



Instruments of 150cm Reflector at Gunma Astronomical Observatory and Its Observational Results



Gunma Astronomical Observatory

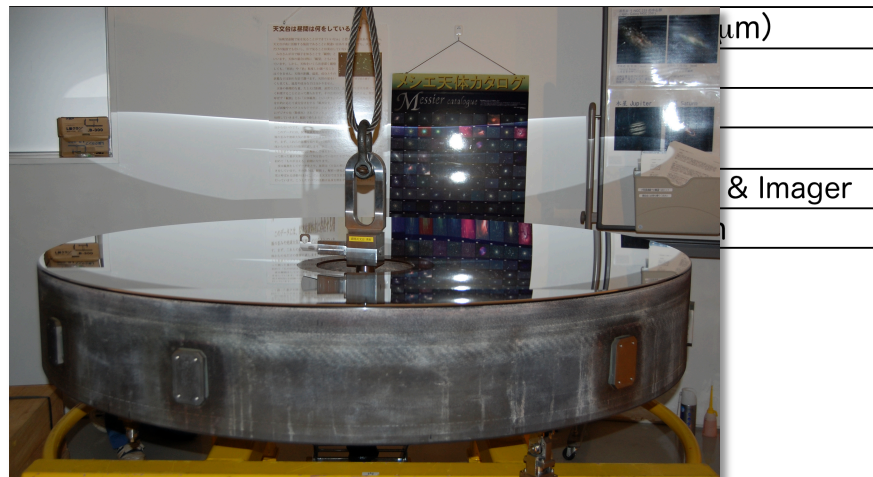
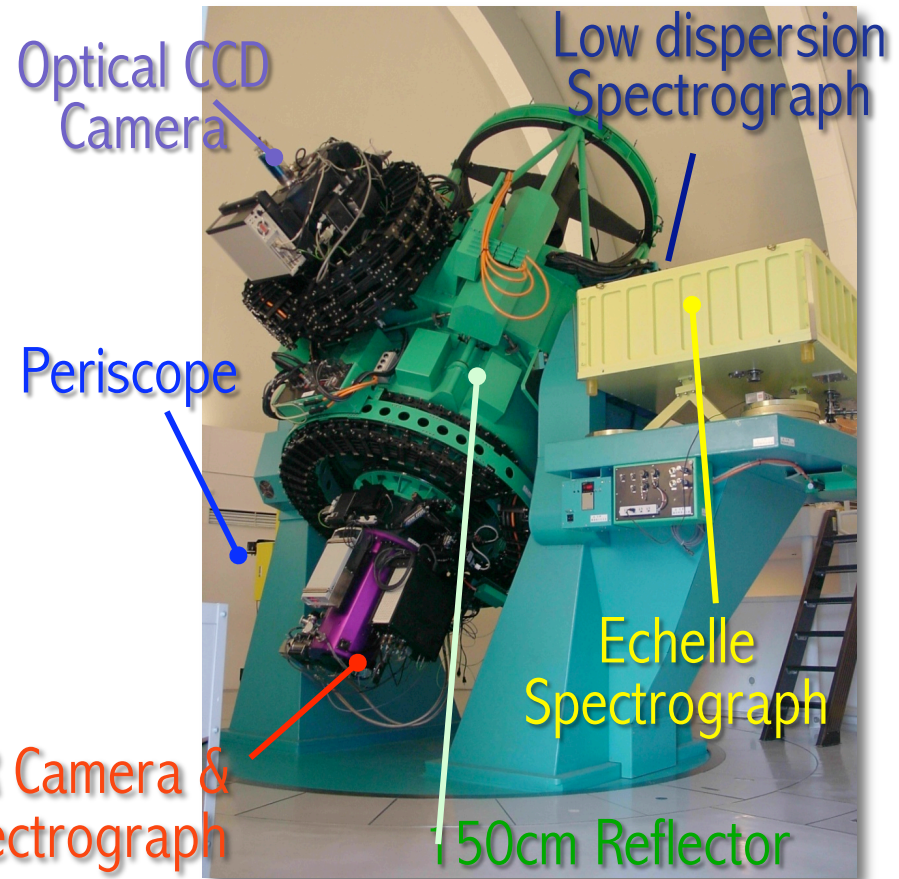
<http://www.astron.pref.gunma.jp/>

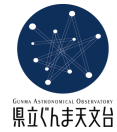
3Rのススメ

Reuse Recycle Reduce

Optics	Ritchey-Chretien
Diameter of primary mirror	160 cm
Effective diameter	150 cm
Focal length	1830 cm (F/12.2)
Haltman constant	0.3 arcsec
Mounting	Altazimuth
Pointing accuracy	3.0 arcsec (rms)
Tracking accuracy	0.7 arcsec (rms) (15 min)
Diameter of dome	11 m
Establish	March 1999
Manufacturer	Mitsubishi Electronics

Gunma Astronomical Observatory & 150cm Reflector





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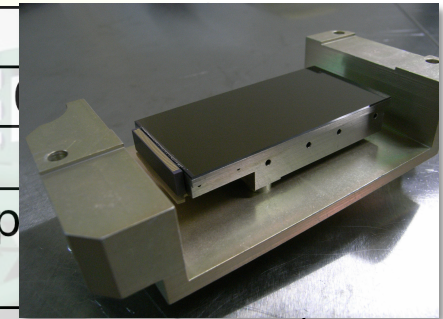


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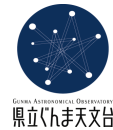
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Gunma Astronomical Observatory Echelle Spectrograph (GAOES)

Coverage	360–1000 nm
Spectral resolution	75,000 (Slit 1.0"), 100,000 (Slit 0.5")
Slit length	8.0" (720 μm)
Detector	e2V CCD44-82 2048 × 4096 pixels (pixel size : 15 μm × 15 μm)
Read-out	MFront2 + Messia-V (read-out noise : <math><3e^-</math>)
Cooler	He circulating mechanical cooler
Type	Semi-Littrow
Collimeter	Lens system
Camera optics	Lens system
Echelle grating	R = 2.8, 31.6 gr/mm, blaze 60°
Cross disperser	(red) 250 gr/mm, blaze 60° (blue) 400 gr/mm, blaze 45°
Limiting magnitude	10 mag (~600nm) S/N~50
Manufacturer	Genesia corporation



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Gunma Infrared Camera and Spectrograph (GIRCS)

Detector	HAWAII (HgCdTe 1024 X 1024) 0."4 / pixel → FOV: 6.'8
Imaging	10 filter positions Wide-band <i>J, H, K, Ks</i> Narrow-band [Fe II] (1.644 um) CIV (2.07 um) H2 1-0 S(1) (2.122 um) Br γ (2.166 um) K-cont. (2.144 um)
Spectroscopy	6 grism positions <i>J</i> (1.114 - 1.397 um) <i>H</i> (1.439 - 1.794 um) <i>K</i> (1.959 - 2.397 um)
	Slit : 1", 2", 4"
Manufacturer	Infrared Laboratories Inc.



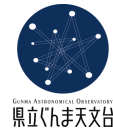
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Gunma LOW resolution Spectrograph and imager (GLOWS)

Detector	Andor DW432 (e2v CCD55-30 Back-illumination 1250 X 1152) 0."6 / pixel → FOV: 10'
Coverage	400 ~ 780 nm
Imaging	4 filter positions (+ hole) : <i>B, V, R, I</i>
Disperser	<i>Grism</i>
Resolution	400 ~ 500
Slit	40" (length) 、 1.8" (width)
Cooler	3 stage Pertier
Comparison	Fe, Ar, Ne in HCT
Manufacturer	Genisia corporation

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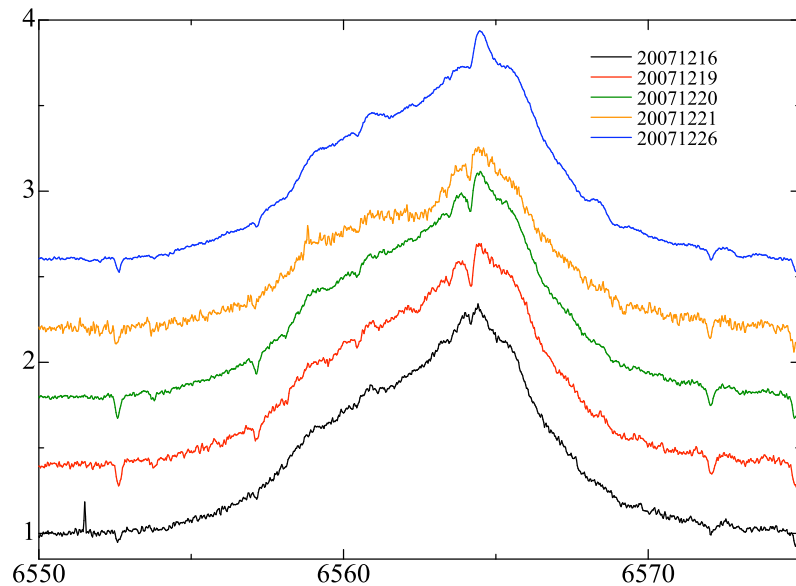
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GAOES

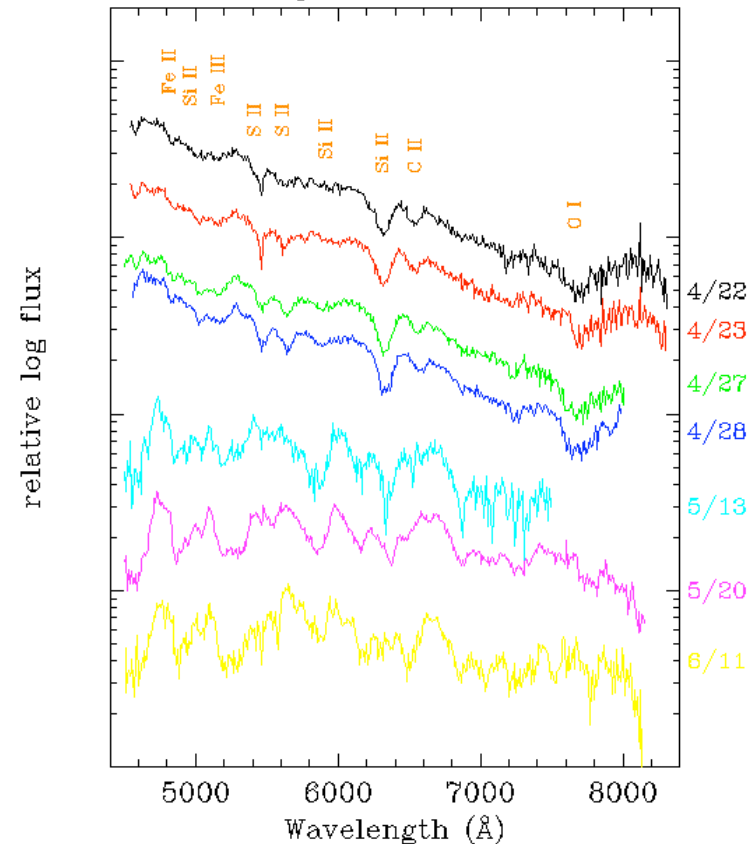
GLOWS

▼ Spectrum variation (Be/X-ray binary V725 Tau)

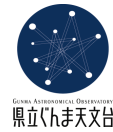


Spectrum variation (SN2009dc) ►

SN 2009dc spectrum variation



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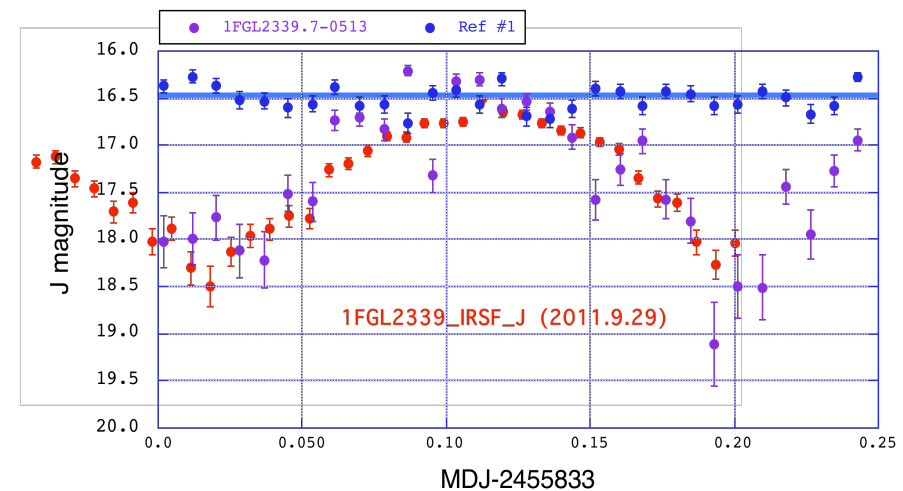
<http://www.astron.pref.gunma.jp/>

GIRCS

◀ Search for Wolf-Rayet stars



Orion / Trapezium 3-colors image
(Red : Br-gamma, Green : Ks, Blue : CIV)



▲ OISTER campaign
(variability of 1FGL2339)