



# THE LAMOST FACILITY AND ITS DATABASE OF 20 MILLIONS STAR SPECTRA

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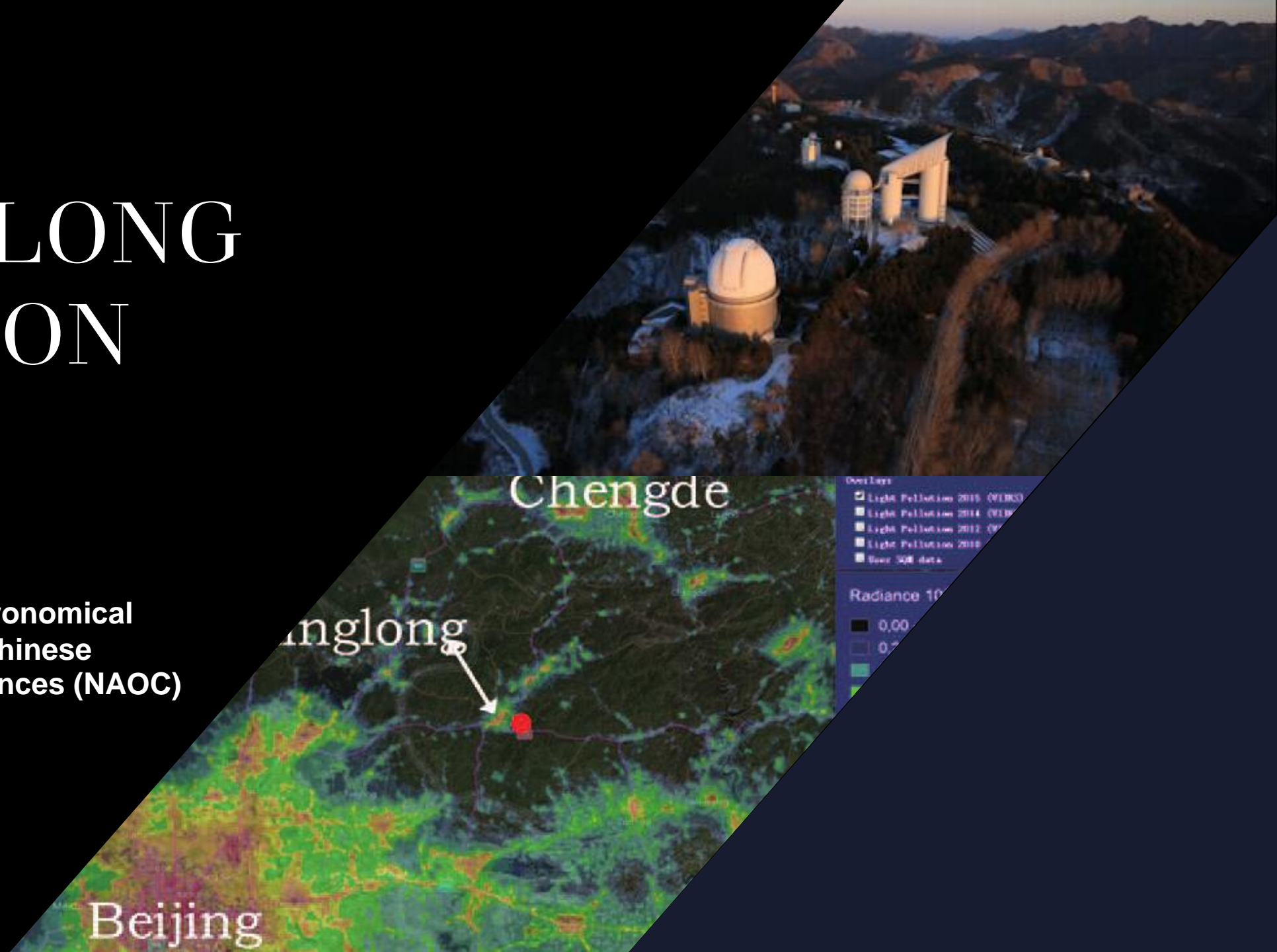


AN OPPORTUNITY TO  
PERFORM  
COORDINATED AND  
SYSTEMATIC  
FOOLOW-UP  
SPECTROSCOPIC  
OBSERVATIONS OF  
LSST TARGETS



# XINGLONG STATION

The National Astronomical  
Observatories, Chinese  
Academy of Sciences (NAOC)



<b>Mirror B (primary)</b>	6.67m×6.05m
<b>Clear aperture</b>	4m
<b>Field of view</b>	5°
<b>Focal plane</b>	f 1.75m
<b>Focal length</b>	20m
<b>Number of fibers</b>	4000
<b>Spectral ranges</b>	370-900nm
<b>Spectral resoluti...</b>	R=1800, 7500, 30000
<b>Limit magnitude</b>	20.5m
<b>Spectral resolution</b>	1/0.25nm
<b>Observable sky</b>	-10°to +90° Declination

## LAMOST – BASIC INFORMATION

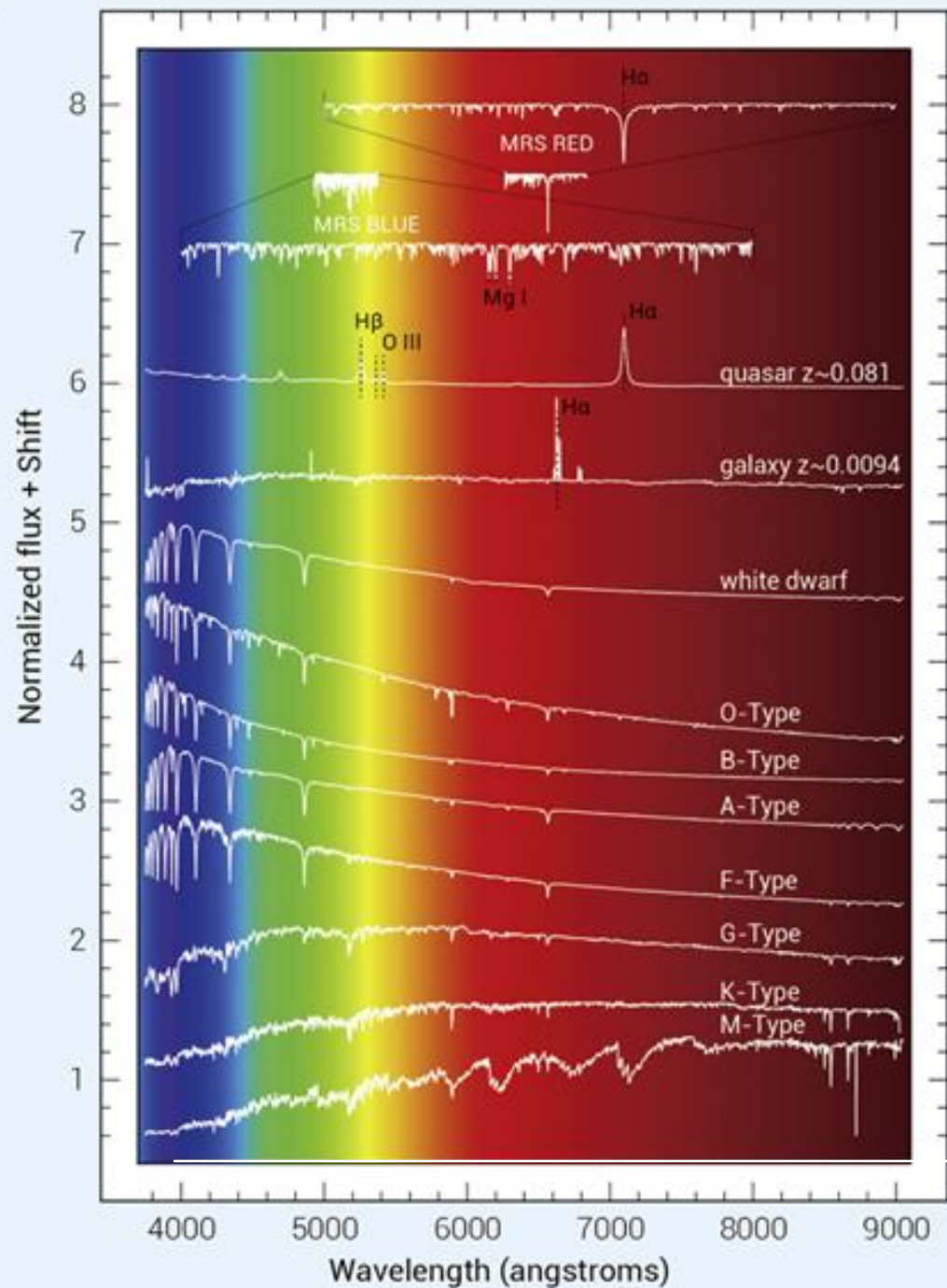


# LAMOST DR10

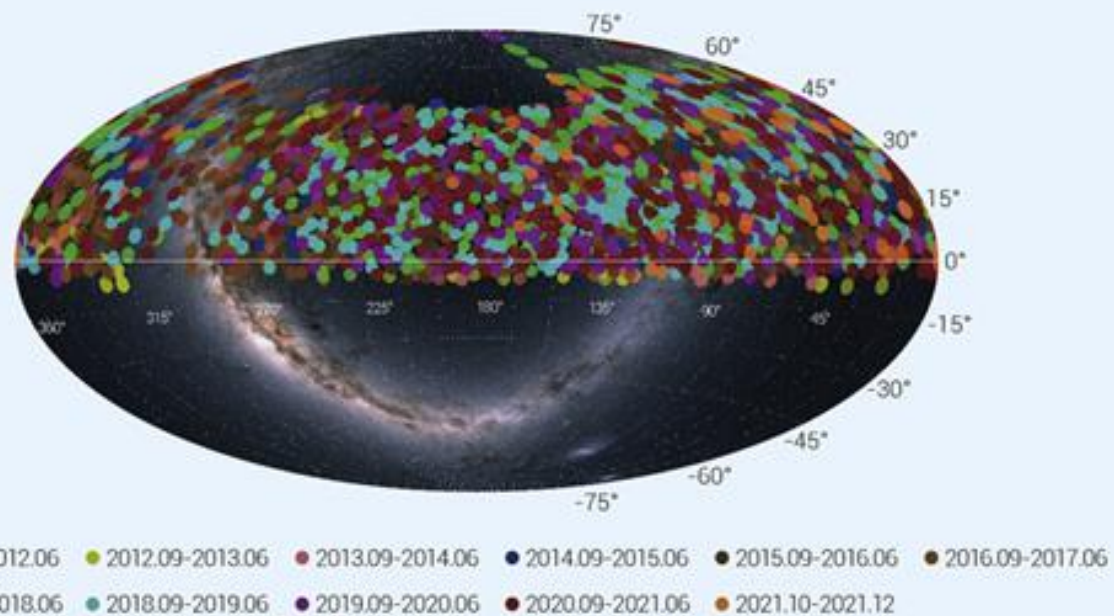
Item	Low-resolution Spectra	Medium-resolution Non-time-domain Spectra	Medium-resolution Time-domain Spectra	DR10 in Total
Total Number Released	11.81 million	2.21 million	8.27 million	22.29 million
Star Number with Stellar Parameters	7.47 million	1.10 million	1.04 million	9.61 million

[HTTP://WWW.LAMOST.ORG/DR10/](http://www.lamost.org/dr10/)

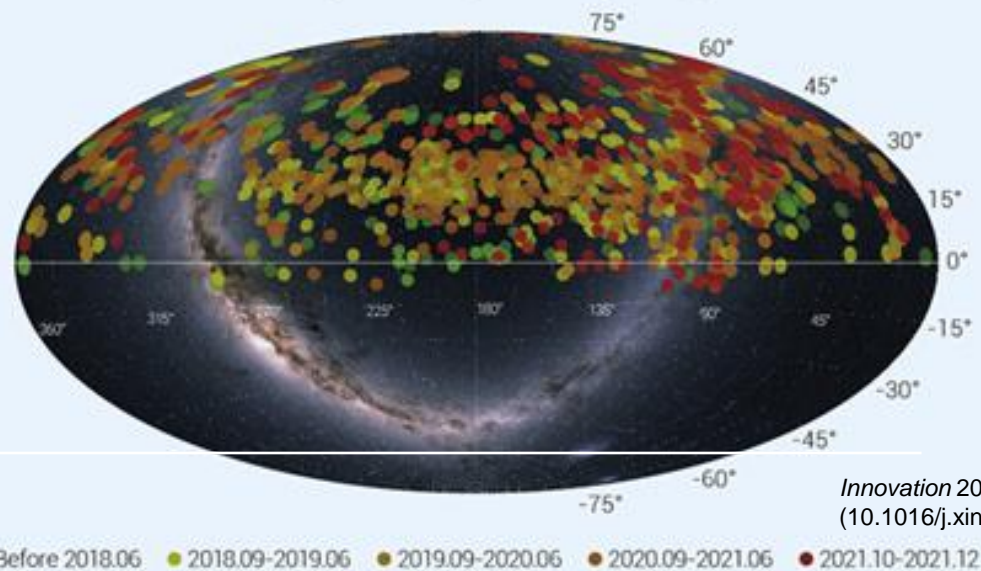
- The LAMOST DR10 dataset was released to the public on September 29, 2024.
  - A collection of the spectra acquired between October 2011 and June 2022.
- A catalog of about 9.61 million sets of stellar spectral parameters (abundances, RV, vsini).

**A****B**

The LAMOST spectroscopic survey footprint-LRS

**C**

The LAMOST spectroscopic survey footprint-MRS



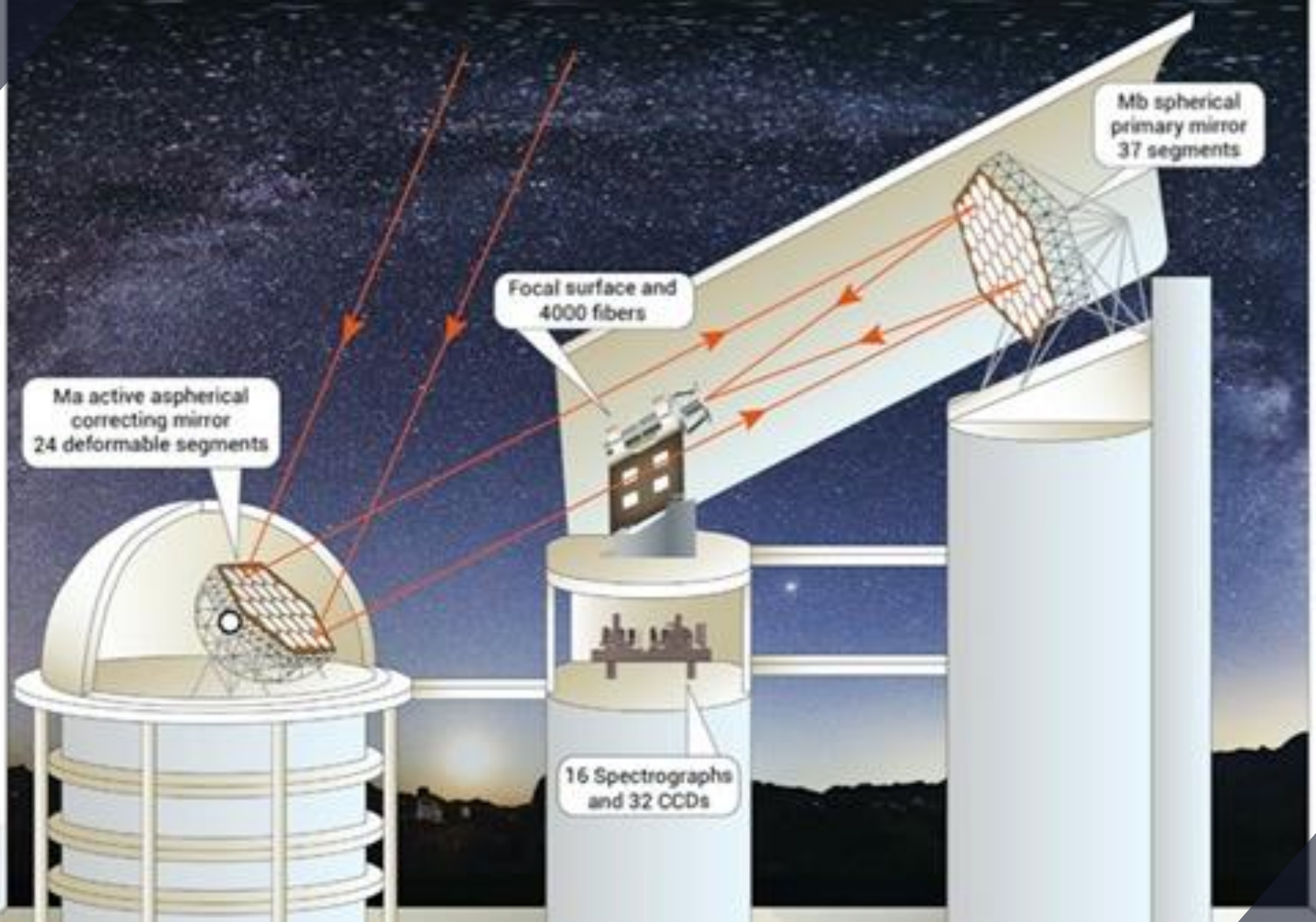


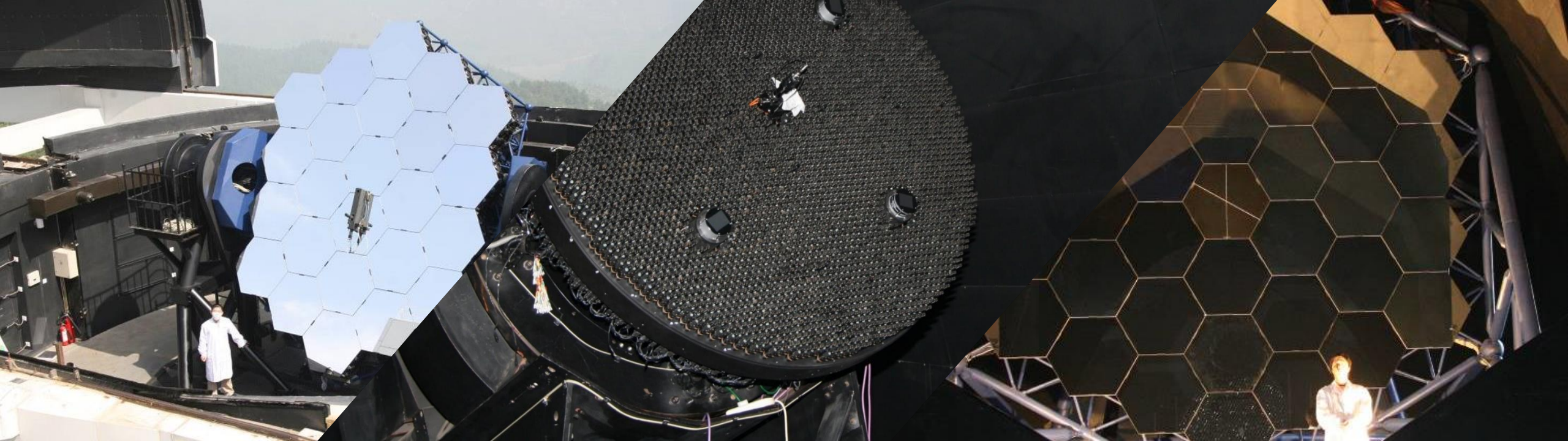
Ma active aspherical  
correcting mirror  
24 deformable segments

Focal surface and  
4000 fibers

Mb spherical  
primary mirror  
37 segments

16 Spectrographs  
and 32 CCDs





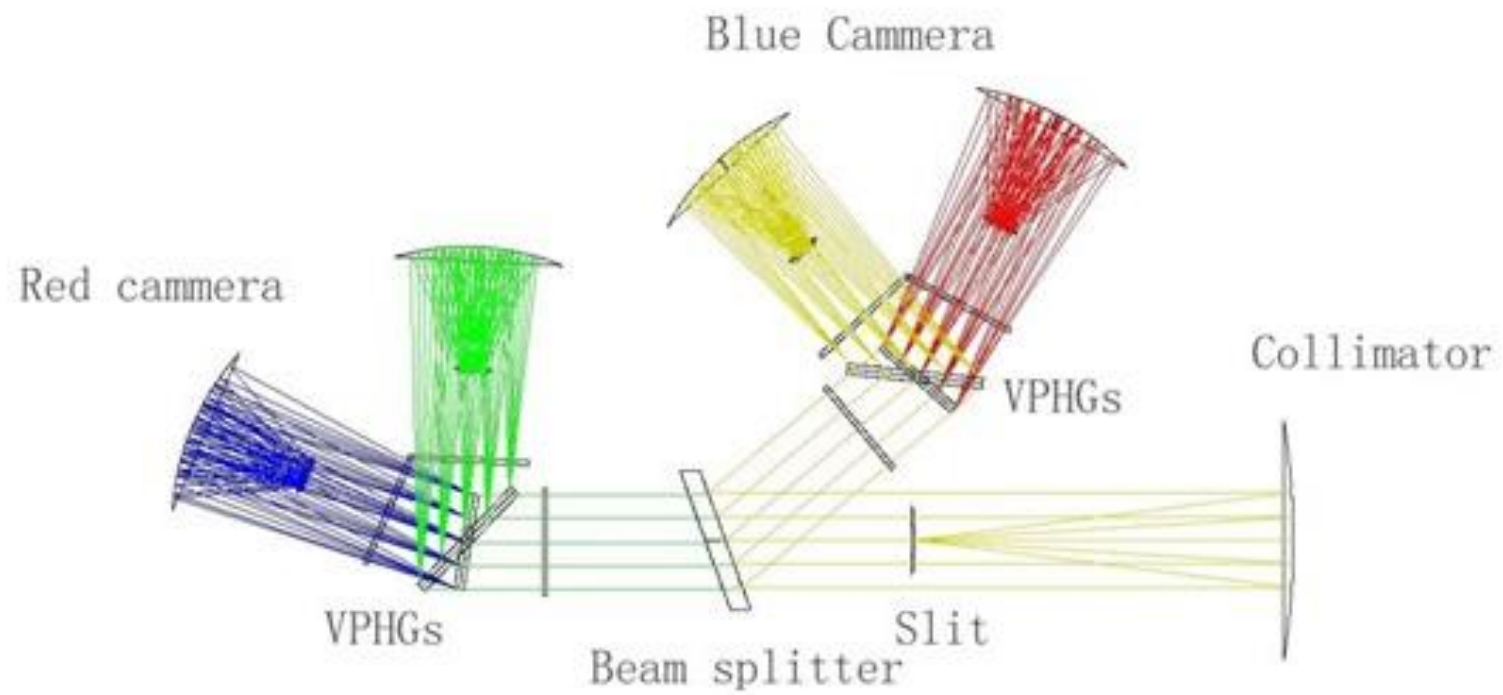
# COMPONENTS

- MIRROR A
- FOCAL PLANE
- MIRROR B

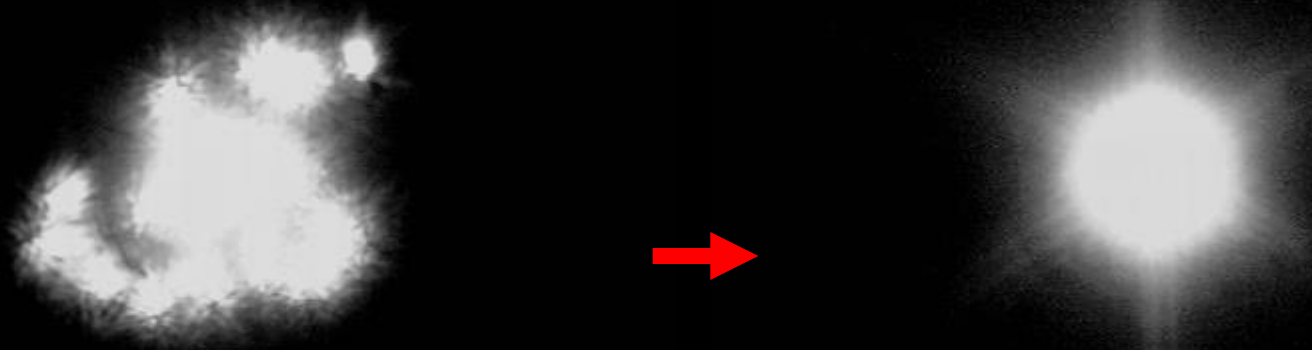




# OPTICAL SYSTEM

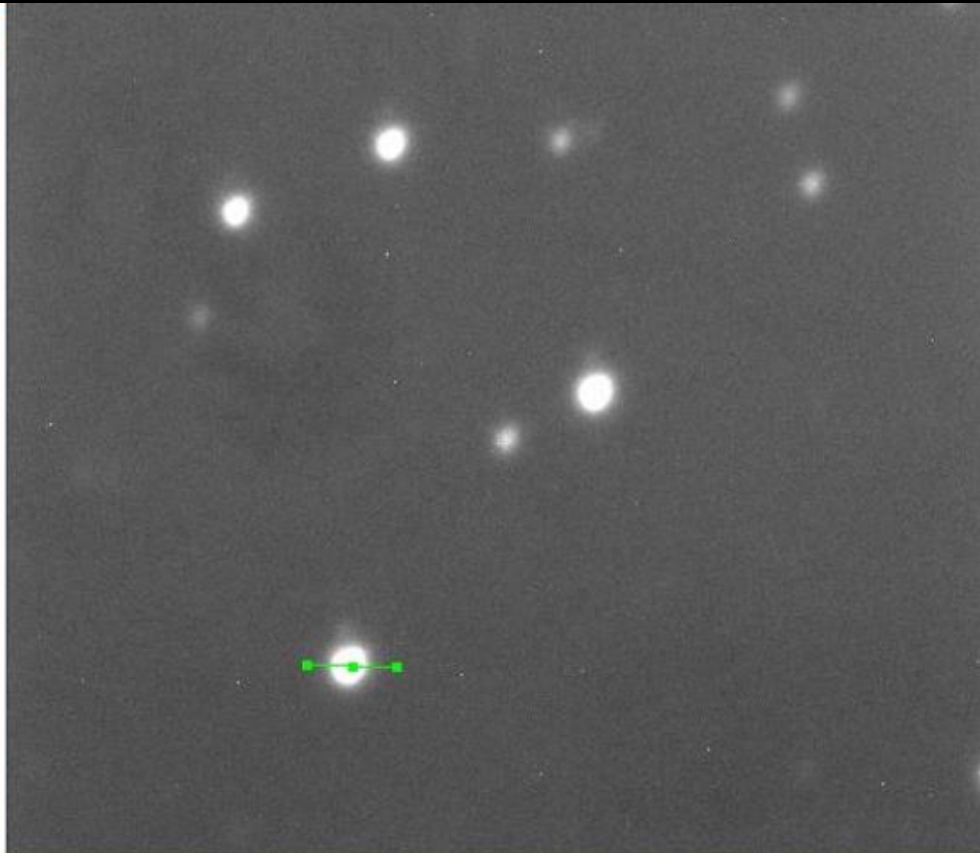
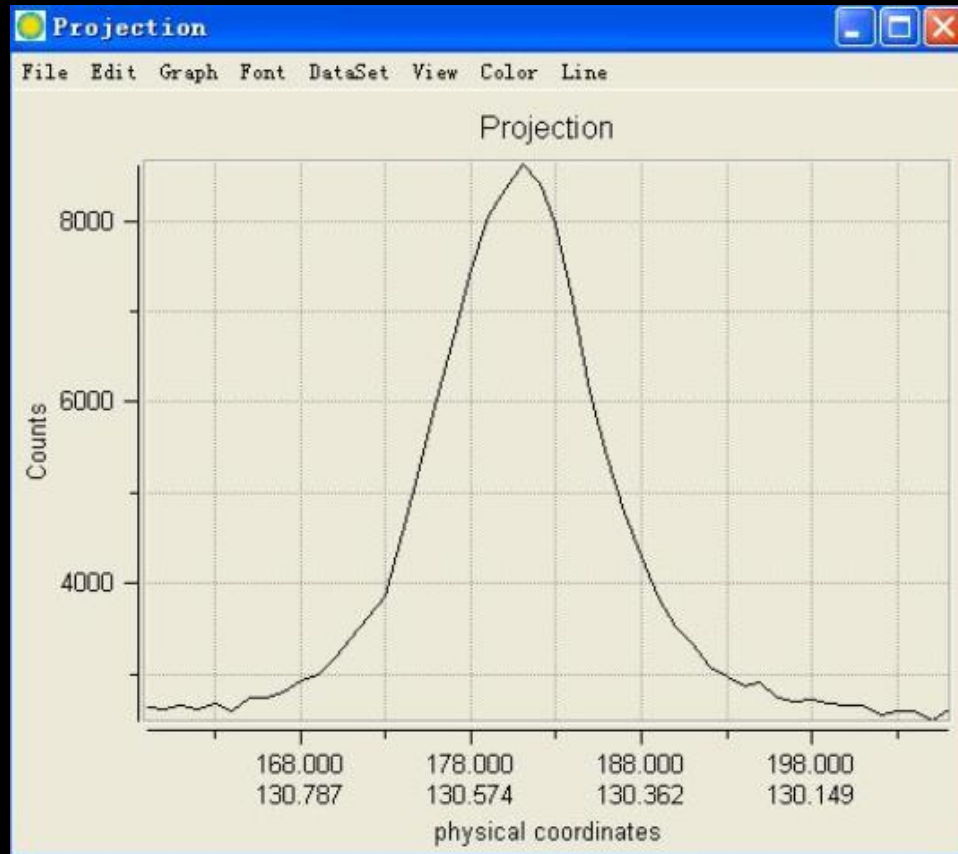


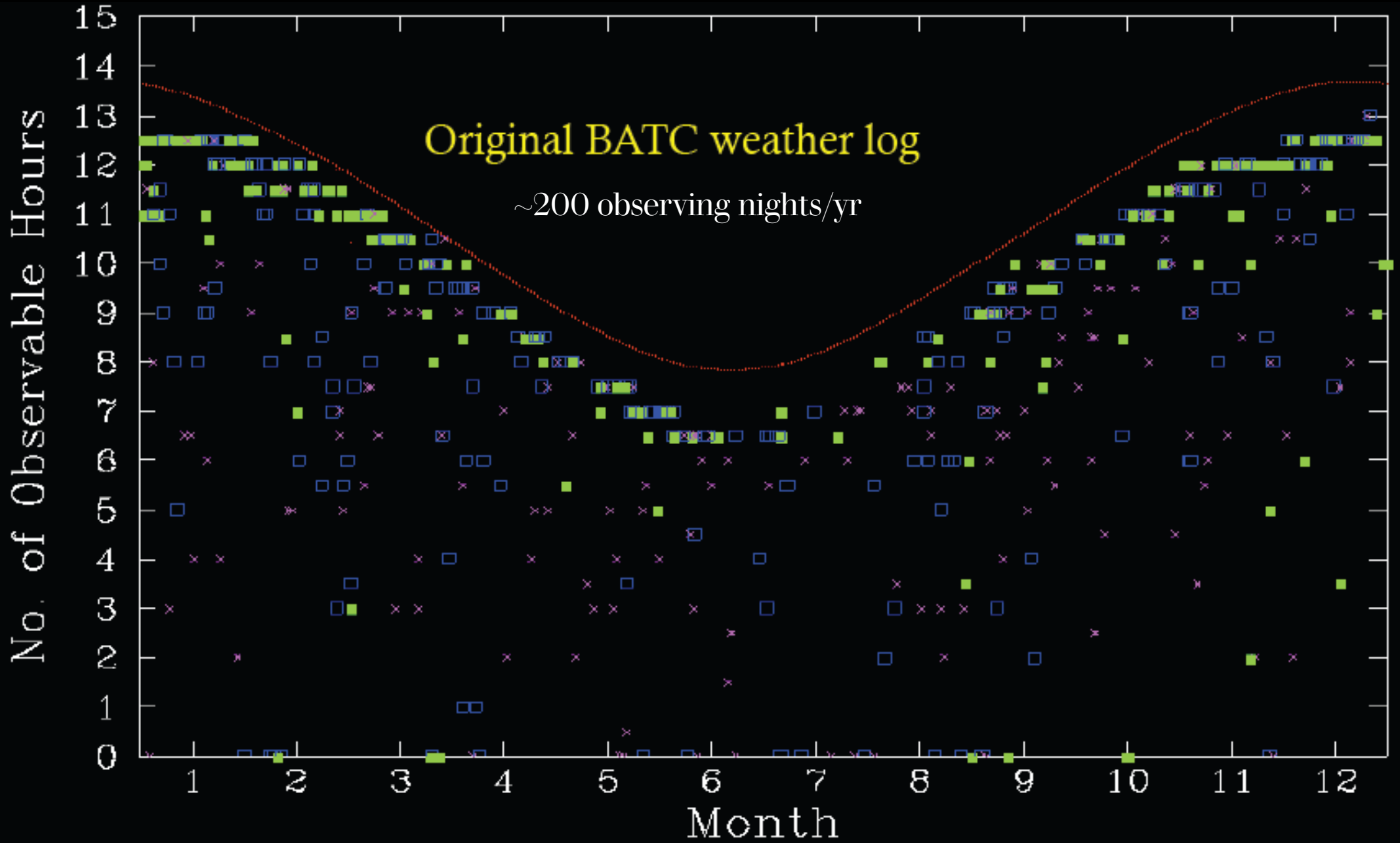
- A combination of segmented mirror active optics and a thin deformable mirror active optics on one mirror,
- Two large segmented mirrors actively controlled at the same time,
- Wave front sensing device in the aperture.





# Point Spread Function







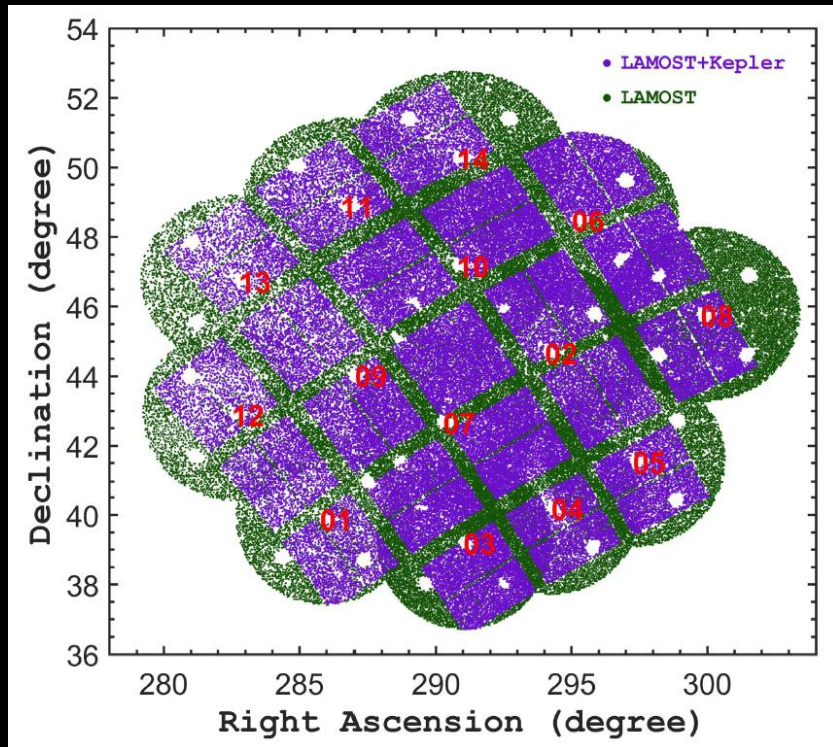


# SCIENTIFIC RESULTS

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# LAMOST – Kepler Project

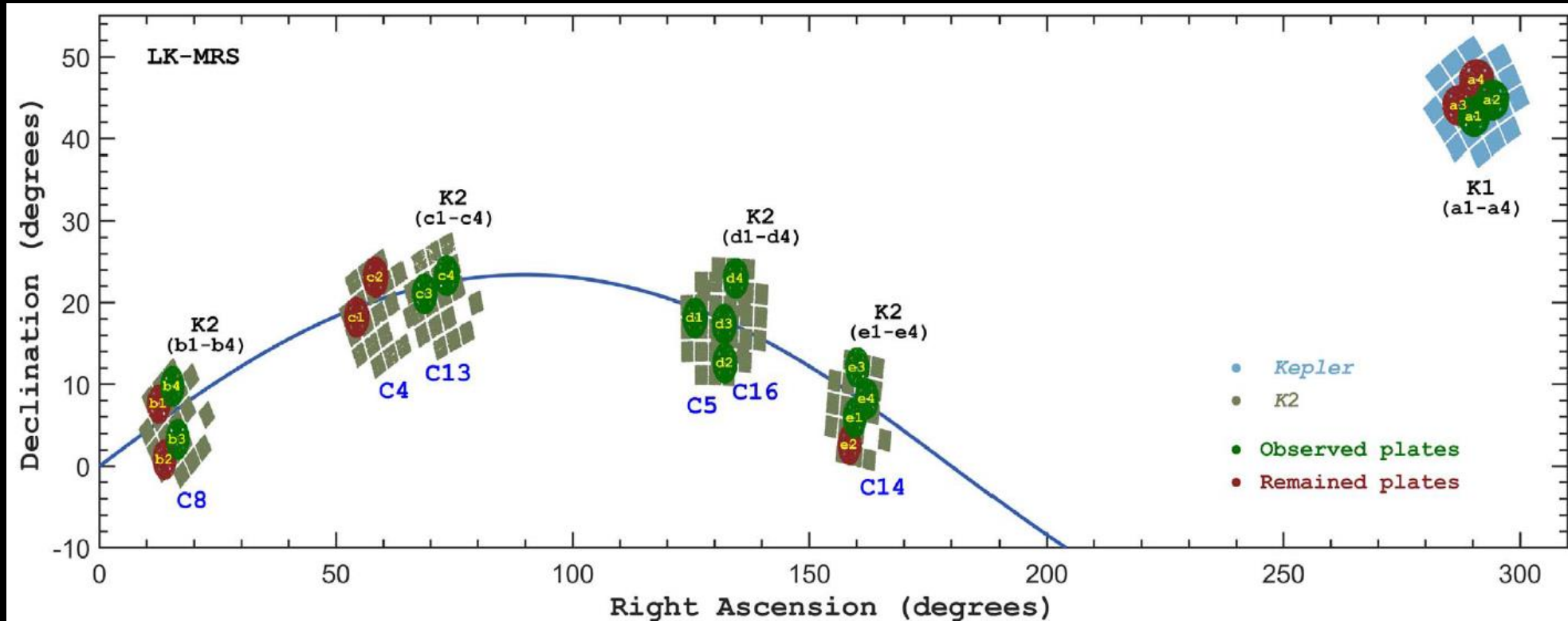


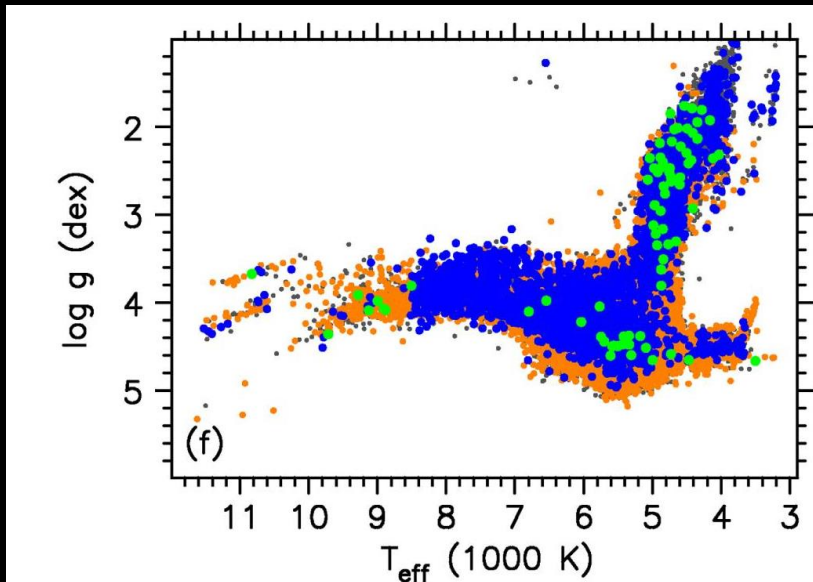
Year	LK field	Plate	Spectra	Parameter
2012	3	7	17 659	11 682
2013	6	14	39 309	28 115
2014	7	14	38 516	29 351
2015	11	32	97 247	81 381
2017	7	18	40 763	28 232
2018	1	2	4 892	3 957
Total			238 386	182 618
Unique			100 219	85 932
2×			37 563	28 555
3×			12 343	8 205
4×			3 441	2 321
+5×			2 057	1 016

Fu, Jian-Ning, 2020, RAA, 20, 167

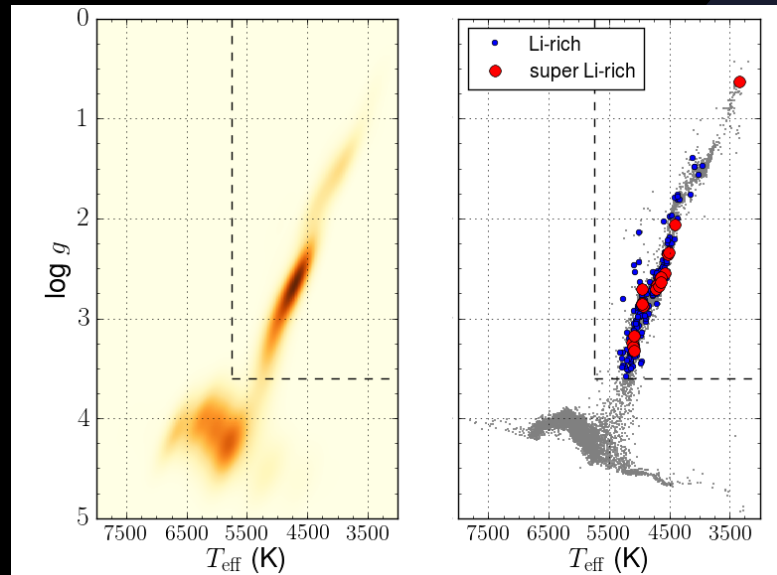


# LAMOST – Kepler Project





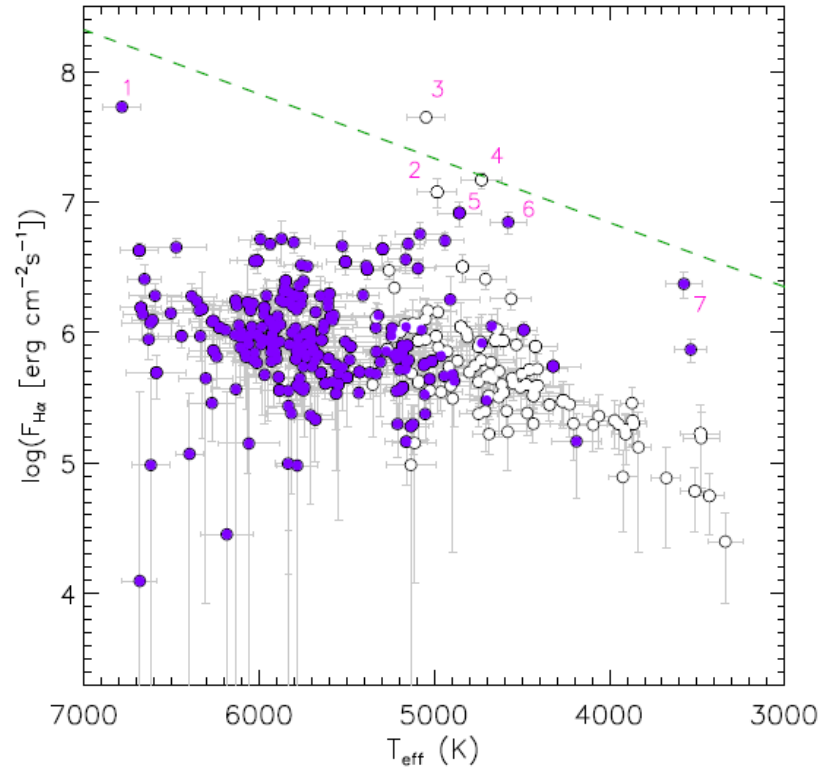
De Cat et al., 2015, ApJSS, 220, 19



Frasca et al. 2022, A&A, 664, 78

# Atmospheric parameters and element abundances

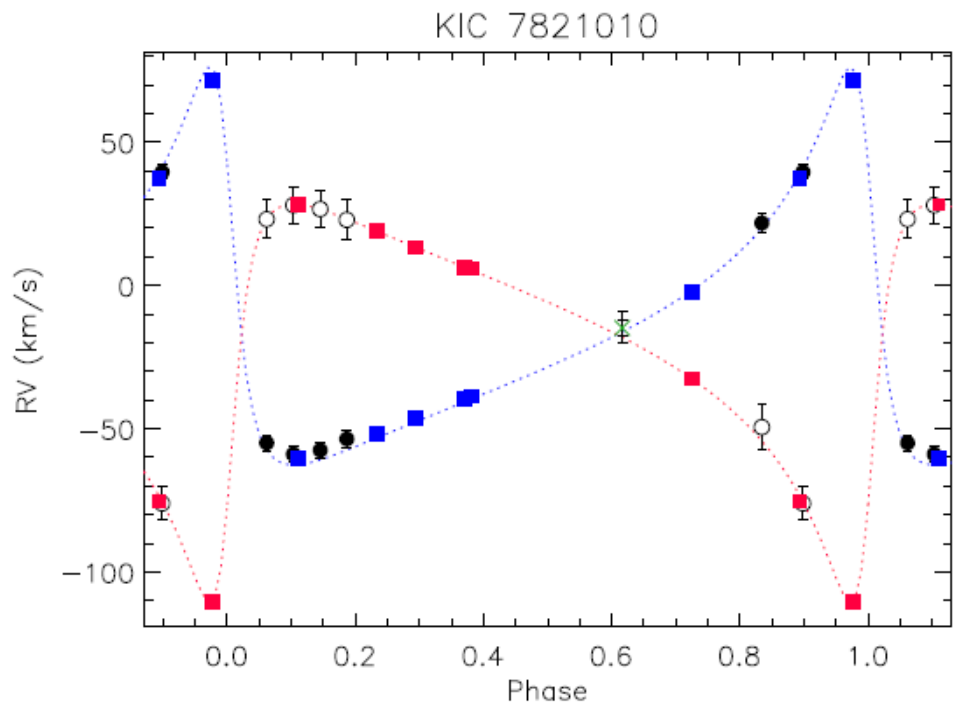




Frasca et al. 2022, A&A, 664, 78

Open circles for giants,  
purple dots for main  
sequence stars, the dashed  
straight line in each panel is  
the boundary between  
chromospheric emission  
(below the line) and  
accretion.

# Chromospheric activity



Frasca et al. 2022, *A&A*, 664, 78

- The blue and red squares indicate RV data from Hełminiak et al. (2019).
- The LAMOST MRS RVs are overplotted with filled black circles.

# Spectroscopic binaries





# LAMOST-LSST FOLLOW UP OBSERVATIONS



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