

# « Exploring magmas under pressure using the Paris-Edinburgh press and synchrotron light »

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Magmas, which are generated by the melting of rocks in the deep interiors of the Earth and other planets, are involved not only in the present-day volcanism but also in 4.5 billion years evolution of the Earth's and planetary interiors. Understanding the generation, transportation and eruption of magmas requires the knowledge of some fundamental structural and physical properties of melts, like elasticity, density and viscosity. In this presentation, I will review recent advances in studying silicate liquids of geophysical importance using the large volume Paris-Edinburgh press at 3<sup>rd</sup> generation synchrotron facilities. After a brief account on the structural properties of silicate melts under pressure, I will describe the available techniques for density and elasticity measurements for non-crystalline materials. This will include X-ray diffraction and absorption methods, X-ray imaging volume measurements, and the ultrasonic technique. I will also introduce the use of X-ray radiography to estimate viscosity of melts from falling sphere experiments; with applications to lunar magmas. Finally, I will present the last developments in X-ray tomography under extreme conditions for studying melt migration processes.