

EGU21-14824

<https://doi.org/10.5194/egusphere-egu21-14824>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Integrative and Comprehensive Understanding on Polar Environments (iCUPE) – concept, results and outlook

Tuukka Petäjä¹ and the iCUPE team*

¹University of Helsinki, Institute for Atmospheric and Earth System Research (INAR) / Physics, Faculty of Science, University of Helsinki, Finland (tuukka.petaja@helsinki.fi)

*A full list of authors appears at the end of the abstract

The world is changing. The polar regions are critical component in the Earth system and influenced by on-going megatrends, such as globalization and demographical changes. The extensive use of Arctic natural resources will have effects on regional pollutant concentrations in the Arctic. We set up the ERA-PLANET Strand 4 project “iCUPE – integrative and Comprehensive Understanding on Polar Environments” to provide novel insights and observational data on global grand challenges with a polar focus. We deploy an integrated approach with in-situ observations, satellite remote sensing and multi-scale modeling to synthesize data from a suite of comprehensive long-term measurements, intensive campaigns, and satellites. This enabled us to deliver novel data and indicators descriptive of the polar environment. The iCUPE framework includes thematic state-of-the-art research and the provision of novel data in atmospheric pollution, local sources and transboundary transport, characterization of arctic surfaces and their changes, an assessment of the concentrations and impacts of heavy metals and persistent organic pollutants and their cycling, the quantification of emissions from natural resource extraction, and the validation and optimization of satellite Earth observation data streams. Here we summarize the project results and provide novel insights into continuation of the work.

iCUPE team: Tuukka Petäjä, Ella-Maria Duplissy, Ksenia Tabakova, Julia Schmale, Barbara Altstädter, Gerard Ancellet, Mikhail Arshinov, Yuri Balin, Urs Baltensperger, Jens Bange, Alison Beamish, Boris Belan, Antoine Berchet, Rossana Bossi, Warren R. L. Cairns, Ralf Ebinghaus, Imad El Haddad, Beatriz Ferreira-Araujo, Anna Franck, Lin Huang, Antti Hyvärinen, Angelika Humbert, Athina-Cerise Kalogridis, Pavel Konstantinov, Astrid Lampert, Matthew MacLeod, Olivier Magand, Alexander Mahura, Louis Marelle, Vladimir Masloboev, Dmitri Moisseev, Vaios Moschos, Niklas Neckel, Tatsuo Onishi, Stefan Osterwalder, Aino Ovaska, Pauli Paasonen, Mikhail Panchenko, Fidel Pankratov, Jakob B. Pernov, Andreas Platis, Olga Popovicheva, Jean-Christophe Raut, Aurélie Riandet, Torsten Sachs, Rosamaria Salvatori, Roberto Salzano, Ludwig Schröder, Martin Schön, Vladimir Shevchenko, Henrik Skov, Jeroen E. Sonke, Andrea Spolaor, Vasileios K. Stathopoulos, Mikko Strahlendorff, Jennie L. Thomas, Vito Vitale, Sterios Vratolis, Carlo Barbante, Sabine Chabrillat, Aurélien Dommergue, Konstantinos Eleftheriadis, Jyri Heilimo, Kathy S. Law, Andreas Massling, Steffen M. Noe, Jean-Daniel Paris, André S. H. Prévôt, Ilona Riipinen, BirgitWehner, Zhiyong Xie and Hanna K. Lappalainen