** SATELLITE WORKSHOP - Photon Science**

**In situ energy-dispersive XRD and imaging on materials at HPHT conditions in the Large Volume Press at P61B**

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| **Monday, 20 January 2025** |  |
| The Aster-15 LVP at beamline station P61B is used to routinely generate high pressures (up to 30 GPa) and temperatures (up to 2400 K) on materials for HPHT investigations using energy-dispersive X-ray diffraction (ED-XRD) and radiography in the high-energy range 30 – 160 KeV. Specialised assemblies may generate even higher pressures or can be enhanced with ultrasonic wave speed measurements. The station provides two highly positional Ge-detectors for XRD acquisitions. In situ deformation experiments are enhanced using X-ray transparent cBN or sintered-diamond anvils and the acoustic emissions detection system. Imaging experiments, such as falling sphere viscosimetry, may be enhanced with an extremely bright scintillator - GAGG:Ce. We are also working toward commissioning of an impedance analyser for in situ electrical conductivity measurements and a monochromator for specialised angle-dispersive XRD measurements in the LVP. Finally, a suite of data processing software is available on the beamline website. Proposals can be submitted to P61B for beam time (normal access) and for time without X-rays (fast access). Details on the status, development and future of the beamline at PETRA IV will also be presented at this dedicated workshop. | |

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| **PROGRAMME** | | | |
|  |  |  | *Chair: R. Farla* |
| 13:30 | *Introduction* |  | S. Bhat |
| 13:40 | High-pressure sound velocity measurements of Sn (tin) in the P61b large volume press. |  | R. Rowland/  B. Sturtevant |
| 14:00 | Breakthroughs in Ultra-High Pressure Multi-Anvil Experiments: Achieving Pressures Over 45 GPa on Millimeter-Scale Samples |  | L. Man |
| 14:20 | Post-spinel phase transition in (Mg0.9Fe0.1)2SiO4 system as an interpretation of the 660-km discontinuity elevation |  | A. Chanyshev |
| 14:40 | *Coffee break* |  |  |
|  |  |  | *Chair: S. Bhat* |
| 15:00 | Unveiling Structural Pathways: In-Situ ED-XRD Studies of Novel Perovskites Formation and Transformations at High Pressure and Temperature |  | C. Coppi |
| 15:20 | Acetylides under Pressure: Crushing it at P61B! |  | C. Hoverath |
| 15:40 | Characterization of the Spin-Frustration in Doubly Ordered Perovskite NaYbZnWO6 Obtained by High-Pressure Synthesis |  | R. Kumar |
| 16:00 | *Coffee break* |  |  |
|  |  |  | *Chair: S. Bhat* |
| 16:15 | Acoustic Emission Detection (AED) techniques at P61B and preliminary results on the *in situ* deformation of Phase A |  | X. Feng |
| 16:30 | **Status and development of P61B, and outlook towards PETRA IV** |  | R. Farla |
| 17:00 | Beamline discussions, suggestions and related topics |  | *Chair: R. Farla* |
| 17:30 | End of workshop |  |  |