

**THE AMBIGUOUS ROTATION PERIOD OF
1269 ROLLANDIA IS SOLVED BY A GLOBAL
COLLABORATION OF OBSERVERS**

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A global collaboration of photometric observers has found for 1269 rotational parameters: synodic period 59.70 ± 0.01 hours with an unsymmetric bimodal lightcurve and amplitude 0.09 ± 0.01 hours.

Many authors have published rotation periods for the Hilda-type asteroid 1269 Rollandia, all of them different results. These include Behrend (2019web), 72 hours; Colazo et al. (2021), 39.81 hours; Fauvaud and Fauvaud, 15.32 hours; Polakis (2019), 28.272 hours; Polakis (2020), 60.45 hours; Slyusarev et al. (2012), 30.98 hours revised in Slyusarev et al. (2013) to >36 hours. Warner et al. (2017), 19.98 hours. Warner et al. (2019) published eight lightcurves with ambiguous periods between 13 and 32 hours that provided fits to their observations in 2016 and 2019. Romanishin (2021) obtained 8-hour sessions on consecutive nights in 2013 May, using the 0.9m SMARTS telescope at Cerro Tololo Observatory in Chile. His observations provide a fit to a suggested 65-hour period lightcurve but with only 30% phase coverage. They also show that his two sessions rule out many of the published smaller periods.

The three authors of this paper, from their respective observatories in North America, Europe, and Australia obtained 31 sessions between 2024 Sept. 5 and Nov. 19 that provide full phase coverage to an unsymmetrical bimodal lightcurve with period 59.70 ± 0.01 hours and amplitude 0.09 ± 0.01 magnitudes. This lightcurve has a period fairly close to that found by Polakis (2020) and improves upon it with a far greater density of points, a much longer interval of observation, and observations from widely spaced longitudes. All of the other previously published rotation periods are now ruled out.

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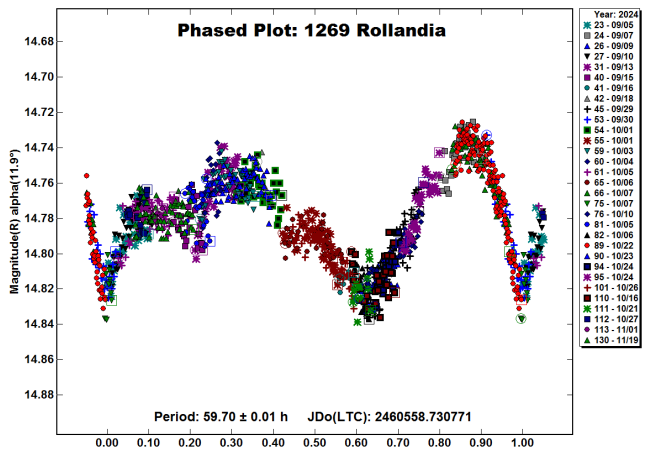
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Number	Name	yyyy/mm/dd	Phase	L _{PAB}	B _{PAB}	Period(h)	P.E	Amp	A.E.
1269	Rollandia	2024/09/05-11/19	*11.9, 6.4	35	-3	59.70	0.01	0.09	0.01

Table I. Observing circumstances and results. The phase angle is given for the first and last date, where the * indicates a minimum was reached between these dates. L_{PAB} and B_{PAB} are the approximate phase angle bisector longitude and latitude at mid-date range (see Harris et al., 1984).