The Italian Arctic Facilities

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*brand new institute from June 2019



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High-level overview of existing infrastructures

Arctic Station Dirigibile Italia, Ny-Ålesund, Svalbard



- Opened in 1996
- Managed by CNR-ISP, but hosts researchers from other institutions and universities
- Surface 330 m² with sleeping rooms, offices and laboratories
- Can host up to 7 researchers
- Since 2018 runs all year round
- Access through a national call and a peer-review process.
- Chemistry laboratory (laminar flow cabinet, fume hood, ultrapure water, etc.)
- Calibration laboratory (temperature, pressure, gas concentration)
- Workshop (mechanics and electronics)

Amundsen-Nobile Climate Change Tower

Installed in 2010, ≈ 2 km outside of Ny-Ålesund Host instrumentation from KOPRI since 2012

COMPLETE CCT INSTRUMENTATION SETUP

- K&Z CNR 1 net radiometer [33 m]
- K&Z CM11 and CGR4 upwelling first class radiometers [25 m]
- Young propeller anemometer [33m, 10m, 5m and 2m]
- Vaisala HMP45 thermo-hygrometers [33m, 10m, 5m and 2m]
- Campbell CSAT3 sonic anemometers [21 m]
- Campbell EC150 fast hygrometer [21 m]
- CH4 and CO2 open path analyzers [21 m]
- CRDS inlet for gas measurements [21 m]
- Gill R50 Solent sonic anemometer [7.5 m]
- Campbell Kh-20 fast hygrometer [7.5 m]
- Gill R50 Solent sonic anemometer [3.7 m]
- Campbell Kh-20 fast hygrometer [3.7 m]
- IR120 infrared sensor for snow skin temperature [5m]
- SR50 sonic range sensor for the snow height [5m]
- Flux plate at the interface soil-snow [at surface]
- PT100 in the snow layer and into the ground [15 , 5, -5, -15 cm]





Gruvebadet Atmospheric Laboratory

Opened in 2010, since 2018 all year measurements. ≈ 1 km from Ny-Ålesund

Collaborations: KOPRI, IO-PAN and Uni Warsaw, NIPR, Uni Helsinki

- PM10 automatic sampling for ions and metals
- PM10 automatic sampling for elements (PIXE)
- PM10 manual sampling for trace metals and Pb isotopic composition
- Dekati 4-stage (>10, 10-2.5, 2.5-1, <1 um) sampling for ions
- APS measurements 52 size classes in the range 0.5 20 um; 10 min. resolution.
- SMPS measurements 54 size classes from 10 to 500 nm; 10 min. resolution.
- Natural radioactivity measurements on aerosol particles 1 h resolution
- Black Carbon continuous measurements by PSAP











Tethered balloon system: payload up to 15 kg, max height 1.2 km, for aerosols and clouds. Mooring Dirigibile Italia: particle fluxes and basic physical properties of water.

Italian new icebreaker: ERNEST SHACKLETON (BAS) -> LAURA BASSI (OGS)



Owned by OGS, managed together with CNR and ENEA

Antarctic and Arctic activity

Strong research/logistics potential, possible contribution to ARICE

- Built year 1995
- Crew 22, researchers 48
- Length 80 m, width 17
- Icebreaker class ICE 05
- DP2 system, crane 50 t
- Helicopter pad
- Operational cost: 650.000 € per month (400.000 € in stand-by)



Look ahead for large campaign and infrastructure plans (next 3-5 years)

- ENI and CNR have signed an agreement for a 5-years (2019-2024) programme for studies on the Arctic. Budget, 5 Millions Euro. First field activities were planned for spring 2020 (Svalbard) and 2021 (Alaska) -> posteponed by 1 year due to COVID19.
- PRA (Arctic Research Programme): special funding programme for studies over the Arctic. 3 year (2018-2020). Funded by the Italian Ministry for University and Research (MIUR). Budget 3 Millions Euro. First call for projects was in 2019, activities will start probably in 2021.
- Nearly future: special plan for research infrastructures funded by MIUR. We hope to get something for the Arctic.

Number of international visitors and guests per year

- Access call INTERACT: 80 days up to 2019, should be 100 with 2020
- Access call SIOS: 1 guest in 2018, 3 in 2019, 4 in 2020 (2 postponed to 2021 due to COVID19)
- Agreement with Uni. Helsinki/INAR for hosting their researchers after first contact through INTERACT

Info on travel and practicalities for international users

- Easy access for people and goods: flights twice a week, ships about once per month.
- Accommodation: besides the rooms at the station, there are rooms for rent from KingsBay AS
- All the technical and logistical facilities: power, network (optical fiber), heavy machines, etc.
- International research community

Experience with international access/availability for access

• About 10 Italian researchers got access to INTERACT infrastructures up to now. No negative experiences to my knowledge.

Financial support for the national infrastructure - is the funding long term or short term? What is the financial scheme for supporting international access?

- The funding from CNR to the station is on annual basis, but regular. CNR pays for all the logistic at the station: rental of the station, snowmobiles, local research ship, shipping of the materials and samples, etc.
- The access is based on INTERACT and SIOS calls. CNR contributes to SIOS being a member institution.

Number 1 operational challenge(s)

- Lack of funding for infrastructural improvements, only maintenance. Improvements have to rely on specific research projects.
- Lack of young scientists. Italy is not attractive for foreign students/researchers.