



**Project acronym:** TVTSOGQIC

**Project title:** Thickness, volume and thermal structure of the southern outlet glaciers of Qaanaaq Ice Cap

**Project leader:** Jānis Karušs, University of Latvia, Latvia

**Discipline:** Earth Sciences & Environment: Other - Earth Sciences

**Station(s):** The DMI Geophysical Observatory Qaanaaq (Greenland/Denmark)

This application is aimed for the research grant of INTERACT III Transnational Access call for field research at the DMI Geophysical Observatory Qaanaaq. Project duration is 15 days from July 30 to August 13, 2022.

Our proposed research will give new and detailed data and knowledge that will greatly contribute to the understanding of 3D structure and geometry of the southern outlet glaciers of QIC as this knowledge (particularly of glacier thermal regime) is essential forecasting future mass balance and drainage changes affecting water availability of local settlement as well. Obtained data will substantially supplement data from previous studies on surface mass balance, ice velocity and near-surface ice temperature.

Internal structure and thickness of glaciers will be determined using GPR. Data for Orthophoto and digital surface model will be obtained via UAV following UAV operational framework developed in previous expeditions. We will use DJI Phantom 4 series quadcopter. To ensure accuracy requirements of generated products ground control points (GCP) will be used. We aim to achieve the resolution of DSMs below 10 cm/px and the resolution of orthomosaics around 2-4 cm/px on average. The precise coordinates of GCP and GPR lines will be determined by GNSS receivers EMLID Reach RS2 using one receiver as a base station and other as a rover. From the DSMs and ice thickness measurements, models of subglacial topography will be created in ESRI ArcMap. Orthomosaics and digital surface models (DSMs) will be developed in Agisoft Metashape using structure-from-motion algorithm.