

Białków Observatory - indispensability of small ground-based telescopes in the era of satellite observations

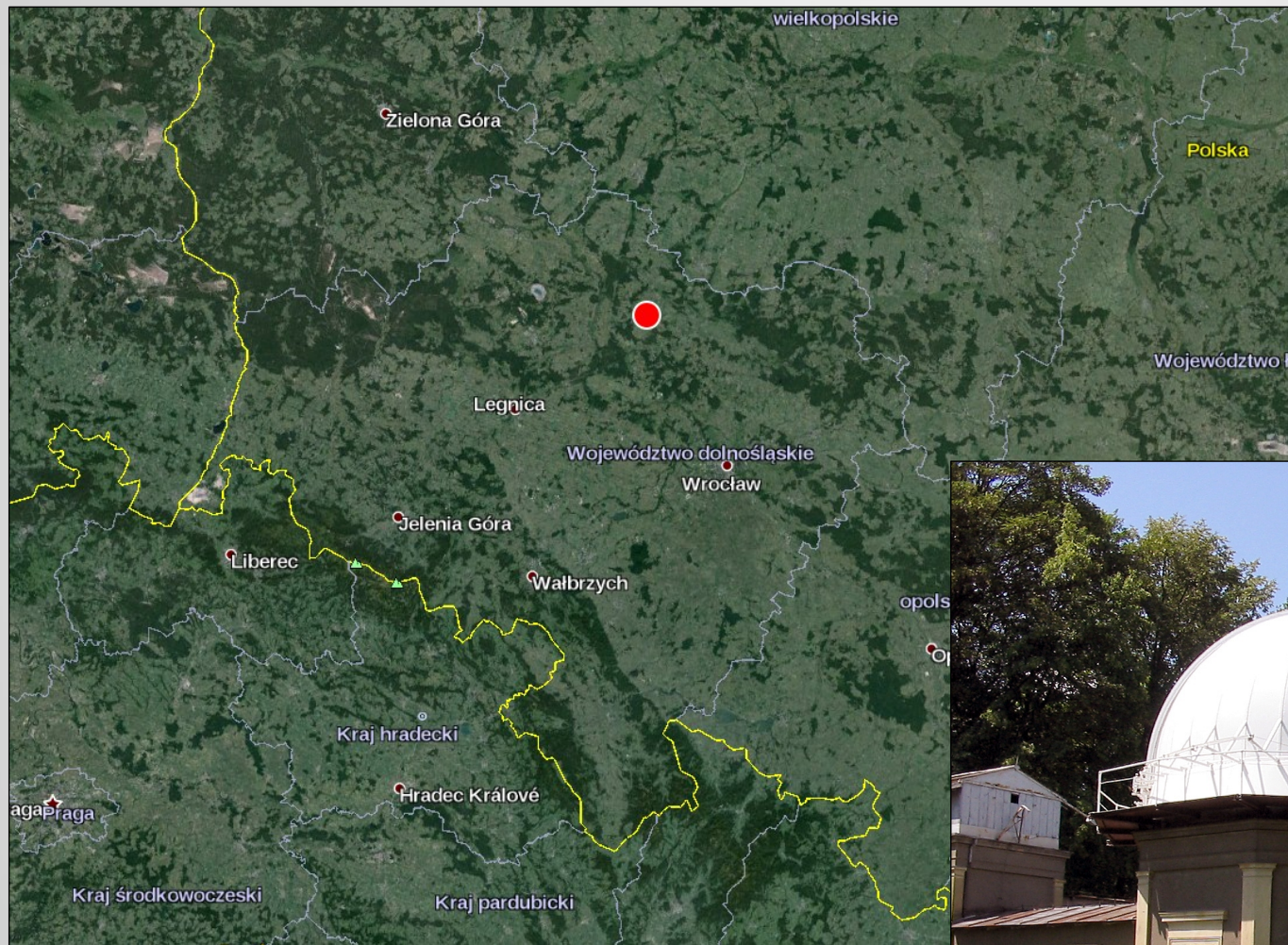


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Warszawa, 08.12.2017

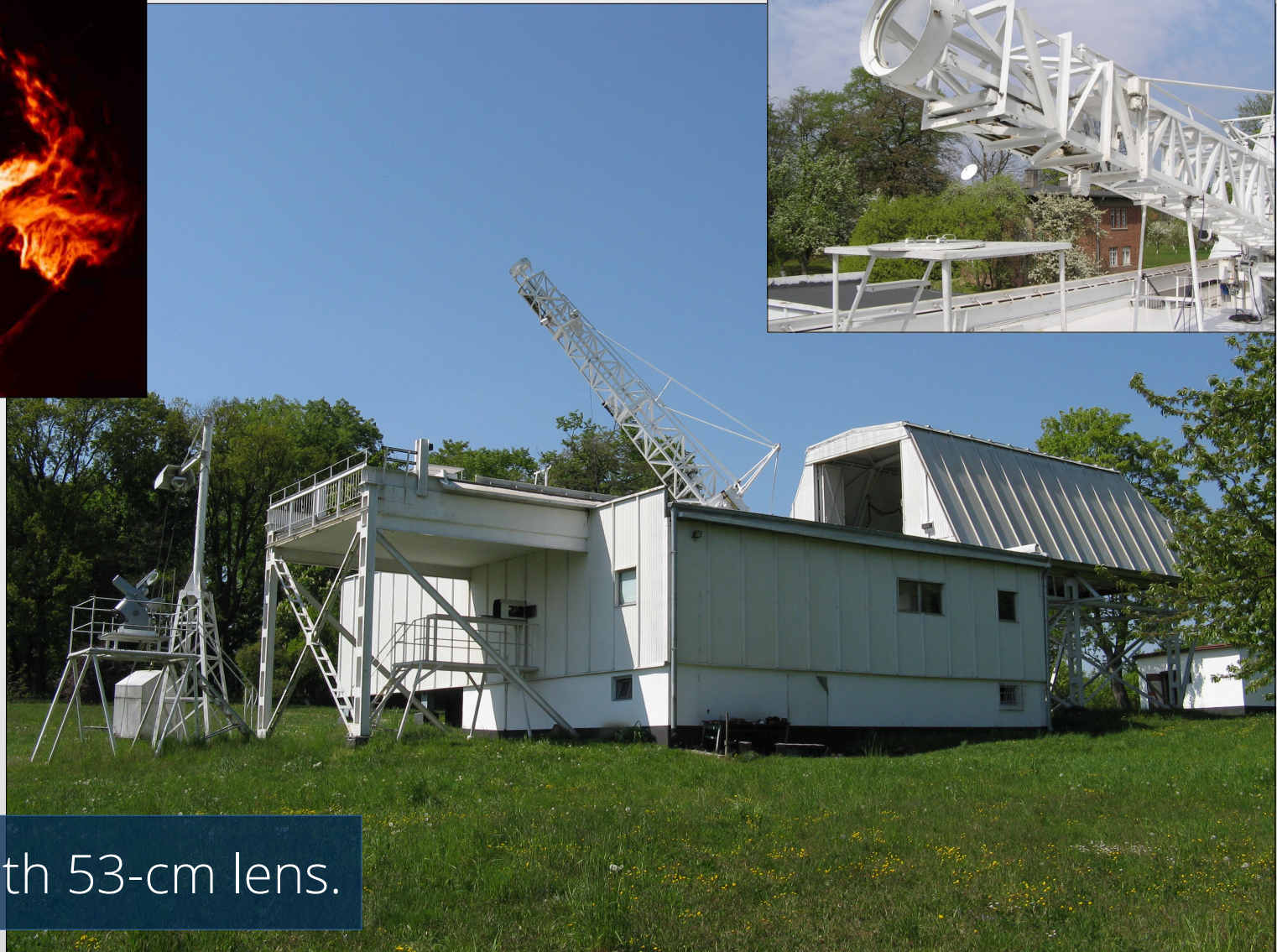
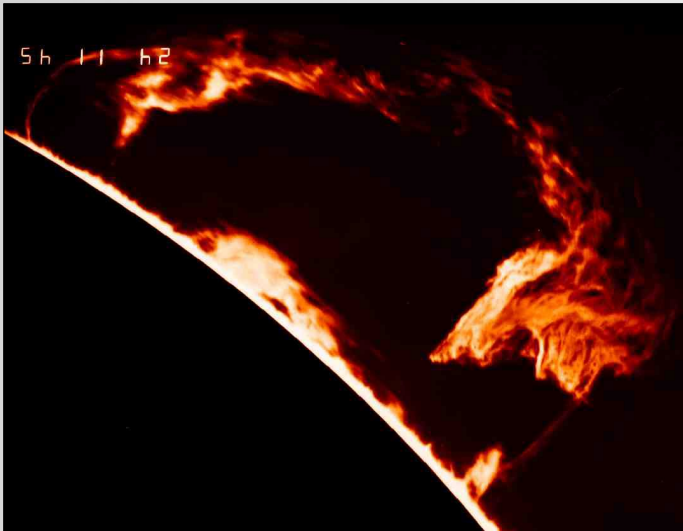
Białków Observatory - location



Altitude ~150m



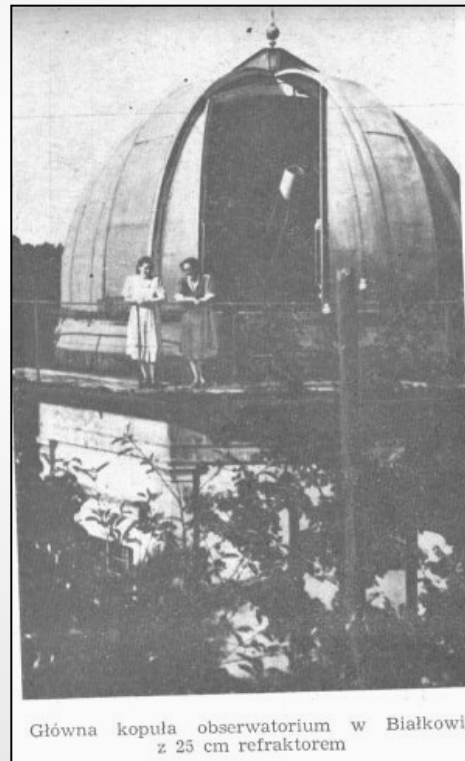
Białków Observatory – astrophysics and heliophysics



Coronagraph with 53-cm lens.

A bit of history...

- The observatory was established by Leo von Wutschichowski in the 80's of XIX century.
- After his death in 1927, the observatory was given to Wrocław University.
- The old, 25-cm refractor, was replaced by the 60-cm Cassegrain telescope in 1976.



Some parameters

- Telescope:
 - 60-cm Zeiss Cassegrain,
 - focal length: 750 cm,
 - image scale: 27.5"/mm.
- CCD camera:
 - back-illuminated ANDOR iKon-L DW432-BV,
 - ccd size: 1250 x 1152 pix, pixel size: 22.5 μm ,
field of view: 12.89' x 11.88', image scale: 0.619"/pix.
- Filters:
 - $BV(RI)_C$ Johnson-Kron-Cousins,
 - H α filters: narrow 3-nm FWHM and wide 40-nm FWHM.
- Weather conditions: seeing $\sim 2.5''$, about 1200 observing nights in the years 2005 – 2017 (biased by the amount of observers): ~ 92 nights/year.
- Automated calibration and half-automated profile and aperture photometry and astrometry (CCDPhot).



Białków astrophysics

Two main observing programs:

- From 1992 - searching for hot, pulsating variable stars in young open clusters.
- From 1997 - searching for variable stars in globular clusters.
- + Kepler, Gaia alerts, and other follow-ups.



NGC 6910 campaign

- Kołaczkowski et al. (2004): 4 β Cep in NGC 6910.

A CCD Search for Variable Stars of Spectral Type B in the Northern Hemisphere Open Clusters. VI. NGC 6910

by

Z. Kołaczkowski, A. Pigulski, G. Kopacki and G. Michalska

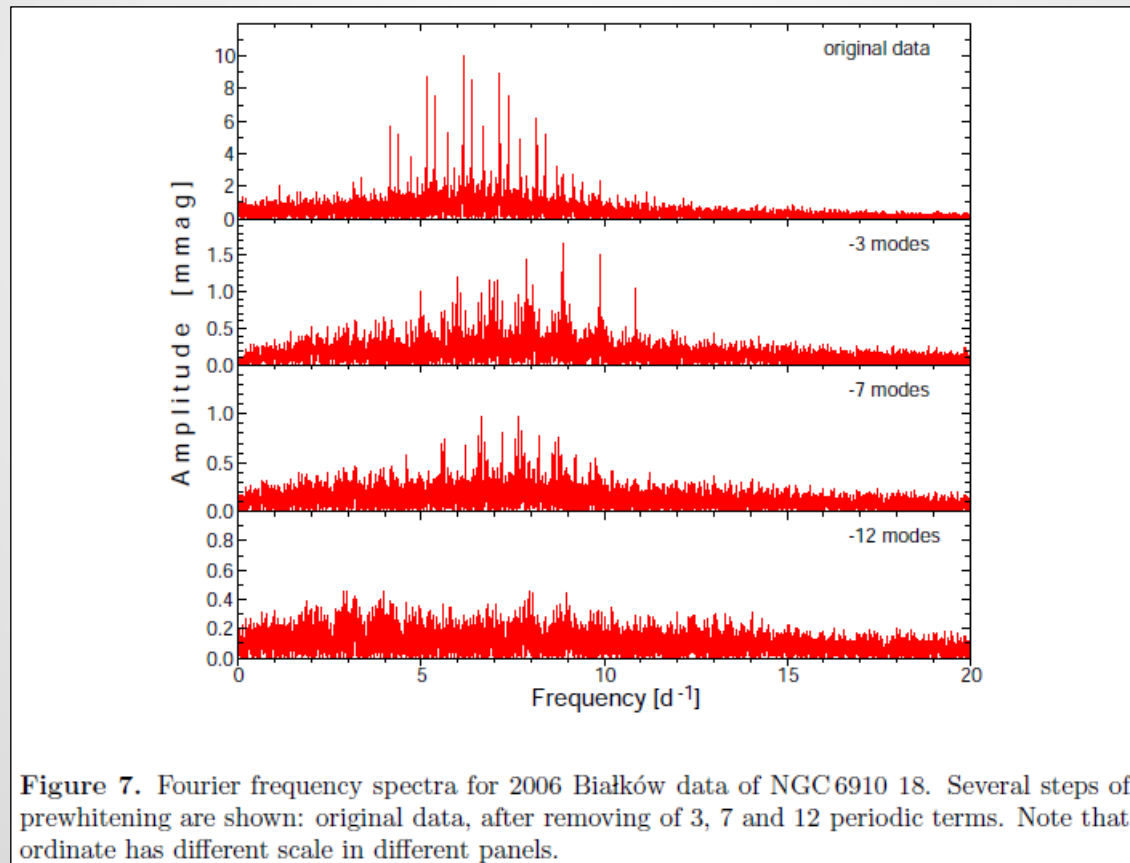
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Received February 27, 2004

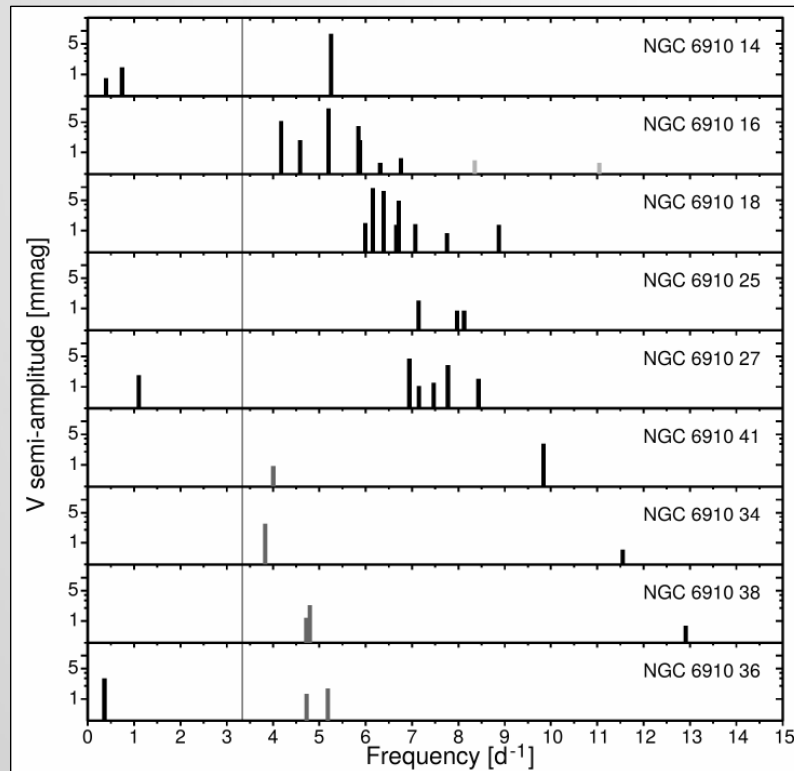
NGC 6910 campaign

- In the years 2005 – 2007 and 2013.
- The most usable photometric data: Białków and Xinglong (China) observatories (157 nights).

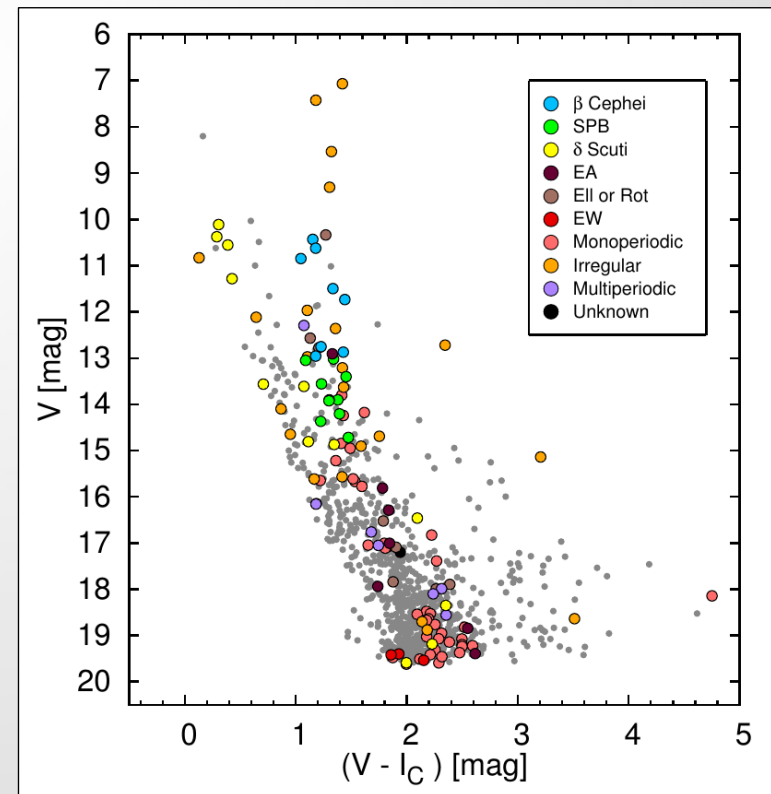


NGC 6910 campaign

- In the years 2005 – 2007 and 2013.
- The most usable photometric data: Białków and Xinglong (China) observatories (157 nights).
- 8 β Cep-type stars, 125 variable stars (117 new) in total.



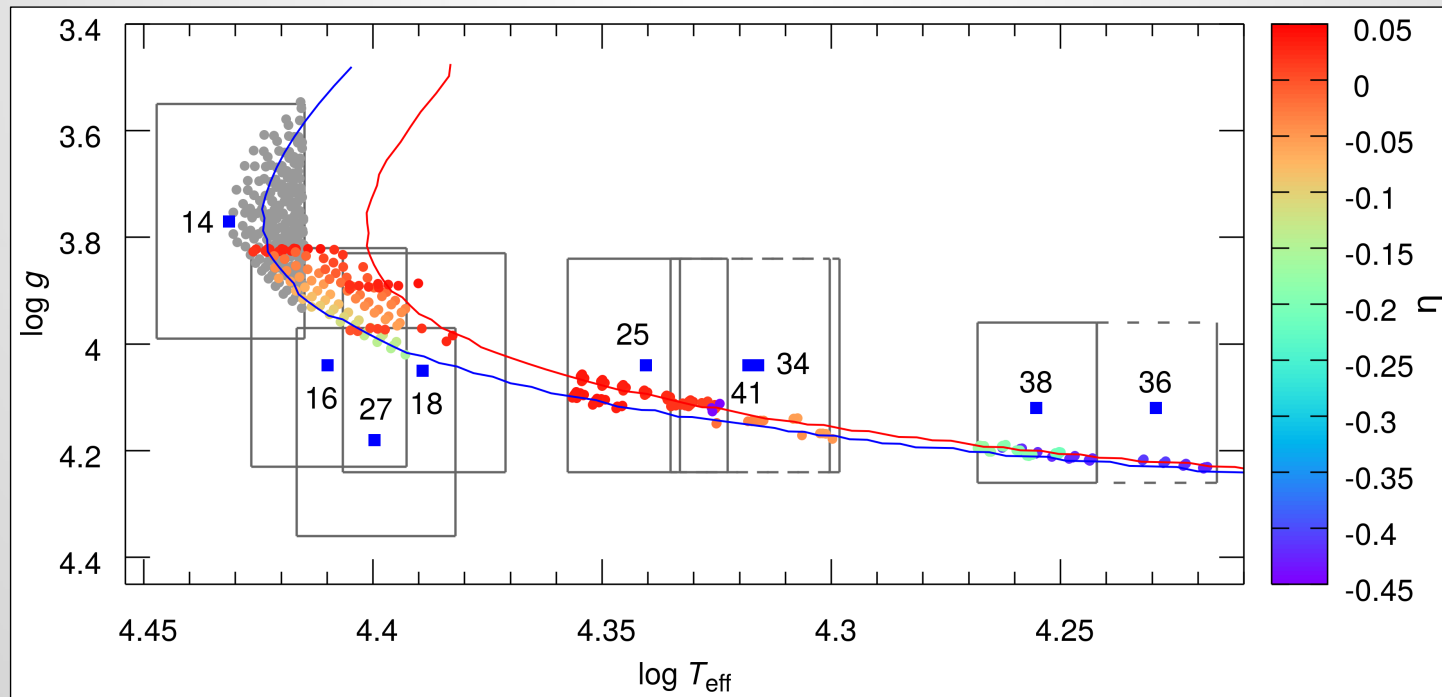
Saesen et al., 2010, AN 331, 1080



Moździerski et al. (in prep.)

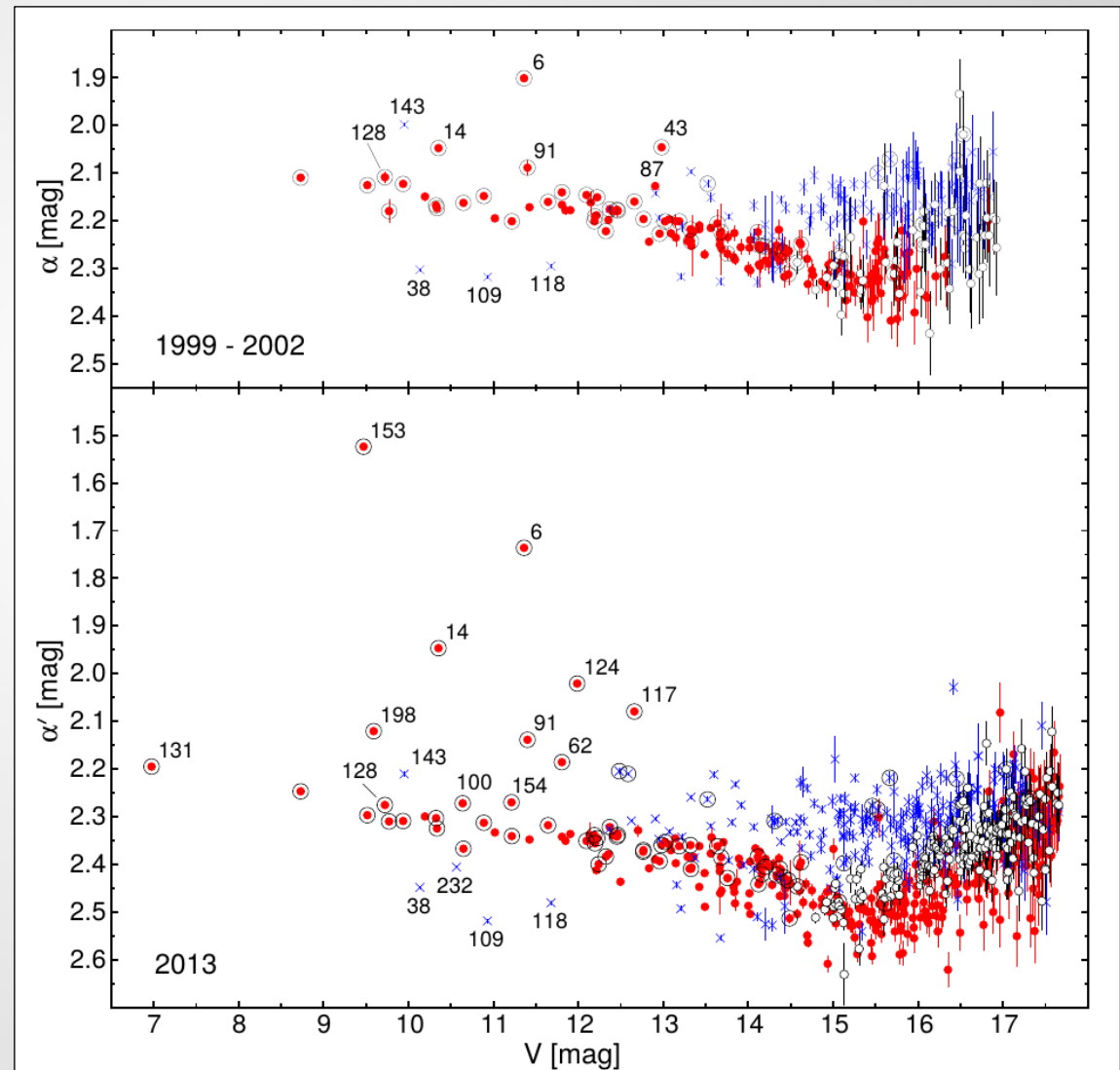
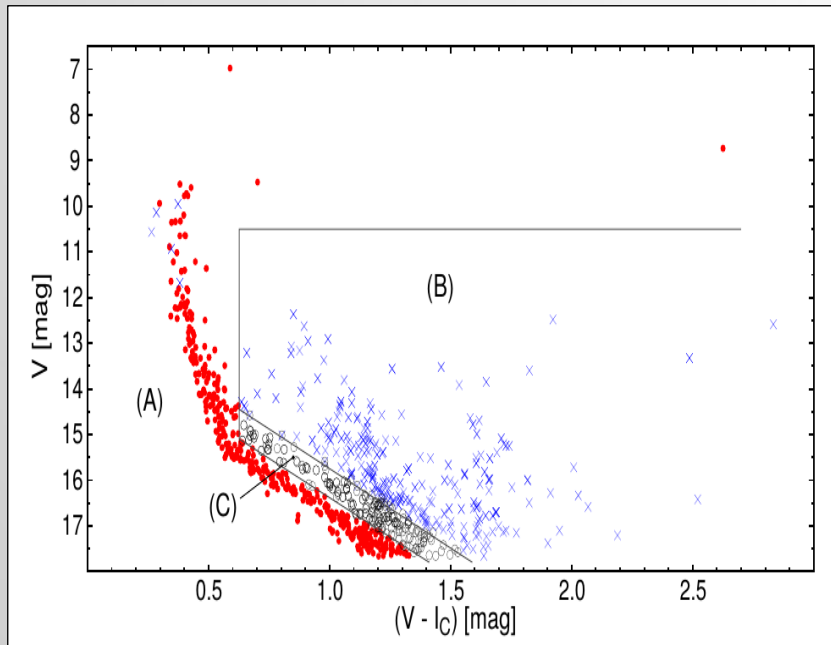
NGC 6910 campaign

- Additionally we determined atmospheric parameters and we got time series of variability of spectral lines profiles in order to carry out so called ensemble asteroseismology of B-type pulsating stars in NGC 6910:
 - APO – Apache Point Observatory (USA), tel. 3,5 m, echelle 3200 Å – 10 000 Å, $R = 31500$.
 - OHP – Haute-Provence Observatory (France), tel. 1,93 m, echelle 3872 Å – 6943 Å, $R = 75000$.
 - NOT – Nordic Optical Telescope (Wyspy Kanaryjskie), tel. 2,56 m, echelle 3700 Å – 7300 Å, $R = 46000$.

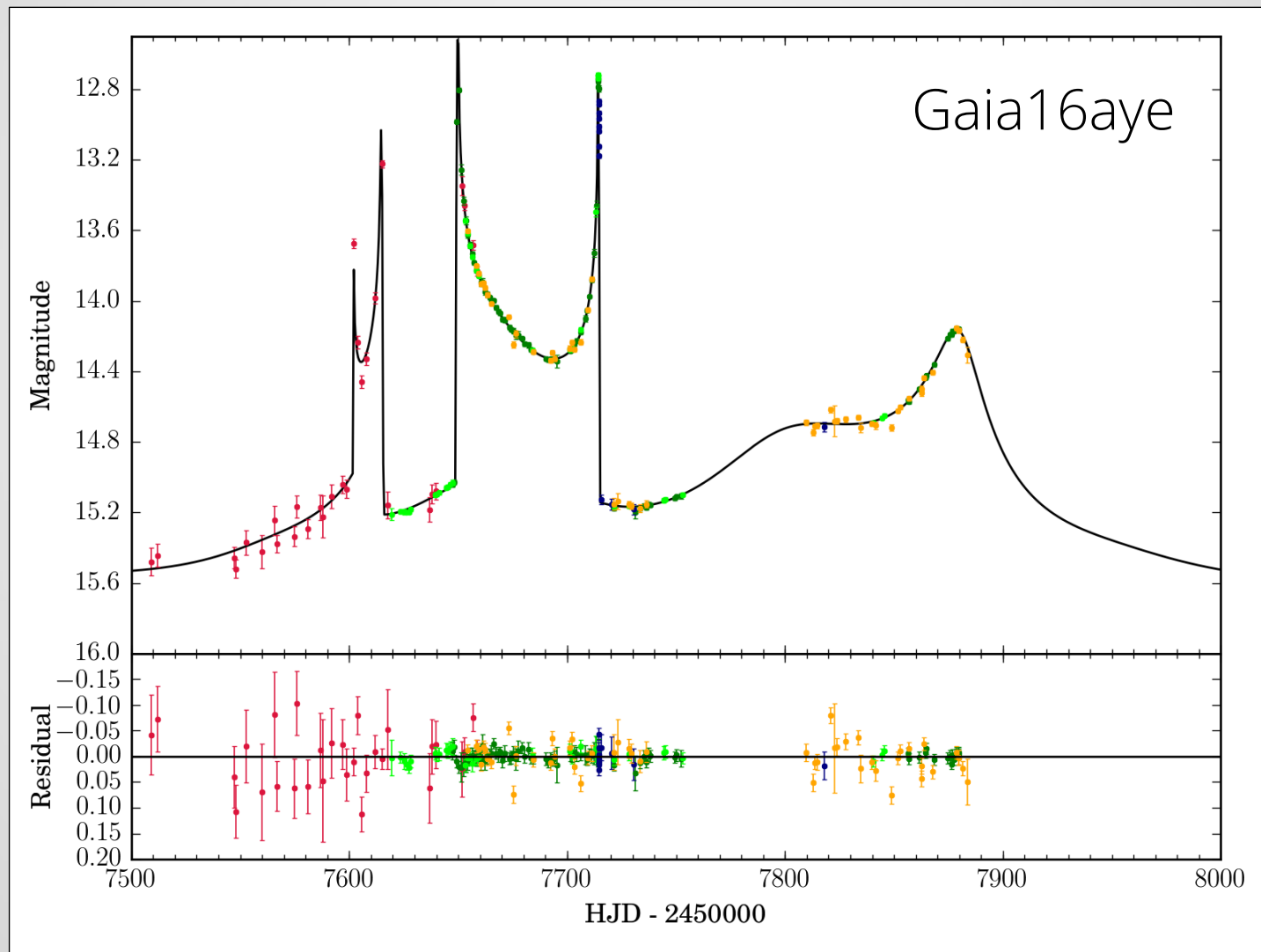


H α photometry – e.g. NGC 457

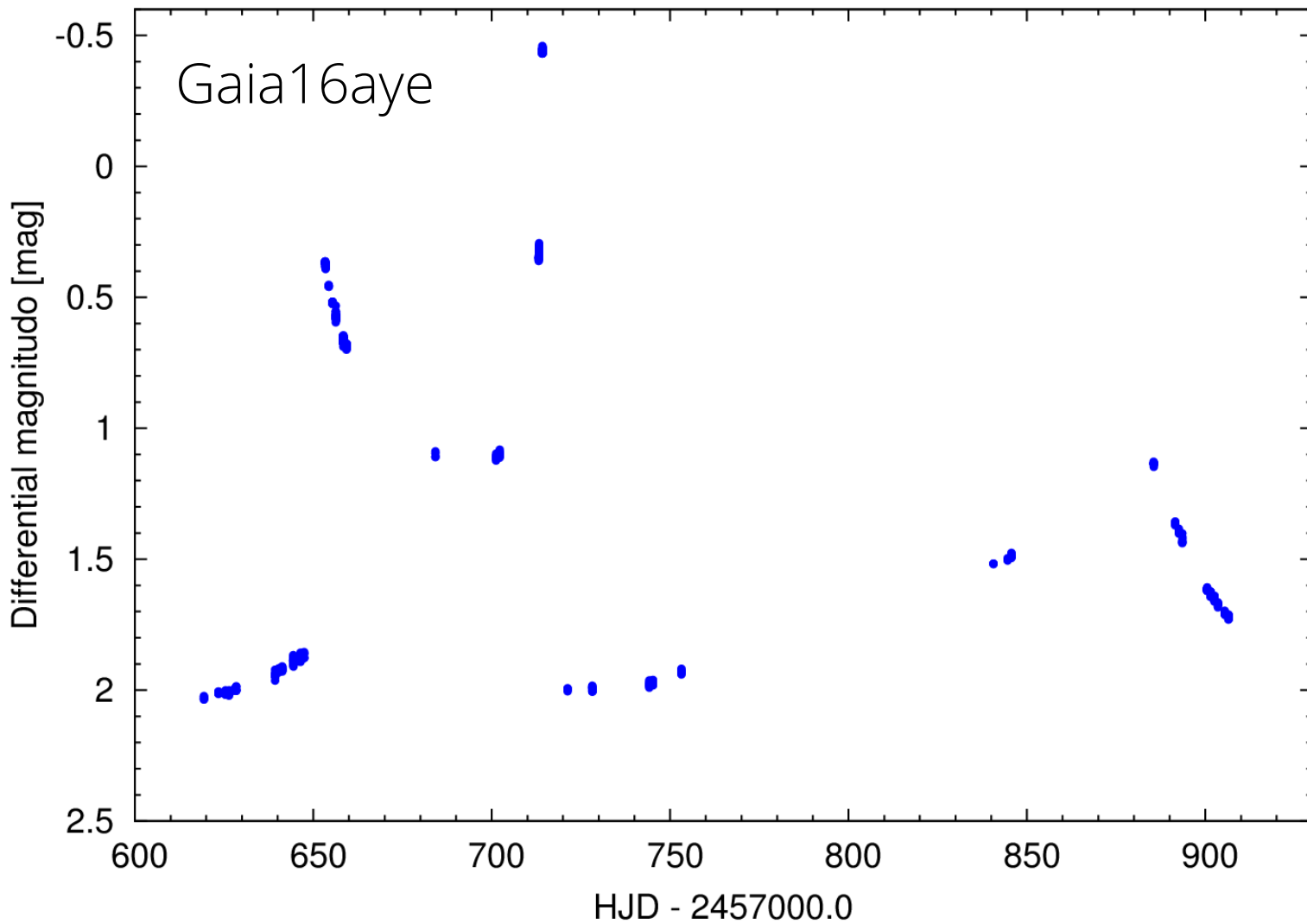
- A – NGC 457 members
- B – field stars
- C – double-star sequence of cluster stars



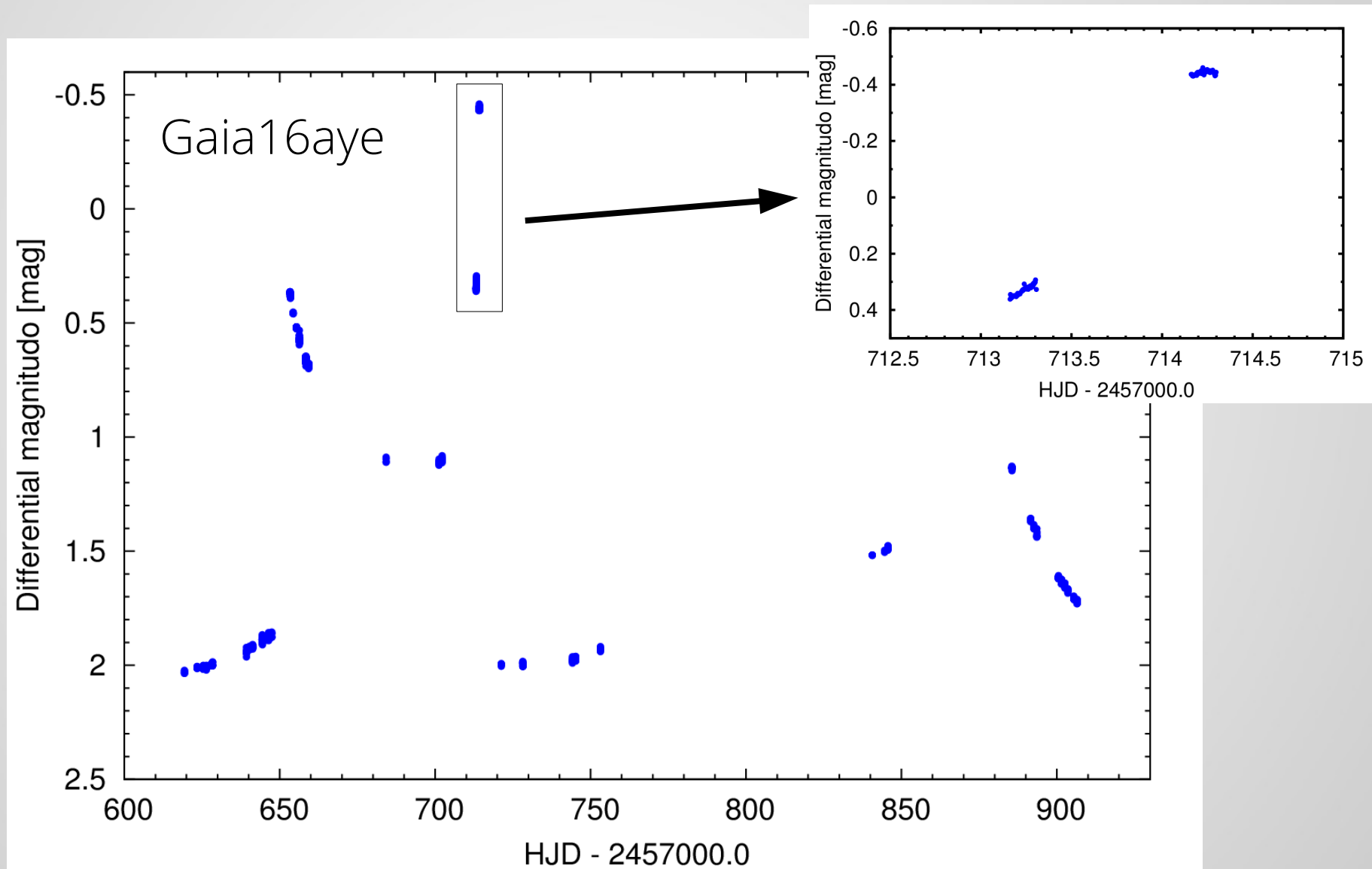
Gaia alerts follow-up



Gaia alerts follow-up



Gaia alerts follow-up



Large Białków Observatory photometry archive

- About 700 objects.

12Lac	ASAS190751+4629.2	GALEXJ0742	Gaia14acf	M65	NGC5985	NGC7023
16Lac	ASAS191404+4456.2	GALEXJ0748	Gaia14ach	M71	NGC6210	NGC7044
1998_V033	ASAS191500+4113.8	GALEXJ0756	Gaia14acj	M71	NGC6217	NGC7063
1999KW4	ASAS191525+5106.4	GALEXJ0807	Gaia14acm	M74	NGC6229	NGC7086
2003UB313	ASAS191704+5115.4	GALEXJ0809	Gaia14acq	M76	NGC637	NGC7128
2005YU55	ASAS192016+4820.3	GALEXJ0825	Gaia14acr	M78	NGC6503	NGC7129
2006VV2	ASAS192023+4659.2	GALEXJ0845	Gaia14acx	M81	NGC654	NGC7160
2MASS132118	ASAS192210+5048.7	GALEXJ0851	Gaia14ada	M82	NGC6543	NGC7235
2MASSJ16211735	.	GALEXJ0924	Gaia14add	M85	NGC6543	NGC7243
3C273	.	GALEXJ1017	Gaia14adf	M92	NGC659	NGC7317
Al_Vel	.	GALEXJ1023	Gaia14adl	M95	NGC663	NGC7318
ALS9779	AU_Mon	GALEXJ1027	.	M97	NGC6796	NGC7319
ASAS-13ax	AZCas	.	.	M99	NGC6811	.
ASAS070452	Abell2151	.	.	NGC1193	NGC6823	.
ASAS121341	Albus8	.	IC1101	NGC1333	NGC6826	.
ASAS142443	Archinal1	GSC4556	IC1396	NGC1491	NGC6830	.
ASAS150031	BF_Oph	GSC4556	IC1590	NGC1502	NGC6834	.
ASAS175245+0700.7	BO_Lyn	GSC_4232	IC1805	NGC1579	NGC6842	.
ASAS184408+4426.8	BS_Dra	Gaia14aaa	IC1871	NGC1624	NGC6857	.
ASAS184625+4347.6	BW_Vul	Gaia14aab	IC2461	NGC1778	NGC6866	.
ASAS184756+4249.4	Bal09	Gaia14aae	IC334	NGC1788	NGC6871	.
ASAS184924+4714.1	Barnard	Gaia14aaf	IC348	.	NGC6888	.
ASAS185443+4340.4	Barnard361	Gaia14aat	IC434	.	NGC6910	.
ASAS185846+4109.9	Be59	Gaia14aax	IC4582	.	NGC6913	.
ASAS185859+4234.4	Berkeley28	Gaia14aaz	IC4996	NGC5278	NGC6913	.
ASAS185953+3908.4	Berkeley59	Gaia14abg	IC5146	NGC5466	NGC6934	.
ASAS185953+3916.1	.	Gaia14abh	KIC10030943	NGC5630	NGC6946	.
ASAS190049+4359.5	.	Gaia14abh	KIC10130954	NGC5669	NGC6951	.
ASAS190635+4327.6	.	Gaia14aca	KIC11754974	NGC581	NGC6960	.
ASAS190737+4640.5	GALEXJ0741	Gaia14acd	KIC1573174	NGC5907	NGC6992	.

Some nice Białków pictures at the end...

C/2014 Q2 (Lovejoy)

M 82

SN2014J

M 57

M 1

C/2013 R1

M 27

IC 1590