

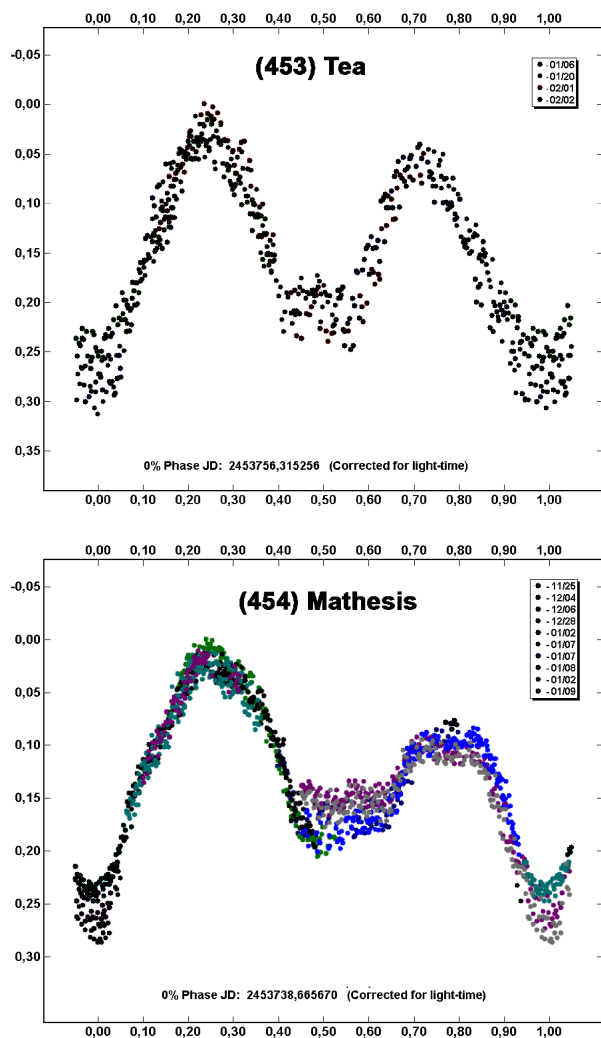
in Licchelli (2006). CCD images recorded in December 2005-February 2006, yielded lightcurves and periods for two asteroids:

453 Tea. I observed this asteroid over four nights, 2006 January 6, 20, February 1 and 2. Wisniewski et al. (1997) reported a period of 6.4hr, while Behrend (2005) in his website suggests a longer value of 10.567hr. Plots against these values didn't show a reasonable lightcurve. The best fit with my data indicates a period of 6.812 ± 0.001 h with an amplitude of 0.30 ± 0.02 mag.

454 Mathesis. Observations were made on nine nights, during the period from November 25, 2005, to January 9, 2006. The best fit of the data suggests a period of 8.378 ± 0.001 h and an amplitude of 0.29 ± 0.02 mag. This period is in very good agreement with that reported by Buchheim (2006), while the amplitude is slightly different, probably due to changed observing geometry. I tried to test the new data with other suggested periods (7.7hr, Lagerkvist et al. (1978), 7.075hr, Di Martino et al. (1994) and 7.04hr, Cieza et al. (1999)), but the resulting lightcurves were not satisfactory.

Acknowledgements

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DEFINITION OF A PLANET: PRAGUE 2006 IAU RESOLUTIONS

Richard P. Binzel, Editor

For members of the ALPO Minor Planets Section and readers of the *Minor Planet Bulletin*, it is useful to review the outcome and implications of the resolutions passed at the XXVIth General Assembly of the International Astronomical Union (IAU) held August 14-25 in Prague.

The General Assembly passed a resolution defining an object to be a "planet" in our Solar System if: (a) it is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, and (c) has cleared the neighborhood around its orbit. By this definition, Ceres resides in the asteroid belt and cannot be a planet (its neighborhood is not "significantly cleared"). Similarly, Pluto's neighborhood of the Kuiper Belt also indicates Pluto cannot be placed in the "planet category."

The IAU resolutions further define a "dwarf planet" to be a celestial body that: (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, (c) does not have to have cleared its neighborhood, and (d) is not a satellite of a planet. Ceres, Pluto, and 2003 UB313 are "dwarf planets" by this definition. Smaller bodies, whose shapes are not controlled by self-gravity, are collectively referred to as "small solar system bodies". A committee within IAU Division III (Planetary Systems) will assess objects near the "dwarf planet" boundary for categorization.

The educational and practical implications are a matter for ongoing discussion. From my own point of view, I find it most useful to refer to the eight planets Mercury through Neptune as the "classical planets". Pluto resides in a growing category of dwarf planets being discovered beyond Neptune, for which a separate IAU resolution recognizes as a new (but yet unnamed) category. My provisional preference for this category is to call Pluto the first of many "Plutonian planets", all of which are likely to be physically described as "dwarf planets." The term "minor planets" may still be used, though the distinctions such as 'asteroid' and 'comet' are generally preferred to describe these subsets of "small solar system bodies". There are no changes planned for the name "Minor Planets Section" and *Minor Planet Bulletin*, as none are required. There are no plans for creating a

dwarf planet catalog – Ceres retains its designation as (1) Ceres. Whether Pluto receives a permanent catalog number is to be decided by IAU Division III, currently presided by Dr. Edward Bowell, Lowell Observatory.

LIGHTCURVE PHOTOMETRY OPPORTUNITIES OCTOBER – DECEMBER 2006

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We welcome Dr. Lance Benner to the group of authors who prepare this regular article. Dr. Benner is well known for his radar studies of asteroids as well as for his efforts to promote pro-am collaborations for joint optical-radar observations. He will be providing targets of opportunity for the period covered by this article where optical observations, often by amateurs, can provide the additional data needed to help determine the rotation period and other characteristics of radar targets.

We present here four lists of “targets of opportunity” for the period 2006 October through December. The first list is those asteroids reaching a favorable apparition during this period, are <15m at brightest, and have either no or poorly constrained lightcurve parameters. By “favorable” we mean the asteroid is unusually brighter than at other times. In many cases, a favorable apparition may not come again for many years. The goal for these asteroids is to find a well-determined rotation rate, if at all possible. Don’t hesitate to solicit help from other observers at widely spread longitudes should the initial finding for the period indicated that it will be difficult for a single station to find the period.

The Low Phase Angle list includes asteroids that reach very low phase angles. Getting accurate, calibrated measurements (usually V band) at or very near the day of opposition can provide important information for those studying the “opposition effect”, which is when objects near opposition brighten more than simple geometry would predict.

The third list gives those asteroids needing only a small number of lightcurves to allow Kaasalainen and others to complete a shape model. Some of the asteroids have been on the list for some time, so work on them is strongly encouraged in order to allow models

to be completed. For these objects, we encourage you to do absolute photometry, meaning that the observations are not differential but absolute values put onto a standard system, such as Johnson V. If this is not possible or practical, accurate relative photometry is also permissible. This is where all differential values are against a calibrated zero point that is not necessarily on a standard system.

Keep in mind that as new large surveys, e.g., Pan-STARRS, come on line and start producing data, individual lightcurves obtained by smaller observatories will become even more important – especially if the data are reduced to a standard system. Observers should not see the surveys as competition but as a means to obtaining the ever needed “more data” and the opportunity to make new discoveries.

The fourth list gives a brief ephemeris for planned radar targets. Supporting optical observations made to determine the lightcurve’s period, amplitude, and shape are needed to supplement the radar data. Reducing to standard magnitudes is not required but high precision work usually is, i.e., on the order of 0.01-0.03mag. A *geocentric* ephemeris is given for when the asteroid is brighter than 16.0. The date range may not always coincide with the dates of planned radar observations, which – for Arecibo – are limited to a relatively narrow band of declinations.

Those obtaining lightcurves in support of radar observations should contact Dr. Benner directly (email given above). There are two web sites of particular interest for coordinate radar and optical observations. Future targets (up to 2010) can be found at <http://echo.jpl.nasa.gov/~lance/future.radar.nea.periods.html>. Past radar targets, for comparison to new data, can be found at <http://echo.jpl.nasa.gov/~lance/radar.nea.periods.html>

Once you have data and have analyzed them, it’s important that you publish your results, if not part of a pro-am collaboration, then in the *Minor Planet Bulletin*. It’s also important to make the data available at least on a personal website or upon request. Previous issues have covered larger upload sites such as OLAF, SAPC, and the ADU. For more information about those sites, please contact Warner at the email address given above.

Note that the lightcurve amplitude in the tables could be more, or less, than what’s given. Use the listing as a guide and double-check your work. Also, if the date is '1 01.' or '12 31.', i.e., there is no value after the decimal, it means that the asteroid reaches its brightest just as the year begins (it gets dimmer all year) or it reaches its brightest at the end of the year (it gets brighter all year).

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Lightcurve Opportunities

#	Name	Brightest					Per.	Amp
		Date	V	Dec	U			
14299	3162 T-2	10 01.8	15.0	- 5	0			
2910	Yoshkar-Ola	10 01.8	15.0	+ 0	0			
1051	Merope	10 02.2	13.9	- 1	2	>20.		>0.09
320	Katharina	10 02.4	14.2	+11	0			
3036	Krat	10 02.9	13.8	- 5	0			
8582	1997 AY	10 03.0	15.0	- 1	0			
3032	Evans	10 05.2	14.8	+ 0	0			
3024	Hainan	10 07.0	14.8	+ 0	0			
2183	Neufang	10 07.8	14.2	-20	?			