



LAPTRON : *Los Alamos Pressure-Temperature Researches Online Neutron*

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We propose to build a dedicated high-pressure (P) and high-temperature (T) neutron beamline at Los Alamos Neutron Science Center (LANSCE) to perform state-of-the-art simultaneous neutron diffraction and neutron tomography experiments at high P-T conditions for the characterization of material properties in a wide range of scientific and technological disciplines. A large volume 2000-tonne press, TAPLUS-2000, will be the central apparatus mounted permanently in the instrument hut and advanced beamline equipments will be built around the press. The proposed high-pressure neutron beamline will integrate diffraction, radiography, tomography, and ultrasonic interferometry, calorimetric measurements, and deformation rheology so that the instrument can profoundly focus on materials property characterization. It will be particularly valuable for the engineering aspects of the materials study such as deformation mechanism, yield strength, constitutive equation, acoustic elasticity, and flow law under high P-T conditions. The integrations with in-situ neutron diffraction, thermo-calorimetry, acoustic elasticity, visco-plasticity, radiography, and tomography will greatly enhance instrument performances and achieve significantly in multidiscipline sciences.