



# VO Roles in Future China Astronomical Projects

Yongheng ZHAO, Ali LUO, Chenzhou CUI  
National Astronomical Observatories, CAS

# Content

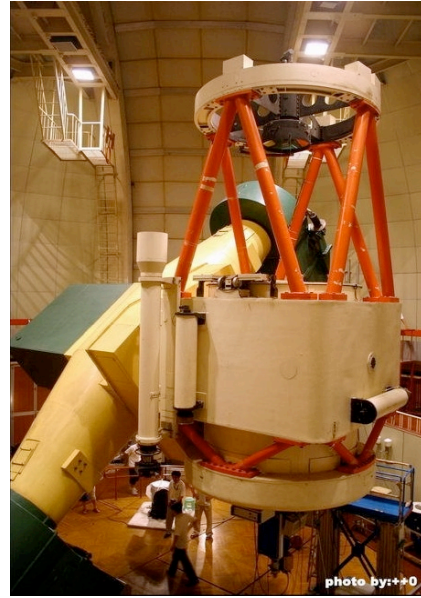
- ❖ Astronomical Projects in China Snapview
- ❖ VO roles



# Existing Facilities - Optical Telescopes



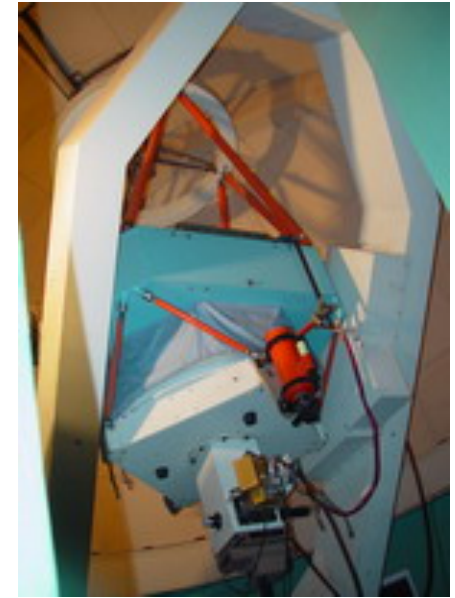
**TTL 2.4-m Telescope**



**2.16-m Reflector Telescope**



**1.56-m Reflector Telescope**



**1.26m Infrared Telescope**



**100/120cm Schmidt Telescope**

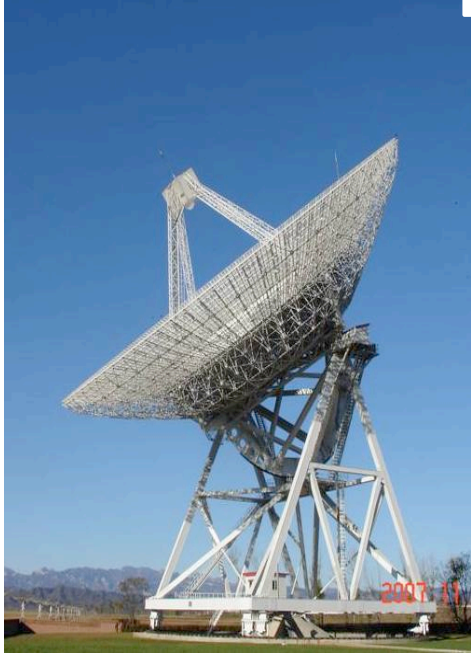


**60/90cm Schmidt Telescope**



**Solar Tower**

# Existing Facilities - Radio Telescopes



**50m @ Miyun**



**40m @ Kunming**



**25m @ Urumqi**



**25m @ Shanghai**



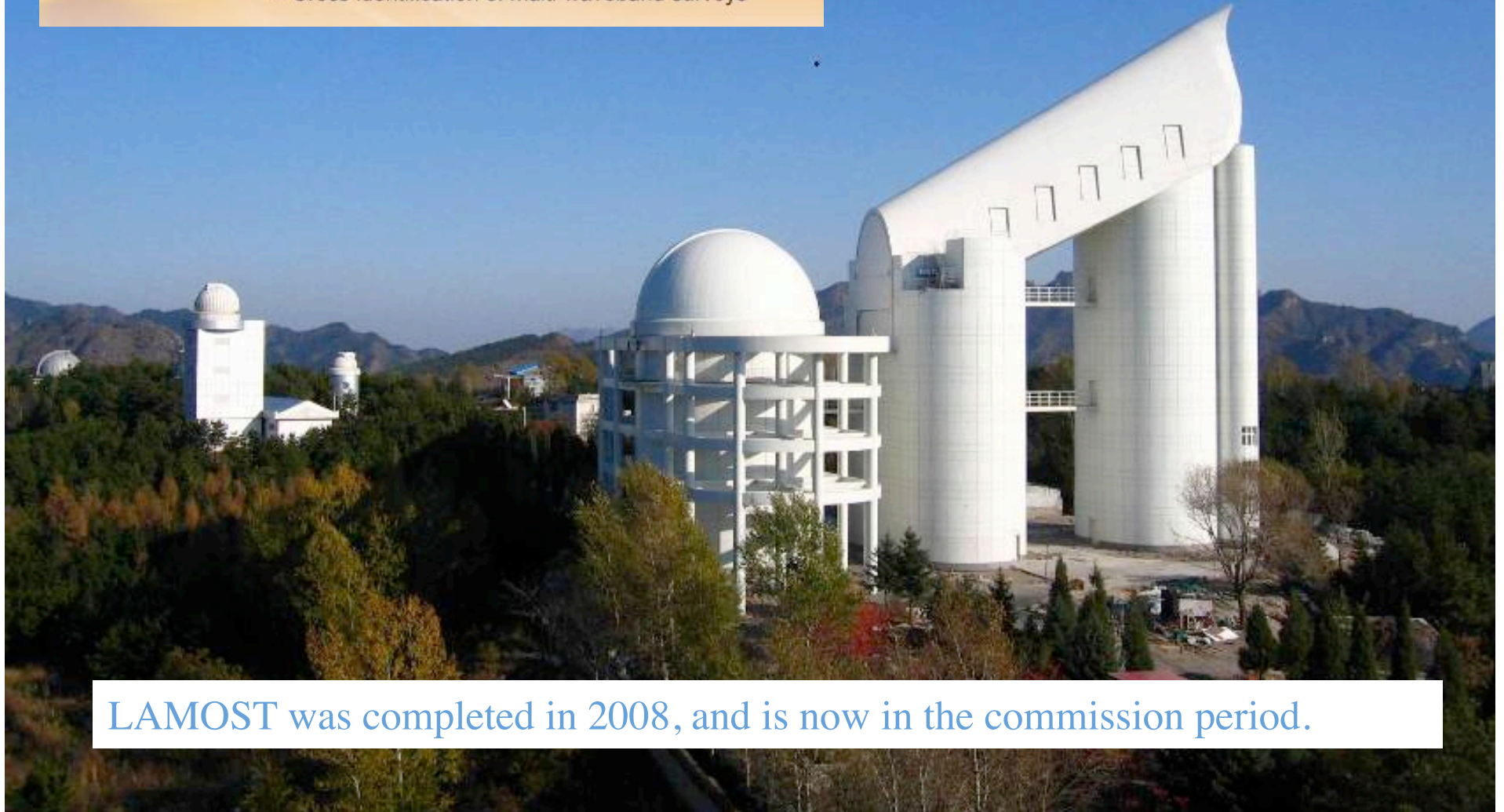
**Radio Aperture Synthesis Array**



**13.7m Sub-mm Telescope**

# Large Sky Area Multi-Object Fiber Spectroscopy Telescope (LAMOST)

- Key programs:
- \* Extra-galactic spectroscopic survey — Large scale structure of the universe
  - \* Stellar spectroscopic survey — Structure of the Galaxy
  - \* Cross identification of multi-waveband surveys



LAMOST was completed in 2008, and is now in the commission period.



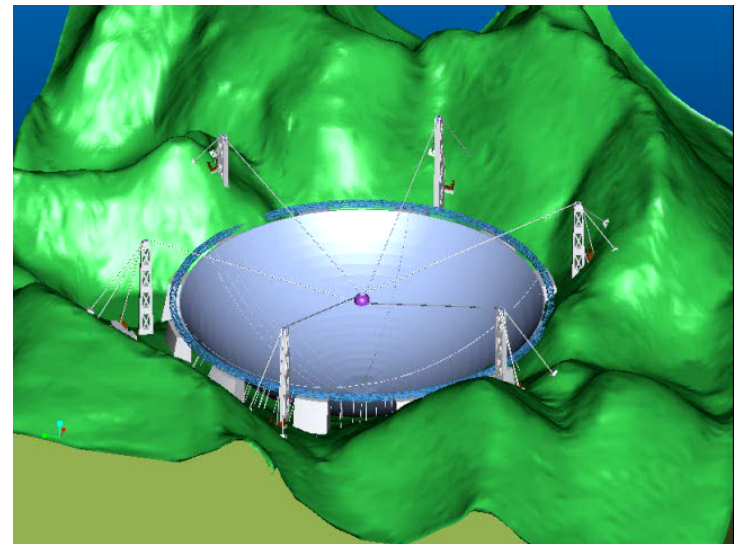
# Five-hundred-meter Aperture Spherical Telescope - FAST

## Three outstanding aspects

**Unique Karst depression as the site**  
**Active main reflector**  
**Cable**

## FAST sciences

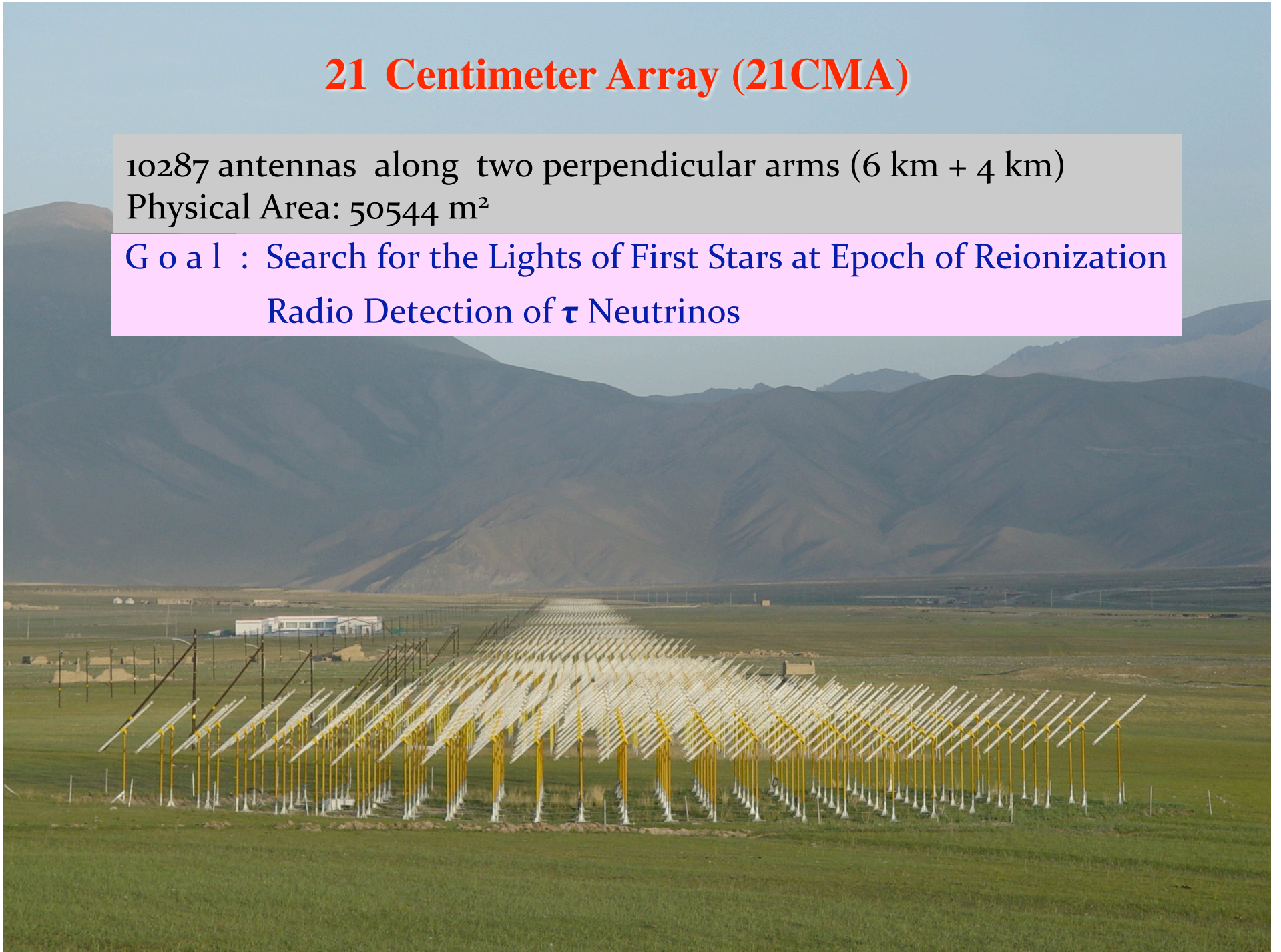
- **Neutral Hydrogen line (HI) survey**
- **Pulsar research**
- **Joining VLBI network**
- **Molecular lines**
- **Search for Extraterrestrial Intelligence (SETI)**



## 21 Centimeter Array (21CMA)

10287 antennas along two perpendicular arms (6 km + 4 km)  
Physical Area: 50544 m<sup>2</sup>

Goal : Search for the Lights of First Stars at Epoch of Reionization  
Radio Detection of  $\tau$  Neutrinos





**Chinese Spectral Radioheliograph (CSRH)**  
a new instrument capable of true imaging  
spectroscopy, with high temporal, spatial, and  
spectral resolution

**Specifications**

Freq Range      0.4–15 GHz

Spatial Res.    1.3"– 50"

Array      40·4.5m + 60·2m

Max baseline    3 km

Field of view    0.6°– 7°

Site: Inner Mongolia

# Chinese VLBI Network (CVN) Project



25m, Urumqi



50m, Beijing



25m, Shanghai

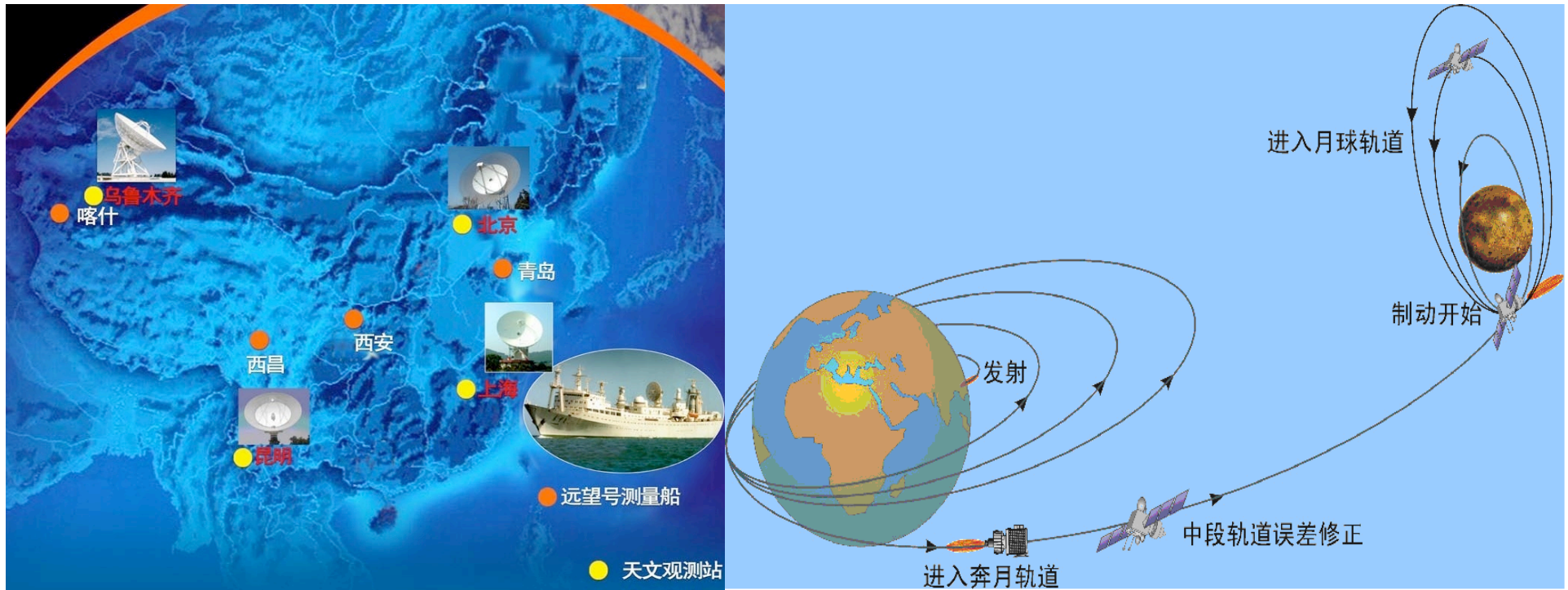


40m, Kunming



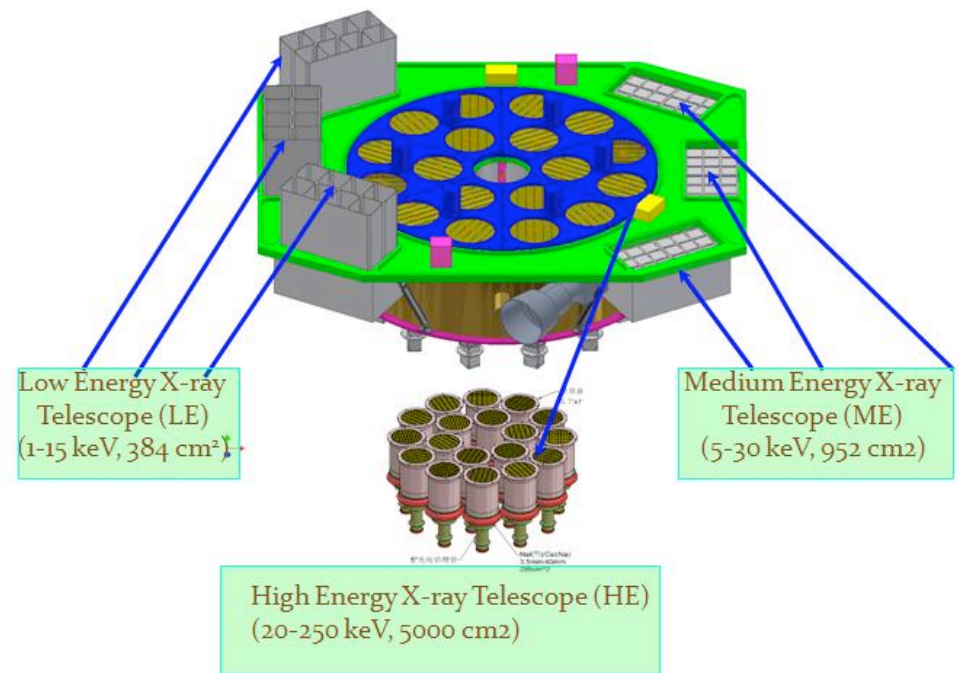
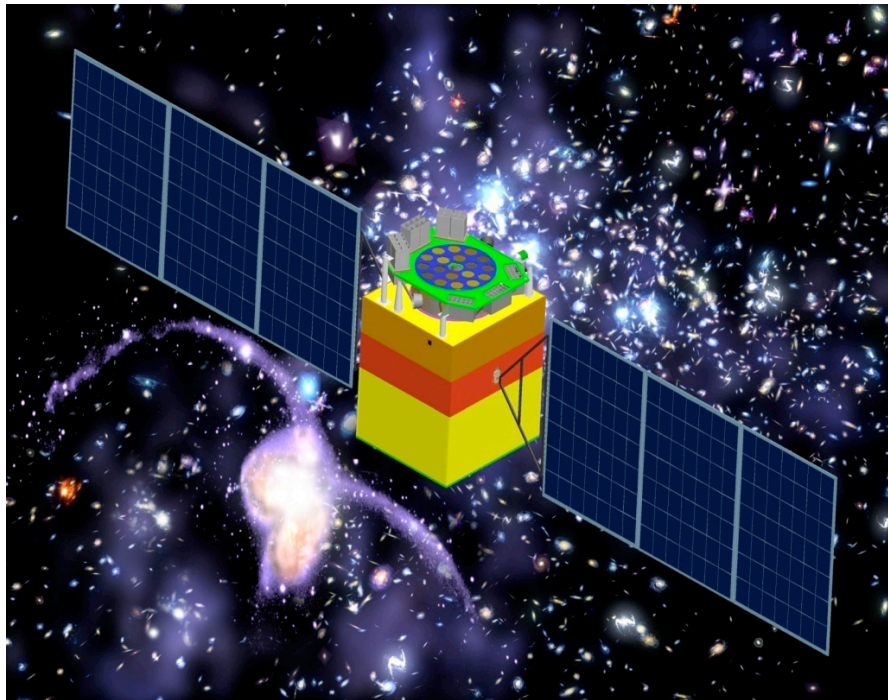
65m, Shanghai

# VLBI: Navigation of the Chinese Lunar Exploration Project 'Chang E-1'



Successfully monitored and tracked the satellite of the Chinese Lunar Exploration Project (Chang'E-1)

# Hard X-ray Modulation Telescope (HXMT)



**HXMT will perform a broad band (1-250 keV) X-ray all-sky survey and make pointed observations of X-ray sources to study their spectroscopic and multi-band temporal properties**

# Space-based multi-band astronomical *V*ariable *O*bject *M*onitor (SVOM)

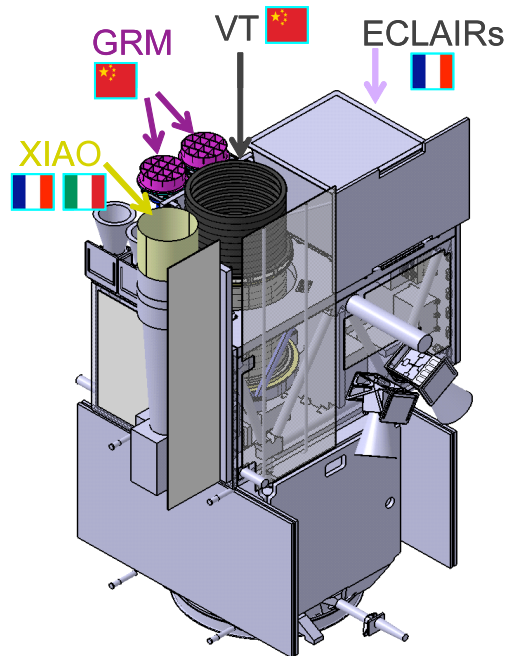
## Multi- $\lambda$ GRB project

Designed to detect about 80 GRBs of all known types per year, including those at very high redshifts

## China's contribution to Scientific Payload

GRM: two soft gamma-ray (50keV-5MeV) spectrophotometers

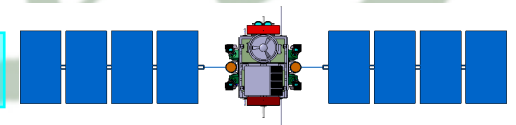
VT: one 45cm-diameter optical telescope



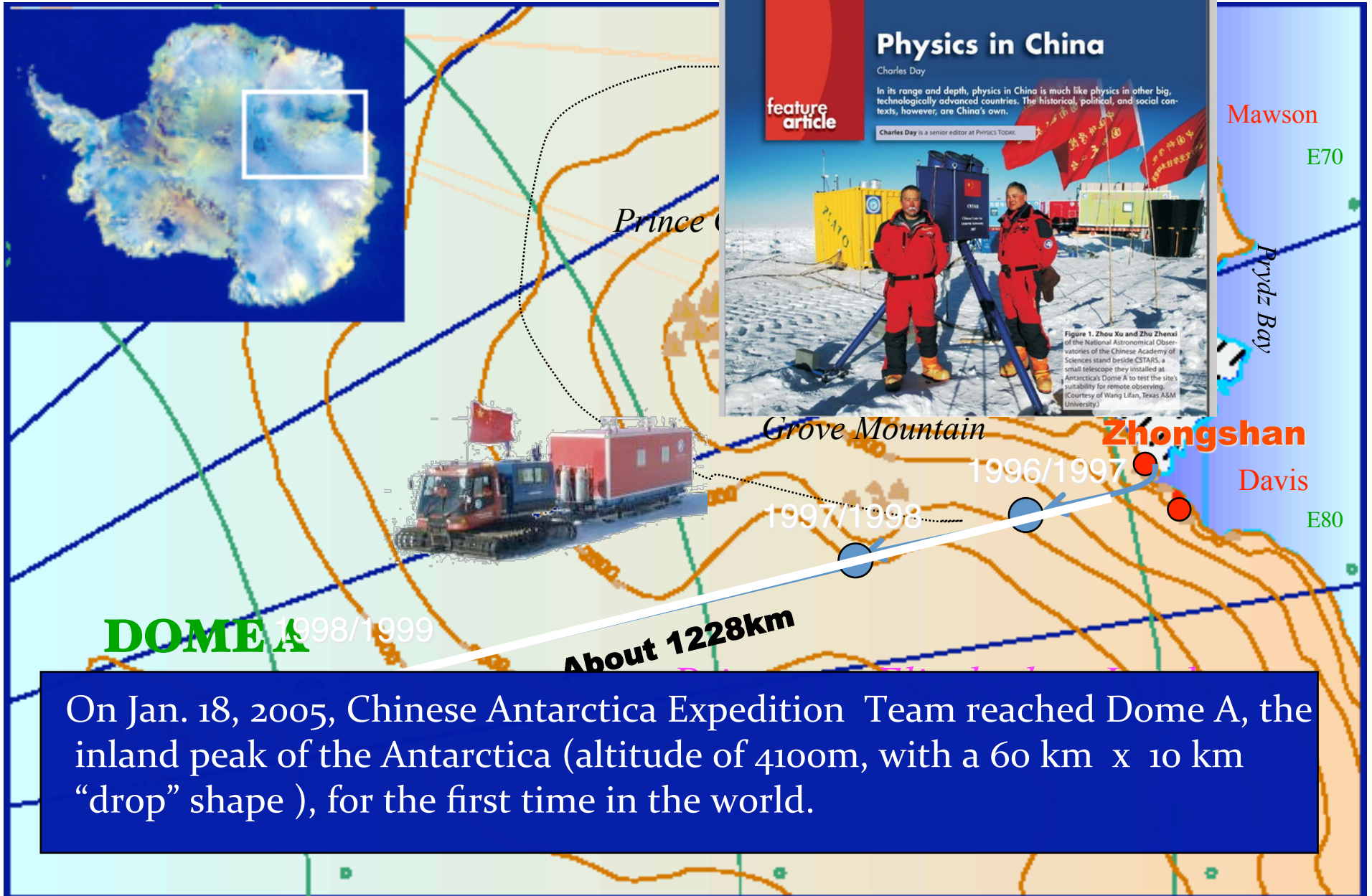
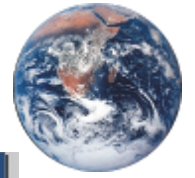
	Spectral band	Field of View	Localization Accuracy	GRBs/yr
GRM	50keV-5MeV	2 sr	N/A	~ 80
ECLAIRs	4-250 keV	2 sr	10 arcmin	~ 80
XIAO	0.3-2 keV	diameter 25 arcmin	10 arcsec	~ 70
VT	400-650 nm 650-950 nm	21 × 21 arcsec	1 arcsec	~ 60



a Sino-French space mission scheduled to be launched in 2014



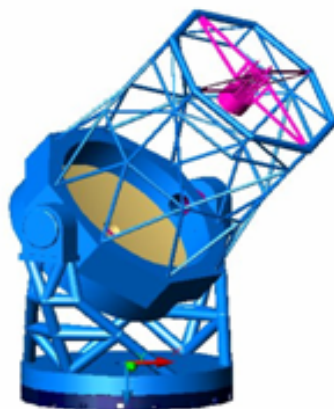
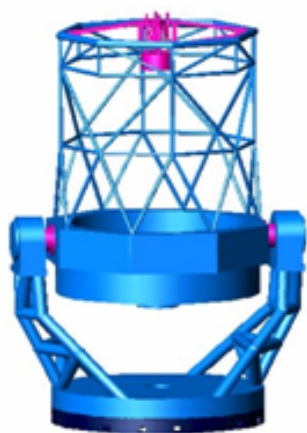
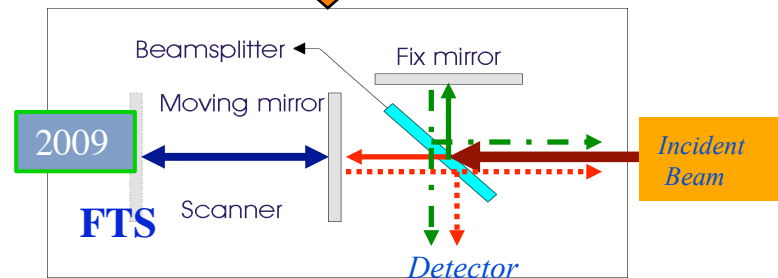
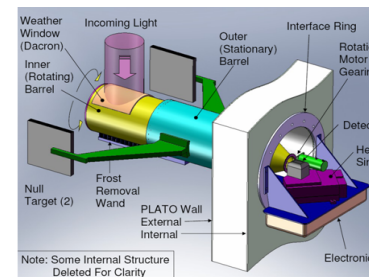
# Chinese Center for Antarctic Astronomy



On Jan. 18, 2005, Chinese Antarctica Expedition Team reached Dome A, the inland peak of the Antarctica (altitude of 4100m, with a 60 km x 10 km “drop” shape ), for the first time in the world.

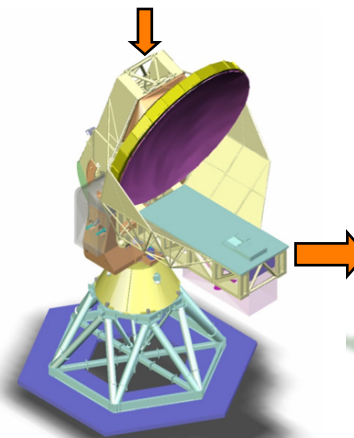


Pre-HEAT  
HEAT

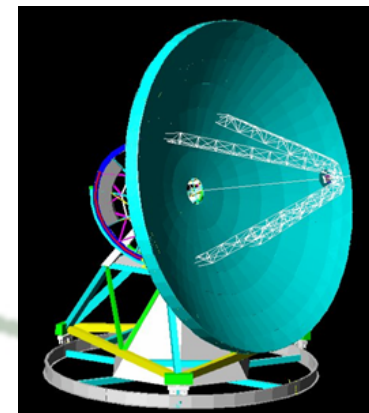


4m IR/Optical telescope with large FOV

**8-10m IR/Optical Telescope**



5m THz Telescope



15m THz Telescope

**Ultimate  
FIR Interferometer!**

# China TMT

## >> 中国参与国际巨型光学三十米望远镜 (CTMT) 情况简介

三十米望远镜(Thirty Meter Telescope, 简称TMT)系新一代率等技术指标提高到前所未有的程度,其强大的洞察宇宙的能力必将贡献的形式,参与下一代巨型光学-红外望远镜国际合作是关系到我国对我国天文学以及其他相关科学与技术的发展具有深远的影响!2009年正式启动了双边科学技术合作谈判的工作。国家天文台和南京天文光过与TMT管理与技术团队的沟通与谈判,有望承担包括望远镜光学子要以“实物贡献”方式体现,因而中国将有望成为TMT的主要建设伙伴间,获得科学回报;通过承担TMT核心技术任务,带动相关高技术发



### >> CTMT最新动态

- 路甬祥院长访问夏威夷天文台
- 南京天光所准备磨制3块TMT主镜于镜
- 朱永田,刘晓为参加TMT EAP Review Meeting

[更多内容](#)

# China TMT

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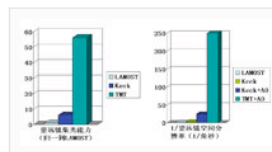
## >> TMT China Overview

A 30-meter telescope, operating in wavelengths ranging from the ultraviolet to the mid-infrared, is an essential tool to address questions in astronomy ranging from understanding star and planet formation to unraveling the history of galaxies and the development of large-scale structure in the universe. The 30-meter aperture permits the telescope to focus more sharply than smaller telescopes by using the power of diffraction of light. The large aperture also collects more light than smaller scopes, allowing images of fainter objects. TMT will therefore reach further and see more clearly than previous telescopes by a factor of 10 to 100 depending on the observation.

[More](#)



### >> TMT



### >> China and TMT

## Languages

[English](#)

[中文](#)

### >> Take a virtual tour



### >> Events and News



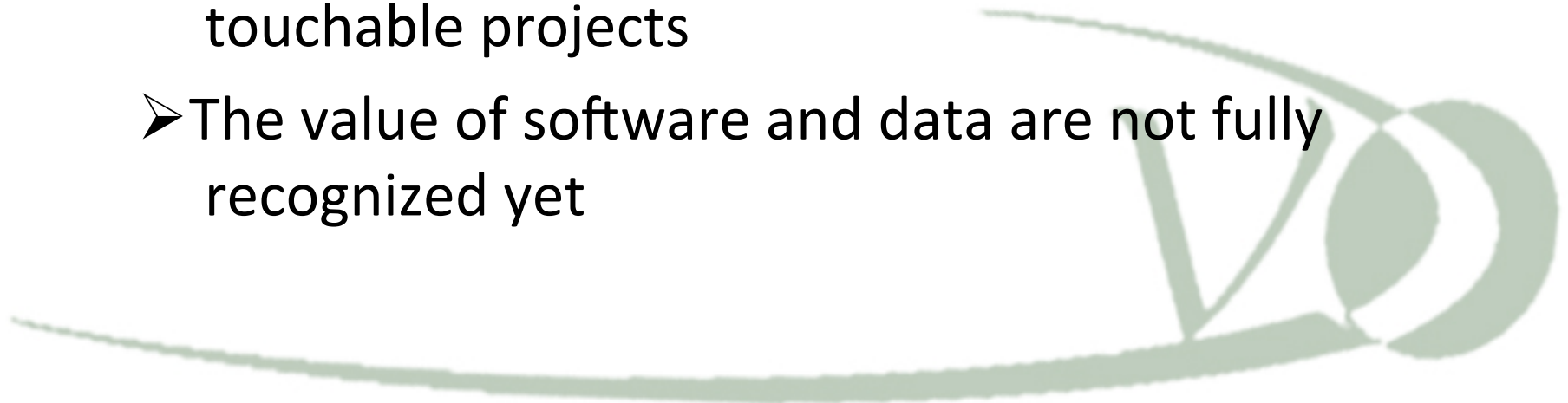
# Context in China

## ❖ Economy is increasing rapidly

- Good funding status
- New projects emerging fast

## ❖ Awareness delayed

- Most resources focused on hardware and touchable projects
- The value of software and data are not fully recognized yet



# China-VO R&D Focuses

- ❖ China-VO Platform
- ❖ Seamless Access to Astronomical Resources and Services
- ❖ VO-ready Projects and Facilities
- ❖ VO-based Astronomical Research Activities
- ❖ VO-based Public Education



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# China-VO R&D Focuses

- ❖ VO-ready Projects and Facilities
  - Inviting current astronomers and projects to involve into VO
- ❖ VO-based Astronomical Research Activities
  - Show the value and power of VO to the community
- ❖ VO-based Public Education
  - Facing the next generation



# Achievements



VOFilter

ID	RA	Dec	RAErr	DecErr	Epoch	Fmag	Jmag	Kmag	classification
1	N1333213:4098	231.73	44.65	0.27	0.27	19.44	18.44	19.13	90 Star
2	N1333213:3972	231.63	44.63						21 Star
3	N1333213:3126	231.62	44.58			45.10			90 Star
4	N1333213:3073	231.60	44.58			45.05			20 Star
5	N1333213:1118	231.60	44.65			44.95			90 Star
6	N1333213:3805	231.60	44.60			44.90			
7	N1333213:4055	231.59							
8	N1333213:4070	231.56							
9	N1333213:4099	231.64							
10	N1333213:4105	231.55							
11	N1333213:4189	231.55							
12	N1333213:4126	231.63							
13	N1333213:3473	231.62							
14	N1333213:3884	231.72							
15	N1333213:3934	231.72							

arXiv.org > astro-ph > arXiv:astro-ph/9910248

### Astrophysics

#### The Multiphase Halo of NGC 891: WIYN H-alpha and BVI Imaging

J. Christopher Houk (Johns Hopkins), Blair D. Savage (Submitted on 14 Oct 1999)

We present new, deep optical images (BVI+H-alpha) of the (ISM) far above the plane of NGC 891. These sub-arcsec visual view of two physically distinct "phases" of the thick galaxy. A dense phase of the thick disk ISM is observed in our BVI images as highly-structured dust-bearing clouds viewed against the stellar light of the galaxy. These structures are traceable to heights  $\geq 2$  kpc from the midplane. Very few highly-structured dust features are present at  $\geq 2$  kpc. The more prominent dust structures have gas masses in excess of  $10^5$  solar masses, each having visual phase of the high-z ISM is present. Our images of the well-studied disk observations of this phase are distributed with some



A&A 477, 139–145 (2008)  
DOI: 10.1051/0004-6361/20078392  
© ESO 2007

arXiv.org Search Results

Search Results in 0.001481 sec. 12 results for arXiv:astro-ph/9910248

1. **WIYN H-alpha and BVI Imaging of the Multiphase Halo of NGC 891**  
Houk, J. C.; Savage, B. D. 1999, *Astronomical Journal*, 118, 139-145

2. **WIYN H-alpha and BVI Imaging of the Multiphase Halo of NGC 891**  
Houk, J. C.; Savage, B. D. 1999, *Astronomical Journal*, 118, 139-145

FitHAS

Header Viewer

Single Archiving

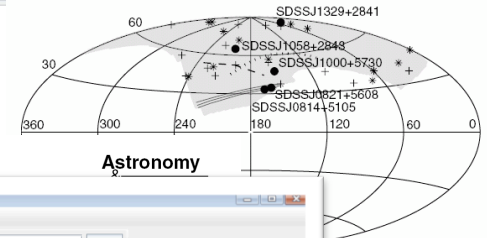
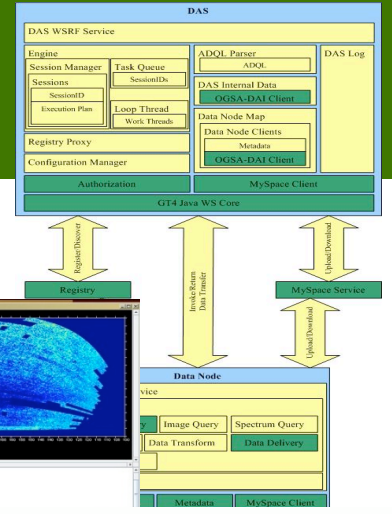
Batch Archiving

Database Browser

**Welcome to FITS Header Archiving System (FitHAS)**

FitHAS

VO-DAS



Desktop - FITS Manager

File Options

Address C:\Users\iccd\Desktop

Category Bookmark Explorer

0452 spAtlas spSpec

View Sort By

View FITS

Version Control

Edit

Rate

Add To Category

Refresh

Property

spSpec-51911-045 spSpec-51911-045 spSpec-51911-045 spSpec-51911-045

FITS Manager

# LAMOST SN feed for SkyAlert

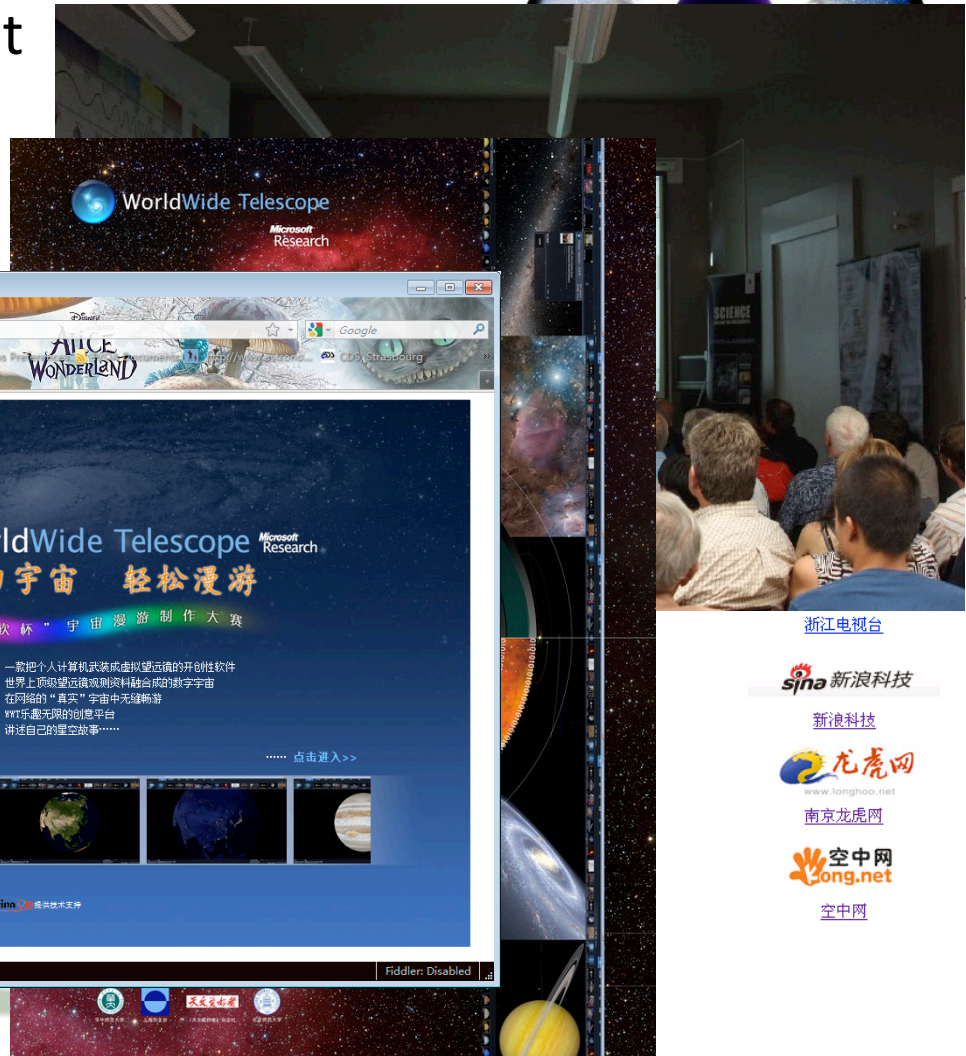
- ❖ Searching for SN candidates through LAMOST galaxy survey in real time
- ❖ Inform telescopes to point them for follow up observation
- ❖ [VO event](#)



# Public Education

- ❖ Total solar eclipse webcast
- ❖ WWT Tour contest
- ❖ NVObook translation

2009国际天文年日全食多路联合直播



# Final Goals of the China-VO

Building the cyber-infrastructure

for Astronomy in China

Leading the e-Science





Thank You!

