The Campaign on Asteroid (1532) Inari

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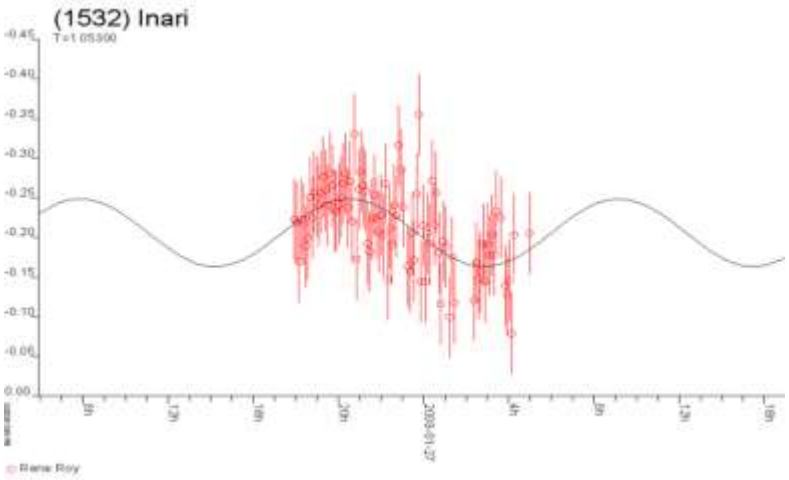
Unlocking the Secrets of (1532) Inari

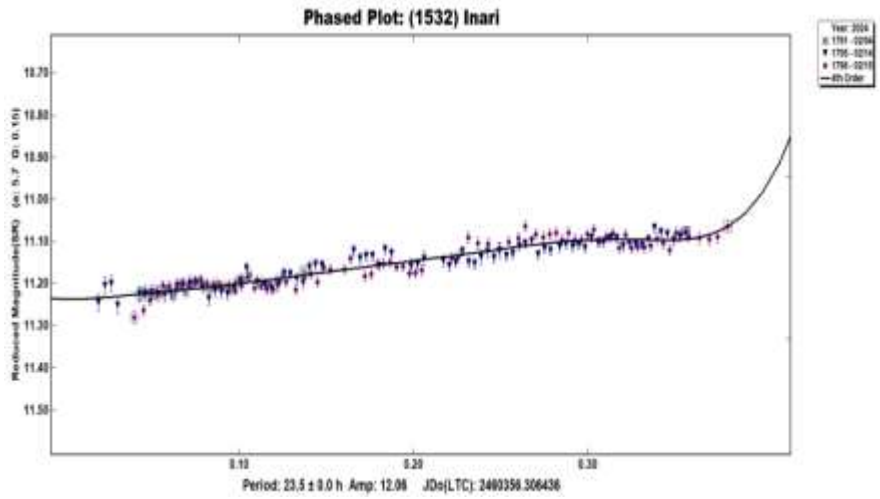
The asteroid (1532) Inari is nestled within the family of Eos asteroids. It is a celestial object with intriguing characteristics. This body, though moderately bright, harbors poorly defined elements, presenting a unique opportunity for our group to contribute to the refinement of our understanding of such celestial bodies.

Campaign Overview

The rotation period that was published on this asteroid is that of around ~25 hours (LCDB, 2024) with an amplitude of 0.09 mag. Hence whenever an observer reobserves the object on subsequent nights, observations will only show data obtained from the same face (phase of the light curve). Below please find the 2008 light curve that derived the 25 h period by Rene Roy. The quality of the published period is 1+ . Below please find a description of the U-value and what it entails:



We have acquired data over 3 nights from a single station on this object. As the ASPIRE telescope network is based around European longitudes, the data that can be obtained from our network is limited. Hence a call for collaboration was issued. Our main objective for this campaign is to determine with some certainty the rotation period of this asteroid.



Why (1532) Inari?

Inari's membership in the 606 Eos family already marks it as a subject of interest. However, its current opposition on February 18, 2024, is a remarkable one as it is at its brightest magnitude over the past 5 years. Right now, the asteroid is of 14.7 magnitude and is slowly getting fainter. The asteroid's location is in the constellation or Leo, around 1 degree West of Regulus. This makes it well placed for observation from northern locations.

The U-Value in asteroid work

The U value class in asteroid light curves is a rating system used to assess the quality and reliability of photometric data obtained from observations of asteroids. This classification system is particularly relevant when studying asteroid light curves, which are graphs that show how the brightness of an asteroid changes over time. Light curves are essential tools in astrophysics for understanding the shape, rotation period, and surface properties of asteroids.

The U value (or quality code) typically ranges from 0 to 3, indicating the level of confidence in the derived rotation period of the asteroid based on the observed light curve. Here's a breakdown of what each U value signifies:

U=0: The data are insufficient to derive a rotation period, or the period found is highly uncertain. This rating might be given to light curves that are too sparse, have too much scatter, or cover too short a time span to reliably determine a period.

U=1: A tentative rotation period has been derived, but it is considered somewhat uncertain. This might be due to limitations in the data quality, coverage, or the presence of ambiguities that could not be resolved with the available observations.

U=2: The rotation period is considered reliable, with the data quality and coverage being good enough to support the findings. There might still be minor ambiguities, but the overall confidence in the period determination is high.

U=3: The rotation period is secured with high confidence, supported by excellent data quality and comprehensive coverage that leaves little room for doubt about the period's accuracy.

Call for Participation

We invite observatories worldwide, especially those situated far from European longitudes (i.e. North America and Asia), to join us in this project. Your participation will be instrumental in capturing the elusive details of Inari's rotation period. This collaborative effort will not only refine our knowledge of (1532) Inari but also contribute to the broader understanding of asteroid families and the evolutionary forces at play within our solar system.

Data Acquisition Methodology

Time-series imaging, consisting of back-to-back images for the longest time possible, is desirable until the asteroid reaches 30 degrees above the horizon. Images should preferably have an SNR (Signal-to-Noise Ratio) of better than >50. A Cousins R (red) filter may be used, but if the target SNR cannot be reached within a 5-minute exposure, a clear or luminance filter may be utilized instead. You may send your images through a link to an online drive or by requesting a link for an online folder where you can upload them. Please include master dark and flat frames, along with a text file detailing the configuration of your equipment and your location.

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