the ASTROGRAPH



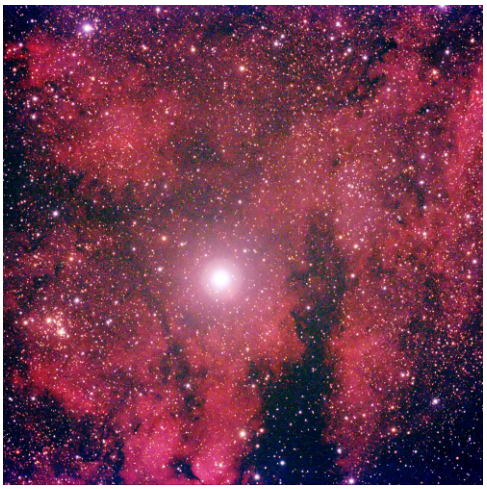
Volume 39 No. 2 October/November 2007

the ASTROGRAPH

Change of Address Notices - in order to expedite your change of address please send it to us promptly and include the old mailing label from your last issue. Remember the Post Office will not forward CDs unless you guarantee forwarding postage by leaving a deposit.

Renewal Notices - Unlike other publications that hound you with renewal notices, the ASTROGRAPH is currently sending out only one renewal notice. When you renew please use the self addressed envelope, or notify us that it is a renewal. Only include a mailing label if there is no indication of your current address.

Articles and Photographs - If possible send us articles on **3.5" floppy IBM compatible disks.** Any word processor is acceptable (WordPerfect is preferred).



COVER PHOTOGRAPH

Object.....Nebulosity around Gamma Cygni and NGC6910 (left edge)

Photographer.....Robert C. Price

Instrument.....Tele Vue NP-101 (4 inch F/5.4 refractor)

Exposure/Instrument.....20 minutes/Hutech modified Canon 350D

Date.....6 September 2007

VOLUME 39 No. 2
EDITOR.....Robert C. Price
CONTRIBUTING EDITOR.....Ralph Proctor
PROOFING CONTRIBUTOR.....Linda Miller
CONTRIBUTORS.....Lee C. Coombs

Features

Image Processing: Selected Processes.....19

Departments

Astrophotography for October and November.....26

The ASTROGRAPH is published in Adobe PDF format six times a year as follows: No. 1, August/March, No. 2 December/March, No. 3 December/March, No. 4 February/March, No. 5 April/May, No. 6 June/July. Copyright © 2007 by the ASTROGRAPH. **Mailed CD** subscription rate is **$15.00** per year for the United States or any address with a U.S. zip code. Mailed CD subscription rate for Canada is $20.00 per year. Mailed CD subscription rate for Mexico is $30.00 per year. Mailed CD subscription rate for all other foreign countries is $35.00 per year. Subscriptions and all manuscripts and photographs submitted for editorial consideration should be sent to **the ASTROGRAPH, Post Office Box 369, Dumfries, VA 22026**. NOTE: for persons submitting articles please indicate if you do not want your name and address to appear at the conclusion of the article. Photographs are kept on file for possible use as illustrations at a later date unless accompanied by a self addressed envelope with return postage. AIRMAIL CD subscription rates per year: U.S. $22.00, Canada and Mexico $31.00, all other foreign countries $35.00.

Image Processing: Selected Processes

by

Robert Price

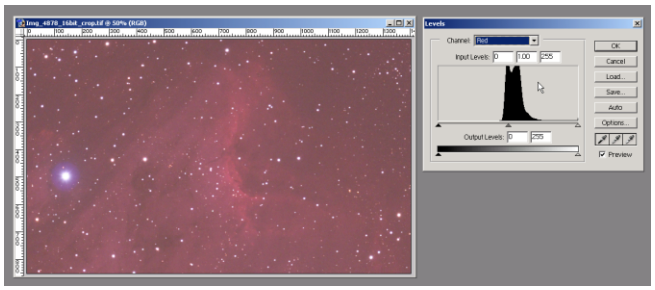
Everyone has a favorite image processing program, or at least one they use most of the time. The editor is no exception, I always use Photoshop 7 or higher for adjusting levels and curves and Paint Shop Pro 7 for browsing directories full of images. Both before and after I get to that part of the image processing that requires the use of levels or curves I use different processes from two different programs. My first step in processing images from my Canon 350D is to obtain a neutral background. Unless the exposure is short or the sky totally dark, the sky background is not a gray but some shade of red. This shade is caused by light reflection off particles in the air and is also known as sky background or sky fog. My first attempts at obtaining a neutral background were made with the use of levels in Adobe Photoshop. Figure 1 shows an unprocessed image of the Pelican Nebula and the associated sky background. My initial processing when using Photoshop consists of using the levels to expand each color. Figures 2, 3, and 4 show each color before being expanded and Figure 5, 6, and 7 show each color after being expanded. Figure 8 shows the combined (RGB) histogram after the expansions and Figure 9 shows the start of additional level adjustments. Figure 10 is the same as figure 8. Figure 11 shows Figure 9 after some additional level and curve processing. Photoshop levels provide the ability to obtain a fairly good neutral background. The Canon-supplied image processing utility, "Digital Photo Professional", has a process that shows the histogram of the red, blue, and green channels simultaneously and allows their adjustment. I found that aligning all three channels gave a fairly good neutral background. Figure 12 shows this tri-color histogram and Figure 13 shows this histogram after color alignment and contrast increase. Figure 14 is the result of the adjustments shown in Figure 13. Figure 15 is the result of additional level and curve adjustments in Photoshop 7. Although the Canon and Photoshop programs can give a fairly good neutral sky background I have found that the program, "CCDStack", gives a better neutral sky background and it does it in one easy



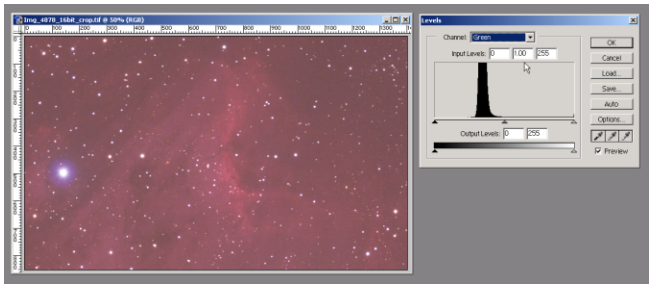
Above, Figure 1: This image is the center part of an unprocessed image of the Pelican Nebula taken by the author on 16 September 2007 using a Televue NP-101 and Hutech modified Canon 350D at 400ASA. Exposure was 20 minutes.

step. Figure 16 shows the unprocessed image, shown earlier as Figure 1, and imported into this program. Figure 17 shows the application of the "set background" color adjustment. Figure 18 is the result of the "set background" function. Figure 19 is the result of processing Figure 18 with additional level and curve processing in Photoshop 7 to darken the background and bring out the red color in the nebula. A close examination of Figures 11, 15, and 19 shows that Figure 11 has good color but a lot of noise. Figure 15 has less color but also less noise. Figure 19 seems to be the best image, having almost as good color as Figure 11 and far better

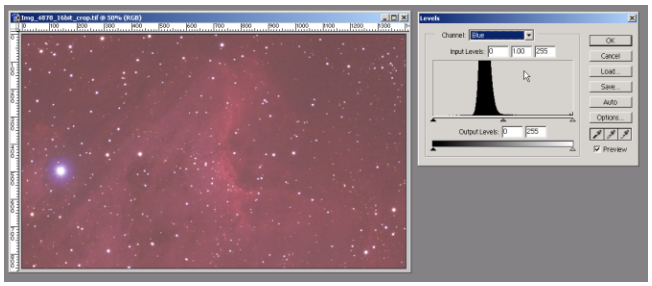
continued on page 28



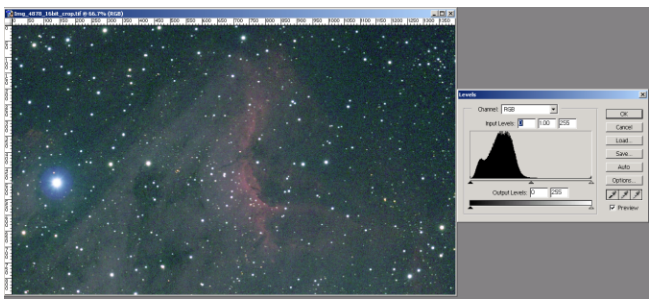
Above, Figure 2: This screen is the color red histogram shown in the levels adjustment in Photoshop 7.



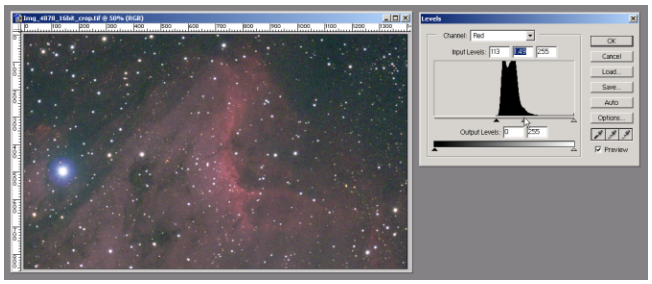
Above, Figure 3: This screen is the color green histogram shown in the levels adjustment in Photoshop 7.



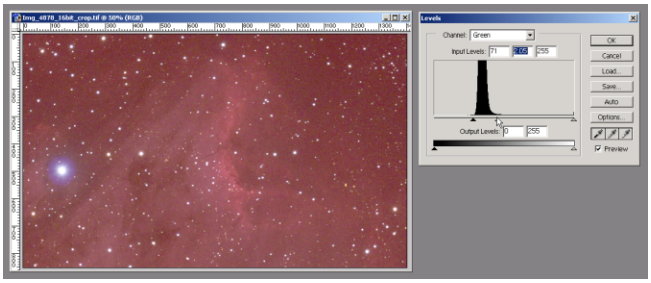
Above, Figure 4: This screen is the color blue histogram shown in the levels adjustment in Photoshop 7.



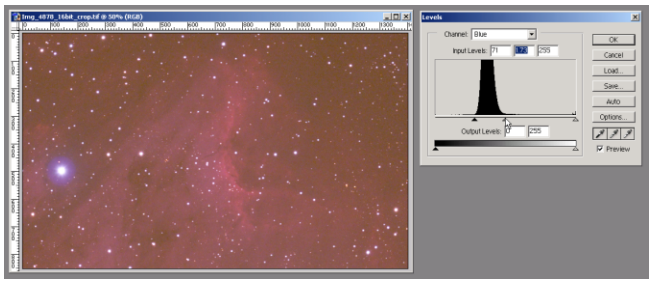
Above, Figure 8: This screen is a histogram of the combined colors (RGB) after each color was expanded.



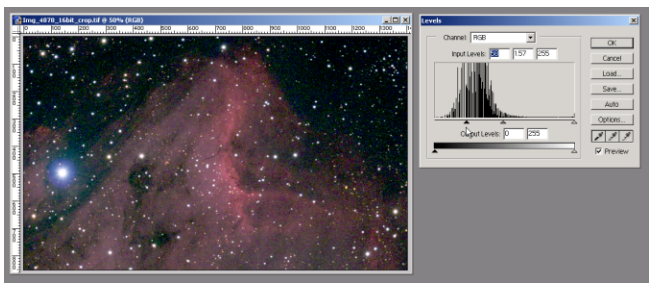
Above, Figure 5: This screen is the color red histogram shown after being expanded using levels in Photoshop 7



Above, Figure 6: This screen is the color green histogram shown after being expanded using levels in Photoshop 7.



Above, Figure 7: This screen is the color blue histogram shown after being expanded using levels in Photoshop 7.



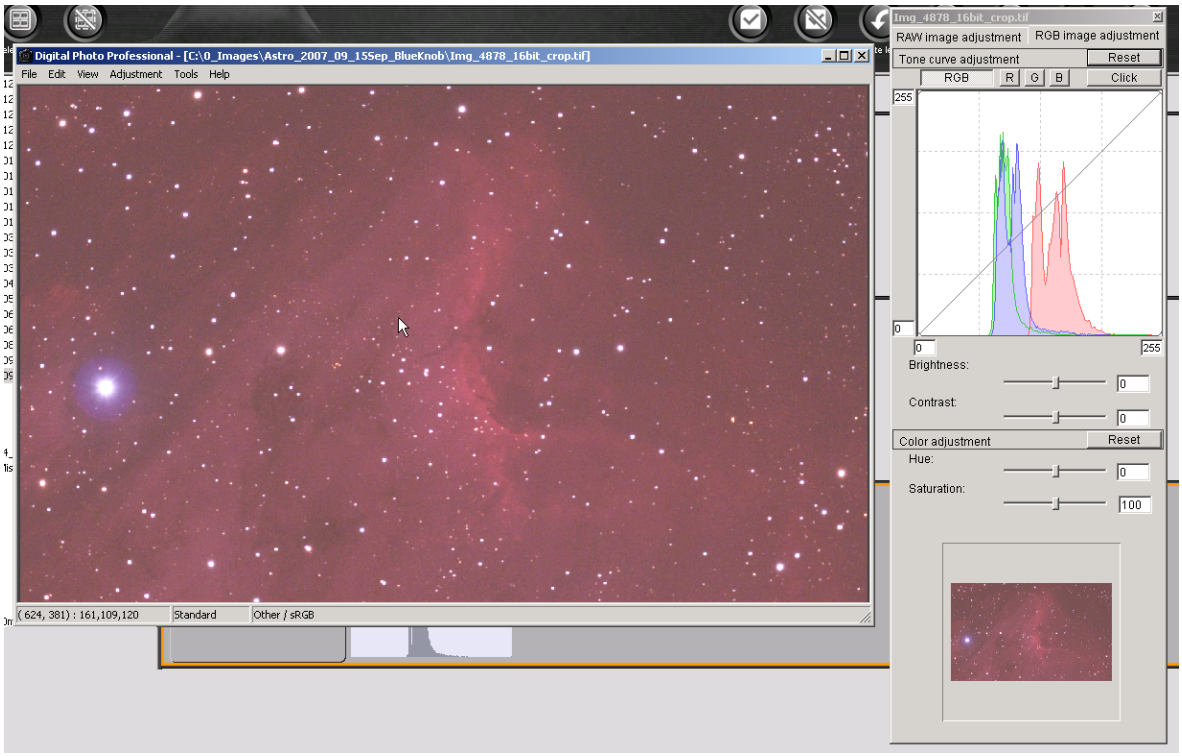
Above, Figure 9: This screen is the RGB histogram after some additional level adjustments to darken the background and bring out the red color of the nebula



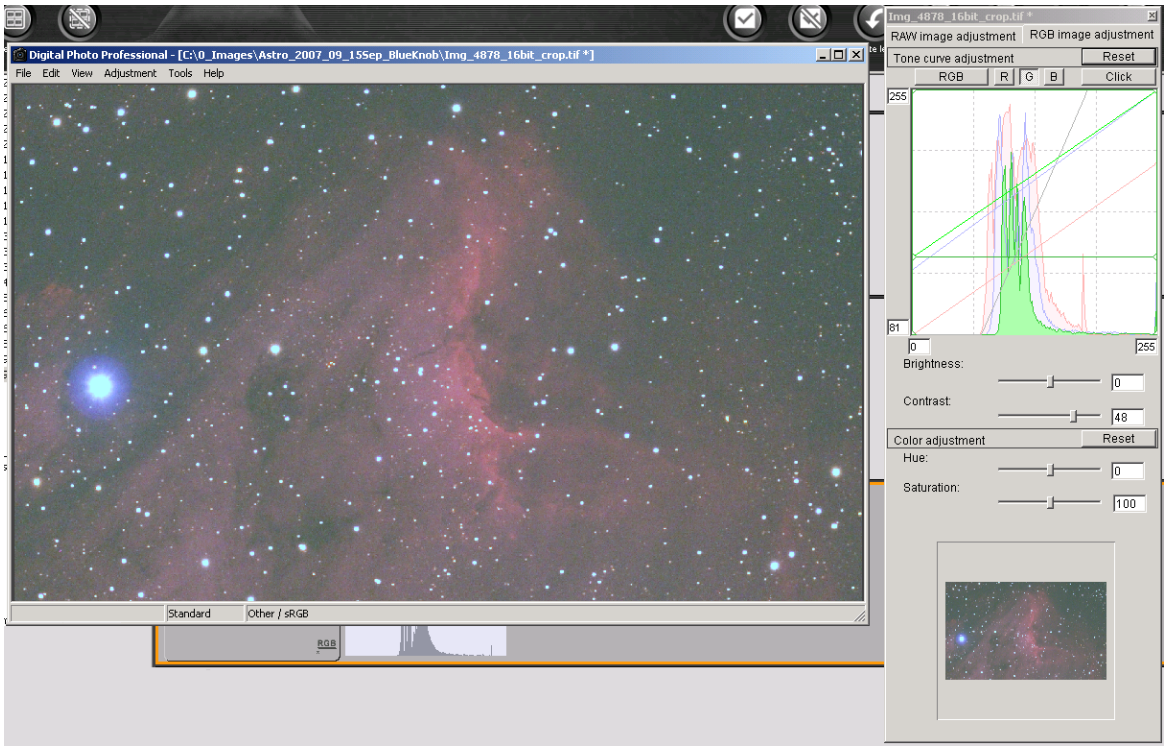
Above, Figure 10: This Image is the same image shown in Figure 8 and the result of expanding each color using levels in Photoshop 7. Note the change in background color compared with the unprocessed image, Figure 1.



Above, Figure 11: This image is the result of taking the image in Figure 10 and applying additional level and curve adjustments in Photoshop 7 to darken the sky and bring out the red nebulosity.



Above, Figure 12: The screen shown above is the appearance of Figure 1 in Digital Photo Professional, the program supplied with the Canon 350D to open, process, and convert Canon RAW images.



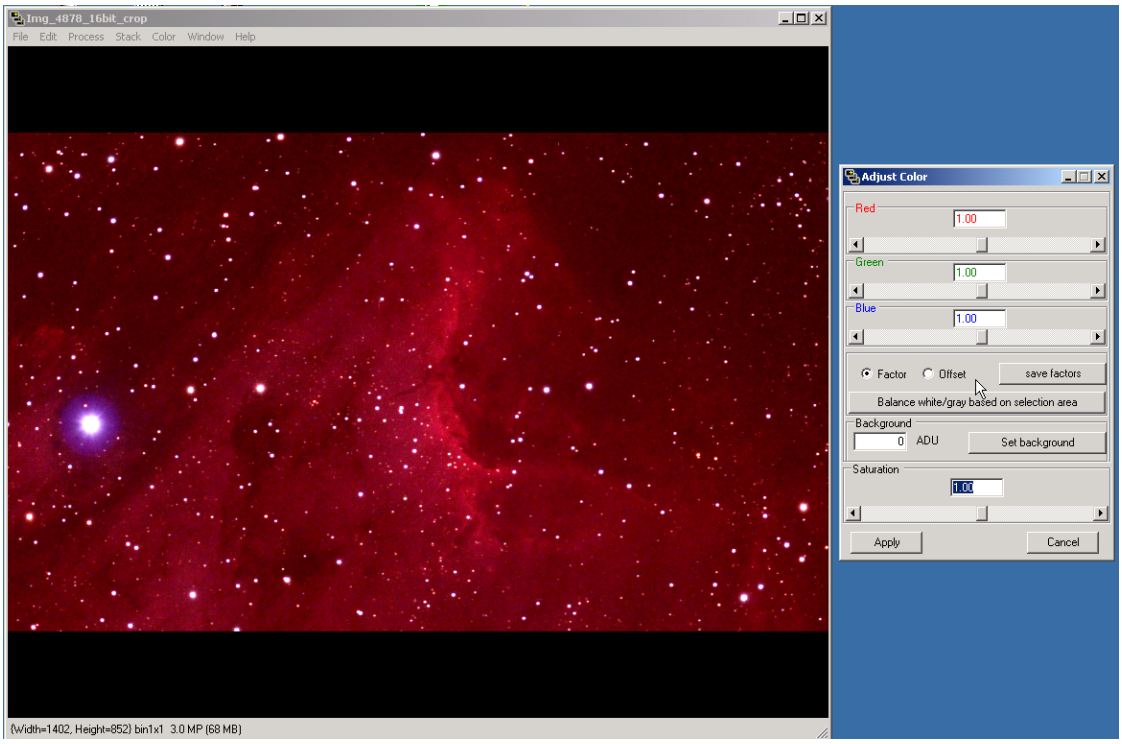
Above, Figure 13: The screen shown above is the appearance of Figure 12 in Digital Photo Professional after alignment of each color and contrast increase. Note that the background is a more neutral color.



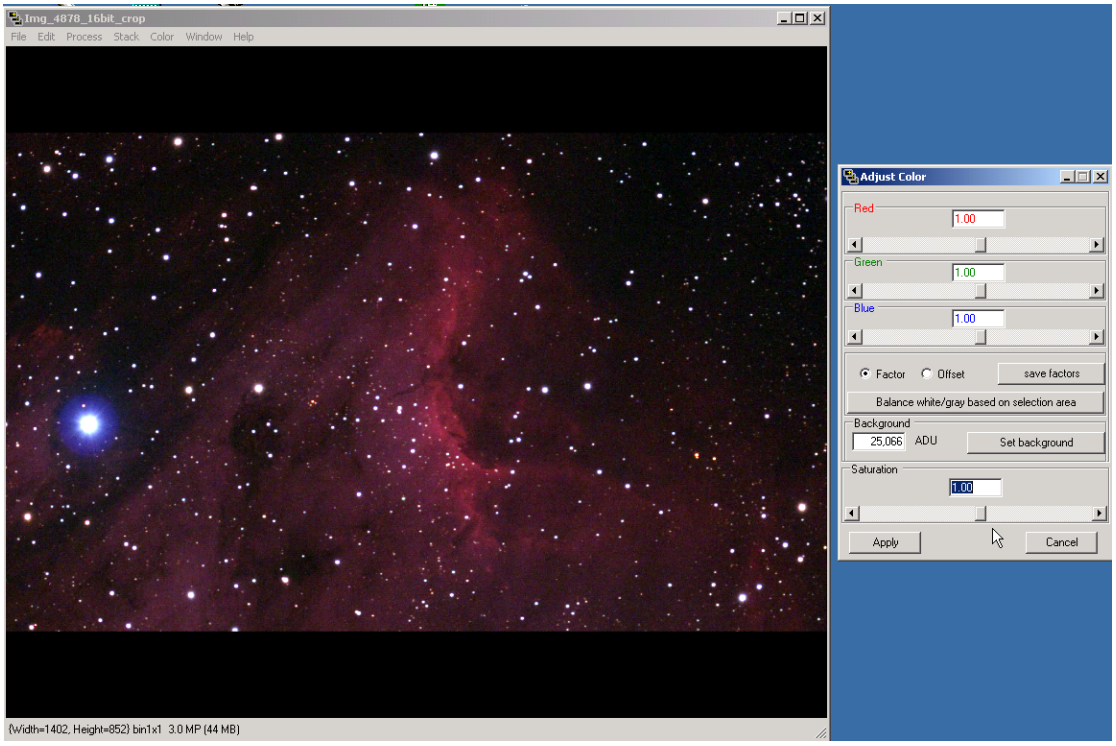
Above, Figure 14: The image shown above is the result of the process shown in Figure 13.



Above, Figure 15: This image is the result of taking the image in Figure 14 and applying additional level and curve adjustments in Photoshop 7 to darken the sky and bring out the red nebulosity.



Above, Figure 16: The screen shown above is the appearance of Figure 1 in the program CCDStack.



Above, Figure 17: The screen shown above is the appearance of Figure 1 in the program CCDStack after the "set background" feature is used to establish a good black background.



Above, Figure 18: The image shown above is the result of the process shown in Figure 17.



Above, Figure 19: This is the result of taking the image in Figure 18 and applying additional level and curve adjustments in Photoshop 7 to darken the sky and bring out the red nebulosity.

Astrophotography for October and November

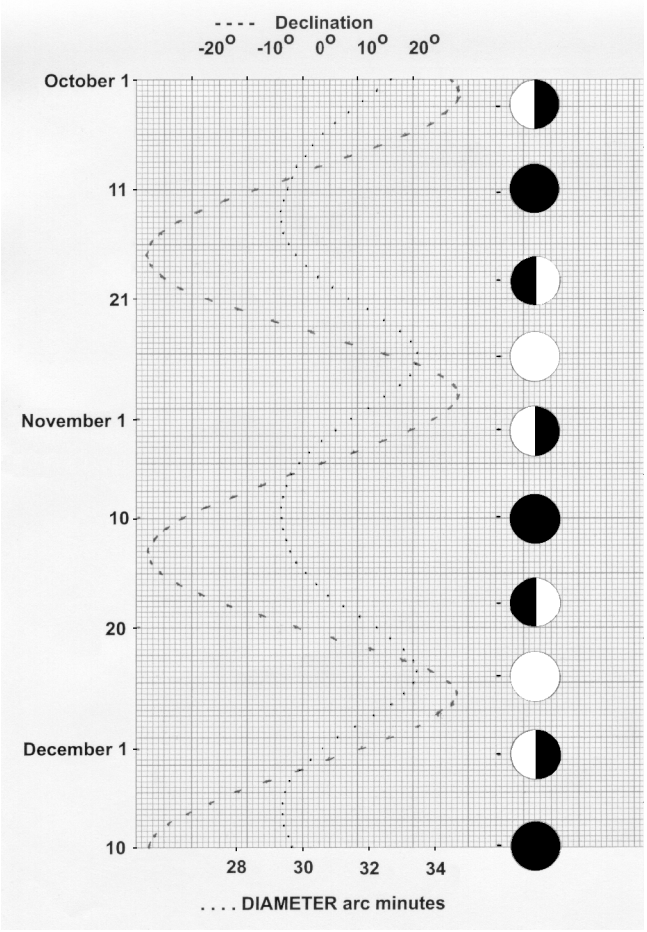
by

Ralph Proctor

Mercury begins October as an evening object high in the western sky. During the remainder of October Mercury moves lower in the western sky and is lost in the Sun's glare during the third week in October. Mercury reaches inferior conjunction with the Sun on 24 October and emerges from the Sun's glare in early November as a morning object low in the eastern sky. Mercury reaches a greatest western elongation of 19 degrees on 8 November when it will be in poor photographic position with a declination of minus 8 degrees.

Venus begins October as a morning object high in the eastern sky. During October and November Venus remains high in the eastern sky and reaches a greatest western elongation of 46 degrees on 28 October.

Lunar Declination and Diameter:



The Moon's waning quarter phase will be located high on the ecliptic and in excellent photographic position during October (October 2 and 30) and November (November 26), with an apparent declination of up to +28 degrees.

Mars begins October as a morning object high in the eastern sky in the constellation Gemini. During October and November Mars moves higher in the eastern sky, increases in brightness from magnitude - 0.1 to - 1.3, and increases in diameter from 9.7 to 15.1 arc seconds.

Jupiter begins October as an evening object low in the western sky in the constellation Ophiuchus. During October and November Jupiter moves lower in the western sky, decreases in brightness from magnitude -2.0 to -1.8, and decreases in diameter from 35.3 to 31.8 arc seconds.

Saturn begins October as a morning object low in the eastern sky in the constellation Leo. During October and November Saturn moves higher in the eastern sky, remains constant in brightness at magnitude +0.8, and increases in diameter from 16.5 to 18.0 arc seconds.

Uranus begins October as an evening object high in the western sky in the constellation Aquarius, having reached opposition with the Sun on 9 September. During October and November Uranus moves lower in the western sky, decreases in brightness from magnitude +5.7 to +5.8, and decreases in diameter from 3.68 to 3.54 arc seconds. Uranus is located at R.A. 23 hours 07.6 minutes declination -06 degrees 29 minutes on 15 October and at R.A. 23 hours 05.3 minutes declination -06 degrees 42 minutes on 15 November.

Neptune begins October as an evening object high in the western sky in the constellation Capricornus, having reached opposition with the Sun on 13 August. During October and November Neptune moves lower in the western sky, remains constant in brightness at magnitude +7.9, and decreases in diameter from 2.33 to 2.25 arc seconds. Neptune is located at R.A. 21 hours 27.4 minutes declination -15 degrees 18 minutes on 15 October and at R.A.

21 hours 27.3 minutes declination -15 degrees 18 minutes on 15 November.

Pluto begins October as an evening object low in the western sky in the constellation Sagittarius. During October and November Pluto moves lower in the western sky and remains constant in brightness at magnitude +13.9. Pluto is located at R.A. 17 hours 49.1 minutes declination -17 degrees 01 minutes on 15 October and at R.A. 17 hours 53.2 minutes declination -17 degrees 07 minutes on 15 November.

Events:

Regulus will be occulted by the Moon on 07 October (07 hours universal time) for Europe, the British Isles, northern and eastern Africa, and the Middle East; and on 03 November (13 hours universal time) for southern North America, the Caribbean, and northern South America.

Antares will be occulted by the Moon on 15 October (15 hours universal time) for most of Antarctica and the southern half of South America; and on 11 November (21 hours universal time) for the southern portion of South America, the southern Pacific Ocean, most of New Zealand, and Polynesia.

Neptune will be occulted by the Moon on 21 October (03 hours universal time) for part of Antarctica, and southern Georgia; and on 17 November (11 hours universal time) for Antarctica, southern Australia, and New Zealand.

Saturn will be occulted by the Moon on 07 October (16 hours universal time) for the Southern Ocean and southern Polynesia.

The Moon will undergo a total eclipse on 20 February 2008 for the Americas and western Europe. The eclipse begins (Penumbra contact) at 00 hours 36.6 minutes and ends at 06 hours 15.7 minutes universal time. Umbra contact begins at 01 hours 43.3 minutes and ends at 05 hours 08.8 minutes. Totality begins at 03 hours 01.2 minutes and ends at 03 hours 50.9 minutes. Mid-eclipse occurs at 03 hours 26.1 minutes universal time, 10:26 PM eastern time.

MINOR PLANETS

		position			
		15 October		15 November	
Planet	Magnitude	R.A.	Decl.	R.A.	Decl.
Ceres	08.0 - 07.6	03 hr 28.0 min	+08 deg 44 min	03 hr 01.7 min	+07 deg 59 min
Pallas	09.2 - 10.0	22 hr 04.6 min	- 04 deg 29 min	22 hr 10.2 min	- 08deg 22 min
Juno	11.5 - 11.4	14 hr 47.5 min	- 07 deg 08 min	15 hr 28.1 min	- 09 deg 44 min
Vesta	07.6 - 07.9	17 hr 54.4 min	- 24 deg 30 min	18 hr 57.3 min	- 24 deg 41 min

Back issues of the ASTROGRAPH in its printed format are still available for $1.50 each ($2.00 for each color issue) plus postage. Currently the following issues are available:

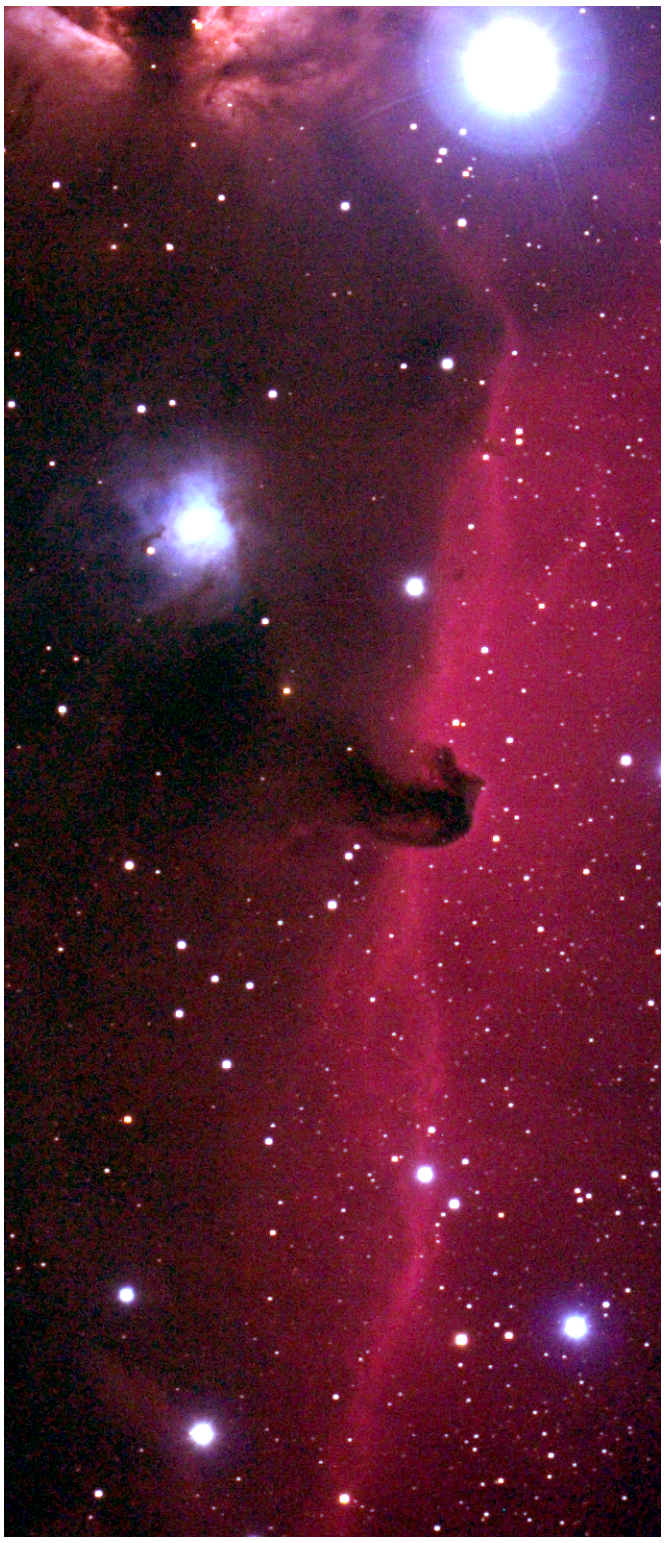
Volume No. 6 issue 6
Volume No. 7 issue 5 and 6
Volume No. 8 issue 11, 3, 4, and 5
Volume No. 9 issue 1, 4, 5, and 6
Volume No. 10 issue 2, 3, 5, and 6
Volume No. 11 issue 1, 2, 3[1], 4, 5, and 6
Volume No. 12 issue 1, 2, 3, 4, 5, and 6
Volume No. 13 issue 1, 2, 3, 4, 5, and 6
Volume No. 14 issue 1, 2, 3, 4, 5, and 6
Volume No. 15 issue 1, 2, 3, 4, 5, and 6
Volume No. 16 issue 1, 2, 3, 4, 5, and 6
Volume No. 17 issue 1, 2, 3[2], 4, 5, and 6
Volume No. 18 issue 1, 4, 5, and 6
Volume No. 19 issue 1, 2, 3, 4, 5, and 6
Volume No. 20 issue 1, 2, 3[1], 4, 5, and 6
Volume No. 21 issue 1, 2, 3, 4, 5, and 6
Volume No. 22 issue 1, 2, 3, and 4
Volume No. 23 issue 4 and 5
Volume No. 24 issue 5 and 6
Volume No. 25 issue 1, 2, 4, and 6
Volume No. 26 issue 1, 2, 3, 5, and 6
Volume No. 27 issue 2, 3, 4, 5, and 6
Volume No. 28 issue 5 and 6
Volume No. 29 issue 1, 2, 3, 4, 5, and 6
Volume No. 30 issue 1, 2, 3, 4[1], 5, and 6
Volume No. 31 issue 1, 2, 3, 4, 5, and 6
Volume No. 32 issue 1, 2, 3, 4, 5, and 6
Volume No. 33 issue 1, 2, 3, 4, 5, and 6
Volume No. 34 issue 1, 2, 3, 4, 5, and 6
Volume No. 35 issue 1 and 2

NOTES: 1 - Color issue - $2.00 each
2 - Comet photography issue.

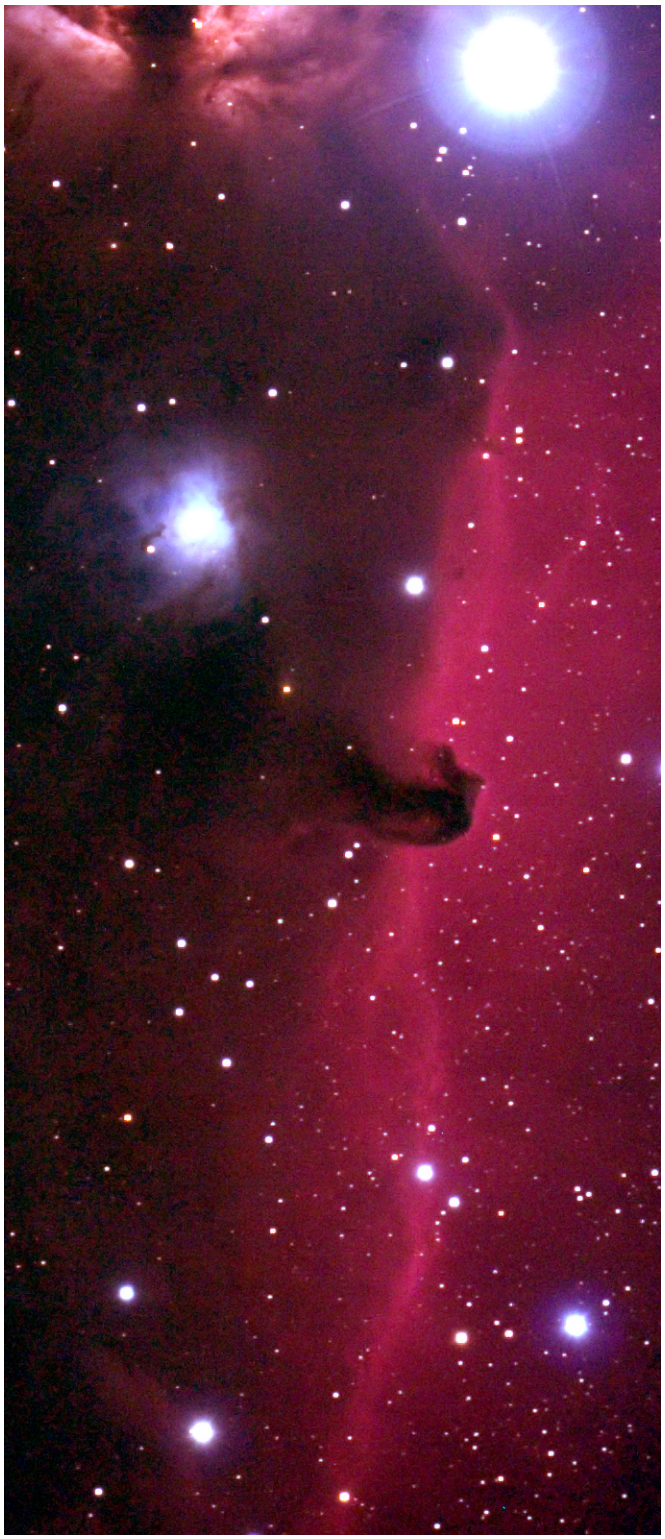
Postage (foreign and domestic) - Add $1.07 for the first issue and $0.75 for each additional issue.

MAILING ADDRESS:
the ASTROGRAPH
PO Box 369 Phone#
Dumfries, VA 22026 (703) 441-6778

noise than either Figure 11 or 15. After using curves or levels in Photoshop 7 to adjust the image to what I want, I use one additional process from the program Corel Paint Shop Pro IX. This Corel image processing program has a "Digital Camera Noise Removal" that seems to smooth the image. Examples of this noise removal are shown in Figures 20, 21, 22, and 23.



Above, Figure 20: This is a portion of the author's processed image of the Horsehead Nebula. This image is a 21 minute exposure using a Hutech modified Canon 350D and Televue NP-101.



Above, Figure 21: This is the same image as Figure 20 but after "Digital Camera Noise Removal" was applied.



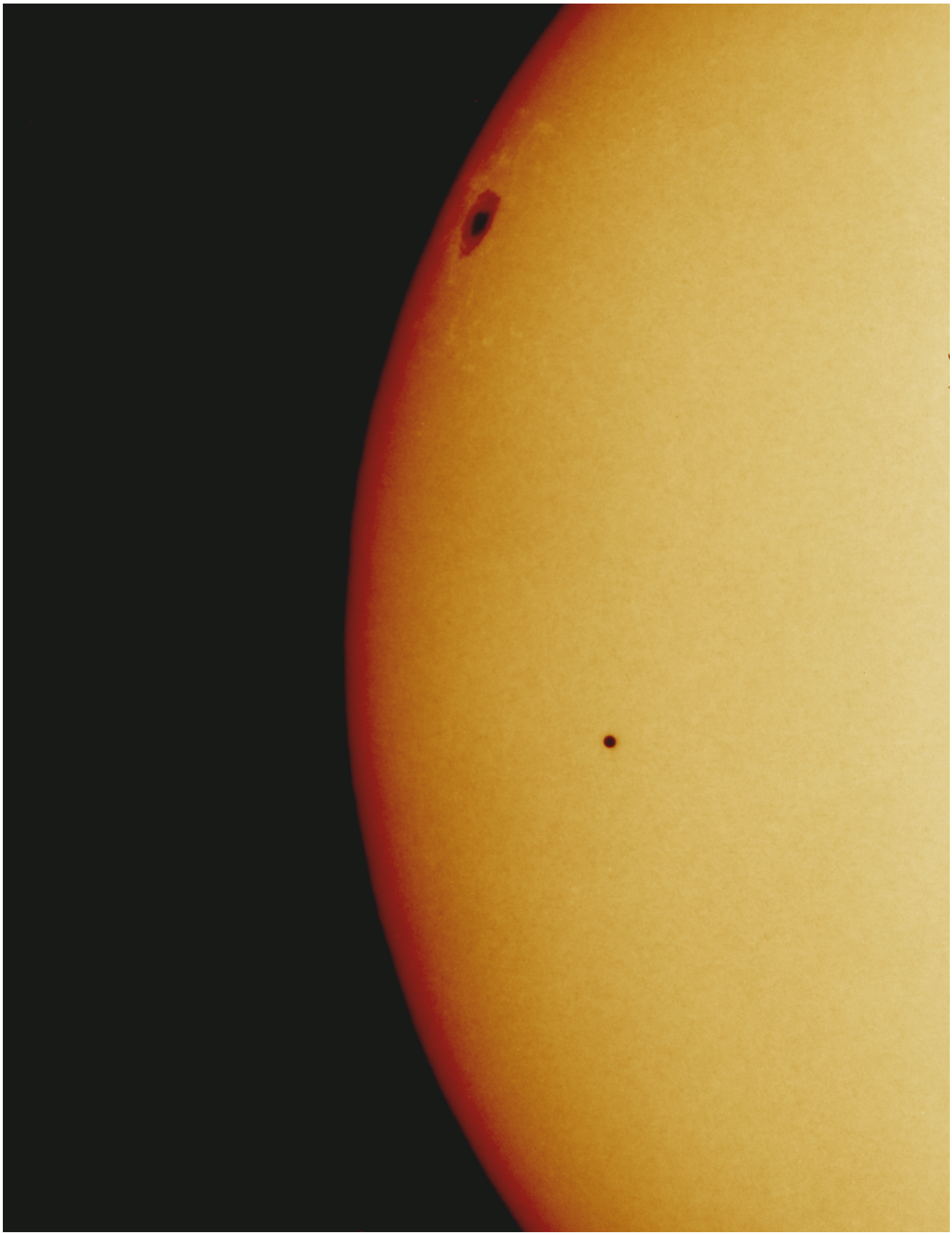
Above, Figure 22: This is a portion of author's processed image of the Helix Nebula. This image is a 20 minute exposure using a Hutech modified Canon 350D and Televue NP-101.



Above, Figure 23: This is the same image as Figure 22 but after "Digital Camera Noise Removal" was applied.



Above: Mercury transit photographed on 8 November 2006 by Lee C. Coombs with a 6-inch F/12 APO Refractor stopped to F/25 and B&L ND.4 solar filter. Exposure was 1/1000 second on TP2415 film developed in D-19 for 4 minuter at 20°C.



Above: Mercury transit photographed on 8 November 2006 by Lee C. Coombs with a 6-inch F/12 APO Refractor stopped to F/19 and then 3x to F/57. Exposure was 1/250 second on TP2415 film developed in D-19 for 4 minuter at 20°C. A B&L ND.4 solar filter was used for this exposure.



Above: NGC 2237, the Rosette Nebula, photographed by Lee C. Coombs on 10 March 2007 using a 70mm F/5.1 Televue Pronto Exposure was 30 minures on Ektachrome Professional 200 film. Scanned and processed in Photoshop 6.