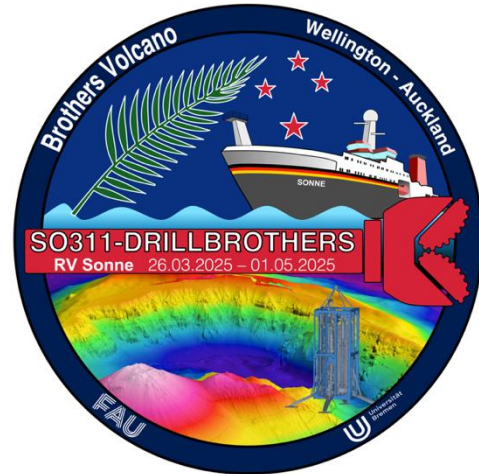


## RV SONNE cruise SO311

### 1<sup>st</sup> Weekly Report (26.03. – 30.03.2025)

The German research vessel SONNE left the port of Wellington, New Zealand, in the early afternoon of March 26. Prior to this, MARUM's MeBo200 marine drilling rig on board was tested in the harbor basin. Our course took us along the southern coast of New Zealand's North Island and past the Bay of Plenty to our working area at around 35°S and 179°E. There, in water depths between 1300 and 1800 meters, is a large submarine volcano called Brothers, which is home to various types of hot springs. On board are 34 researchers, including eleven members of the team that will deploy MeBo200. The cruise is being jointly organized and conducted by MARUM - Center for Marine Environmental Sciences at the University of Bremen and the GeoZentrum Nordbayern at Friedrich-Alexander-Universität Erlangen/Nürnberg (FAU). Researchers from New Zealand and Canada are also taking part in the SO311 cruise.



The scientific objective of research cruise SO311, entitled “DrillBrothers”, is to develop a better understanding of the processes immediately below the hot solution seeps. Our scientific questions include aspects of reservoir-forming processes and the study of microbial life in extreme environments. Where the hot solutions flow from the seafloor into the ocean, accumulations of metal sulphides form and unique biotopes develop in which the chemical energy of the solutions forms the basis of food webs. However, even before the hot solutions emerge from the sea floor, they mix with seawater in crevices and cavities in the ocean floor. Drilling into the rocky subsurface is necessary to understand the role of these processes. We are also studying rock samples to gain insights into the volcanological evolution of Brothers and two other volcanoes (Healy and Haungaroa). These rock samples are mainly recovered with a TV grab provided by GEOMAR in Kiel and used by the FAU team.



*Fig. 1: RV SONNE sets sail from Wellington in glorious weather.  
Photo: Fabian Hampel*

The scientific team covers the disciplines of geology, volcanology, geochemistry, microbiology and oceanography and also includes technical personnel with different objectives and tasks. Daily meetings promote exchange between the various groups on board.



*Fig. 2: The MeBo200 marine drilling rig is being prepared for its first deployment.  
Photo: Fabian Hampel*

In ideal weather, the sun covered a distance of 520 nautical miles before we arrived in the working area in the late afternoon of March 28. The station work began immediately after arrival. First, the CTD probe was deployed to accurately determine the sound velocity profile of the water column in the working area. The first water samples were taken from different depths using the water samplers arranged in a ring around the probe. Subsequently, the underwater volcano Healy, which is less than ten nautical miles away from Brothers, was surveyed with the ship's own multibeam echo sounder EM122.

The first MeBo well was to be drilled on a fairly steep crater wall in the northwest of Brothers, but the terrain proved to be too steep and irregular and therefore unsuitable for a promising drilling location. A second, flatter area with evidence of extinct hydrothermal activity in the southeast of the volcanic crater was selected for the current MeBo deployment. Samples of the seabed at the drilling locations were taken in advance using the TV grab.

Everyone on board is well. The bridge and crew ensure that the preparatory work during the transit and the beginning of the station work runs smoothly in a friendly and professional manner. The stay on board is an extremely pleasant experience thanks to the sunny weather, the calm sea and, in particular, the excellent work of the cooks and stewards.

Best regards, also on behalf of all those taking part in the trip,

Wolfgang Bach