VILLUM RESEARCH STATION, STATION NORD

Station Nord is a military camp located at ~81º N in North Greenland. In the past a measurement hut located about 2 km outside the camp ("Flygers hut") has been used for scientific monitoring.

From the beginning of 2015, the VILLUM RESEARCH STATION is established at Station Nord including:

- **An Atmospheric Observatory, 108 m², heated**
- **A Garage and A Storage Facility, app. 110 m². heated**
- **Accommodation and laboratory facilities, app. 360 m², heated**

The station is operated by Aarhus University and researchers from all countries are welcome to carry out research at the facilities.

In late winter in 2015 CRAICC will carry out a campaign at the Villum Research Station lasting up to the summer in 2015

Objectives are:

- Identification and characterization of changes in atmospheric chemistry from dark to sunlight period
- Arctic Haze Characterization
- Identification of nucleation processes

Department of Environmental Science
AARHUS UNIVERSITY

Henrik Skov and Andreas Massling

Roskilde, July 2014

Parameters provided at Station Nord during CRAICC campaign 2015

Aarhus University

Denmarks Technical University

Finnish Meteorological Institute

Helsinki University

Gothenburg University

Lund University

Meteorology (by AU-ENVS and DMI)

- T, RH
- WD, WS (Sonic)
- Precipitation (electronic sensor)
- Radiation

Other (by AU-ENVS and DMI)

- Snow depth

Gasses (by AU-ENVS)

- Ozone, Gaseous Elemental Mercury (GEM), NOx, CO, CH_4, CO_2, H_2
- Fluxes of mercury fractions (Gaseous Elementary Mercury GEM, Total Atmospheric Mercury TAM)

Remote sensing (DTU-RISØ)

- Ceilometer measurements for boundary layer height
- Optionally wind-lidar measurements

Chemistry (by AU-ENVS and AU-Chem)

- Filter Pack Sampler (Inorganics: Elements (ICP-MS), SO_4^{2-}, NO_3^-, NH_4^+ (IC))
- High Volume Sampler (Carbonaceous: EC/OC (Thermo-optical method and Identification of organo sulfates))
- High Volume Sampler (POPs)
- Chemical speciation of aerosols using a SP-TOF-MS
- Speciation of gas phase compounds using a PTR-TOF-MS

Particle physics (by AU-ENVS)

- Particle number size distribution (10 - 900nm, SMPS)
- Particle number size distribution (0.5 - 32µm, OPC)
- Chemical composition of particles (AMS)
- Absorption coefficient / Black carbon mass concentration (MAAP)
- Scattering coefficient at three wavelengths (Nephelometer)

Modelling (by AU-ENVS)

- COPREM (COnstrained Physical REceptor Model) and PMF (Positive Matrix Factorization) for source apportionment
- DEHM (Danish Eulerian Hemispheric Model) for estimate of various gas phase and particle compounds

Physics (by LU)

- NAIS Neutral Air Ion Spectrometer (neutral clusters /air ion number size distribution: size range between 2 and 40 nm)

Remote Sensing (by FMI)

- LIDAR measurements
- BC investigation in snow samples

Geology (by UH-ECRU and UH-GEO)

- Lake sediment core sampling

Physics (by UH-Phys)

- UFP (Ultrafine particles) CPC (size range > 3nm)
- Airmodus CPC (size range > 6 nm)
- CI-APITOF Chemical Ionization - Atmospheric Pressure Interface - Time-Of-Flight mass spectrometer (measures sulfuric acid and neutral clusters)
- PSM Particle Size Magnifier (particle/cluster number size distribution: size range between 1 and 4 nm)

Geology (by GU-CHEM)

- Ice nucleation activity in snow samples