J-PARC in Japan
14:25	Tulk, Chris	ORNL, USA	Prospects for neutron diffraction under extreme pressure conditions at the new Spallation Neutron Source
14:50	Sturhahn, Wolfgang	APS, USA	Geophysics studies with high-resolution X-ray spectroscopy
15:10	Haskel, Daniel	APS, USA	Magnetic spectroscopy at high pressure using XMCD
15:30	Leshner, Charles	UC Davis, USA	X-ray microtomography at high pressure
15:50	Yang, Wenge	HPCAT, CIW, USA	A scanning angle energy-dispersive X-ray diffraction (SA-EDXD) technique for studying the structure of materials at high pressure in the diamond anvil cell
16:10	Poster overviews (2 min presentations in alphabetical order by last names)		
17:00	Posters and refreshment (Bldg. 402 Gallery, downstairs)		
19:00	Dinner (Argonne Guest House dining room)		

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Section III. Ultrahard and Other Materials

(Bldg. 402, Room E1100/E1200)

Time	Speaker	Affiliation	Title
9:00	Irifune, Tetsuo	GRC, Ehime Univ., Japan	Synthesis of large and high-quality nanopolycrystalline diamond and its potential applications to high-pressure mineral physics
9:25	Ohfuji, Hiroaki	GRC, Ehime Univ., Japan	High-pressure and high-temperature experiments using nanocrystalline diamond anvil and laser heating
9:45	Okuchi, Takuo	Nagoya Univ., Japan	Precision laser machining of nanopolycrystalline diamond
10:05	Wang, Yuejian	LANL, USA	High-pressure deformation study of nanocrystalline nickel

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Section III. Ultrahard and Other Materials — Continued

(Bldg. 402, Room E1100/E1200)

Time	Speaker	Affiliation	Title
10:25	Coffee Break		
10:50	Yamanaka, Takamitsu	Geophysical Laboratory, CIW, USA	Electron-lattice interaction under high pressure examined by single-crystal diffraction study
11:15	Dera, Przemyslaw	GSECARS, Univ. Chicago, USA	New synchrotron-based single-crystal methods for structural mineral physics and materials science
11:30	Ding, Yang	HPSynC, USA	Novel structural phase transition of vanadium under high pressure
11:50	Borkowski, Lauren	UNLV/GSECARS, USA	Determination of the high-pressure phases (II' and IV') of CuGeO ₃ using single-crystal technique
12:10	Manghnani, Murli	Hawaii Univ., USA	Equation of state and pressure induced transition(s) in B ₄ C: Correlation of static high-pressure synchrotron XRD, Raman, and shock-wave data
12:30	Lunch (Bldg 402 Gallery, downstairs)		

Section IV. Mineral Physics Applications

(Bldg. 402, Room E1100/E1200)

Time	Speaker	Affiliation	Title
14:00	Fiquet, Gillaume	Université Paris 6 et 7, France	Synchrotrons: A core business?
14:25	Chen, Bin	UIUC, USA	Effect of pressure on the melting behavior of the Fe-S system at moderate pressures
14:45	Tsuno, Kyusei	Bayreuth, Germany	In situ observation of liquid immiscibility in the Fe-O-S melt at high pressure using an X-ray radiographic technique
15:05	Alatas, Ahmet	APS, USA	Inelastic X-ray scattering experiments on liquids in diamond anvil cell
15:25	Coffee Break		
15:50	Inoue, Toru	GRC, Ehime Univ., Japan	Time-resolved X-ray diffraction experiment of dehydration of serpentine at high pressure
16:10	Sakai, Takeshi	Tohoku Univ., Japan	Partitioning of iron between perovskite, post-perovskite, and ferropericlasite up to 154 GPa and 2000 K
16:30	Kono, Yoshio	GRC, Ehime Univ., Japan	Ultrasonic velocity measurements of polycrystalline MgO and standard free pressure calibration at high pressures and high temperatures
16:50	Irifune, Tetsuo	GRC, Ehime Univ., Japan	Closing remarks
17:00	Adjourn		
18:00	No-host dinner (interested persons meet in Guest House lobby)		

Posters (Thursday, December 6, 2007)

Presenter	Affiliation	Title
<i>Materials Science</i>		
Yu, Tony	Stony Brook Univ.	Synthesis and strength measurement of superhard B ₆ O at high pressure and temperature
Kharlamova, Svetlana	APS	Pressure-induced phase transitions in gadolinium iron borate materials
Yusa, Hitoshi	NIRIM	Post corundum phases in Ga ₂ O ₃ and In ₂ O ₃ : X-ray diffraction experiments and theoretical computations
Zhang, Jianzhong	LANL	Elastic properties of BaCe _{1-x} Y _x O _{3-0.5x} perovskite: effect of oxygen vacancy and pressure-induced softening
Zhao, Yusheng	LANL	Graphic derivations of high P-T thermo-mechanics for polycrystalline materials
<i>Mineral Physics</i>		
Gao, Lili	UIUC	Magnetic transition and sound velocities of Fe ₃ C at high pressure
Lavina, Babara	GSECARS	Effect of the cation ordering on the spinel elastic properties
Nakajima, Yoichi	Tokyo Institute of Technologies	Effect of hydrogen and carbon on the melting temperature of iron
Sanehira, Takeshi	GSECARS, Univ. Chicago	Density changes of pyrolite and MORB near the 660 km seismic discontinuity by in-situ X-ray diffraction measurements and chemical composition analyses
Scott, Henry	Indiana Univ., South Bend	Room temperature equation of state for Fe ₂ P
Shinmei, Toru	GRC, Ehime Univ.	Density and Fe-Mg partitioning changes in pyrolite to 50 GPa
Whitaker, Matthew	Stony Brook Univ.	Combined in situ synchrotron X-ray diffraction and ultrasonic interferometry study of ϵ -FeSi at high pressure and temperature
<i>New Techniques</i>		
Arakawa, Masashi	Univ. Tokyo	Vibrational spectroscopic analysis of CO ₂ fluids at high pressure
Higo, Yuji	JASRI, SPring-8	Elastic wave velocity measurements under the condition of lowermost mantle transition region
Knight, Jason	LBNL	The study of binary chemical reactions at high pressure and high temperature using an imaging system and laser heated diamond anvil cell
Liu, Haozhe	Harbin, China	High-pressure diamond anvil cell studies using synchrotron micro-tomography and high energy X-ray scattering techniques
Nishiyama, Norimasa	GRC, Ehime Univ.	Concept of a new large volume press: MADONNA
Odake, Shoko	Univ. Tokyo	Development of spectroscopic three-dimensional stress imaging technique around mineral inclusions in diamond
Rivers, Mark	GSECARS, Univ. Chicago	Gas loading system
Sanehira, Takeshi	GSECARS, Univ. Chicago	Johnson noise thermometry at high pressure
Urakawa, Satoru	Okayama Univ.	Development of high-pressure and high-temperature X-ray tomography technique: Application to sessile drop interfacial energy measurement
Zhai, Shuangmeng	ISEI, Okayama Univ.	Pressure generation and observation of post-perovskite Phase in MnGeO ₃ and MgGeO ₃ by in situ X-ray diffraction using sintered diamond anvils
Zhao, Jiyong	APS	Nuclear resonant scattering under simultaneous high pressure and high temperature at 3-ID, APS