



Seminario

Marine magnetics: from hydrothermal sites to subducting slabs

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Aula Arduino

Relatore: **Dr. Jérôme Dymont**

Institut de Physique du Globe de Paris (France)

Abstract

Marine magnetic anomalies have long been used to date the seafloor and allow plate tectonic reconstructions. However, they have a much wider potential if studied like a real geophysical signal, beyond being only seen as sequences of geomagnetic polarity reversals, i.e. isochrons of seafloor spreading. I will show how high-resolution marine magnetic data acquired near the seafloor allow to decipher dykes or hydrothermal sites; how, in case of continuous magmatic crust, they can provide a tool to date the seafloor at a few tens of thousands years interval; and how they give a unique access to past geomagnetic variations for a better understanding of the geodynamo. Sea-surface magnetic data offer ways to better understand the thermal structure of passive margins or subduction zones. Our global compilation of such data reveals that hydrothermalism at ridge axes ceases after ~ 10 Ma; that the magnetization of the oceanic floor is spreading-rate dependent; and finally that peculiar mantle provinces bear peculiar magnetic signatures. Marine magnetics therefore represent a cheap but efficient tool in the marine geoscience. The poor resolution of old, pre-GPS measurements makes important to acquire these data even on routes that seem already well known, if only to refine our knowledge of plate motions and unravel the history of slow plate boundaries.

Proponente: **Christine Meyzen**