

**Plenary Talk**

PV X Fri 9:45 Audimax

**How does the heat get to the ice? - Comprehensive year-round observations of ocean-ice-atmosphere interactions in the high Arctic Ocean** — ●CHRISTIAN HAAS<sup>1,2</sup> and MOSAiC TEAM<sup>1</sup> — <sup>1</sup>Alfred Wegener Institute, Bremerhaven, Germany —<sup>2</sup>Institute of Environmental Physics, University of Bremen, Germany

Arctic sea ice retreats rapidly with profound consequences for climate and the ecosystem, however the underlying processes and their interactions are still poorly understood quantitatively, and regional and climate model projections are uncertain. In 2019/20 the international Multidisciplinary Drifting Observatory for the Study of Arctic Climate (MOSAiC) set out to improve process understanding and model

parameterizations by collecting the most comprehensive, year-long observations ever of the atmosphere, ice, ocean, and ecosystem and their interactions in the high Arctic Ocean. The German research icebreaker Polarstern was used as a drifting base camp to support the work in, under, and above the ice. Here we briefly summarize the events of the expedition and its most important results. These show the importance of heat fluxes in the atmospheric and oceanic boundary layers for the growth and melt of sea ice, and of the wind and current driven redistribution of snow and ice for the sea ice mass balance. Attempts to budget energy and matter fluxes and their impact on sea ice growth and melt show the challenges related to inconsistent satellite data products and to distributed measurements of parameters subject to variability on different temporal and spatial scales.