EISCAT

EISCAT

Space Radars in the European Arctic

2026-03-12

Emil Rosendahl,
EISCAT

European Incoherent SCATter

EISCAT operate the most advanced radars on Earth, enabling cutting edge science for the good of society.

Ministry of Education and Research
Norway

Suomen Akatemia
Finland

Vetenskapsrådet
Sweden

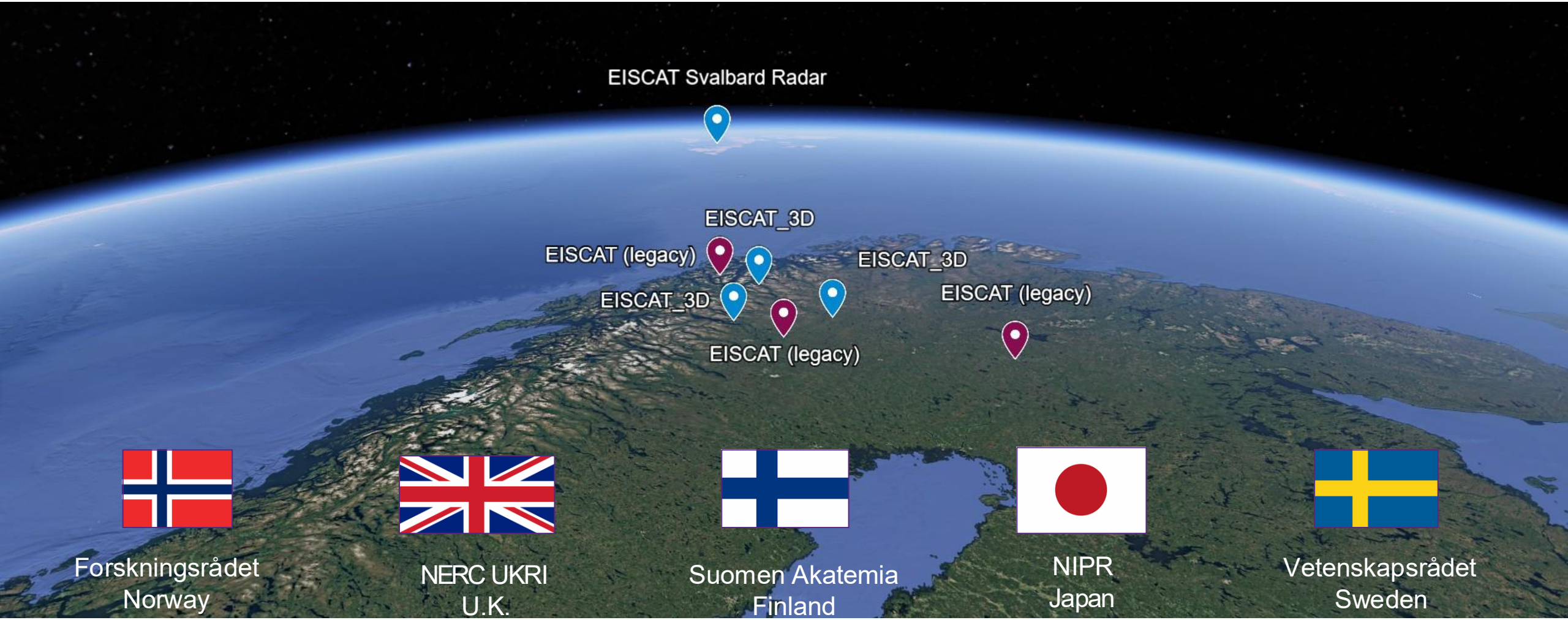
Board of directors

Anna Rathsman Chair
Viktoria Mattson
Prof. Aslak Tveito
Torill Johansen
Kati Sulonen
Erja Heikkinen

Advisory groups

Associate Forum
Scientific Advisory Committee
EISCAT User Community

Associate Members



Core Mission - Research

- Ionospheric Science
- Atmospheric Science
- Solar Terrestrial Physics
- Meteor Science

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Future Areas – Commercial and governmental support

- Space Debris Tracking
- Satellite Tracking
- Launch Vehicle Tracking
- Radar Technology and Operations

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EISCAT
RAMFJORDMOEN
VHF TX/RX 224 MHz
120 m x 42 m aperture with steerable elevation
Peak power 3 MW


EISCAT
RAMFJORDMOEN
UHF TX/RX 930 MHz
32m aperture fully steerable parabolic dish
Peak power 2 MW


EISCAT HEATING
1.2 GW ERP
4-8 MHz

EISCAT SVALBARD

UHF TX/RX 500 MHz

Two parabolic dishes (32 m and 42 m)

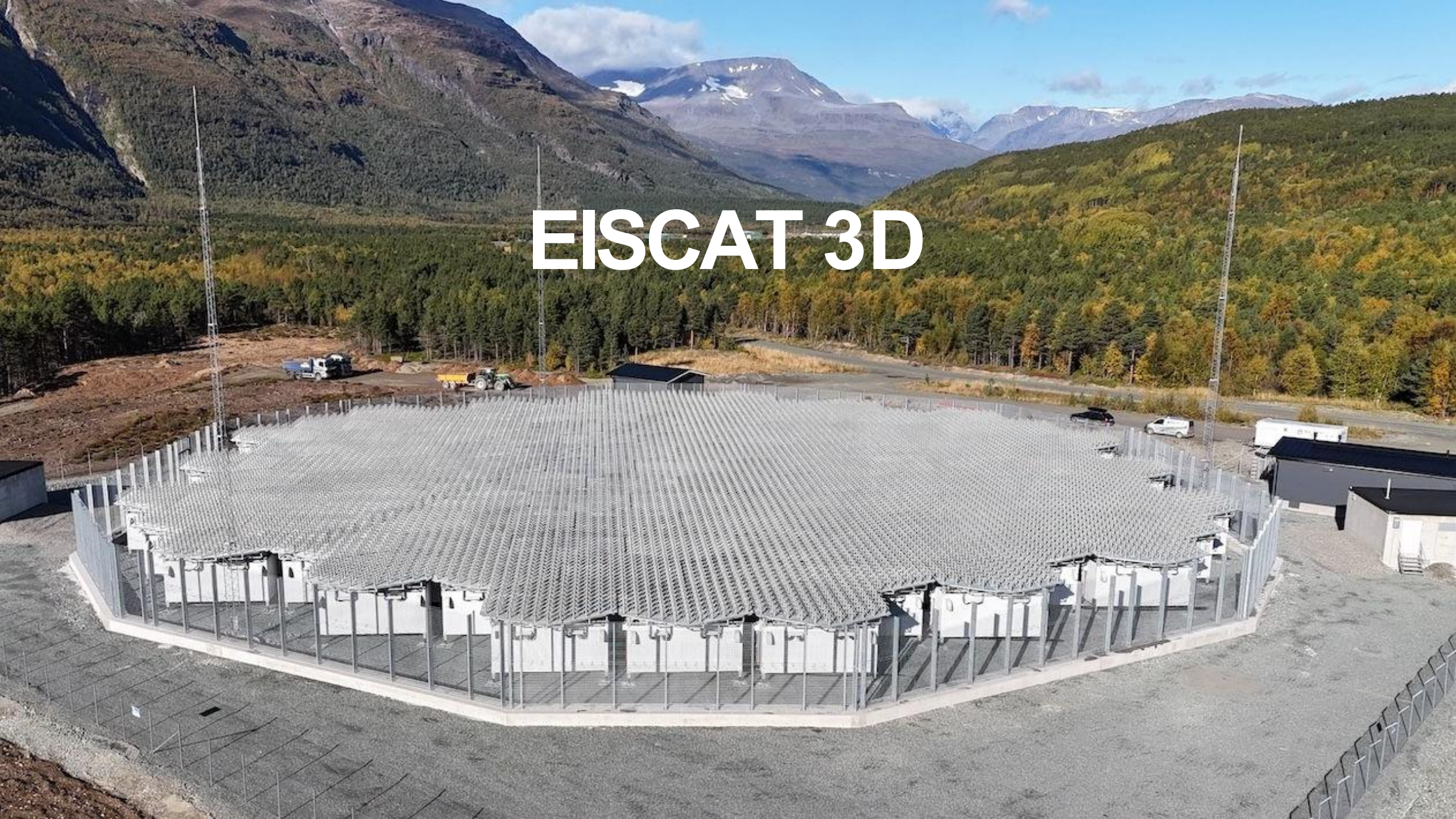
Peak power 1 MW

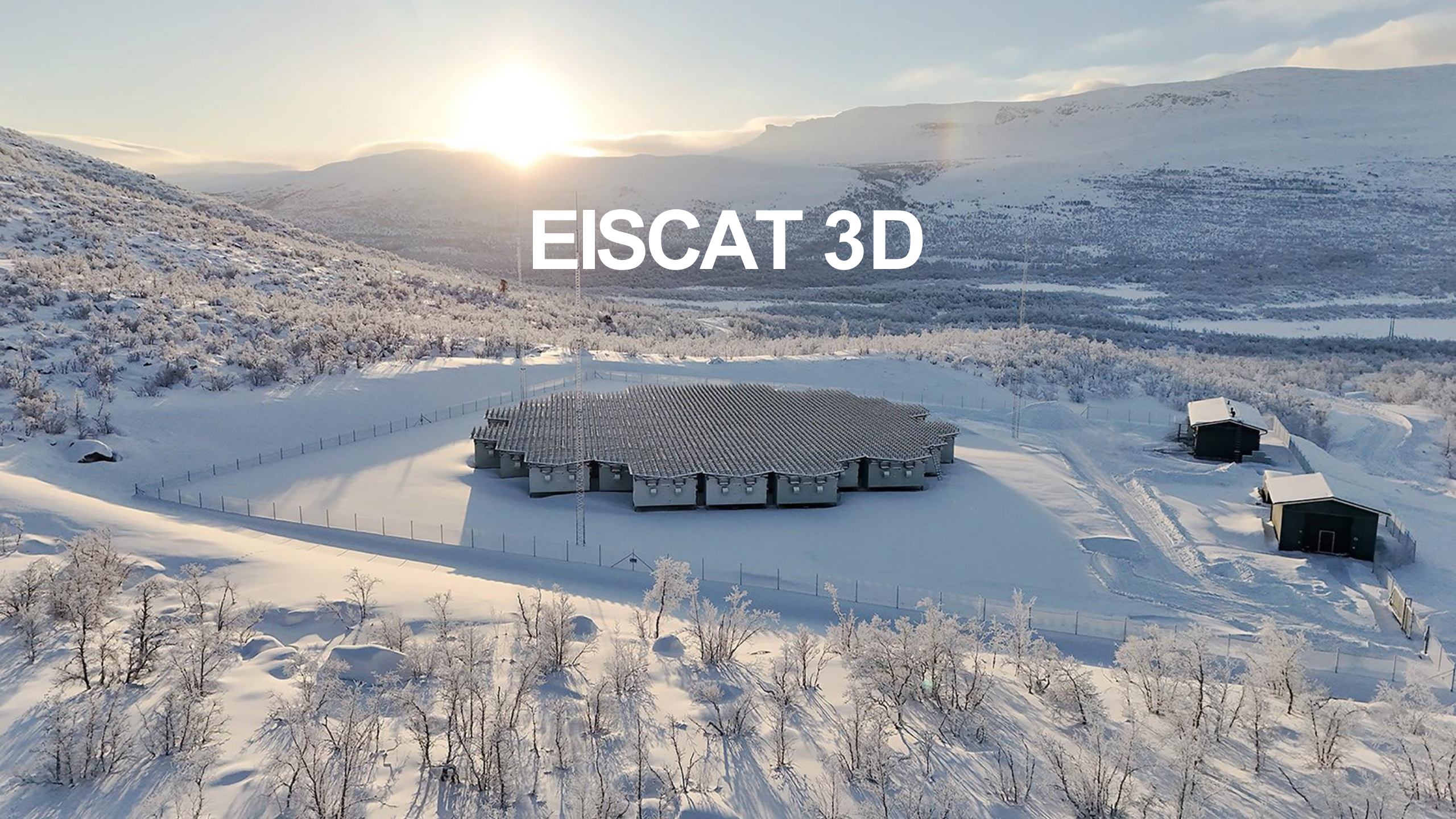

EISCAT
RECEIVERS
Kiruna and Sodankylä
Now defunct

EISCAT

EISCAT_3D


The most advanced
radar in the world
20000+ Antennas
3.3 MW – 5 MW – 10 MW
Software defined beam forming and control


EISCAT 3D


EISCAT 3D


EISCAT 3D

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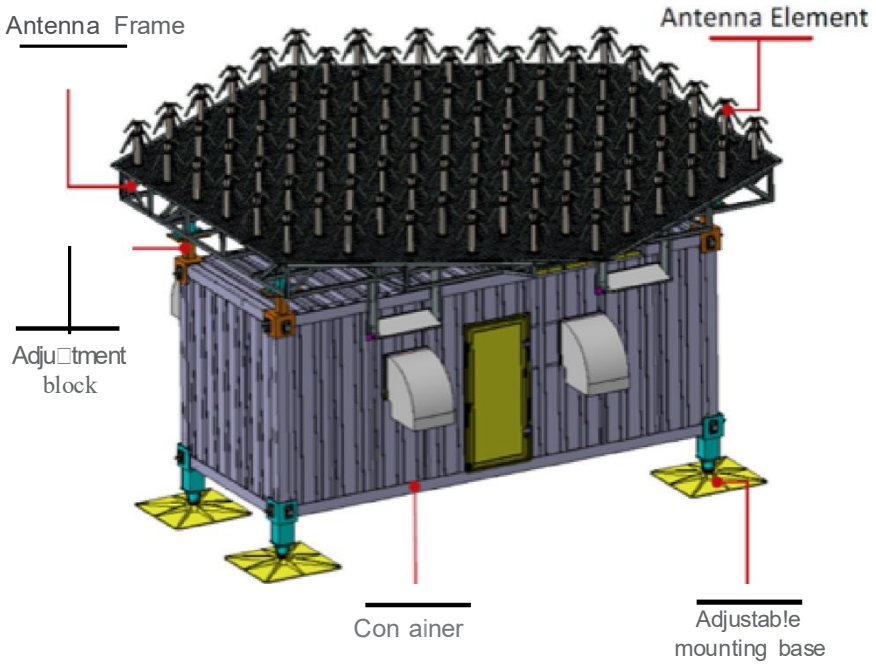
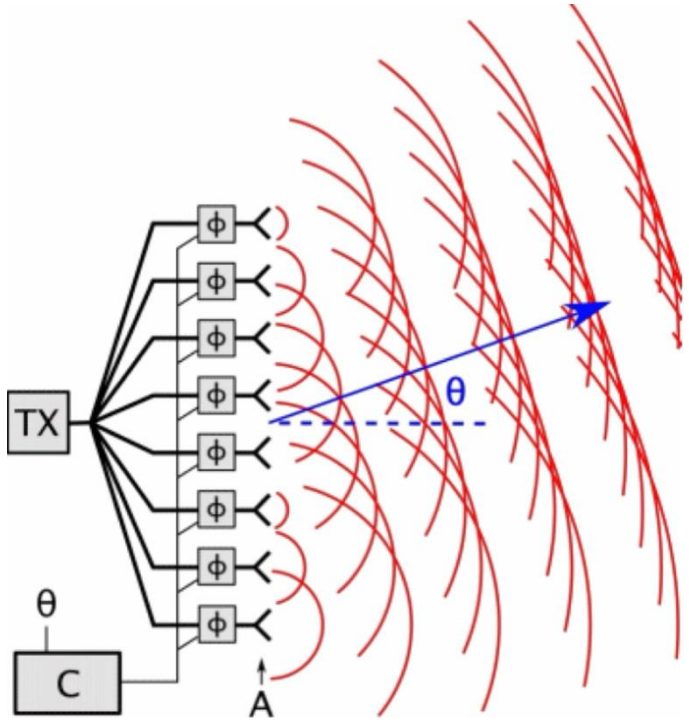

Antenna Frame
Antenna Element
Adju□tment block
Con ainer
Adjustab!e mounting base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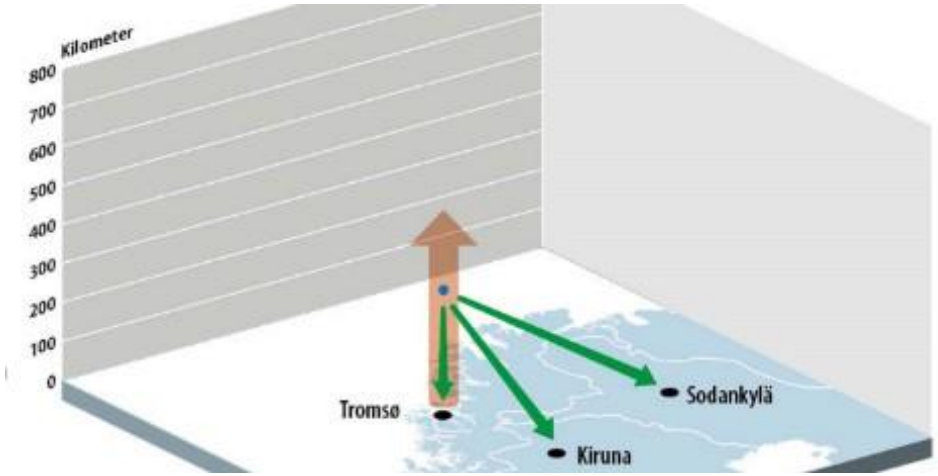
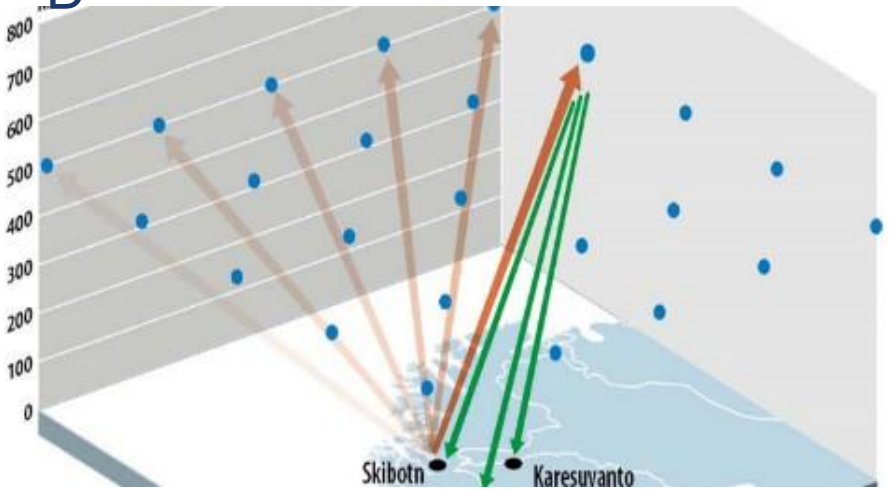
Classic



EISCAT_3D

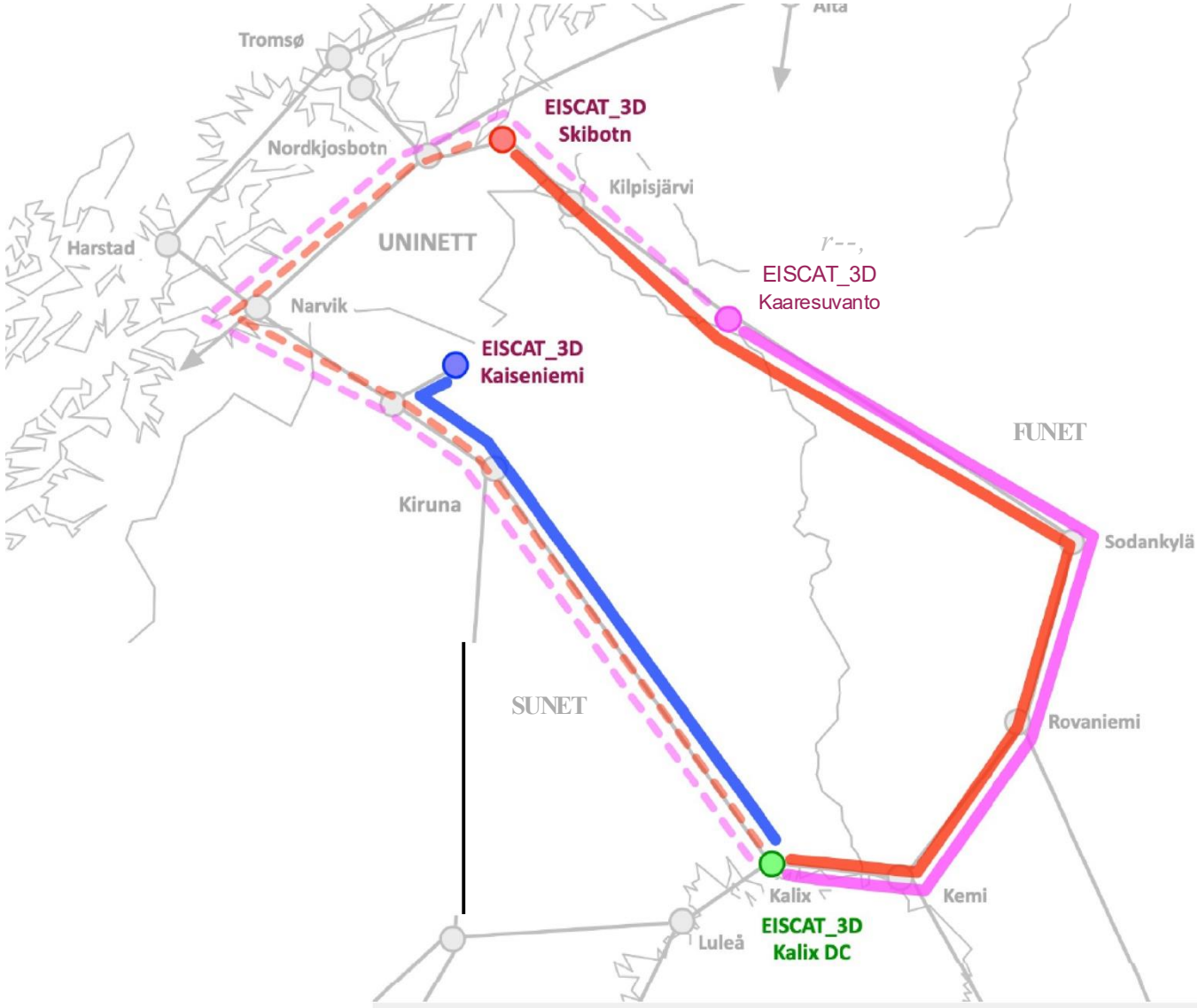


EISCAT

- Thousands of full-site measurements per second
- White Rabbit
  - Nanosecond precision time distribution over Ethernet
- Custom Control System
  - ~2500 hardware units
  - … but only ~6-8 types
- Theoretical max data rate at 10 000 Gbit / s
  - Practically useful rate of 10-50%
- Custom built fiber ring-network

White Rabbit
COLLABORATION

@EISCAT


Tromsø
Alta
EISCAT_3D
Skibotn
Nordkjosbotn
Kilpisjärvi
Harstad
UNINETT
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Kaaresuvanto
Narvik
EISCAT_3D
Kaiseniemi
FUNET
Kiruna
Sodankylä
SUNET
Rovaniemi
Kalix
Kemi
Luleå
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