

Project NeilBone

Asteroid Observations at Low Phase Angles

Dr. Richard Miles (Director of the Asteroids and Remote Planets Section of the British Astronomical Association) initiated an observing campaign in the fall of 2009 called Project NeilBone. The plan was to observe various asteroids which pass through opposition at very low phase angles (all less than 0.20 degrees). The project's namesake, 7102 Neilbone, reached the extremely low phase angle of 0.03 degrees in January 2010. In total, 14 asteroids were observed during Oct 2009 through Mar 2010.

The observing team consists of roughly 12 individuals. Most of the observers are located in the UK, but several are in different parts of the world. I supported the project throughout the fall and winter seasons by recording CCD images at the Indian Hill Observatory, and by reducing the observational data in those images to standard V magnitudes. Wide separation of the observing locations is beneficial since an object's rotational period (needed for the phase curve plot) can be difficult to construct if the period coincides with the earth's rotation. Observations from different longitudes are helpful in those cases.

The observations were concentrated in the nights near each opposition, when the phase angle was near minimum. But additional observations for each object were recorded during the weeks and months before and after opposition as well. The preliminary phase curve plots (reduced V magnitude vs. phase angle) show some very interesting and surprising results. For example, some of the objects exhibited little opposition effect, but others showed a very large surge in brightness right at opposition. Such surges might have been missed if the minimum phase angle had been only slightly larger.

More information about Project NeilBone can be found in an article which appeared in the Aug 2010 issue of the Journal of the British Astronomical Association.

Permission to post the article on our website has been kindly given by author Dr. Richard Miles:

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