

Geomagnetism

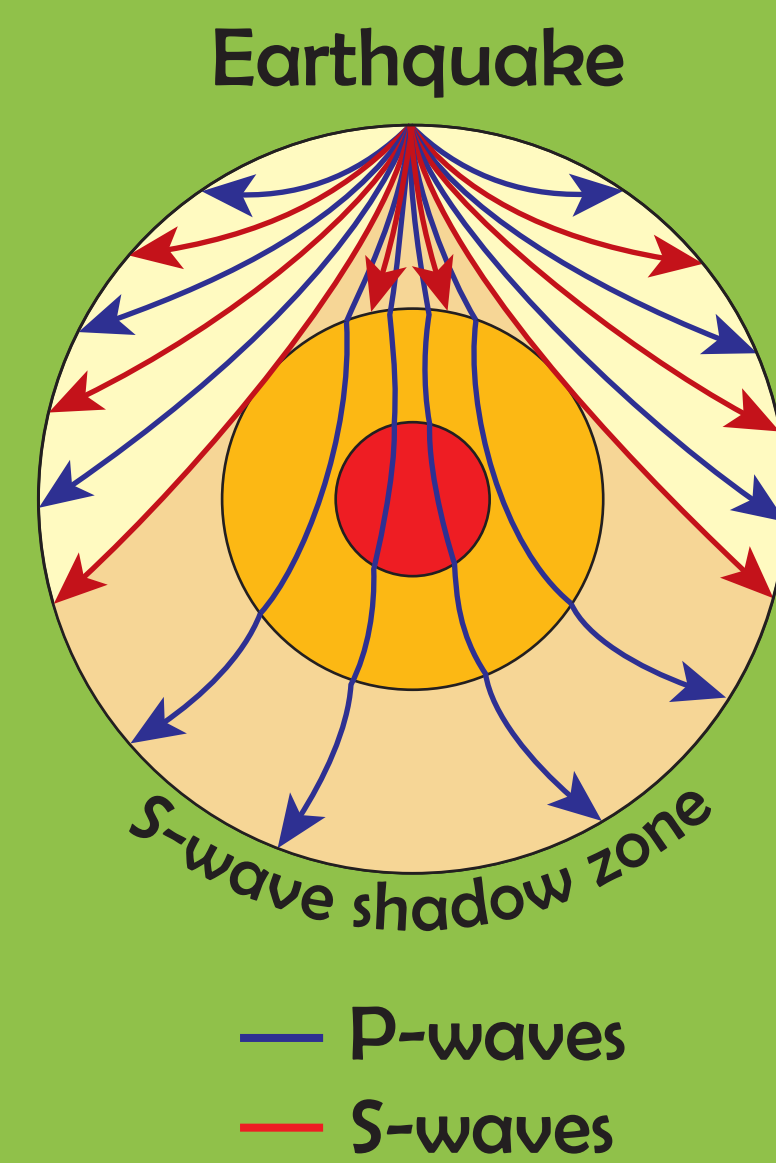
Study of the strength and behaviour of Earth's magnetic field on all timescales

GEOMAGNETISM
TRAILHEAD



Inge Lehmann

Inge Lehmann discovered the Earth's solid inner core and liquid outer core in 1936. Since S-waves cannot travel through the liquid outer core they disappear on the opposite side of the Earth after an Earthquake. The Earth's magnetic field is generated in this liquid outer core, while the solid inner core stabilizes the field.



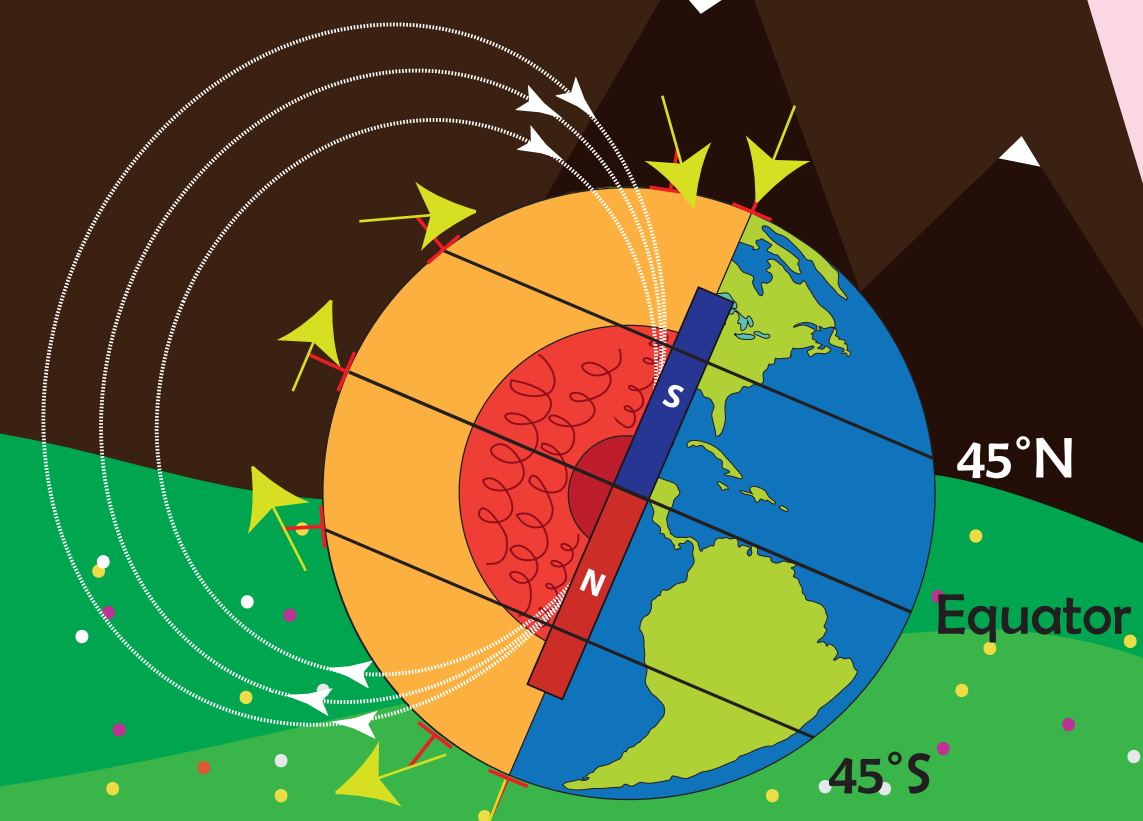
Joseph Larmor

Joseph Larmor proposed the theory of a self-sustaining dynamo process in 1919. His research mainly focused on solar magnetic fields and the magnetic properties of sunspots, but his ideas are also applicable to the geomagnetic field.

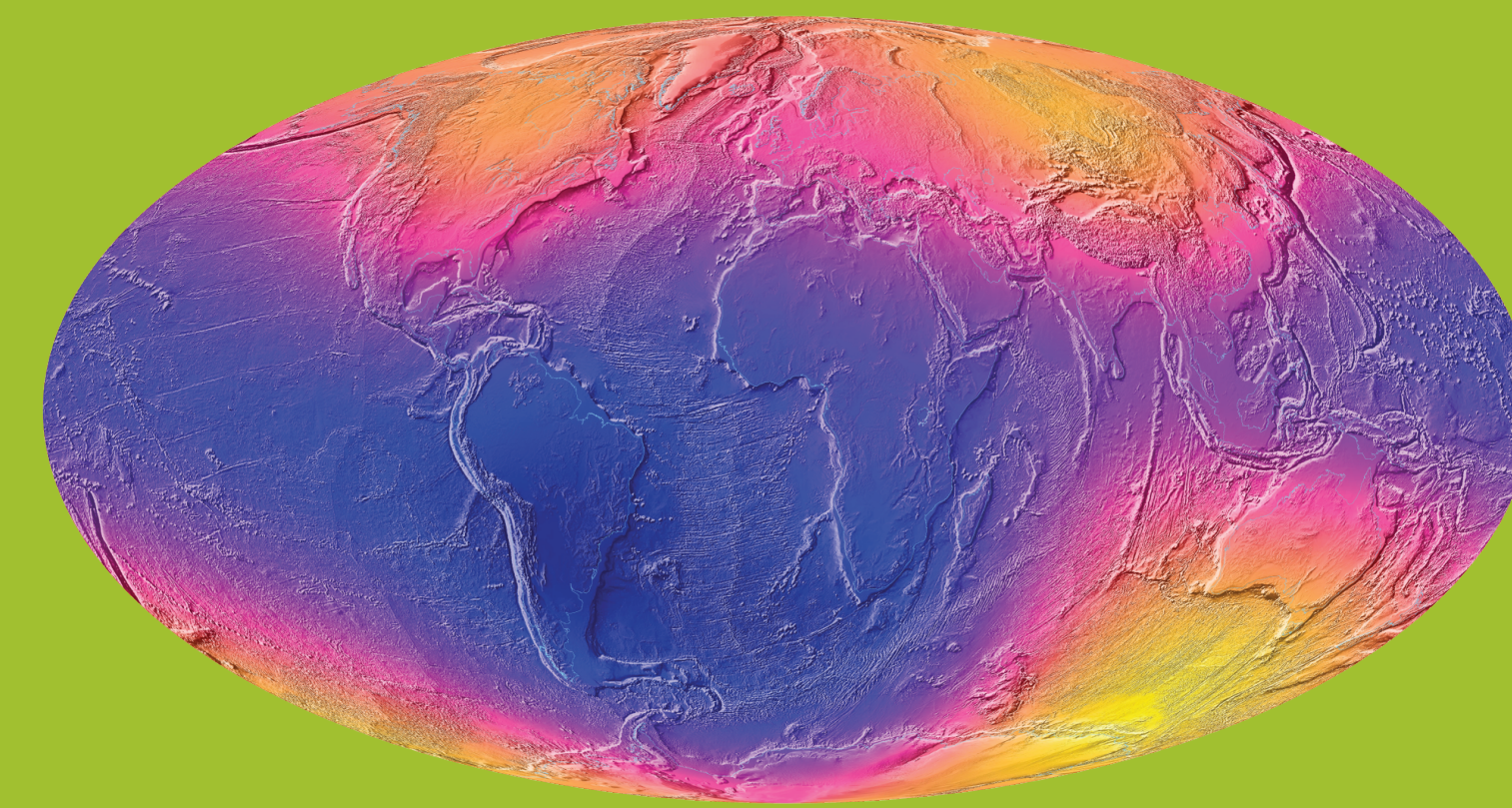


William Gilbert

William Gilbert was the first to describe the magnetic properties of the Earth in 1600. Using his Terrella and a small compass, he was able to explain the observed declination and inclination of the Earth's magnetic field.



Carl Friedrich Gauss

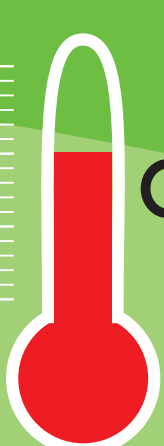


Carl Friedrich Gauss made the first global model of the Earth's magnetic field using spherical harmonic functions in 1838. In the preceding years he made great efforts to measure the intensity of the Earth's magnetic field and established several geomagnetic observatories.



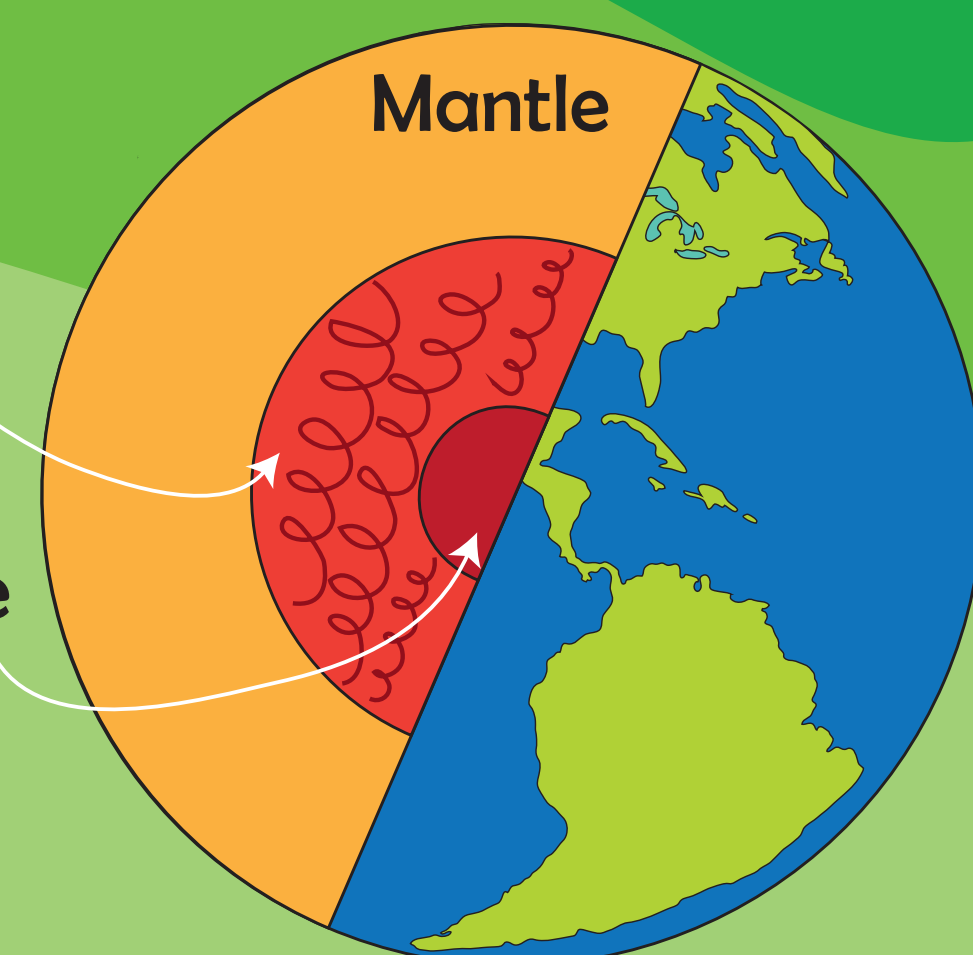
Bernard Brunhes

Bernard Brunhes found volcanic rocks that had a magnetization almost opposite to the present-day magnetic field. In 1905, he hypothesized that the Earth's magnetic field must have flipped its polarity through geologic history.

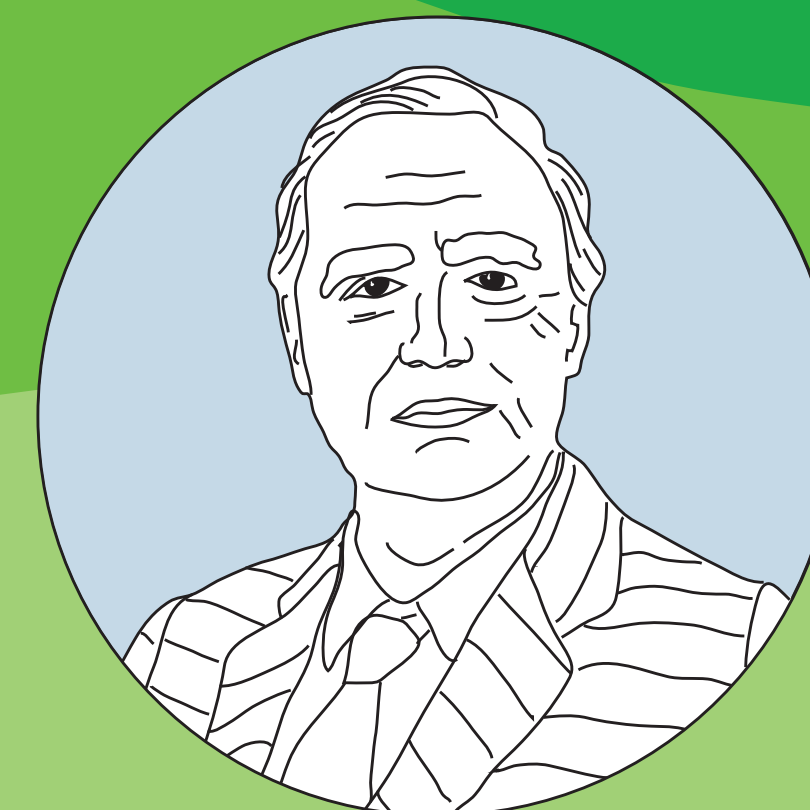


Outer Core (liquid)

Inner Core (solid)

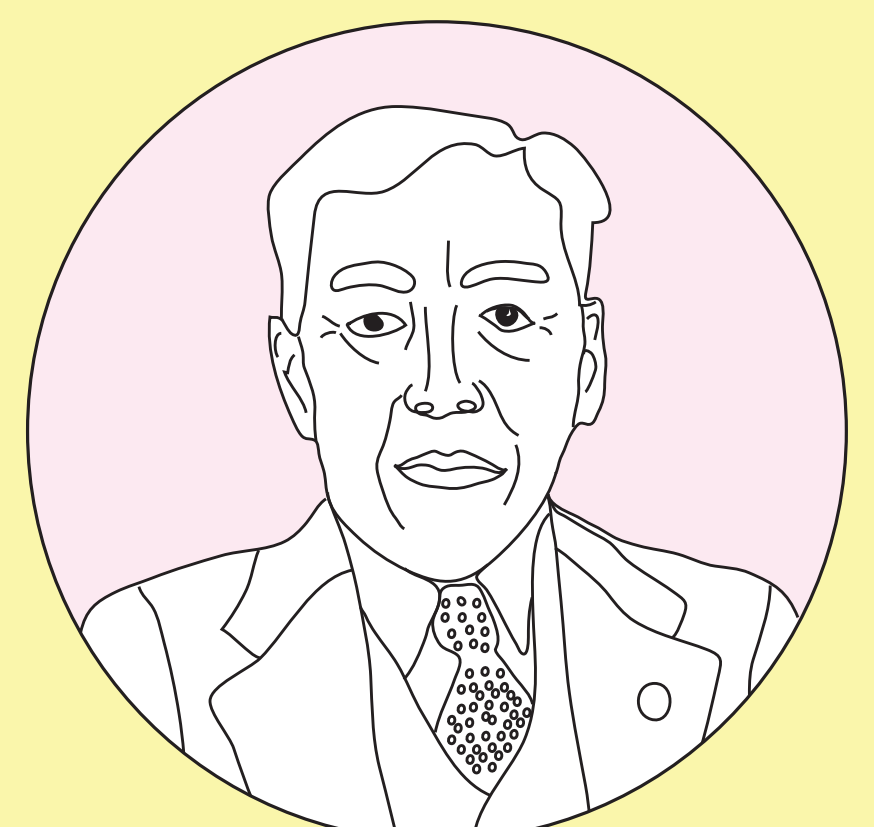


Edward Bullard developed the first quantitative model for the geodynamo in 1954. The geodynamo is a self-sustaining process that generates the Earth's magnetic field by the movement of liquid iron in the outer core.



Edward Bullard

Motonori Matuyama systematically studied the magnetization in a sequence of volcanic rocks. He found a clear correlation between the polarity of the magnetization in a rock and its stratigraphic position, in 1929. This proved that the Earth's magnetic field reverses its polarity from time to time.



Motonori Matuyama

