

## EGI-ACE Community Workshop

[EISCAT\_3D]

*Ingemar Häggström/EISCAT Scientific Association*

*16th-17th February 2021*

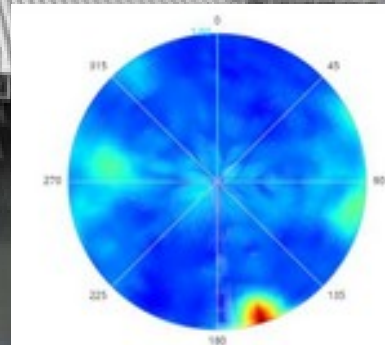


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Agenda: <https://indico.egi.eu/event/5360/>

- Background about the scientific community
- Ambition and challenges
- High-level architecture
- Technical requirements
- Capacity requirements
- Integration support
- Timeline
- Training for external users

EISCAT 3D, the new research radar for atmosphere, ionosphere and near Earth space - ESFRI Landmark since 2018



EISCAT\_3D, Stage 1

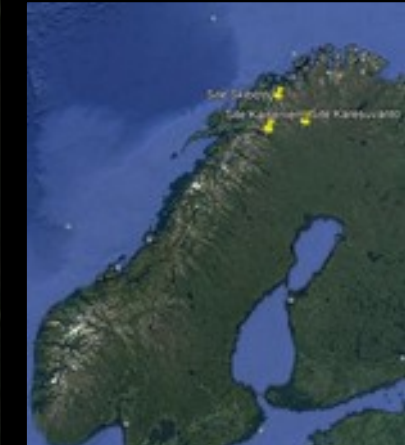
EISCAT\_3D Skibotn

EISCAT\_3D Karesuvanto

EISCAT\_3D Kaiseniemi

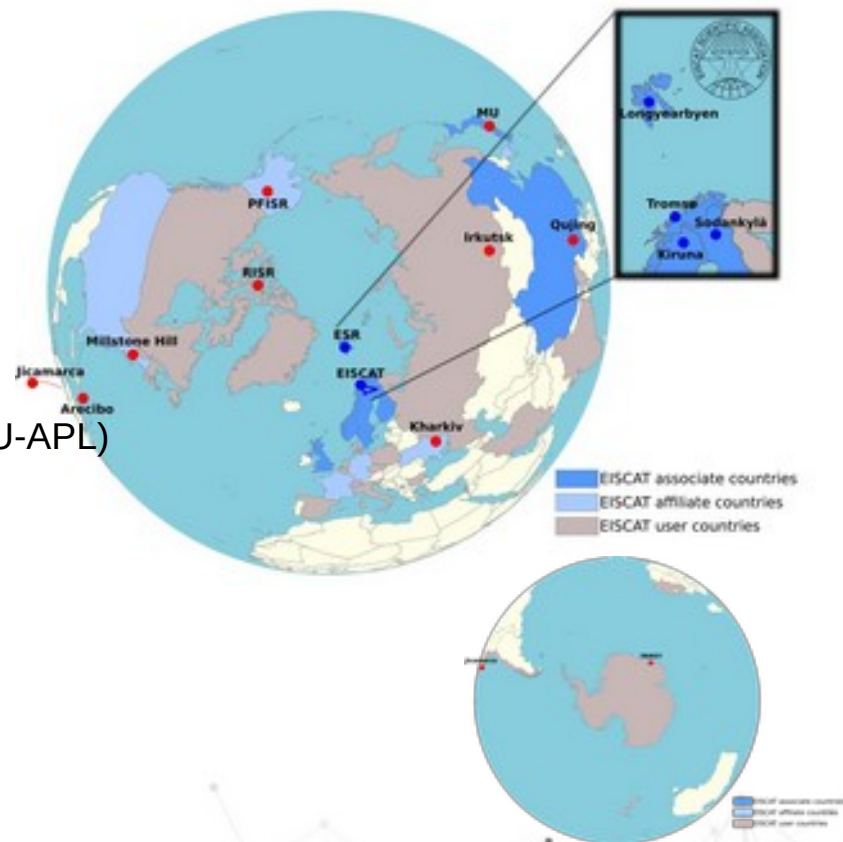
E8

E45



# Background about the scientific community

- Radars
  - Northern Europe (1981- )
  - Regular joint campaigns with other ISradars
- Members
  - Associates
    - Research Councils
    - SE(VR),FI(SA),NO(NFR),UK(UKRI),JP,CN
  - Affiliates
    - Universities/Institutes
      - FR(IRAP),DE(DLR-SO),KR\*2,UA,US(JHU-APL)
- Users
  - Global



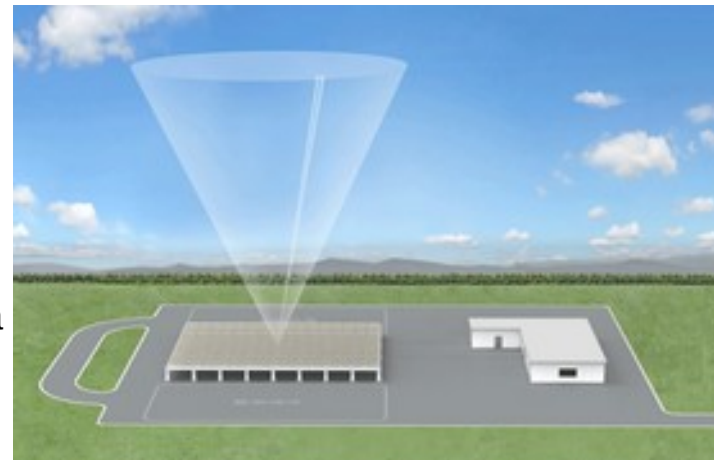
# Ambition and challenge(s)

- EISCAT 3D system will have large compute and storage resources
  - Full capacity needed in High Power mode (10% of the time)
  - >100 Tflop/s
  - >20 PB
  - Upscaled every ~5 years
  - Open for EISCAT users during Low Power / Off periods
  - Secures sustainability
    - Application platform for analysis software
    - Co-location platform for sophisticated searches
    - Notebooks for user development
- Integration to federation(s)
  - Mirror Storage's & Applications
  - Storage platform for continuous data transfer (eg Rucio + dCache)
  - Third-party for far east (e.g. China, Japan, S Korea)

# High-level architecture of the Early Adopter

**Perun**

- EISCAT\_3D/SYISR radar data
  - Similar hardware
    - Multistatic phased array radars
  - Separate repositories
    - Metadata federation
      - Search portal(s) accessing both repos metadata
  - Federation processing
    - Joint application platform
    - Launch jobs in EGI/CNIC clouds
  - On demand data movement
    - For processing in either cloud

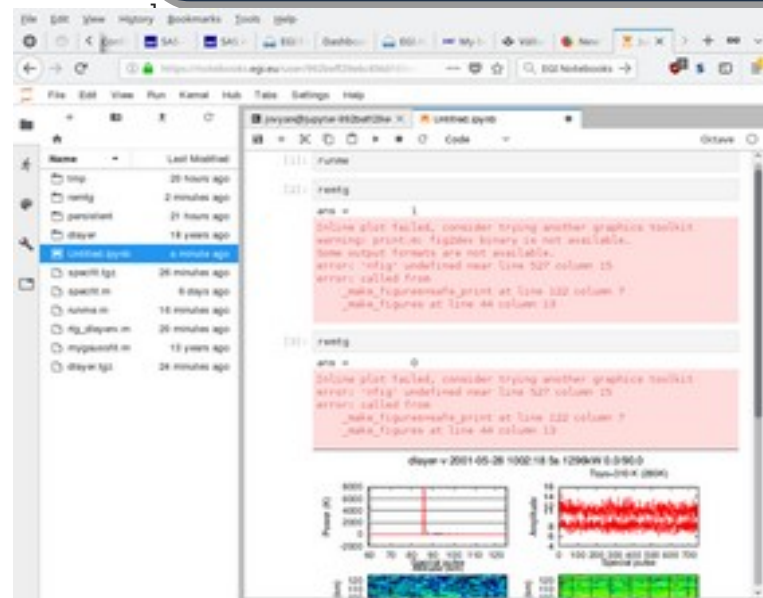




- Workflow management
  - Dirac file catalogue (L1+L2)
  - B2share entries (L3)
  - EGI Checkin
    - Authenticate EISCAT 3D users
    - Authorize for accessing embargoed data
    - Id providers
      - University, Social
    - Managed in Perun
      - Groups - Members
- Job submission
  - Containers (EISCAT & EGI)
  - Existing EISCAT user software (Matlab/Octave, C)
    - GUISDAP General analysis L1/L2 → L3
    - RTG General tool for display of L2 data (L3)

## Job definition file

```
[
  Executable = "run_rtg_docker.sh";
  Arguments = "";
  JobName = "my_job_name";
  Site = "Cloud.CSC.fi";
  CPUTime = 86400;
  InputSandbox = {
    "run_rtg_docker.sh",
    "LFN:/eiscat.se/archive/2016/..."
  }
  OutputSandbox = {"output/*"};
]
```



# Capacity requirements

*Generally small requirements for development*

*DIRAC instance at EGI*

*metadata*

*EGI notebooks*

*Mirror subset*

*test prototyping and deployment*

*CNIC-EGI case*

*Mainly EGI resources*

*Processing/Storage*

*~30 TB storage*

*~10 CPUs*

- EGI Checkin
  - VO management
    - Closed → embargoed → open data
  - Integration
    - Keycloak (LDAP/2FA)
      - Operation service
      - Present portal (continued for parts of the system)
- DIRAC Integration at EISCAT
  - Checkin
  - File catalogue (metadata)
  - Jupyter integration
    - Binders
    - Wraps for large jobs
  - Job submissions
- B2share/B2find
- EGI alternatives?

- EISCAT\_3D
  - Spring 2022 First site ready
  - Autumn 2022 Operation/Data/Processing service ready
  - Spring 2023 Three sites ready
  - Spring 2024 Full operation
- EGI Checkin Integration
  - Keycloak (LDAP/2FA) - M6
- DIRAC Integration at EISCAT – M12
  - Old data
    - File catalogue (metadata) - M9
  - Jupyter integration - M9
  - Job submissions - M12

- EISCAT Symposium
  - Biannually (Sweden spring 2022)
  - Radar School (Mainly summer)
- Joint radar schools with NSF
  - Yearly
- EISCAT\_3D User meeting
  - Every May, Uppsala Sweden
  - Now short virtuals
- ENVRI schools
  - Project based (-2023)
- PITHIA-NRF project (EGI) (2021-2025)
  - TNAs
  - Integration with European Space Ris

**Thank you!**