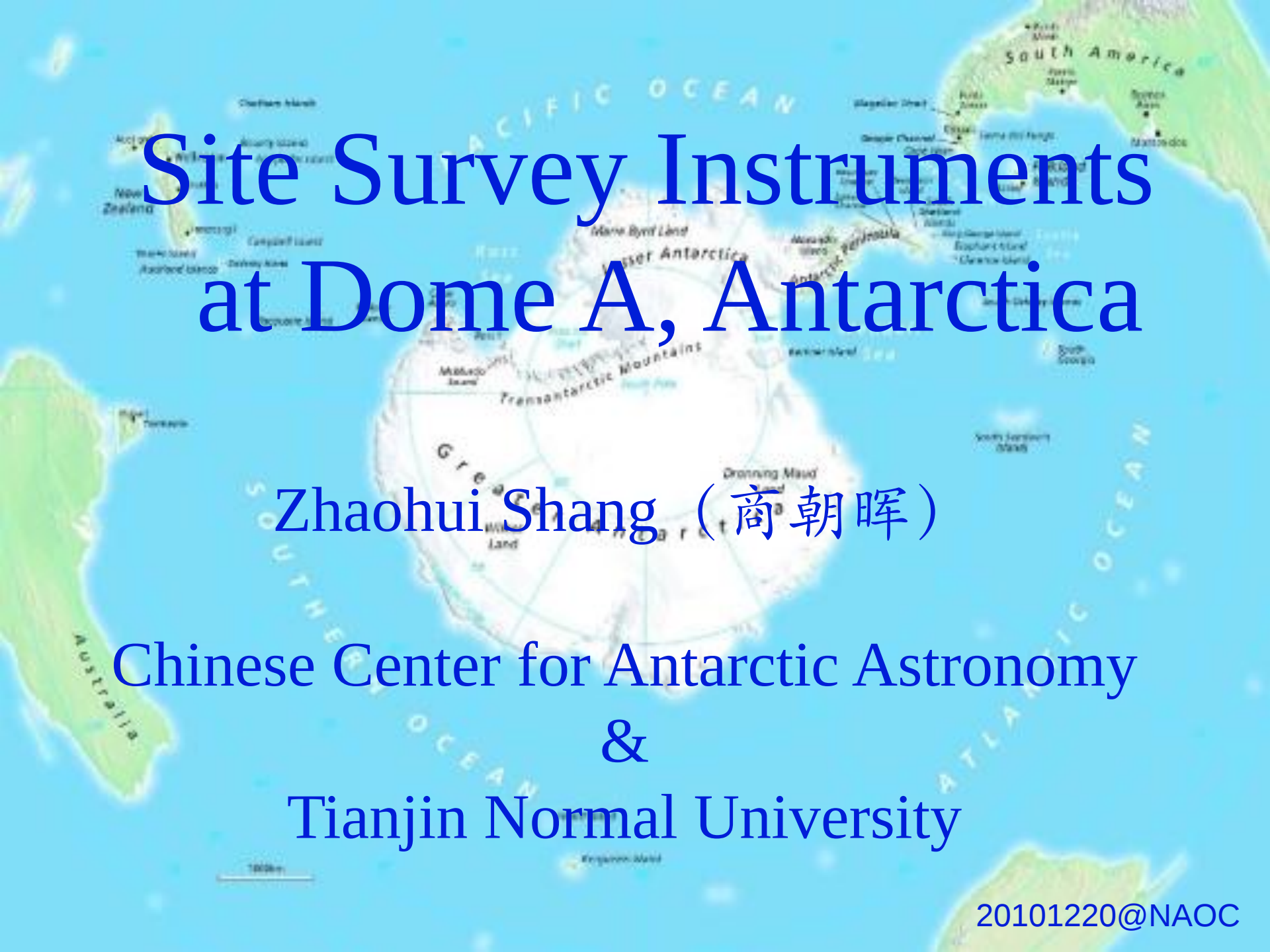


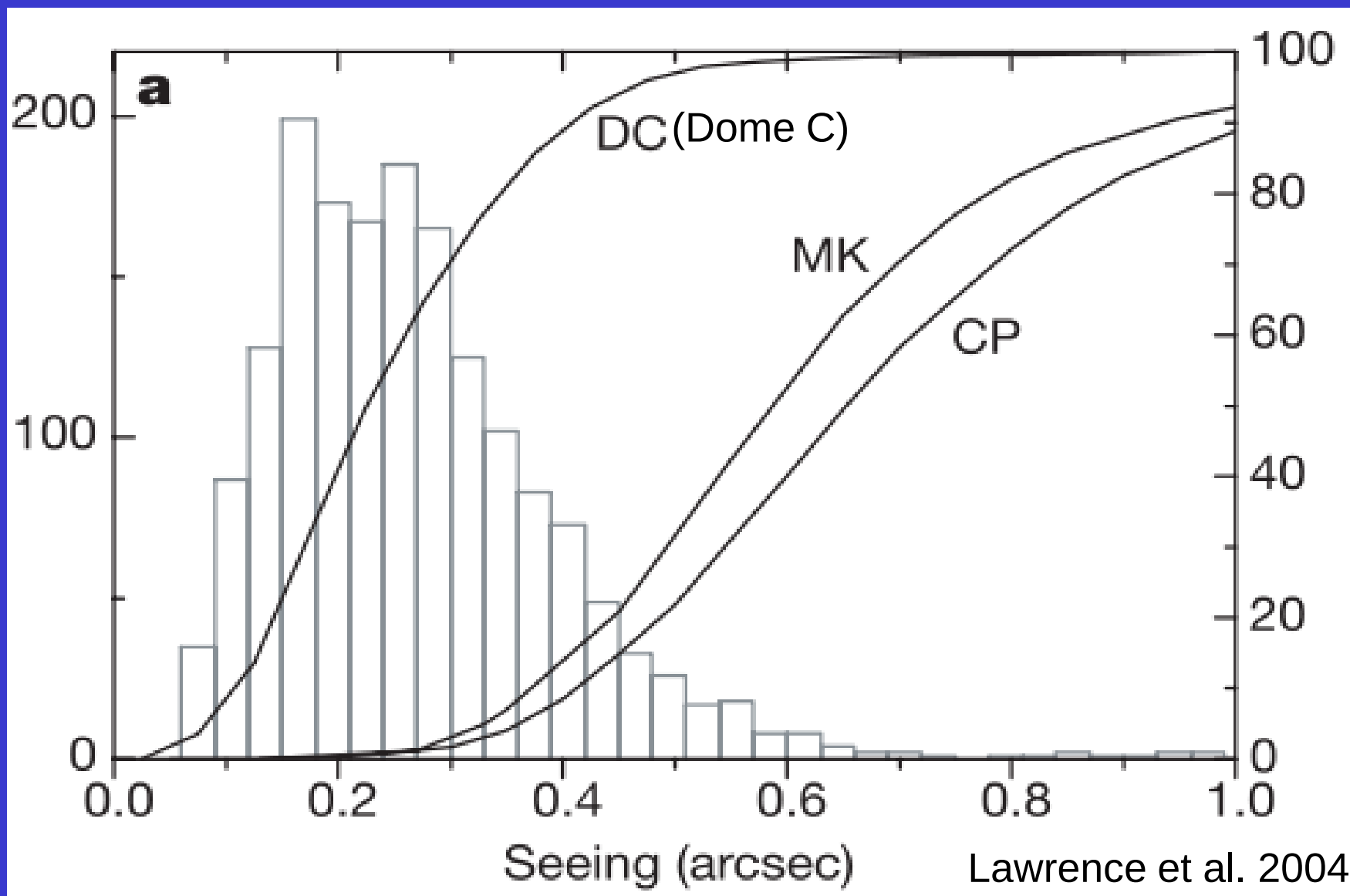
A map of Antarctica and its surrounding regions, including South America, Australia, and New Zealand. The map shows the continent of Antarctica with various geographical features like the Transantarctic Mountains, McMurdo Station, and the Ross Sea. The surrounding oceans are labeled: Pacific Ocean, Atlantic Ocean, and Southern Ocean. The text "Site Survey Instruments at Dome A, Antarctica" is overlaid in large blue font.

Site Survey Instruments at Dome A, Antarctica

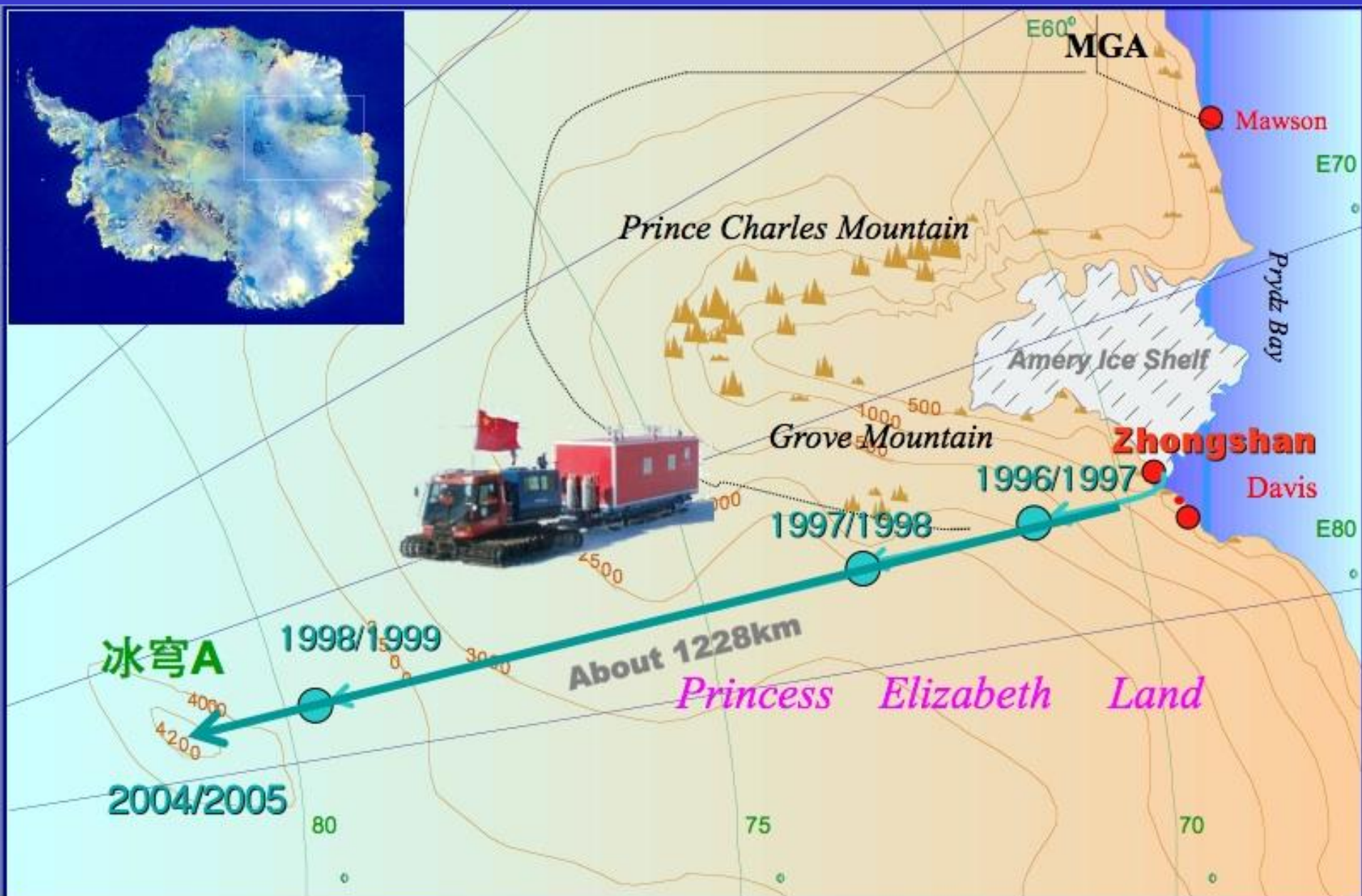
Zhaohui Shang (商朝晖)

Chinese Center for Antarctic Astronomy
&
Tianjin Normal University

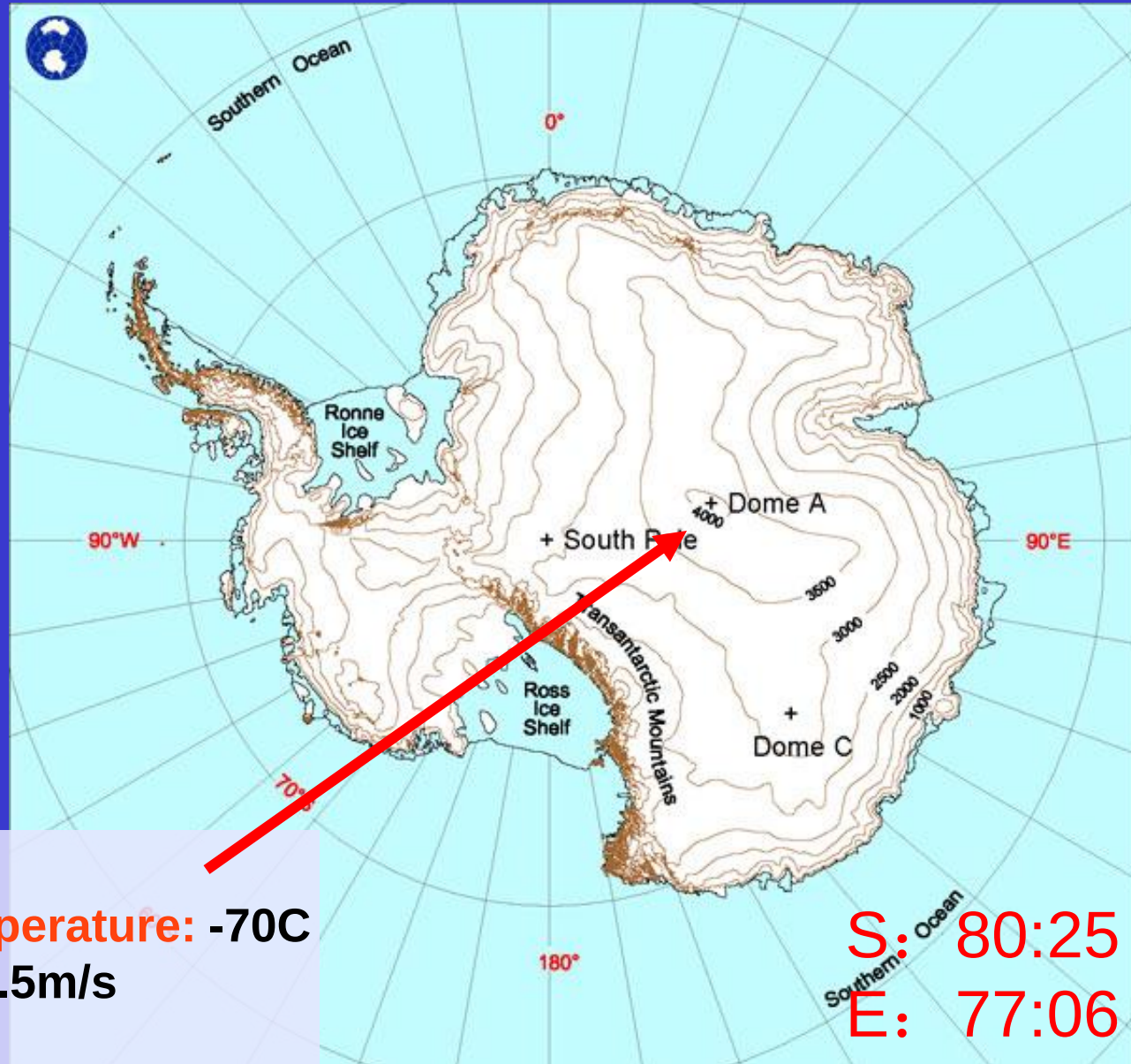
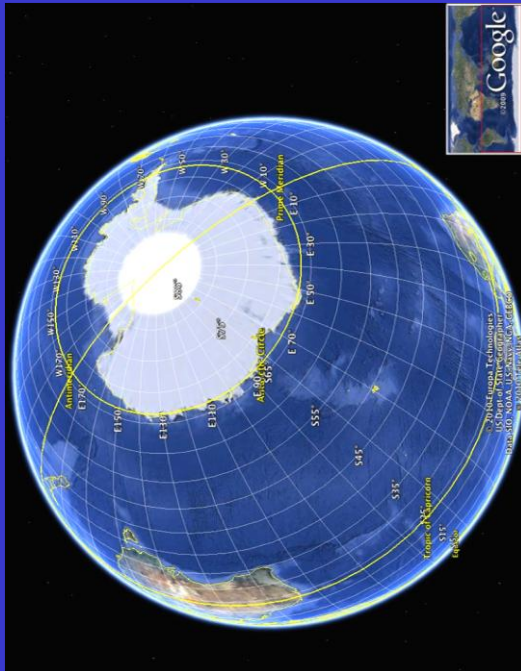
Cumulative seeing probability



Chinese Antarctic Research Expedition Reached Dome A in Early 2005



Dome A, Antarctica



Dome A is better:

Altitude: 4093m

Typical wintertime temperature: -70C

Average wind speed: 2.5m/s

Very Dry

Boring, tough, insane, fun, exciting, ...

A wide-angle photograph showing a line of seven icebreakers and support vessels moving across a vast, flat, icy landscape. The ice is a mix of white and grey, with some darker patches. The sky is a clear, solid blue. The vessels are spaced out, moving from left to right. The one on the far right is a red icebreaker with a prominent red flag. The others are various shades of orange, yellow, and blue. The horizon is flat and distant.

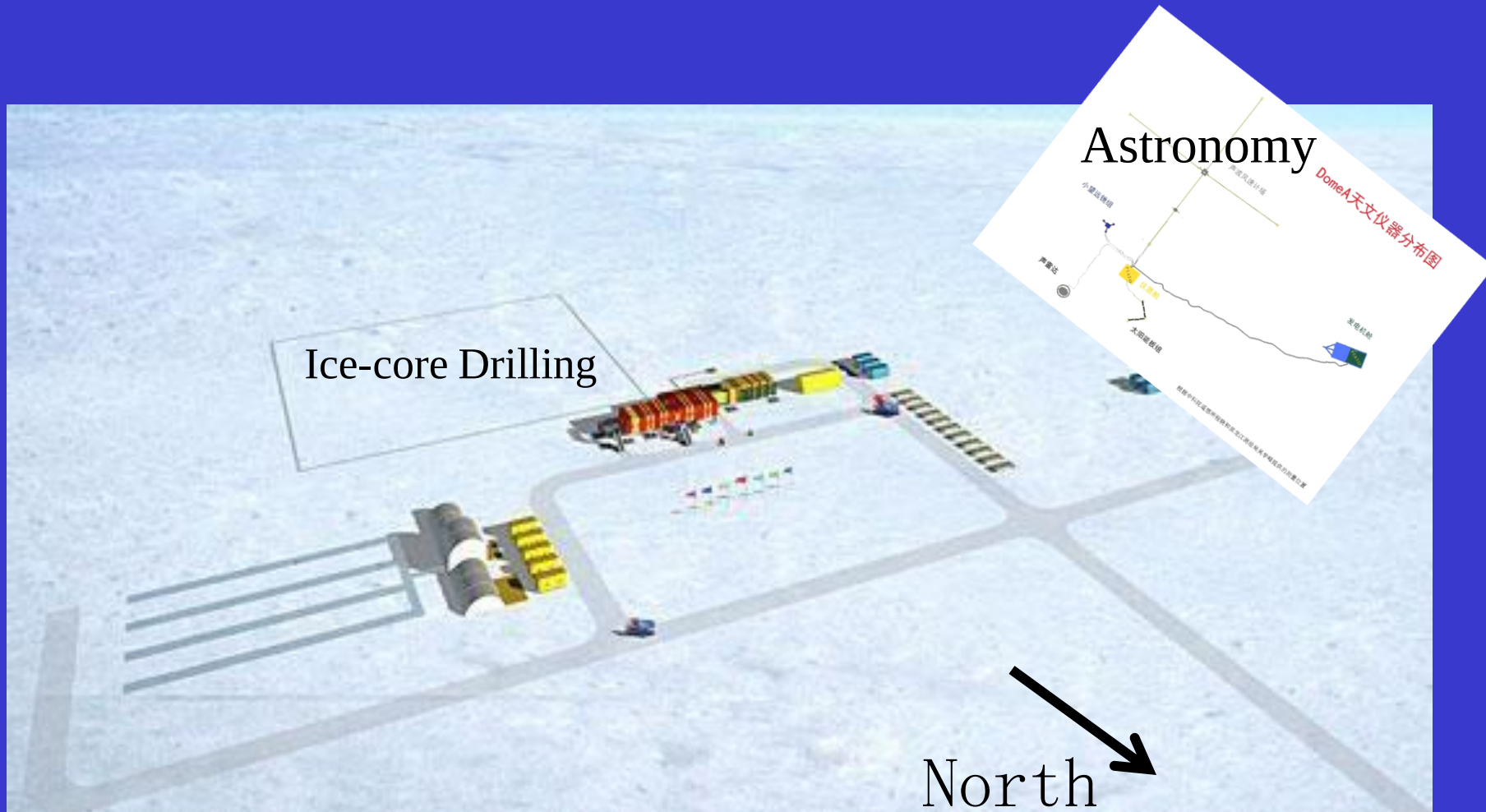
Traverse from coast to Dome A

Astronomical Site Testing

- Collaborations with Australian and US Astronomers;
- Installed various equipments/instruments (2007/2008);
- Fully automatic operation through the winter;
- Serviced twice (2009-2010);
- Still running.



Layout of Kunlun Station (old)



↑ AST3场地

仪器

发电

仪器

DomeA天文仪器分布图

发电

发电机舱

声波风速计塔

DIMM

小望远镜组

声雷达2

声雷达

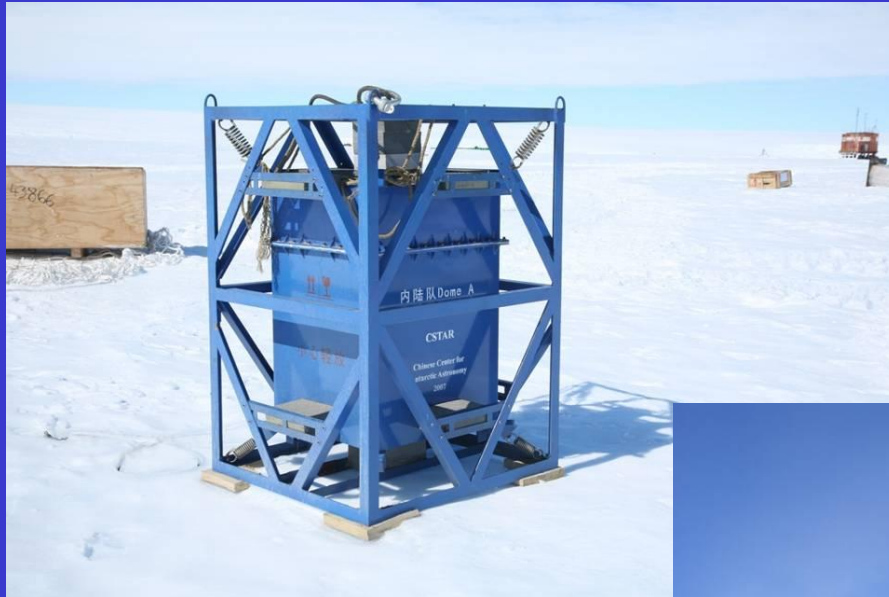
太阳能板组

↓ 昆仑站

北

根据中科院遥感所程晓和黑龙江测绘局吴学峰提供的测量位置

CSTAR Installation--2008



CSTAR Servicing

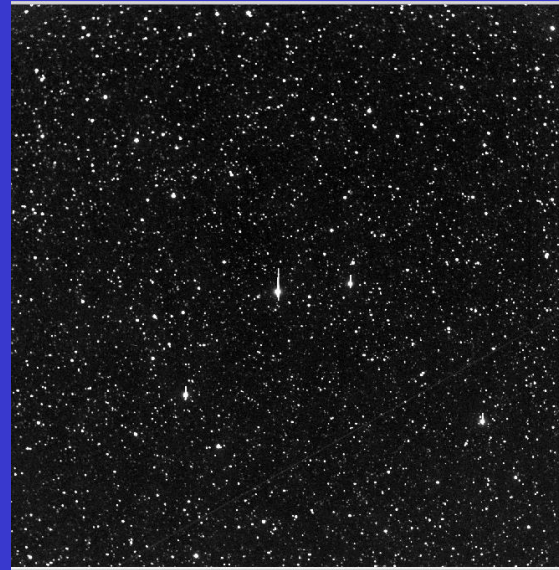


webcam

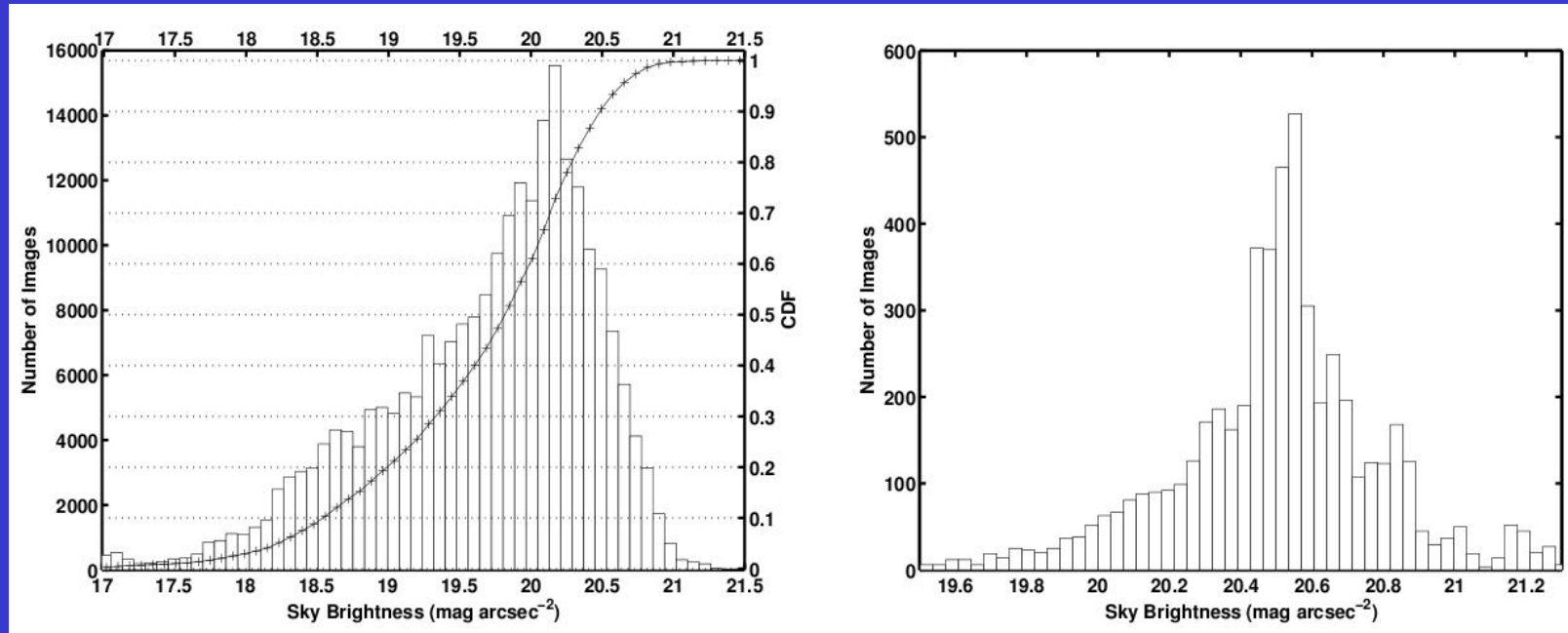


Chinese Small Telescope Array (CSTAR)

- 4 telescopes
- Apperture: 14.5cm
- Filters: g, r, i, blank
- Focal ratio f/1.2
- CCD 1k x 1k frame transfer
- FOV: $\sim 4.5^\circ \times 4.5^\circ$
- Pointing to South Celestial Pole
- one image / 20-30 sec
- Limiting mag: ~ 16



Dome A sky background (Zou et al. 2010)



Distribution of Sky Brightness (i-band)

Dome A		20.5	
La Palm	20.10	Cerro Tololo	20.07
Paranal	19.93	Calar Alto	19.57

Median Sky Brightness (i-band)

Dome A Cloud Coverage (Zou et al. 2010)

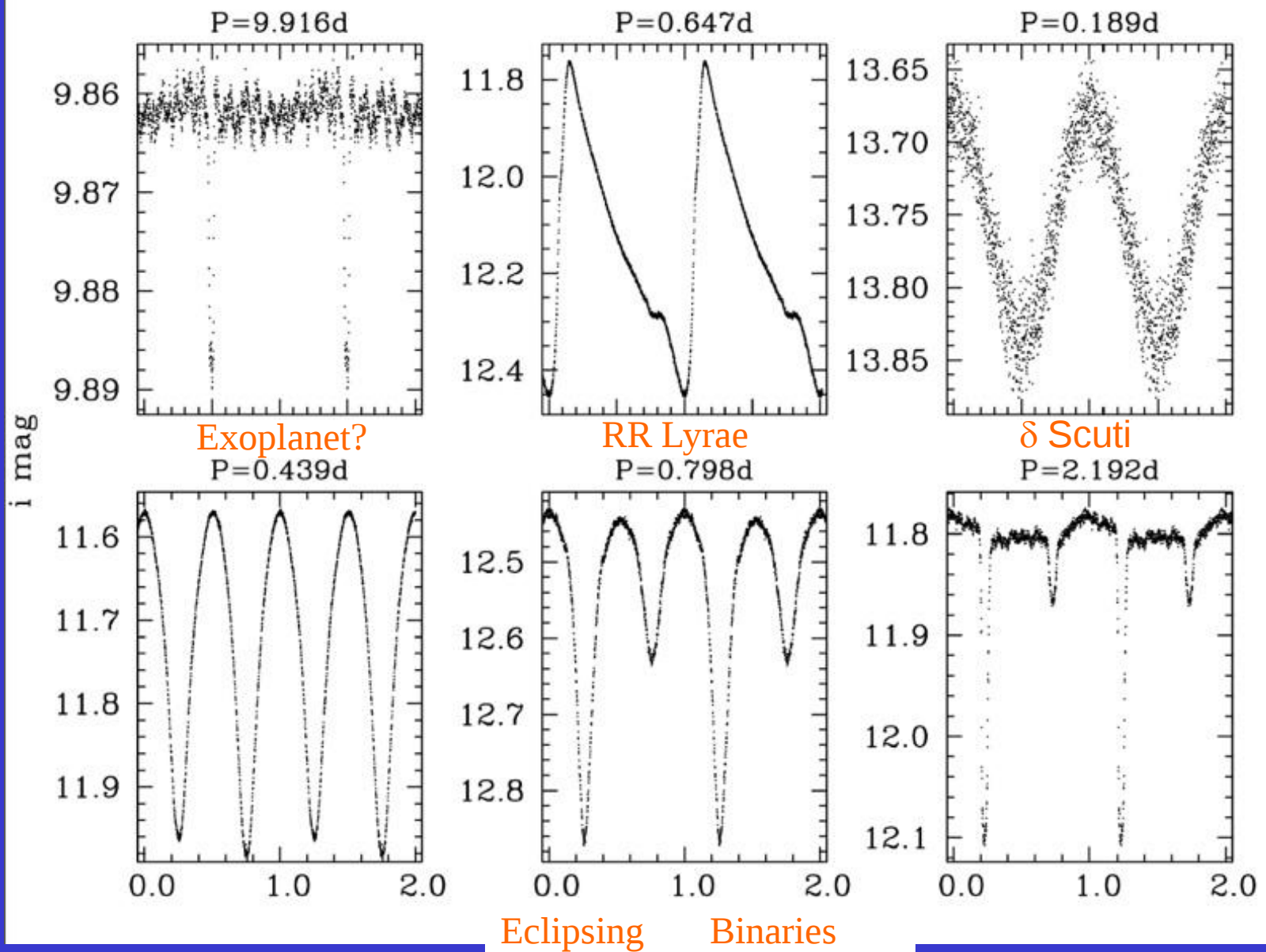
The Comparison of Cloud Cover Between Mauna Kea and Dome A

Mauna Kea (Gemini)			Dome A
Cloud Cover	Extinction (V)	Fraction	Fraction
Any other usable	>3	10%	0
Cloudy	2–3	20%	2%
Patchy cloud	0.3–2	20%	31%
Photometric	<0.3	50%	67%

Notes. The definition of cloud cover is adopted from the Gemini Observatory. For comparison, we use $V - i = 0.07$ in extinction for the different transparencies of these two bands as presented in the text. Note that the term “photometric” as used here is just one kind of cloud cover category and it is different from the normal term “photometric night.”

Better than Mauna Kea

Folded Light Curves from CSTAR



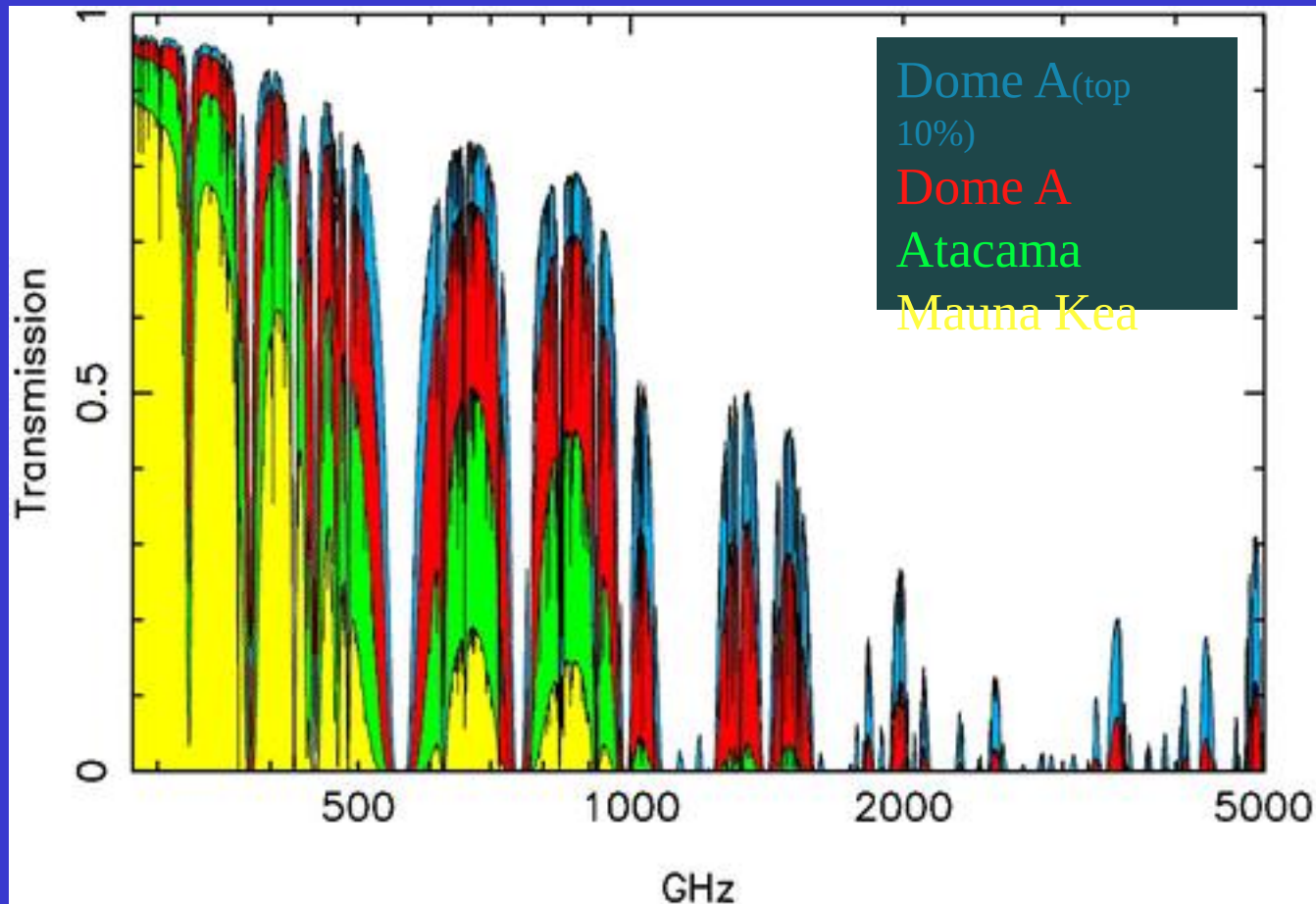
Pre-HEAT (Transmission @Tera-Hz or sub-mm)

- Dry => good for THz



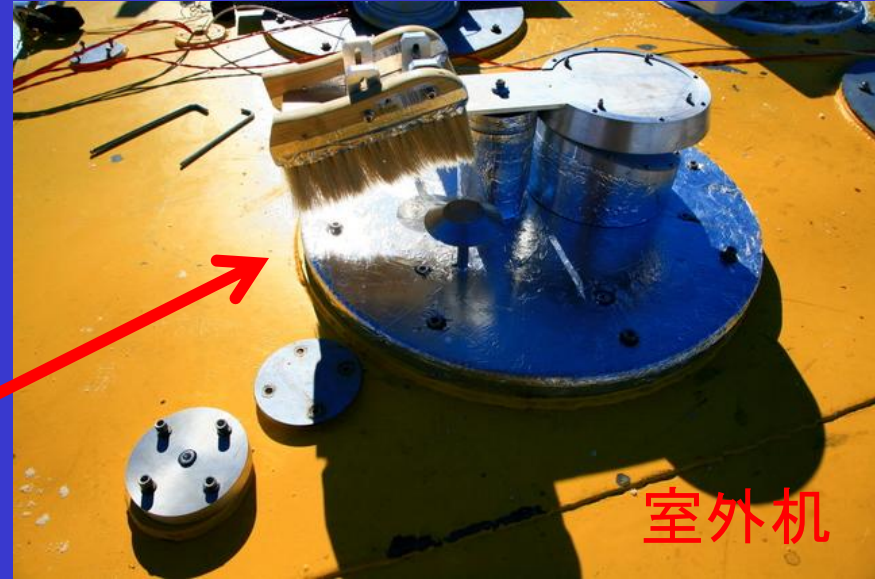
Pre-HEAT (@Tera-Hz or sub-mm)

THz Atmospheric Transmission



THz FTS (Fourier Transform Spectrograph)

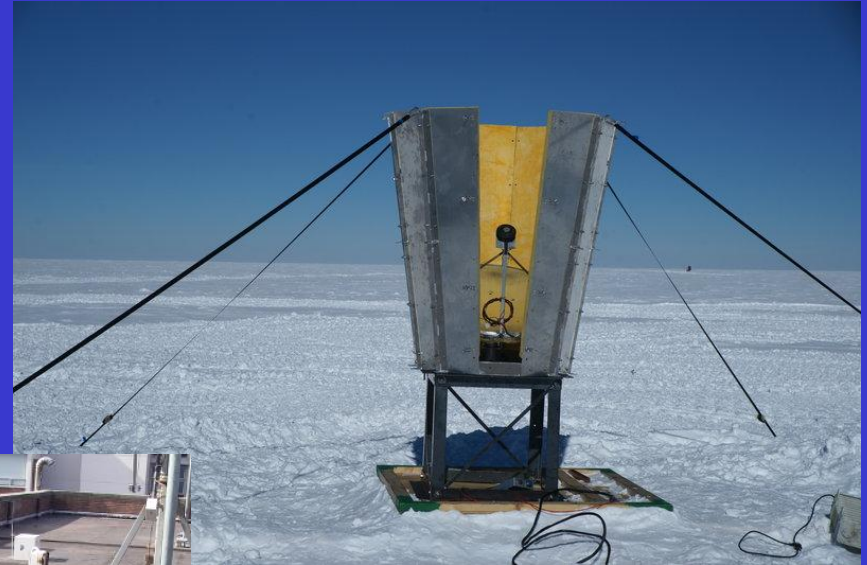
Installed in Jan. 2010



室内机

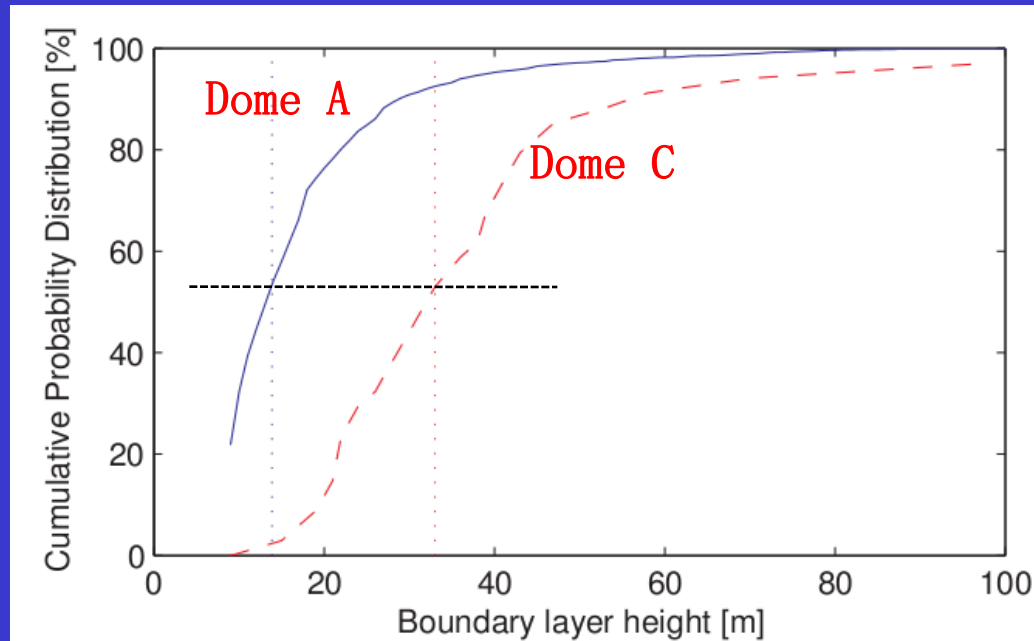
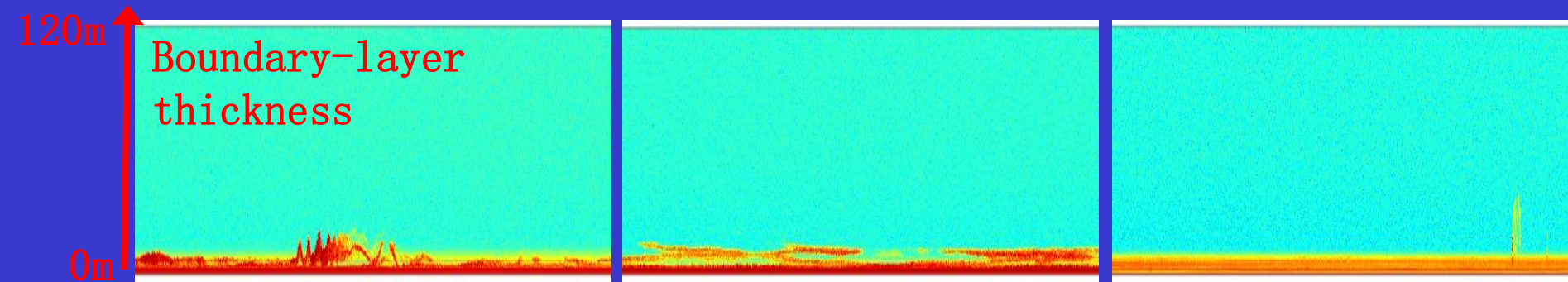
Snodar (Sonic Radar)

- Measure the atmospheric boundary-layer thickness



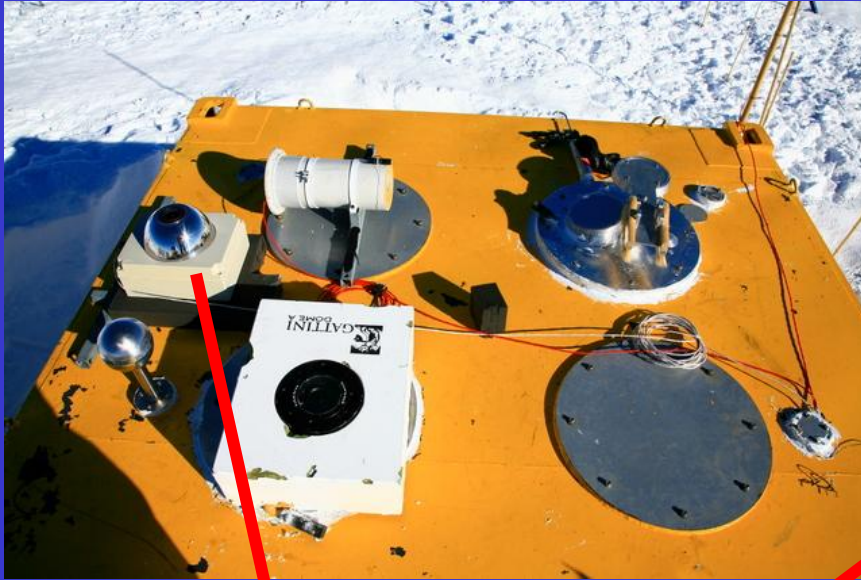
Snodar (Sonic Radar)

- Measure the atmospheric boundary-layer thickness (BLT)

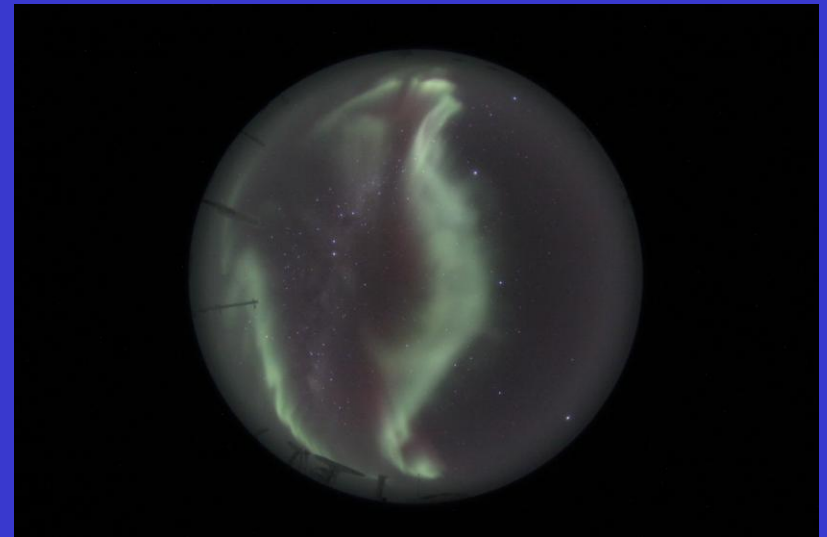


- Median BLT $\sim 13.9\text{m}$.
- Lower than any other sites

HRCAM (High-resolution Camear)



All-sky
images
with
fish-eye
lens

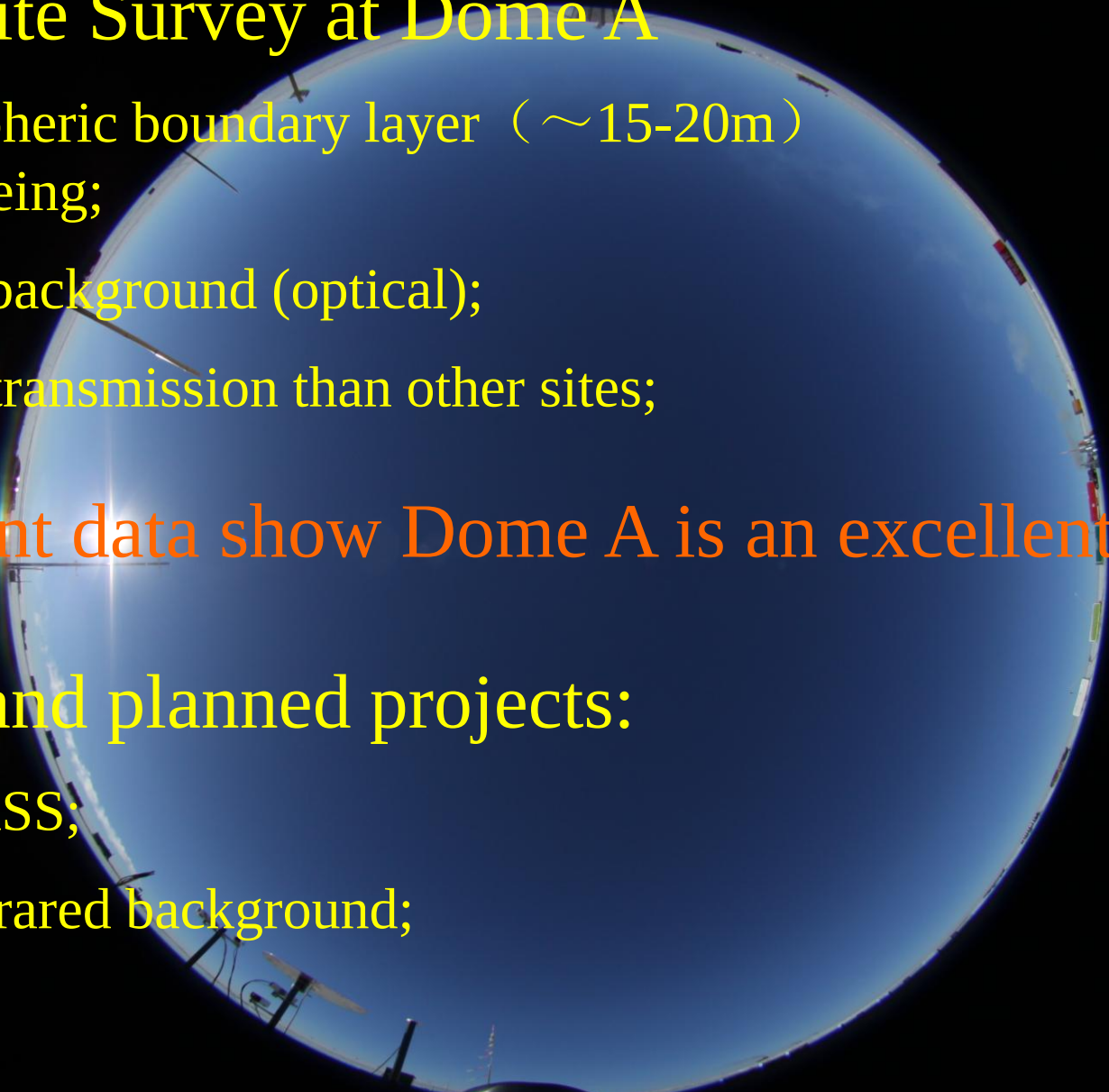


HRCAM

HRCAM (High-resolution Camear)



Status of Site Survey at Dome A



- Low atmospheric boundary layer ($\sim 15\text{-}20\text{m}$)
=> better seeing;
- Darker sky background (optical);
- Better THz transmission than other sites;

Current data show Dome A is an excellent site.

On-going and planned projects:

- DIMM, MASS;
- Measure infrared background;
- Monitoring;

2010. 01. 26

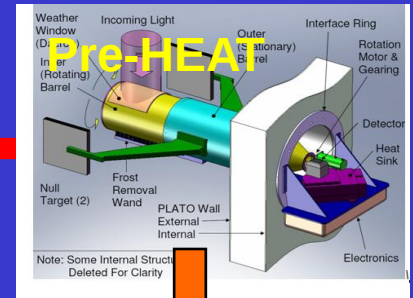
昆仑站一天文项目—其他仪器



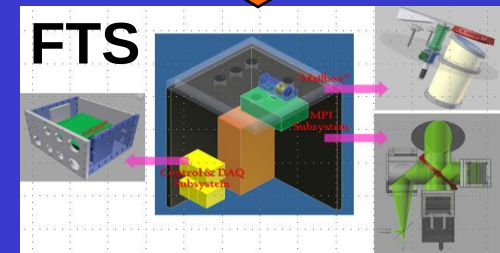
Road Map of Antarctic Observatory

Optical/IR-----sub-mm

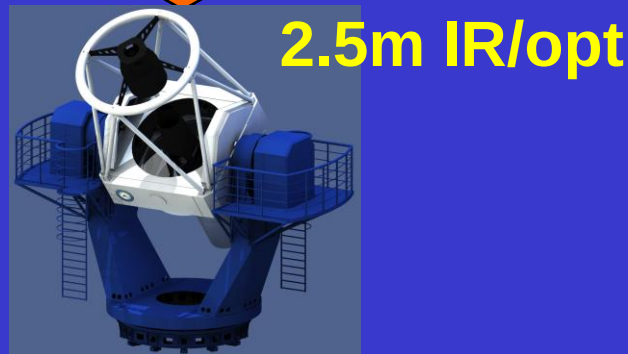
Current =>



near term =>



mid-term =>



5m sub-mm

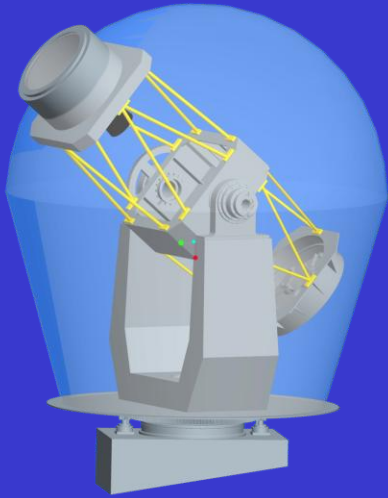


long term =>

.....

Antartic Schmidt Telescope x 3 (AST3)

Plan to install
one in 2011



... and this is how clear it is at Dome A, BTW.

← Sun

Thank you !

