

COMETA 67P/CHURYUMOV-GERASIMENKO

Il 12 novembre 2021, alle 00:50 UTC, la cometa 67P/Churyumov-Gerasimenko – studiata a lungo dalla sonda Rosetta dell'Agenzia Spaziale Europea dall'agosto 2014 al settembre 2016 – torna alla minima distanza dalla Terra, anche se a 61 milioni di km. Non sono pochi: infatti per osservarla sarà necessario un potente binocolo o un telescopio. Lo stesso giorno del 2014 il lander Philae atterrava sulla sua superficie, dopo un viaggio, a bordo della sonda Rosetta, di dieci anni e 6.5 miliardi di km.

La cometa effettua un'orbita intorno al Sole ogni 6.42 anni. Un passaggio più vicino alla Terra di quello di questo mese sarà solo nel 2214, tra 193 anni, anche se quello del 29 novembre 2034 sarà a meno di 70 milioni di km.

Ecco le effemeridi della cometa 67P/Churyumov-Gerasimenko calcolate per il nostro Grange Observatory.

JPL/HORIZONS		67P/Churyumov-Gerasimenko				2021-Nov-06 03:01:58				

Target body name:		67P/Churyumov-Gerasimenko				{source: JPL#K212/16}				
Center body name:		Earth (399)				{source: DE441}				
Center-site name:		Grange Observatory, Bussoleno								

Start time		: A.D. 2021-Nov-06 00:00:00.0000 UT								
Stop time		: A.D. 2021-Dec-06 00:00:00.0000 UT								
Step-size		: 1440 minutes								

Date__ (UT) __HR:MN		R.A. _____ (ICRF) _____		DEC	Azi _____ (a-app)	Elev	T-mag	N-mag	S-O-T /r	

2021-Nov-06 00:00		07 36 38.02	+26 32 09.1	88.842752	37.828091	12.658	n.a.	111.8417	/L	
2021-Nov-07 00:00		07 40 18.86	+26 34 21.2	88.853801	37.895923	12.658	n.a.	112.0296	/L	
2021-Nov-08 00:00		07 43 55.52	+26 36 21.0	88.880369	37.973984	12.659	n.a.	112.2335	/L	
2021-Nov-09 00:00		07 47 27.90	+26 38 09.5	88.922452	38.062700	12.660	n.a.	112.4536	/L	
2021-Nov-10 00:00		07 50 55.92	+26 39 47.6	88.980037	38.162476	12.662	n.a.	112.6901	/L	
2021-Nov-11 00:00		07 54 19.52	+26 41 16.4	89.053106	38.273695	12.665	n.a.	112.9433	/L	
2021-Nov-12 00:00		07 57 38.63	+26 42 36.9	89.141640	38.396727	12.668	n.a.	113.2133	/L	
2021-Nov-13 00:00		m 08 00 53.18	+26 43 49.9	89.245616	38.531929	12.672	n.a.	113.5003	/L	
2021-Nov-14 00:00		m 08 04 03.11	+26 44 56.5	89.365017	38.679642	12.676	n.a.	113.8046	/L	
2021-Nov-15 00:00		m 08 07 08.35	+26 45 57.7	89.499825	38.840201	12.681	n.a.	114.1263	/L	
2021-Nov-16 00:00		m 08 10 08.87	+26 46 54.3	89.650027	39.013926	12.687	n.a.	114.4655	/L	
2021-Nov-17 00:00		m 08 13 04.60	+26 47 47.2	89.815618	39.201127	12.693	n.a.	114.8225	/L	
2021-Nov-18 00:00		m 08 15 55.49	+26 48 37.5	89.996596	39.402101	12.700	n.a.	115.1975	/L	
2021-Nov-19 00:00		m 08 18 41.50	+26 49 25.9	90.192972	39.617136	12.708	n.a.	115.5905	/L	
2021-Nov-20 00:00		m 08 21 22.58	+26 50 13.4	90.404765	39.846504	12.716	n.a.	116.0017	/L	
2021-Nov-21 00:00		m 08 23 58.69	+26 51 00.7	90.632008	40.090468	12.724	n.a.	116.4313	/L	
2021-Nov-22 00:00		m 08 26 29.80	+26 51 48.8	90.874746	40.349275	12.733	n.a.	116.8795	/L	
2021-Nov-23 00:00		m 08 28 55.86	+26 52 38.2	91.133043	40.623158	12.743	n.a.	117.3462	/L	
2021-Nov-24 00:00		m 08 31 16.84	+26 53 29.9	91.406980	40.912335	12.753	n.a.	117.8318	/L	
2021-Nov-25 00:00		m 08 33 32.71	+26 54 24.5	91.696657	41.217008	12.763	n.a.	118.3361	/L	
2021-Nov-26 00:00		m 08 35 43.44	+26 55 22.7	92.002195	41.537360	12.774	n.a.	118.8595	/L	
2021-Nov-27 00:00		m 08 37 49.01	+26 56 25.1	92.323741	41.873560	12.786	n.a.	119.4019	/L	
2021-Nov-28 00:00		m 08 39 49.38	+26 57 32.3	92.661468	42.225753	12.798	n.a.	119.9634	/L	
2021-Nov-29 00:00		08 41 44.55	+26 58 44.8	93.015575	42.594067	12.810	n.a.	120.5440	/L	
2021-Nov-30 00:00		08 43 34.50	+27 00 03.2	93.386290	42.978605	12.823	n.a.	121.1438	/L	
2021-Dec-01 00:00		08 45 19.21	+27 01 27.9	93.773874	43.379443	12.836	n.a.	121.7628	/L	
2021-Dec-02 00:00		08 46 58.67	+27 02 59.2	94.178613	43.796628	12.850	n.a.	122.4010	/L	
2021-Dec-03 00:00		08 48 32.89	+27 04 37.5	94.600825	44.230172	12.864	n.a.	123.0583	/L	
2021-Dec-04 00:00		08 50 01.87	+27 06 23.0	95.040857	44.680051	12.879	n.a.	123.7346	/L	
2021-Dec-05 00:00		08 51 25.62	+27 08 15.9	95.499088	45.146198	12.894	n.a.	124.4298	/L	
2021-Dec-06 00:00		08 52 44.18	+27 10 16.4	95.975934	45.628508	12.910	n.a.	125.1437	/L	

Column meaning:

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 using integer leap-seconds for 1972 and later years.

Conversion from the internal Barycentric Dynamical Time (TDB) of solar system dynamics to the non-uniform civil 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-scale conversion from TDB on Earth regardless of observer location within the solar system, although clock rates may differ due to the local gravity field and no analog to "UT" may be defined for that location.

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)____DEC' =

Astrometric right ascension and declination of the target center with respect to the observing site (coordinate origin) in the reference frame of the planetary ephemeris (ICRF). Compensated for down-leg light-time delay aberration.

Units: RA in hours-minutes-seconds of time, HH MM SS.ff{ffff}

DEC in degrees-minutes-seconds of arc, sDD MN SC.f{ffff}

'Azi____(a-app)____Elev' =

Airless apparent azimuth and elevation of target center. Compensated for light-time, the gravitational deflection of light, stellar aberration, precession and nutation. Azimuth is measured clockwise from north: North(0) -> East(90) -> South(180) -> West(270) -> North (360)

Elevation angle is with respect to a plane perpendicular to the reference surface local zenith direction. TOPOCENTRIC ONLY. Units: DEGREES

'T-mag N-mag' =

Comets' apparent visual total magnitude ("T-mag") and nuclear magnitude ("N-mag") using the standard IAU model:

T-mag= M1 + 5*log10(delta) + k1*log10(r)

N-mag= M2 + 5*log10(delta) + k2*log10(r) + phcof*beta

Units: MAGNITUDES

'S-O-T /r' =

Sun-Observer-Target apparent SOLAR ELONGATION ANGLE seen from the observers' location at print-time.

The '/r' column provides a code indicating the targets' apparent position relative to the Sun in the observers' sky, as described below:

Case A: For an observing location on the surface of a rotating body, that body rotational sense is considered:

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

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

Computations by ...

Solar System Dynamics Group, Horizons On-Line Ephemeris System

4800 Oak Grove Drive, Jet Propulsion Laboratory - Pasadena, CA 91109 USA

General site: <https://ssd.jpl.nasa.gov/>

System news : <https://ssd.jpl.nasa.gov/horizons/news.html>

User Guide : <https://ssd.jpl.nasa.gov/horizons/manual.html>

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Links:

https://ssd.jpl.nasa.gov/tools/sbdb_lookup.html#/?sstr=67P

<http://www.aerith.net/comet/catalog/0067P/2021.html>

<https://earthsky.org/astronomy-essentials/famous-comet-67p-c-g-closest-nov-2021-until-2214/>

<https://www.media.inaf.it/2021/11/05/67p-is-back/>

