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From: Andrew Sedgwick

Subject: Collecteur Lunaire

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Message

Dear Humbert,

Peter has told be that you will be visiting the solar furnace near Perpignan shortly to investigate further the use of mirrors to collect moonlight.

He suggested that I should send you some ideas for experiments that may be carried out using the facilities at the solar furnace site.

Please find my suggestions for investigations attached. For some of them we have theoretical answers already (for instance how far the moon can be expected to move in one hour), but in would be very encouraging if these predictions could be confirmed by experiment!

I also attach some general notes on the physical data for the moon that we prepared last year.

Best of luck with your investigations,

Yours sincerely,

A.C. Sedgwick

Andrew Sedgwick

FULL MOON AT THE SOLAR FURNACE - NOVEMBER 1990

Site Data

Solar furnace near Perpignan, France

Latitude : 42° 37 ' North of the Equator

Longitude : 2° 23' East of Greenwich

Some Theoretical Predictions about the Moon

Date	Local Time	Moon Altitude	Moon Azimuth	Phase (1 = full moon)
1 Nov.	24:00	61° 31'	192° 41'	0.985
2 Nov.	21:00	41° 29'	102° 30'	0.998
	22:00	51° 38'	115° 46'	0.998
	23:00	60° 29'	134° 22'	0.998
	24:00	66° 19'	162° 08'	0.998
3 Nov.	01:00	66° 39'	196° 26'	0.998
	24:00	63° 36'	128° 38'	0.982

THE MOON

Physical Data

Mean distance	:	384,000 km
Mean diameter	:	3476 km
Apparent angular size at mean distance	:	31' 05"
Eccentricity of orbit	:	0.0549
Distance at perigee	:	356,410 km
Distance at apogee	:	406,740 km
Plane of orbit	:	5° 9' to ecliptic

Photometric Data

Albedo (reflectance)	:	0.07	
Magnitude of full moon	:	-12".5	≠ clat relatif apparent
Luminance of full moon	:	4,000 cd/m^2	quotient de l'intensité lumineuse de la surface par l'aire apparente de cette surface -
Luminous intensity of full moon	:	3.8 x 10^{-6} candelas	
Extraterrestial illuminance from full moon:		0.26 lux	
Illuminance at sea level, normal to full moons rays	:	0.19 lux	

FULL MOON AT THE SOLAR FURNACE - NOVEMBER 1990

SUGGESTIONS FOR EXPERIMENTS

For each experiment the weather conditions and exact time should be recorded.

1. Record lunar altitude and lunar azimuth at each hour. -

   Equipment : sextant, compass, watch

   Purpose : To validate lunar position prediction programs and to find out how far the moon can be expected to move during a performance.

2. Measure illuminance from full moon at each hour, both one a horizontal plane and perpendicular to the moon's rays.

   Equipment : sensitive lightmeter, watch

   Purpose : To check theoretical predictions of moon brightness and atmospheric absorption.

3. Measure illuminance from moon at same time (say 23:00) for some days either side of the full moon date - perhaps 1,3,4,5 November.

   Equipment : sensitive lightmeter, watch

   Purpose : To establish how many days moonlight can be used around the date of the full moon.

4. Measure colour of moonlight. There are a number of measures for light colour that can be used : colour temperature, CIE chromaticity co-ordinates, spectral power content - it depends what sort of meter can be obtained.

   Equipment : spectro-photometer

   Purpose : To provide information to allow calculations on the colour rendering of different materials under moonlight.

5. Measure colour of moonlight reflected through the mirror system.

   Equipment : spectro-photometer

   Purpose : to find effect of mirror reflection process on colour of moonlight.

6. Measure illumination level of moonlight reflected through the mirror system, and calculate theoretical magnification of mirror system.

   Equipment : lightmeter

   Purpose : to indicate practical efficiency of a mirror system.

7. Measure the fall-off of illumination from the sky at twilight - shade lightmeter from direct moonlight, and measure light from sky only at ten minute intervals from sunset until midnight.

Equipment : sensitive lightmeter

Purpose : to establish when light from sky becomes less than light from moon, so that an estimate of earliest start time for performances can be made.