Micrometeorites on the Earth surface: Understanding their origin and properties

Abstract:
Throughout its history planet Earth has been continuously bombarded by high-speed extra-terrestrial material. These are debris of comets and asteroids that are leftover material in the solar system, but additional sources may occasionally contribute. The Earth surface accretes a complex variety of these extra-terrestrial material at a rate of approximately 40,000 tons per annum. The dominant size fraction of these extra-terrestrial materials are in the range of few ten of 痠 too few mm. These sub-mm size particles called as micrometeorites (MMs) provide us a unique opportunity to study diverse collection of samples of solar system bodies in the laboratory. Many micrometeorites have shown textural, chemical, Isotopic and trace element composition that can be linked to primitive chondrites such as CI and CM chondrites. Some of these particles are not found in meteorite studies indicate existence of diverse type of precursors in the asteroidal belt that is still not in our inventory. Most dust-sized cosmic particles undergo ablation and chemical alteration during atmospheric entry due to rapid frictional heating, which alters their original properties depending on the size, composition, entry velocity and angle. A comprehensive understanding of this process is essential in order to decipher their pre-entry characteristics. My talk will focus on understanding their chemical and isotopic properties of micrometeorites, that can enhance our overall understanding of these objects.