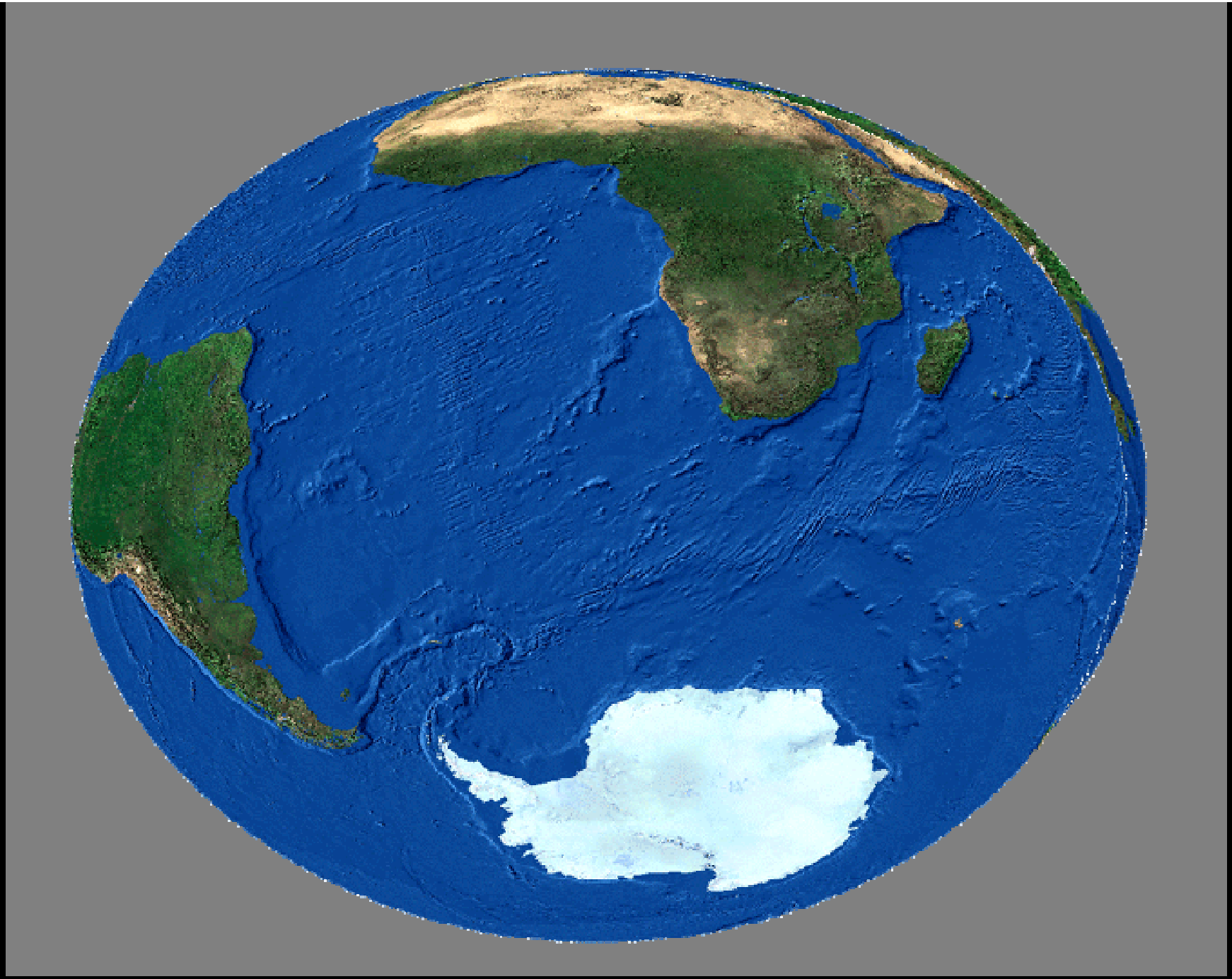
ANTARTIDE ultima FRONTIERA

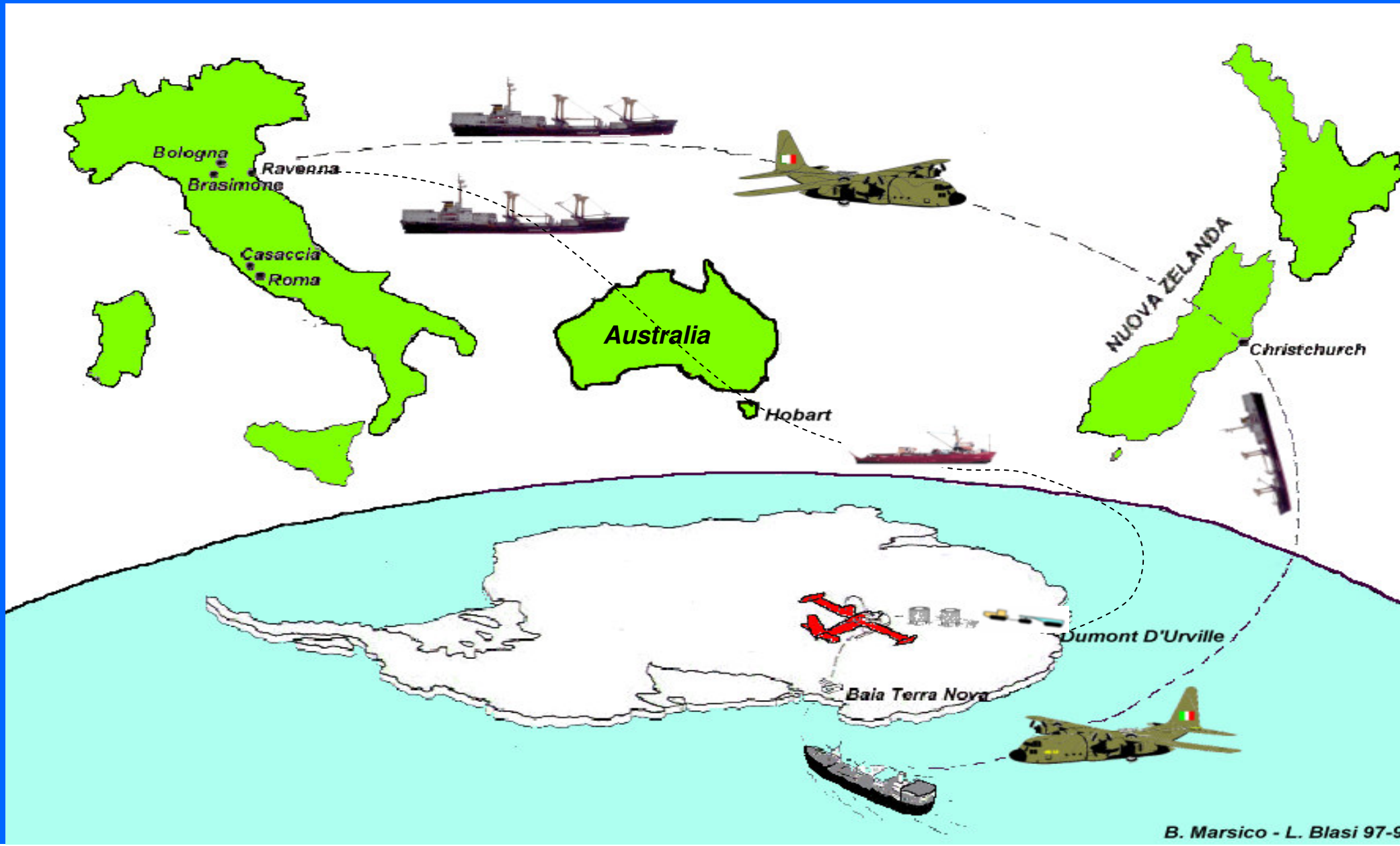
TERRA DI SCIENZA E RISERVA NATURALE

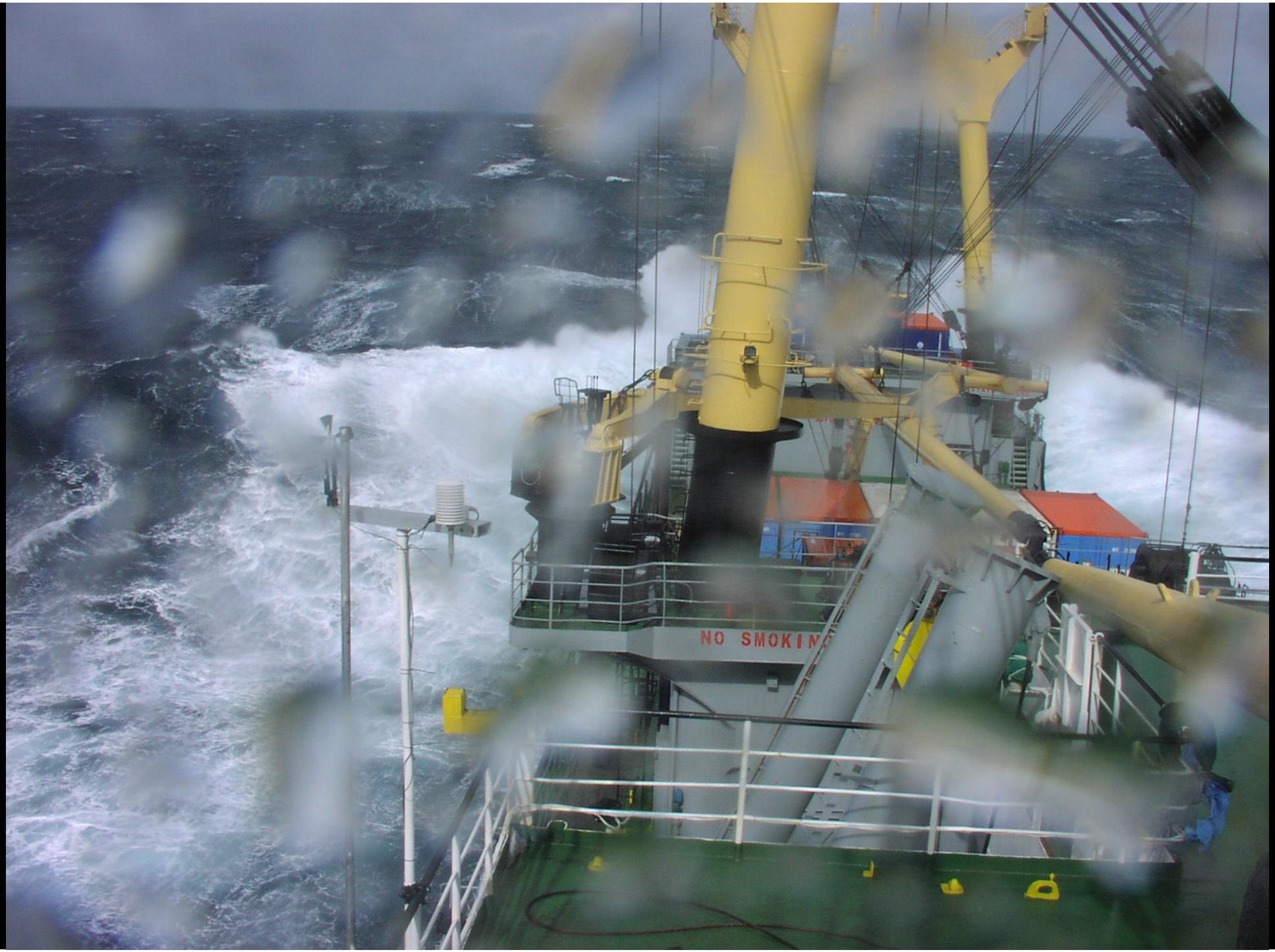
FRANCESCO CAVALIERE

Dipartimento di Fisica Università degli studi di Milano



Come arrivare in ...




NO SMOKIN


ITALIANTARTIDE

C H I ?

RICERCATORI

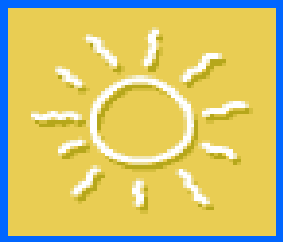
- astronomi
- biologi
- chimici
- geologi
- glaciologi
- geofisici
- tecnologi

LOGISTICI

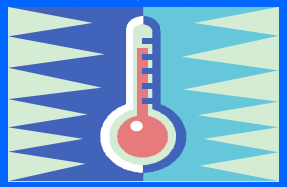
- piloti aereo
- guide alpine
- meccanici
- elettricisti
- meteoprevisori
- cuochi
- medici/infermieri

QUANDO ?

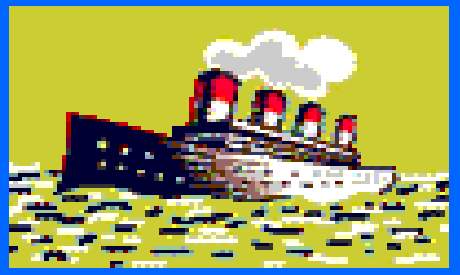
Campagna estiva



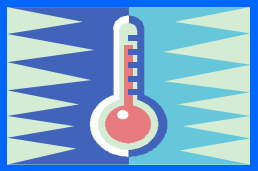
da 3 °C a -25 °C



ottobre	novembre	dicembre	gennaio	febbraio

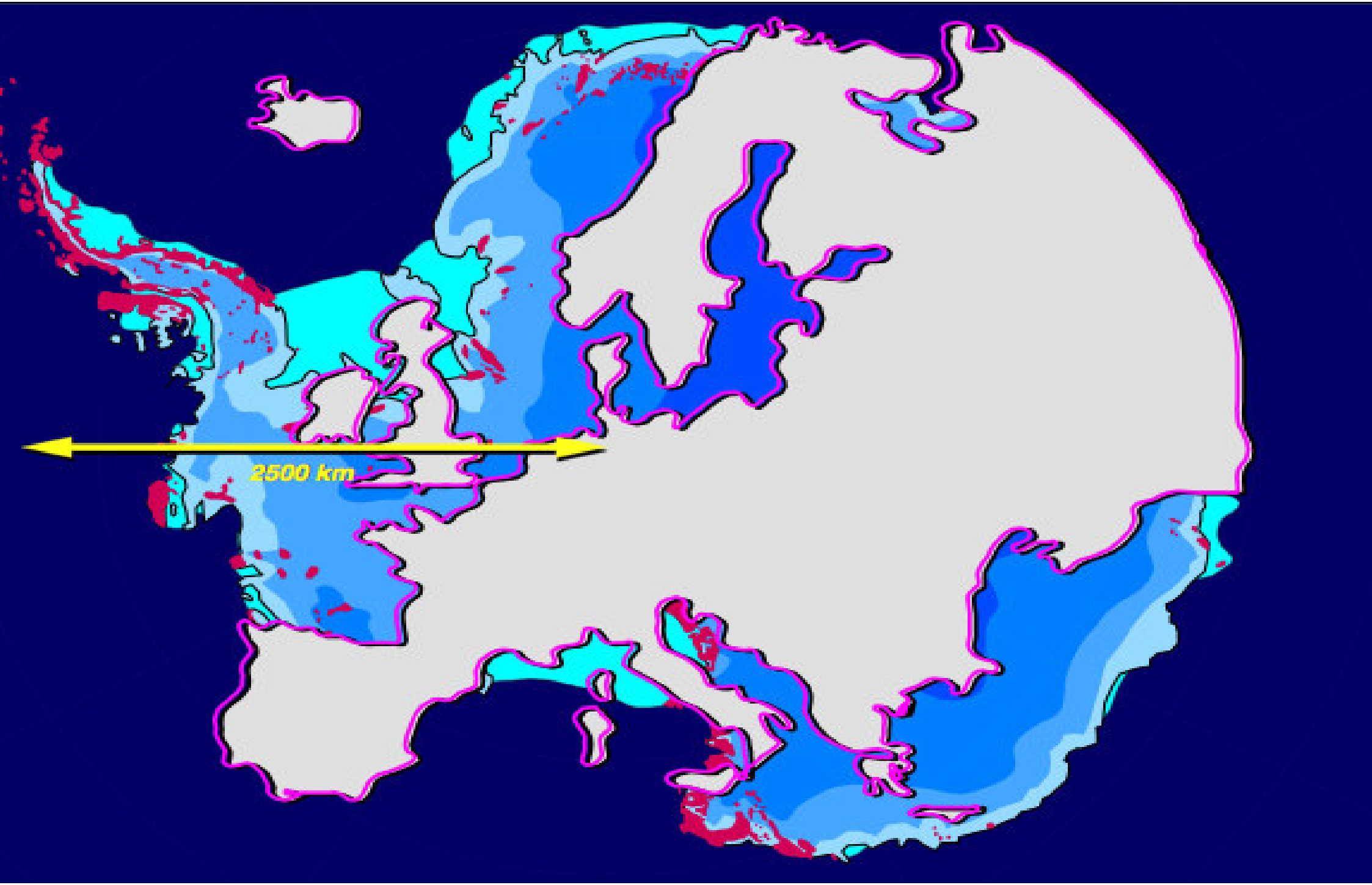


Winter over



Minima reg.
-79 °C

marzo	aprile	maggio	giugno	luglio	agosto	settembre


2500 km

L'ANTARTIDE NON E' DI NESSUNO O MEGLIO E' DI TUTTI

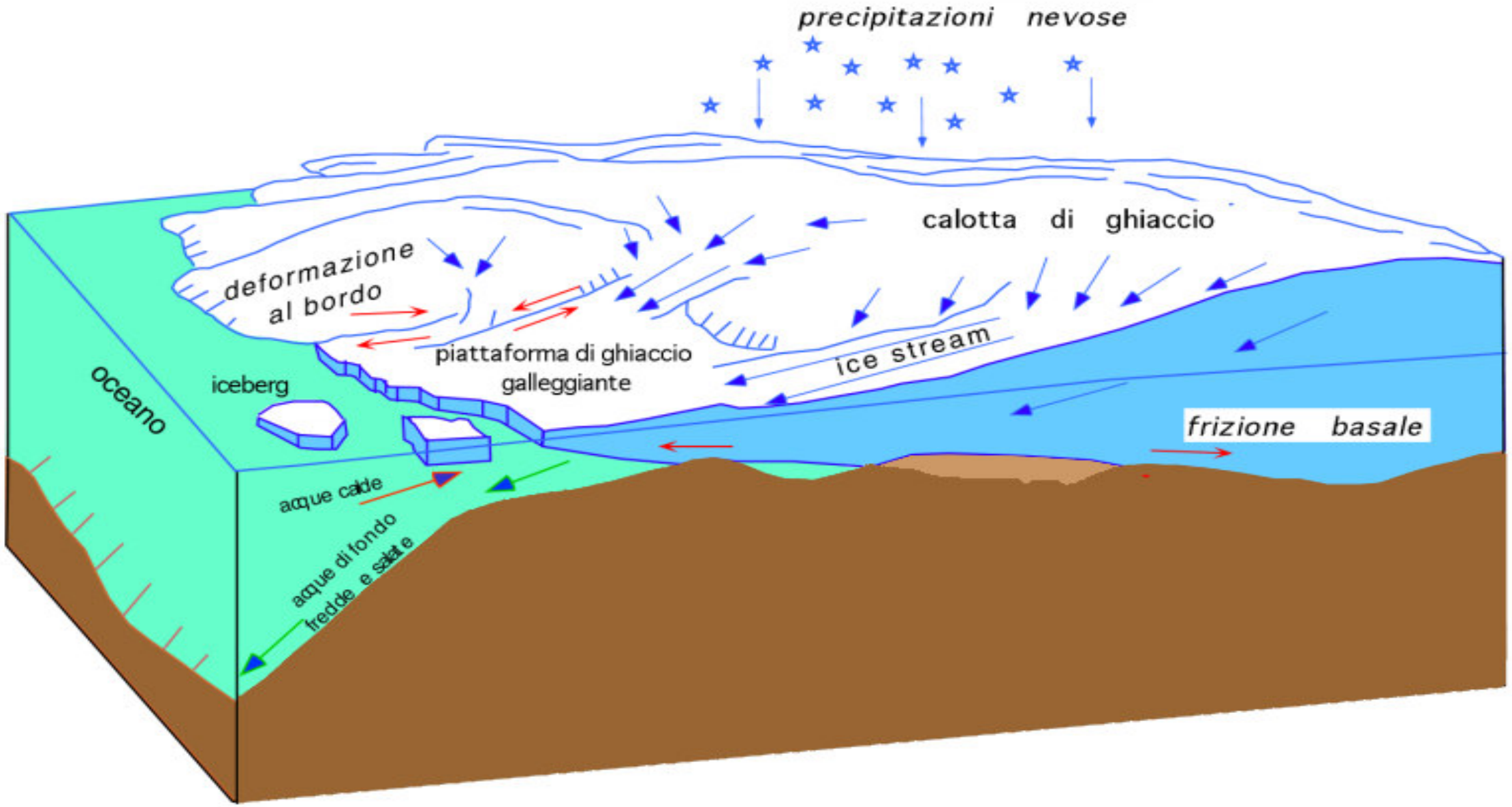
30°W
0°
30°E
60°W
60°E
90°W
90°E
120°E
180°
150°E
Sanae
Georg von Neumayer
Gen. Bernardo O'Higgins
Capt. Arturo Prat
Esperanza
Marambio
Palmer
Vernadsky
Rothera
San Martin
Belgrano II
Halley
Maitri
Dakshin Gangotri
Syowa
Molodezhnaya
Mawson
Dome Fuji
Zhongshan
Davis
Mirny
Amundsen - Scott
Vostok
Dome C
Casey
Scott Base
Mc Murdo
Baia Terra Nova
Dumont d'Urville

ITALIA/USA-SOUTH POLE 1989

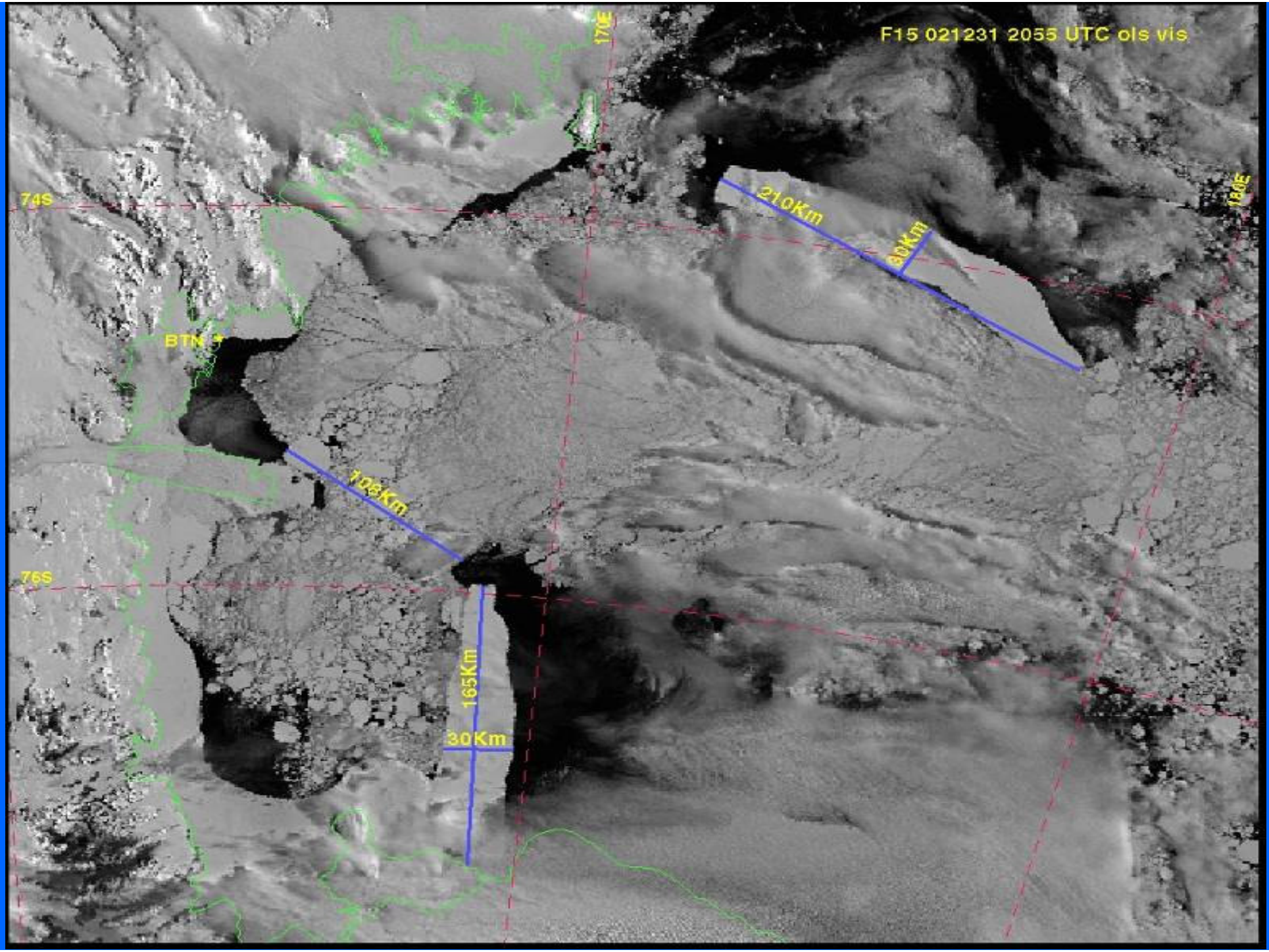
AMUNDSEN-SCOTT SOUHT POLE STATION 11/1989


J6

Il clima


precipitazioni nevose
calotta di ghiaccio
deformazione al bordo
piattaforma di ghiaccio galleggiante
ice stream
iceberg
oceano
frizione basale
acque calde
acque di fondo fredde e salate


Novembre 2004- Gennaio 2005


F15 021231 2055 UTC ols vis
17E
18E
74S
76S
BTN
210Km
40Km
105Km
165Km
30Km

Ventoso velocità >200 km/h

Freddo
T℃ < - 80°

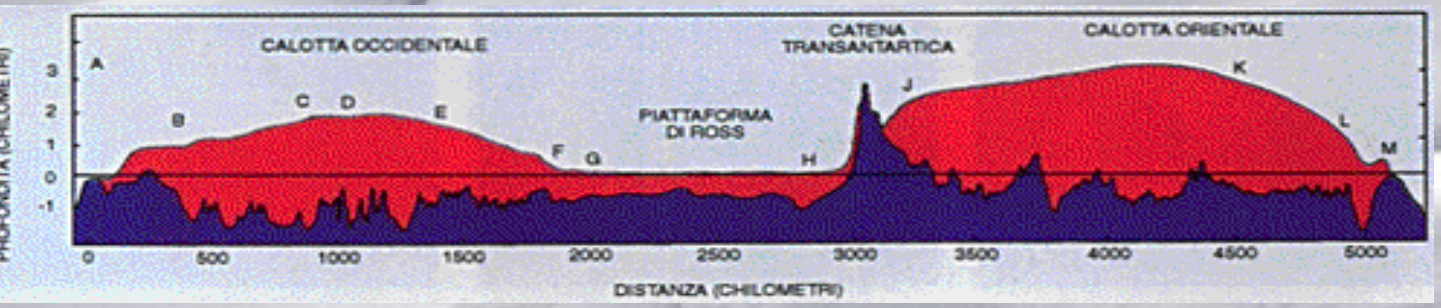
Il sistema glaciale antartico

Costituisce l'80% della riserva di acqua dolce

Funziona come serbatoio freddo del sistema termodinamico globale, influenzando il clima dell'emisfero australe e di tutta la Terra.

Riflette circa l'80% della radiazione solare.

Il bilancio termico dell'Antartide è negativo (il calore perso per irraggiamento supera quello ricevuto), in parte compensato da scambi termici attraverso la Convergenza Antartica (Oceano Antartico).



Stazione Mario Zucchelli

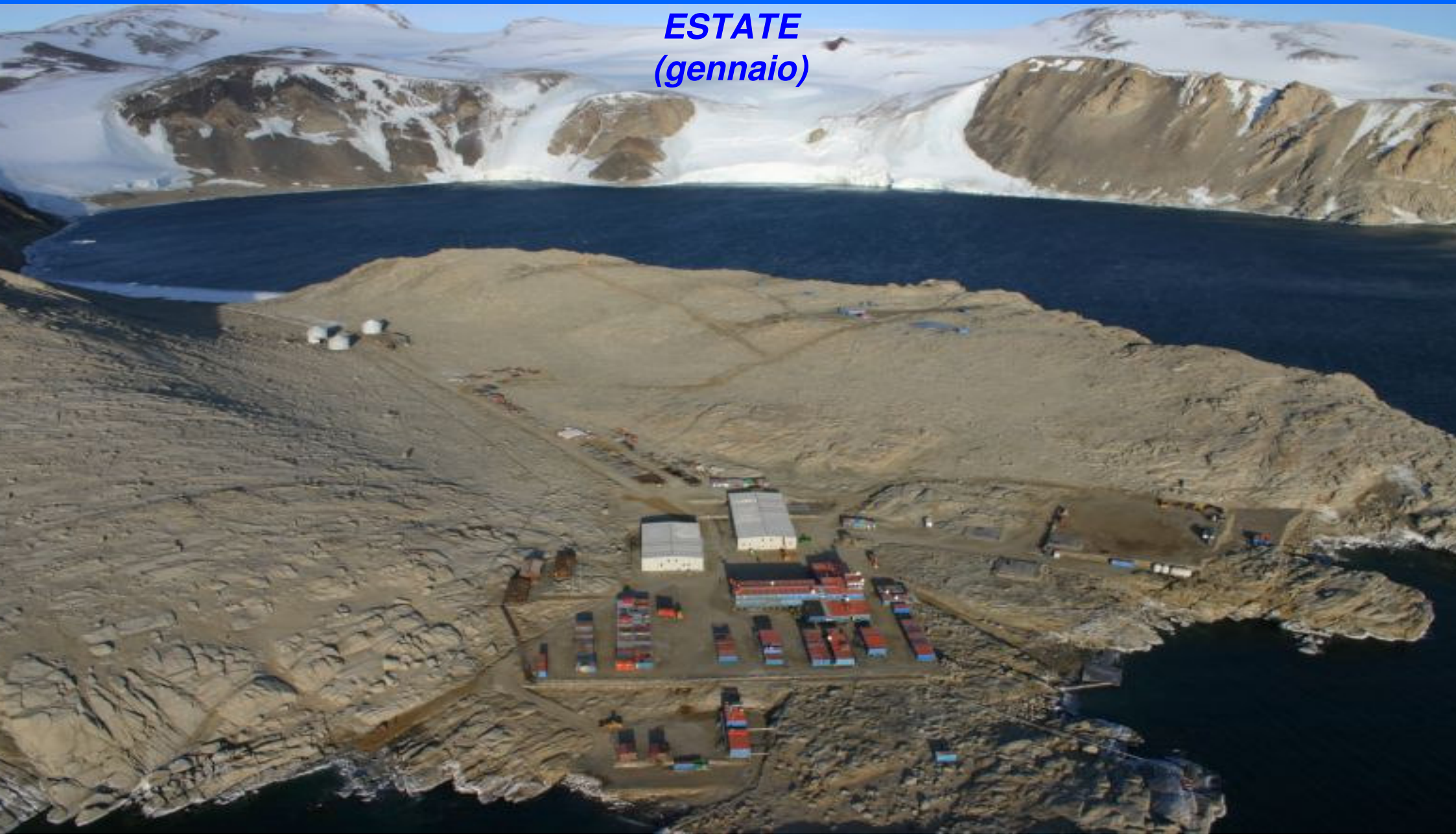
PRIMAVERA

(ottobre)

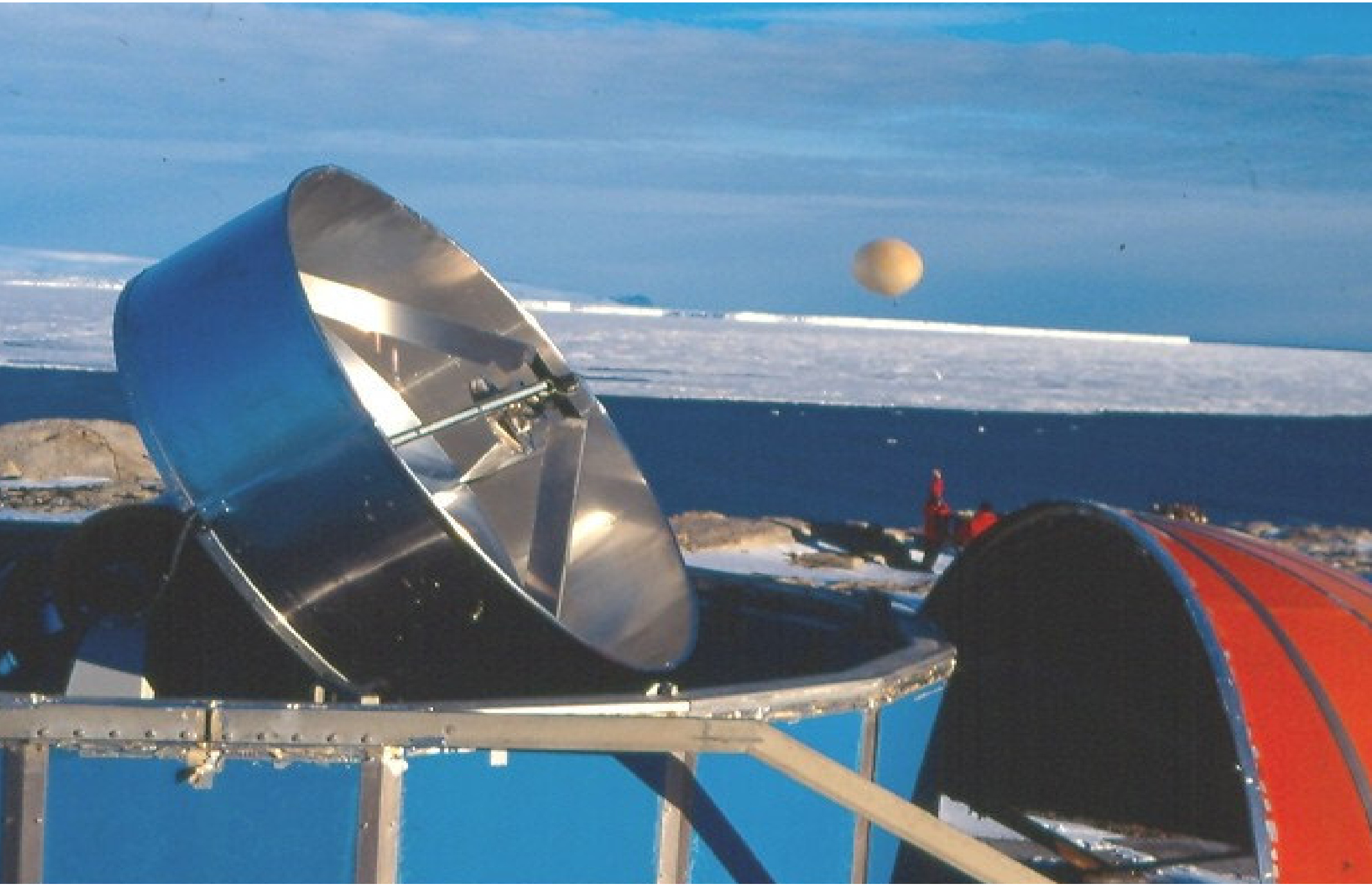

SAFAIR
PROGRAMMA NAZIONALE DI RICERCHE IN ANTARTIDE
ITALIANTARTIDE

Stazione Mario Zucchelli

ESTATE
(gennaio)



DI GIORNO LE STELLE




SIGNAL
14/12/2007


climalit
MAGNEHELIC
14/12/2007

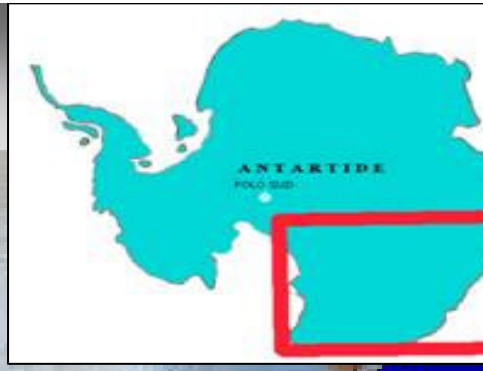
Il campo estivo di Dome C

Periodo: da metà novembre ai primi di febbraio

- ***Posizione: Lat. 75°06'S Long. 123°24'E***
- ***3300 mt s.l.m.***
- ***1500 mq coperti escluso Concordia Station (laboratori, magazzini, alloggi, impianti, servizi)***
- ***55 posti letto***
- ***180 kVA per un massimo di 140 kW***

Nel 1993 L' ENEA (Ente per le Nuove tecnologie, l'Energia e l'Ambiente, oggi PNRA SCrl) e l'IPEV (Istituto Francese Per la Ricerca Polare e le Tecnologie) hanno stipulato una collaborazione mirata allo sviluppo di progetti tecnologici e di ricerca nel sito denominato Dome C.

Il triangolo operativo



Carburante
AWS-Argos
Shelters
Cibo
Aviosuperficie

Stazione Concordia
Sito: Dome C

McMurdo

Mid Point

Carburante
AWS-Argos
Shelters
Cibo
Aviosuperficie

D-85

~ 650000 Km²

Stazione Mario Zucchelli
Sito: Baia Terra Nova

C-3

Carburante
Aviosuperficie

D-10

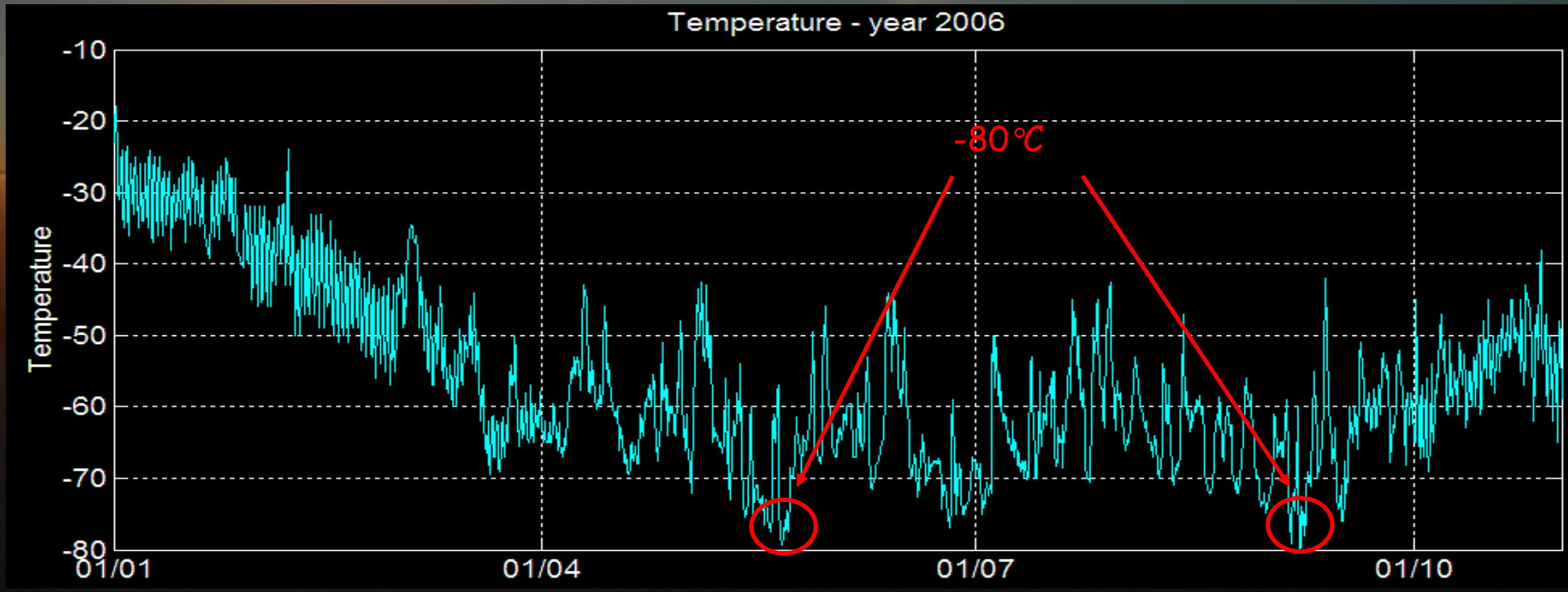
Dumont d'Urville

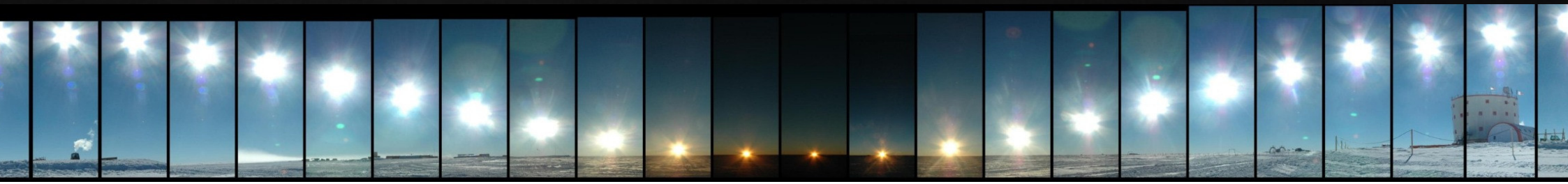
The french-italian station Concordia

Accomodation for 18 p.
in winter

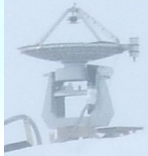

PeakSimple Chromatography Data System

Towards the winter…






ONALE DI RICERCHE IN ANTARTIDE · PROGRA
PORTATA MAX Kg 200

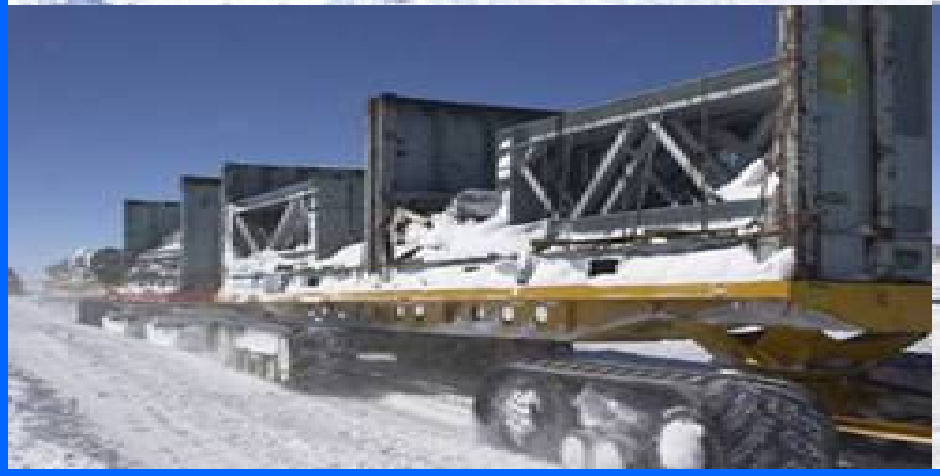


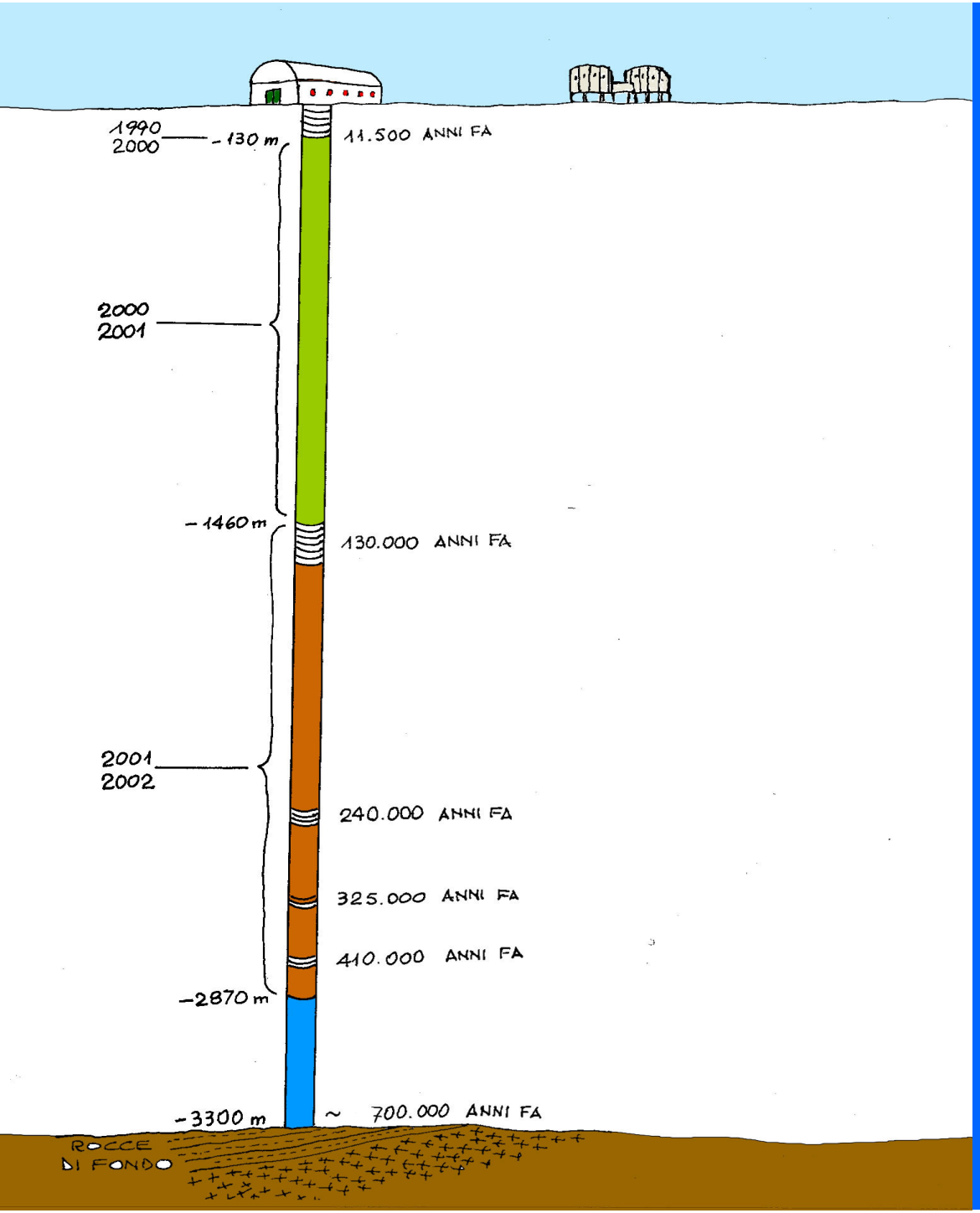

BAILO
BAILO

Traverse

I materiali pesanti ed ingombranti (elementi strutturali, carburante e vi
vengono trasportati mediante trattori e slitte.





Perforazione del ghiaccio: EPICA

Launching the balloon

In winter

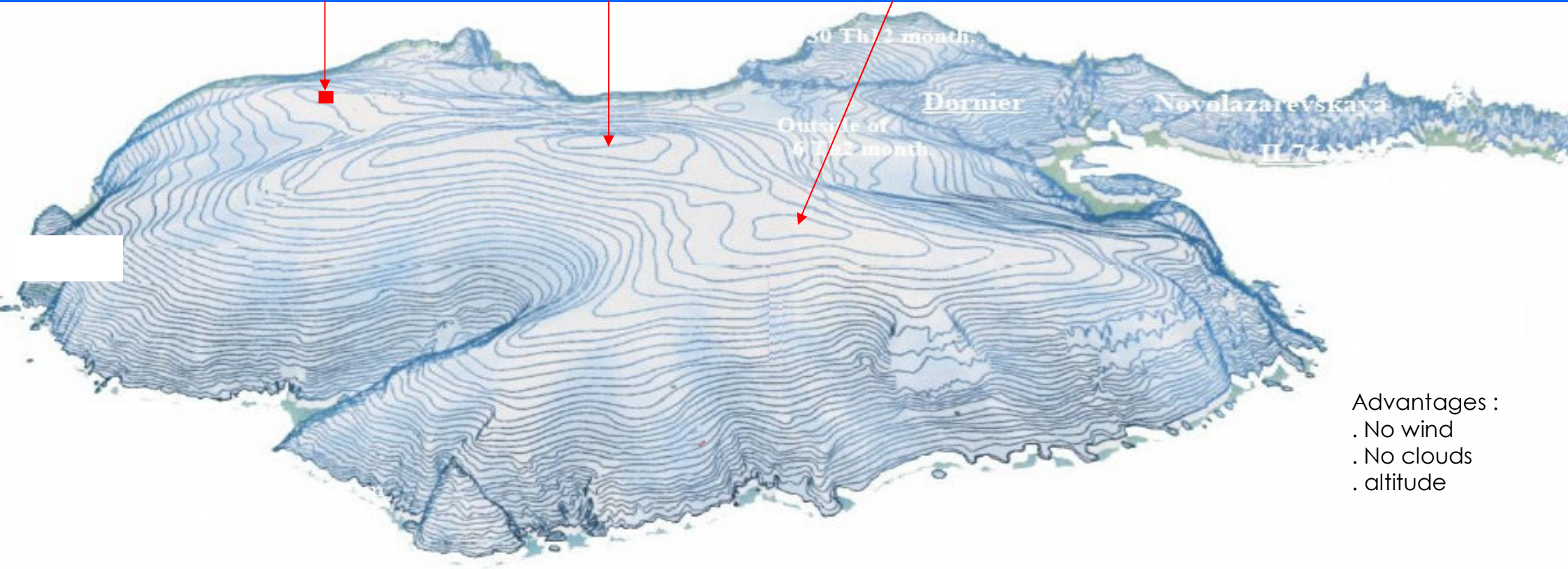
In summer

The Antarctic plateau

Dome C/Charlie
3300 m

Dome A/Argus
4100 m

Dome F/Fuji
3800 m

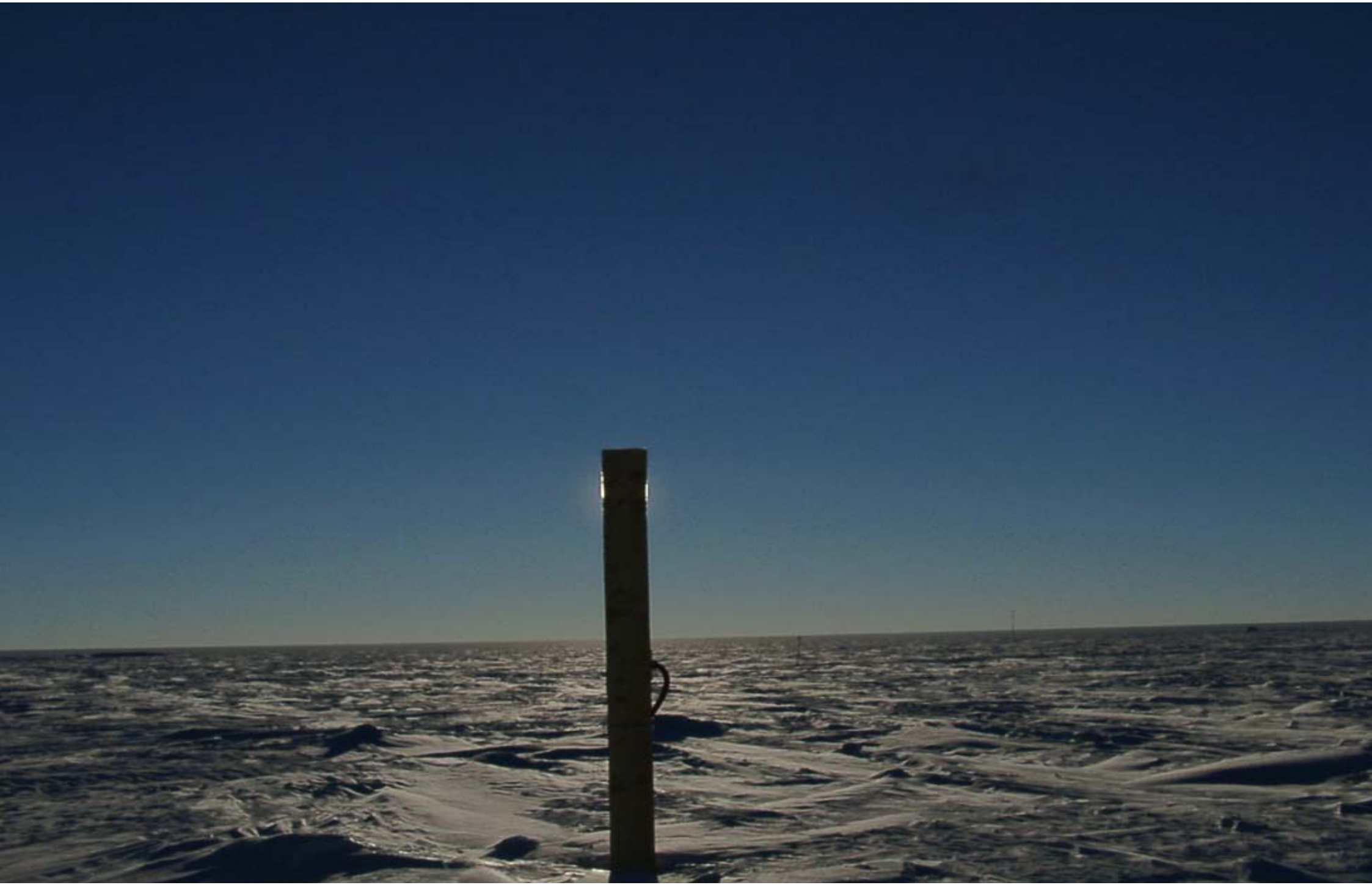


Advantages :
. No wind
. No clouds
. altitude

What makes a good observing site?

- Clear
- High
- Dry
- Cold
- Clean
- Dark
- Transparent

- Low precipitation
- Low surface wind
- Low turbulence
- Low seismic activity
- Accessible
- Continuous observing possible

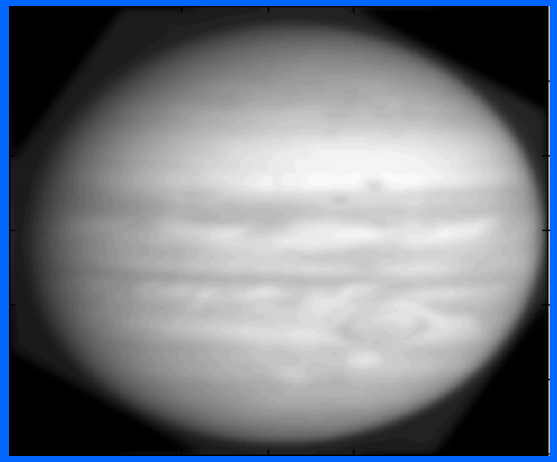


The « seeing »

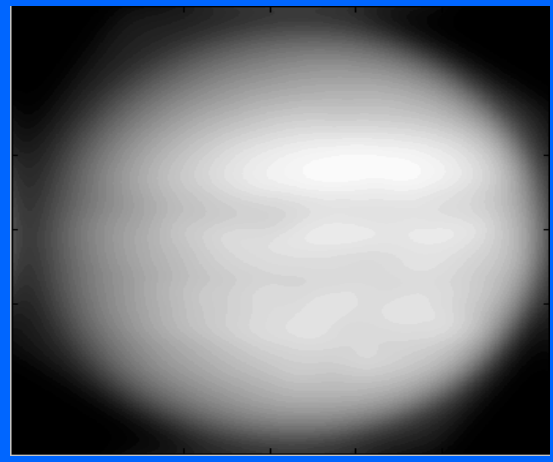
A parameter characterising atmospheric turbulence. The seeing ε is the angular resolution of long exposure images through the atmosphere.

ε = 0″05
r_0=2.5 m

ε = 0″1
r_0=1 m



ε = 0″3
r_0=30 cm

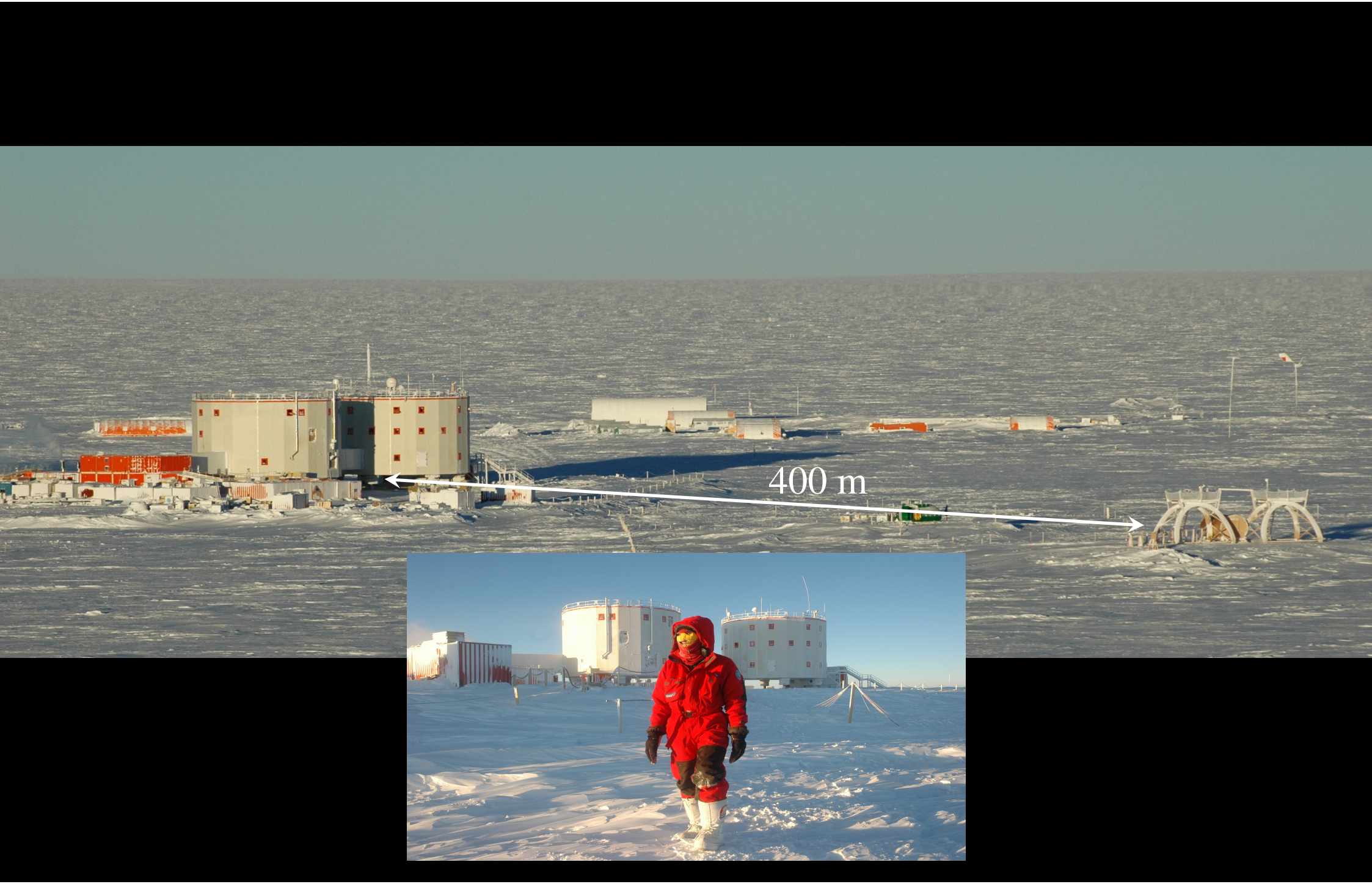


ε = 1″
r_0=10 cm

Comparison with other sites

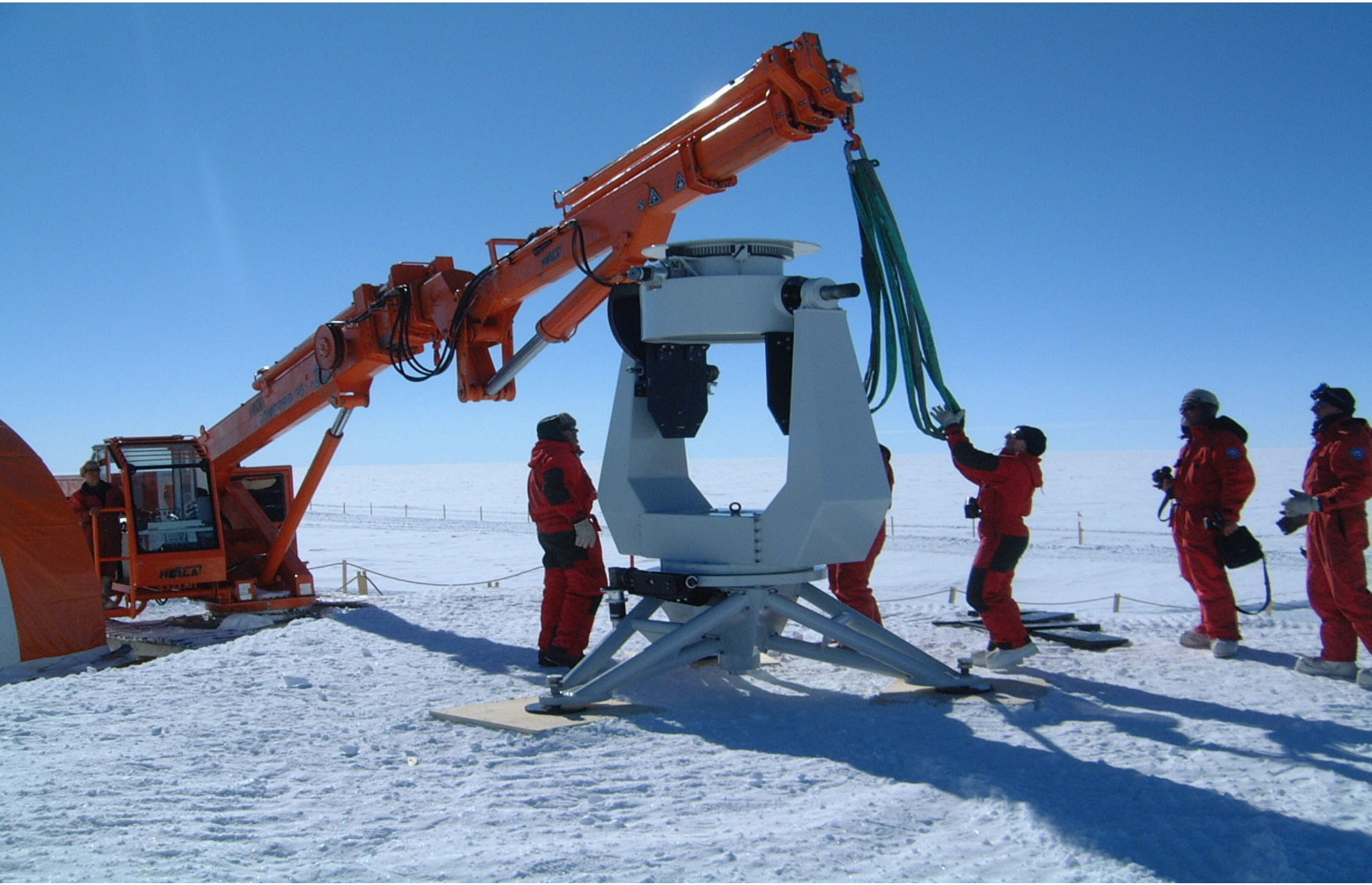
Site	Seeing
Paranal	0.66
La Silla	0.87
Maidanak	0.70
South Pole	1.74
Dome C (summer)	**0.54**

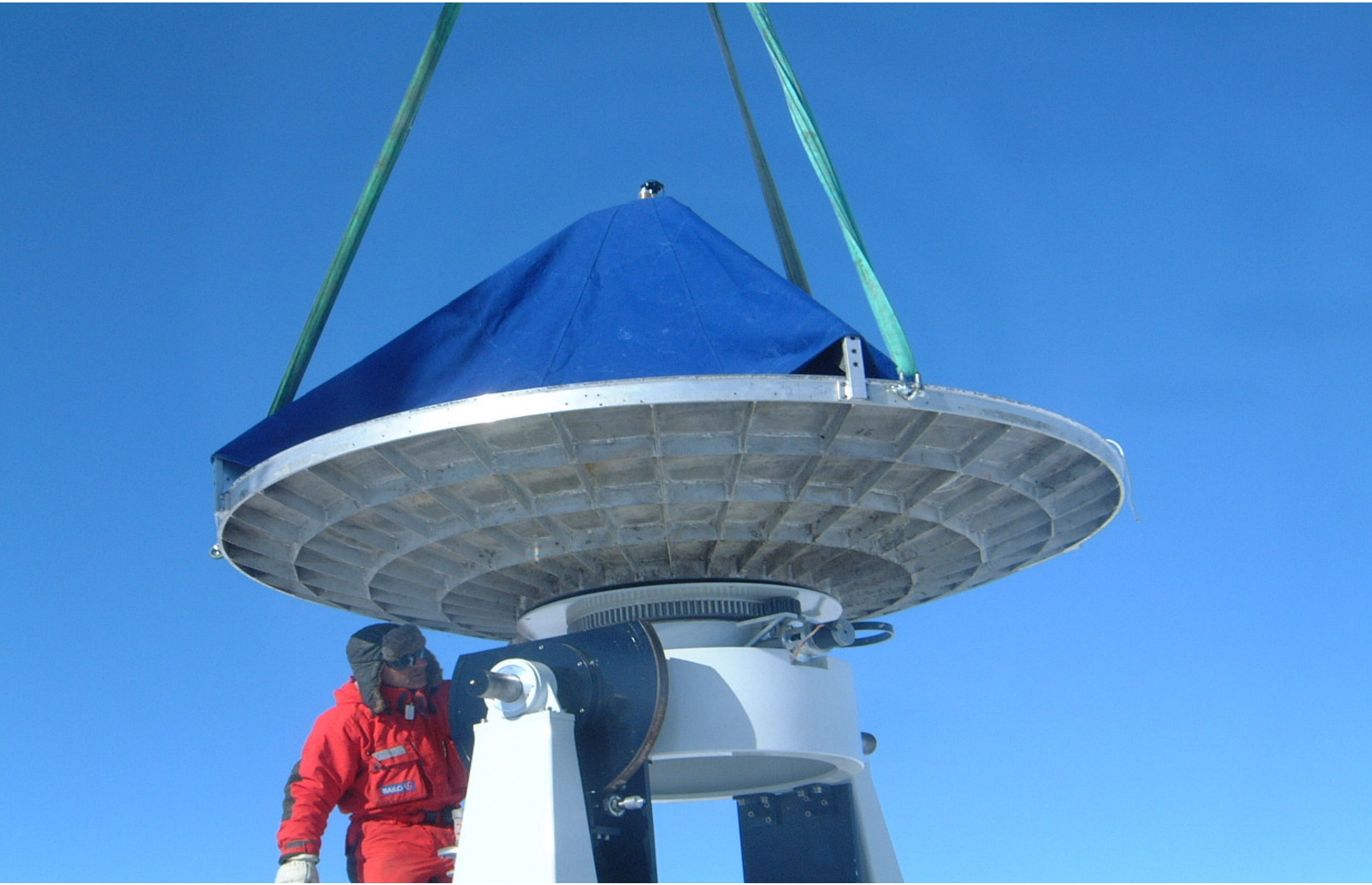
The best site of the world ?


400 m


1


16/01/2008



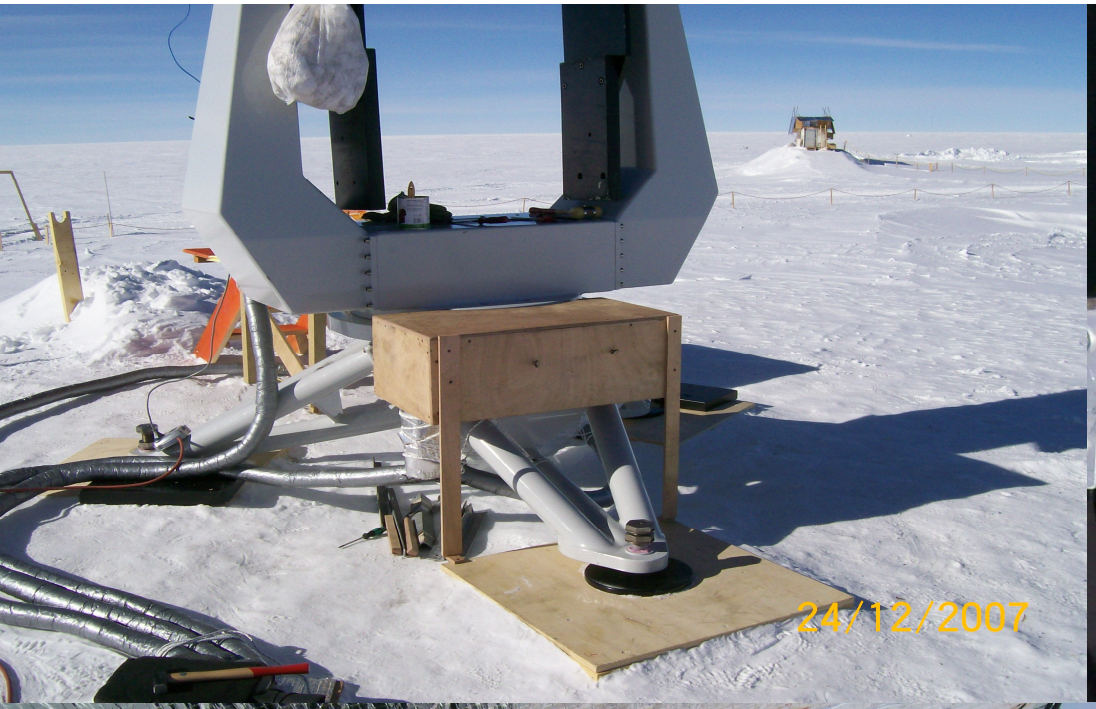



04/01/2008


SENS. 1 TRATTO = 0.10 X 1000
RUPAC
SENS. 1 TRATTO = 0.10 X 1000
RUPAC
18/12/2007
18/12/20


OASI
2
BTN
OASI
2


24/12/2007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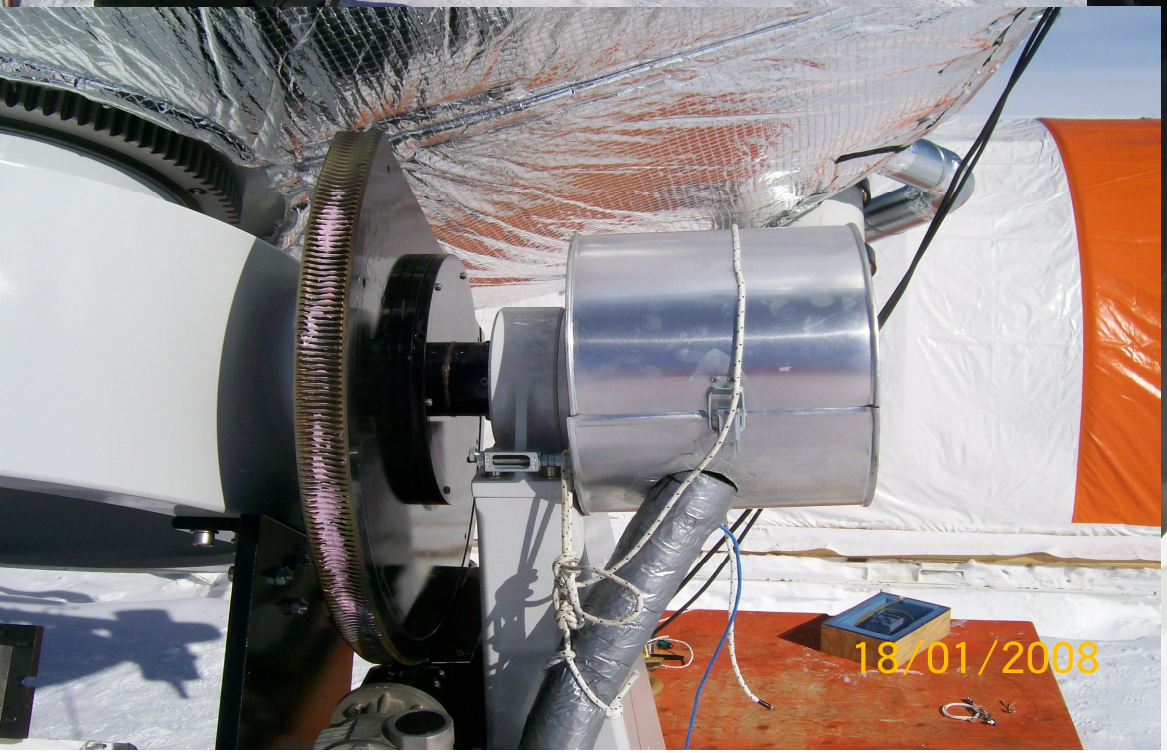
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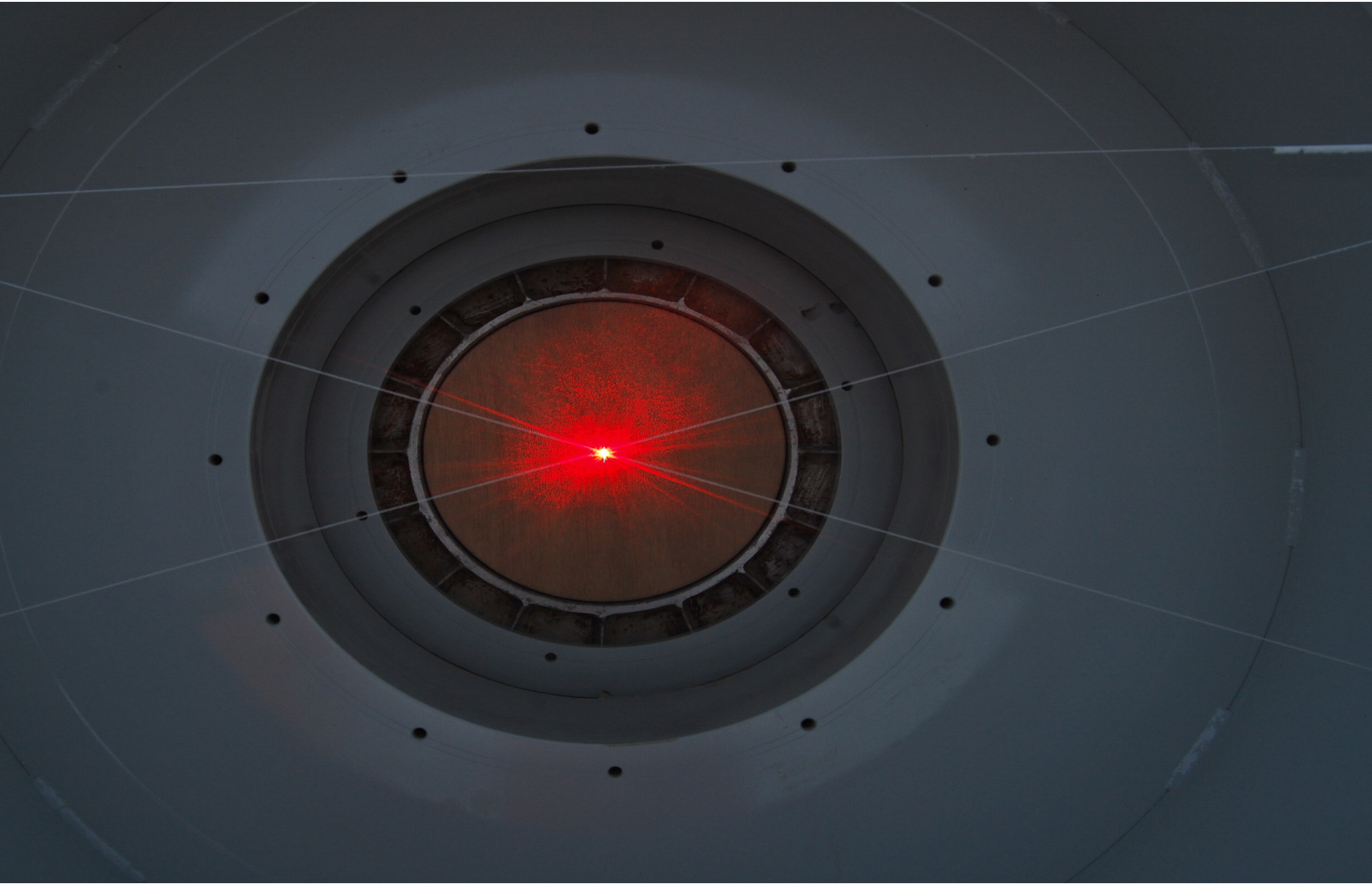
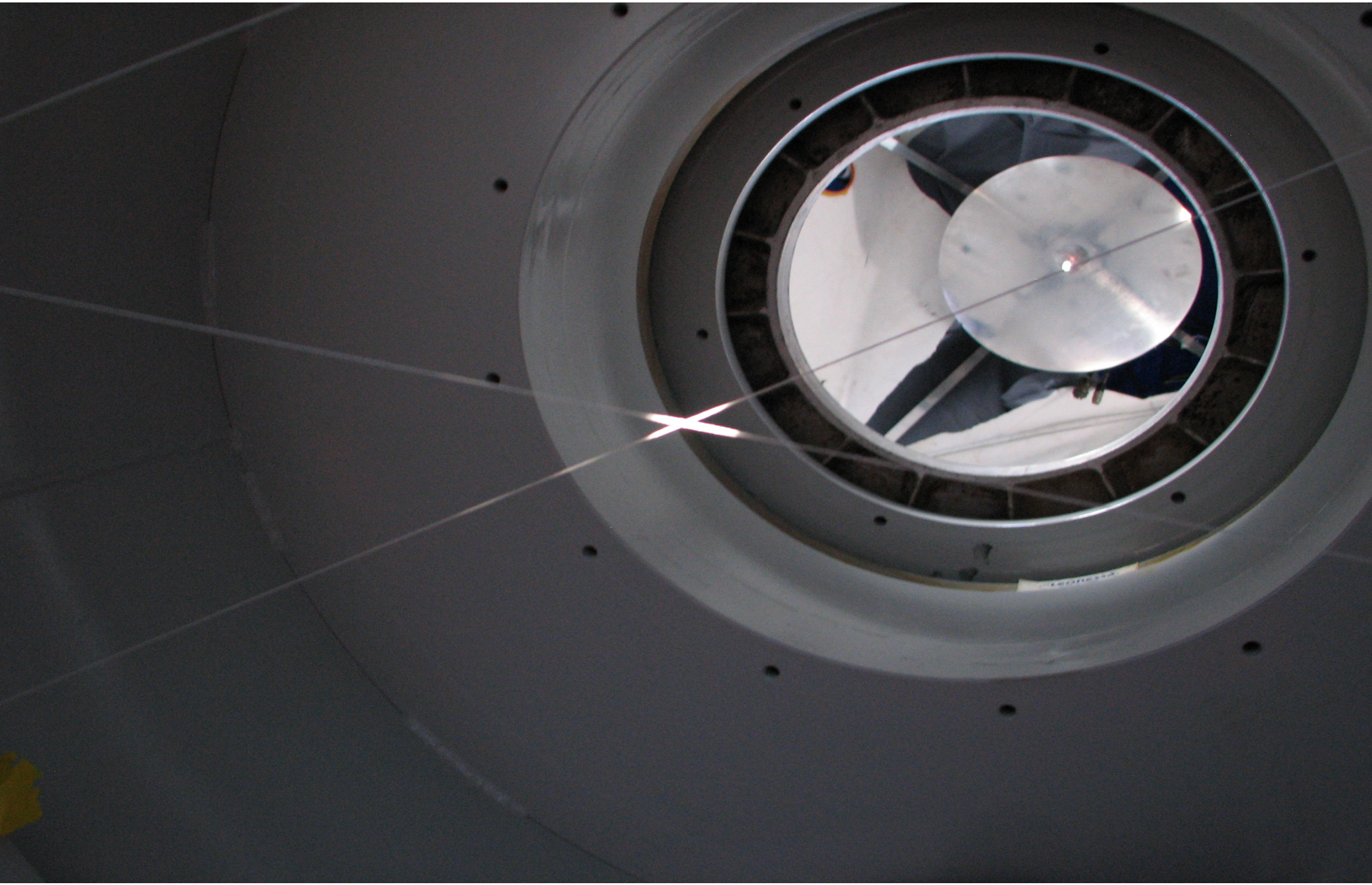
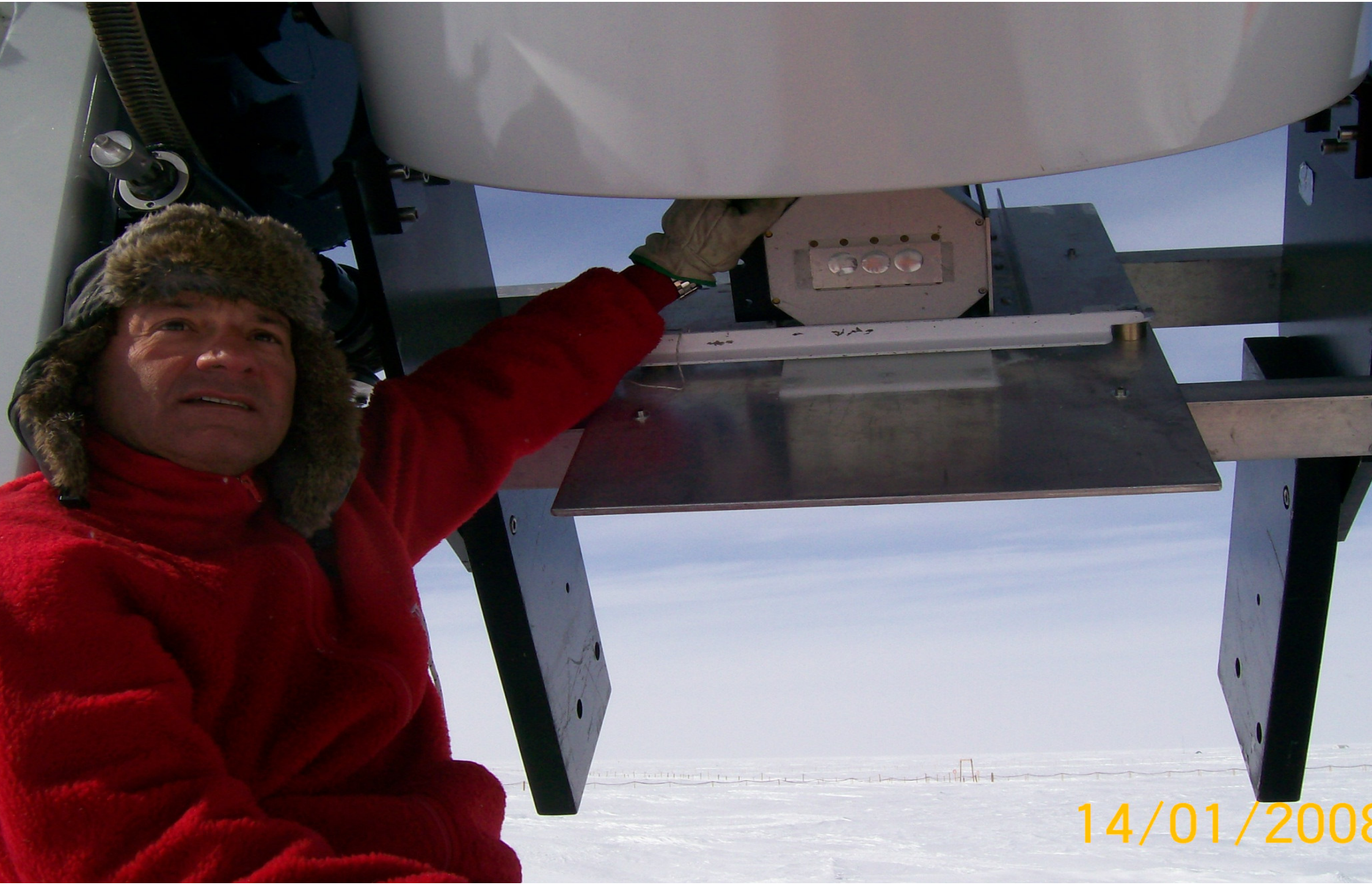




kjaer
05/01/2008

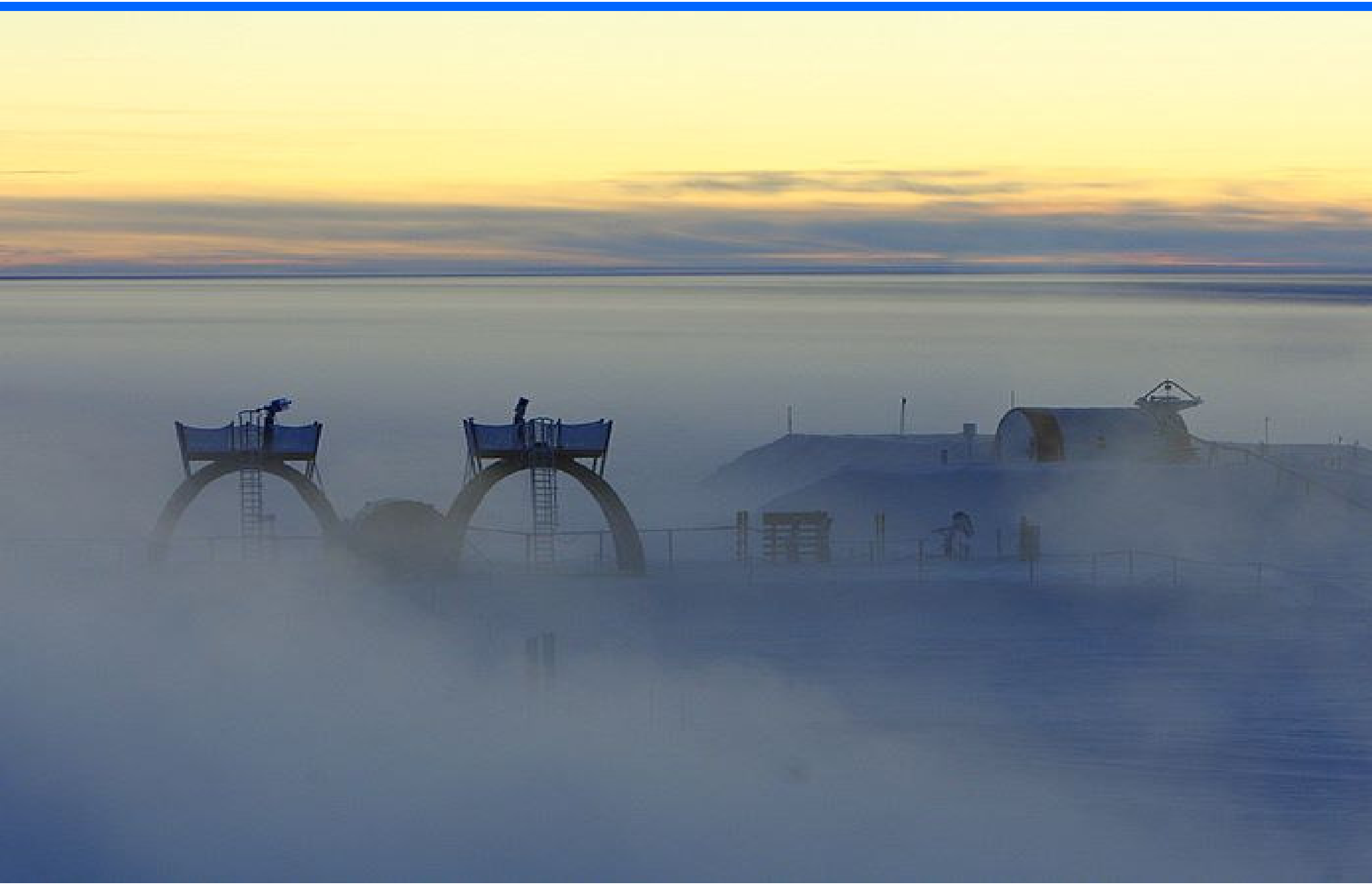

20/01/2008

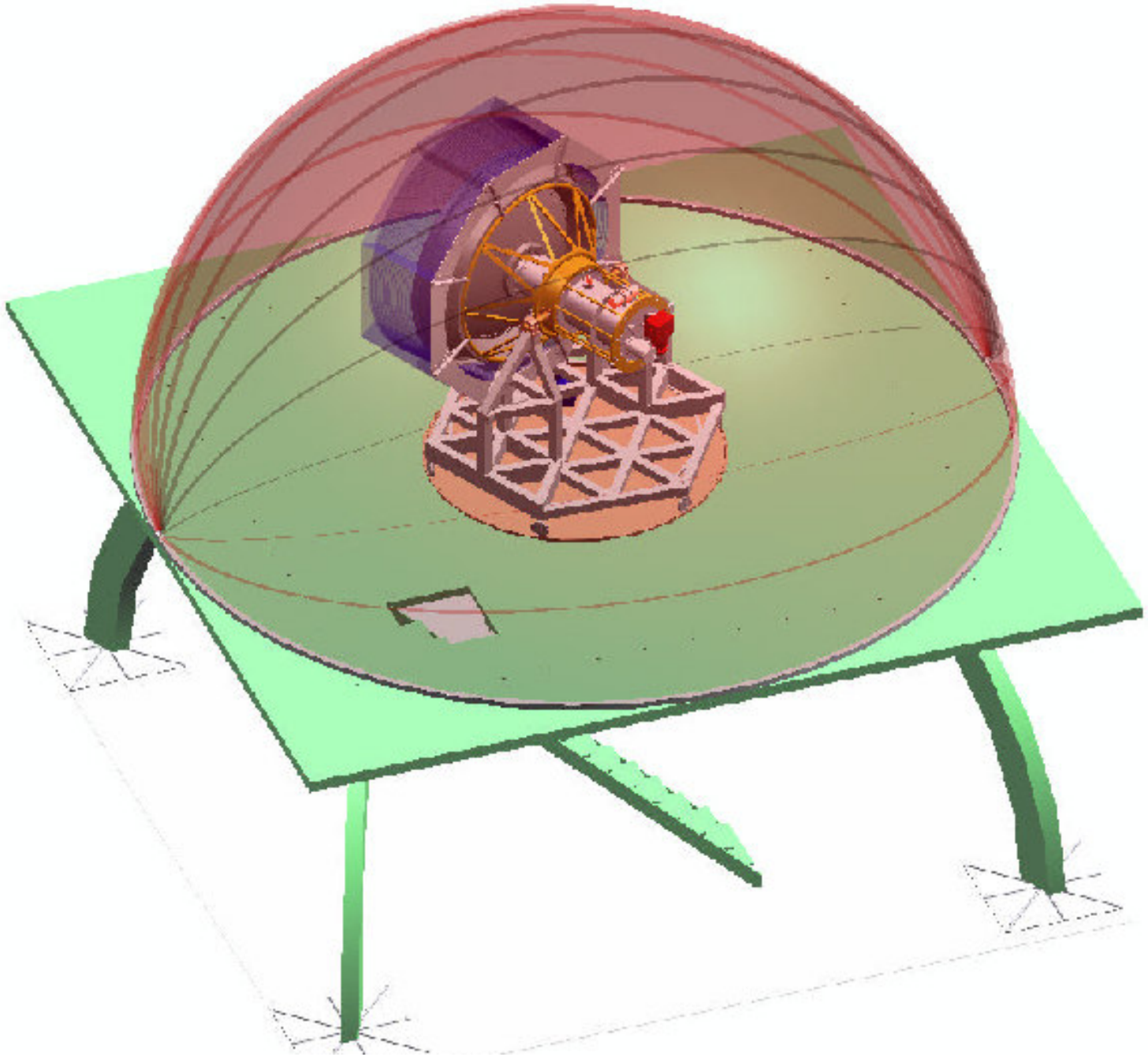

14/01/2008

14/01/2008

RS 232
BATTERY
MONITOR
CH 1
1mm
18/01/2008


ALTEZZA TELESCOPIO 5m
DIAMETRO 2.6m
18/01/2008

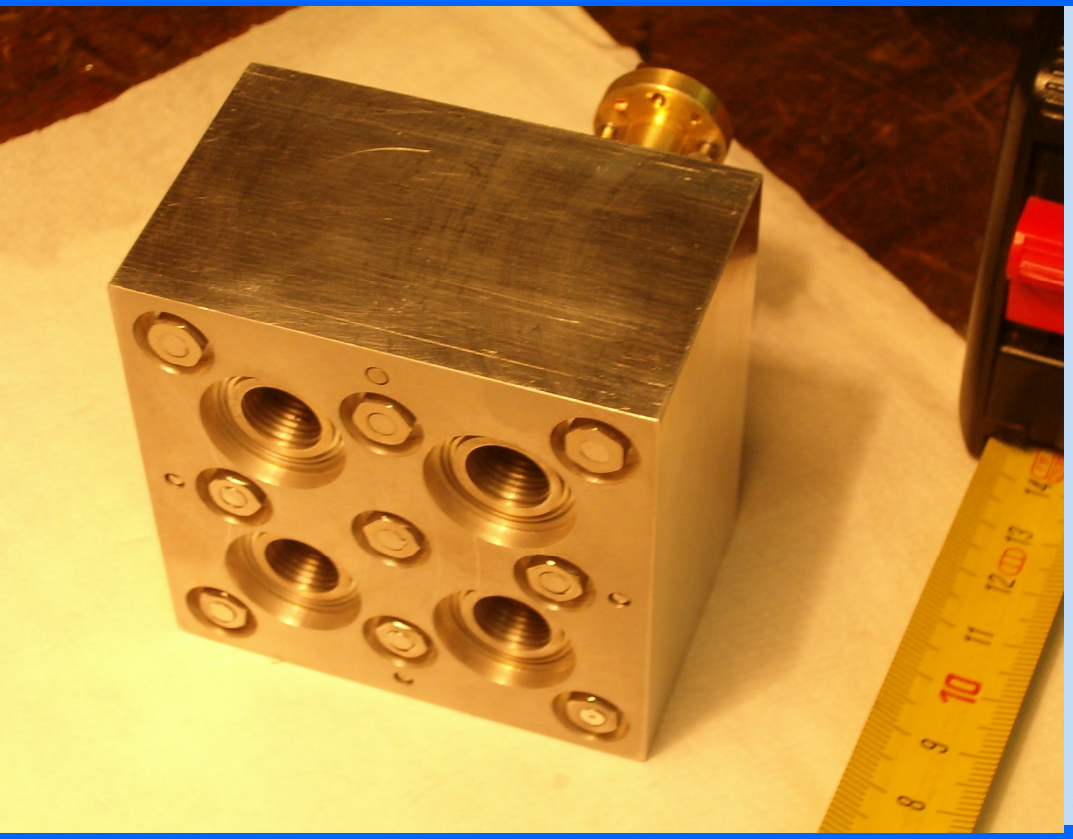


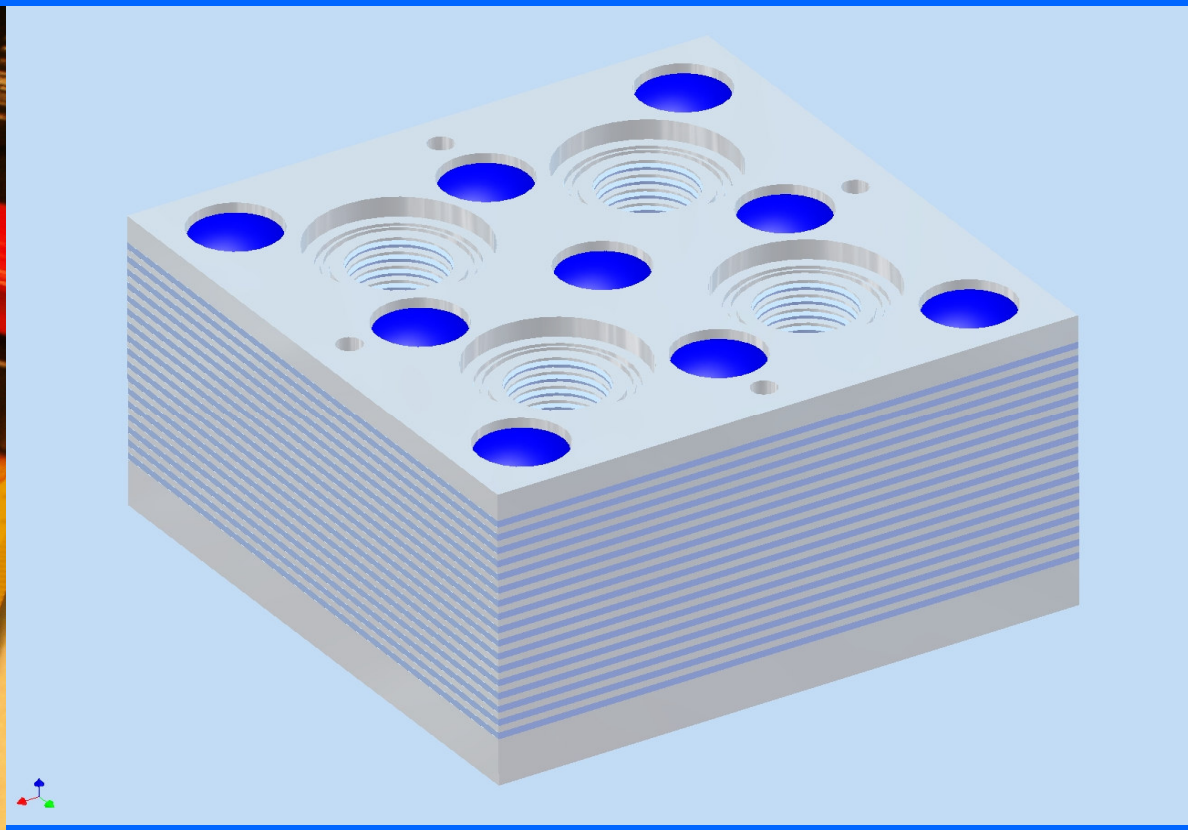


WCAM-PROTO 001

- Materiale lamine:Al6061

Massa [kg]: 0,512



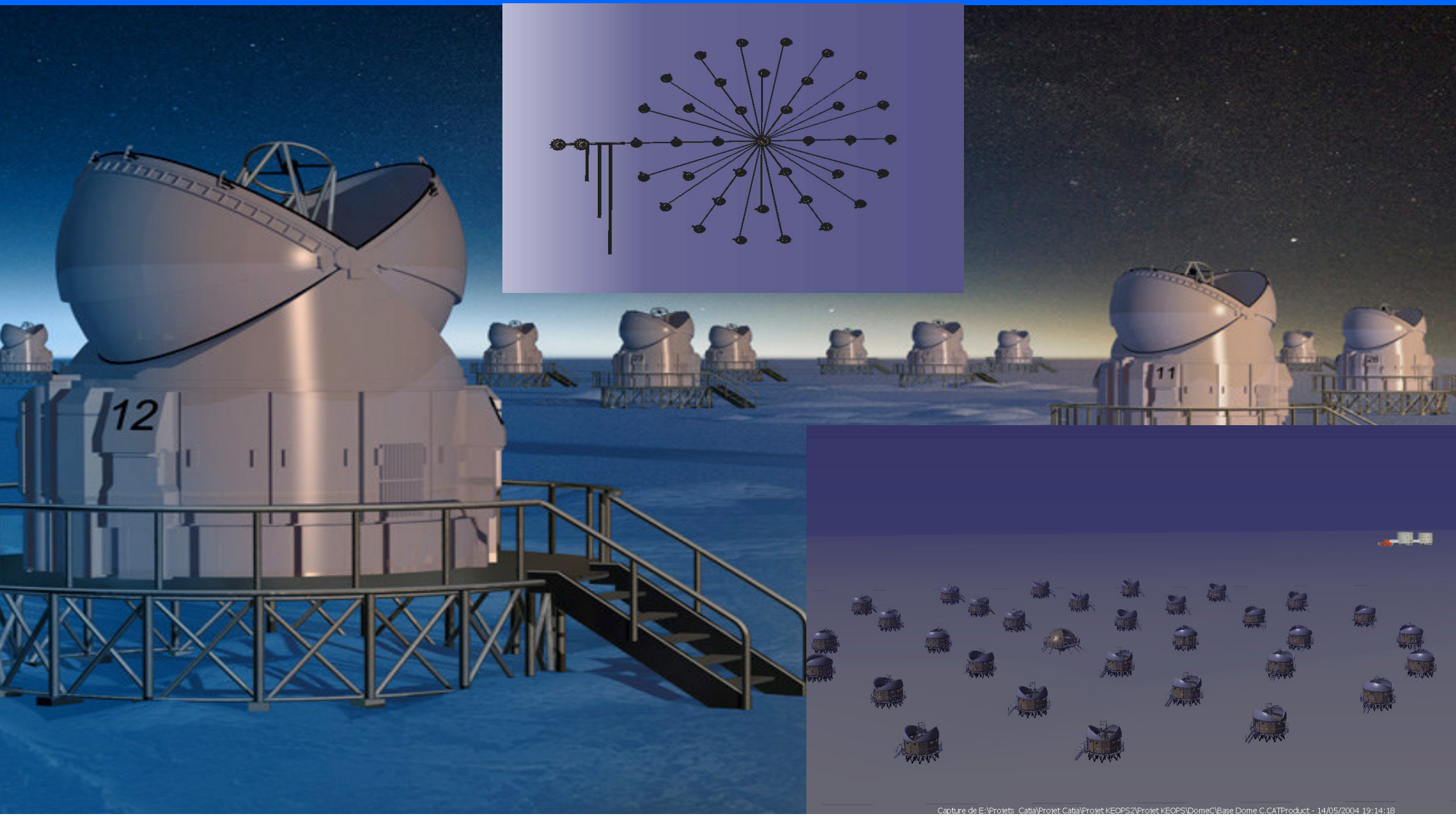


DIPARTIMENTO DI FISICA

Far future (20 years ?)

KEOPS : Kiloparsec Explorer for Optical Planet Search

... an array of 36+ telescopes equivalent to a 1 km diameter mirror.



Le aurore

Le aurore


11/01/2008

GRAZIE per **L'ATTENZIONE**