Astronomy and Space Physics Department
Faculty of Physics
Taras Shevchenko National University of Kyiv

Observational research at the Lisnyky Observatory

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8th OPTICON Gaia Science Alerts Workshop
6-8 December 2017
Warsaw, Poland

Telescopes & Instrumentation

- 0.7-m telescope AZT-8
- Filter wheel with UBVRI filters

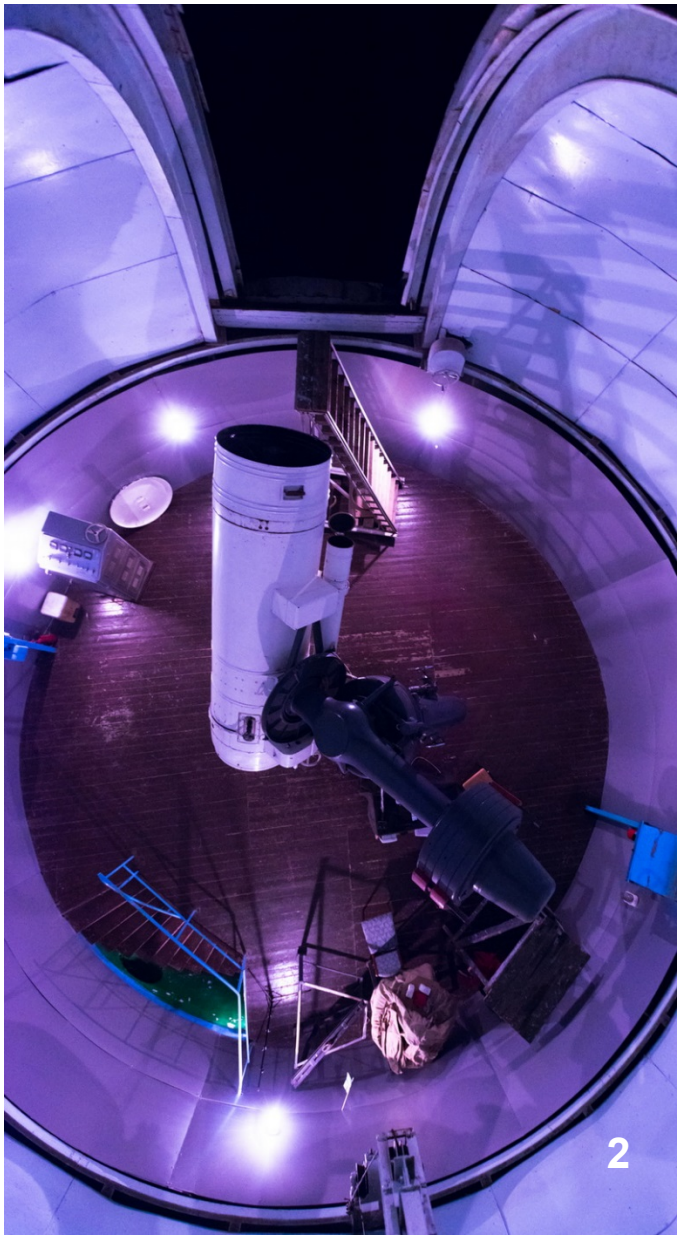
& CCD FLI PL47-10

- 0.48-m telescope AZT-14A
- Low-resolution prism

Spectrograph ASP-9

& fullframe CCD

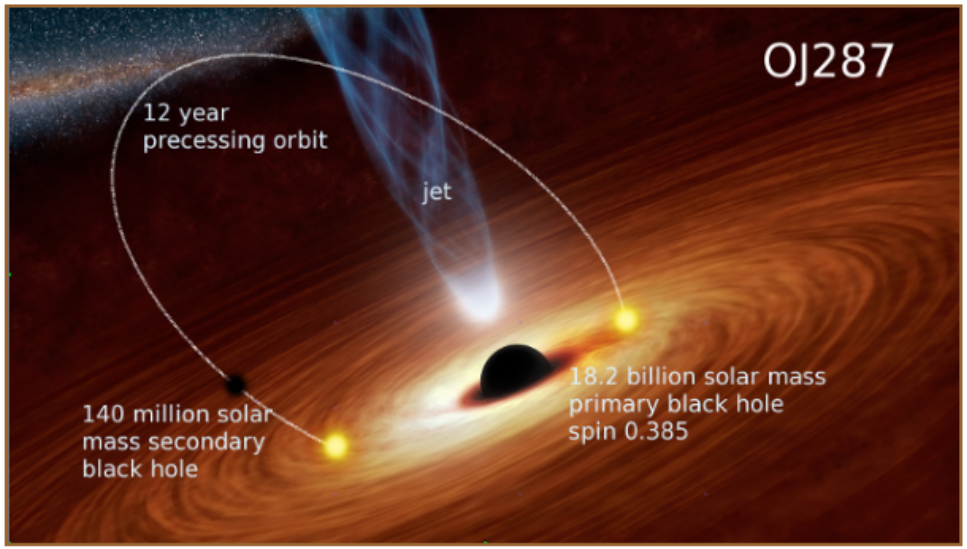
Starlight Xpress SXVR-H35



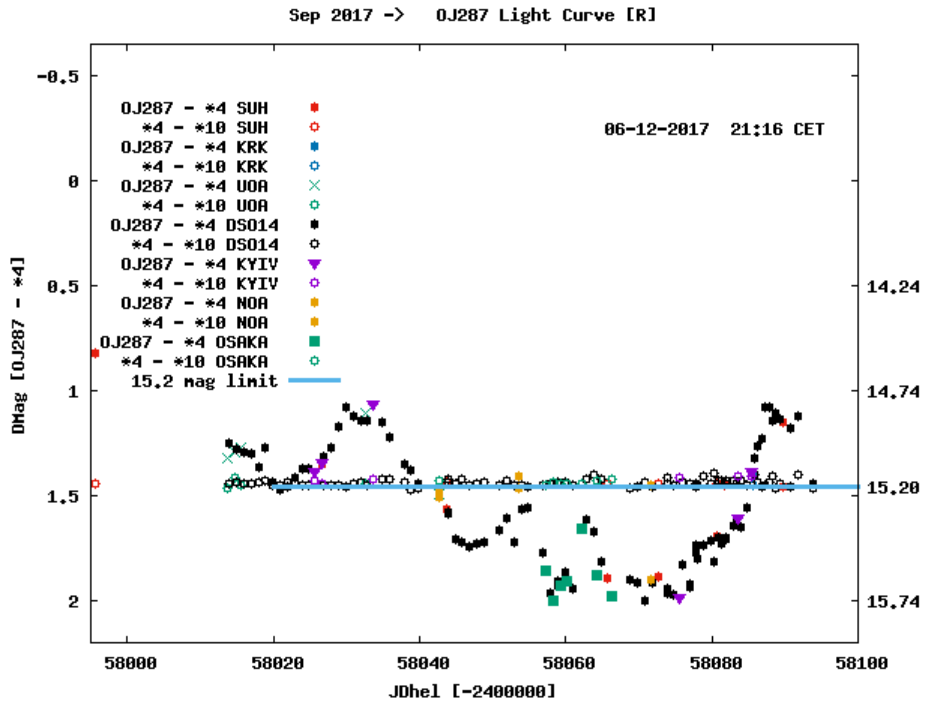
On-going science projects

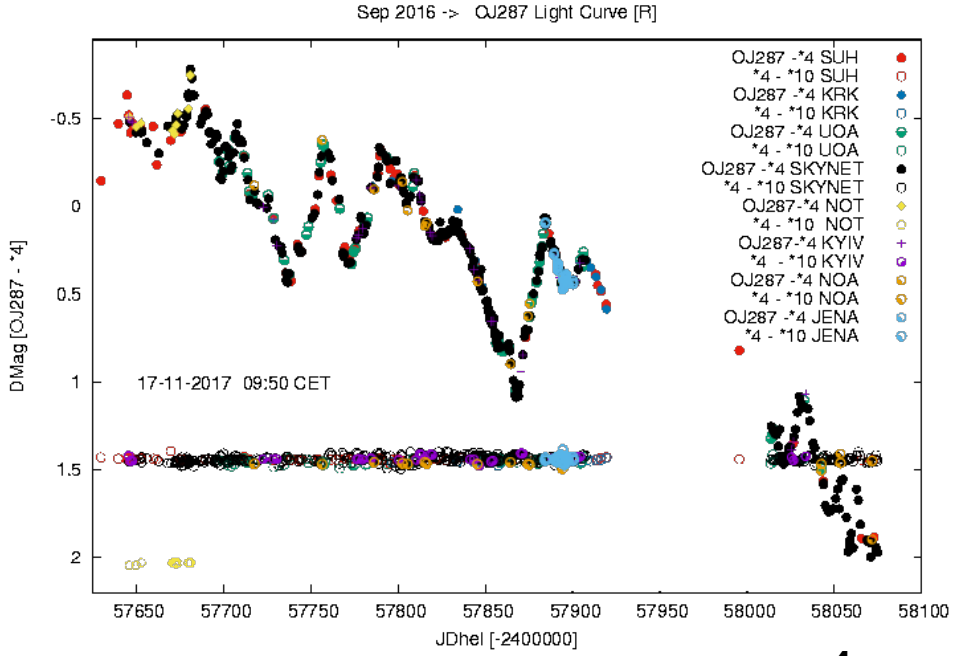
- Monitoring of OJ 287 and some AGNs
- Follow-up photometry of CVs
- Monitoring of selected X-ray binaries (including Be/X-ray)
- Follow-up astrometry and photometry of asteroids and comets
- Astrometry newly detected asteroids by Gaia
- Low-resolution spectroscopy of bright comets

Photometric Monitoring of OJ287 Blazar
2006-2017

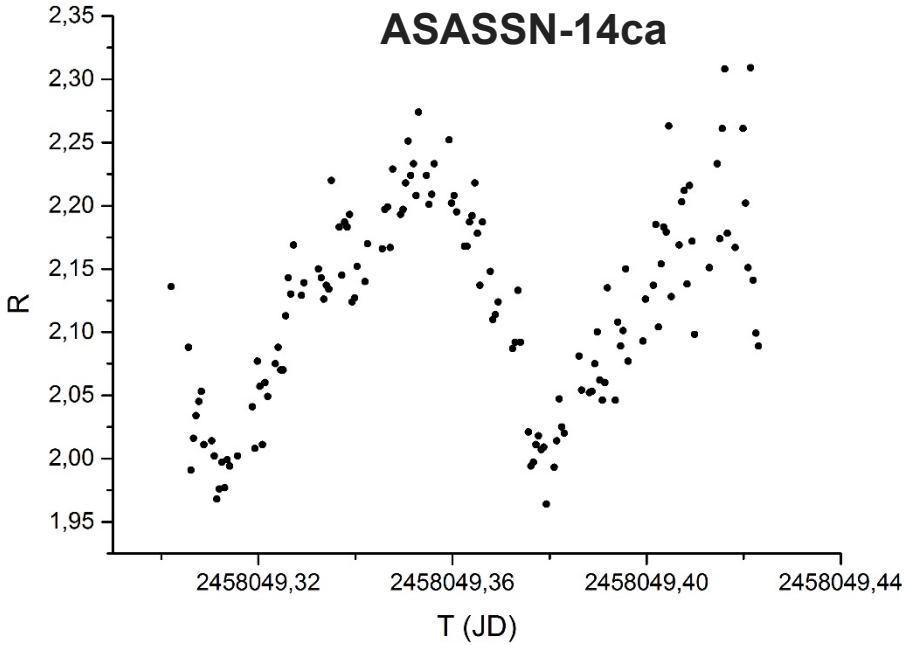


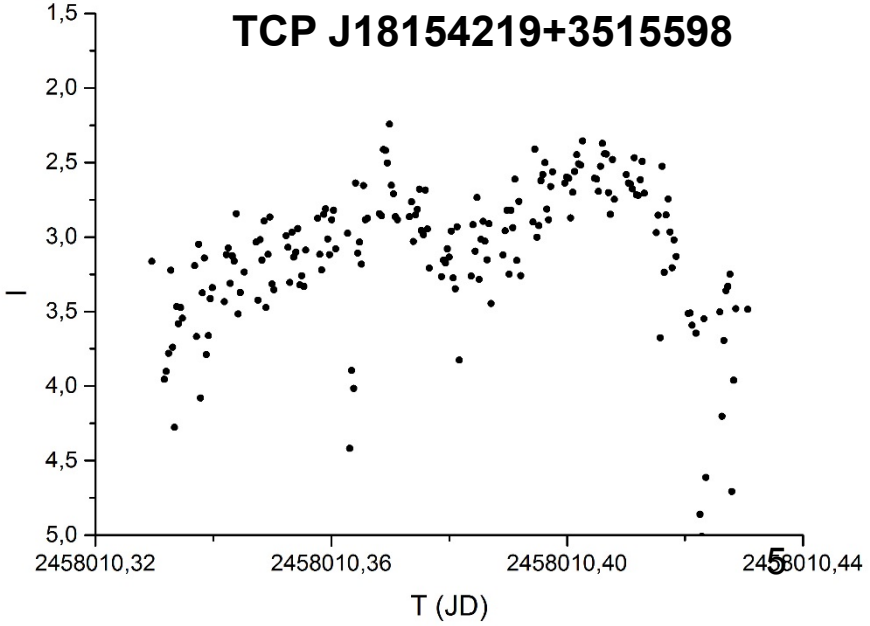
credit: S. Zola & NASA/JPL





Follow-up photometry of CVs





Be/X-ray binaries 1H1936+541 and 1H2202+501

- Spectral data from SAO RAS and Terskol observatory -> sp. classes (B1 Ve, B3 Ve) and abs. magnitudes
- Photometrical data from Crimean station of SAI MSU and Lisnyky Observatory -> visual magnitude
- As a result we obtain distances to these objects: $r_{1H1936+541} \approx 2.8$kpc, $r_{1H2202+501} \approx 1.2$kpc
- From **GAIA DR-1** we have:

  $r_{1H1936+541} > 2.2$kpc, $r_{1H2202+501} \approx (1.1 \pm 0.4)$kpc

Astrometry of asteroids and comets

- In 2017 we discovered 2 asteroids and rediscovered 1.
- An accuracy on average is about 0.2-0.3 arcseconds.
- Precise astrometric data have been continuously reported to the Minor Planet Center (MPC).

NEODyS-2

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Parallax info

Obs & residuals

585-Kyiv comet station

Detections | Residuals | Detections & Residuals

[1-200] [201-400] [401-600] [601-800] [801-1000] [1001-1200] [1201-1400] [1401-1600] [1601-1800] [1801-2000] [2001-2200] [2201-2400] [2401-2600] [2601-2800] [2801-3000] [3001-3200] [3201-3400] [3401-3600] [3601-3800] [3801-4000] [4001-4200] [4201-4400] [4401-4600] [4601-4800] [4801-5000] [5001-5200] [5201-5310]

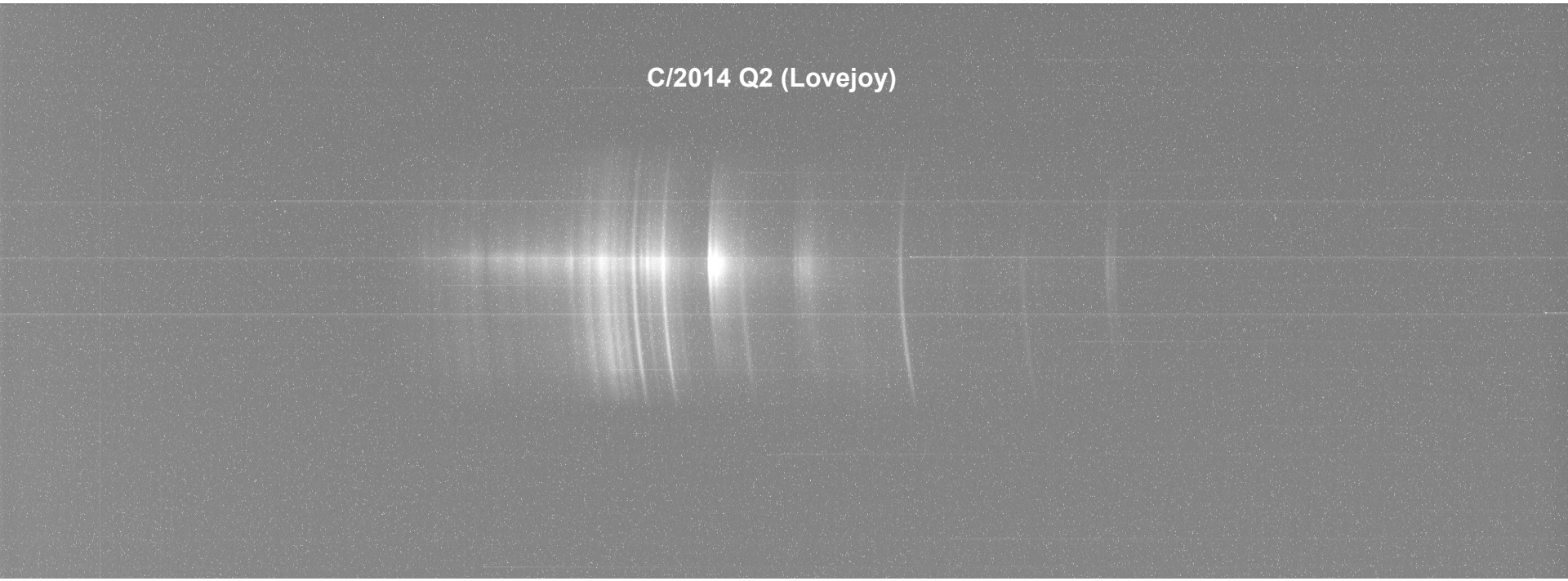
Designation	T	Tech	N	Date		Right Ascension						Declination						Apparent Magnitude			Star Catalog	Site code	X	Used A	Used M
				yr-mo-day	precision	hr:min:sec	precision	rms	F	bias	residual	deg min sec	precision	rms	F	bias	residual	mag/col	rms	residual					
2017OD	O	C	K	2017-07-18.90171	1.000E-05	17:24:01.270	1.500E-01	0.738	F	0.049	0.093	+06° 52' 14.50"	1.000E-01	0.671	F	0.040	0.136	17.3 R	0.70	-0.22	q	585	0.24	Yes	Yes
2017OD	O	C	K	2017-07-18.90223	1.000E-05	17:24:01.200	1.500E-01	0.738	F	0.049	-0.013	+06° 52' 30.80"	1.000E-01	0.671	F	0.040	0.293	17.2 R	0.70	-0.32	q	585	0.44	Yes	Yes
2017OC	O	C	K	2017-07-19.87965	1.000E-05	15:19:42.130	1.500E-01	0.330	F	0.051	-0.626	-06° 11' 38.70"	1.000E-01	0.300	F	0.089	0.337	19.7 R	0.70	0.56	q	585	2.23	Yes	Yes
2017OC	O	C	K	2017-07-19.88038	1.000E-05	15:19:42.360	1.500E-01	0.330	F	0.051	-0.499	-06° 11' 36.40"	1.000E-01	0.300	F	0.089	0.252	19.7 R	0.70	0.56	q	585	1.75	Yes	Yes

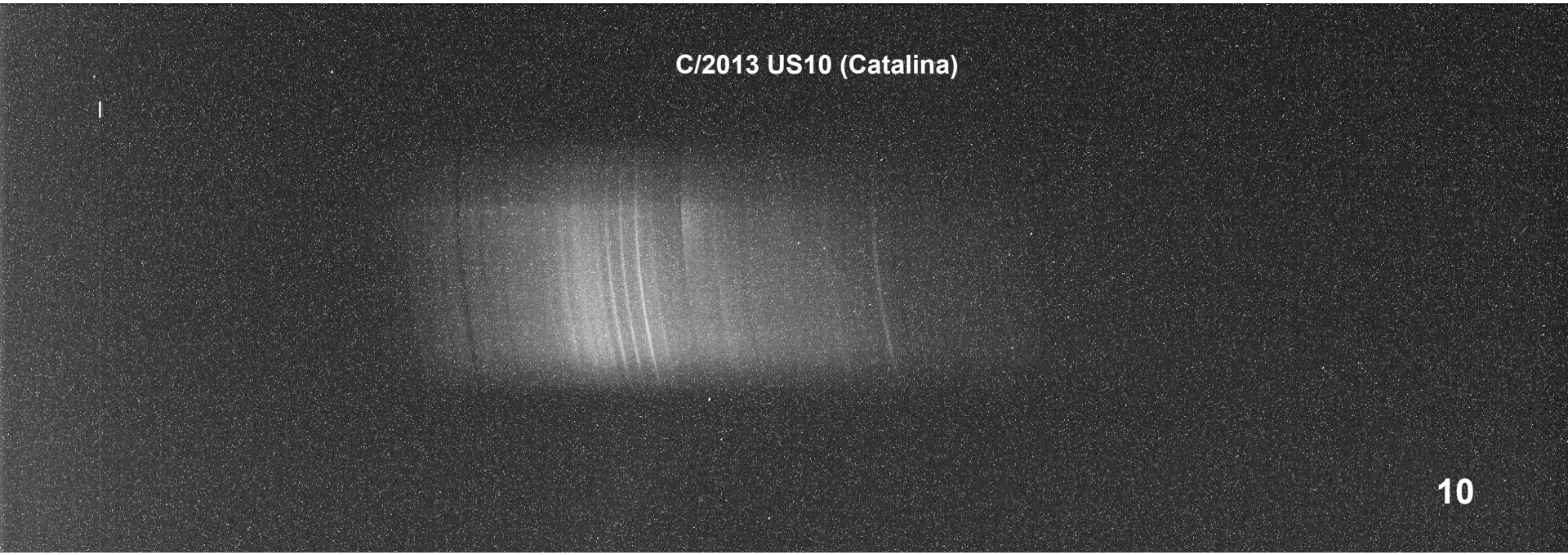
- On September 28 we started to observe candidates into asteroids from GBOT **G06810** and **G06809**. On images except these asteroids we have detected two others. It were unknown objects and now they have “names” **2017 ST39** and **2017 SV39**

- During the next observational sets in order to confirm new asteroids we have found one more asteroid (now it is **2017 TS7**). But it appears that this asteroid was observed previously by others and now have some designations: **2017 TS7 = 2000 WN134 = 2010 RD162 = 2015 DH186**.

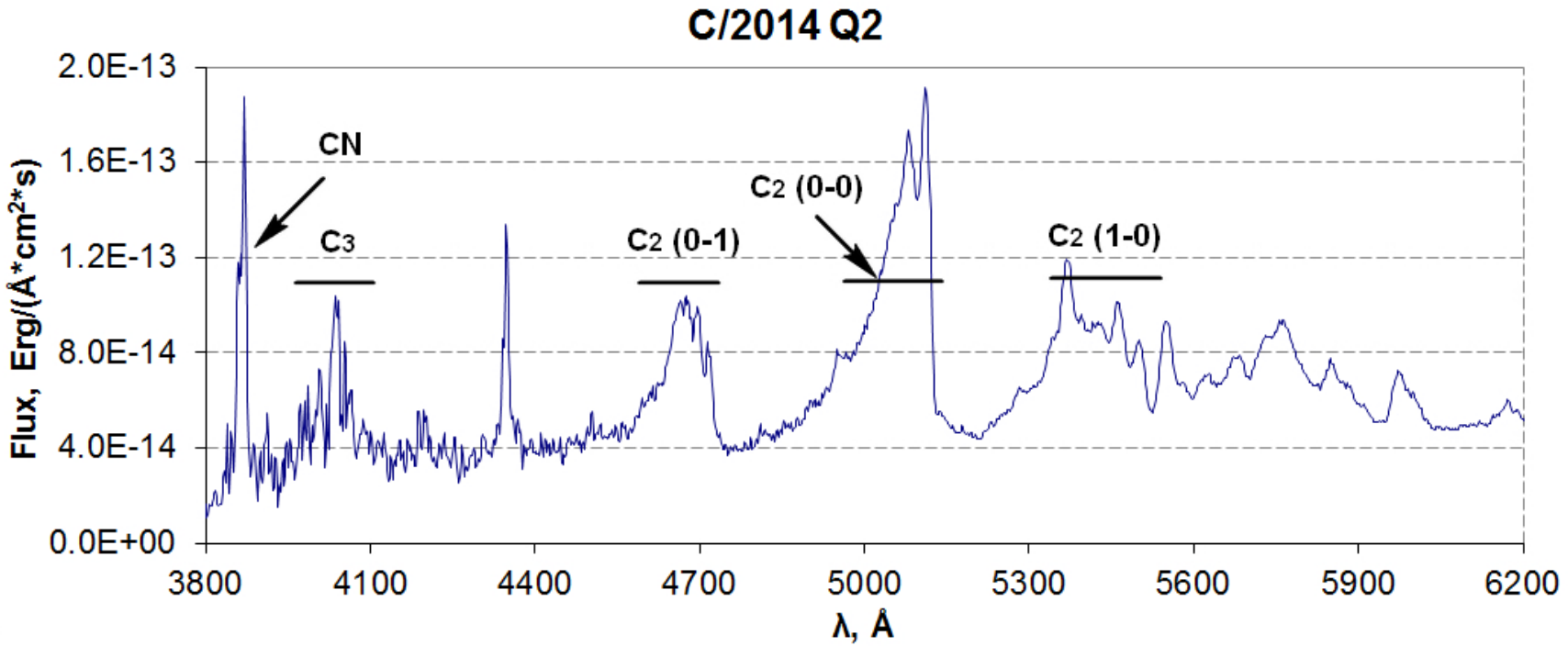
- The limiting magnitude of objects we can detect with binning 2 on images in integral light with sum exposure of about 20-30 minutes is a little more 21^m.

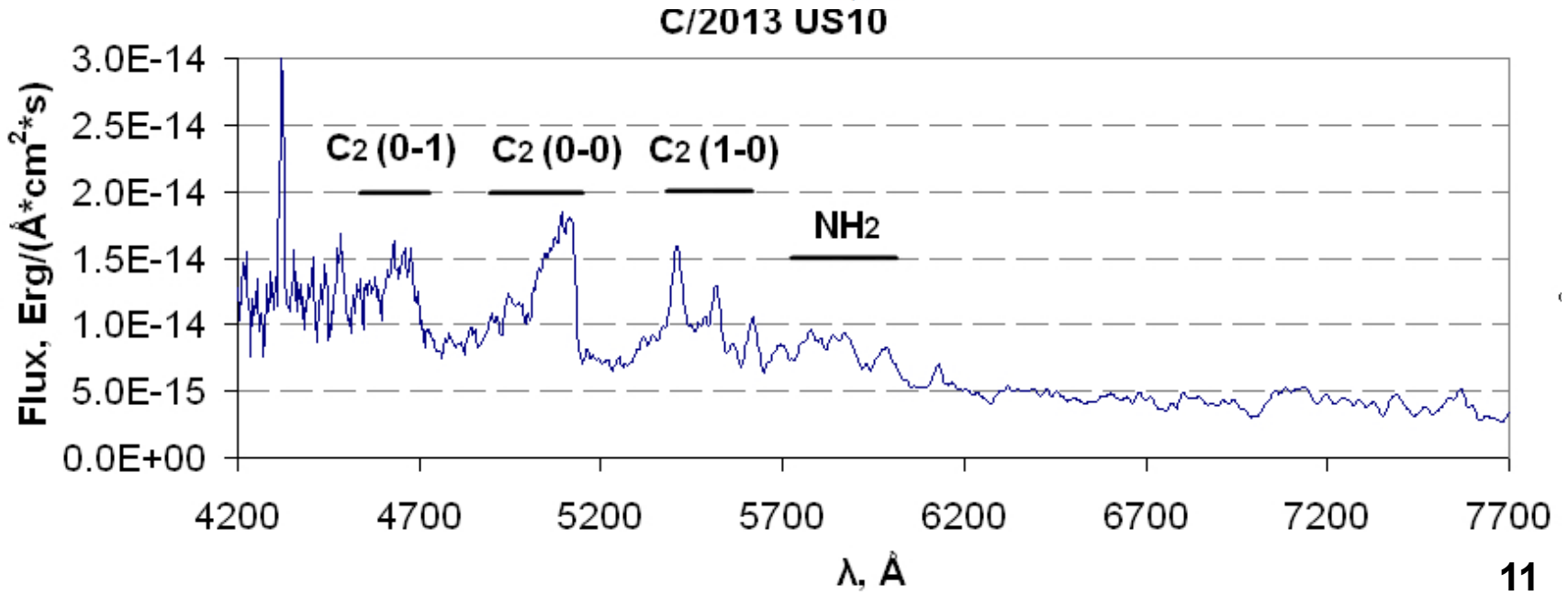
Telescope AZT-14A with the spectrograph ASP-9


C/2014 Q2 (Lovejoy)


C/2013 US10 (Catalina)

The emissions in prism's spectrum of comets Lovejoy and Catalina





Thank you for attention!