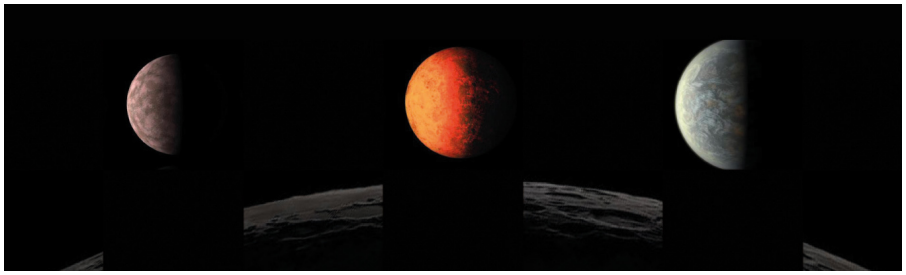

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# Measurements of Earth's magnetic field anomalies caused by meteorite impacts

*Thursday 23 October 2025 16:05 (15 minutes)*

Meteorites that have impacted the Earth's surface in the past have created impact craters. Most of these craters have not been preserved in a form that allows for their contemporary identification, but some, especially in Central and Northern Europe, have been described and classified as geological structures formed by meteorite impacts. When a celestial body strikes the Earth's surface, it causes a temporary increase in temperature to several hundred degrees Celsius, sometimes exceeding the Curie temperature for ferromagnetic rocks and minerals that make up the near-surface layer. Magnetization is relatively stable from a geological time perspective. The magnetic record in magnetite is usually stable and is quite difficult to remagnetize (Fassbinder, 2015).

The impact leads to a change in the direction of magnetization in the minerals, which sometimes persists after the impact. This phenomenon is known as Thermoremanent Magnetization (TRM). It is characteristic of meteorite impact sites.

The project aims to conduct research in the field of applied geophysics and the magnetic properties of rock and mineral samples in the area of craters formed by meteorite impacts in the context of thermomagnetic anomalies.

As part of this project, proton magnetometer measurements have been conducted in the areas of the Morasko craters in Poland, the Dobele crater in Latvia, the Vepriai crater in Lithuania, and several craters in Estonia (Ilumestsa, Simuna, Tsõõrikmäe, Kärdla, Kaali). Samples from the Estonian craters have been collected for paleomagnetic studies and analyzed using a rotational magnetometer and a magnetic susceptibility instrument. The results of the magnetometric measurements are very promising and exhibit characteristic patterns of magnetic field anomalies typical of impact craters.

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