

# First results from the paleomagnetic study of Cumbre Vieja

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Josep Parés working in Cumbres Viejas. Credit: CENIEH

Josep M. Parés, coordinator of the Geochronology and Geology Program

at the Centro Nacional de Investigación sobre la Evolución Humana (CENIEH), has led the first study of the magnetic properties of the lava and ash produced during the 2021 eruption of the Cumbre Vieja volcano (island of La Palma, Canary Islands, Spain), which has been published in the journal *Geosciences*.

Beyond the [tragedy](#) and socioeconomic impact this natural eruption phenomenon meant for the island of La Palma, volcanoes are generators of crustal material that open a window onto the Earth's interior. Given the results of this preliminary study, carried out in collaboration with the Universidad de Burgos (UBU) and the Instituto de Productos Naturales y Agrobiología (CSIC, La Laguna), a field campaign is planned to take samples at selected points on Cumbre Vieja, which is a true natural laboratory for investigating the unique properties of the Earth's [magnetic field](#).

Apart from enhancing our comprehension of volcanism per se, the eruption offers a one-off opportunity for understanding which of the Earth's properties, such as its magnetic field, are recorded at the moment of their formation by the materials like lava generated, and how this takes place.

"One of the foundations and premises of paleomagnetism is precisely that rocky materials acquire and retain the ambient terrestrial magnetism at the moment of their formation. However, we also know that that record, or paleomagnetic signal, can often be imperfect," comments Parés, who is a paleomagnetism specialist.

To determine the reliability of paleomagnetic measurements, it is crucial to characterize that signal in materials formed under known conditions, in terms of time, direction, and magnitude of the geomagnetic field. These conditions are met to an exceptional extent for the volcanic materials ejected by Cumbre Vieja. "We have here the generation of

new rocks, where on the one hand the conditions of the site are known and, on the other, we can measure the magnitude and direction of the geomagnetic field, and in real time too," adds Parés.

The CENIEH and the UBU have collaborated closely to obtain the magnetic composition of the lava and ash from Cumbre Vieja, which is an indispensable step to establishing which formations will be appropriate for deeper studies of the geomagnetic field record in lavas.

To do this, the twin CENIEH and UBU paleomagnetism laboratories conducted coercivity studies using a vibration magnetometer, and plotted curves of thermomagnetism and other properties which, taken together, reveal the characteristics of the titanomagnetites present in those materials.

**More information:** Josep M. Parés et al, Rock Magnetism of Lapilli and Lava Flows from Cumbre Vieja Volcano, 2021 Eruption (La Palma, Canary Islands): Initial Reports, *Geosciences* (2022). [DOI: 10.3390/geosciences12070271](https://doi.org/10.3390/geosciences12070271)

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