Title: Shock-induced incongruent melting of olivine and formation of natural Fe-bearing aluminous bridgmanite in ordinary chondrites

Abstract:
The planet Earth was formed from a similar material that constitutes present-day asteroids. Olivine and bridgmanite are the most volumetrically abundant mineral of the Earth's upper and lower mantle, and it is important to understand its formation mechanism to better comprehend the origin and evolution of planetary interiors. Olivine breaks down to bridgmanite and magnesiowüstite formed by the solid-state or melting of the olivine. Whereas, natural bridgmanites have been reported in only a few shocked meteorites; however, the composition of these specimens differs from plausible compositions of terrestrial bridgmanite. In this presentation, I will present our recent results which show the possible occurrence of bridgmanite and magnesiowüstite formed by incongruent melting of olivine in an ordinary chondrite (Kamargaon L6 chondrite) and the first natural occurrence of bridgmanite, observed in an ordinary chondrite, with a composition closest to the bridgmanite present in the Earth's lower mantle. The bridgmanite in the ordinary chondrite (Katol L6 chondrite) has high Fe3+/Fe ratio and agrees with experimental predictions. The Katol chondrite may serve as a unique analogue for crystallization of bridgmanite during the final stages of magma ocean crystallization of the Earth.