Seminar: “Characterization of unmelted micrometeorites using synchrotron-based X-ray analysis”

14/06/2018 - 16:00

AMGC Seminar Thursday June 14 2018 – 16.00 h

By Flore van Maldegem “Characterization of unmelted micrometeorites using synchrotron-based X-ray analysis”

Yearly, the Earth accretes approximately 40,000 metric tons of extra-terrestrial material, mostly in the form of micrometeorites, particles ranging from 10 – 2000 μm. Unmelted micrometeorites, generally rare and small, represent unique material that largely preserved the original petrographic, mineralogical and geochemical properties of the precursor. The collections of the Transantarctic and Sør Rondane Mountains contain well-preserved and relatively large specimens compared to more conventional micrometeorite deposits, thus providing a unique opportunity to study the characteristics of a set of unmelted micrometeorites from different locations across the Antarctic continent.

The ID16B Nano-Analysis beamline at the European Synchrotron Radiation Facility (ESRF) was used to non-destructively characterize the micrometeorites by obtaining nanoCT, XRF and XRD data on 2 samples from the Transantarctic and 6 samples from the Sør Rondane Mountains, with a size ranging from 100 to 400 μm, to provide information on mineralogical, textural, structural, and chemical variations in these particles, and to trace and characterize primary parent body features. The results will provide a set of tools to analyse micrometeorites in a non-destructive way.