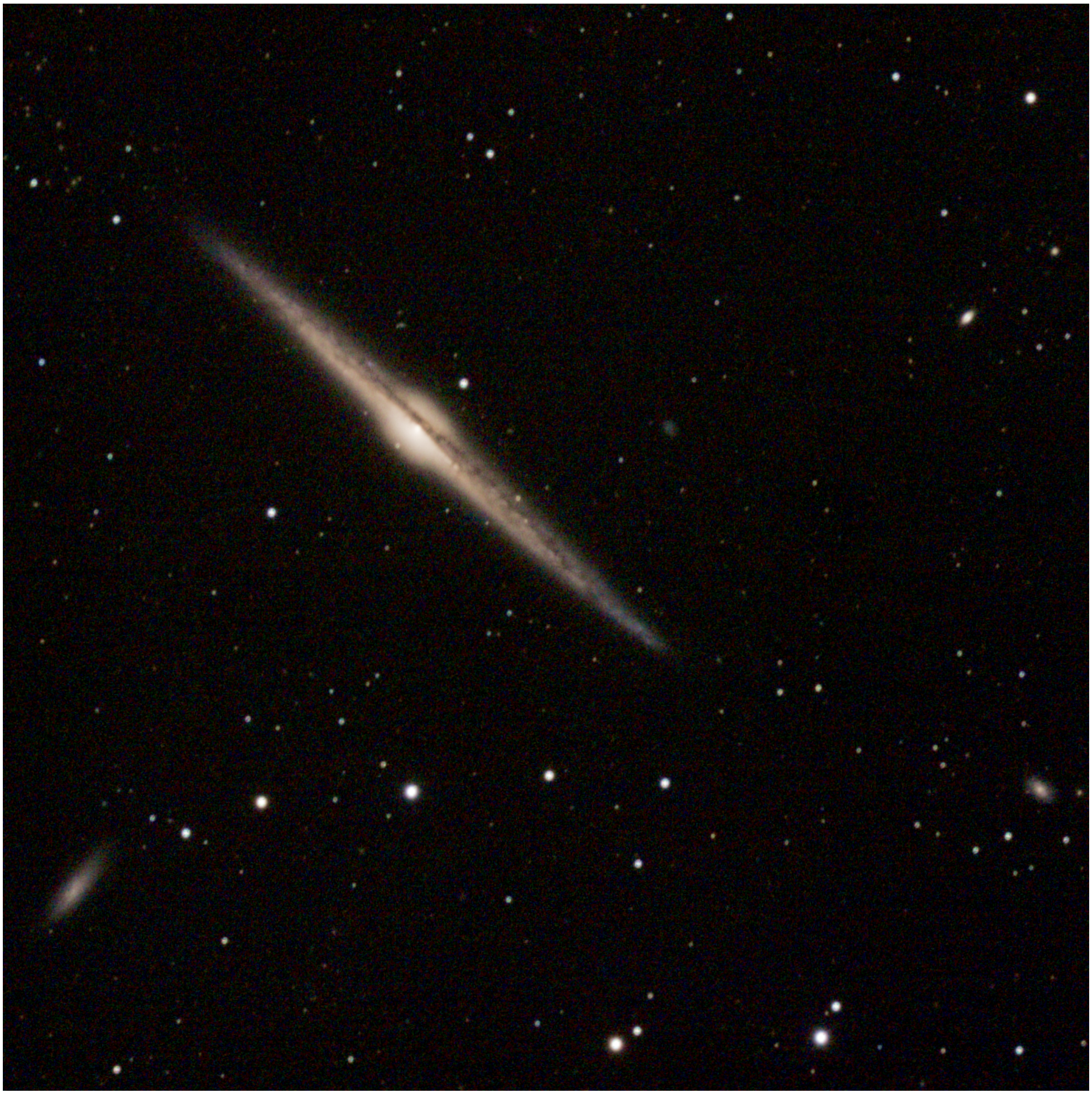
the ASTROGRAPH



Volume 40 No. 5 April/May 2009

the ASTROGRAPH

COVER PHOTOGRAPH

Object.....NGC 4565
Photographer.....Robert C. Price
Instrument.....TOA150 (6 inch F/7.3 refractor)
Exposure.....three 20 minutes exposures at 200ASA
Camera.....Hutech modified Canon 40D
Date.....21 March 2009
Location.....farm just south of BlueKnob State Park, PA

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VOLUME 40 No. 5
EDITOR.....Robert C. Price
CONTRIBUTING EDITOR.....Ralph Proctor
PROOFING CONTRIBUTOR.....Linda Miller
CONTRIBUTORS.....Lee C. Coombs

Features

Departments

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. 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.

Product Evaluation: UltraWide Adapter

by

Robert C. Price

The product being evaluated is a 2 inch UltraWide adapter that couples a 2 inch eyepiece holder to a specific camera. The UltraWide adapter eliminates the need for a T-adapter because the camera threads are built into the adapter. This type of adapter has the advantage of the 1.5 inch opening of a T-adapter being eliminated, thus allowing the full inside diameter of the UltraWide adapter to be the limiting factor restricting the light cone from the optical system. Figure 1 shows a standard T-adapter and T-ring. Figure 2 shows the UltraWide adapter. Figure 3 shows the camera's CMOS sensor as seen

Above: Figure 1, Williams optics T-adapter and T-ring attached to a Canon 40D camera.

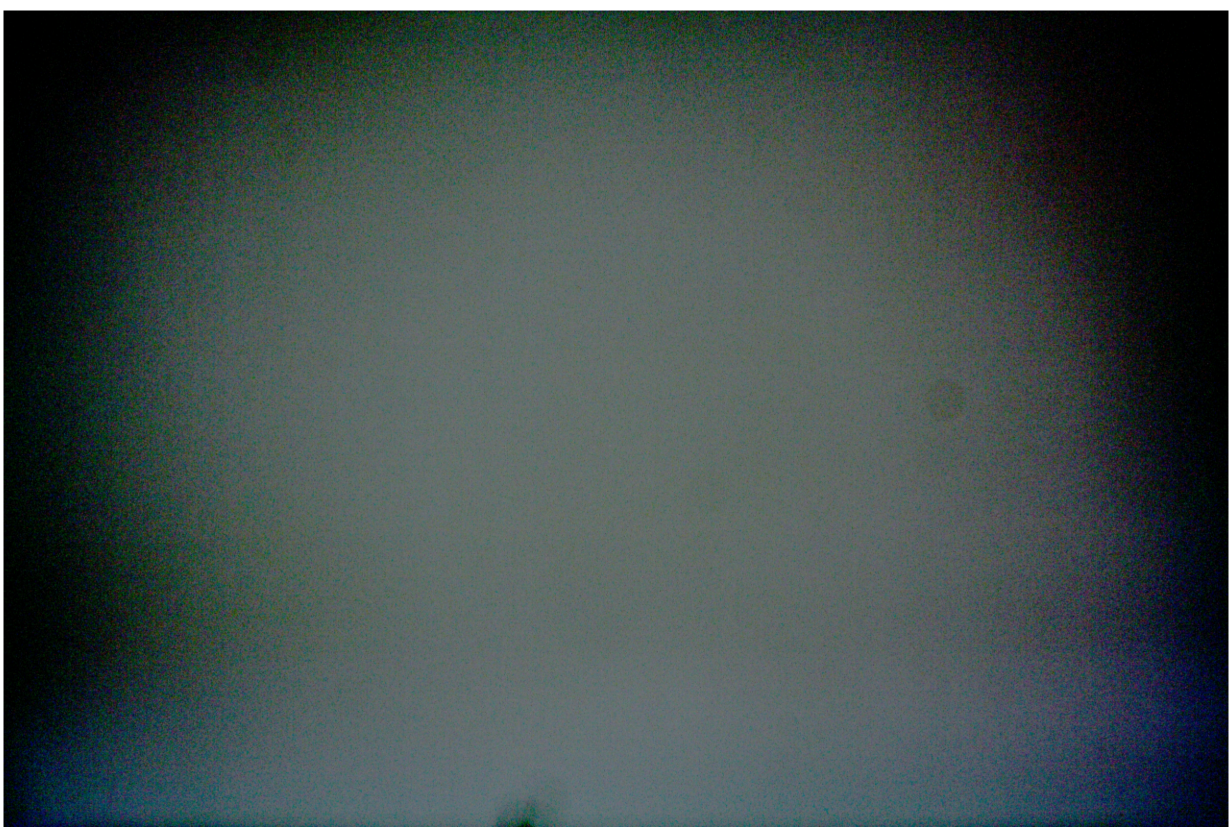
Above: Figure 2, UltraWide adapter attached to a Canon 40D camera.

looking into the standard adapter. Figure 4 shows this same view looking into the UltraWide adapter. Figure 5 shows a flat field image using the standard T-adapter and T-ring combination. Figure 6 shows a flat field image using the UltraWide adapter. These flat field images were made using an NP-127 F/5.2 refractor and canon 40D camera. With the APS-C size sensor there is no advantage with the UltraWide adapter. Both adapters show the same flat field image characteristics. The main cause of vignetting seen in these flat field images appears to be the camera itself. The UltraWide adapter might prove useful for 35mm size sensors, but it has no advantage over T-rings with APS-C sensors.

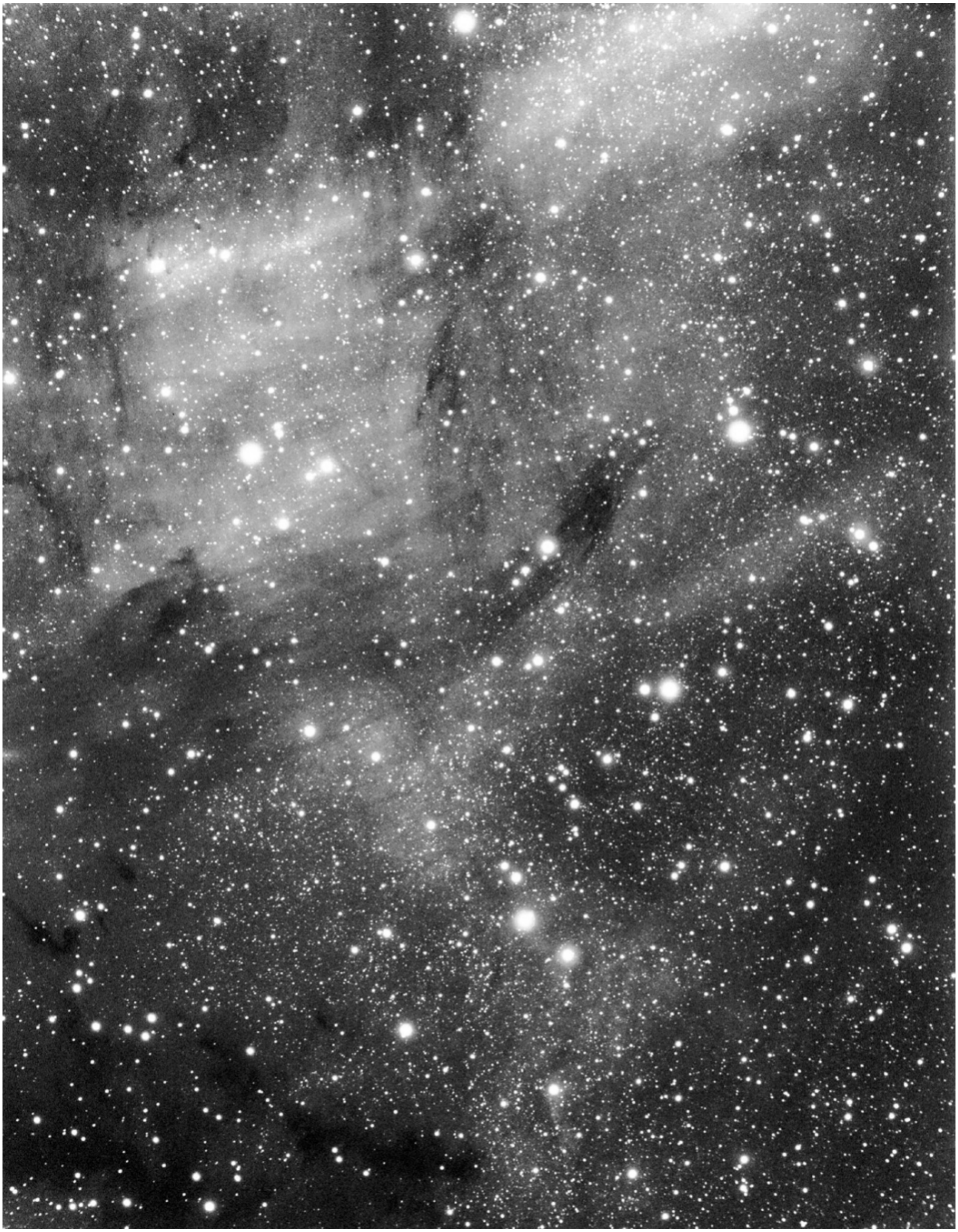
Above: Figure 3, View of the Canon 40D CMOS sensor looking down the Williams Optics T-adapter and T-ring.

Above: Figure 4, View of the Canon 40D CMOS sensor looking down the UltraWide adapter.

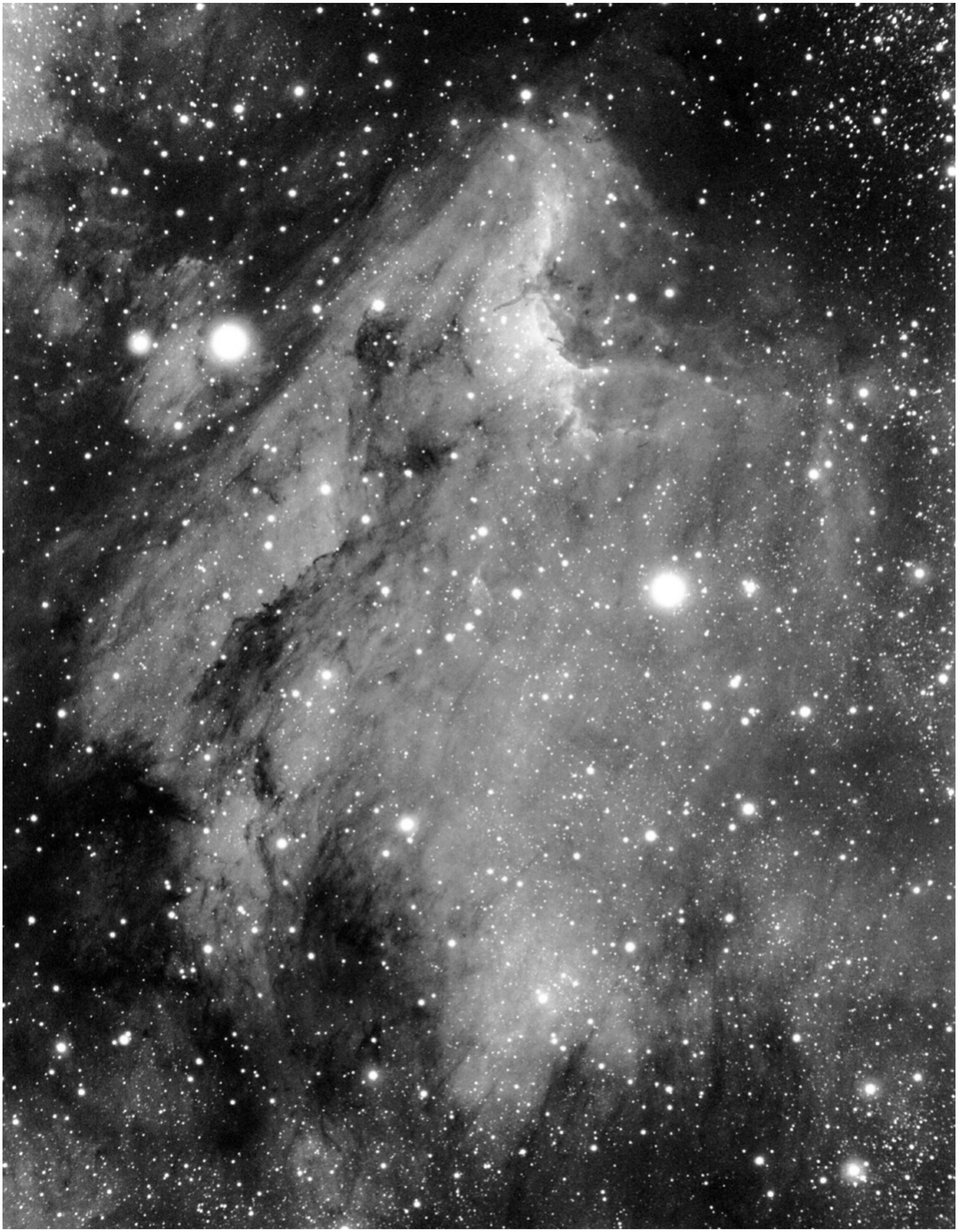
Above: Figure 5, Flat field image with a Canon 40D and T-adapter/T-ring attached to a NP-127 refractor. Image has been processed to exaggerate the difference in image density over the image field.



Above: Figure 6, Flat field image with a Canon 40D and UltraWide adapter attached to a NP-127 refractor. Image has been processed the same as the image in Figure 5.



Above: IC5068 (Nebulosity just south of the Peilcan Nebula) photographed by Chuck Vaughn using an AstroPhysics 130EDT (1040mm-f/8). Exposure was 150 minutes on TP2415 film.



Above: The Peilcan Nebula photographed by Chuck Vaughn using an AstroPhysics 130EDT (1040mm-f/8). Exposure was 150 minutes on TP2415 film.

Above: M 78 photographed by Lee C. Coombs on 8 March 2002 using a 10 inch F/5 Newtonian. Exposure was 35 minutes on Kodak Ektachrome Professional 200.

Above: NGC1973 photographed by Lee C. Coombs on 6 March 2005 using a 10 inch F/5 Newtonian. Exposure was 35 minutes on Kodak Ektachrome Professional 200.

Astrophotography for April and May

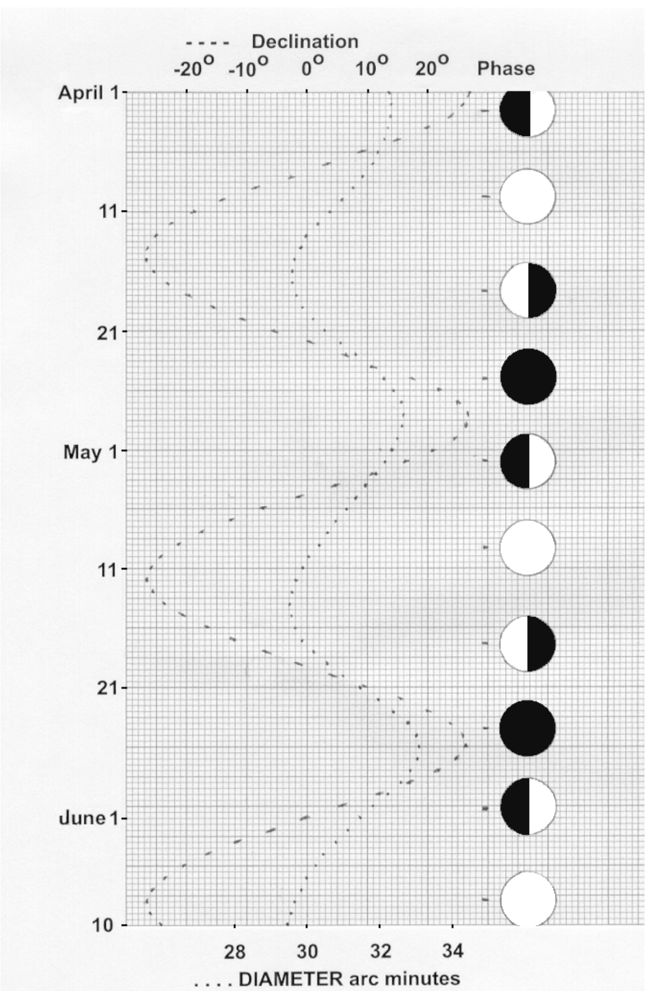
by

Ralph Proctor

Mercury begins April lost in the Sun's glare. Mercury emerges from the Sun's glare in early April as an evening object low in the western sky. Mercury moves higher in the western sky and reaches a greatest eastern elongation of 20 degrees on 26 April when it will be in good photographic position with a declination of plus 22 degrees. During the remainder of April Mercury moves lower in the eastern sky and by the first week in May disappears into the Sun's glare.

Venus begins April lost in the Sun's glare. During the first week in April Venus emerges from the Sun's glare as a morning object low in the eastern sky. During April and May Venus moves higher in the eastern sky.

Lunar Declination and Diameter:



The Moon's first quarter phase will be located high on the ecliptic and in excellent photographic position during April (April 2) and May (May 1), with an apparent declination of up to +27 degrees.

Mars begins April as a morning object low in the eastern sky in the constellation Sagittarius. During April and May Mars moves higher in the eastern sky, remains constant in brightness at magnitude +1.2, and increases in diameter from 4.29 to 4.7 arc seconds.

Jupiter begins April as a morning object low in the eastern sky in the constellation Capricornus. During April and May Jupiter moves higher in the eastern sky, increases in brightness from magnitude -2.1 to -2.4, and increases in diameter from 35.0 to 41.4 arc seconds.

Saturn begins April as an evening object high in the western sky having reached opposition with the Sun on 8 March. Saturn is still in good photographic position during April and May with a declination of plus 8 degrees. During April and May Saturn moves lower in the western sky, decreases in brightness from magnitude +0.6 to +0.9, and decreases in diameter from 19.6 to18.0 arc seconds.

Uranus begins April lost in the Sun's glare. Uranus emerges from the Sun's glare in early April as a morning object low in the eastern sky in the constellation Pisces. During April and May Uranus moves higher in the eastern sky, remains constant in brightness at magnitude +5.9, and increases in diameter from 3.35 to 3.46 arc seconds. Uranus is located at R.A. 23 hours 40.7 minutes declination -02 degrees 53 minutes on 15 April and at R.A. 23 hours 45.6 minutes declination -02 degrees 22 minutes on 15 May.

Neptune begins April as morning object low in the eastern sky in the constellation Capricornus. During April and May Neptune moves higher in the eastern sky, increases in brightness from magnitude +8.0 to + 7.9, and increases in diameter from 2.22 to 2.29 arc seconds. Neptune is located at R.A. 21 hours 53.3 minutes declination -13 degrees 13 minutes on 15 April and at R.A. 21 hours 55.2 minutes declination -13 degrees 04 minutes on 15 May.

Pluto begins April as a morning object low in the eastern sky in the constellation Sagittarius. During April and May Pluto increases in brightness from magnitude +14.0 to + 13.9. Pluto is located at R.A. 18 hours 13.1 minutes declination -17 degrees 38 minutes on 15 April and at R.A. 18 hours 11.5 minutes declination -17 degrees 37 minutes on 15 May.

Events:

Antares will be occulted by the Moon on 13 April (13 hours universal time) for the Marshall Islands, the Kiribati Republic, the Hawaiian Islands, Mexico, and Guatemala; and on 16 May (22 hours universal time) for the northeastern portion of Africa, the southeastern portiof Europe, the Middle East, Arabia, India, the southern portion of China, the southeastern portion of Asia, and the northern portion of the Philippines.

Venus will be occulted by the Moon on 22 April (14 hours universal time) for northern Mexico, all but the eastern portion of the United States, all but the eastern portion of Canada, the eastern portion of Alaska, and Svalbad.

The Sun will undergo a total eclipse on 21-22 July 2009 for India, southern and eastern Asia, Japan, northern Indonesia, the Philippines, and the western and central portion of the Pacific Ocean. The eclipse begins at 23 hours 58.3 minutes universal time 21 July and ends at 05 hours 12.4 minutes universal time 22 July. Central eclipse at local apparent noon occurs at 02 hours 33.0 minutes universal time 22 July. The shadow of the total eclipse begins in the central Pacific Ocean, travels across Asia, and ends off the eastern coast of India.

The Moon will undergo a penumbral eclipse on 7 July 2009 for Antarctica, the eastern portion of Australia, the Pacific Ocean including the Hawaiian Islands, the western portion of South America, Central America, the western portion of North America, and the western portion of Alaska. The eclipse begins (Penumbra contact) at 08 hours 32.8 minutes and ends at 10 hours 44.4 minutes universal time. Mid-eclipse occurs at 09 hours 38.6 minutes universal time.

MINOR PLANETS

		position			
		15 April		15 May	
Planet	Magnitude	R.A.	Decl.	R.A.	Decl.
Ceres	07.5 - 08.4	10 hr 29.7 min	+25 deg 04 min	10 hr 40.3 min	+21 deg 33 min
Pallas	08.7 - 09.0	06 hr 15.5 min	- 02 deg 56 min	07 hr 14.0 min	+02 deg 22 min
0Juno	10.7 - 10.2	22 hr 14.6 min	- 04 deg 18 min	22 hr 56.8 min	- 00 deg 40 min
Vesta	08.5 - 08.3	04 hr 03.7 min	+18 deg 05 min	04 hr 55.8 min	+20 deg 42 min

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Volume No. 28 issue 5 and 6
Volume No. 29 issue 1, 2, 3, 4, 5, and 6
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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
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Product Evaluation: TOA Field Flattener

by

Robert C. Price

The product being evaluated is a Takahashi 67 field flattener for the Takahashi TOA 150 six inch refractor. By their nature refractors with doublet and triplet objective lenses do not have a flat field. Some 4-element Nagel-Petzval optical design refractors are really designed to be astrographs and do have flat fields. With normal refractors, the faster the lens, the more the image field is curved. Take telephoto lenses as an example. Telephoto lenses are designed to work with flat sensors, either film or a CCD type sensor and as a result must have a flat field. A typical 600mm F/9 telephoto lens has 5 elements. A typical 400mm F/5.6 lens has 7 elements. A typical 400mm F/4 lens has 17 elements. As the lens becomes faster, more optical correction is necessary to ensure both a flat field and good color correction at the focal plane. More optical correction means more optical elements are necessary to provide this correction. The Takahashi 67 flattener is a 4-element optical flattener that produces either a 70mm or 90mm (depending on what vendors specification is cited) flat image circle. The Takahashi 67 is described as a 4 inch flattener. It is actually 3.75 inches in diameter. Optically the flattener changes the 1100mm focal length of the objective lens to a focal length of 1090mm and changes the focal ratio from F/7.33 to F/7.3. Figure 1 shows the Takahashi 67 flattener attached to the TOA 150 and a Canon 40D camera attached to the 67 flattener. Figure 2 shows the corner of an image centered on M42 taken without the flattener. Figure 3 shows the center of this same image. Note the elongation of the star images in the corner of the frame, Figure 2. Figure 4 shows the same area seen in Figure 2 but with the use of the 67 flattener and Figure 5 shows the center of this same image. Note that the star images appear uniform across the frame. It should be noted that Figures 4 and 5 are from an image that was not as well focused as the image shown in Figure 2 and 3. The softness of the image is a result of poorer focus, not the use of the 67 flattener. Subsequent images with the 67 flattener show the same sharp images as seen in Figures 3. Figure 6 shows the corner of a well focused image centered on M13 and taken with the 67 flattener. Field testing by this author shows that the Takahashi 67 flattener does a superb job of flattening the field of the Takahashi TOA 150 refractor. Star images are uniformly excellent across the field.

Above: Figure 1, Takahashi 67 flattener attached to a Takahashi TOA150 six inch refractor. A Canon 40D camera is shown attached to the flattener.

Above: Figure 2, Corner area of an image centered on M42 taken with a Takahashi TOA150 six inch refractor and a Hutech modified Canon 40D. Note elongated images of stars in the corner of this image.

Above: Figure 3, Center area of the image shown in Figure 2 taken with a Takahashi TOA150 six inch refractor and a Hutech modified Canon 40D.

Above: Figure 4, Corner area of an image centered on M42 taken with a Takahashi 67 flattener, Takahashi TOA150 six inch refractor, and a Hutech modified Canon 40D.

Above: Figure 5, Center area of the image shown in Figure 4 taken with a Takahashi 67 flattener, Takahashi TOA150 six inch refractor, and a Hutech modified Canon 40D.

Above: Figure 6, Corner area of an image centered on M13 taken with a Takahashi 67 flattener, Takahashi TOA150 six inch refractor, and a Hutech modified Canon 40D.

Above: NGC6357 photographed by Lee C. Coombs on 6 June 2002 using a 10 inch F/5 Newtonian. Exposure was 35 minutes on Kodak Ektachrome Professional 200.