van den Bergh Catalog

This catalog contains 159 reflection nebulae from the van den Bergh Reflection Nebulae Catalog. The catalog was originally published in 1966 by Sidney van den Bergh. According to van den Bergh it contains information for "all BD and CD stars north of -33 deg which are surrounded by reflection nebulosity visible on both the blue and red prints of the Palomar Sky Survey. The nearer reflection nebulae lie predominantly along Gould's Belt, whereas the more distant ones are concentrated to the galactic plane."

I am systematically imaging these fascinating nebulae, many of which are often overlooked for other more famous objects. Many vdB objects are reflection portions of more famous nebulous objects, see M45 for example. A few vdB objects are included in a single image; these may not be close up images of the individual vdB objects but it gives the imager an idea where the various object may be found in relation to other cataloged objects.

• vdB 1	• vdB 41	• vdB 81	• vdB 121
			• 122
• 2	• 42	• 82	• 123
• 3	• 43	• 83	• 124
• 4	• 44	• 84	• 125
• 5	• 45	• 85	• 126
• 6	• 46	• 86	• 127
• 7	• 47	• 87	• 128
• 8	• 48	• 88	• 129
• 9	• 49	• 89	• 130
• 10	• 50	• 90	• 131
• 11	• 51	• 91	• 132
• 12	• 52	• 92	• 133

. 13	. 53	. 93	. 134
. 14	. 54	. 94	. 135
. 15	. 55	. 95	. 136
. 16	. 56	. 96	. 137
. 17	. 57	. 97	. 138
. 18	. 58	. 98	. 139
. 19	. 59	. 99	. 140
. 20	. 60	. 100	. 141
. 21	. 61	. 101	. 142
. 22	. 62	. 102	. 143
. 23	. 63	. 103	. 144
. 24	. 64	. 104	. 145
. 25	. 65	. 105	. 146
. 26	. 66	. 106	. 147
. 27	. 67	. 107	. 148
. 28	. 68	. 108	. 149
. 29	. 69	. 109	. 150
. 30	. 70	. 110	. 151
. 31	. 71	. 111	. 152
. 32	. 72	. 112	. 153
. 33	. 73	. 113	. 154
. 34	. 74	. 114	. 155
. 35	. 75	. 115	. 156a,b,c
. 36	. 76	. 116	. 156d
. 37	. 77	. 117	. 157
. 38	. 78	. 118	. 158
. 39	. 79	. 119	. 159
. 40	. 80	. 120	

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vdB 1, LBN 578, LDN 1265, [YDM97] CO 106, HH 161, HH 164, HH 461, HH 800-2; *Cassiopeia*
Astro Systeme Austria N12 f/3.5 astrograph
Astro-Physics 160 (160TCC) f/5.8 refractor
KAI-11000M; SBIG STL
Total Exposure Time: 10.5 hours; LRGB 210:120:120:120 minutes unbinned
October-November 2009; Inkom, ID and Mayhill, NM
Comments: This target was difficult to image due to the intrusion of Beta Cassiopeia (Caph). A wider view may be seen here.

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vdB 2, LBN 585, LBN 590, GN 00.04.4, Teutsch GN J0016.8+6546, [YDM97]
CO 112,115,118, Sh2-171; *Cassiopeia*
Astro-Physics 160 (160TCC) f/5.8 refractor
KAI-11000M, SBIG STL
Total Exposure Time: 7 hours; LRGB 240:60:60:60 minutes unbinned
October 2009; Mayhill, NM
Comments: Numerous other faint nebulae occupy the region near vdB 2. Sh2-171 is just making an appearance in the lower right corner. [YDM97] CO 112, 115, 118 are portions of a large molecular cloud in this region of *Cassiopeia*.

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vdB 3, LBN 602, GN 00.31.6; *Cassiopeia*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (color)
KAI-11000M/CM M(Lum), CM(color)
Total Exposure Time: 10.25 hours, L:OSC 300:315 minutes, unbinned
September 2009; Inkom, ID
Comments: This very faint relection nebula in *Cassiopeia* is surrounded by a dark nebula which I can not find a catalog designation, even with SIMBAD. A wider FOV may be seen here.

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van den Bergh 4, NGC 225 (oc); *Cassiopeia*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (RGB)
KAI-11000M; SBIG STL (Lum), FLI Microline (RGB)
Total Exposure Time: 13+ hours; LRGB 310:160:160:160 minutes, unbinned
September 2008, Inkom, ID
Comments: vdB 4 is reflection nebula number 4 in Sidney van den Bergh's Catalog of Reflection Nebulae, 1966.
The adjacent dark nebulae and dust appear not to be cataloged. Cropped image below.

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IC59, 63, vdB 5; *Cassiopeia*
Astro-Physics 155EDF f/7
STL-11000M
HaRGB 135:35:35:35 minutes
October 26-28, 2006; Inkom, ID
Comments: This is a difficult nebulosity to image due to the brightness and proximity of *Gamma Cassiopeia.* A wider field of view may be seen here.

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vdB 6, NGC 654 (oc), NGC 663 (oc), LDN 1343-4; *Cassiopeia*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (color)
KAI-11000M/CM M(Lum), OM(color)
Total Exposure TIme: 10+ Hours, L:OSC 300:310 minutes, unbinned
August 2009; Inkom, ID
Comments: vdB 6 is the very small reflection nebula in the lower left of the open cluster NGC 654. The image has a light hazy background due to the fact that these hazy patches are actually dark nebulae catalog by Beverly Lynd. They have been penetrated in this image, all except the most dense portions. These dark nebulae appear to part of a larger molecular cloud cataloged in [YDM97] (Yonekura, Dobashi, Mizuno, *et al*. **Molecular clouds in Cepheus and Cassiopeia.** *Astrophys. J. Suppl. Ser.* 1997).

See the color data here giving a much wider field of view as well as other star clusters.

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vdB 7,9 and 8 (see wide field color data image), LBN 643, LDN 1355, LDN 1357, LDN 1358 1, [LM99] 4; *Cassiopeia*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (color)
KAI-11000M/CM; SBIG M (Lum), CM (color)
Total Exposure Time: 9.8+ hours; L:OSC 290:300 minutes unbinned
September 2009; Inkom, ID
Comments: Very faint reflection and dark nebulae in *Cassiopeia*. vdB 7 is to the right, while vdB 9 is center. vdB 8 is off the frame to the frame to the left and can be seen on the wide field color data image. [LM99] 4 is part of the large molecular cloud in the image. The background has been slightly brightened so to better see the dust in the region.

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vdB 10, LBN 680; *Perseus*
Astro-Physics 160 (160TCC) f/5.8 refractor
KAI-11000M SBIG STL
Total Exposure Time: 6.5 hours LRGB 120:90:90:90 minutes unbinned
November 2009; Mayhill, NM

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vdB 11; *Camelopardalis*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-8300M SBIG
Total Exposure Time: 8.6+ hours LRGB 210:110:90:110 minutes unbinned
September 2011; Inkom, ID
Comments: A 8.5 x 3 arcmin bluish reflection nebula illuminated by star BD +61 570.

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NGC1333, vdB 12-13, vdB16-17, B1-2, B202-206; *Perseus-Aries*
Takahashi FSQ-106 f/5 refractor (wide field regional dust)
Astro Systeme Austria N12 f/3.8 astrograph (NGC1333 core)
KAI-11002CM SBIG STL (FSQ)
KAI-11000M SBIG STL (ASA)
Total Exposure Time: 5.25 hours (FSQ), 12.5 hours (ASA)
October 2010; Inkom, ID
Comments: This wide field view of the region surrounding NGC1333 shows the vast clouds of dust and dark nebulae. The background has been greatly stretched to bring out the faint dust. The denser dust appears to have a reddish brown coloration while the very faint dust at the periphery of the large cloud has less color fidelity. The complete image of NGC1333 core may be seen here.

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vdB 13, vdB 16, B202-4; *Aries*
Astro-Physics 160 (160TCC) f/5.8 refractor
KAI-11000M SBIG STL
Total Exposure Time: 7 hours; LRGB 180:80:80:80 minutes; RGB binned x 2
January 2009; NMS, Mayhill, NM

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van den Bergh 14 and 15; *Camelopardalis*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL
Total Exposure Time: 8+ hours; LRGB ◆330:70:60:70 minutes; unbinned
September 2007; Inkom, ID
Comments: This pair of reflection nebulae are very faint and difficult to image, therefore they are rarely the target of astroimagers. vdB15 is on the left and has a faint emission cloud, while vdB14 is the blue cloud just above the bright star on the right of the image.

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vdB 13, vdB 16, B202-4; *Aries*
Astro-Physics 160 (160TCC) f/5.8 refractor
KAI-11000M SBIG STL
Total Exposure Time: 7 hours; LRGB 180:80:80:80 minutes; RGB binned x 2
January 2009; NMS, Mayhill, NM

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NGC1333, vdB17, LDN 1448; *Perseus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL
Total Exposure 12.5+ Hours; LRGB 410:120:110:120 minutes; unbinned
September 2007; Inkom, ID
Comments: NGC 1333 is catalogued as a reflection nebula but is actually a diverse region and part of the Perseus OB2 molecular cloud complex. It is one of the nearest star forming regions and particularly rich in young stellar objects (YSOs). Stellar clusters are born embedded within molecular clouds and during their early evolution as YSOs are often only visible at infrared wavelengths, being heavily obscured by dust. Four classes of young stellar objects have been described. Class I though III objects progress through an evolutionary sequence of being less dust enshrouded, as they develop towards the zero-age main sequence. The earliest and most imbedded stage of star formation is the class 0 YSOs. These earliest protostars are difficult to detect due to their heavily imbedded nature. Less than 50 Class 0 objects are known however 4 of these low mass protostars exist in NGC 1333. Also 36 Herbig-Haro obejects have been identified in NGC 1333 confirming its status as a young active region of star formation. Herbig-Haro objects are collisionally excited nebulae produced by outflows ejected by YSOs. They are produced mainly during the first few hundred thousand years of life of a YSO and are usually highly obscured by the cloud core environment from which they formed.

The gaseous structure of NGC 1333 has been mapped at radio wavelengths and appears to support the large scale star formation observed. Lumpy and filamentary cloud structure exists in NGC 1333 indicative of recent collapse and fragmentation of the parent molecular cloud leading to the clustered mode of star formation observed in the nebula. In addition a series of cavities and shells exist presumably blown out by the outflows of infant protostars. Infrared surveys reveal the presence of YSOs at the edge of these cavities indicating that sequential star formation has occurred there and has been triggered by the effects of the powerful outflows from the first generation of stars. The entire process is extremely recent as the cloud hosting NGC 1333 is less than a million years old.' (Text copyright Robert Gendler)

A wide field view of the region may be sen here.

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vdB18, GN 03.31.9, LBN721, TGU H1043 P2 (Drk Neb); *Perseus*
Astro Systeme Austria N12 f/3.8 astrograph
KAI-11000M SBIG STL
Total Exposure Time: 6.8+ hours LRGB 120:80:70:140 minutes unbinned
September 2010; Inkom, ID
Comments: You may see a wider FOV image here.

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IC 348, vdB 19, Ced 18b, Ced 21, DG 21, B4, LDN 1470, GN 03.41.5, [RK68]
13; *Perseus*
Astro-Physics 160 (160TCC) f/5.8 refractor (Lum)
Tele Vue 127is f/5.2 refractor (color)
KAI-11000M/XCM; SBIG STL
Total Exposure Time: 9.9 hours; L:OSC 220:375 minutes
November 2009; NMS (Lum), Inkom, ID (color)
Comments: This image shows some of the nebulosity near Omicron Persei. The seeing was soft the night of imaging. A larger view of the region with just the color data is here. A wider field of view may be seen here.

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M45 (vdB20 - 23) **The Pleiades or Subaru**; *Taurus*
Astro-Physics 155EDF f/7 refractor
STL-11000M; SBIG STL
Total Exposure 5+ Hours; (LB)RGB (60,60):60:60:70 min; unbinned.
September 28, 2005; Inkom,ID
Comments: This is likely the most famous cluster in the heavens. Also called the Seven Sisters, most people can see only six stars with the unaided eye, but reports of up to 18 visible stars have been documented. Many people don't realize that M45 also contains a nebula. This nebula is of the reflection type (blue) with only a slight emission component (pink). This star cluster is close, by cosmic standards, being only 407 light years away.

A different view may be seen here.

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vdB24 region; *Perseus*
Takahashi FSQ-106 f/5 refractor
KAI-11000CM SBIG STL
Total Exposure Time: 2.5 hours
December 2010; Inkom, ID

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vdB25, PCG 3089657; *Taurus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 105 minutes RGB 35:35:35 minutes binned 2x2
November 2011; Inkom, ID
Comments: vdB25 is 9 x 3.5 arcmin, red equals blue color, faint, illuminated by star BD +23 642. Due to the small size of this nebula this image has been cropped from the larger original frame. PCG 3089657 is the 16.54 magnitude galaxy in the lower left of the image.

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vdB26, LBN828, PGC138717; *Taurus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-8300 SBIG
Total Exposure Time: 4.8 hours RGB 100:90:100 minutes
September 2011; Inkom, ID
Comments: vdB26 is 11 arcmin, very blue, moderately bright and illuminated by star BD +09 549. There is a lot of color noise in this image due to short exposure time and the effect of HIP19799, the 5th magnitude star in the lower left of the image.

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van den Bergh 27, Cederblad 30, LBN782, B10, B7, B209;*Taurus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL --*Two frame mosaic*
Total Exposure 10.6+ Hours; LRGB@300:120:100:120 minutes; unbinned
October 2007; Inkom, ID
Comments: This region in Taurus is not commonly imaged but contains a wealth of beautiful reflection and dark nebulae.

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NGC1555/4 **Hind's Variable Nebula**, vdB28, Cederblad 32a-c; *Taurus*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (RGB)
KAI-11000M; SBIG STL (LUM), FLI Microline (RGB)
Total Exposure Time: 9+ hours; LRGB 250:100:100:100 minutes, unbinned
January 2009, Inkom, ID
Comments: The orange star centered in this view is T Tauri, prototype of the class of T Tauri variable stars. Nearby it is a dusty yellow cosmic cloud historically known as Hind's Variable Nebula (NGC 1555/1554). Over 400 light-years away, at the edge of a molecular cloud, both star and nebula are seen to vary significantly in brightness but not necessarily at the same time, adding to the mystery of the intriguing region. T Tauri stars are now generally recognized as young (less than a few million years old), sun-like stars still in the early stages of formation. To further complicate the picture, infrared observations indicate that T Tauri itself is part of a multiple system and suggest that the associated Hind's Nebula may also contain a very young stellar object (Ref). The red star in the right portion of this image is V1100 Tauri, a spectral class M variable star. Many dusty nebulae are seen in the region, some of which have not been cataloged. This image was a challenge to take and process since it was shot through the nearby night skiing lights of Pebble Creek Ski Area.

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vdB29, DG46, LBN 793, TGU H1177 P1; *Taurus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 2.75 hours; LRGB 60:35:35:35 minutes, RGB binned 2x2
November 2011; Inkom, ID
Comments: This image shows what can be captured with a moderate aperture, short focal length astrograph despite high, thin clouds and nearby night skiing lights. Note also that this is a very short total exposure time compared to most of my images.

vdB29 is 14 x 8 arcmins, moderate surface brightness, blue, illuminated by star BD +29 731.

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vdB 30; *Camelopardalis*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 9.8 hours LHaRGB 120:290:60:60:60 min, HaRGB data 2x2 binned
September 2012; Inkom, ID
Comments: This is a modest size reflection nebulae. Size: 20 arcmin. Very faint. Color is mixture of emission and reflection nebulae. Illuminating star: BD +66 358. Below can be seen the same nebula, but without the hydrogen alpha data. This 5 hour image demonstrates how very faint this object really is! The curved gas is the stars bow shock seen in hydrogen-alpha.

Alpha Camelopardalis is considered a runaway star. The distance and speed of Alpha Cam is somewhat uncertain. It is probably somewhere between 1,600 and 6,900 light-years away and moving at an astonishing rate of somewhere between 680 and 4,200 kilometers per second (between 1.5 and 9.4 million miles per hour). Astronomers believe runaway stars are set into motion either through the supernova explosion of a companion star or through gravitational interactions with other stars in a cluster. Because Alpha Cam is a supergiant star, it gives off a very strong wind. The speed of the wind is boosted in the forward direction the star is moving in space. When this fast-moving wind slams into the slower-moving interstellar material, a bow shock is created, similar to the wake in front of the bow of a ship in water. The stellar wind compresses the interstellar gas and dust, causing it to heat up and glow. ref

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vdB 31, B26-28; *Auriga*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL
Total Exposure Time: 9.5 hours; LRGB 330:80:80:80 minutes; unbinned
November 2008; Inkom, ID
Comments: This beautiful blue reflection nebula is number 31 in Sidney van den Bergh's Catalog of Reflection Nebulae, 1966. The adjacent dark nebulae are numbers 26-28 (B27 is just below vdB 31, with B26 below B27 and B28 to the upper right) in Edward E. Barnard's Catalogue of 349 Dark Objects in the Sky, 1927. The other dust clouds may not be cataloged.

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vdB 32; Be14, Be15; *Auriga*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph, Lum
Takahashi FSQ-105 f/5 refractor, OSC
KAF-16803 FLI Proline
KAI-11000CM, SBIG STL
Total Exposure Time: 8.3+ hours; L:OSC 160:340 min
October 2013; Inkom, ID
Comments: vdB32 is difficult to image due to the close proximity to Epsilon Auriga, a magnitude 3 star. vdB 32 is 1.8 arcsec. Blue, Faint. Illuminating star BD +44 1080. Be14 and 15 are open clusters.

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IC405 **Flaming Star Nebula,** vdB34; *Auriga*
Astro-Physics 155EDF f/7
KAI-11000M SBIG STL
Total Exposure 7.8+ Hours; (HaR)RGB (220,60);60:60:70 minutes
September 28, 2005; Inkom, ID
Comments: IC405 is created by the radiant energy of AE Auriga, a highly energetic variable star. This star was formed in M42 but was ejected by gravitational interactions with other stars. AE Auriga is just passing through this nebulosity; it was not formed from it. Both reflection and emission nebulae are presenting this amazing nebula.

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IC405, IC410, IC417, NGC1931, NGC1893, NGC1907, M38, Do16, LBN791, LBN795-6, LBN807, vdB34, vdB39; *Auriga*
Takahashi FSQ-106; f/5 refractor
KAI-11002CM SBIG STL
Total Exposure Time: 7.5 hours
October 2010 and January 2011; Inkom, ID
Comments: Two frame mosaic. Another view of M38 may be seen here. vdB 34 is 18 arcmin, bright, blue, and illuminated by star BD +34 980. vdB 39 is 0.6 arcmin, faint, moderately blue and illuminated by star BD +32 970. A closer view of the region surrounding vdB 39 is seen below. vdB 39 is marked with the arrow.

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vdB 35, vdB 37; *Orion*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 9+ hours; L:OSC 380:165 min
October 2013; Inkom, ID
Comments: vdB 35 is the reddish-blue nebula to the right. Size is 4 arcmin. Moderately red. Moderate brightness. BD +12 754. vdB 37 is to the left of center. Size is 11 x 5 arcmin. Very red. Bright. BD +13 853. A wider FOV may be seen here.

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vdB 35, vdB 37; *Orion*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 9+ hours; L:OSC 380:165 min
October 2013; Inkom, ID
Comments: vdB 35 is the reddish-blue nebula to the right. Size is 4 arcmin. Moderately red. Moderate brightness. BD +12 754. vdB 37 is to the left of center. Size is 11 x 5 arcmin. Very red. Bright. BD +13 853. A wider FOV may be seen here.

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vdB38, LBN866, Sh2-263, B233; *Orion*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAI-16803; FLI Proline
Total Exposure Time: 11.5 hours; LRGB 210:160:160:160
October 2013; Inkom, ID
Comments: vdB38 is the blue reflection nebula in the upper right corner. Size: 10 x 8 arcmin. Blue. Moderately bright. Illuminating star: BD +08 933. Sh2-263 is the red nebula.

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M42 **Great Orion Nebula**, NGC1977, NGC1980-1, vdB42, vdB44; *Orion*
Astro-Physics 155 EDF (155TCC) f/5.4 refractor
KAF-16803 FLI Proline
Total Exposure Time: 8 hours; LRGB 190:100:70:120 minutes unbinned
December 2009-January 2010; RDO, Moorook, AU
Comments: This great star forming region of the Milky Way Galaxy is readily visible with the unaided eye if the night sky is reasonably dark. It appears as the middle fuzzy "star" in Orion's sword (which "hangs" from his belt). Unlike most deep sky objects, the Great Orion Nebula is very impressive when seen through a small or modest aperture telescope. It is also visible through binoculars. Numerous other objects are within this image; they are too numerous to list here!

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B33 **Horsehead Nebula region**, vdB52; *Orion*
Astro-Physics 155EDF f/7
STL-11000M; SBIG STL
Total Exposure 5.6+ Hours; (HaR)RGB ◆(160,50):50:40:40 minutes
October 10, 2005; Inkom, ID
Comments: This is the color version of the region around B33, the Horsehead Nebula.

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M78, vdB59 - 60; *Orion*
Astro-Physics 155 EDF f/7 refractor
.67x reducer
ST-10XME LRGB 76:100:40:40 min. L=36Clr,40B. R= 60Ha,40R
December 12-16, 2004
Inkom, ID
Comments: This famous star forming region in Orion contains a beautiful reflection nebula which appears blue in images. Not as often imaged, is a portion of a large and diffuse emission nebula which appears red. This emission nebula is part of a larger semi-circular complex called Barnard's Nebula. Other nebula see in this image are dark nebula, where dense gaseous regions block out starlight yielding dark clouds. A wide field view may be seen here.

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van den Bergh 62 - 63, and LDN1622; *Orion*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL
Total Exposure 8.8+ Hours; HaRGB 210:120:80:120 minutes; unbinned
November 2007; Inkom, ID
Comments: This region is near the more famous M78 in *Orion* and is contained within Barnard's Loop. The two van den Bergh objects are the two small reflection nebulae in the right side of the image. The two dark nebula look like two dolphins jumping; one with a ball on its head (vdB62). The challenge in processing these dark nebula is that unlike more "traditional" reflection or emission nebula, dark nebula are darker that the background sky. Therefore to bring out subtle details the sky background has to be brightened slightly. A hydrogen-alpha version may be seen here.

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vdB 71, NGC2169, Sh2-268; *Orion*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAI-16803; FLI Proline
Total Exposure Time: 4 hours; LRGB 60:60:60:60 min. RGB binned 2x2.
November 2013; Inkom, ID
Comments: vdB71 is the blue reflection nebula near the center on the image. Size: 3.4 arcmin. Blue. Faint.
Illuminating star: BD +14 1171.

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NGC2170 region, NGC2185, NGC2183, LBN999, LDN1646, vdB72-74, vdB67-70; *Monoceros*
Astro-Physics 155EDF (155TCC) f/5.4 refractor
KAF-16803; FLI Proline
Total Exposure Time: 12.6 hours; LHaRGB 260:300:100:100:100, unbinned
January 2009; RDO, Moorook, AU
Comments: NGC2170 is a common nebula imaged and yet with long exposures it takes on a whole new look. Many of the nebulae seen here appear to be uncataloged and not previously imaged. This image has been carefully processed to reveal the many faint and dusty nebulae in this region of Monoceros.

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IC447, vdB77-79, vdB 82, IC446, NGC2245, NGC2247, B37; *Monoceros*
Astro-Physics 160 (160TCC) f/5.8 refractor
KAI-11000M SBIG STL
Total Exposure Time: 10.3 hours; LRGB 200:160:120:140 minutes unbinned
December 2009; Mayhill, NM
Comments: Processing dark nebulae tends to enhance some very subtle colors.

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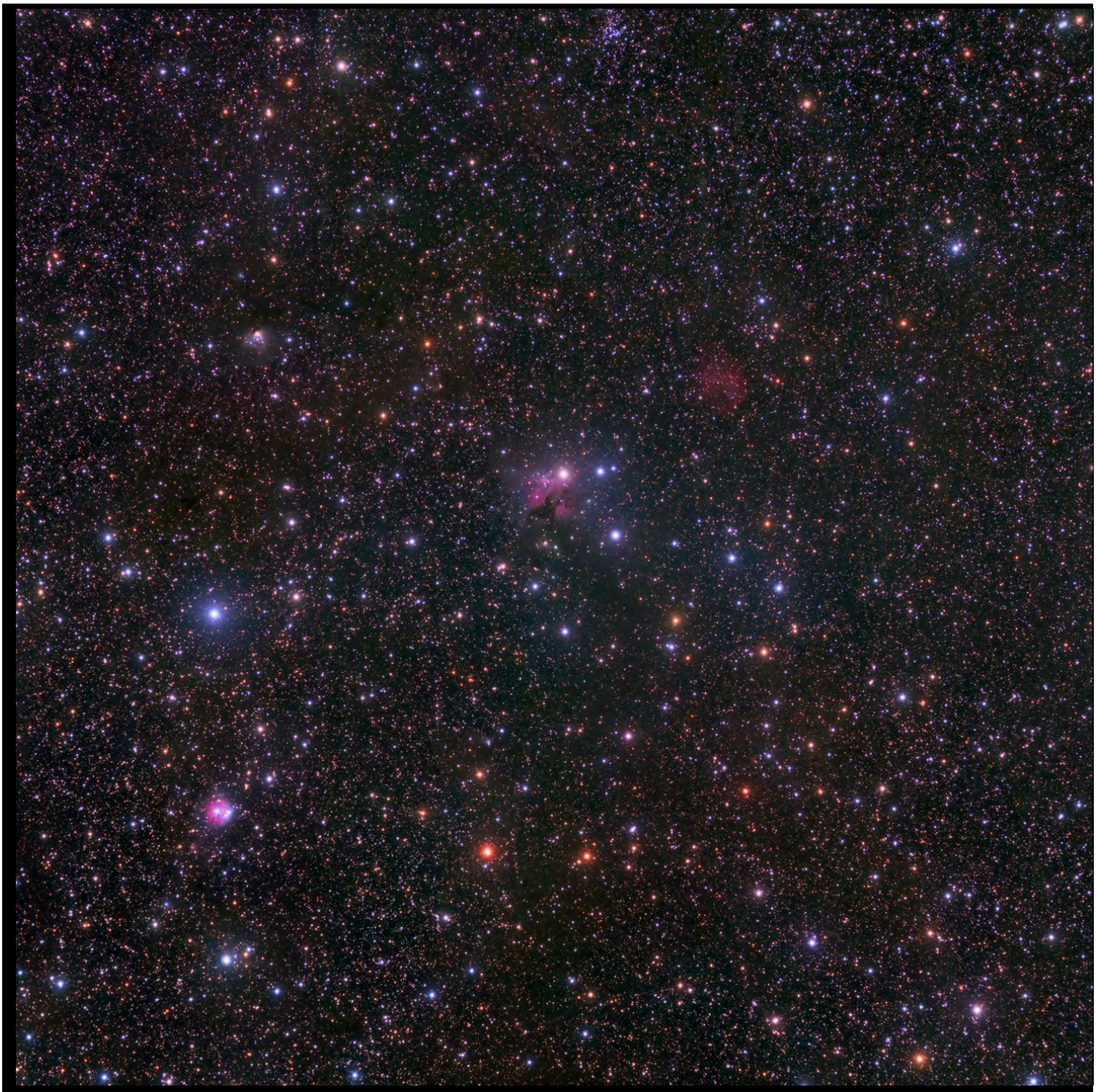

LBN1022, DG113, vdB 87, Sh2-291, NGC2309, NGC2316, RN J0700-0738;
Monoceros
Astro-Physics 155 EDF (155TCC) f/5.4 refractor
KAI-16803 FLI Proline
Total Exposure Time: 9 hours LRGB 180:120:120:120 minutes unbinned
December 2009; RDO, Moorook, AU
Comment: This beautiful region contains a large variety of deep sky objects, such as open clusters, emission and reflection nebulae, herbig-haro objects, and even a few galaxies. There may also be a newly discovered star outburst nebula found recently by amateur Jim Thommes. My FOV is much too wide to see this nebula very well, so here is a cropped version. LBN1022 is the bright nebula in the center of the image. NGC2309 is the open cluster in the upper center. vdB 87 is lower left. This image is in the region near M50.

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This is the 54 minute total exposure time RGB image. It shows vdB 88, 90, 93, and 95 in this image. Because it was used only for the star color in the narrowband version, I did not bother to clean up the halos and other distractions.

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vdB 100, IC 4593, B 40; *Scorpius*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 5.3 hours LRGB 170:50:50:50 min, RGB 2x2 binned
June 2013; Inkom, ID
Comments: vdB 122 is 14 arcmin, moderate bightness, moderately blue and illuminated by star BD -19 4333. vdB 100 is the blue reflection nebula surrounding NU Sco, whereas IC 4593 is the more peripheral reflection nebula.

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IC 4601, vdB 101-3, Cederblad 129, LBN 104, B 41, LDN 1717-19; *Scorpius*
Astro Physics 155 EDF f/5.4 (155TCC) refractor
KAI-16803; FLI Proline
Total Exposure Time: 7.3 hours; LRGB 120:120:80:120 minutes, unbinned
June 2009, RDO, Morrok, AU
Comments: I tried to show some of the fainter portions of this famous region. Stretching the data brings out some strange color though.

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Rho Ophiuchus complex, vdB106 - 107; *Ophiuchus*
Astro-Physics 105EDFS f/6 refractor
STL-11000M LRGB 50:40:35:50 minutes
Astrodon Filters
April 26, 2006; Inkom, ID
Comments: This highly complex nebulous region demonstrates emission, reflection and dark nebulae. A wider field of view may be seen here. A closer view of the Rho complex may be seen here.

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vdB 109, LBN 5; *Ophiuchus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAI-16803; FLI proline
Total Exposure Time: 3.5 hours: LRGB 120:30:30:30 minutes RGB binned 2x2
May 2012; Inkom ID
Comments: vdB109 is 40 x 20 arcmin. Very faint surface brightness. Moderately red. Illuminating star BD-17 4618. There are numerous asteroids in this image that I did not process out. The colors are somwhat stretched due to the very faint surface brightness of the nebula and the regional dust.

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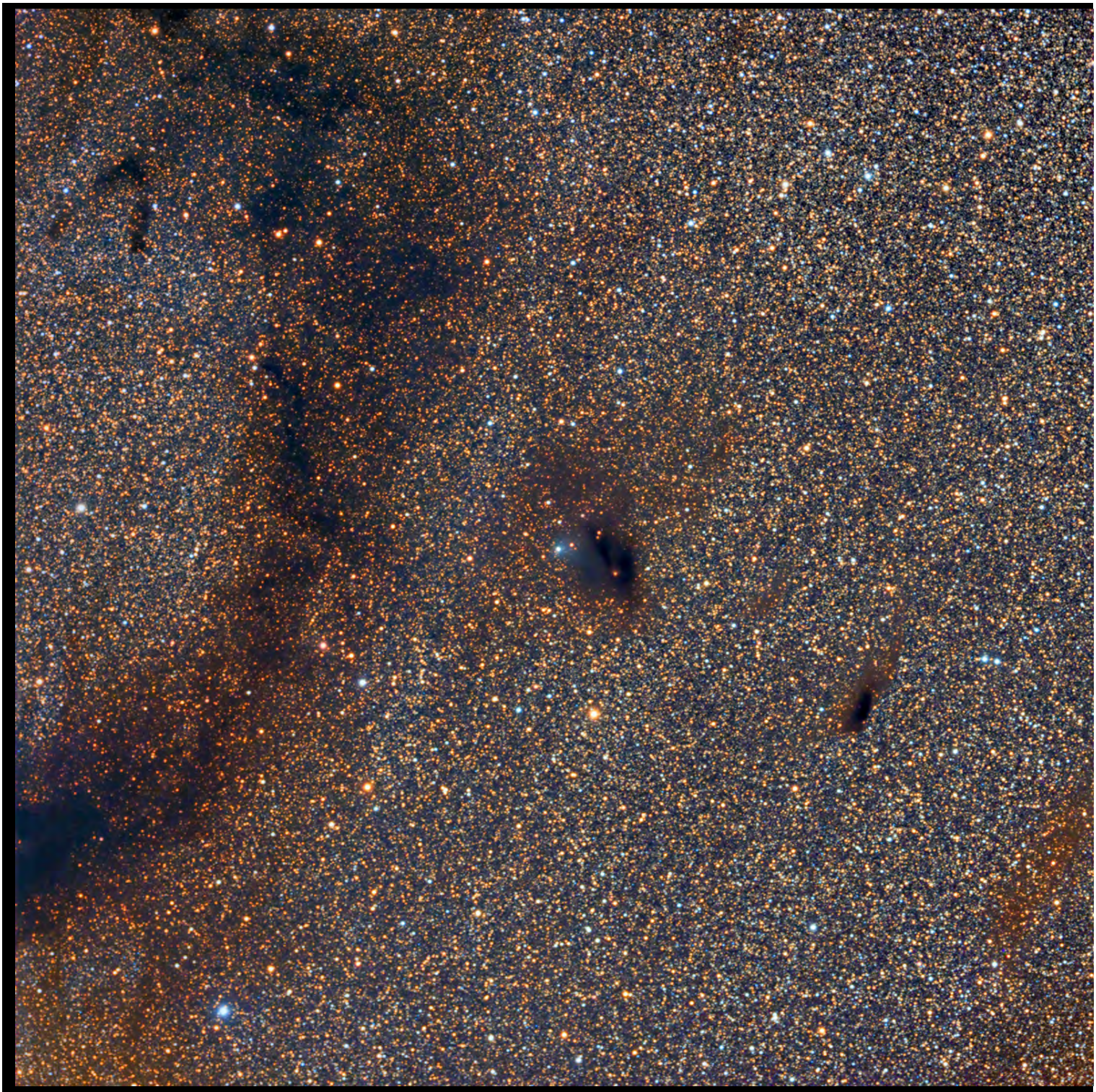

vdB110, B61-63; *Ophiuchus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAI-16803 FLI Proline
Total Exposure Time: 3 hours; LRGB 110:25:25:25 minutes RGB binned 2x2
June 2012; Inkom, ID
Comments: vdB110 is 1.2 arcmin in size. Moderately bright. Blue. Illuminating star BD -20 4896.

Barnard 62 is a large, very opaque Bok globule surrounded by bright rims. Optical and near-infrared observations have revealed four low-luminosity pre-main sequence stars, of which one is a visual binary, in association with the globule. In addition, an embedded low-luminosity source has been detected by IRAS. The star BD -20°4896 is surroundedby a reflection nebula (vdB110) and is probably a field star accidentally passing through the globule. It has spectral type A7 or A8, and if it is of luminosity class V, the distance to the globule is about 225 pc. The neighbouring globule Barnard 61 shows no signs of star formation activity. (ref)

Note: Starry Night planetarium software has the position of this nebulae incorrect as of June 17, 2012.

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vdB111, DG146, LBN88; Ophiuchus
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAI-16803 FLI Proline
Total Exposure Time: 5.6+ hours; LRGB 160:30:30:30 minutes RGB binned 2x2
May 2012; Inkom, ID
Comments: vdB111 is 12 x 9 arcmin in size. Moderately bright. Blue. Illuminating star BD +06 3386.

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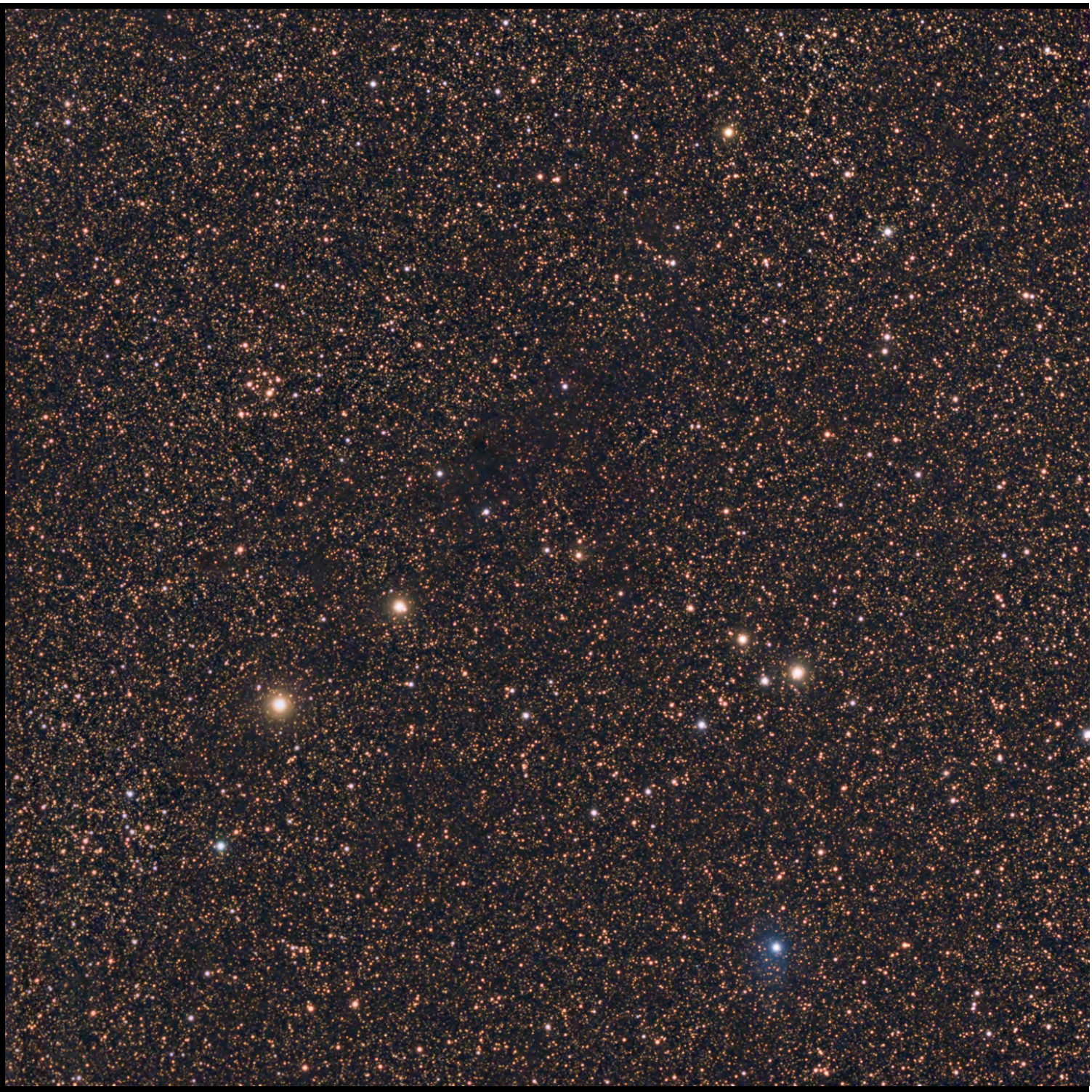

vdB 112, GN 17.48.1.01, LDN 421, TGU H224 P1; *Ophiuchus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 4.5 hours LRGB 120:50:50:50 min, RGB 2x2 binned
June 2013; Inkom, ID
Comments: vdB 112 is 1.2 arcmin, faint, red and illuminated by star BD -05 4524. vdB 112 is the very small yellow-red reflection nebula in the center of the image (see image below). GN 17.48.1.01 is the blue reflection nebula in the lower right. LDN 421 and TGU H224 P1 are dark clouds just "above" vdB 112 in this image.

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vdB113, Sh2-34, LBN38; *Sagittarius*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAI-16803 FLI Proline
Total Exposure Time: 2.2 hours: LRGB 40:30:30:30 minutes RGB binned 2x2
June 2012; Inkom, ID
Comments: vdB113 is 12 arcmin in size. Faint. Blue. Illuminating star BD -21 4866.

There is not much to this very faint reflection nebula. It is located in the center of the frame.

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vdB114, 116, 117, 120, 121; *Sagittarius*
Takahashi FSQ-106 f/5 refractor
KAI-11000XCM SBIG STL
Total Exposure Time: 2 hours
June 2012; Inkom, ID
Comments: This skyscape shows a region of Sagittarius that has these 5, small van den Bergh objects. They are noted with small arrows and run consecutively left to right. Because they are small, and without much interesting form, I did not shoot higher resolution images of them; the exception is vdB120. Cropped and 200% enlarged images of vdB114, 116, 117 and 121 are included below. M17, the Swan Nebula, is seen in the lower right corner of the main image.

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vdB 114: size 1.2 arcmin, faint, blue, moderate absorption, star BD -18 4800

vdB116: size 0.6 arcmin, faint, blue moderate absorption, star BD -17 5049

vdB117: size 2.2 arcmin, moderate brightness, blue, moderate absorption, star BD -17 5080

vdB121: size 0.6, faint, blue moderate absorption, BD -17 5141

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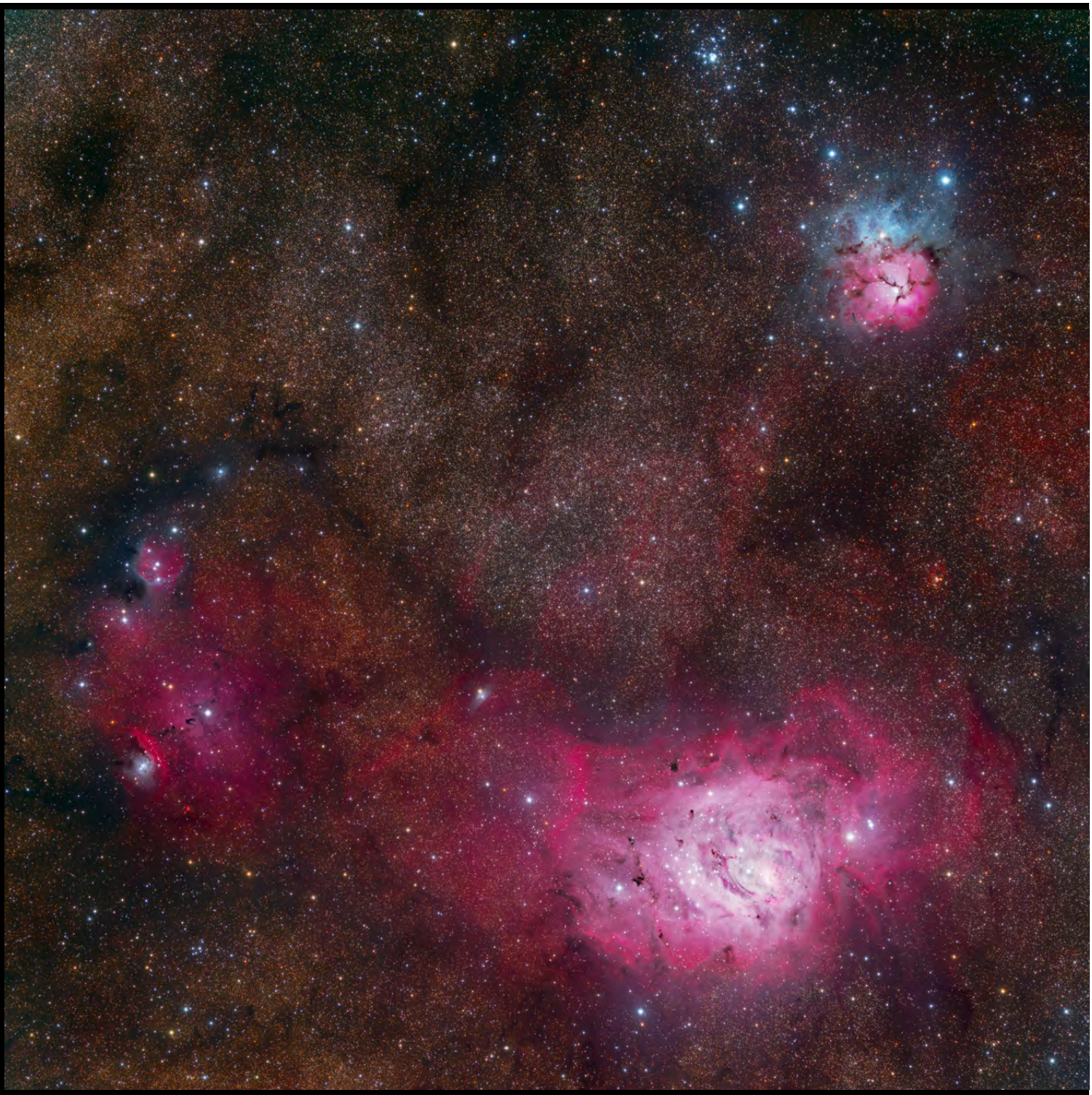

M8 (**Lagoon Nebula),** M20 **(Trifid Nebula),** M21, IC 4685, IC 1274, LBN 105-6, vdB 115; *Sagittarius*
Astro-Physics 155 EDF (155TCC) f/5.3 refractor
KAF-16803, FLI Proline
Total Exposure Time: 13.6+ hours, LHaRGB 200:300:100:80:140 minutes, unbinned
June-July 2009; Riverland Dingo Observatory, Moorook, AU
Comments: This image shows the great diversity of celestial objects in the region of M8. These include the emission nebulae M8, M20, IC4685 and IC1274. Reflection nebulae are also seen in M20, IC1274-5, vdB 115, IC 4678. M21 open cluster is also seen. Many of the nebulae seen here are not often imaged do to their low surface brightness. Of note is the bluish halo surrounding and encompassing M8 itself. This appears to not be cataloged according to SIMBAD. It may be just a portion of M8 itself that is usually not seen. I purposefully left the background bright so to see this nebula. M20 may be seen here.

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vdB120, vdB121, vdB117, M17, M18, NGC6596, IC4701, IC4706; *Sagittarius*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAI-16803 FLI Proline
Total Exposure Time: 2.5 hours; LRGB 60:30:30:30 minutes RGB binned 2x2
June 2012; Inkom, ID
Comments: vdB120 is 1.2 arcmin in size. Moderately bright. Red. Illuminating star BD -16 4790. A wider view of this region may be seen here. A portion of the image including vdB120 (upper center) is below. There are some pretty amazing dust formations near the center of the cropped image.

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IC1283-4, NGC6589-90, vdB118 -119, Sh2-35, IC4715, B92, B304, NGC 6603, M24; *Sagittarius*
Astro-Physics 155 EDF (155TCC) f/5.4 refractor
KAI-16803, FLI Proline
Total Exposure Time: 15 hours; LHaRGB 260:210:140:120:170) minutes, Ha binned x 2 otherwise unbinned
June-September 2009; RDO, Moorook, AU
Comments: I thought that this looked like an interesting part of the sky. It is near M8-M20 in Sagittarius but appears to have been much less imaged. The emission nebulae IC1283-4 are near center with the two small reflection nebulae NGC6589-90 nearby. The large red area in the lower right is a portion of Sh2-35. M24 is the dense star region right of center.

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vdB 122, Sh2-53; *Scutum*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 4.5 hours LRGB 120:50:50:50 min, RGB 2x2 binned
July 2013; Inkom, ID
Comments: vdB 122 is 1.2 arcmin, moderate bightness, moderately red and illuminated by star BD -13 4965. It is the small redish-blue reflection nebula in the center of the image.

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Van den Bergh 123, LBN 98, [HBR97]SNN Serpens Cloud; *Serpens*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (color data)
KAI-11000M/CM SBIG M (LUM)/CM (OSC)
Total Exposure Time: 9.8+ hours; L-OSC 320:270 minutes, unbinned
July 2009; Inkom, ID
Comments: This region of Serpens contains what is referred to as the Serpens Cloud. It has been cataloged in Herbst, Beckwith, Robberto, 1997 *Astrophys. J.* This super cloud of dust contains many reflection nebulae, one of which is vdB 123. This is the blue reflection nebula just "above" the center of this image. This super dust cloud overlies the rich star field of the Serpens Milky Way and appears as a pale blue mist with defined borders. To see in part the extent of the cloud refer to the color data. Also noted are numerous HH objects in this region of the cloud.

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vdB 124, NGC 6649, LBN 77, Sh2-56; *Scutum*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M SBIG STL
Total Exposure TIme: 3.8 hours
July 2010; Inkom, ID
Comments: Another faint reflection nebula cataloged by van den Bergh. NGC6649 is the open cluster, LBN 77 and Sh2-56 is the HII region in the lower right of the image.

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vdB 125, King 26 (oc), [FSR2007] 0133 (oc); *Aquila*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 4.2 hours LRGB 200:50:50:50 min, RGB 2x2 binned
July 2013; Inkom, ID
Comments: vdB 125 is 1.2 arcmin, very faint, blue and illuminated by star BD +15 3811.

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vdB 126, LBN 133-4, LDN 768, LDN 772; *Vulpecula*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Astro-Physics 160 (160TCC) f/5.8 refractor (RGB)
KAI-11000M, SBIG STL
Total Exposure Time:10 hours: LRGB 300:300 minutes unbinned
October 2009; Inkom, ID (Lum), Mayhill, NM (RGB)
Comments: This is a composite mosiac image using two different telescopes from two different locations.

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vdB128, LBN155; *Cygnus*
Takahashi FSQ-106 f/5 refractor
KAI-11002CM SBIG STL
Total Exposure Time: 3.5 hours OSC 210 minutes unbinned
June 2011; Inkom, ID

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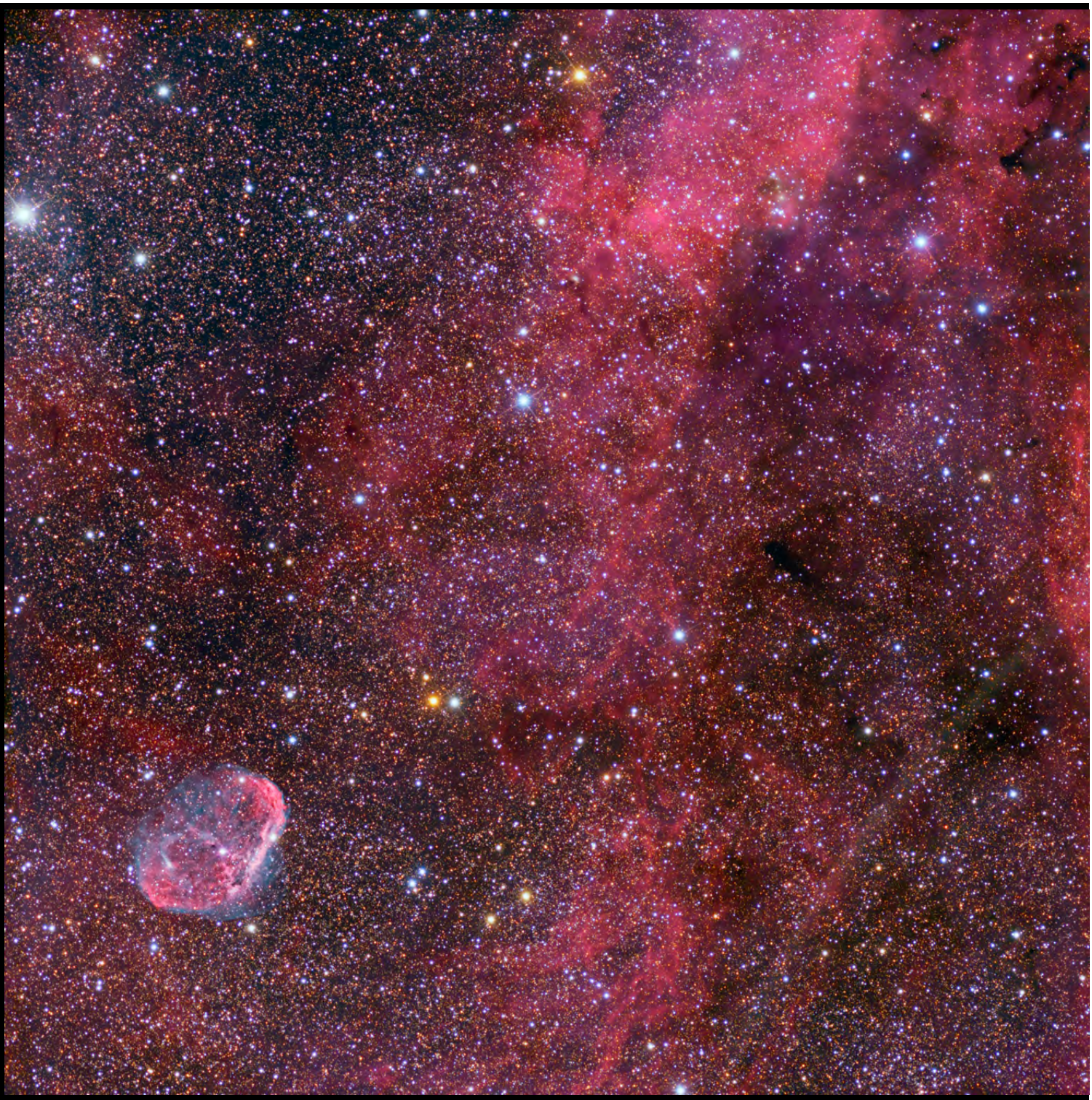

vdB130 region, IC 1318, LBN 208, NGC 6888; *Cygnus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph (Lum, Ha, OIII)
Takahashi FSQ-106 f/5 refractor (color)
KAF-16803 FLI Proline (Lum, Ha, OIII)
KAI-11002XCM SBIG STL (color)
Total Exposure Time: 12.6 hours L:OSC 140:195, NGC6888 Ha:OIII 180:240 minutes unbinned
July 2011, Inkom, ID

Comment: This is a hybrid-composite mosiac image using data from two different telescopes and cameras. vdB 130 is a small, faint, moderately red reflection nebula surrounding star BD +38 3993. Size 1.2 arcmin. It is in the right upper quadrant of the image and surrounds the small open cluster of the same designation. See cropped image below. NGC 6888 has been enhanced with additional H-alpha and OIII data. See the H:O:O image below. It is interesting but, of course, the reflection nebulae can not been seen in it. Narrowband filters really cut out the stars however!

vdB 130 crop

vdB 130 H:O:O

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van den Bergh 132, vdB 131, NGC6914; *Cygnus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M
HaRGB 350:60:60:60 minutes; unbinned
June 2007; Inkom, ID
Comments: This region is a very faint portion of the complex HII region near *Gamma Cygnus*. I could not find any significant information regarding this region other than the blue reflection nebula is cataloged as separate components: NGC6914A and B. A cropped version of the reflection may be seen here. Also, the hydrogen alpha version of this region is very interesting and may be seen here.

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vdB133, LBN218, TGU H491 P32 (drk neb); *Cygnus*
Astro System Austria N12 f/3.8 astrograph
KAI-11000M SBIG STL
Total Exposure Time: 5.8+ hours LRGB 150:70:60:70 minutes unbinned
September 2010: Inkom, ID
Comments: vdB133 is the reflection nebula in the center of the image surrounding the variable star 44 Cyg. The blue reflection nebula around 42 Cyg (the magnitude 5.9 star in the upper right) appears not to be cataloged - at least I can't find a catalog designation.

A wide field image of this region may be seen here.

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van den Bergh 134, LBN382, PLN 86+5 1; *Cygnus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL
Total Exposure Time: 12.5+ hours; HaRGB 345:100:140:170 minutes, unbinned
July 2008; Inkom, ID
Comments: These nebulae are very faint thus requiring long total exposure times. PLN 86+5 1 is the very faint circular planetary nebula just "above" and to the "left" of the blue reflection nebula vdB 134. Innumerable faint stars are seen in this region of the Milky Way giving the background a speckled appearance.

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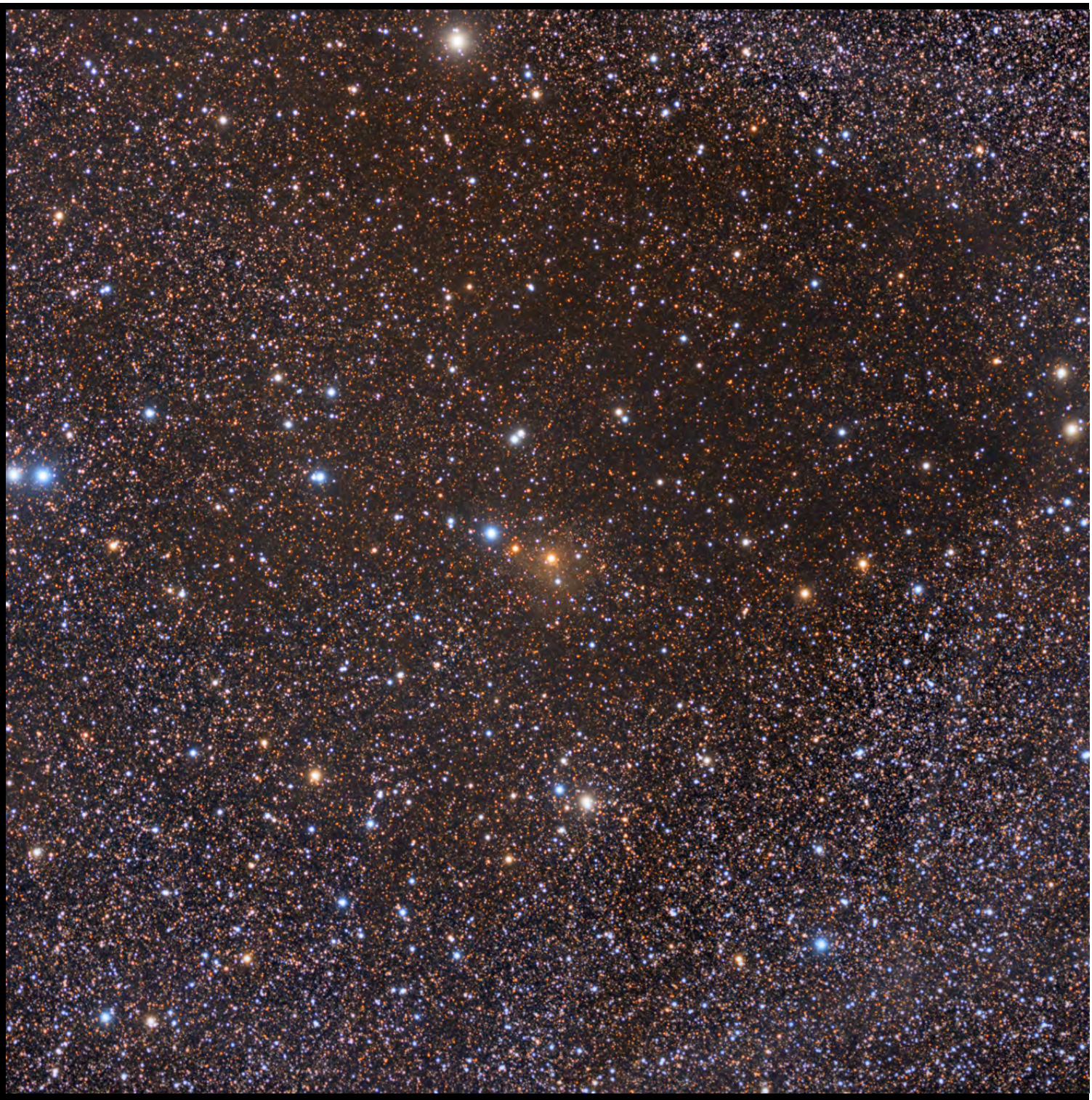

vdB135; *Cygnus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph (Lum)
Takahashi FSQ-106 f/5 refractor (color)
KAF-16803 FLI Proline (Lum)
KAI-11002CM SBIG STL (color)
Total Exposure Time: 6.3+ hours L:OSC 200:180 minutes unbinned
June 2011; Inkom, ID
Comments: This is a hybrid-composite mosiac image using data from two different telescopes and cameras.
This is a faint, moderately red reflection nebula surrounding star BD +31 4152. Size 2.8 arcmin.

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vdB 136, GN 20.36.5 (RNeb), LDN 906, Diamond Ring Cluster (IR CC), [KC97c]
G081.5+00.6 (HII), TGU H491 P10 (DNeb); *Cygnus*
Astro Systeme Austria N12 f/3.5 astrograph
Tele Vue 127is f/5.2 refractor
KAI-11000M/CM SBIG STL; M (Lum), CM (RGB)
Total Exposure Time: 5.6 hours; L-OSC 110:225 minutes
August 2010; Inkom, ID
Comments: vdB 136 is the yellow reflection nebula in the center of the image. Numerous emission nebulae are present in this area of the constellation Cygnus. Also present, but much less seen, are thin vales of dust which when imaged give a bluish tint to the sky background. Processing the data to bring out the faint dust does reduce the overall contrast of the image, but I feel that it is worth it to see this etheral dust. Areas where there is much less dust or more opaque dust appear black. Color data image may be seen here. The Diamond Ring Cluster is a star cluster in the image, but it can only be seen in infared.

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IC 5076 (vdB137), vdB 138, NGC 6991(oc); *Cygnus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M, SBIG STL
Total Exposure Time: 8.8+ Hours, LRGB 250:100:80:100 minutes, unbinned
August 2009; Inkom, ID
Comments: vdB 138 is the small reflection nebulae in the upper right of the image.

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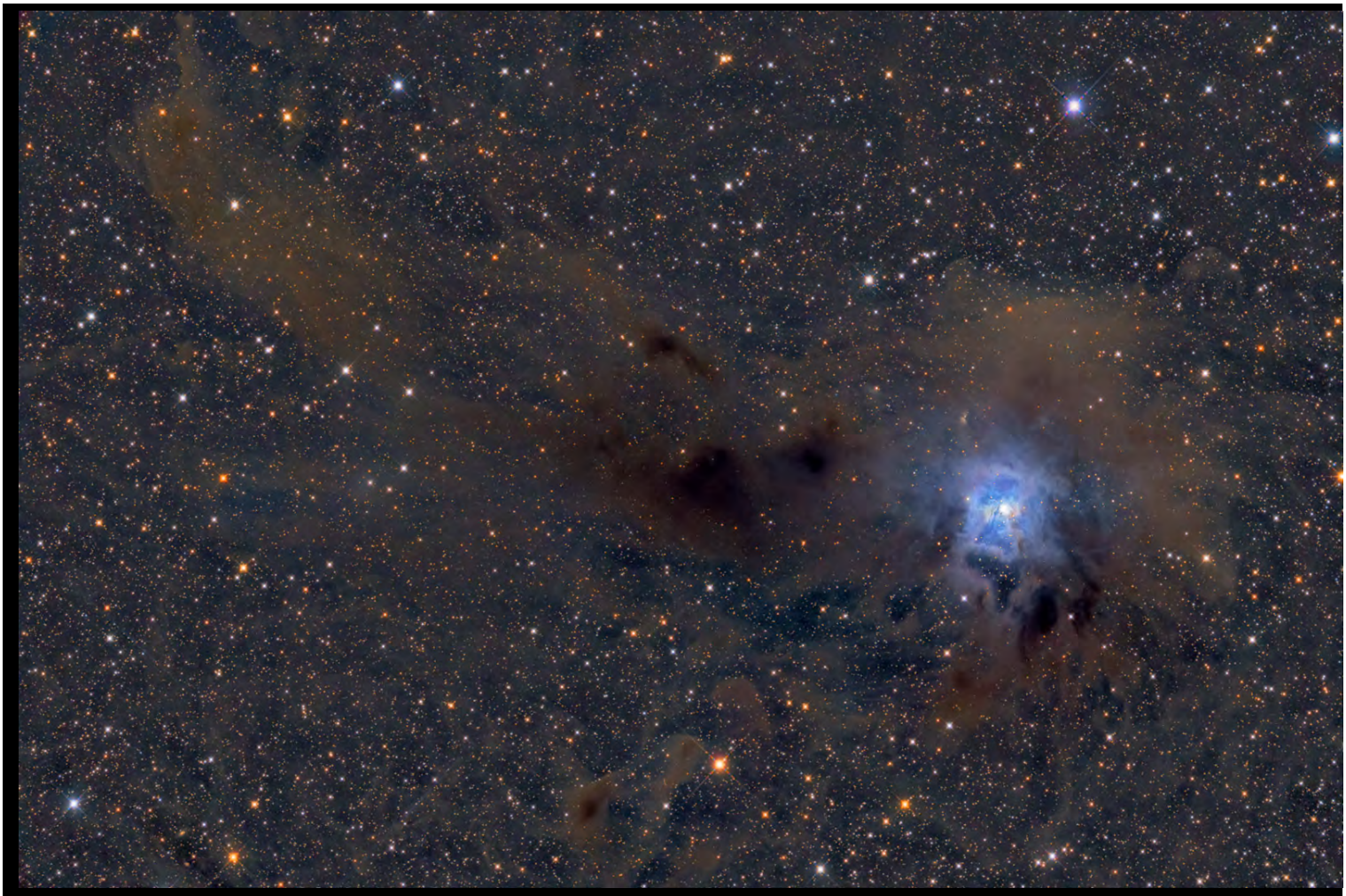

NGC7023 (vdB139) **Iris Nebula**; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL
Total Exposure Time: 6+ Hours; LRGB 186:60:60:60 minutes; unbinned
June 2007; Inkom, ID
Comments: Like delicate cosmic petals, these clouds of interstellar dust and gas have blossomed 1,300 light-years away in the fertile star fields of the constellation Cepheus. Sometimes called the Iris Nebula and dutifully cataloged as NGC 7023, this is not the only nebula in the sky to evoke the imagery of flowers. Still, the beautiful digital image shows off the Iris Nebula's range of colors and symmetries in impressive detail. Within the Iris, dusty nebular material surrounds a massive, hot, young star in its formative years. Central filaments of cosmic dust glow with a reddish photoluminesence as some dust grains effectively convert the star's invisible ultraviolet radiation to visible red light. Yet the dominant color of the nebula is blue, characteristic of dust grains reflecting starlight. Dark, obscuring clouds of dust and cold molecular gas are also present and can lead the eye to see other convoluted and fantastic shapes. Infrared observations indicate that this nebula may contain complex carbon molecules known as PAHs (comment source: NASA APOD).

A view of the center portion of the nebula may be seen here. A wider field of view may be seen here. A very wide field of view mosaic may be seen here.

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vdB 140, LBN 446, Cederblad 191, SH2-129; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (color)
KAI-11000M/CM, M (Lum)/CM (color)
Total Exposure TIme: 6.8+ hours, L:OSC 170:240 minutes, unbinned
September 2009; Inkom, ID
Comments: You may see the color data image here for a wider field of view. Sh2-129 is the HII nebula.

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van den Bergh 141; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.1 refractor (RGB)
KAI-11000M: SBIG STL (Lum), FLI Microline (RGB)
Total Exposure Time: 12.5 hours: LRGB 310:160:140:140 minutes, unbinned
September 2008; Inkom, ID
Comments: vdB 141 is reflection nebula number 141 in Sidney van den Bergh's Catalog of Reflection Nebulae, 1966. It is often referred to as the Ghost or Ghostly Nebula. In the cropped image below are seen two "ghosts" rising up out of the main nebula. The adjacent dark nebulae and dust appear not to be cataloged. The dust in the region appears to be being swept from "right to left". There is a lot of dust in this image.

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IC1396, IC1396a **Elephant Trunk Nebula**, vdB142; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph
STL-11000M; SBIG STL
HaRGB 240:60:60:60 minutes
May 2007; Inkom, ID
Comments: vdB142 is a small nebula near the much larger emission nebula IC1396. It is a reflection nebula related to the B3 type star HD 239710. IC1396a is sometimes called the "Elephant's Trunk" due to its unusual appearance. A closeup of vdB142 may be seen here.

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vdB 143, LBN 504, Cederblad 194, LDN 1199, [KTK2006] 62-70; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (color)
KAI-11000M/CM, M=Lum, CM=color
Total Exposure Time: 10 Hours, L-OSC 360:240 minutes, unbinned
August 2009, Inkom, ID
Comments: This region is rarely imaged. I could not find any other image of this region therefore this image may be a premier.

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vdB 144, NGC 7127; *Cygnus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M SBIG STL
Total Exposure Time: 4.3 hours
August 2010; Inkom, ID
Comments: NGC 7127 is the small open cluster lower right of vdB 144 (the small, faint reflection nebula).

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vdB 145; Cygnus
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-8300 SBIG
Total Exposure Time: 7.8 hours LRGB 160:120:70:120 minuts unbinned
September 2011; Inkom, ID
Comments: This is a small reflection nebula with an interesting shape. It is 8 x 6 arcmin, moderately blue, illuminated by star BD +48 3485. Ths image is cropped from a larger, original image. See it below. The seeing was very poor during the imaging.

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NGC7129, vdB 146, NGC7142 (oc); *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Mak Newt 7" f/4 astrograph (RGB)
KAI-11000M; SBIG STL (Lum), FLI Microline (RGB)
Total Exposure Time: 8.6+ hours;LRGB 320:70:60:70, unbinned
May 2008; Inkom, ID
Comments: Extremely faint dust which is very challanging to image surrounds NGC7129, the reflection nebula near the center of the image. Other information regarding this region may be found here.

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IC5146 **Cocoon Nebula**, vdB 147, B168, LDN1055; *Cygnus*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Takahashi FSQ-106 f/5 astrograph (RGB)
KAI-11000M; SBIG STL (Lum), FLI Microline (RGB)
Total Exposure Time: 14 hours; LRGB 650:80:80:80 minutes, unbinned
June 2008; Inkom, ID
Comments: This nebula, which is about 3,300 light years distant, lies among some of the richest star fields in the northern Milky Way (as one can see, there are a lot of stars). First noted by British double-star observer Thomas E. Espin, this complex nebula seems to sit at the end of a long, star poor path. This "path" is actually dense gas and dust which obscures the light of the stars more distant to it. In this image, the background has been carefully adjusted so to show the obscuring dust in the region. As you can see, the dark dust lanes vary from moderately opaque to deeply obscuring. There is a lot of dust in the region. Van den Bergh 147 is the small reflection nebula just to the lower right of the Cocoon.

This image is a complex composite of a two frame high resolution mosiac using the N12 (Lum) combined with RGB data from FSQ.

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vdB 148; *Cepheus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 5 hours 120:60:60:60 min, RGB 2x2 binned
September 2012; Inkom, ID
Comments: This is a small reflection nebulae. Size: 3.4 arcmin. Faint. Blue. Moderate absorption. Illuminating star: BD +55 2682. A cropped version is seen below.

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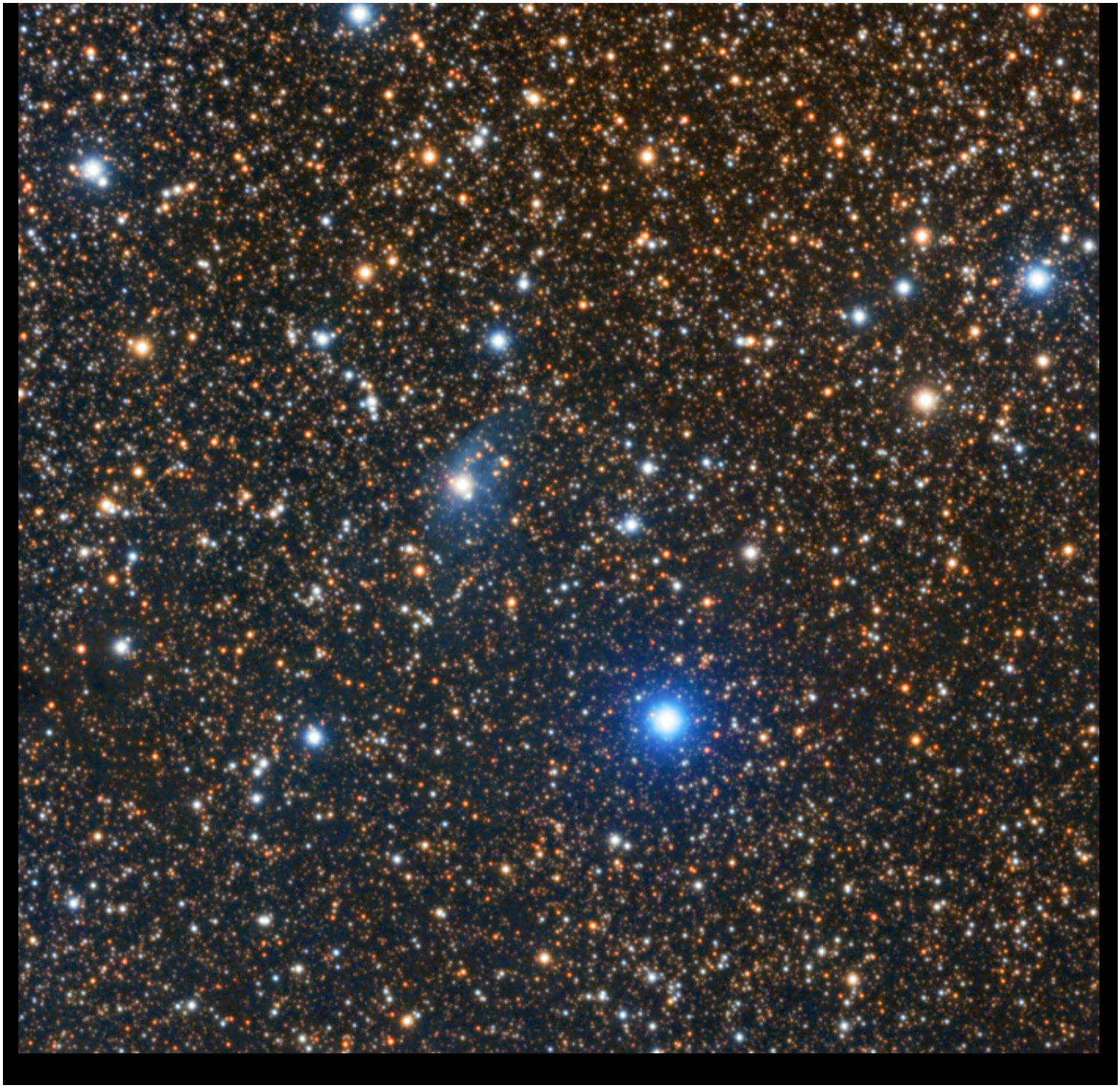

van den Bergh 149 and 150, LDN1235; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph (LUM)
Takahashi FSQ-106 f/5 astrograph (RGB)
KAI-11000M; SBIG STL (Lum), FLI Microline (RGB)
Total Exposure 10.6+ hours; LRGB 260:120:120:120 minutes, unbinned
April-May 2008; Inkom, ID USA
Comments: These two reflection nebulae are rarely imaged and this image may well be a premiere for amateur astroimaging. vdB 149 is the blue reflection nebula on the center left; vdB150 the center right. The darker nebula just "above" vdB150 is Lynds Dark Nebula 1235. It is likely an Extended Red Emission nebula (ERE). These ERE are galactic dark nebulae at high latitudes that become visible through illumination by the interstellar radiation field. ERE is a dust-luminescence process, which appears in a broad band extending in wavelength across the R-band (Schedler)..This image is a composite-hybrid between two images taken with telescopes of different focal lengths. These nebulae have very low surface brightness and pose a significant challenge in imaging them. There are even fainter wisps of dust that make up the sky background. These small clouds are yet uncataloged as far as I can find through research.

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vdB 151; *Lacerta*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M SBIG STL
Total Exposure Time: 4.3 hours
August 2010; Inkom, ID

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van den Bergh 152, Cederblad 201, B 175, LBN 538, LDN 1217, LDN 1219, PN G111.0+11.6; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL
Total Exposure Time: 7 Hours; LRGB 240:60:60:60 minutes; unbinned
June 2007; Inkom, ID
Comments: Described as a "dusty curtain" or "ghostly apparition", mysterious reflection nebula vdB 152 really is very faint. It lies about 1400 light-years away, along the northern Milky Way in the royal constellation Cepheus. Near the edge of a large molecular cloud, pockets of cosmic dust in the region block light from background stars or scatter light from the embedded bright star (top) giving parts of the nebula a characteristic blue color. Ultraviolet light from the star is also thought to cause a dim reddish luminescence in the nebular dust. Though stars do form in molecular clouds, this star seems to have only accidentally wandered into the area, as its measured velocity through interstellar space is very different from the cloud's velocity (comment source: NASA APOD).
A closer view of the the central nebula complex is here. A deeper version may be seen here.

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vdB 153, Sh2-140, LDN 1204, LBN 505; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M SBIG STL
Total Exposure Time: 4.8 hours LRGB 110:60:60:60 minutes unbinned
August 2010; Inkom, ID

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vdB 154, Sh2-150, LBN 520, LDN 1207-9; *Cepheus*
Astro Systeme Austria N12 f/3.5 astrograph (Lum, Ha)
Tele Vue 127is f/5.2 refractor (Color)
KAI-11000M/CM; M (Lum), CM (color)
Total Exposure Time: 15.75 Hours; LHa:OSC 300:300:345 minutes, unbinned
August 2009; Inkom, ID
Comments: This interesting combination of emission and reflection nebulae in Cepheus is very difficult to process given the large number of stars. The processing goal was to try to bring out as much faint nebulosity as reasonably possible, thus the image appears to have a ground glass appearance from the large amount in the region. This method does tend to washout the colors a bit but to the advantage of bringing faint detail to light. Adding H-alpha to the red channel and some to the blue channel intensifies the delicate HII clouds in the region.

The color data image may been seen here. It shows a wider field of view of the region. The reflection and dark nebulosity can be seen but not in as much detail.

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Sharpless 2-155 **Cave Nebula**, vdB 155, LDN 1216, GGD 37, GN 22.55.2;
Cepheus
Astro Systeme Austria N12 f/3.5 astrograph (Lum, Ha)
Takahashi FSQ-106 f/5 astrograph (RGB)
KAI-11000; SBIG STL (Lum), FLI Microline (RGB)
Total Exposure Time: 9.6+ hours.◆LHaRGB 150:250:60:60:60 minutes; unbinned
June 2008; Inkom, ID
Comments: Sh2-155 is the HII region just right of center, while vdB 155 is the reflection nebula slight below and to the left of center.This area contains significant dust clouds which contribute to these star forming regions.
Other information (Gendler) may be found here.

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vdB 156 (a,b,c); *Lacerta*
Astro Systeme Austria N12 f/3.5 astrograph (Lum)
Tele Vue 127is f/5.2 refractor (color)
KAI-11000M/CM M(Lum), CM(color)
Total Exposure Time: 10.5 Hours; L:OSC 300:330 minutes, unbinned
August 2009; Inkom, ID
Comments: These are three of the four components of vdB 156. These are the three main clouds seen, component A is to the right, B lower left and C upper left. The fainter dust may not be cataloged. vdB 156d may be seen here.

Here is the color data. It shows a wider field of view of the dust.

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vdB 156d, LBN 477; *Andromeda*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 7 hours LRGB 190:80:70:80 min, RGB 2x2 binned

October 2012; Inkom, ID
Comments: vdB156 is divided into 4 components:a,b,c,d. vdB 156d is 33 x 13 arcmin, faint, blue and illuminated by star BD +41 4664. The other components of vdB 156 may be seen here.

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vdB157, PGC70067; *Cepheus*
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-8300M SBIG
Total Exposure Time: 9.2+ hours LRGB 260:100:80:110 minutes
September 2011; Inkom, ID
Comments: vdB157 is 7 x 4 arcmin, very blue, and illuminated by star BD +71 1181. PGC70067 is the faint galaxy to the right of center. The dust or molecular cloud is uncataloged as far as I can find.

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van den Bergh 158, DG 191; *Andromeda*
Astro Systeme Austria N12 f/3.5 astrograph
KAI-11000M; SBIG STL
Total Exposure 9.5 Hours; LRGB 230:110:110:120 minutes; unbinned
September 2007; Inkom, ID
Comments: This reflection nebula is very difficult to image due to its very low surface brightness. Never the less, clouds of faint dust can be seen in the region surrounding the bluish reflection nebula. Note the small blue planetary nebula PK 110-12 1 just to the upper left of the main portion of the blue reflection nebula.

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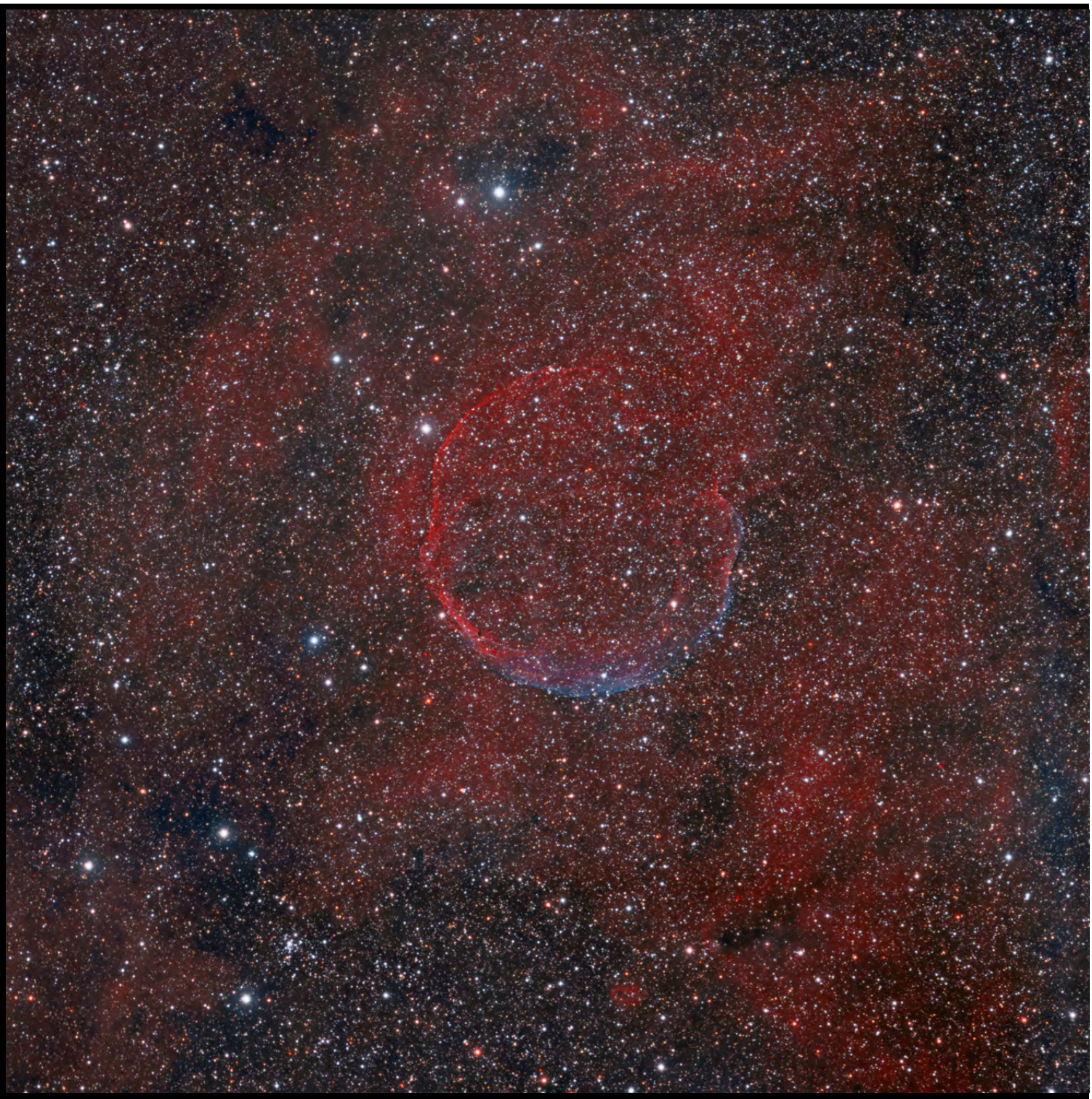
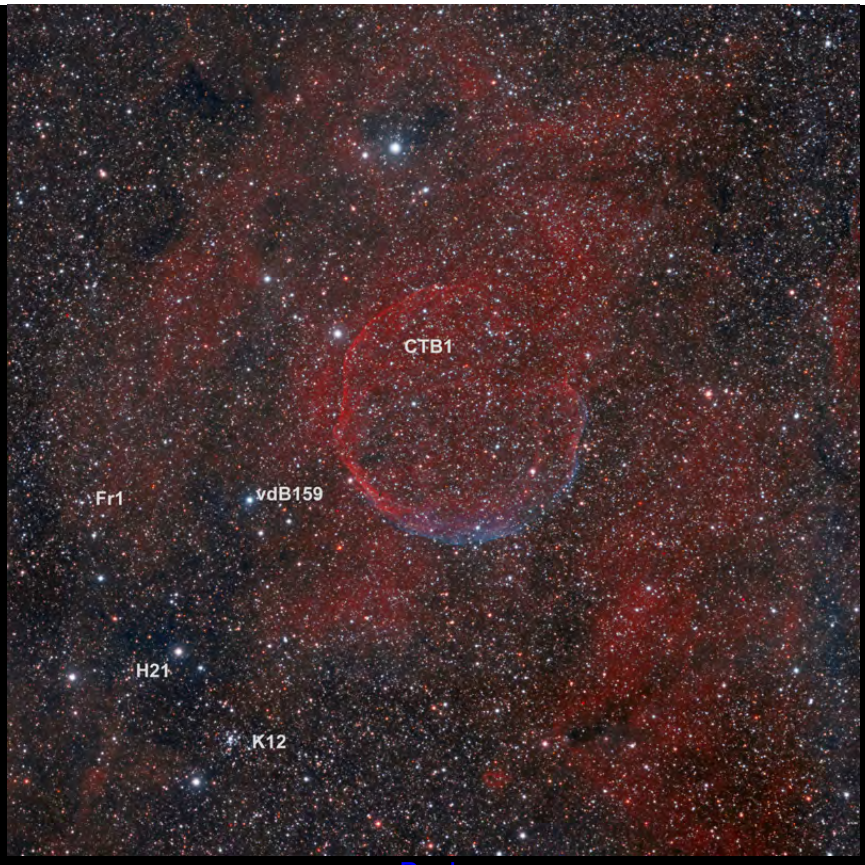


CTB1 (SNR G116.9+00.1), vdB159, Fr1(oc), K12(oc), H21(oc), LBN576;
Cassiopeia
Astro-Physics 305mm f/3.8 Riccardi-Honders astrograph
KAF-16803 FLI Proline
Total Exposure Time: 14+ hours H:O:O:R:G:B 340:460:460:15:15:15 minutes unbinned RGB used for star color and vdB159
July 2011; Inkom, ID
Comments: CTB1 is a very, very faint supernova remnant in Cassiopeia. It is very difficult to image in any detail due to its very low surface brightness. It can mainly be imaged with H-alpha filters but it also has a small but definate OIII component. vdB159 is very small (1.5 arcmin) reflection nebula adjacent to magnitude 7.68 star BD +61 2573. Since it is not worth imaging by itself, I thought a better composition was to include CTB1. Please see the image below for some object identifications. Fr1, K12, and H21 are small open clusters.



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Astronomy magazine

The van den Bergh catalog

In the January 2009 issue of *Astronomy*, Thomas V. Davis wrote about the van den Bergh catalog of reflection nebulae. Here is a list of all 158 objects Canadian astronomer Sidney van den Bergh cataloged.

Visually, you can expect to see the nebulae van den Bergh classified as VBR (very bright), BR (bright), and M (moderate). Those with other surface brightnesses will challenge even the largest telescopes.

These objects make great targets for astroimagers, however. CCD cameras coupled to medium-sized telescopes can capture most of them, albeit with long exposure times. If you successfully image any of these objects, send high-resolution copies to readergallery@Astronomy.com.

vdB number	Right ascension (2000.0)	Declination (2000.0)	Magnitude	Type	Surface brightness
1	0h11m	58°46'	8.60	I	BR
2	0h13m	65°37'	9.50	I	M
3	0h35m	69°26'	8.50	I	M
4	0h43m	61°55'	9.50	I-II	F
5	0h57m	60°43'	2.57	II	M
6	1h44m	61°50'	9.20	II	F
7	2h49m	69°38'	6.50	II	F
8	2h52m	67°49'	8.50	I	VBR
9	2h52m	68°53'	5.96	II	F
10	3h16m	57°08'	6.00	I	F
11	3h24m	61°32'	8.37	II	M
12	3h25m	31°44'	7.00	I	M
13	3h26m	30°56'	8.80	I	F
14	3h29m	59°56'	4.23	II	M
15	3h30	58°53'	4.58	II	M
16	3h28m	29°48'	9.10	II	M
17	3h29m	31°25'	9.50	I	BR
18	3h35m	38°01'	7.58	II	F
19	3h45m	32°10'	8.53	I	BR
20	3h45m	24°07'	3.71	I	M
21	3h46m	24°22'	3.88	I	BR
22	3h46m	23°57'	4.18	I	VBR
23	3h47m	24°06'	2.87	I	M
24	3h50m	38°59'	8.80	II	M
25	4h12m	23°34'	7.50	II	F
26	4h14m	10°13'	7.20	I	M
27	4h22m	28°27'	9.10	I	F
28	4h22m	19°32'	9.40	II P	F
29	4h48m	29°46'	6.50	II	M
30	4h54m	66°21'	4.30	II	VF
31	4h56m	30°33'	6.80	I	M
32	5h02m	44°16'	9.12	I-II	F
33	5h07m	–3°20'	10.12	I	BR
34	5h16m	34°19'	5.80	I	BR
35	5h15m	13°01'	8.70	I	M
36	5h15m	–8°12'	0.15	II	M
37	5h18m	13°25'	8.20	I	BR
38	5h22m	8°26'	5.77	II	M

vdB number	Right ascension (2000.0)	Declination (2000.0)	Magnitude	Type	Surface brightness
39	5h25m	32°49'	9.50	II	F
40	5h26m	6°35'	9.00	I	M
41	5h29m	23°42'	9.30	I	VF
42	5h31m	–5°42'	9.46	II	F
43	5h32m	6°03'	9.00	I	BR
44	5h32m	–4°31'	8.11	II	F
45	5h37m	31°51'	9.50	I	BR
46	5h36m	–6°43'	9.30	I	VBR
47	5h39m	23°19'	7.80	II	VF
48	5h38m	–0°11'	7.46	II	F
49	5h39m	4°07'	4.50	I	B
50	5h40m	–1°28'	7.67	I	B
51	5h41m	–1°30'	6.98	I	VBR
52	5h42m	–2°16'	7.82	I	VBR
53	5h41m	–10°19'	9.50	I	VF
54	5h42m	–6°15'	9.50	I	BR
55	5h42m	–8°08'	8.70	I	F
56	5h44m	16°22'	9.00	I	BR
57	5h43m	–2°19'	8.30	I	VBR
58	5h44m	–8°43'	9.50	I	VF
59	5h47m	0°05'	10.49	I	VBR
60	5h47m	0°18'	9.50	I	BR
61	5h53m	5°10'	8.60	II	VF
62	5h54m	1°40'	9.50	I	M
63	5h56m	1°52'	9.20	I	F
64	5h58m	–14°04'	10.00	I	M
65	6h05m	30°31'	9.50	I	BR
66	6h03m	–9°43'	9.30	I	MF
67	6h08m	–6°24'	9.50	I	VB
68	6h08m	–6°14'	9.00	I	M
69	6h08m	–6°22'	9.00	I	M
70	6h08m	–5°20'	8.50	I-II	F
71	6h10m	14°05'	9.00	II	F
72	6h10m	–6°20'	9.00	I	VBR
73	6h11m	–6°13'		I	BR
74	6h12m	–6°09'	9.70	I	BR
75	6h19m	23°16'	7.50	I	M
76	6h12m	13°41'	9.30	II	M

vdB number	Right ascension (2000.0)	Declination (2000.0)	Magnitude	Type	Surface brightness
77	6h31m	9°49'	9.50	I-II	M
78	6h31m	9°47'	8.80	I-II	BR
79	6h32m	10°20'	9.40	II	F
80	6h31m	–9°39'	8.60	I	M
81	6h33m	7°20'	4.48	I	M
82	6h33m	10°19'	8.74	I	BR
83	6h40m	–27°15'	9.50	I	BR
84	3h49m	–26°58'		I	M
85	6h47m	1°19'	9.30	I-II	M
86	6h57m	–10°17'	8.20	II	M
87	7h00m	–8°52'	8.80	I	BR
88	7h02m	–11°18'	7.20	I	F
89	7h03m	–12°14'	9.50	I	VF
90	7h03m	–11°27'	8.70	I	F
91	7h03m	–10°42'	9.40	II	F
92	7h04m	–11°35'	9.20	I	VF
93	7h04m	–10°27'	6.97	I	VBR
94	7h05m	–12°20'	8.50	I	VBR
95	7h07m	–11°18'	5.38	II	F
96	7h20m	–24°01'	9.20	I	M
97	7h31m	–16°54'	9.90	I-II	M
98	7h37m	–25°20'	7.30	I	M
99	15h59m	–26°07'	2.89	II	M
100	16h12m	–19°28'	4.03	II	M
101	16h19m	–20°13'	6.37	I	F
102	16h20m	–20°03'	8.08	I	BR
103	16h21m	–20°07'	7.30	I	M
104	16h21m	–25°36'	2.89	I	M
105	16h25m	–24°28'	7.89	I	M
106	16h26m	–23°27'	4.61	I	BR
107	16h29m	–26°26'	0.92	I	M
108	16h30m	–25°07'	4.78	I	M
109	16h42m	–17°45'	5.30	II	VF
110	17h16m	–21°02'	9.40	I	M
111	17h19m	6°05'	6.49	II	M
112	17h54m	–5°37'	9.60	II	F
113	18h09m	–21°27'	6.80	II	F
114	18h09m	–18°23'	9.10	I	F
115	18h09m	–23°26'	9.30	I	BR
116	18h11m	–17°44'	9.50	I	F
117	18h15m	–17°22'	9.10	I	M
118	18h17m	–19°47'	9.40	I	BR
119	18h17m	–19°52'	9.40	I	VBR
120	18h17m	–16°56'	8.80	I	M
121	18h20m	–17°00'	9.43	I-II	F
122	18h25m	–13°39'	9.30	I	M
123	18h30m	1°13'	9.10	I	M
124	18h31m	–10°48'	5.50	I	BR
125	19h26m	15°33'	8.00	I	VF
126	19h26m	22°45'	8.30	I	BR
127	19h47m	18°32'	3.82	II P	F
128	20h05m	32°13'	5.63	I	M
129	20h11m	–0°49'	3.24	II	F
130	20h18m	39°21'	9.50	I	BR
131	20h24m	42°18'	9.10	I	BR
132	20h25m	42°23'	8.70	I	BR
133	20h31m	36°56'	6.19	I	BR
134	20h30m	48°57'	4.95	I-II	F
135	20h37m	32°27'	8.60	II	F
136	20h38m	42°04'	7.80	II	VF
137	20h56m	47°25'	5.69	II	VBR
138	20h57m	48°18'	8.28	I	F
139	21h02m	68°10'	6.80	I	VBR
140	21h17m	58°37'	6.41	I-II	M
141	21h16m	68°16'	9.40	I	F
142	21h37m	57°30'	8.80	I	M
143	21h37m	68°11'	8.30	I	BR
144	21h41m	54°52'	6.00	I	VF
145	21h44m	48°53'	7.40	I	M U
146	21h43m	66°07'	9.40	I	BR
147	21h53m	47°14'	9.50	I	M
148	22h07m	56°14'	8.70	II	F
149	22h09m	72°53'	9.10	I	M
150	22h10m	73°23'	8.40	I	M
151	22h14m	39°43'	4.49	II U	F
152	22h13m	70°15'	8.80	I	VBR
153	22h23m	62°42'	9.40	I	M
154	22h31m	65°28'	8.90	II	F
155	22h53m	62°09'	9.29	I	M
156	23h02m	42°20'	3.62	II	F
157	23h02m	72°44'	7.80	P	F
158	23h38m	48°30'	9.00	I	M

Key: Type I = star embedded in the nebulosity; Type II = star outside the nebulosity; P = peculiar; BR = bright; F = faint; M = moderate; VBR = very bright; VF = very faint; U = uncertain.