



Project acronym: TERRArctic

Project title: Impact of TERREstrial emissions on Atmospheric new particle formation in the High Arctic

Project leader: Nina Sanela, University of Helsinki, Finland

Discipline: Earth Sciences & Environment: Other - Earth Sciences

Station(s): CNR Arctic Station “Dirigibile Italia” (Svalbard/Italy)

This project focuses on characterizing qualitatively and quantitatively the sources and pathways of atmospheric new particle formation by measuring key gas-phase precursors of aerosols continuously and for long term complemented with targeted emission measurements from different terrestrial surfaces. The NyÅlesund- CNR site, by its location, offers a unique platform for studying the Arctic secondary aerosol precursors in the High Arctic. Due to very strong seasonality, land emissions influencing new particle formation have drastically distinct patterns along the year. Here we propose two distinct aspects of aerosol formation research: (1) the study of emission of volatile organic compounds (VOC), principally by continuous monitoring of their oxidation products, i.e. highly oxygenated organic compounds – well known initiators of new particle formation in vegetated areas – and implementation of VOC flux chamber measurements from diverse spots – both vegetated and non-vegetated – especially during the biogenically most active summer period. (2) investigating the halogen chemistry linked to snow chemistry occurring at the critical times after sunrise, during the melting season and during the refreezing season using the most advanced on-line mass spectrometry analysis technologies yet available for field measurements (Multi scheme chemical ionization -a technique that has not yet used at Arctic sites). This project is a continuation of an ongoing project that was started in 2017.