



## **Rock magnetism and Paleomagnetism of Mistastin Lake impact structure, Labrador, Canada**

Gwenaël Hervé (1), Stuart Gilder (1), Cassandra Marion (2), Gordon Osinski (2), Jean Pohl (1), and Paul Sylvester (3)

(1) Department of Earth and Environmental Sciences, Ludwig-Maximilians University, Munich, Germany, (2) Department of Earth Sciences, University of Western Ontario, Canada, (3) Department of Earth Sciences, Memorial University, St John's, Canada

The  $35.8 \pm 1.0$  Ma Mistastin Lake impact structure (Labrador, Canada) is characterized by a dominantly anorthositic target, which makes it a good terrestrial analogue for a lunar highland crater. The 28 km-diameter Mistastin structure contains impact melt rocks whose thickness reaches up to 80 meters. We collected 116 oriented cores in melt lithologies from four locations around the crater. Rock magnetic analyses show that the remanent magnetization is carried both by Ti-rich and Ti-poor titanomagnetite. Microscopic observations show that the latter probably resulted from high-temperature oxidation of the Ti-rich titanomagnetite. Stepwise thermal and alternating field demagnetization initially removes a viscous overprint, and then isolates what appears to be a stable thermoremanent magnetization at higher unblocking temperatures and peak fields. The mean direction, assumed to be parallel to the ambient geomagnetic field at the time of the impact, is consistent with the 30 Ma polar wander path of North America. We also collected 25 cores from anorthosite and mangerite from the Mesoproterozoic basement (around 1400 Ma), in order to study the pressure and thermal effects of the impact on the magnetic remanence and rock magnetic properties. Saturation remanence and coercivity increase from the periphery to the centre of the crater. Most samples have remanent magnetization directions similar to those expected for the Mesoproterozoic. Only basement rocks from the South shore lying very close to the contact of the melt rocks have a magnetization parallel to that of the melt.