## 1st Workshop for the Extreme Conditions Beamline at PETRA III



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## **High Pressure Research at GSECARS**

Monday 18 May 2009 13:15 (45 minutes)

GSECARS, sector 13 at the Advanced Photon Source, operates as a national user facility for earth, planetary, and environmental research. It includes facilities for both diamond anvil cell and large volume high-pressure research. The high-pressure facilities include:

- 13-ID-D station with online laser heating on an undulator beamline. The laser system includes double-sided heating with two 100 watt Yb:fiber lasers, and single-sided heating with a 200 watt CO2 laser. Experiments include x-ray diffraction, scattering and emission spectroscopy.

- 13-ID-D station with 1000-ton large-volume press. This apparatus includes a T-25 teacup module, and is used for diffraction, scattering and imaging experiments. It will soon include a D-DIA30 module for higher pressures and deformation experiments.

- 13-BM-D station diamond-anvil cell on the bending magnet beamline. This station has online Brillouin spectroscopy and external heating.

- 13-BM-D station with 250-ton large volume press. This press includes DIA, T-cup, D-DIA and rotational Drickamer modules. The Drickamer module is used for high-pressure computed tomography.

- Gas-loading system for loading inert gases at up to 2000 bar in the diamond anvil cell. This system provides online optical access with ruby fluorescence, for very high success rate in gas loading.

- Offline Raman, ruby fluorescence and Yb:fiber laser heating. This offline laser can be used for drilling diamond cell gaskets and other micromachining tasks.

Recent technical advances and scientific results will be presented.

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