THE LUNAR OBSERVER

A MONTHLY NEWSLETTER FOR STUDENTS OF THE MOON — JULY 1998

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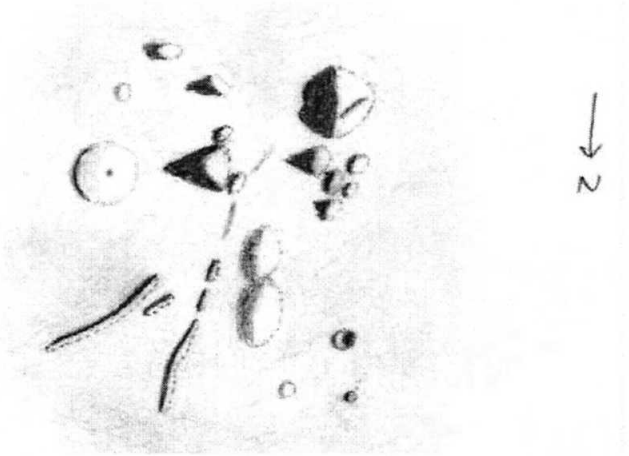
FEATURE OF THE MONTH

Kies Pi (26.7°S - 24.2°W)



Sketch by Robert H. Hays, Jr. - Worth, Illinois
15cm Reflector - 170X - Seeing 7/10

In the southwestern corner of Mare Nubium, just west of the crater Kies, is the very prominent dome Kies Pi. On March 22, 1998 Robert H. Hays, Jr. sketched Kies Pi and vicinity and submitted the following report:

"I sketched this conspicuous dome and the area to the west after timing three occultations on the morning of March 22, 1998 (10:47 - 11:05 UT). The ruined crater Kies to the east was largely in shadow at this time. Kies Pi is a circular dome with a speck of shadow in the middle. This may have been the summit crater mentioned in the December 1997 Lunar Observer. Kies Pi also showed some definite shadow and not just slope shading. An assortment of elevations was noted west of Kies Pi. The largest peak on my sketch is Kies C. Between this crater and Kies Pi was what appeared to be a double dome. Smaller domes were apparent northeast of Kies C and south of Kies Pi. Several narrow ridges were seen north of Kies Pi and east of the double dome. I tried sketching the various features as I saw them."

Thanks to Robert for another fine sketch. Kies Pi can be found on Map #53 in Rukl's Atlas of the Moon and should be in good position for viewing approximately 10 days after New Moon.

Lunar Observer's Notebook .....

How do you select a film for lunar photography? Most astrophotographers recommend Kodak's Technical Pan 2415. Tech Pan is an extremely fine grained film that has incredibly high resolution. Unfortunately, it is also a very slow film having an ISO rating of about 25. Contrary to popular belief, increasing development time and/or developer strength does not increase the speed of a film. These procedures only affect the densest part of a negative (the highlights) but have virtually no effect upon the thinner areas (the shadows). This will produce negatives of higher contrast but will not record any additional shadow detail. In fact, increasing contrast can actually obscure certain details. The only way to increase detail in the shadow areas of a photograph is to increase the length of the exposure, brighten the image by decreasing the focal ratio, or use an inherently faster film.

Since I photograph the Moon with a small portable telescope at a strictly urban location*, I must keep the following factors in mind: In order to neutralize the severe local air turbulence I must keep exposure times as brief as possible. Exposures under one second are necessary just to nullify any errors in the drive rate and/or polar alignment. (Yes, these are important factors for lunar photographers as well as the deep sky guys!) I also want to employ an effective focal length over 8000mm (equivalent to about 160X) in order to produce an image on a scale large enough to show minor features such as domes.

With my 5 inch f/9 refractor, a 6mm eyepiece gives me an effective focal length of 9500mm, a focal ratio of f/75 and an image of the Moon with a scale of 40km per millimeter on the negative. If I were to employ Tech Pan 2415 I would need an exposure time of 3-4 seconds, far too long for my typical seeing conditions. My film of choice, therefore, has been Kodak T-Max 400 which allows me to use a more appropriate exposure time of 1/4 sec. T-Max 400 should not be confused with Kodak Tri-X which has a similar ISO rating but is far grainier. T-Max 400 employs a relatively recent T-Grain technology which gives it the speed of an ISO 400 film but the finer grain characteristics of a typical 100 speed film. Carrying the premise that "faster is better" to the extreme I decided to try a super-speed film (T-Max 3200) on the Moon. With an ISO rating of 3200 I could, supposedly, use a shutter speed of 1/30 sec. Would this help in offsetting the local air turbulence? And what would the images look like?

Vibrations caused by the camera mirror and shutter are often eliminated by using the hat-trick method. Exposure time under 1/2 sec., however, cannot be made accurately in this manner. With the afocal method the camera can be mounted on its own tripod and not in physical contact with the telescope so the shutter can be tripped without imparting any vibrations to the telescope. I used an afocal setup with the following components: (1) Meade 5-inch f/9 apochromatic refractor; (2) 6mm Vixen Lanthanum eyepiece; (3) Pentax K-1000 camera: (4) 50mm f/1.7 Pentax-M lens.

Seeing on the night of the test (September 5, 1995) was below average and the target selected was the crater Gassendi; a good combination for unsteady conditions. Two series of exposures were taken with T-Max 400 using exposure times of 1/8, 1/4, and 1/2 second. The camera was reloaded with F-Max 3200 and two other series of exposures were made using shutter speeds of 1/250, 1/125, 1/60, 1/30, 1/15, and 1/8 sec. A wider range of exposures was used for the T-Max 3200 because of my unfamiliarity with the film. The total number of exposures was kept low because of the limited time available and the poor placement of the Moon that night. It would have been desirable to make a great many more exposures but, even so, the results could still be useful.

Both films were developed in T-Max developer diluted 1:4 at 70 degrees F; T-Max 3200 for 11 minutes and T-Max 400 for 9 minutes as recommended by Kodak. It was immediately apparent that T-Max 3200 had a relatively high degree of filmbase+fog. Filmbase+fog is the amount of density in the area of the negative which does not contain an image. It is a result of the physical properties of the film base and the chemical action of the developer on the unexposed silver grains in the emulsion. A photographic

transmission densitometer revealed that the filmbase+fog density of the T-Max 3200 was 0.3 while that of the T-Max 400 was 0.26. Neither level would have an adverse effect on the image.

The T-Max 3200 image produced with a shutter speed of 1/250 sec. was just barely visible with a density of 0.02 over the level of filmbase+fog. The first useable image was the one taken at 1/60 sec. but I prefer the one taken at 1/30 sec. because of the greater shadow detail. A densitometer reading of the floor of Gassendi showed that it matched the density of the image taken with T-Max 400 at 1/4 sec.; an indication that the ISO rating of 3200 was an accurate one.

Comparison prints make from the best negative on each roll were made at an enlargement of 5.5X The T-Max 3200 print at 1/30 sec. was slightly sharper than the T-Max 400 print at 1/4 sec. but, interestingly, not all of the images taken at higher shutter speeds were sharper than those taken at the slower speeds. In addition, none of the images compared favorably with exposures made under good seeing conditions. Apparently seeing conditions have an effect on the sharpness of images that cannot be overcome simply by increasing the shutter speeds to this level. Also, the coarser grain of the super-speed film was already apparent at 5.5X and rather distracting. It was comparable to the grain visible in a 15X enlargement from a T-Max 400 negative. Not bad for a 3200 speed film but not really suitable for serious lunar work.

*This was true at the time of the testing. I have since moved to the burbs.

..... *Bill Dembowski*

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Lunar Calendar for July 1998 (UT)

1	18:41	First Quarter
2	18:00	Moon at Apogee (404,209 km)
9	16:02	Full Moon
16	14:00	Moon at Perigee (369,969 km)
16	15:14	Last Quarter
17	06:00	Moon 2 Degrees South of Saturn
23	13:44	New Moon (Start of Lunation 935)
30	12:00	Moon at Apogee (404,290 km)
31	12:04	First Quarter

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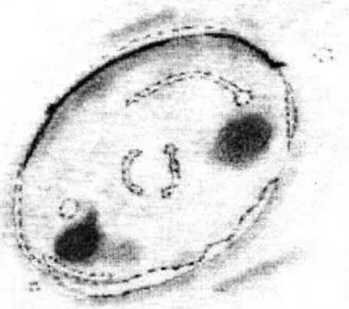
Observations Received During The Month:

David Lehman - Fresno, California.....Sketches of craters Bessel, Peirce, and Cassini

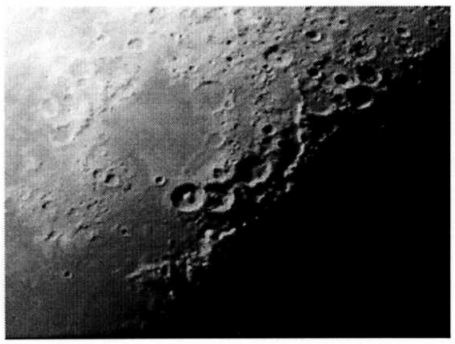
Rik Hill - Tucson, Arizona.....Three sketches of crater Torrecelli

Topographical Studies

Gassendi
Photograph by Bill Dembowski
Elton, Pennsylvania
127mm Refractor - f/75
T-Max 3200 - 1/30 sec.
September 5, 1995 - Seeing 4/10



Atlas
Sketch by David J. Lehman
Fresno, California
250mm Reflector - 196X
Nov. 15, 1997 - Seeing 3/10



Mare Nectaris
CCD Image by Doug Hansen
San Diego, California
150mm Maksutov-Cassegrain
May 2, 1998 - Seeing 9/10

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From The Editor:

The Lunar Observer was created for the exchange of information and observations among students of the Moon. We welcome contributions of sketches, photographs, CCD images, and/or written accounts of lunar observations. Observers at all skill and experience levels are encouraged to participate. Remember that an observation that is not shared is like a song that goes unsung.

TLO can be found online at the websites of The Association of Lunar & Planetary Observers and The American Lunar Society. Hard copies of TLO may be obtained by sending a set of self-addressed-stamped-envelopes to the editor at the address on Page 1; or by subscribing at the rate of $5.00 for twelve issues.

Clear & Steady Skies ..... WMD