

# ***Observations of Gaia transients at the Terskol Observatory***

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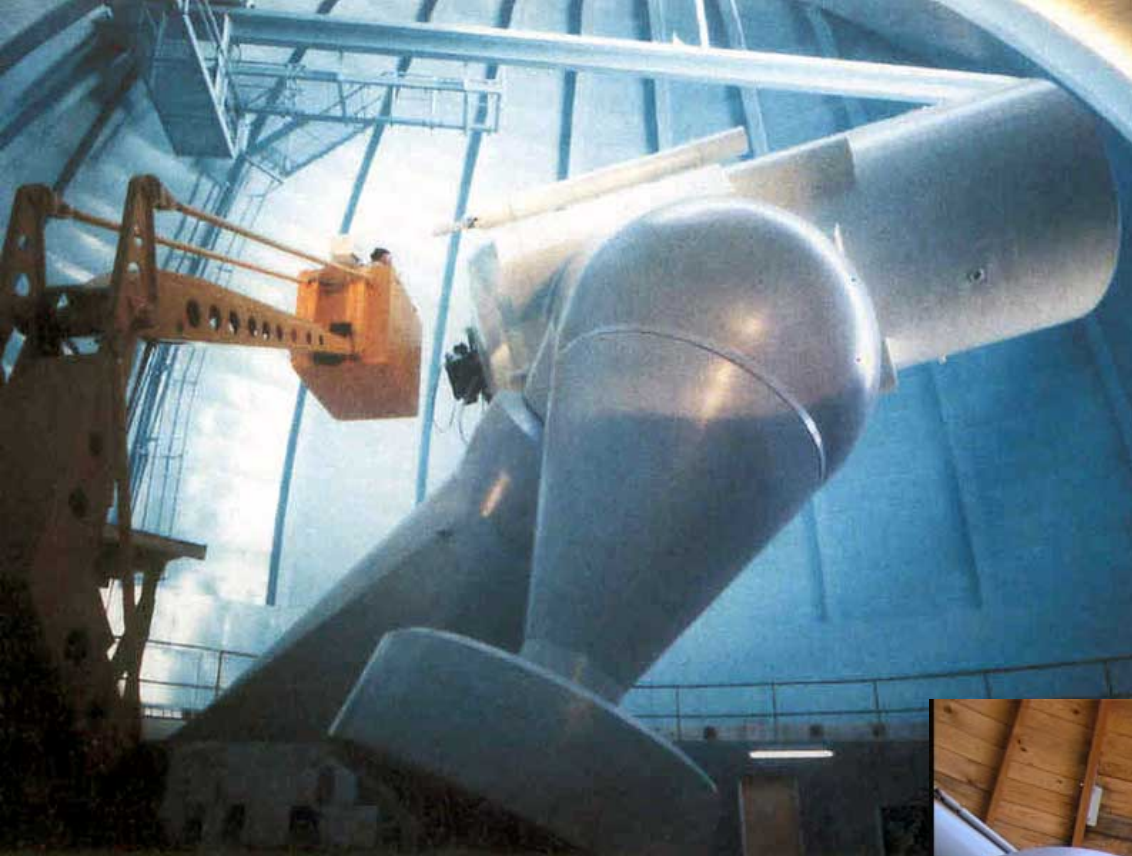


# ***Terskol Observatory***

***Location:*** Terskol Peak in the Northern Caucasus ( $43^{\circ}16'29''\text{N}$ ,  $42^{\circ}30'03''\text{E}$ , 3143 m asl)







## **2-m RCC telescope**

Main mirror:  $d = 2\text{m}$ ,  $f = 5.6\text{ m}$

*Ritchey-Chretien system*

*equivalent focal length: 16 m*

*field of view: 11' x 11'*

*CCD Camera FLI PL4301*

## **Zeiss-600 telescope**

$d = 0.6\text{ m}$

*focal length 7,75 m*

*field of view: 10.9' x 10.9'*

*CCD camera SBIG STL-1001*

*(1024x1024) 24x24 microns*



## ***Scientific activities***

- High-resolution spectroscopy of stars; study of interstellar matter
- **Follow-up observations of Gaia transients and asteroids**
- Search for optical afterglow of gamma ray bursts
- Observations of white dwarfs within the Whole Earth Telescope project (the WET collaboration)
- Astrometry, photometry, and spectroscopy of Solar System small bodies

# ***Observations of Gaia transients***

***Photometry with BVRI filters*** (including a long-term monitoring)

## ***Selection of targets***

- (very) recently detected transients (*G* mag down to 19<sup>m</sup>)
- a high emphasis on follow-up observations of **unclassified** objects
- objects which show unusual (intriguing) light curves

***In 2016-2017, a variety of Gaia transients was observed at Terskol:***

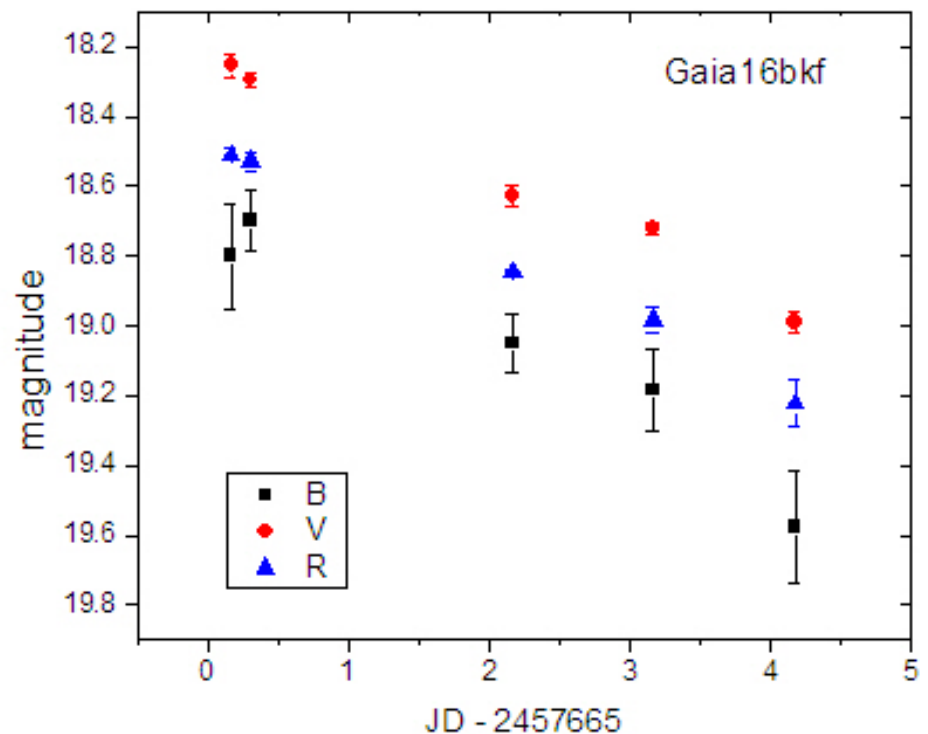
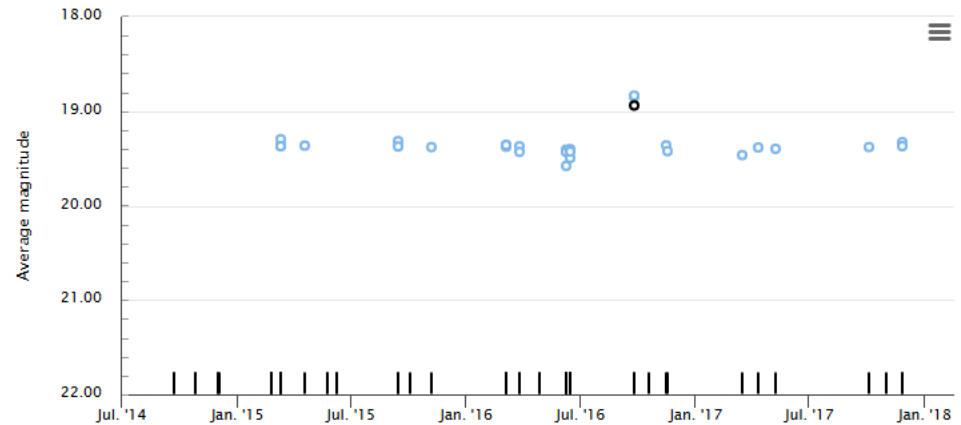
Gaia16asm, Gaia16bkf, Gaia16bkn, Gaia16blg, Gaia16bnz,  
Gaia16bvs, Gaia16bvt,  
Gaia17akp, Gaia17agr, Gaia17agj, Gaia17aqm, Gaia17asz, Gaia17bqo,  
Gaia17cty, Gaia17cuh, Gaia17cvx, etc.

***Most recently observed (2017, December 1-2):***

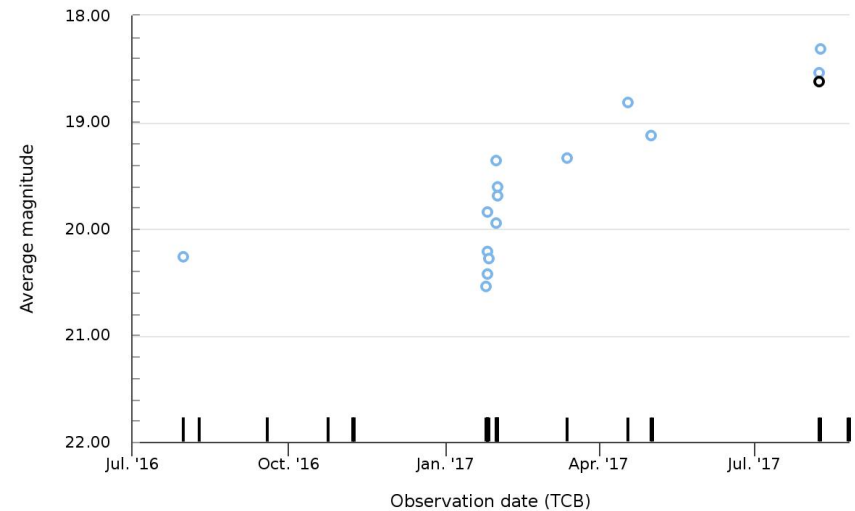
**Gaia17dce, Gaia17dev, Gaia17dcx, Gaia17ddg**

**Gaia16bkf** was detected at magnitude  $G=18.94$  on 2016-09-24. This star near the Galactic plane was found 0.6 mag brighter than during its previous observations by Gaia which had demonstrated a minor variability (about 0.06 mag) in the last 1.5 years. Follow-up of this object started at Terskol on 2016-10-03, just after the alert was published. The BVRI photometry was performed with the 2-m telescope; CCD images were calibrated using NOMAD field stars.

*The plot depicts a rapid decay of Gaia16bkf with changing its color within four days.*



# Gaia17cao

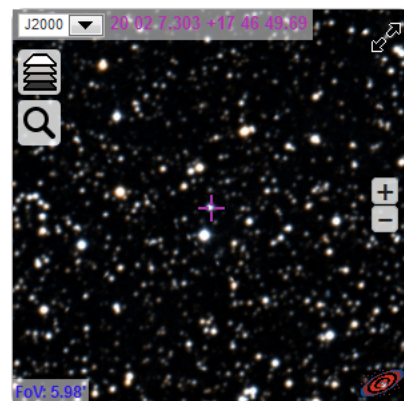


A long-term increase in brightness of Gaia source **Gaia17cao** was announced on 2017-08-11 after its G magnitude reached 18.62 on 2017-08-08 08:33:06 (and 18.31 two hours later). We had begun to observe this object on 2017-08-28 using the 0.6-m Zeiss telescope. Gaia17cao was detected at magnitudes  $V = 19.6 \pm 0.1$ ,  $R = 18.8 \pm 0.1$  (MJD 57993.71) that indicated a fading trend in brightness of the source. Results of further observations in September and November 2017 are as follows:

The magnitudes were calibrated against AAVSO field stars; they are not corrected for the Galactic foreground extinction.

MJD	V	<u>eV</u>	R	<u>eR</u>
57999.78	20.1	0.1	19.4	0.1
58000.77	20.0	0.1	19.5	0.1
58066.65	20.1	0.1	19.3	0.1
58070.64	20.2	0.1	19.4	0.2



[Details](#)[Follow-up](#)

Other surveys detections

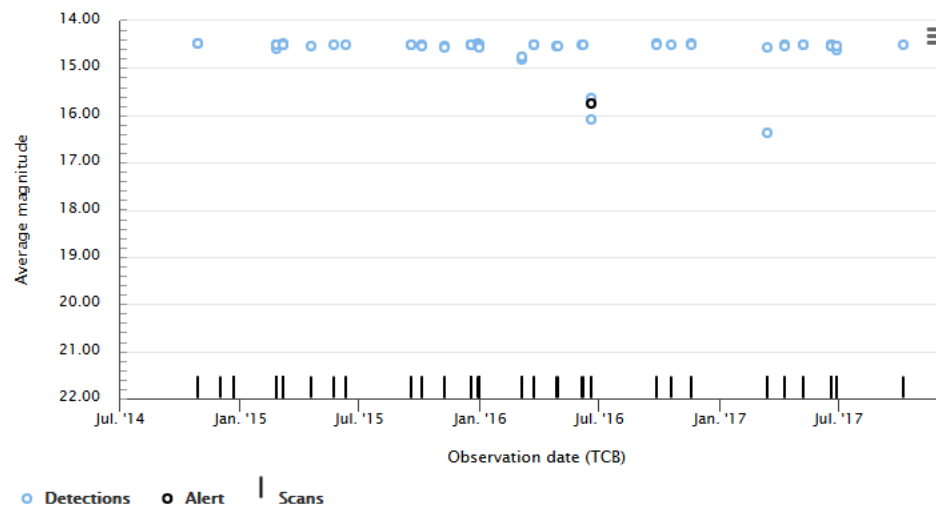
None

Comments

almost 2 mag dip in star

ATels

11006

TNS ID  
AT2016edyRA - DEC  
300.53043 17.78047  
20:02:07.30 17:46:49.69  
Galactic coords.  
56.91197 -6.77712Alerting date  
2016-06-19 20:37:39  
Julian date  
2457559.36  
Alerting magnitude  
15.74  
Historic magnitude  
14.61  
Historic StdDev  
0.02  
Class  
unknown  
Publication date  
July 2, 2016, 10:01 p.m.[Get lightcurve data](#)

An almost 2 mag dip in brightness of **Gaia16asm** was detected by Gaia twice over the last three years. Our photometry which was performed in July and November 2017 with the 0.6-m telescope didn't show any signs of significant variability in brightness of this star. The magnitudes were calibrated against NOMAD field stars; they are not corrected for the Galactic foreground extinction

MJD	B	<u>eB</u>	V	<u>eV</u>	R	<u>eR</u>
57936.94	14.66	0.01	14.56	0.02	15.10	0.02
57937.96	14.67	0.02	14.57	0.01	15.10	0.01
57939.98	14.68	0.06	14.59	0.01	15.13	0.03
58066.71	14.71	0.01	14.57	0.01	15.10	0.01
58070.69	14.72	0.01	14.57	0.01	15.10	0.01
58072.74	14.66	0.05	14.56	0.03	15.10	0.02
58074.79	14.73	0.06	14.54	0.02	15.08	0.05

# Follow-up of asteroids

In 2015, we start to observe asteroids discovered within the Gaia project. Objects have been selected from the lists of recently discovered asteroids prepared by the GBOT team (<http://gbot.obspm.fr/index.php?page=asteroids>), as well as by the Gaia-FUN-SSO group (<https://gaiafunssso.imcce.fr/public-alerts/list.php> - s. *W.Thuillot's presentation*)

Objects have been observed down to V magnitude of 21<sup>m</sup>, with individual exposure times of 60-180 s.

Asteroids from the GBOT list:

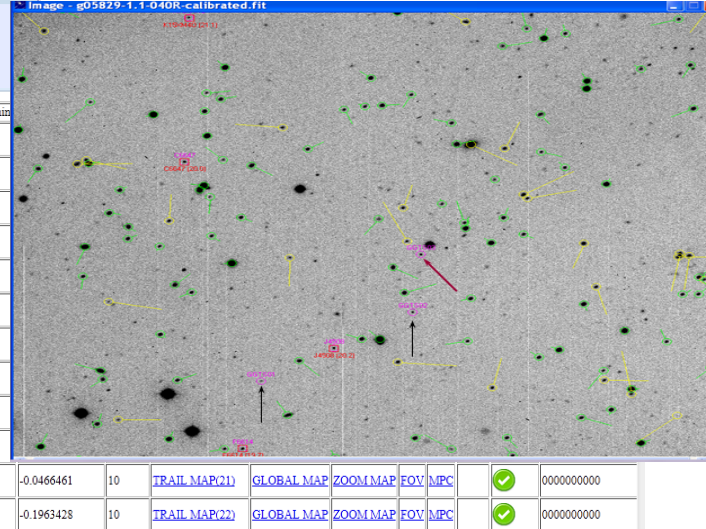
G01366, G01378, G01831, G01893, G01899, G01900, G01764, G01773, G05150, G05164, G05168, G05165, G05089, G05154, G05117, G05120, G05096, G05829, G05860, G05865, G06018, G06026, G06028, G06029, G06030.

All the positions were submitted to the IAU Minor Planet Center (\url{www.minorplanetcenter.net}).



## Presentation of the GBOT asteroid finding programme

GBOT AST NAME	STATUS	MPC NAME	DATE(UTC)	RA(hh mm ss.s)	DEC(dd mm mss.ss)	MAG(R)	d[RAcosDEC] dt(" min
AST_20151031_CCD1_11	new	G02528	2015 11 01.13996	03 12 25.07	+18 48 44.5	19.4	-0.7356079
AST_20151031_CCD2_12	new	G02529	2015 11 01.13996	03 12 42.21	+18 42 39.0	20.5	-0.4935554
AST_20151031_CCD2_13	new	G02530	2015 11 01.13996	03 12 50.41	+18 45 17.8	20.3	-0.5622914
AST_20151031_CCD2_14	new	G02531	2015 11 01.13996	03 12 42.13	+18 41 17.0	19.7	-0.5277379
AST_20151031_CCD2_15	new	G02532	2015 11 01.13996	03 12 54.64	+18 46 11.3	20.7	-0.6423381
AST_20151031_CCD2_16	new	G02533	2015 11 01.13875	03 12 55.11	+18 35 42.7	21.4	-0.3356912
AST_20151031_CCD1_12	new	G02534	2015 11 01.13996	03 13 19.86	+19 09 01.4	21.1	-0.5441000
AST_20151031_CCD1_13	new	G02535	2015 11 01.13996	03 13 39.13	+19 17 38.6	20.6	-0.5518354
AST_20151031_CCD1_12	new	G02536	2015 11 01.13996	03 13 08.37	+19 33 09.7	20.8	-0.5776573
AST_20151031_CCD20_11	new	G02537	2015 11 01.13996	03 16 08.88	+18 46 57.5	20.3	-0.5380488
AST_20151031_CCD21_12	new	G02538	2015 11 01.13996	03 14 26.60	+18 55 16.8	20.5	-0.5451306
AST_20151031_CCD22_11	new	G02539	2015 11 01.13996	03 14 53.42	+19 01 01.7	20.5	-0.5270800




# Hunt for Gaia asteroids

<https://gaiafunssso.imcce.fr/public-alerts/list.php>

***g1Y031***

<input type="checkbox"/>	2017-06-26 23:58:51	17:34:13.104	21:22:32.880	$19.7^{0.5}_{0.2}$	0.05697
<input checked="" type="checkbox"/>	2017-06-27 01:31:26	17:34:09.552	21:28:40.440	$19.7^{0.5}_{0.2}$	0.05826
<input type="checkbox"/>	2017-06-27 07:31:26	17:33:55.728	21:28:26.040	$19.7^{0.5}_{0.2}$	0.06349
<input checked="" type="checkbox"/>	2017-06-27 13:31:26	17:33:41.976	21:28:09.480	$19.7^{0.5}_{0.2}$	0.06904
<input type="checkbox"/>	2017-06-27 19:31:26	17:33:28.296	21:14:38.040	$19.7^{0.5}_{0.2}$	0.07491
<input checked="" type="checkbox"/>	2017-06-27 23:58:51	17:33:18.168	21:14:11.760	$19.7^{0.5}_{0.2}$	0.0795
<input type="checkbox"/>	2017-06-28 01:31:26	17:33:14.688	21:14:02.400	$19.7^{0.5}_{0.2}$	0.08113
<input checked="" type="checkbox"/>	2017-06-28 07:31:26	17:33:01.128	21:27:07.560	$19.7^{0.5}_{0.2}$	0.0877
<input checked="" type="checkbox"/>	2017-06-28 13:31:26	17:32:47.640	21:26:35.520	$19.7^{0.5}_{0.2}$	0.09465

The International Astronomical Union  
**Minor Planet Center**

**OBSERVERS****PUBLIC**

2017 MY7

First observed at Terskol on 2017-06-28.

(Discoverer will be defined when the object is numbered. See [this](#).)


Orbit

Orbit type: Hungaria

Interactive Orbit Sketch

Note: WebGL enabled browser required

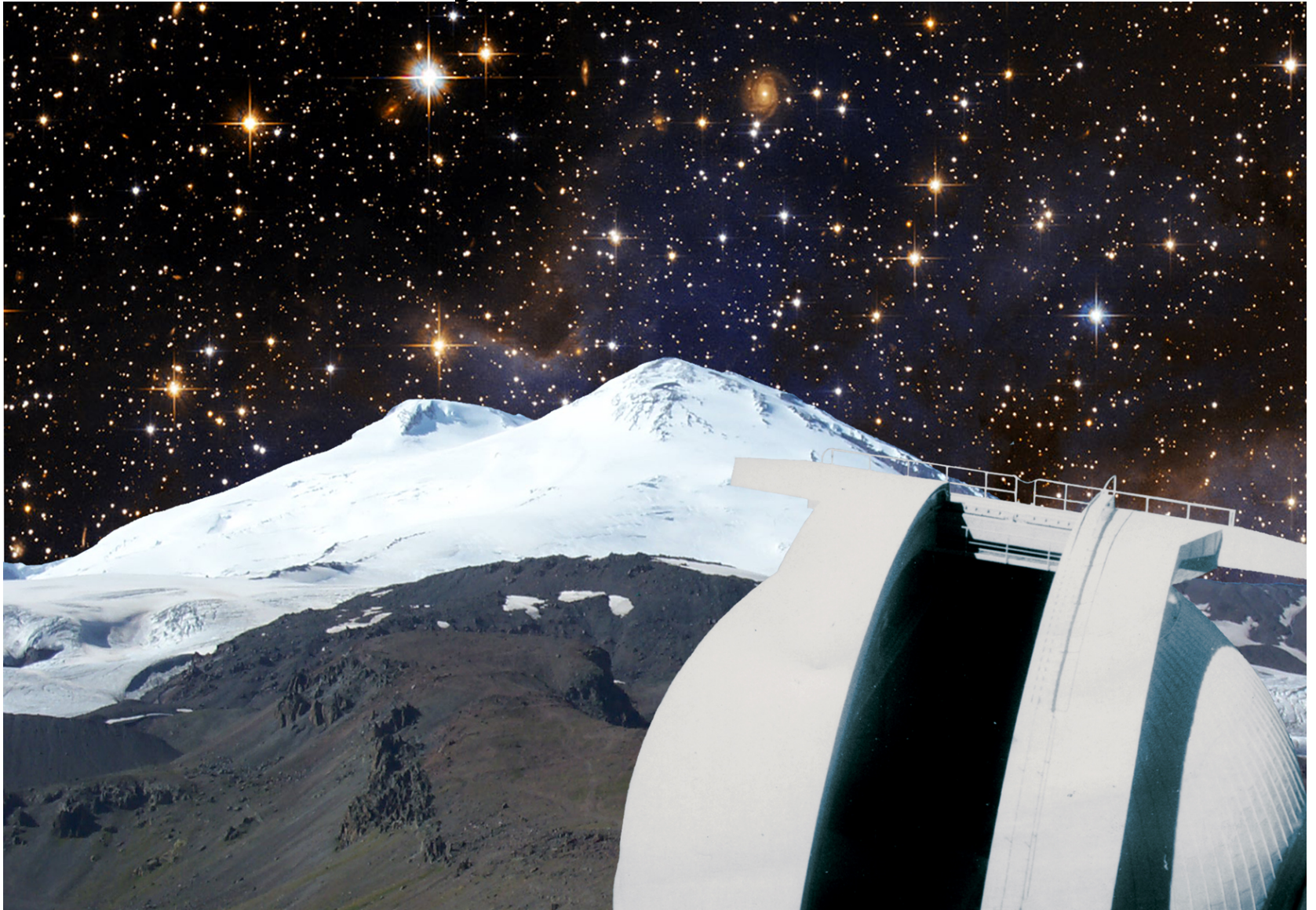
J2000 17 28 26.743 +21 23 24.50



FoV: 2°



# Thank you for attention!



We acknowledge ESA Gaia, DPAC and the Photometric Science Alerts Team (<http://gsaweb.ast.cam.ac.uk/alerts>).