

Central Bureau for Astronomical Telegrams
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C. Weber, European Section of the International Occultation Timing Association (IOTA), Berlin, reports the discovery of an apparent satellite of the minor planet (108968) based on an occultation of the star UCAC4 427-071562 (which has catalogued magnitudes $G = 13.1$ and $R = 12.0$) on 2025 July 12.958 UT. The magnitude then of this main-belt asteroid was 19.5. The observations were made by J. Kaeser and J. Schenker, observing from Schafmatt Observatory in Aarau, Switzerland, using a 45-cm telescope, and M. Gutekunst, observing from Eberfing, Germany, using a 28-cm telescope. All observations were made with Swiss DVTI+CAM video cameras designed for use by occultation observers and utilizing Sony IMX430 CMOS sensors. All of the observers recorded two consecutive light drops, of durations 1.10 and 0.21 s at Aarau, and 1.14 and 0.09 s at Eberfing, with corresponding chord lengths of 12.5 and 2.4 km (Aarau) and 12.1 and 1.0 km (Eberfing). The light drops reached a depth greater than the G magnitudes of two faint comparison stars (UCAC4 427-071537, $G = 14.1$; UCAC4 427-071545, $G = 15.4$) with the limiting magnitude of the recordings being about $G = 15.8$ (Aarau) and 15.5 (Eberfing). The light curves were modeled on the basis of Fresnel diffraction; the light curves, together with corresponding plots of overlaying modeled and observed light curves, have been posted at the following website URL: http://www.cbat.eps.harvard.edu/iau/cbet/005500/CBET5589_Fig1.png; with chords labeled "1+2" being from Eberfing, and chords "4+5" from Aarau. The red curves in the lower two graphs are from the model, which was generated for white light, and the vertical scale of the plot is normalized to a full-light level of 1.0. The vertical blue-dashed lines indicate the location of the physical edges of the two bodies. The diffraction model that gave the best agreement to the observed light curve, and the sky-plane plot of the events, are posted at the following website URL: http://www.cbat.eps.harvard.edu/iau/cbet/005500/CBET5589_Fig2.png. In the diffraction model (top image), the brightness is represented in gray-scale with the gray background representing the normal light level of the star and black representing no light; the shade of gray otherwise represents the brightness above and below the normal light level at that location. Inside each ellipse is a thin red line that represents the physical size of the body. For the main body, the Fresnel modeling indicated that the observed chords were generally normal to the limb, and the ellipse fitted to those chords (having the same apparent area as that of the NEOWISE-catalogue diameter for this asteroid of 9.2 km) has axes of 12.6 and 6.8 km. For the satellite, the modeling indicated an ellipse with axes of 2.90 and 1.83 km. The separation of the satellite from the main body is $0''.0135$ in p.a. 85 deg, with a sky-plane separation of 23.9 km. D. Herald, Trans-Tasman Occultation Alliance (TTOA) and IOTA; and D. Gault, TTOA, aided in the analysis, using a Fresnel diffraction modeling tool by Bob Anderson (IOTA).

NOTE: These 'Central Bureau Electronic Telegrams' are sometimes superseded by text appearing later in the printed IAU Circulars.

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