
EISCAT_3D – The world's most advanced incoherent scatter radar in the European Arctic

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EISCAT AB (formerly EISCAT Scientific Association) is currently building EISCAT_3D, the most advanced volumetric imaging radar for atmospheric, ionospheric and near-Earth space research. This tri-static phased-array incoherent scatter radar is located in Skibotn (Norway), Karesuvanto (Finland), and Kaiseniemi (Sweden). The transmit-receive array at Skibotn consists of about 10,000 aerials and ten 91-aerial outrigger receivers in the immediate vicinity. The receive-only arrays of Kaiseniemi and Karesuvanto consist of about 5,000 aerials each.

After a number of set-backs, EISCAT are in the process of getting the SE-7 (seven antenna units in Sweden) ready for thorough stress-testing. Thereafter, next step will be the so-called "NO-7" transmit-receive system in Skibotn. Once both systems work satisfactorily, they will be expanded gradually to full size and the Finland site will be equipped, too. We expect NO-7, consisting of 637 aerials with 1 kW power each, will already allow for scientific incoherent scatter radar measurements.

EISCAT_3D will eventually replace the EISCAT mainland radars, i.e. the 930-MHz UHF radar and the 224-MHz VHF radar at Tromsø, even though some overlap is foreseen not least for cross-calibration and comparison purposes. The remote receiver at Kiruna has already been removed in October 2024, and the 32-m dish at Sodankylä (Finland) will be removed in spring 2025.

The EISCAT Svalbard Radar (ESR) and the ionospheric Heating facility at Tromsø will not be affected by EISCAT_3D becoming operational, however, it is important to make the case for Heater maintenance so that there's a chance for the existing instrument to operate until funding for a new Heater at Skibotn can be found.