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APRIL 8 2005: SELENE DECKED OUT WITH BAILY BEADS (HYBRID[1] ECLIPSE OF THE SUN)

C. C. Mallamaci[2]

On Friday April 8, 2005 the first hybrid eclipse of the sun of the XXI century will take place. The hybrid term is used to indicate that the central phase of the eclipse is annular in a part of its path, and total in another part, depending on the geometry between the curvature of the Earth and the longitude of the shadow cone of the Moon. It will be visible in general from a wide area of the Central Pacific Ocean and parts of the American continent. The central phase will be visible only from a narrow corridor of not more than 33 km wide and 14200 km long that will cross the whole Pacific Ocean from SE New Zealand up to N of South America.

The central phase will begin as annular at about 700 km SE of Wellington (NZ), it will change to total at about 2200 kms S of Tahiti, and it will finally return to annular phase at about 800 kms N of Galapagos Islands (Ecuador). The end of the central eclipse will occur in the E of Venezuela, less than 100 km SE of Ciudad Bolívar, in front of the Guri Hydroelectric Dam. The maximum of the eclipse will last 42s and will take place at 20:36 UT over the Pacific Ocean (lat = $10° 34' S$, long = $118° 59' W$) at about 2100 kms N of Easter Island (Chile). Along its whole path, the moon's umbral shadow will cover 0.06% of the earth surface in 3h24m, but no island or mainland will be reached along its watery path. The closest approach to land will occur at 19:48 UT when the umbral shadow passes north and almost grazes Oeno Island, near Pitcairn.

During the annular or total phase, the apparent diameter of the Moon will hardly be 1% shorter or longer, respectively, than that of the Sun. Therefore, it might be expected that many red protuberances and bright Baily beads be visible along the whole lunar limb.

TABLE 1

GENERAL CIRCUMSTANCES (dt = 66s)

Contacts[a]	U.T. h:m:s	Latitude	Longitude
P1	17 : 51 : 17	$40° 41' S$	$170° 56' W$
U1	18 : 53 : 23	$47° 54' S$	$175° 25' W$
U2	18 : 53 : 53	$48° 00' S$	$175° 19' W$
P2	20 : 04 : 48	$76° 33' S$	$177° 31' W$
Mx	20 : 35 : 44	$10° 34' S$	$118° 59' W$
P3	21 : 07 : 07	$22° 22' S$	$49° 28' W$
U3	22 : 17 : 46	$7° 32' S$	$63° 02' W$
U4	22 : 18 : 22	$7° 39' S$	$63° 10' W$
P4	23 : 29 : 26	$14° 56' S$	$77° 41' W$

[a]P: penumbral contact; U: umbral contact; Mx: greatest; 1: external; 2: internal.

Fig. 1. General region of eclipse visibility, and umbra/antiumbra path. Central phase begins and ends as annular, and develops as total over Pacific Ocean.

It will be the 51st eclipse of Saros serie 129, which has a duration of 1424.4 years and produces 80 eclipses in total. The first eclipse of the serie occurred on 1103 October 3, and the last will occur on 2528 February 21.

General contact times of the eclipse can be seen in Table 1.

[1]The hybrid term is not yet widely accepted, and there are still some discussions on the appropiate word to describe this type of eclipses.

[2]Observatorio Astronómico Félix Aguilar, Universidad Nacional de San Juan, Av. Benavídez 8175-Oeste, 5400 - San Juan, Argentina (ccmalla@speedy.com.ar).