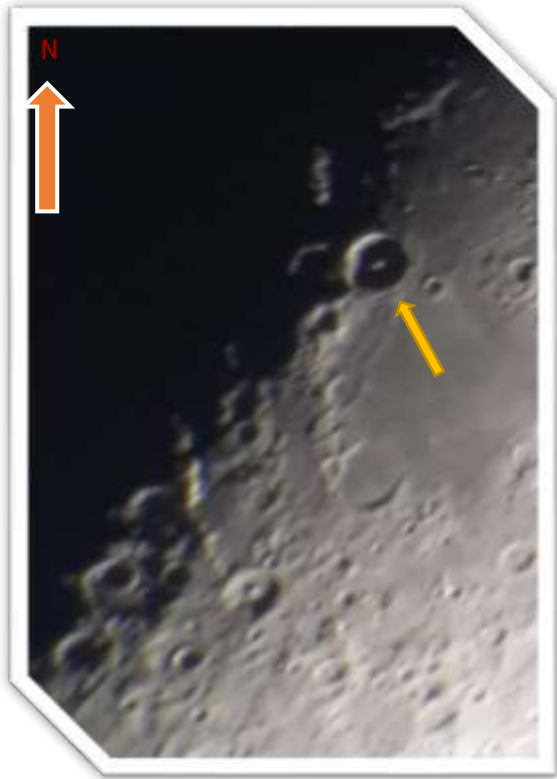


ALPO LUNAR PROGRAM

CRATER THEOPHILUS OBSERVATION



<i>Observer</i>	MADVOX
<i>Location</i>	XXXX OH, US
<i>Address</i>	xxxxxxxxxxxx (41.6662° N, 81.3396° W)
<i>UD</i>	July 29th, 2017
<i>UT</i>	01:03
<i>Seeing</i>	4 // interference from clouds and turbulence as well as high wind. Relatively ill-defined image
<i>Transparency</i>	4 // Moon is main target. At observation time, still in daylight, Spica is left of the moon. Other dimmer stars can be perceived with some difficulty.
<i>CM</i>	N/A
<i>Telescope</i>	Meade Star Navigator 4.5" (114mm) 1000 Focal Length - Ratio 8.7
<i>Filters</i>	None
<i>Magnification</i>	166.4 thru 333.4 – this drawing at 166.4



TIDELOCK OBSERVATIONAL DATA

OBJECT	Crater Theophilus
Coordinates	11.4°S 26.4°E
Diameter	100 Km
Depth	3.2 Km

Temperature	70 F / 21.1 C
Dew Point	57 F / 13.9 C
Wind Speed	19 Knots / 35 Km
Wind Direction	50 Deg
Humidity	64%
Pressure	29.92 in / 1013.2 mb
Visibility	10 miles / 16.1 Km

Sun Altitude	-16.56 Deg
Sun Azimuth	314.58 Deg

JD	2457963.5438
Sun RA	8.568 h
Sun DEC	18.74 deg
Moon RA	13.212 h
Moon DEC	-3.12 deg
Libration LON	6.3 deg
Libration LAT	-5.5 deg
Sun Colongitude	335.60 deg
Selenog. Colongitude	24.4 deg
Disc Illumination	0.346
Angle of Bright Limb	290.9 deg
Angle of Polar Axis	23.2 deg

Observation Notes

Background

Theophilus was my first target for my first contribution. This is because the moon was just coming out from NEW when I first thought about it and so I wanted to aim at something at colongitude 35 degrees or less, otherwise I would have to wait a week or two to do some work until the terminator reached other large spots for my education.

Quoting from Wikipedia and LRO: Theophilus is an ancient impact crater (possibly from the Erathostenian period between 3.2 and 1.1 billion years ago). It encroaches into Cyrillus and both are bordered south by Catharina, the latter connected to Cyrillus and Theophilus by a depression with a smaller central crater visible inside the walls. The group of three is very prominent and an easy and interesting target.

Observation

Drawing is rotated. North is directly up.

For simplicity and convenience, I used my 4.5" Star Navigator telescope for this observation. I started out at 166 magnification and ended up at 330X plus. Due to seeing conditions the larger magnification proved very difficult to manage so I completed the observation at 166X. This revealed less details but much more clearly. The total time spent was close to 40 min and this included time to draw an outline and an intensity map of the formation. I took some basic afocal pictures to accompany my drawing.

Theophilus is a deep crater. A profound darkness sinks into its large bowl as the terminator crosses over with the northern rim highly illuminated as it stands very tall over the crater basin. I can distinguish a prominent mound in the center. This is a tall peak (I believe from LRO that it is about 1,500 m) and its top crest is lit while its skirt remains in darkness. I can distinguish at least two sides to this formation as if it is broken in the middle. A closer examination at high-resolution LRO pictures does reveal that this central peak is complex with various heights and depressions. I am glad I was able to distinguish that the central peak was in fact complex and broken up into at least two peaks.

There is a small crater called Mädler to the east/south east of Theophilus. This crater is clearly and neatly visible and it is around 28 km wide as well as significantly smaller than the trio to its west. The north-western rim of crater Cyrillus is visible in my drawing, as well as its southern edge. The rest of it is immersed in darkness as is Catharina.

A valley appears to pour out of Theophilus directly south east. It seems to connect with Catharina while bordering the outer eastern rim of Cyrillus. While I have not examined this valley (almost a canyon) at high resolution it appears taller than Theophilus' outer rim. I know Theophilus has terraces and you can perceive said terracing on the western illuminated rim as grayscales vary when you look at higher magnification. Shadows become gradually more intense while visually descending the slope of the north western rim.

There are various ground features surrounding the crater. I cannot exactly tell if they are rilles or montes from my observation but they are certainly undulations with some height. This is visible on the eastern plain which is the outer edge of Mare Nectaris.

Features of various elevations surround the crater at its north-east point. They appear to be a combination of large rock formations or montes though it seems to me they may be associated to the impact

shockwave more than any Maria nor features from the nearby Mare Nectaris or any features of the plain itself.

The most impressive and interesting feature for me is the valley that connects straight south to Catharina. I would like to explore this at a later time with a larger telescope and magnification. It seems feature rich and quite deep.