

1st Weekly report - MARIA S. MERIAN - MSM89

14th – 19th Jan. 2020



The crusader "Aida Perla" (300m length, 4300 passengers) leans right over the front deck of Maria S. Merian at the pier in Bridgetown

After some busy days in the busy port of Bridgetown we started our research cruise as part of EUREC4A (Elucidating the role of clouds-circulation coupling in climate) on Monday 17 January 2020, together with METEOR. It will be the first time that the two German research vessels, METEOR and MARIA S. MERIAN, will carry out a measurement campaign together. In collaboration with even two more ships from France and the USA, and in coordination with four research aircrafts,

EUREC4A will work on the formation and dynamics of clouds. Especially the shallow clouds in tropical regions drive feedback mechanisms that in turn create large uncertainties in current climate projections. A better understanding of clouds and their representation in numerical models is therefore essential. EUREC4A is an European and an international field study, which is carried out with the participation of more than 30 national and international partners, including from Germany four Max Planck Institutes, four universities, three Helmholtz institutions, one Leibniz Institute and the German Weather Service DWD.



Our science program started with reference measurements at the "Barbados Cloud Observatory" (BCO), which the Max Planck Institute for Meteorology in Hamburg has been operating for almost 9 years. Here the RV METEOR was also waiting for us and together the two ships were able to steam into the approaching clouds in their first dedicated measurement campaign.

The bridge of Maria S. Merian with view of the RV Meteor in the background

Probably the most unusual device on board MERIAN is the Cloudkite from the Max Planck Institute for Dynamics and Self-Organization in Göttingen. The helium-filled balloon has a diameter of more than 10 m and is equipped with various measurement devices. A slightly smaller kite is also going to be installed on METEOR. The kites are attached to the stern of the ships and ascend into cloud regions of up to 2 km height to measure cloud microphysics, turbulence and other processes.

MSM89 – Bridgetown/Barbados – Bridgetown/Barbados

The University of Cologne operates a W-band radar and a Micro rain radar with which, for example, precipitation, cloud top and cloud composition can be determined from these measurements. The instruments are installed on a platform that compensates for the ship's motion to achieve optimal measurement results on the MARIA S. MERIAN.

Together with the Helmholtz Centre for Environmental Research (UFZ), the University of Hohenheim has developed a very powerful lidar as part of the Helmholtz project MOSES (Modular Observation Solution for Earth Systems). The ARTHUS can measure temperature and humidity up to a height of more than 5 km. In addition, wind lidars are used.

The oceanic measurements are performed by GEOMAR (physics), the Max Planck Institute for Microbiology (microbiology and biogeochemistry) and the Max Planck Institute for Meteorology (biogeochemistry). The famous underwater gliders will be deployed from MERIAN, which “fly” through upper 1 km of the ocean and record data. Coordinated high frequency radiosounding of atmospheric state variables will be done from all ships, an aerosol sampler has been installed (Max Planck Institute for Chemistry) and rain samples for analysis of the isotopic composition are collected (ETH Zurich, Swiss).

MARIA S. MERIAN is running fine and the support by the crew leaves nothing to desire. The food is excellent as always and after everyone has settled in, it also tastes really good again.



With greetings from the MARIA S. MERIAN,
Johannes Karstensen, GEOMAR, for the participants of the MSM89



RV Meteor under a rainbow as seen from RV Maria S Merian

See also our blog at “Ocean blogs”: <http://www.oceanblogs.org/msm89>