

COLLABORATIVE ASTEROID PHOTOMETRY FROM UAI: 2021 APRIL-JUNE

Lorenzo Franco
Balzaretto Observatory (A81), Rome, ITALY
lor_franco@libero.it

Alessandro Marchini
Astronomical Observatory, DSFTA - University of Siena (K54)
Via Roma 56, 53100 - Siena, ITALY

Marco Iozzi
HOB Astronomical Observatory (L63), Capraia Fiorentina,
ITALY

Giulio Scarfi
Iota Scorpis Observatory (K78), La Spezia, ITALY

Nico Montigiani, Massimiliano Mannucci
Osservatorio Astronomico Margherita Hack (A57)
Florence, ITALY

Pietro Aceti, Massimo Banfi
Seveso Observatory (C24), Seveso, ITALY

Fabio Mortari
Hypatia Observatory (L62), Rimini, ITALY

Gianni Galli
GiaGa Observatory (203), Pogliano Milanese, ITALY

Paolo Bacci, Martina Maestripieri
GAMP - San Marcello Pistoiese (104), Pistoia, ITALY

Adriano Valvasori, Ernesto Guido
ALMO Observatory (G18), Padulle (BO), ITALY

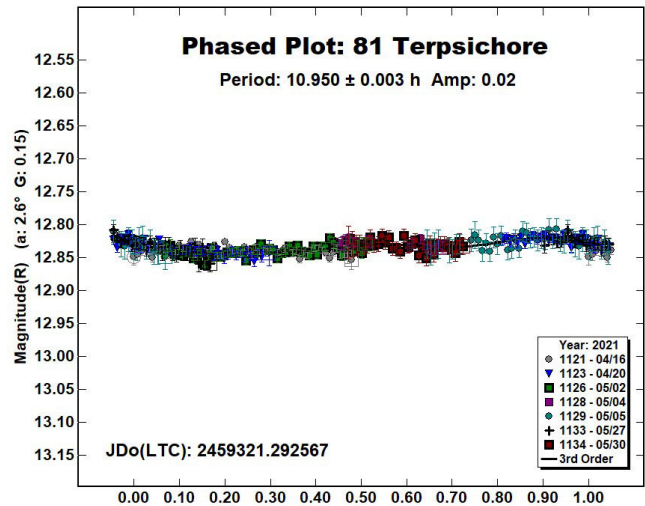
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Photometric observations of eight asteroids were made in order to acquire lightcurves for shape/spin axis modeling. The synodic period and lightcurve amplitude were found for 81 Terpsichore, 363 Padua, 563 Suleika, 909 Ulla, 929 Algunde, 1048 Feodosia, 3385 Bronnina, 3760 Poutanen.

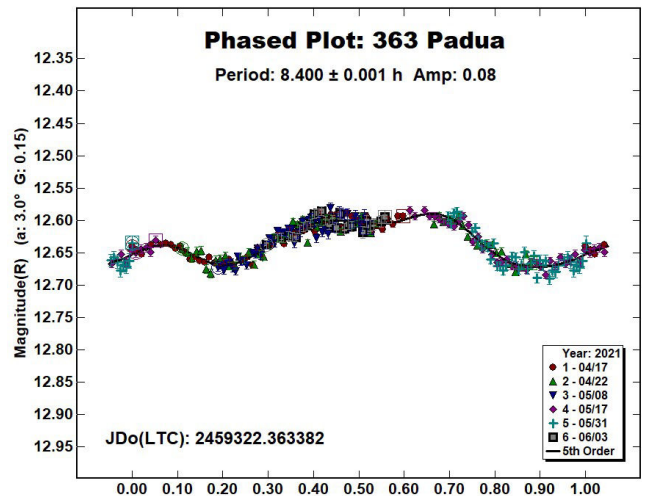
Collaborative asteroid photometry was done inside the Italian Amateur Astronomers Union (UAI; 2021) group. The targets were selected mainly in order to acquire lightcurves for shape/spin axis modeling. Table I shows the observing circumstances and results.

CCD observations of eight asteroids were made in 2021 April-June using the instrumentation described in the Table II. Lightcurve analysis was performed at the Balzaretto Observatory with *MPO Canopus* (Warner, 2021). All the images were calibrated with dark and flat frames and converted to R magnitudes using solar colored field stars from CMC15 catalogue, distributed with *MPO Canopus*. For brevity, the following citations to the asteroid lightcurve database (LCDB; Warner et al., 2009) will be summarized only as "LCDB."

81 Terpsichore is a Cb-type (Bus & Binzel, 2002) outer main-belt asteroid discovered on 1864 September 30 by E.W. Tempel at Marseille. Collaborative observations were made over seven nights. The analysis shows a synodic period of $P = 10.950 \pm 0.003$ h with an amplitude $A = 0.02 \pm 0.01$ mag. The period is close to the previously published results in the LCDB.



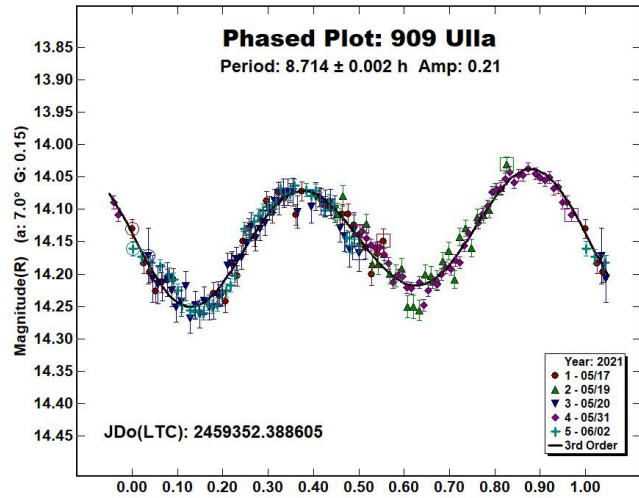
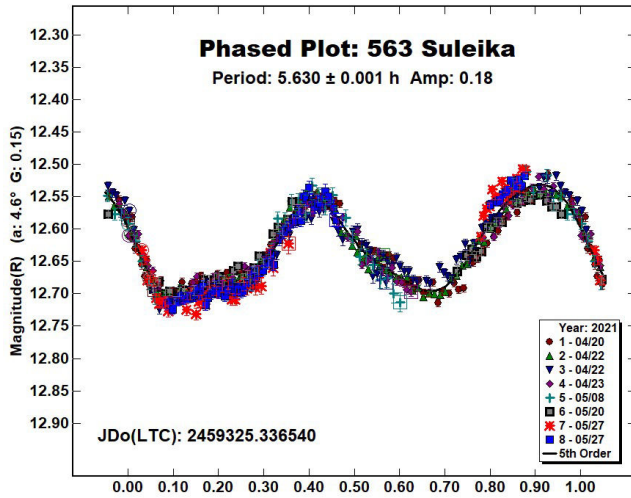
363 Padua is an X-type (Bus & Binzel, 2002) outer main-belt asteroid discovered on 1893 March 17 by A. Charlois at Nice. Collaborative observations were made over six nights. The analysis shows a synodic period of $P = 8.400 \pm 0.001$ h with an amplitude $A = 0.08 \pm 0.02$ mag. The period is close to the previously published results in the LCDB.



563 Suleika is an Sl-type (Bus & Binzel, 2002) outer main-belt asteroid discovered on 1905 April 6 by P. Gotz at Heidelberg. Collaborative observations were made over six nights. We found a synodic period of $P = 5.630 \pm 0.001$ h with an amplitude $A = 0.18 \pm 0.03$ mag. The period is close to the previously published results in the LCDB.

Number	Name	2021 mm/dd	Phase	L_{PAB}	B_{PAB}	Period(h)	P.E.	Amp	A.E.	Grp
81	Terpsichore	04/16-05/30	2.6, 14.4	200	-4	10.950	0.003	0.02	0.01	MB-O
363	Padua	04/17-06/03	3.0, 17.1	202	4	8.400	0.001	0.08	0.02	MB-O
563	Suleika	04/20-05/27	4.5, 13.8	205	10	5.630	0.001	0.18	0.03	MB-O
909	Ulla	05/17-06/02	*7.0, 6.8	245	22	8.714	0.002	0.21	0.03	MB-O
929	Algunde	06/13-06/15	7.9, 9.0	251	2	3.302	0.002	0.13	0.02	MB-I
1048	Feodosia	03/24-05/02	9.0, 19.8	180	15	10.417	0.001	0.09	0.05	MB-O
3385	Bronnina	04/23-05/08	*2.3, 7.3	216	3	2.959	0.001	0.22	0.03	FLOR
3760	Poutanen	04/23-05/08	11.4, 8.7	226	14	2.9560	0.0002	0.18	0.05	MB-I

Table I. Observing circumstances and results. The first line gives the results for the primary of a binary system. The second line gives the orbital period of the satellite and the maximum attenuation. The phase angle is given for the first and last date. If preceded by an asterisk, the phase angle reached an extremum during the period. L_{PAB} and B_{PAB} are the approximate phase angle bisector longitude/latitude at mid-date range (see Harris et al., 1984). Grp is the asteroid family/group (Warner et al., 2009).

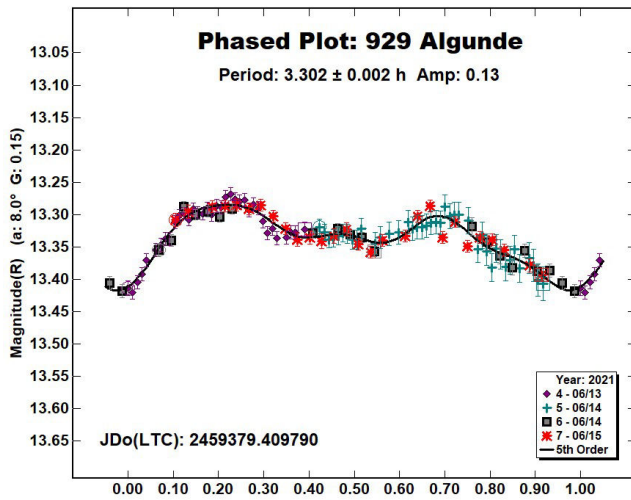


909 Ulla is an X-type (Tholen, 1984) outer main-belt asteroid member of the Cybele group that was discovered on 1919 February 7 by K. Reinmuth at Heidelberg. Collaborative observations were made over five nights. We found a synodic period of $P = 8.714 \pm 0.002$ h with an amplitude $A = 0.21 \pm 0.03$ mag. The period is close to the previously published results in the LCDB.

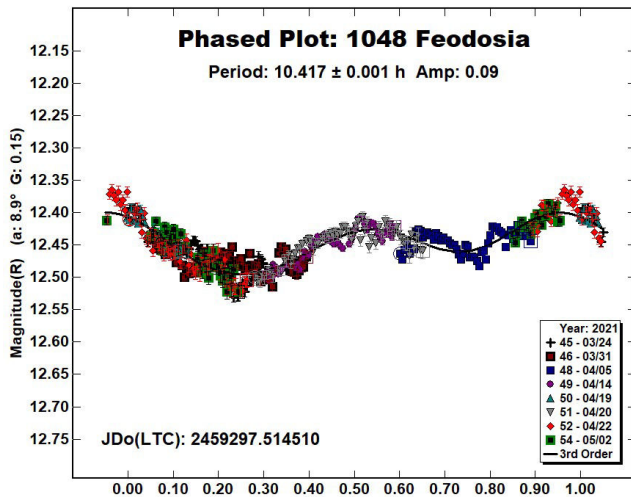
929 Algunde is an S-type (Bus & Binzel, 2002) inner main-belt asteroid discovered on 1920 March 10 by K. Reinmuth at Heidelberg. Collaborative observations were made over three nights. We found a synodic period of $P = 3.302 \pm 0.002$ h with an amplitude $A = 0.13 \pm 0.02$ mag. The period is close to the previously published results in the LCDB.

Observatory (MPC code)	Telescope	CCD	Filter	Observed Asteroids (#Sessions)
Astronomical Obs. of the University of Siena (K54)	0.30-m MCT f/5.6	SBIG STL-6303e (2x2)	C, Rc	81 (7), 363 (3), 909 (1), 929 (2), 3385 (1), 3760 (2)
HOB Astronomical Observatory (L63)	0.20-m SCT f/6.8	CMOS ASI 294 (2x2)	C	363 (3), 1048 (8)
Iota Scorpii (K78)	0.40-m RCT f/8.0	SBIG STXL-6303e (2x2)	Rc	563 (1), 909 (2), 3760 (1)
Osservatorio Astronomico Margherita Hack (A57)	0.35-m SCT f/8.3	SBIG ST10XME (2x2)	Rc	563 (1), 3760 (2)
Seveso Observatory (C24)	0.30-m SCT f/6.3	SBIG ST9	Rc	563 (1), 909 (2)
Hypatia Observatory (L62)	0.25-m RCT f/5.4	SBIG ST8-XE	Rc	563 (3)
GiaGa Observatory (203)	0.36-m SCT f/5.8	Moravian G2-3200	Rc	563 (1), 929 (1)
GAMP (104)	0.60-m NRT f/4.0	Apogee Alta	C	3385 (2)
ALMO Observatory (G18)	0.24-m SCT f/5.1	Atik 4000	Rc	563 (1)

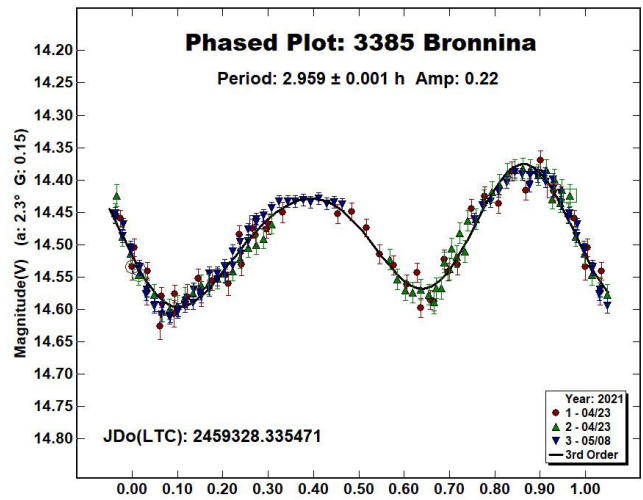
Table II. Observing Instrumentations. MCT: Maksutov-Cassegrain, NRT: Newtonian Reflector, RCT: Ritchey-Chretien, SCT: Schmidt-Cassegrain.



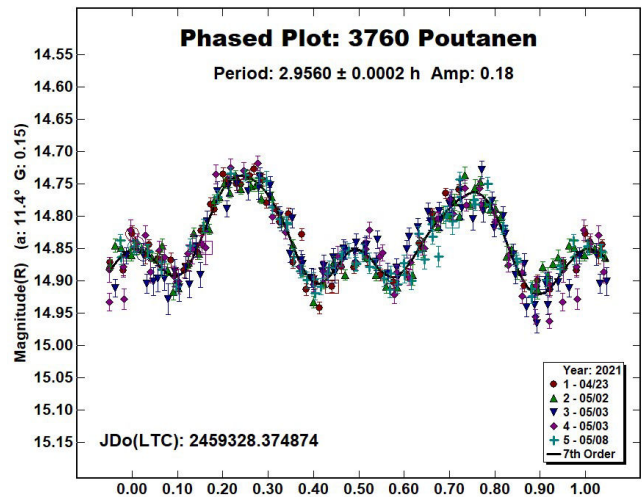
1048 Feodosia is a Ch-type (Bus & Binzel, 2002) outer main-belt asteroid discovered on 1924 November 29 by K. Reinmuth at Heidelberg. Collaborative observations were made over eight nights. We found a synodic period of $P = 10.417 \pm 0.001$ h with an amplitude $A = 0.09 \pm 0.05$ mag. The period is close to the previously published results in the LCDB.



3385 Bronnina is an S-type (Bus & Binzel, 2002) inner main-belt asteroid member of the Flora family; it was discovered on 1979 September 24 by N. Chernykh at Nauchnyj. Collaborative observations were made over two nights. We found a synodic period of $P = 2.959 \pm 0.001$ h with an amplitude $A = 0.22 \pm 0.03$ mag. The period is close to the previously published results in the LCDB.



3760 Poutanen is a medium-albedo inner main-belt asteroid discovered on 1984 January 8 by E. Bowell at Flagstaff. Collaborative observations were made over four nights. We found a synodic period of $P = 2.9560 \pm 0.0002$ h with an amplitude $A = 0.18 \pm 0.05$ mag. The period is close to the previously published results in the LCDB.



References

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