

### **ALS Beamline 12.2.2, A High-pressure X-ray User Facility at the US-West-Coast**

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Beamline 12.2.2 is a hard-X-ray beamline making use of the radiation spectrum ( $\sim 5 \text{ keV} < E < 40 \text{ keV}$ ) emitted from a superconducting bending magnet. The radiation is conditioned using a plane parabola collimating mirror (M1), a Kohzu monochromator assembly with a Si(111) crystal ( $E/\Delta E \sim 7000$ ) or W/B<sub>4</sub>C multilayer ( $E/\Delta E \sim 100$ ), and a toroidal focusing mirror (M2) with variable focusing distance, before it is directed into the experimental hutch

In the hutch, two experimental stations facilitate a variety of high-pressure experiments, focusing on *in-situ* high-pressure - high-temperature powder diffraction, EXAFS and X-ray imaging. End-station 1 is presently optimized for combining externally heated diamond anvil cells (DACs) with powder X-ray diffraction and can be used for high-pressure EXAFS experiments as well. End-station 2 is designed for *in situ* laser heating of DACs using a set of Kirkpatrick-Baez mirrors for secondary focusing (spot size at sample =  $0.01 \times 0.01 \text{ mm}^2$ ) as well as a double sided YLF laser heating system

Samples are placed on a kinematic mount equipped with 2 rotation stages as well as 4 linear stages in order to center the DAC reproducibly at the same reference position. The overall accuracy of the distance calibration is  $\sim 0.01 \text{ mm}$  corresponding to a theoretical  $\Delta d/d$  of  $10^{-4}$  at a sample to detector distance of 100 mm. Further benchmarks as well as examples of current research will be presented.

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