

“Exploring the Dust Reservoir of the Upper Stratosphere with DUSTER” – A. Musolino

Abstract: DUSTER (*Dust in the Upper Stratosphere Tracking Experiment and Retrieval*) is an instrument designed to fly on stratospheric balloons to collect uncontaminated particles from the upper Earth stratosphere (30–40 km). The collection in the upper stratosphere is a key point: at that altitude the terrestrial dust supply is limited, therefore the upper stratosphere is an excellent reservoir for extraterrestrial materials like Interplanetary Dust Particles (IDPs). Thanks to the DUSTER’s efficient sampling system and the adoption of strict protocols for minimizing contamination, the particles collected do not require sample manipulation after collection and they are ready for identification and characterization directly on the instrument “collector” (a sample holder with 13 TEM grids). Until now, DUSTER collected more than ~300 particles that range from 0.1 to 150 μm . The ambitious goal of DUSTER is to become a reference collection for uncontaminated extraterrestrial particles collected in the stratosphere, complementing micrometeorites and IDPs available at the Earth’s surface. Their cosmochemical study is thus expected to provide new information on the composition of the inner Solar System interplanetary cosmic dust complex and its geochemical contribution to Earth - an outstanding issue in earth and planetary science and astrophysics.