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DIPARTIMENTO DI GEOSCIENZE

Seminario

Magnetic Archives of Earth's History: From Ocean Drilling to Archaeological Chronology

Tuesday, 19 May 2026 – 16:30, Aula Arduino

Relatore: **Dr. Anita Di Chiara –** Istituto Nazionale di Geofisica e Vulcanologia (Roma)

The Earth's magnetic field is one of the most dynamic and important physical properties of our planet, serving as both a shield against cosmic radiation and a high-resolution chronological tool for geological records and human history. This seminar presents some of the recent advancements in paleomagnetism, focusing on two distinct but complementary archives: deep-sea sediments and archaeological materials.

The first part of the seminar focuses on results from International Ocean Drilling Program (IODP) Expeditions 384, 395, and 395C in the North Atlantic Ocean, across the Reykjanes Ridge. I will present high-resolution sedimentary records from the Björn and Gardar drifts, which provide a continuous archive of geomagnetic excursions during the Matuyama and Brunhes chrons. These data are instrumental in refining the magnetostratigraphic framework for the North Atlantic Ocean in the last 4 Ma, offering new insights into the onset of major North Atlantic current systems at around 3.6 Ma. The second part of the seminar moves to "human timescales" utilizing archaeomagnetism to reconstruct the Holocene geomagnetic field refining the applicability of archaeomagnetic dating. By analyzing the magnetic signals preserved in burnt structures and artifacts, such as the Ishtar Gate of Babylon, Neolithic ceramics from Jordan, and ceramics from the Roman Empire, past variations in field intensity (paleointensity) with unprecedented precision can be reconstructed. I will discuss how these fluctuations, including the discovery of rapid intensity "spikes," provide a powerful tool for independent dating and give some examples of dating Ancient Roman ceramics and a salt production site.

By bridging the gap between million-year tectonic processes and centennial-scale archaeological records, this seminar demonstrates the versatility of paleomagnetism in addressing fundamental questions in both geophysics and archeology.

Proponente: **Katinka Bellomo**