# China-Iceland Joint Aurora Observatory

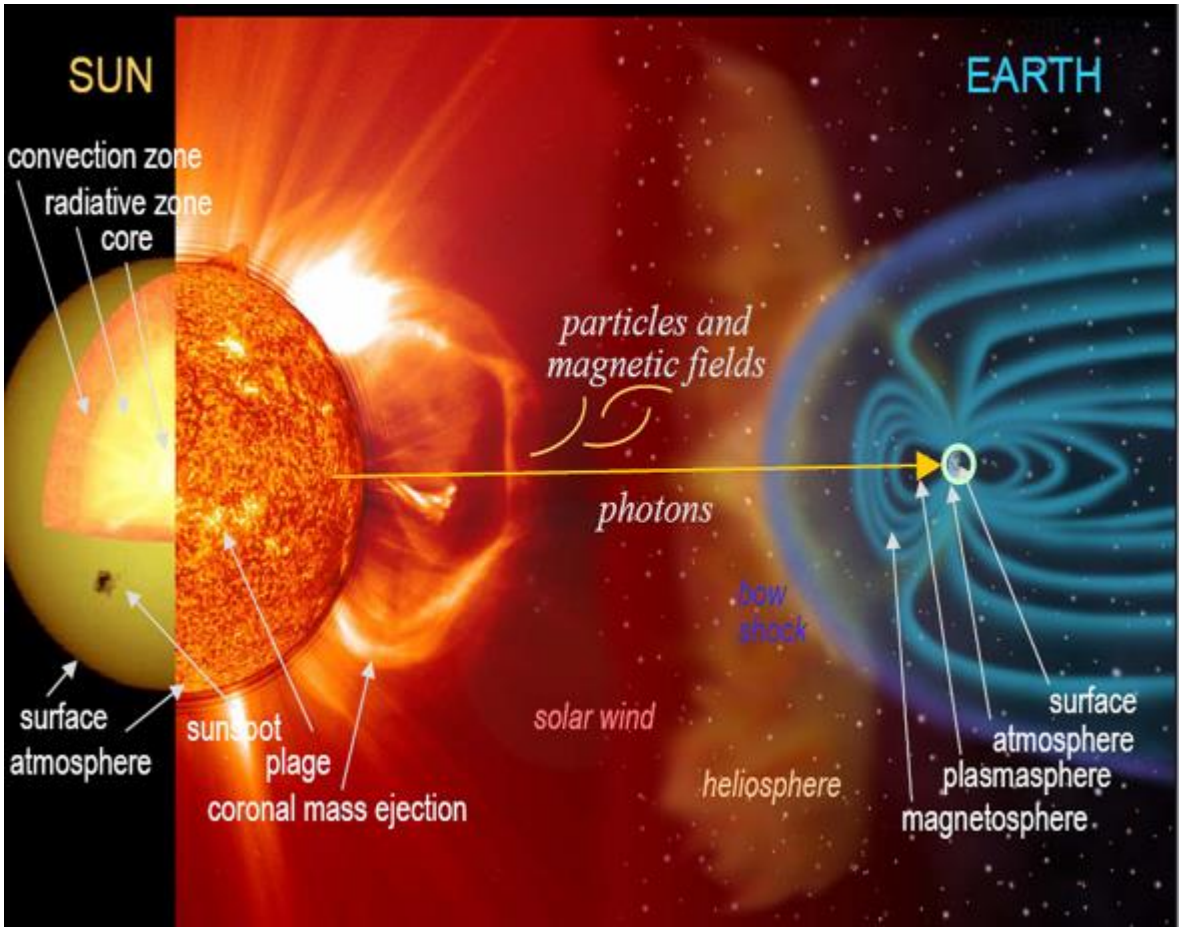
**Why?**
**Where?**
**What?**
**How?**
**When?**

***14 June 2012, Shanghai***

# Why?

Introduction on

**Polar Atmospheric and Space Physics Division (PASP) in PRIC**




## Main research interests

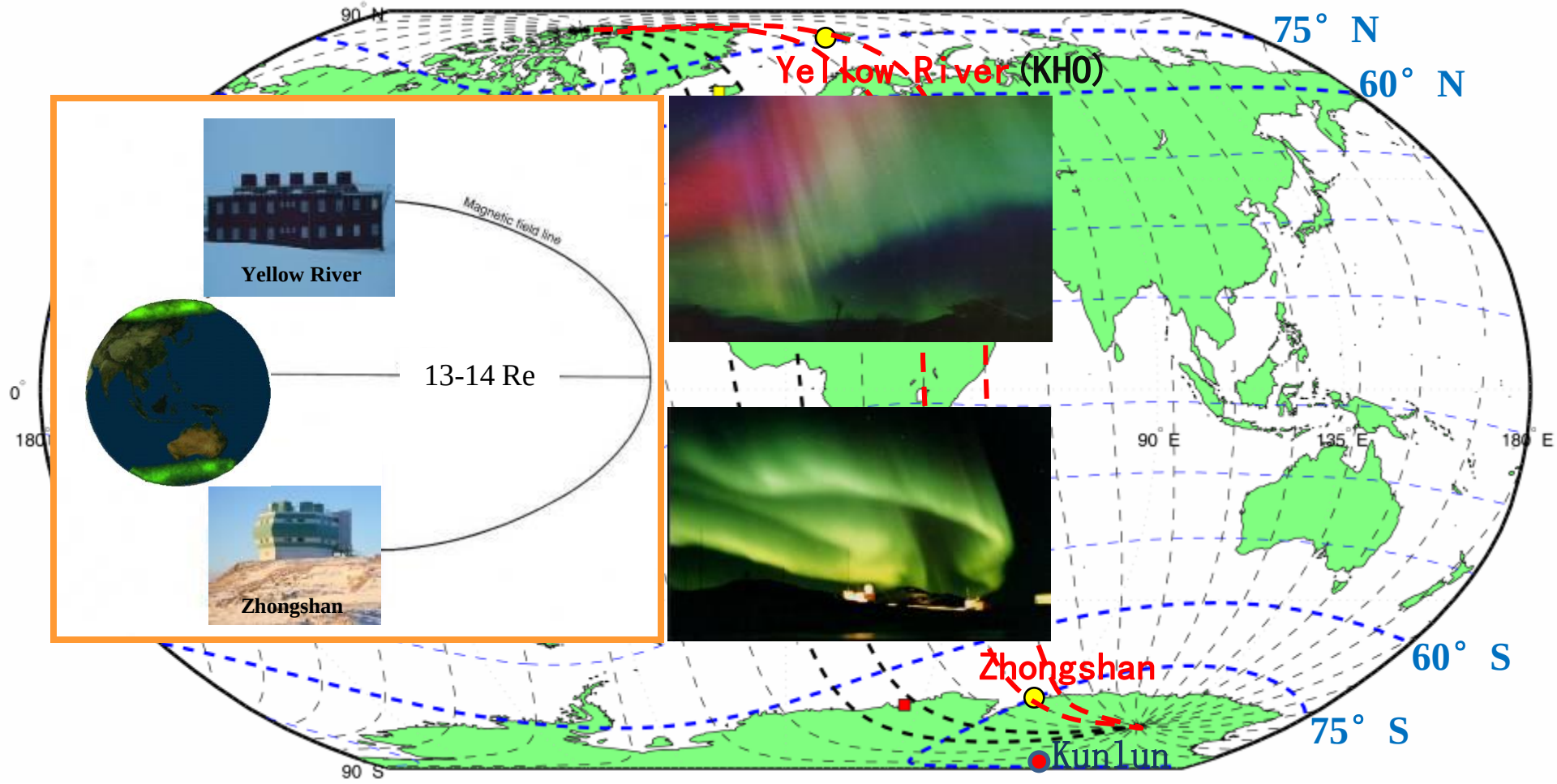
- Aurora and magnetospheric dynamics
- Polar ionosphere
- Polar upper and middle atmosphere
- Plasma waves in polar regions
- Coupling between solar wind, magnetosphere, ionosphere, and upper /middle atmosphere
- Space weather and climate

中国极地研究中心
Polar Research Institute of China

# *Aurora Observatories in the Antarctic and Arctic*

**Yellow River Station: (78.9ºN，11.9ºE)，76.24ºMLAT，MLT≈UT+3h**

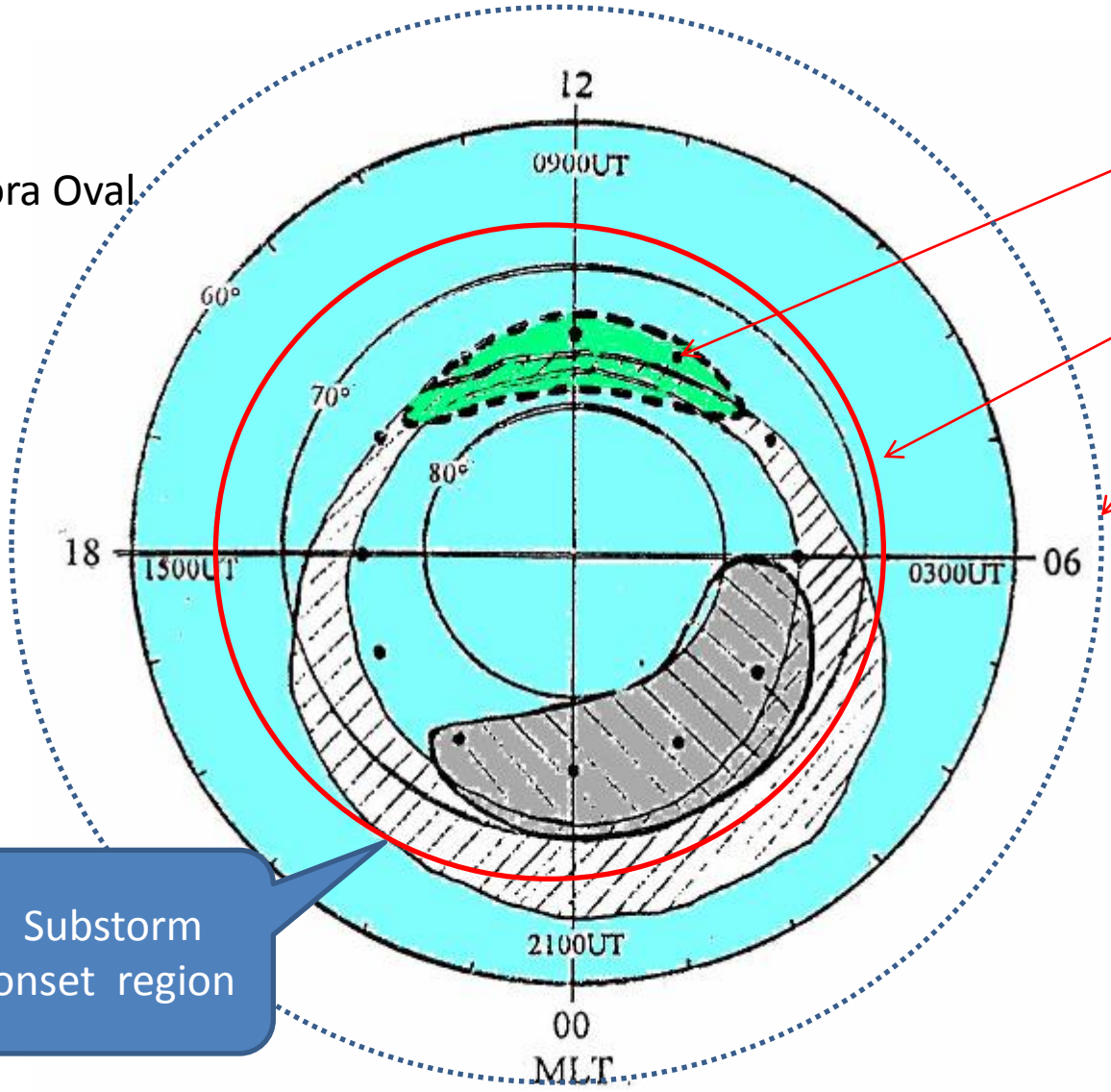
**Kjell Henriksen Observatory (KHO):(78.1ºN，16.0ºE)，75ºMLAT，MLT≈UT+3h**




**Zhongshan Station: (69.4ºS，76.4ºE)，-74.5ºMLAT，MLT≈UT+1.75h**

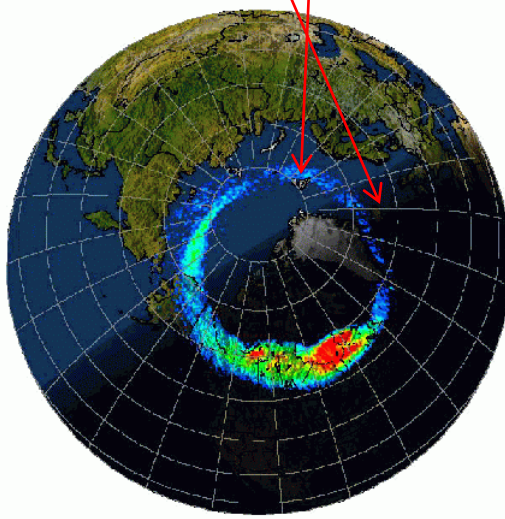
**KunLun Station: (80.4ºS，77.4ºE)，-77.6ºMLAT**

Aurora Oval




- Zhongshan（Yellow River）
- Iceland
- Greatwall

Substorm onset region



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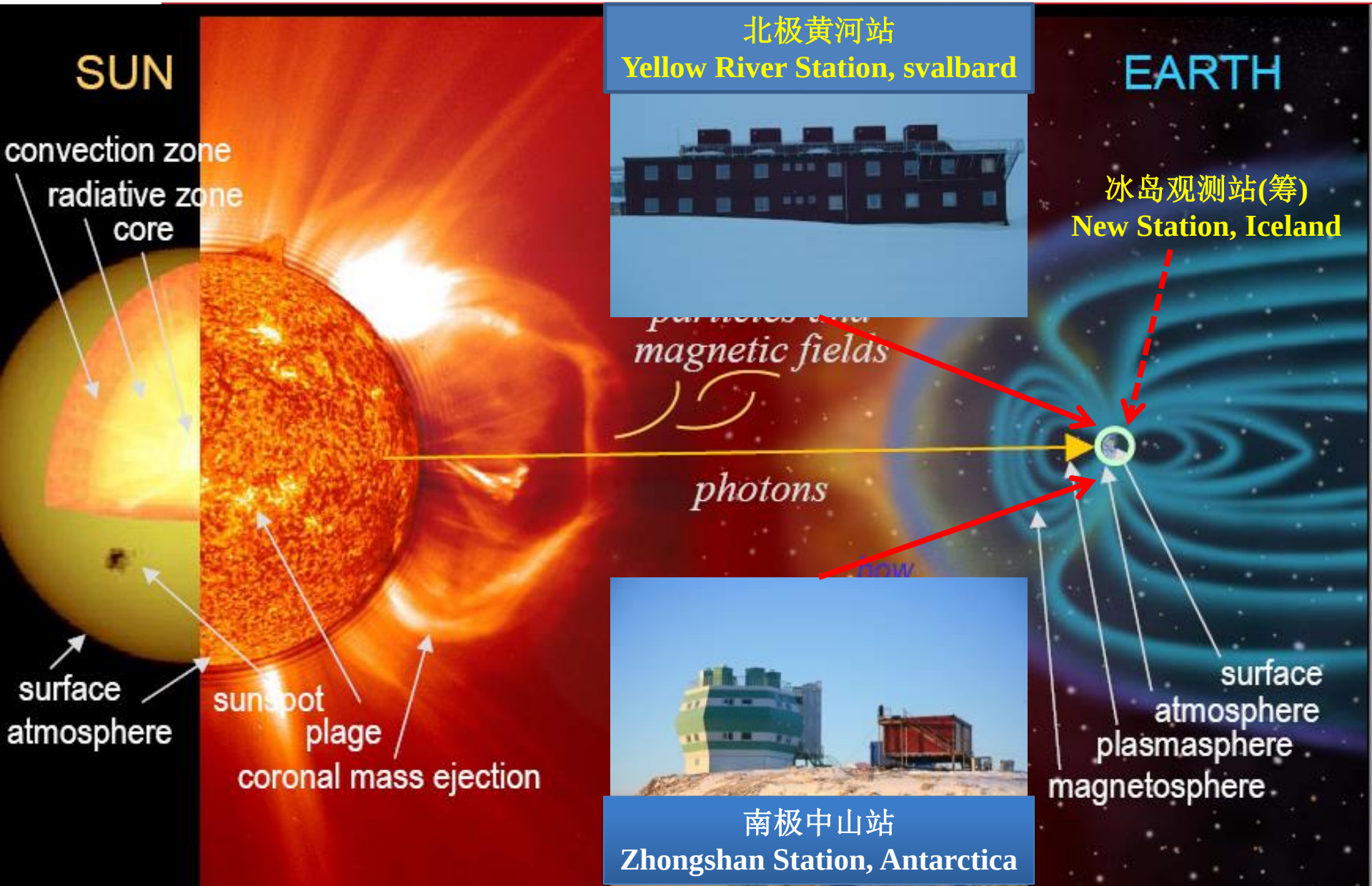
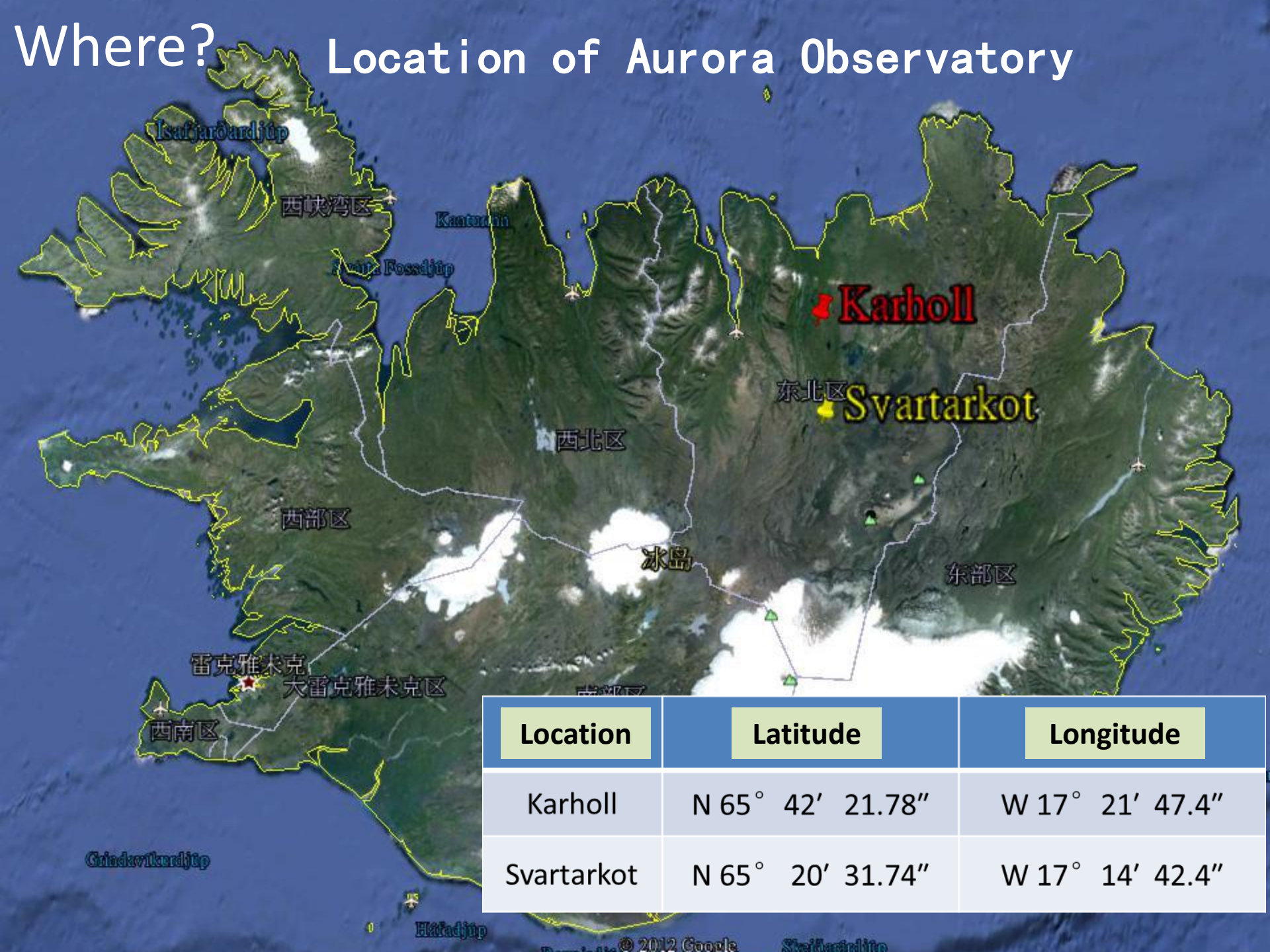
# *Why to establish aurora Observatory in Iceland?*



# Where? Location of Aurora Observatory



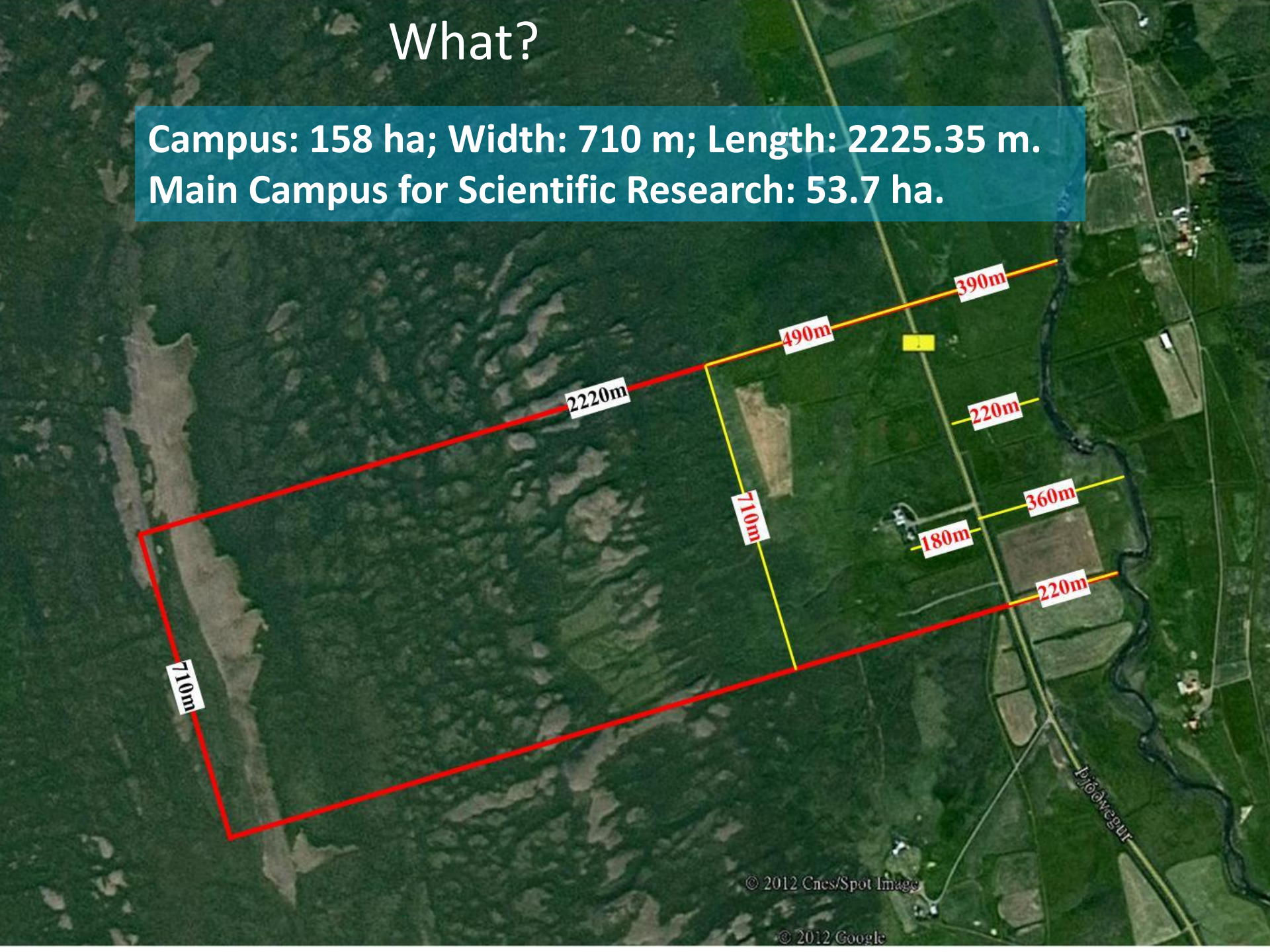

| Location | Latitude | Longitude |
|---|---|---|
| Karholl | N 65° 42′ 21.78″ | W 17° 21′ 47.4″ |
| Svartarkot | N 65° 20′ 31.74″ | W 17° 14′ 42.4″ |


# Kárhóll

**Transportation： HW 1, 61 km from Akureyri;**
**2 km from Laugur；**
**Electric Power： supply from power company**
**Communication: Access Internet by cable and wireless**

# What?

**Campus: 158 ha; Width: 710 m; Length: 2225.35 m.**
**Main Campus for Scientific Research: 53.7 ha.**




1
Main Campus
© 2012 Cnes/Spot Image
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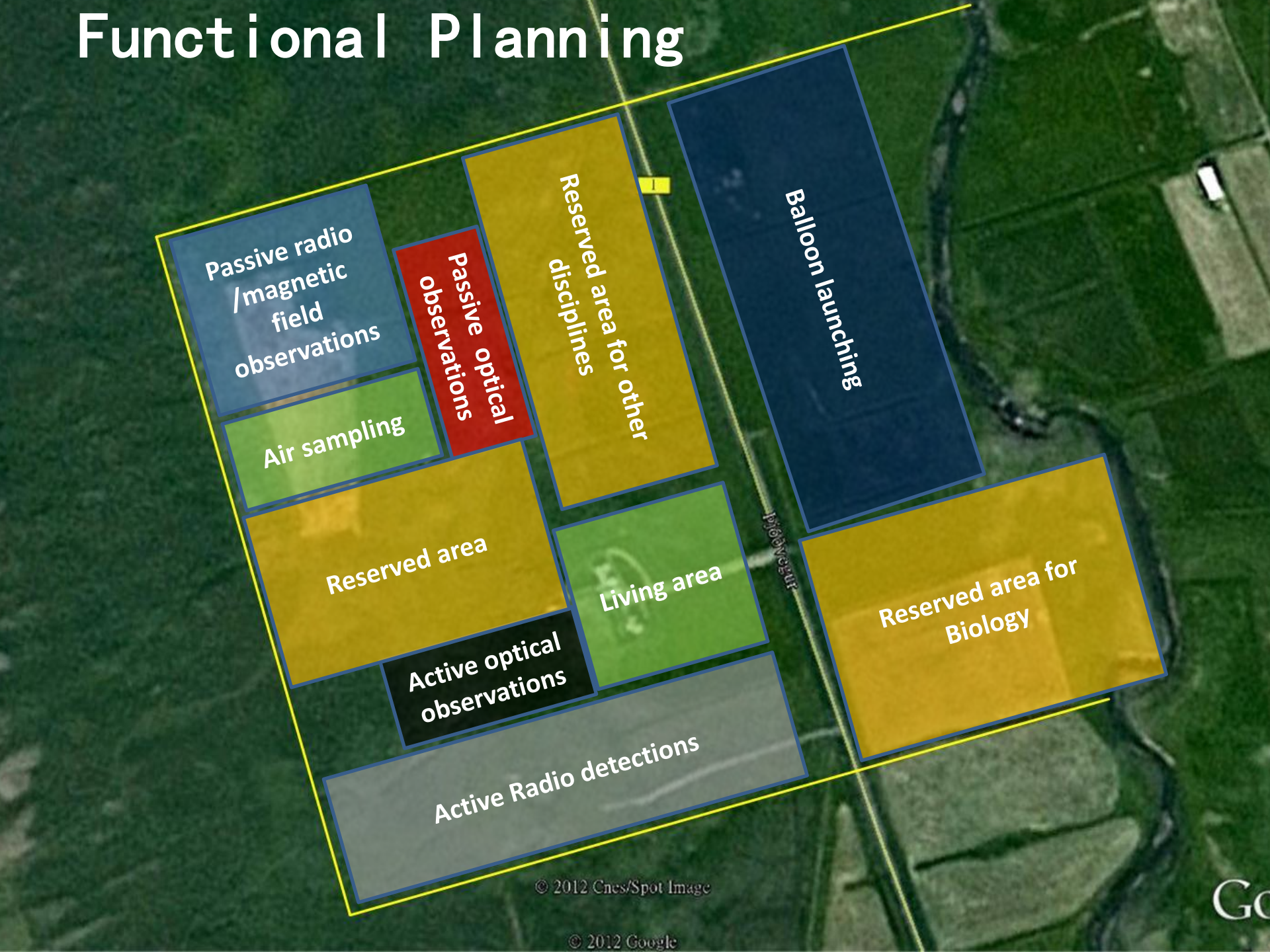
**House: 158.9 $m^2$, 1 kitchen, 5 bedrooms, and 1 office**
**Storehouse and stable: 500$m^2$**
**Keep it unchanged.**

# Functional Planning




Air sampling
Alternative area for the passive radio detections
2220m
490m
390m
220m
710m
360m
180m
220m
710m
Bjoavegen
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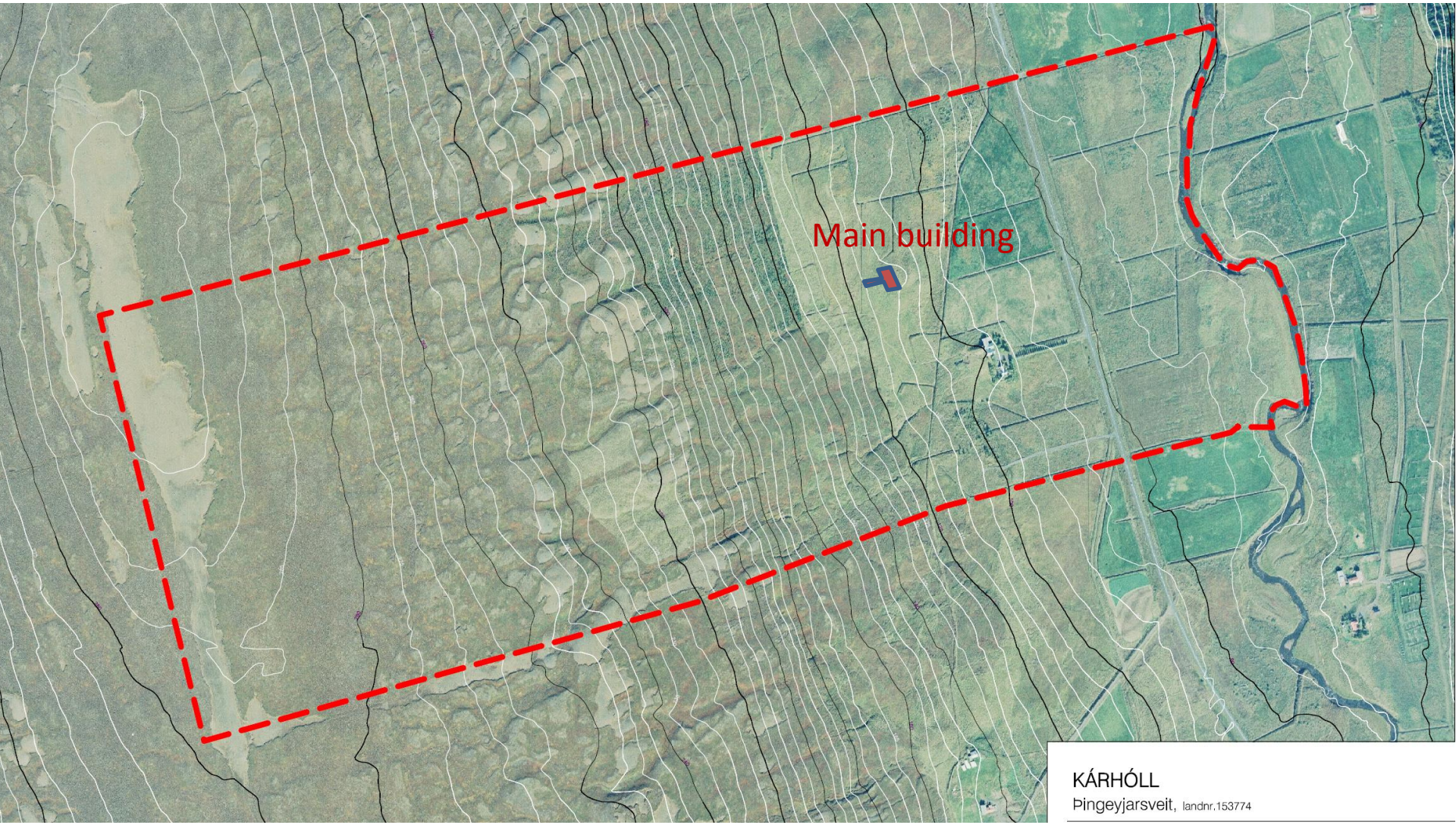
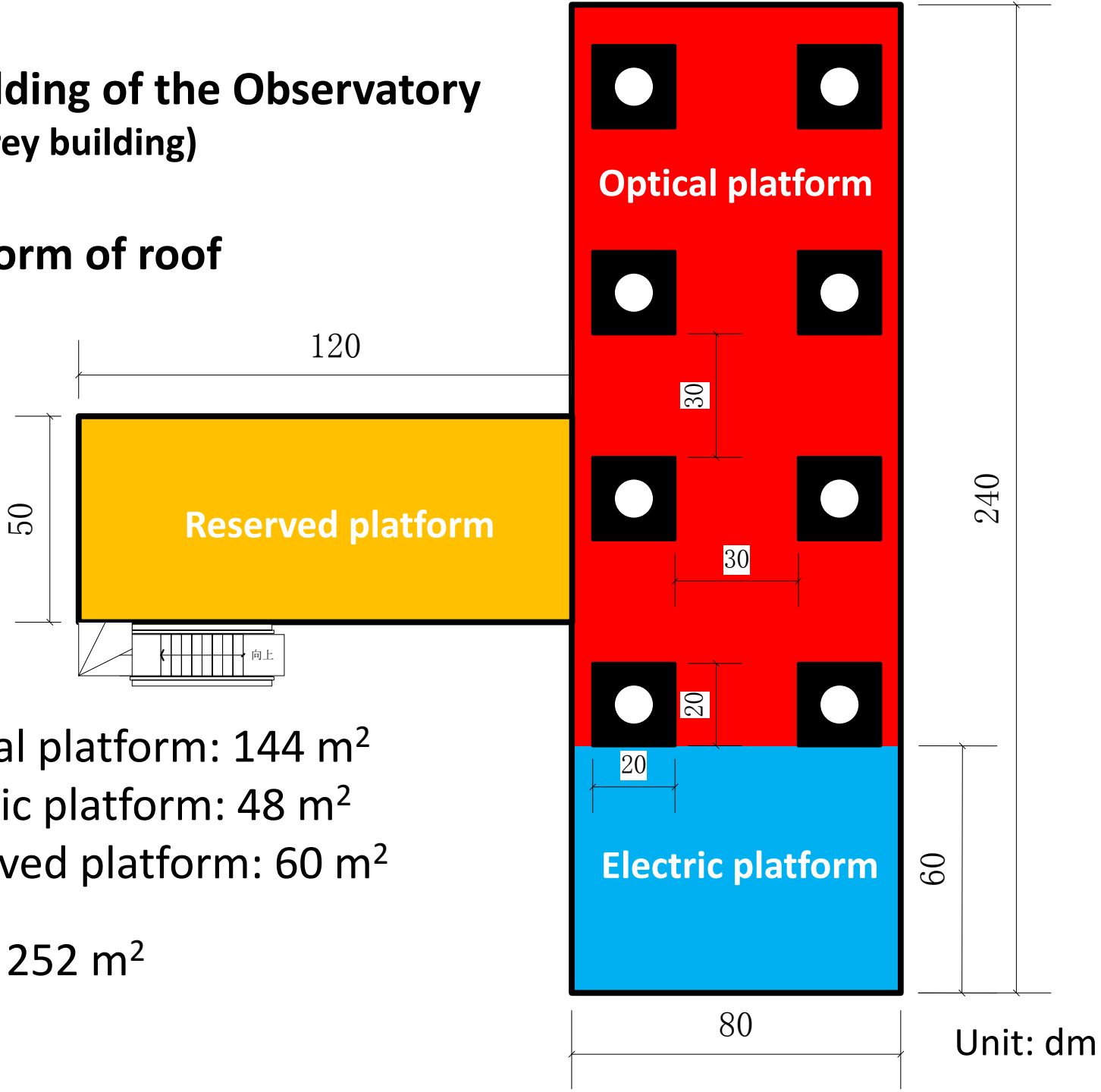
# Topographical map of Karholl



## Main building of the Observatory
**(A one-storey building)**

## The platform of roof




Optical platform: 144 $m^2$
Electric platform: 48 $m^2$
Reserved platform: 60 $m^2$

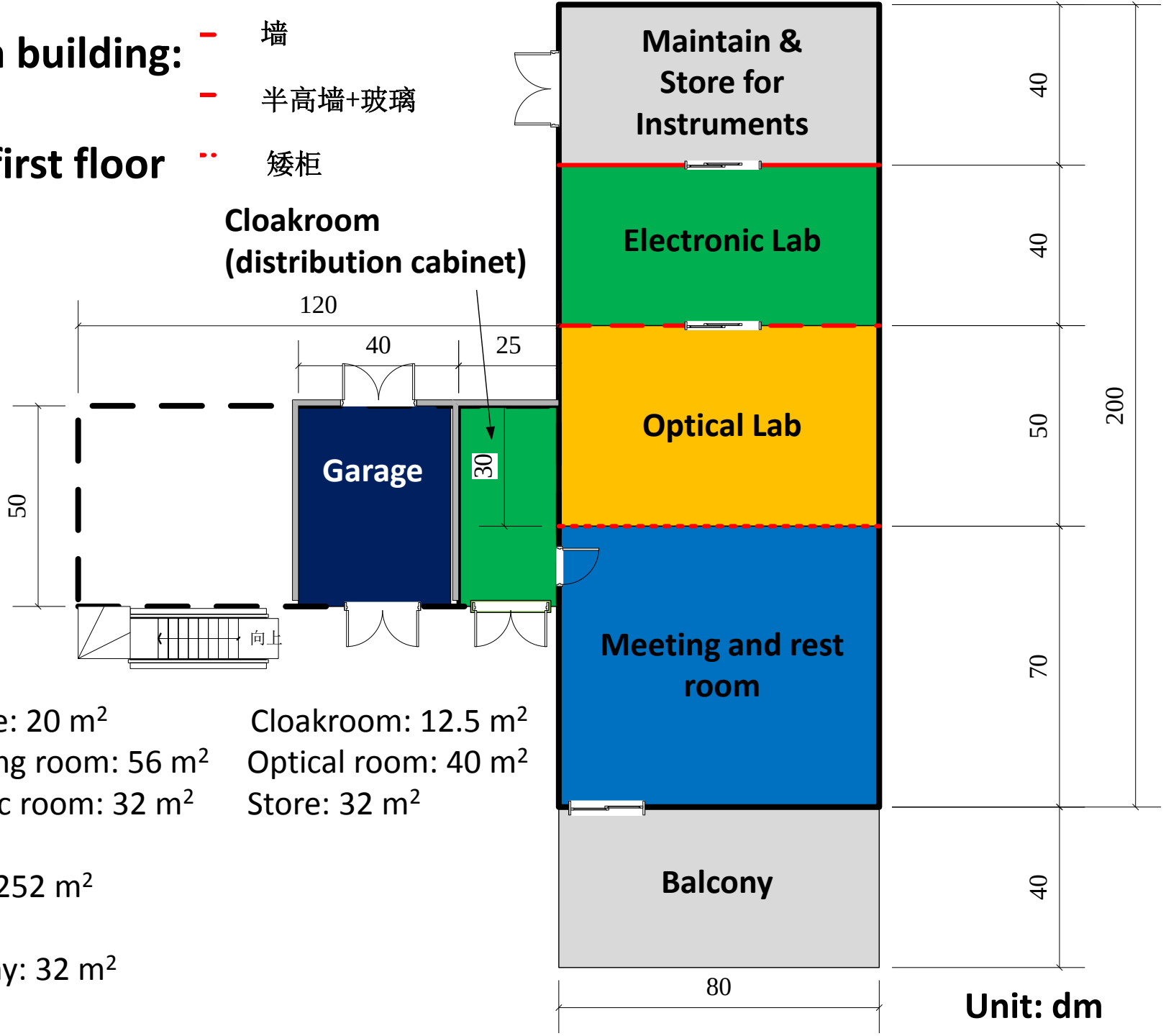
Total: 252 $m^2$

**Main building:**

- 墙
- 半高墙+玻璃

**The first floor**

- 矮柜




Garage: 20 $m^2$
Meeting room: 56 $m^2$
Electric room: 32 $m^2$

Cloakroom: 12.5 $m^2$
Optical room: 40 $m^2$
Store: 32 $m^2$

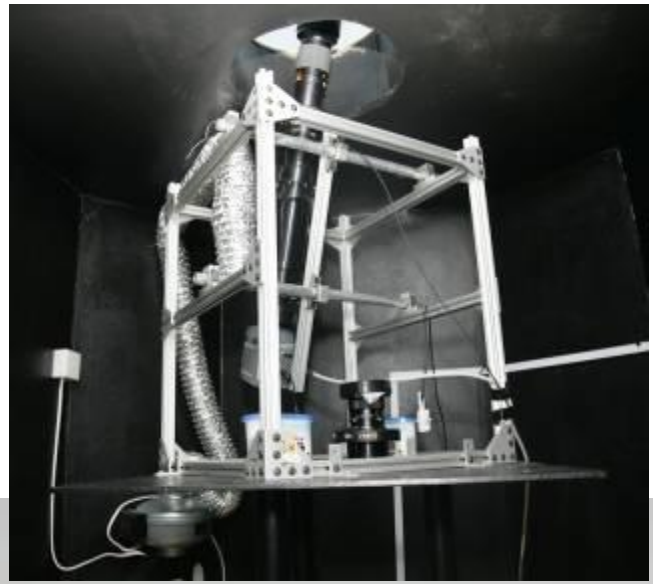
Total: 252 $m^2$

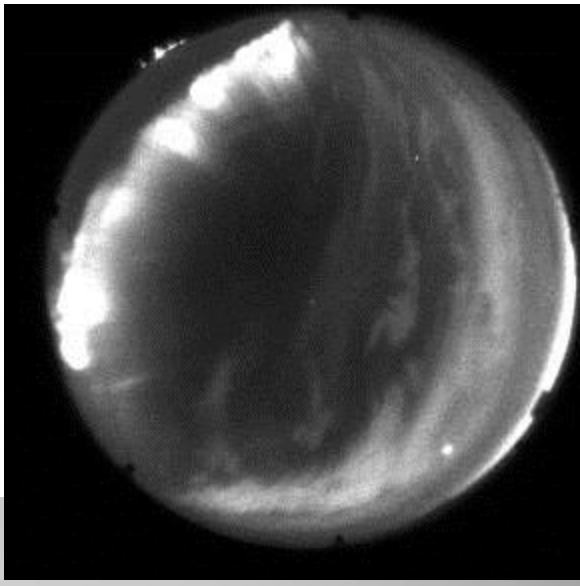
Balcony: 32 $m^2$

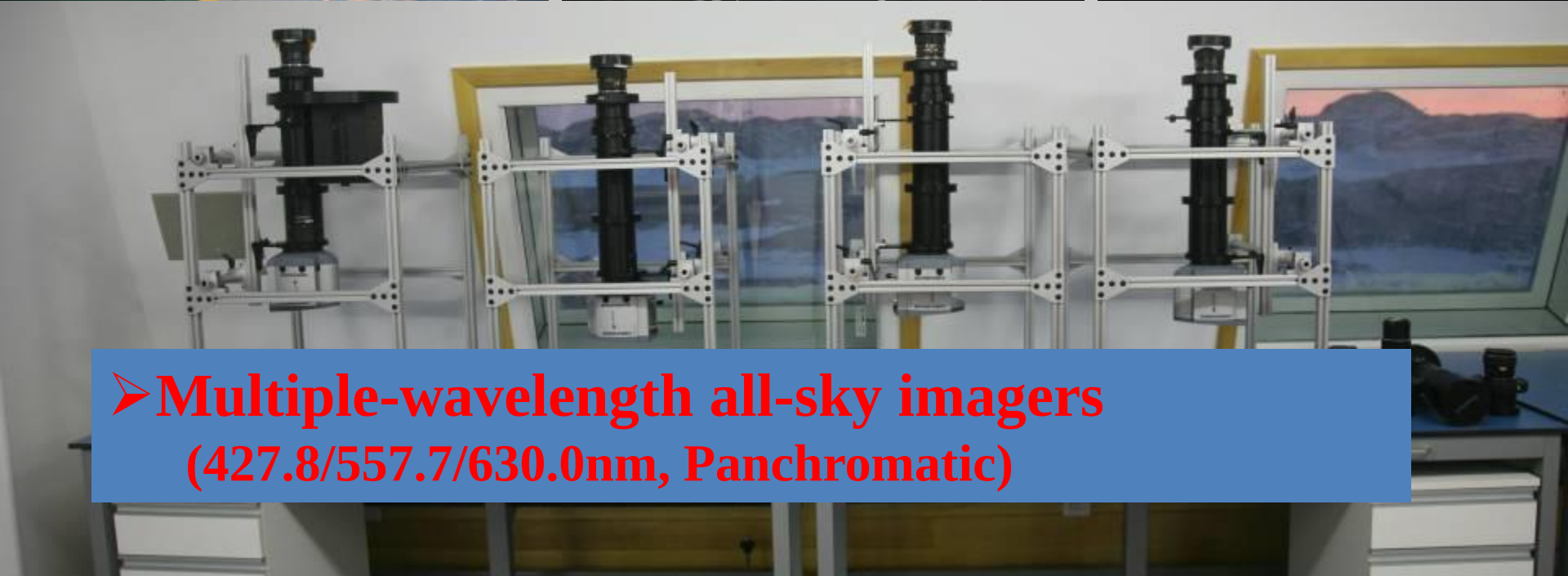
# Instruments

| Class | Instruments | Number | Planning | Remark |
|---|---|---|---|---|
| Passive Optical Observations | All-sky CCD Imagers | 4 | 1 step | Aurora |
| | Auroral Spectrograph | 1 | 2 step | Aurora |
| | F-P Interferometer | 1 | Future | Thermosphere |
| Active Optical detection | Lidar | 1 | 2 step | Middle/upper Atmos. |
| Passive Electronic/Radio & Magnetic Field Observation | Flux magnetometer | 1 | 1 step | Magnetic field |
| | Induction magnetometer | 1 | 2 step | Magnetic field |
| | Wide band Riometer | 1 | 1 step | Ionosphere |
| | Imaging Riometer | 1 | Future | Ionosphere |
| | GPS Receivers | 3 | 2 step | Ionosphere |
| | Meteorological Station | 1 | 1 step | Meteor |
| | VLF Receiver | 1 | Future | Wave |
| Active Radio Detections | Ionosphere Digisonde | 1 | 2 step | Ionosphere |
| | Meteor Radar | 1 | Future | Middle/Upper Atmos |
| | MF Radar | 1 | Future | Middle/Upper Atmos |
| | Incoherent Scatter Radar | 1 | Future | ionosphere |
| Active Atmospheric Investigations | Sounding balloons | | Future | Atmosphere |
| | Air Samplers | | Future | Atmosphere |

# All Sky CCD Aurora Imagers

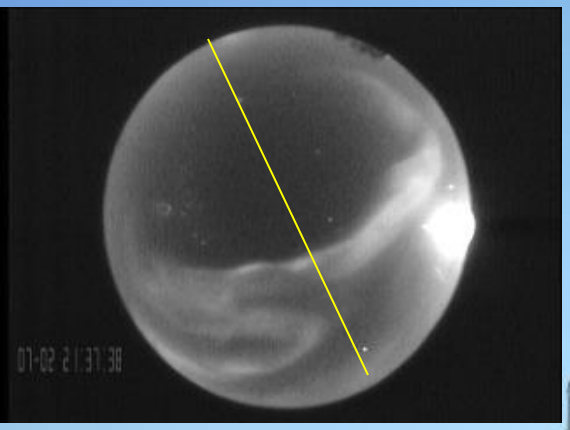


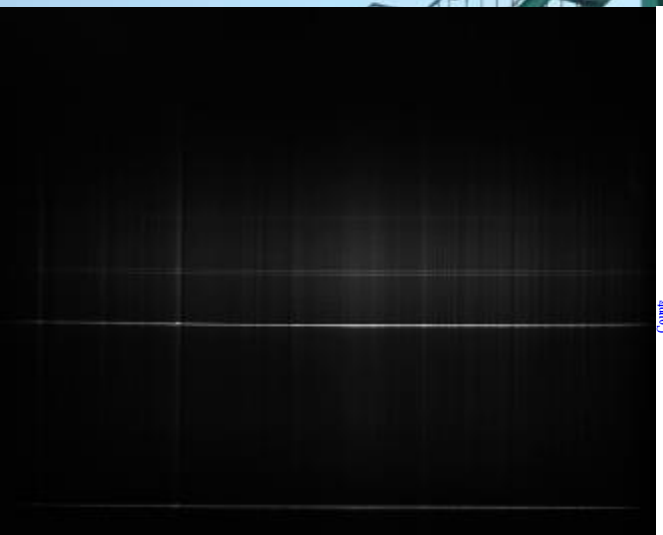


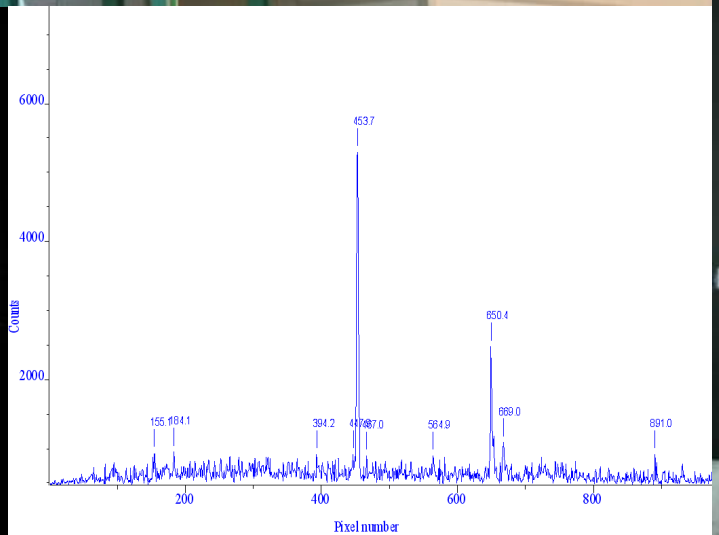


- **Multiple-wavelength all-sky imagers (427.8/557.7/630.0nm, Panchromatic)**

# Auroral spectrograph （420-730nm）





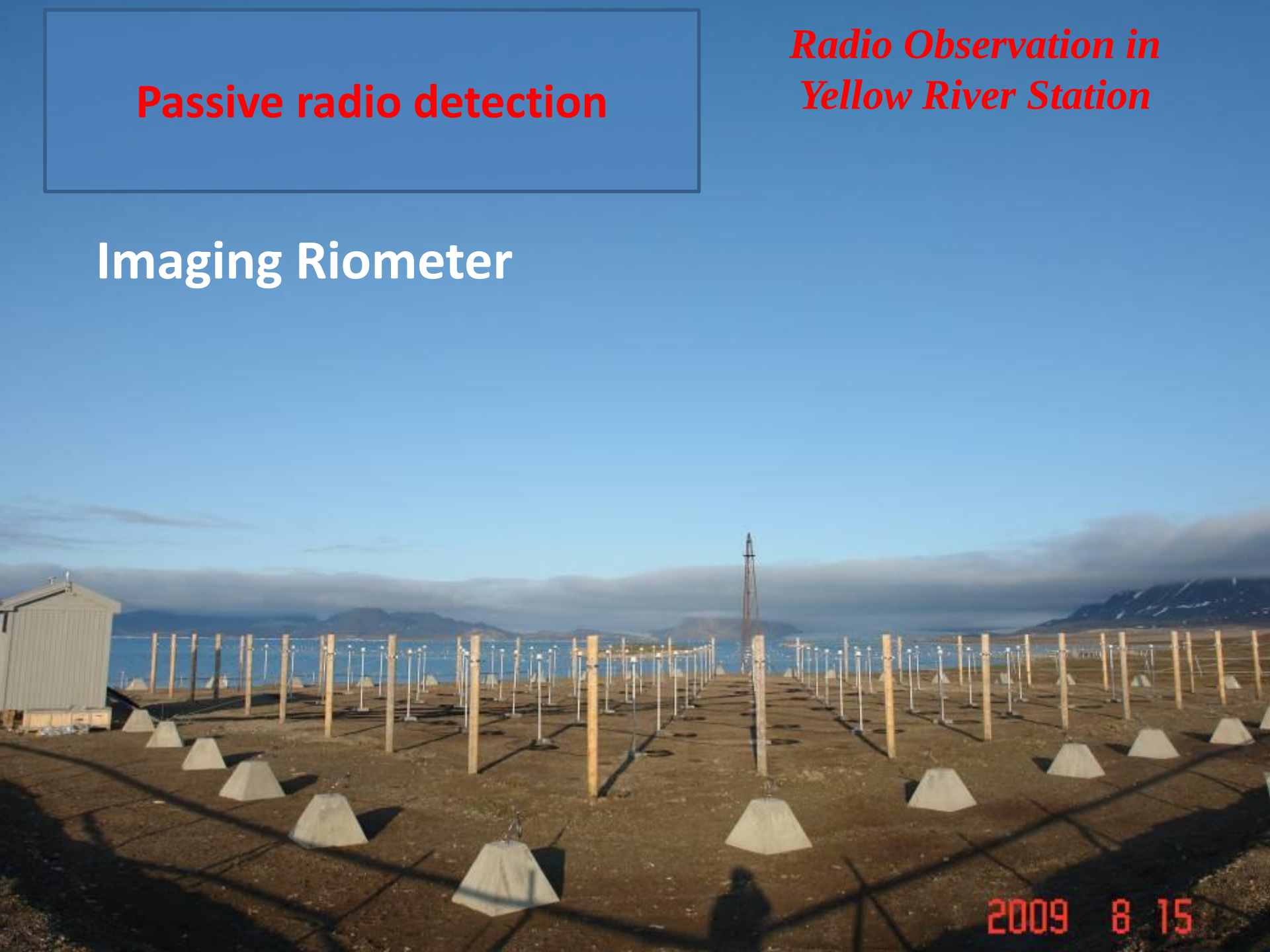



# Active optical detection instruments: Lidar

# Passive radio detection

*Radio Observation in Yellow River Station*

## Imaging Riometer



# Magnetometers

Fluxgate Magnetometer

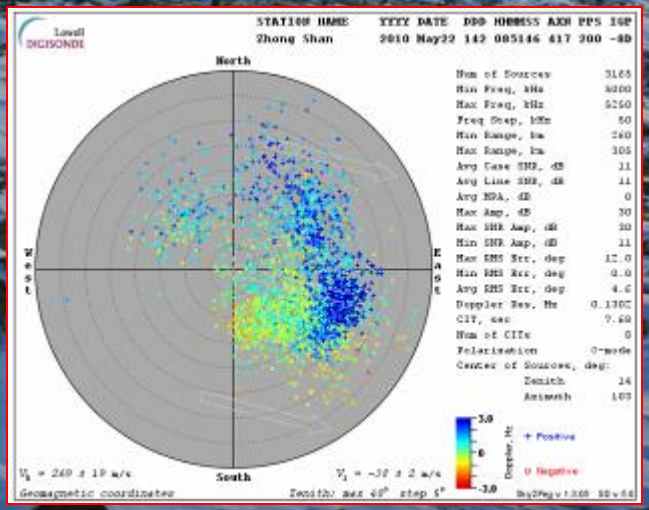
Induction magnetometer

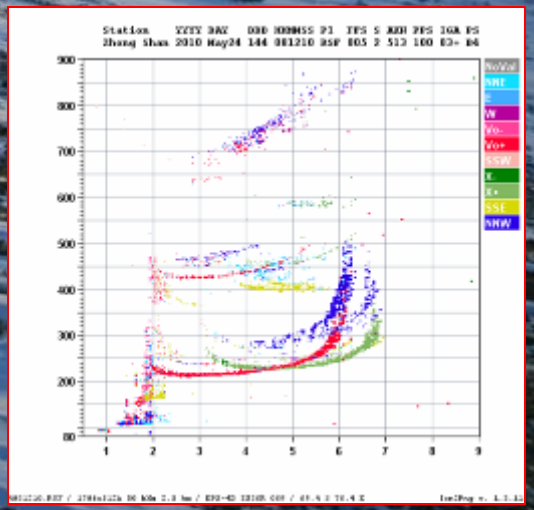
# GPS receivers

## Ionospheric TEC & Scintillation

# Ionospheric Digisonde

**Active radio detection**



# How to realize it cooperatively?

- In order to build a long term observatory, we have to answer:
  - How to purchase the place at Karholl?
  - How to construct the observatory?
  - How to operate the observatory?
  - How to…….

**&When……?**

**Thanks for you attention!**