



Project acronym: Deep Sense

Project title: Trailblazing glacial hydrology in-situ measurements with Artificial Intelligence

Project leader: Maarja Kruusmaa, Tallinn University of Technology, Estonia

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

Station(s): Ny-Ålesund Research Station - Sverdrup (Svalbard/Norway)

In this project we utilize Artificial Intelligence to reconstruct flow conditions and pathways in glacial drainage systems from drifter measurements. We plan to conduct fieldwork in surface channels on Austre Brøggerbreen (Svalbard, Base: Sverdrup Research Station) to further calibrate our algorithms before moving on to subsurface drainage systems at Kongsvegen. We will collect the following data of the water flow in glacial channels: Flow paths, flow velocities, flow accelerations, water pressures, magnetic field strength and rotation rate of our drifters. This information can then be used to reconstruct spatially referenced flow paths in GPS denied subsurface drainage systems. This will allow us to create a precise map of subsurface water flow paths and water pressures of glaciers around Ny-Ålesund, which will help the glaciological community to calibrate their glacier dynamic models and can further inform communities interested in meltwater discharge into Kongsfjorden.