



Shanghai Astronomical Observatory  
Chinese Academy of Sciences

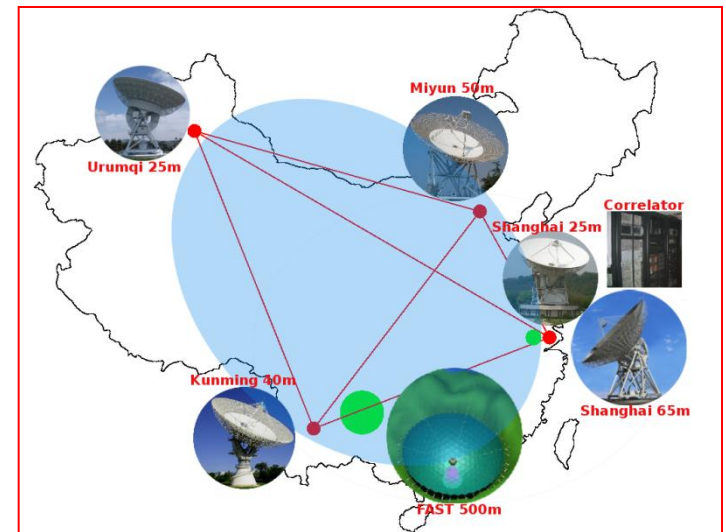
# **The mission of Chinese Space VLBI and Laser Ranging support for VLBI satellite with LRAs**

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# VLBI Development in China

- 1970s VLBI Network Concept
- 1980s Shanghai 25m
- 1990s Urumqi 25m
- 2000s Beijing and Kunming
- Chinese VLBI network (CVN):  
4 sites + correlator
- 2010s FAST (500m) + Shanghai 65m ...)
- 2020s QQT(110m) + space VLBI



Chinese VLBI Network

The coordinator of CVN: Shanghai Astronomical Observatory (SHAO)

# VLBI Development in China

**Shanghai 65m radio telescope, finished in last month**

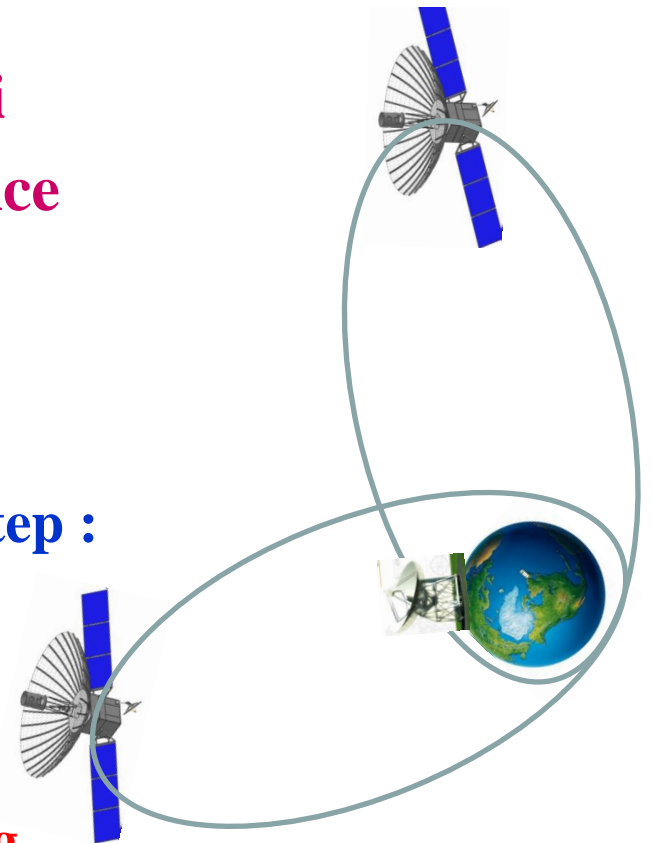


**VLBI became famous in China after the application to support for Chinese lunar mission since 2007**



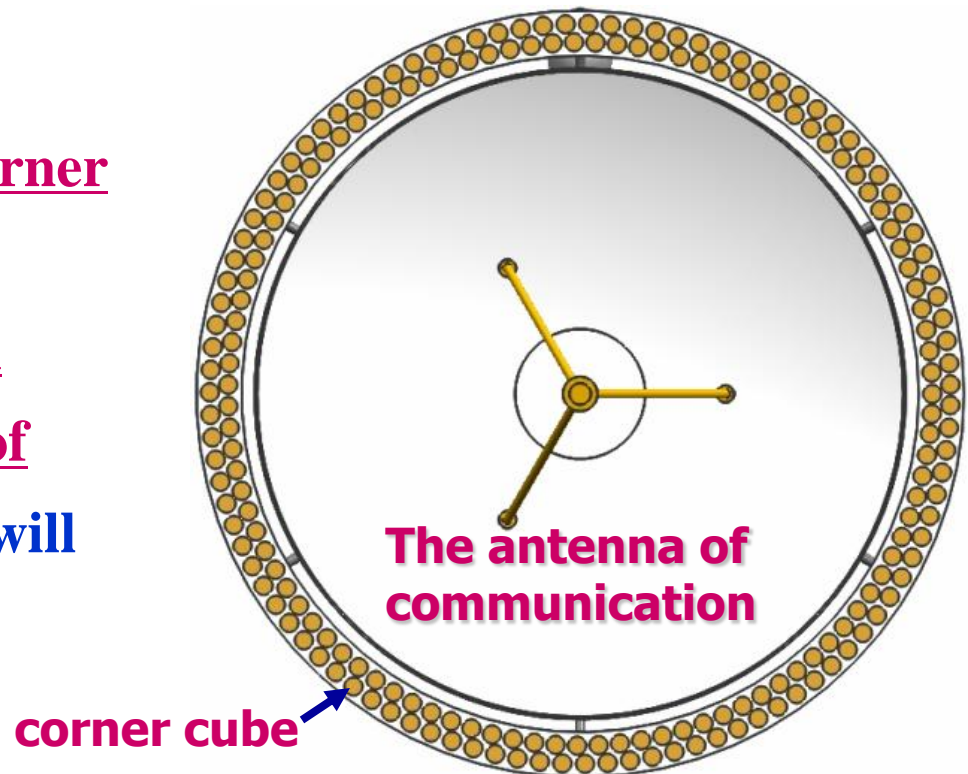
# The Chinese Space VLBI mission

- The programs performed by **Shanghai Observatory and National Space Science Center of China, et al.**
- **Two Satellites (10m in diameter) in first step :**
  - **Apogee: 60,000 km**
  - **Perigee: 1,200 km**
  - **Inclination: 28.5 deg**
  - **Angle between two orbital planes ~120 deg**



# Laser Retro-reflector for Space VLBI

- The  $5 \pm 1''$  divergence angle of corner cube will be adopted for the compensation of velocity aberration.
- To receive the enough laser returns, the effective reflective area of retro-reflector will be designed at  $1650\text{cm}^2$ .
- The concept of the annular-planar arrays (about 200 corner cubes) around the satellite-ground communicating link antenna with the diameter of  $1.5\text{m}$  directing to the earth will be adopted.



# Laser Ranging support for VLBI satellite

- **SLR tracking stations: ILRS stations**
- **Orbit accuracy required: 10cm or better**
- **SLR data accuracy: better than 5cm for single shot**
- **Data analyzing and orbit prediction: by SHAO**
- **Operations requirements mission coordinator: by SHAO**