



## Thermal conductivity of salt-bearing ice analogs in Jovian moons to support future JUICE mission.

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Thermal properties of frozen salt solutions are crucial to interpret the JUPITER ICy moons Explorer (JUICE) (ESA) and Europa Clipper (NASA) missions, which will be launched in the upcoming years to make detailed observations of the giant gaseous planet Jupiter and three of its largest moons (Ganymede, Callisto, and Europa) due to the scarcity of experimental measurements.

Therefore, we have conducted a set of experiments to measure and study the thermal conductivity and calorimetry of macroscopic frozen salt solutions of particular interest in these regions, including Na-chloride (NaCl), Mg-sulphate (MgSO<sub>4</sub>), sodium sulphate (Na<sub>2</sub>SO<sub>4</sub>), and Magnesium chloride (MgCl<sub>2</sub>). A climatic chamber has been used to mimic the cryogenic conditions in the Jovian Icy Moons. Measurements were performed at atmospheric pressure and temperatures from 0 to -70°C. Temperature and thermal conductivity were measured during the course of the experiments. A side effect of these measurements is that they served to spot phase changes in the ice mixtures. A small sample of the liquid salt-water solution was set aside for the calorimetry measurements.

These experiments and the measurements of thermal conductivity and calorimetry will be valuable to constrain the chemical composition, physical state, and temperature of the upper layers of the icy crusts of Ganymede, Callisto, and Europa (please see abstracts EPSC Muñoz Iglesias et al. 2020 and EPSC Solomonidou et al. 2020).