Project acronym: NPFArctic

Project title: **Molecular steps of New Particle Formation in the Arctic atmosphere**

Project leader: Mikko Sipilä, *University of Helsinki, Finland*

Discipline: Earth Sciences & Environment

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

In this project, molecular steps of secondary new aerosol particle and cloud condensation nuclei formation will be resolved by direct measurement of aerosol precursor vapours and the chemical composition of nucleating clusters. Our preliminary data recorded at Villum research station in Greenland and at the Aboa station at Antarctica point toward the critical role of sulphuric acid, iodic acid, ammonia and amines as well as ionisation by galactic cosmic radiation in secondary aerosol production in the polar atmospheres. However, the detailed mechanisms and relative importance of different mechanisms responsible on aerosol formation in the Arctic remain unresolved. Exact mechanisms leading to secondary aerosol formation need to be known in order to assess the influence of anthropogenic air pollution as well as shrinking sea ice, a source of molecular iodine, to secondary aerosol and cloud condensation nuclei budgets. Measurements will be performed with novel chemical ionisation time-of-flight mass spectrometers in conjunction with standard aerosol and trace gas instrumentation in Gruvbadet laboratory facility (CNR, Italy) in Ny Ålesund, Svalbard .