

* NOVA *

N. 1535 - 21 MAGGIO 2019

ASSOCIAZIONE ASTROFILI SEGUSINI

ASTEROIDE 66391 (1999 KW4)

L'asteroide 1999 KW4 – scoperto il 20 maggio 1999 da LINEAR, uno dei primi sistemi robotici che riprendeva parte del cielo stellato più volte ogni notte utile – è un NEO di classe Aten e numerato (66391) dal Minor Planet Center¹. Si stima che abbia un diametro di 1,78 km.

1999 KW4 ha un satellite che lo accompagna, una sua luna, chiamata S/2001 (66391) 1 o anche 1999 KW4 Beta; ha circa 360 m di diametro e compie la sua orbita attorno all'asteroide in 0,758 giorni (18,192 ore) ad una distanza media di 2,6 km. La presenza di un compagno fu suggerita da osservazioni fotometriche compiute nel giugno 2000.

L'asteroide 1999 KW4 è stato anche mappato nel maggio del 2001 da osservazioni radar (da Arecibo, Porto Rico, e da Goldstone in California) durante un suo avvicinamento.

Il 25 maggio l'asteroide transiterà a 5190000 km (0,03 UA circa, pari a 13,5 distanze lunari, LD²) dalla Terra, con magnitudine 12,5.

Per questo flyby la Sezione Asteroidi³ dell'Unione Astrofili Italiani (UAI) ha organizzato una campagna osservativa fotometrica e astrometrica⁴.

¹ <https://ssd.jpl.nasa.gov/sbdb.cgi?sstr=66391&orb=1>

² 1 LD = 384.401 km

³ <http://asteroidi.uai.it>

⁴ <https://www.uai.it/pubblicazioni/uainews/11-uainews/9308-66391-1999-kw4-il-flyby-dell-asteroide-binario.html>

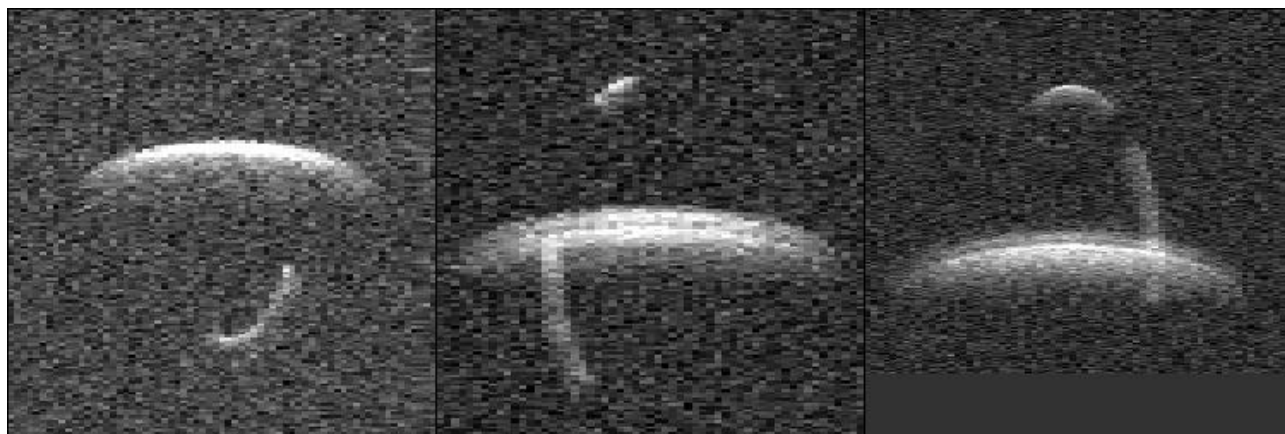


Immagine radar di (66391) 1999 KW4 ripreso da I radiotelescopio di Goldstone nel maggio 2001. Le strisce sull'immagine sono le tracce della piccola luna dell'asteroide che si sposta mentre l'immagine viene catturata. Crediti: NASA

Nelle prossime pagine le effemeridi del flyby, calcolate dal Jet Propulsion Laboratory per il nostro Grange Observatory.

NEWSLETTER TELEMATICA APERIODICA DELL'A.A.S. PER SOCI E SIMPATIZZANTI - ANNO XIV

La Nova è pubblicazione telematica aperiodica dell'A.A.S. - Associazione Astrofili Segusini di Susa (TO) riservata a Soci e Simpatizzanti.

È pubblicata senza alcuna periodicità regolare (v. Legge 7 marzo 2001, n. 62, art. 1, comma 3) e pertanto non è sottoposta agli obblighi previsti dalla Legge 8 febbraio 1948, n. 47, art. 5. I dati personali utilizzati per l'invio telematico della Nova sono trattati dall'AAS secondo i principi del *Regolamento generale sulla protezione dei dati* (GDPR - Regolamento UE 2016/679).

www.astrofilisusa.it

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*****
Ephemeris / WWW_USER Thu May 9 07:56:31 2019 Pasadena, USA / Horizons
*****
Target body name: 66391 (1999 KW4) {source: JPL#265}
Center body name: Earth (399) {source: DE431}
Center-site name: Grange Observatory, Bussoleno
*****
Start time : A.D. 2019-May-09 20:00:00.0000 UT
Stop time : A.D. 2019-Jun-30 20:00:00.0000 UT
Step-size : 1440 minutes
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Date (UT)	HR:MN	R.A. (ICRF/J2000.0)	DEC	Azi (a-app)	Elev	APmag	S-brt	delta	deldot	S-O-T / r
2019-May-09	20:00	Nm	01 43 13.75	-29 39 09.4	291.3198	-60.7634	17.56	5.59	0.20279315101163	-20.92677761 50.9664 /L
2019-May-10	20:00	Nm	01 45 25.61	-30 07 27.3	291.0923	-61.3590	17.43	5.60	0.19063125197399	-20.8911778 51.7938 /L
2019-May-11	20:00	Nm	01 48 00.23	-30 37 53.3	290.6792	-61.9128	17.29	5.61	0.17849329458793	-20.8481850 52.6137 /L
2019-May-12	20:00	Nm	01 51 02.59	-31 10 59.5	290.0350	-62.4154	17.14	5.62	0.16638421085154	-20.7946055 53.4267 /L
2019-May-13	20:00	Nm	01 54 39.37	-31 47 26.0	289.1029	-62.8529	16.98	5.63	0.15431099843321	-20.7262405 54.2337 /L
2019-May-14	20:00	Nm	01 58 59.61	-32 28 03.5	287.8120	-63.2045	16.80	5.64	0.14228343791464	-20.6373214 55.0364 /L
2019-May-15	20:00	Nm	02 04 15.90	-33 13 56.5	286.0745	-63.4391	16.62	5.65	0.13031522262843	-20.5195935 55.8379 /L
2019-May-16	20:00	Nm	02 10 46.23	-34 06 27.4	283.7841	-63.5088	16.41	5.65	0.11842577248541	-20.3607762 56.6441 /L
2019-May-17	20:00	Nm	02 18 57.04	-35 07 21.0	280.8171	-63.3387	16.18	5.66	0.10664322110013	-20.1418823 57.4652 /L
2019-May-18	20:00	Nm	02 29 28.65	-36 18 47.1	277.0406	-62.8097	15.93	5.66	0.09500949332413	-19.8323638 58.3206 /L
2019-May-19	20:00	Nm	02 43 24.82	-37 43 12.3	272.3340	-61.7301	15.64	5.67	0.08358926050316	-19.3809614 59.2470 /L
2019-May-20	20:00	N	03 02 30.38	-39 22 35.9	266.6325	-59.7885	15.31	5.66	0.07248637287683	-18.6978315 60.3164 /L
2019-May-21	20:00	N	03 29 42.82	-41 15 43.0	259.9907	-56.4796	14.92	5.64	0.06187510435647	-17.6190771 61.6750 /L
2019-May-22	20:00	N	04 09 59.04	-43 09 01.8	252.6442	-51.0029	14.46	5.60	0.05206038644929	-15.8396087 63.6215 /T
2019-May-23	20:00	N	05 10 18.37	-44 11 41.6	245.0145	-42.1976	13.91	5.52	0.04358713083914	-12.8180262 66.7378 /T
2019-May-24	20:00	N	06 34 00.95	-42 16 50.8	237.6165	-28.8622	13.31	5.37	0.03738194085346	-7.8250823 71.9042 /T
2019-May-25	20:00	N	08 06 31.38	-35 00 51.6	230.9041	-11.2582	12.77	5.18	0.03468595340797	-0.7542907 79.4987 /T
2019-May-26	20:00	N	09 22 53.16	-23 48 13.7	225.1574	7.1733	12.51	4.99	0.03628973295927	6.6200378 87.8719 /T
2019-May-27	20:00	N	10 15 45.94	-13 00 32.3	220.4665	22.3490	12.55	4.85	0.04169812645897	12.1481304 94.5537 /T
2019-May-28	20:00	N	10 51 04.27	-04 45 43.6	216.7856	33.1831	12.77	4.76	0.04968048507918	15.5520042 98.8598 /T
2019-May-29	20:00	N	11 15 16.95	+01 05 58.8	213.9999	40.6028	13.05	4.72	0.05920037247866	17.5388498 101.3741 /T
2019-May-30	20:00	N	11 32 35.48	+05 16 03.9	211.9734	45.7334	13.35	4.69	0.06962491268572	18.7203391 102.7622 /T
2019-May-31	20:00	N	11 45 28.29	+08 18 16.2	210.5758	49.3743	13.64	4.67	0.08059817127820	19.4511096 103.4651 /T
2019-Jun-01	20:00	N	11 55 23.69	+10 34 55.1	209.6926	52.0295	13.90	4.67	0.09191759725269	19.9206974 103.7427 /T
2019-Jun-02	20:00	N	12 03 16.08	+12 20 13.4	209.2281	54.0119	14.15	4.66	0.10346288298257	20.2313518 103.7469 /T
2019-Jun-03	20:00	N	12 09 40.28	+13 43 19.2	209.1035	55.5193	14.37	4.66	0.11515889717443	20.4402851 103.5689 /T
2019-Jun-04	20:00	Nm	12 14 59.42	+14 50 14.1	209.2547	56.6804	14.58	4.66	0.12695634118108	20.5809017 103.2653 /T
2019-Jun-05	20:00	Nm	12 19 29.35	+15 45 02.7	209.6300	57.5811	14.78	4.67	0.13882133031139	20.6735389 102.8727 /T
2019-Jun-06	20:00	Nm	12 23 21.28	+16 30 35.7	210.1869	58.2809	14.96	4.67	0.15072956024255	20.7310755 102.4151 /T
2019-Jun-07	20:00	Nm	12 26 43.32	+17 08 55.0	210.8910	58.8217	15.12	4.67	0.16266291286684	20.7619719 101.9092 /T
2019-Jun-08	20:00	Nm	12 29 41.46	+17 41 29.7	211.7141	59.2339	15.28	4.68	0.17460740863261	20.7719782 101.3667 /T
2019-Jun-09	20:00	Nm	12 32 20.24	+18 09 26.2	212.6327	59.5401	15.43	4.68	0.18655192777001	20.7651234 100.7958 /T
2019-Jun-10	20:00	Nm	12 34 43.12	+18 33 35.1	213.6274	59.7575	15.56	4.69	0.19848738423402	20.7443074 100.2027 /T
2019-Jun-11	20:00	Nm	12 36 52.81	+18 54 35.5	214.6822	59.8993	15.70	4.69	0.21040617394274	20.7116630 99.5920 /T
2019-Jun-12	20:00	Nm	12 38 51.46	+19 12 58.1	215.7834	59.9759	15.82	4.69	0.22230179380692	20.6687853 98.9672 /T
2019-Jun-13	20:00	Nm	12 40 40.77	+19 29 07.1	216.9198	59.9956	15.94	4.70	0.23416856983784	20.6168785 98.3309 /T
2019-Jun-14	20:00	Nm	12 42 22.13	+19 43 22.1	218.0817	59.9652	16.05	4.70	0.24600145658248	20.5568545 97.6852 /T
2019-Jun-15	20:00	Nm	12 43 56.68	+19 55 59.1	219.2611	59.8902	16.15	4.71	0.25779588444270	20.4893986 97.0319 /T
2019-Jun-16	20:00	Nm	12 45 25.36	+20 07 11.0	220.4512	59.7753	16.25	4.71	0.26954764041994	20.4150175 96.3723 /T
2019-Jun-17	20:00	Nm	12 46 48.94	+20 17 08.7	221.6462	59.6245	16.35	4.71	0.28125277362108	20.3340765 95.7074 /T
2019-Jun-18	20:00	N	12 48 08.09	+20 26 01.2	222.8414	59.4411	16.44	4.71	0.29290752044627	20.2468289 95.0382 /T
2019-Jun-19	20:00	N	12 49 23.36	+20 33 56.1	224.0328	59.2280	16.53	4.72	0.30450824628225	20.1534425 94.3653 /T
2019-Jun-20	20:00	N	12 50 35.22	+20 41 00.0	225.2169	58.9879	16.61	4.72	0.31605140122903	20.0540211 93.6895 /T
2019-Jun-21	20:00	N	12 51 44.07	+20 47 18.2	226.3912	58.7230	16.69	4.72	0.32753348742943	19.9486221 93.0112 /T
2019-Jun-22	20:00	C	12 52 50.27	+20 52 55.7	227.5532	58.4352	16.77	4.72	0.33895103543107	19.8372697 92.3309 /T
2019-Jun-23	20:00	C	12 53 54.11	+20 57 56.6	228.7014	58.1263	16.84	4.72	0.35030058698900	19.7199632 91.6489 /T
2019-Jun-24	20:00	C	12 54 55.85	+21 02 24.6	229.8343	57.7980	16.91	4.72	0.36157868191053	19.5966829 90.9656 /T
2019-Jun-25	20:00	C	12 55 55.72	+21 06 22.7	230.9507	57.4517	16.98	4.72	0.37278184691736	19.4673909 90.2812 /T
2019-Jun-26	20:00	C	12 56 53.90	+21 09 53.9	232.0500	57.0887	17.04	4.73	0.38390658499534	19.3320316 89.5958 /T
2019-Jun-27	20:00	C	12 57 50.56	+21 13 00.6	233.1315	56.7103	17.10	4.73	0.39494936430710	19.1905300 88.9098 /T
2019-Jun-28	20:00	C	12 58 45.85	+21 15 45.1	234.1950	56.3173	17.16	4.72	0.40590660651518	19.0427912 88.2232 /T
2019-Jun-29	20:00	C	12 59 39.90	+21 18 09.5	235.2402	55.9110	17.22	4.72	0.41677467537966	18.8887025 87.5361 /T
2019-Jun-30	20:00	N	13 00 32.82	+21 20 15.5	236.2671	55.4922	17.28	4.72	0.42754986774429	18.7281395 86.8487 /T

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Column meaning:

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TIME

Times PRIOR to 1962 are UT1, a mean-solar time closely related to the prior but now-deprecated GMT. Times AFTER 1962 are in UTC, the current civil or "wall-clock" time-scale. UTC is kept within 0.9 seconds of UT1 by introduction of integer leap-seconds for 1972 and later.

Conversion from the internal TDB timescale to the non-uniform UT time-scale requested for output has not been determined for UTC times after the next July or January 1st. Therefore, the last known leap-second is used as a constant over future intervals.

Time tags refer to the UT time on Earth, regardless of where the observer is located in the solar system. For example, if an observation from the surface of another body has an output time-tag of 12:31:00 UT, it refers to a time-scale conversion from TDB to UT valid at the center of the Earth, not the actual observer location elsewhere in the solar system, where clock rates may differ slightly due to the local spacetime metric and there is no precisely defined or adopted "UT" analog.

Any 'b' symbol in the 1st-column denotes a B.C. date. First-column blank (" ") denotes an A.D. date. Calendar dates prior to 1582-Oct-15 are in the Julian calendar system. Later calendar dates are in the Gregorian system.

NOTE: "n.a." in output means quantity "not available" at the print-time.



SOLAR PRESENCE (OBSERVING SITE)

Time tag is followed by a blank, then a solar-presence symbol:

'*' Daylight (refracted solar upper-limb on or above apparent horizon)
'C' Civil twilight/dawn
'N' Nautical twilight/dawn
'A' Astronomical twilight/dawn
' ' Night OR geocentric ephemeris

LUNAR PRESENCE (OBSERVING SITE)

The solar-presence symbol is immediately followed by a lunar-presence symbol:

'm' Refracted upper-limb of Moon on or above apparent horizon
' ' Refracted upper-limb of Moon below apparent horizon OR geocentric ephemeris

R.A._(ICRF/J2000.0)_DEC =

Astrometric right ascension and declination of the TARGET CENTER with respect to the observing site in the coordinates of the ICRF/J2000 inertial reference frame. Compensated for down-leg light-time.

Units: RA in hours-minutes-seconds of time (HH MM SS.ff),

DEC in angular degrees-minutes-seconds (DD MM SS.f)

Azi_(a-appr)_Elev =

Airless apparent azimuth and elevation of target center. Adjusted for light-time, the gravitational deflection of light, stellar aberration, precession and nutation. Azimuth measured North(0) -> East(90) -> South(180) -> West(270) -> North (360). Elevation is with respect to plane perpendicular to local zenith direction. TOPOCENTRIC ONLY. Units: DEGREES

APmag S-brt =

Asteroid's approximate apparent visual magnitude & surface brightness:

APmag = $H + 5 \log_{10}(\Delta) + 5 \log_{10}(r) - 2.5 \log_{10}((1-G) \phi_1 + G \phi_2)$

For solar phase angles > 90 deg, the error could exceed 1 magnitude. For phase angles > 120 degrees, output values are rounded to the nearest integer to indicate the errors could be large and unknown.

Units: NONE & VISUAL MAGNITUDES PER SQUARE ARCSECOND

delta deldot =

Range ("delta") and range-rate ("delta-dot") of target center with respect to the observer at the instant light seen by the observer at print-time would have left the target center (print-time minus down-leg light-time); the distance traveled by a light ray emanating from the center of the target and recorded by the observer at print-time. "deldot" is a projection of the velocity vector along this ray, the light-time-corrected line-of-sight from the coordinate center, and indicates relative motion. A positive "deldot" means the target center is moving away from the observer (coordinate center). A negative "deldot" means the target center is moving toward the observer.

Units: AU and KM/S

S-O-T /r =

Sun-Observer-Target angle; target's apparent SOLAR ELONGATION seen from the observer location at print-time. Angular units: DEGREES

The '/r' column indicates the target's apparent position relative to the Sun in the observer's sky, as described below:

For an observing location on the surface of a rotating body (considering its rotational sense):

/T indicates target TRAILS Sun (evening sky; rises and sets AFTER Sun)

/L indicates target LEADS Sun (morning sky; rises and sets BEFORE Sun)

For an observing point NOT on a rotating body (such as a spacecraft), the "leading" and "trailing" condition is defined by the observer's heliocentric orbital motion: if continuing in the observer's current direction of heliocentric motion would encounter the target's apparent longitude first, followed by the Sun's, the target LEADS the Sun as seen by the observer. If the Sun's apparent longitude would be encountered first, followed by the target's, the target TRAILS the Sun.

NOTE: The S-O-T solar elongation angle is numerically the minimum separation angle of the Sun and target in the sky in any direction. It does NOT indicate the amount of separation in the leading or trailing directions, which are defined in the equator of a spherical coordinate system.

Computations by ...

Solar System Dynamics Group, Horizons On-Line Ephemeris System

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Information: <http://ssd.jpl.nasa.gov/>

Connect : telnet://ssd.jpl.nasa.gov:6775 (via browser)

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