

# Keynote Lectures

**[KN1] In situ structural studies under extreme conditions: the precision frontier.**

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A major goal of extreme conditions crystallography in the field of materials science is to obtain the highest precision data possible on samples studied in situ in sample environments, which also scatter and limit access. One of the most suitable techniques to perform such high-precision structural studies under extreme conditions of pressure is single-crystal x-ray diffraction using diamond anvil cells. This technique is well developed on both laboratory and synchrotron sources and the two types of experiments will be described and compared. Examples of high pressure studies of open framework materials such as zeolites and transition metal cyanides will be presented. The materials adopt or transform at high pressure to structures that can be particularly complex (large unit cells, phase transitions, disorder, host-guest systems). Future possibilities will also be discussed.

**Keywords:** high-pressure structure determination; structural phase transitions; single-crystal X-ray diffraction