

Towards an Antarctic meteorite hotspot map

Background

Meteorites are left-overs from the formation of the solar system, and as such, they contain priceless information about the chemical composition of the solar system as it was being born. The Antarctic Ice Sheet is the most prolific region for collecting meteorites on Earth. Most meteorites are collected in blue ice areas, which can act as meteorite *hotspots*. In these *hotspots*, meteorites are transported to the surface through ice flow, where they can remain for several hundreds to thousands of years. So far, the collection of meteorites in Antarctica has mainly focused on a few dedicated sites, which have typically been identified by chance (i.e. by encountering meteorites when exploring this region).

Objective and tasks

The main objective of this project is to generate a meteorite hotspot map for Antarctica. For this, the candidate will start by examining the typical characteristics of the known present-day Antarctic meteorite locations. Subsequently, this information will be used to systematically identify other locations in Antarctica where the same conditions are met (e.g. low surface albedo, slow surface velocities,...etc). To reach this goal, the candidate will be making use of a variety of remote sensing data for characterizing the surface of the Antarctic ice sheet. For this, she/he will be using Google Earth Engine. Potentially, statistical analyses will be needed to derive the final product, which is a meteorite hotspot map. This map will be of large interest to research groups who look for meteorites on the Antarctic ice sheet and who are planning future missions.



Figure 1 A 18-kg meteorite collected on the Nansen blue ice field meteorite trap (East Antarctica) during the JARE-54/BELARE 2012-2013 expedition.

Profile

Candidate students should preferably have some prior knowledge in working with Google Earth Engine.

Information:

Dr. Stef Lhermitte (s.lhermitte@tudelft.nl)
Dr. Harry Zekollari (h.zekollari@tudelft.nl)