Workshop on high-pressure time-resolved synchrotron techniques


Comprehensive Program

Wednesday, September 24, 2014

17:00  Registration and Reception (cash bar + finger food; concludes at 19:30) – Argonne Guest House

Thursday, September 25, 2014

7:30  Poster setup – in the Gallery, lower level APS Conference Center (Building 402)
7:30  Registration, Continental Breakfast – APS Auditorium (Building 402)
Note:  All talks will be held in APS Auditorium

Session 1: Introduction
Chair: Guoyin Shen

8:30  Welcome, Stas Sinogeikin (HPCAT)
8:40  Overview of HPCAT and future perspectives for time-resolved experiments, Ho-Kwang (Dave) Mao (HPCAT, CIW)
9:10  MBA upgrade and effect on time-resolved experiments, Dennis Mills (APS)
9:40  Coffee break

Session 2: Time-resolved high-pressure x-ray imaging
Chair: Nenad Velisavljevic

10:00  High-pressure x-ray imaging experiments at HPCAT, Yoshio Kono (HPCAT)
10:25  Study of liquid-liquid immiscibility (silicate melt-water) by x-ray imaging in large volume press, Kenji Mibe (U. Tokyo)
10:50  X-ray fast tomography and its applications in dynamical phenomena studies in geoscience at APS, Xianghui Xiao (APS)
11:15  High-pressure and high-speed liquid jets: shock waves, cavitations and dynamics, Jin Wang (APS)
11:40  Discussion
11:50  Group photo - Front steps
12:00  Lunch - Gallery, lower level APS Conference Center (Building 402)
Session 3: X-ray micro-diffraction with fast compression and decompression

Chairs: Choong-Shik Yoo and Jesse Smith

1:00   Fast (de)compression capabilities and first experimental results at HPCAT, Jesse Smith (HPCAT)
1:25   Time-resolved X-ray diffraction and electrical resistance measurements on metals at high pressure, Nenad Velisavljevic (LANL)
1:50   Rate dependent pathways for the high pressure synthesis of novel metastable phases in Group IV elements, Bianca Haberl (ANU/ORNL)
2:15   Dynamic response of materials by oscillatory deformation experiment + X-ray imaging, Don Weidner (Stony Brook)
2:40   Discussion
2:50   Coffee break
3:10   Modeling phase transition kinetics under dynamic compression, Carl Greeff (LANL)
3:35   Kinetics of structural phase transitions and fast x-ray diffraction, John Tse (USASK)
4:00   X-ray transient absorption spectroscopy for solar energy research, Lin Chen (NU/ANL)
4:25   Challenges and opportunities in analysis of massive data from time resolved experiments, Przemek Dera (UH)
4:50   Discussion

5:00   Poster session – in the Gallery, lower level APS Conference Center (Building 402)
       Chair: Stanislav Sinogeikin
6:30   Workshop Dinner – Gallery, lower level APS Conference Center (Building 402)

Friday, September 26, 2014

7:30   Continental Breakfast – APS Conference Center (Building 402)

Session 4: Pulsed/ramped laser heating and x-ray micro-diffraction

Chairs: Tom Duffy and Yue Meng

8:30   High PT experiments with pulsed laser heating: capabilities at HPCAT, Yue Meng (HPCAT)
8:55   Technical developments on high-pressure melting of metals using pulsed laser heating, Ross Hrubyak (HPCAT)
9:20   Time-resolved x-ray diffraction of solids under dynamic loadings, Choong-Shik Yoo (WSU)
Melting measurements using XAS at megabar pressures, *Reini Boehler (CIW)*

**Discussion**

**Coffee break**

Time-domain experiments at extreme conditions at GSECARS, *Vitali Prakapenka (GSECARS)*

**Discussion**

Time-resolved X-ray diffraction at APS beamline 7ID, *Don Walko (APS)*

**Discussion**

Lunch - *Gallery, lower level APS Conference Center (Building 402)*

**Session 5: New time-resolved high-pressure X-ray techniques and directions and related topics**

*Chairs: John Tse and Yuming Xiao*

**Laue capabilities at HPCAT - towards time-resolved studies, Dmitry Popov (HPCAT)**

**Dynamic Laue diffraction: A probe for understanding the kinetics of strength and phase transitions, Joel Bernier (LLNL)**

**100 ps time-resolved white beam diffraction at BioCARS, Keith Moffat (UC)**

**Time-resolved XES, Tsu-Chien Weng (SSRL)**

**Discussion**

**Coffee break**

**Fast detectors for time resolved studies – current status and new developments, Robert Bradford (APS)**

**Laser-based dynamic compression of solids, Tom Duffy (Princeton)**

**Ultrafast x-ray scattering measurements from dynamically compressed solids, Siegfried Glenzer (LCLS)**

**A first laser shock experiment at the ESRF to probe Warm Dense Iron, Florent Occelli (DPTA/SPMC)**

**Discussion**

**Posters / free time (take down posters between 6-6:30)**

**Workshop Dinner – Gallery, lower level APS Conference Center (Building 402)**
Saturday, September 27, 2014

8:00  Continental Breakfast – HPCAT / Building 434C

Parallel hands-on / demonstration sessions

NOTE: Four parallel hands-on / demonstrations sessions will be held simultaneously at four different stations. Attendees can sign up for groups (A, B, C, or D) during registration.

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11:20  Tour of HPCAT facilities (same 4 groups)

12:00  Lunch – HPCAT / Building 434C

13:00  Adjourn