UNIVERSITÄT BERN

# Institute of Geological Sciences Kolloquium Seminar

**Monday, 13th May 2024**

at 16:15 Studer Auditorium, 2 OG


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## "Holocene Ice Shelf Breakup and Subsequent Antarctic Ice Sheet Retreat in Lützow-Holm Bay, East Antarctica, Driven by Warm Deep Water and Sea-Level Rise"


Recent observations and model simulations show that the inflow of warm Circumpolar Deep Water (CDW) causes rapid and significant melting and thinning of the ice shelves of the West Antarctic Ice Sheet, contributing to the ongoing increase in the discharge of grounded ice. This process is also thought to contribute to the deglaciation of the West Antarctic Ice Sheet after the Last Glacial Maximum (LGM). However, the role of the CDW in a potential large-scale ice-mass loss in East Antarctica is largely unknown. In this study, we present new, well-dated sedimentary core records of the ice sheet and ice shelf retreat since the LGM, including a signature of the ice shelf collapses in Lützow-Holm Bay, eastern Dronning Maud Land, East Antarctica. Foraminiferal 14C age indicates the ice shelf collapses occurred at ca. 9 ka, which is consistent with the initiation of the thinning of the East Antarctic Ice Sheet revealed by 10Be surface exposure dating along the southern coast of the bay. In addition, foraminiferal oxygen and carbon isotope data from the cores suggest that the CDW inflow had intensified and reached the southern coast during this period. Suganuma et al. (2022) reported that the regional sea level reached a highstand at 9–8 ka based on the glacial isostatic adjustment modeling using the newly obtained ice thinning history in Dronning Maud Land. Based on these data, we suggest that regional sea-level rise and the intensified warm CDW inflow can trigger the ice shelf collapses via the marine ice sheet instability mechanism and subsequent rapid ice sheet retreat in Dronning Maud Land, East Antarctica.