



Project acronym: subMIT

Project title: Characterization of Subglacial and Englacial Drainage Systems and Ice Thickness at Mittivakkat Glacier

Project leader: Christoph Posch, University of Graz, Austria

Discipline: Earth Sciences & Environment: Global change & Climate observation

Station(s): Sermilik Research Station (Greenland/Denmark)

Our project will be conducted at Sermilik Station. In this project, an improved understanding and characterization of englacial and subglacial channels and drainage systems in the ablation area of Mittivakkat Glacier (MIT) and an assessment of ice thickness changes shall be achieved. Here we can locally study changes under a changing climate and processes that apply on a large scale across Greenland. We aim to document and characterize changes on a decadal scale by building upon former studies on MIT. Ice thickness assessment will be done by using ground-penetrating radar (GPR) with 10 and 30 MHz antennas along ~250 m horizontally spaced transverse profiles and two longitudinal profiles. Rhodamine WT dye tracer injections will be applied at a number of selected moulins and detected by sensors installed at the two main subglacial outlets at the glacier front for assessing discharge quantities, its diurnal evolution, and the dynamics and routes of the drainage system. Furthermore, unmanned aerial vehicle (UAV) flights will be done to capture the ablation area. This allows a comprehensive documentation of supraglacial melt water features crucial for internal drainage (channels terminating into moulins), and provides a data basis for further surface mass balance (SMB) studies. We expect a decreased ice thickness, moulins extending further up the glacier, extended drainage channels and systems, and increased discharges.