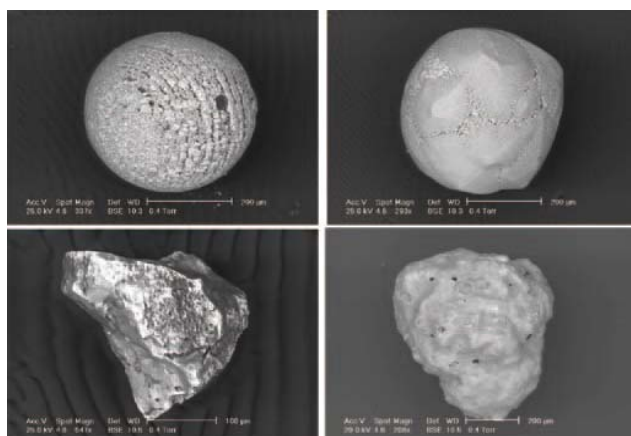


A NEW MICROMETEORITE COLLECTION FROM ANTARCTICA AND ITS PRELIMINARY CHARACTERIZATION BY MAGNETIC METHODS.

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Introduction: In December 2003, the meteorite recovery party of the XIX PNRA expedition collected by magnetic extraction thousands of micrometeorites in the 100-800 μm size range in an aeolian deposit at the top of Frontier Mountain (northern Victoria Land, Antarctica), a few Myr old glacially eroded surface. This discovery, located by the use of a magnetic gradiometer, offered a good opportunity to test and develop a magnetic classification procedure for these objects, in parallel to "classical" mineralogical and geochemical characterization.

After SEM imaging (see figure), magnetic measurements were performed on individual particles with diameter above 400 μm . EDAX detectable Ni and Cr contents of the particles confirm their extraterrestrial origin. Hysteresis loop parameters, magnetic susceptibility and demagnetization of isothermal remanence at saturation were obtained on single particles.



Backscattered SEM images of four micrometeorites collected at Frontier Mountain. Scale bar is 200 μm , 100 μm for lower left picture.

Preliminary results: The magnetic measurements allow the discrimination of at least four distinct populations of particles. The largest population contain about 10 wt. % magnetite. Another population contains around 2 w% magnetite in much smaller grains, likely concentrated in the external crust. The lower left particle in figure is dominantly made of Fe,Ni metal and a C-bearing phase.

Perspectives: Microprobe and noble gas analyses will be performed on these micrometeorites. The results will be compared to the magnetic classification in order to evaluate its accuracy and usefulness. If validated, the non-destructive and rapid magnetic classification will be applied to a large number of micrometeorites in order to compare the Frontier Mountain collection with other micrometeorite collections (e.g. the South Pole [1] or the Cap Prudhomme [2] collections).

References: [1] Taylor S. et al. 2000. *Meteoritics & Planetary Science* 35:651-666. [2] Maurette M. et al. 1991. *Nature* 351:44-47.