

Eugene Astronomical Society



IO - April 2020

Eugene Astronomical Society
 Annual Club Dues \$25
 President: Andrew Edelen 618-457-3331
 Secretary: Jerry Olton 541-343-4758
 Additional Board members:
 Oggie Golub, Jim Murray, Ken Martin.

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 Eugene, OR 97405
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EAS is a proud member of
 The Astronomical League



Next Meeting Thursday, April 16th, 7:00 p.m.

Probably to be Cancelled

There seems little likelihood that the coronavirus outbreak will have diminished in time for us to hold an April meeting. It hasn't been officially cancelled yet, but it certainly seems likely. If miracles happen and we get the go-ahead to have meetings again, we'll let everyone know by email (or phone in the case of club members without email).

If we do have a meeting, the program would probably be Jerry's talk on Unusual Telescope Designs that was cancelled last month.

Next First Quarter Friday Cancelled

Our April 3rd First Quarter Friday will undoubtedly be cancelled due to social distancing requirements of the coronavirus outbreak. Hopefully we'll be back in business in May. (We have two shots at it!)

First Quarter Fridays are laid-back opportunities to do some observing and promote astronomy at the same time. Mark your calendar and bring your scope to the College Hill Reservoir (24th and Lawrence in Eugene) and share the view with whoever shows up. Here's the schedule through 2020. Star parties start at dusk or 6:00, whichever is later.

May 1 (65% lit)
 July 24 (24% lit)
 September 25 (71% lit)
 December 18 (23% lit)

May 29 (50% lit)
 August 15: Dexter Dark Sky Party
 October 23 (56% lit)

June 26 (37% lit)
 August 28 (84% lit)
 November 20 (39% lit)

For ongoing discussion of astronomical topics and impromptu planning of telescope outings, join the EAS mail list at www.eugeneastro.org (Click on the *Mailing List* link.) Also, subscribe to our free newsletter by clicking on the *Newsletter* link.

Discounted Magazine Subscriptions

One of the benefits of EAS membership is a club discount on subscriptions to *Sky & Telescope* and *Astronomy* magazines. For more information, contact club secretary Jerry Olton at j.olton@gmail.com.

EAS Astronomy Book Library

Through the various donations the EAS has received in the last few months, we have acquired a respectable library of observing books and charts. Andy Edelen has gone through them all and gotten them ready to loan out. Andy sent an extensive description of each item to our email list; here's that email in a more permanent form. Keep this issue of the *Io* to refer to when you need one of these items. If you're interested in borrowing any of these books or charts, contact Andy.

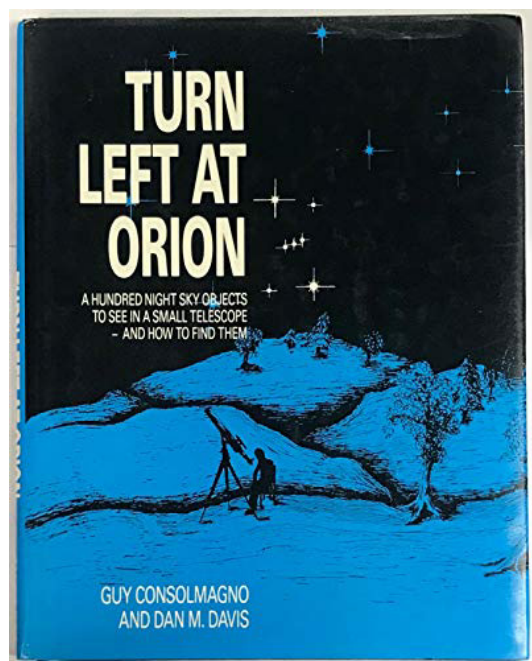
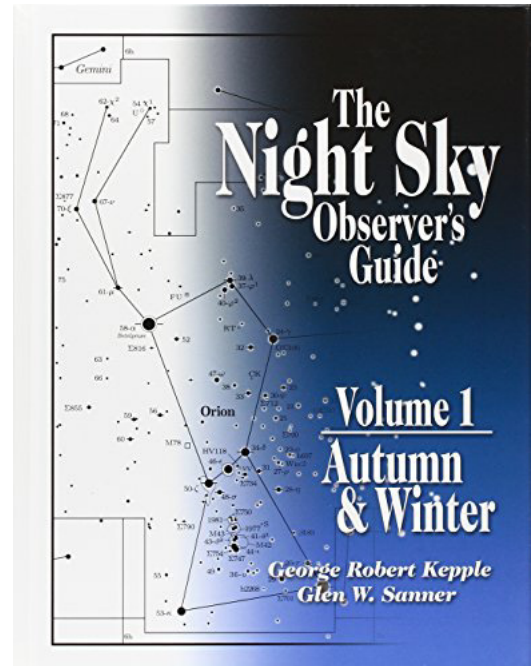
Observing Guides:

The Night Sky Observer's Guide, Vols. 1 & 2: "A subtitle to the two-volume *Night Sky Observer's Guide* could have been "Burnham's Celestial Handbook: The Next Generation..." (it is) a bible of very deep-sky observing, taking objects constellation by constellation with full page charts and numerous smaller finder charts and drawings. Tables list variable and double stars, and a few individual stars are highlighted. But the meat of the volumes is the descriptions of galaxies, nebulae and star clusters as they appear through a variety of apertures. If you're looking for targets to keep you busy and challenge your observing skills, the Night Sky Observer's Guide has come to your rescue." –From *Sky & Telescope* review

The NSOG consists of two primary volumes, Autumn/Winter (Vol. 1) and Spring/Summer (Vol. 2). There are also Volumes 3 & 4 (The Southern Sky; A Deeper Guide to the Milky Way), but we only have the first two. We have two copies of each of the first two volumes. These are books for those who already know their way around the night sky and have done some deep-sky exploring on their own. They describe and rate over 5500 objects using a variety of telescope apertures; the ratings they give are from 1-5 stars based on how impressive an object is in the eyepiece. (As always, the ratings are very subjective.). These are pretty large books.

Turn Left At Orion: "A superb guidebook described in *Bookwatch* as "the home astronomer's bible," *Turn Left at Orion* provides all the information beginning amateur astronomers need to observe the Moon, the planets and a whole host of celestial objects. Large format diagrams show these objects exactly as they appear in a small telescope and for each object there is information on the current state of our astronomical knowledge. Unlike many guides to the night sky, this book is specifically written for observers using small telescopes. Clear and easy to use, this fascinating book will appeal to skywatchers of all ages and backgrounds. No previous knowledge of astronomy is needed." –Amazon blurb

One of the very best books for beginning telescope users.



Burnham's Celestial Handbook, Vols 1-3: "While there are many books on stars, there is only one Celestial Handbook. Now completely revised through 1977, this unique and necessary reference is available once again to guide amateur and advanced astronomers in their knowledge and enjoyment of the stars.

"Volume I of this comprehensive three-part guide to the thousands of celestial objects outside our solar system ranges from Andromeda through Cetus. Objects are grouped according to constellation, and their definitions feature names, coordinates, classifications, and physical descriptions. After an extensive introduction in Volume I, which gives the beginner enough information to follow about 80 percent of the body of the material, the author gives comprehensive coverage to the thousands of celestial objects outside our solar system that are within the range of telescopes in the two- to twelve-inch range.

"The objects are grouped according to the constellations in which they appear. Each constellation is divided into four subject sections: list of double and multiple stars; list of variable stars; list of star clusters, nebulae and galaxies; and descriptive notes. For each object the author gives names, celestial coordinates, classification, and full physical description. These, together with a star atlas, will help you find and identify almost every object of



interest. But the joy of the book is the descriptive notes that follow. They cover history, unusual movements or appearance, and currently accepted explanations of such visible phenomena as white dwarfs, novae and supernovae, cepheids, mira-type variables, dark nebulae, gaseous nebulae, eclipsing binary stars, the large Magellanic cloud, the evolution of a star cluster, and hundreds of other topics, many of which are difficult to find in one place. Hundreds of charts and other visual aids are included to help in identification. Over 300 photographs capture the objects and are works of beauty that reflect the enthusiasm that star gazers have for their subject.

"Robert Burnham, Jr., who was on the staff of the Lowell Observatory, Flagstaff, Arizona, conceived the idea of *The Celestial Handbook* decades ago, when he began assembling a notebook of all the major facts published about each celestial object. In its former, privately printed edition, this handbook was acclaimed as one of the most helpful books for astronomers on any level." –Publisher blurb

They aren't exaggerating; this is one of the greatest works of amateur astronomy ever written. Two drawbacks: it was published in 1977, so much/most of the astrophysical knowledge is well out of date; and it uses 1950-epoch coordinates for the various objects and data tables (only a problem if you need the coordinates).

The Southern Sky: More a general overview of amateur astronomy than a specific observing guide, this book covers everything from astronomy basics, to using a telescope and binoculars, to observing the Sun, Moon, solar system, and deep-sky objects. As the title suggests, this book has a bias toward objects visible from the Southern Hemisphere, but the vast majority of objects included in it are visible from both hemispheres. Pretty much a beginner's guide with a southern slant.

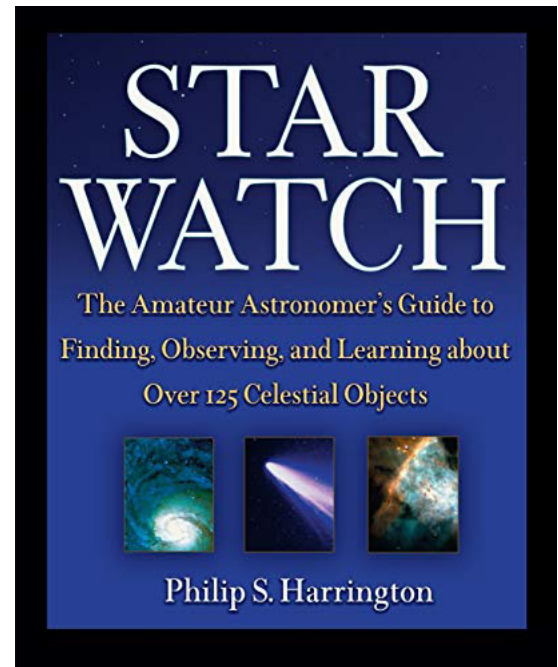
Atlas of Deep-Sky Splendors: Also not what it really seems to be, this is an oversized photo album of deep-sky objects, all shot to the same scale, featuring many of the sky's showpiece objects; there's a little bit of explanatory text for each object, but the black-and-white photos (shot on good old Kodak Tech Pan film!) are the real highlight. Useful for comparing objects, searching down smaller objects very near larger ones, or just staring at the photos.

Star Watch: “The night sky is alive with many wonders — distant planets, vast star clusters, glowing nebulae, and expansive galaxies, all waiting to be explored. Let respected astronomy writer Philip Harrington introduce you to the universe in *Star Watch*, a complete beginner’s guide to locating, observing, and understanding these celestial objects. You’ll start by identifying the surface features of the Moon, the banded cloud tops of Jupiter, the stunning rings of Saturn, and other members of our solar system. Then you’ll venture out beyond our solar system, where you’ll learn tips and tricks for finding outstanding deep-sky objects from stars to galaxies, including the entire Messier catalog—a primary goal of every serious beginner.

“Star Watch features a detailed physical description of each target, including size, distance, and structure, as well as concise directions for locating the objects, handy finder charts, hints on the best times to view each object, and descriptions of what you’ll really see through a small telescope or binoculars and with the naked eye.

“Star Watch will transport you to the farthest depths of space — and return you as a well-traveled, experienced stargazer.” –Amazon blurb

Harrington is one of the best writers in amateur astronomy, and his guidebooks are excellent for astronomers of all levels.

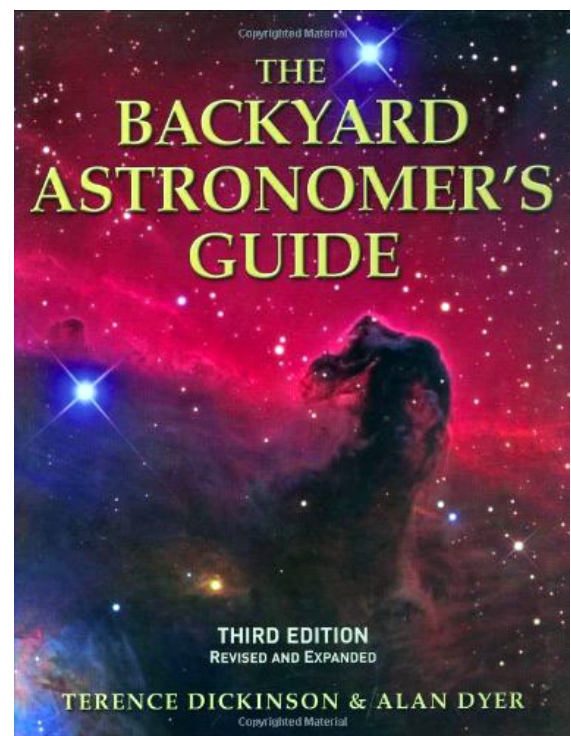


The Backyard Astronomer’s Guide: “An essential reference tool for both beginning and veteran sky observers. Drawing on decades of stargazing experience, the authors suggest what equipment to buy and what to avoid, describe observing techniques, and explain how to hunt down the most interesting celestial objects. Each chapter is illustrated with the latest, breathtaking astrophotography.

“This companion is broken down into three parts: ‘Equipment for Backyard Astronomy’, ‘Observing the Celestial Panorama’ and ‘Astrophotography.’ It focuses on the practical aspects of astronomy.

“Among many astronomy subjects, the authors offer advice on how to contend with light pollution, and how to take successful and impressive color photographs of galaxies and nebulae (with or without a telescope). Each chapter is written in clear, jargon-free yet detailed.” –Amazon blurb

This is my choice for the ideal beginner’s guide to amateur astronomy; I can’t really think of a better one. This is the one I always recommend when someone asks which book to start with.



The National Geographic Backyard Guide to the Night Sky: “Stargazing’s too much fun to leave to astronomers. This National Geographic book brings the solar system, space, stars, science, and planets to life in your own backyard, inspiring us to look up and understand the heavens above.

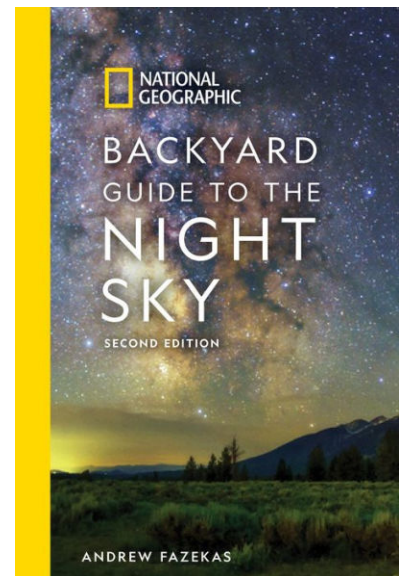
“Authors Howard Schneider and Patricia Daniels take an expert but easygoing approach that doesn’t overwhelm — it invites. Ten chapters cover everything a beginning stargazer will need to know, from

understanding the phases of the moon to picking Mars out of a planetary lineup to identifying the kinds of stars twinkling in the constellations.

“Throughout the book, star charts and tables present key facts in an easy-to-understand format, sidebars and fact boxes present illuminating anecdotes and fun facts to sweep us swiftly into the stardust, and by the time we realize we’ve been schooled in solid science we’re too engrossed to object.

“Along with practical advice and hands-on tips to improve observation techniques, the guide includes an appendix full of resources — from books and web sites to lists of astronomy clubs and associations to local planetariums and museums. This indispensable book guides us on a new path into the night sky, truly one of the greatest shows on Earth.” —Amazon blurb

A small but packed introduction to astronomy concepts, thoroughly illustrated.



Astronomy For All Ages: “This collection of fifty-one fascinating and engaging activities opens up the gateway to outer space for stargazers young and old.” —Amazon blurb

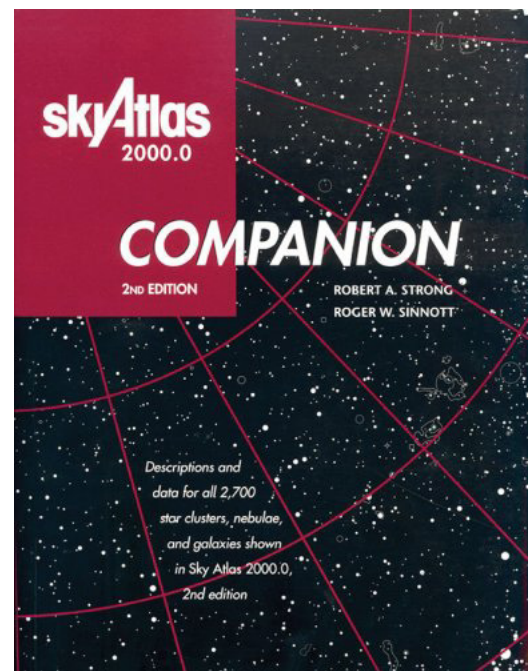
Part introduction, part workbook, with enough depth for adults but enough simplicity for kids. Anything Harrington writes is going to be done very well.

Star Atlases:

Sky Atlas 2000.0: This was the standard star atlas for use by amateur astronomers until the publication of The Pocket Sky Atlas, but it’s still (IMO) the best for general use. This is the “desk” version: 26 looseleaf charts with black stars on white background, and it’s the 1st edition, with 86,000 stars, clusters, nebulae, and galaxies (stars down to magnitude 8.5). Does NOT have constellation lines drawn in, so you have to keep that in mind when using it. Still the best overall field atlas IMO, although the charts are a bit large to hand-hold at the telescope.

Sky Atlas 2000.0 Companion: A chart-by-chart listing of each object found on each chart of Sky Atlas 2000.0, with size, magnitude, and visual data for each. Lots of good info here.

Astronomy Magazine Atlas of the Stars: A magazine-sized publication with 24 charts, lots of images, and a ton of information about the objects featured on the charts.



Norton’s Star Atlas: “First published in 1910, coinciding with the first of two appearances by Halley’s Comet during the book’s life, Norton’s owes much of its legendary success to its unique maps, arranged in slices known as gores, each covering approximately one-fifth of the sky. Every star visible to the naked eye under the clearest skies — down to magnitude 6.5 — is charted along with star clusters, nebulae and galaxies. Extensive tables of data on interesting objects for observation accompany each of the precision drawn maps. Preceding the maps is the unique and authoritative reference handbook covering time-keeping and positional measurements on the celestial sphere; the Sun, Moon and other bodies of the Solar

System; telescopes and other equipment for observing and imaging the sky; and stars, nebulae and galaxies. Throughout, succinct fundamental principles and practical tips guide the reader into the night sky. The appendices Units and Notation, Astronomical Constants, Symbols and Abbreviations, and Useful Addresses complete what has long been the only essential reference for the stargazer. Now presented more accessibly than ever before, the text and tables of the 20th edition have been revised and updated to take account of the new and exciting developments in our observation of the cosmos. The redesigned star maps offer outstanding legibility, in the living room or under a red light in the dark outdoors.” –Amazon blurb

DeepMap 600: A single poster-sized star chart, printed on vinyl, with 600 of the best deep-sky objects labeled and a series of tables describing them on the back.

Star Maps of Dominion Astrophysical Observatory: A very small (24pp.) series of monthly star charts down to magnitude 5. Not all that useful, I suspect, but a curio.

General:

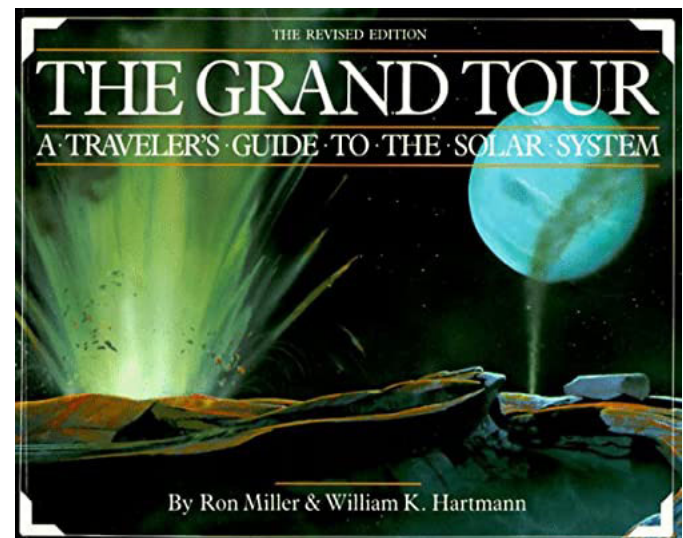
The National Geographic Picture Atlas of Our Universe: “Text, photographs, paintings, and maps explore the history of astronomy, the solar system, the universe, and new space discoveries.” –Amazon blurb

Not an atlas but a pretty-extensively illustrated book covering a wide range of astronomy subjects (as the blurb indicates).

The Guide to the Galaxy: “This guide to our galaxy is written in non-technical language and includes colour photographs of stars, star clusters and gas clouds in the Milky Way. The guide introduces the nature and structure of our galaxy and describes all types of objects that it contains. Maps are included.” –Goodreads blurb

The Grand Tour: “A Traveler’s Guide to the Solar System: “Hurricanes so enormous that the earth itself could be lost in one; a volcano larger than the state of Missouri and higher than Everest; a planet with a billion moons; a planet that rotates on its side; worlds made of solid ice; a world where it rains gasoline. These are not inventions of fantasy or science fiction, but are places that really exist-in our own solar system.

“Now with 190,000 copies in print, here is a spectacular Grand Tour of the solar system featuring a unique blend of science and art-photographs along with dazzling full-color paintings, drawings, and maps based on years of astronomer William Hartmann’s research, personal observation, and interviews with colleagues.



“In text and diagrams, too, *The Grand Tour* explains how the strange and uncanny worlds on the journeys came to be, and what it would be like to actually set foot upon them today. The book includes an atlas of the planets and their satellites, and of the Earth’s moon.” –Goodreads blurb

Universe: An Evolutionary Approach to Astronomy: A 1988 college textbook by Eric Chaisson covering the entire field of astronomical topics. A lot is out of date; a lot is still relevant.

Small Telescopes and Astronomical Research: A series of scientific research papers conducted using small telescopes — great for inspiration! 300+ pp.

Telescope Making/Equipment:

Star Ware (1st Ed.): “A user-friendly guide offering all the necessary information for anyone purchasing a telescope, using one for the first time or upgrading current equipment. Includes a comparison of available telescopes describing which are best suited to specific needs. Contains scores of handy tips, diagrams, illustrations and activities and suggests what to look for in the night sky.” –Amazon blurb

Note that this is the First Edition, from 1994, so much of the equipment here is no longer made. Harrington’s advice is always great, though, and some of the stuff included is still circulating, especially on the used market.

Standard Handbook for Telescope Making: “A scientifically accurate yet easy-to-use guide to the art and science of telescope making. The clear text, detailed drawings, and specially prepared photographs teach you how to: chose the right telescope to build; Buy inexpensive equipment and tools; Rough and fine grind the mirror; Test and polish for a perfect mirror; Select the right eyepiece; Construct the tube and its fittings; Mount your telescope; Plan and build a complete observatory; Photograph the stars. Fully Illustrated; Fully Indexed; Appendices including Glossary of Terms, Tables for Finding Sidereal Time, Tables of Films and Exposures for Celestial Photography.” –Amazon blurb

A pretty technical work from 1959 (revised 1984). Cover is damaged.

The Alt-Az Initiative: Telescope, Mirror, and Instrument Developments: A series of papers (some by our own Mel Bartels!) on more-recent (c. 2010) developments in amateur telescope building. 500+ pp.

Other:

The Mind’s Sky: Human Intelligence in a Cosmic Context: “Timothy Ferris, the bestselling author of *Coming of Age in the Milky Way*, delivers fascinating essays on the human mind, the search for extraterrestrial (and thus nonhuman) intelligence, comet strikes as a source of species extinction, near-death experiences, apocalyptic prophecies, information theory, and the origin of laughter.” –Amazon blurb

Albert Einstein: The World as I See It / Out of my Later Years: “The Einstein revealed in these writings is witty, keenly perceptive, and deeply concerned for humanity. Einstein believed in the possibility of a peaceful world and in the high mission of science to serve human well-being. As we near the end of a century in which science has come to seem more and more remote from human values, Einstein’s perspective is indispensable.” –Amazon blurb

For purposes of lending books, I think it fairly prudent to allow only the *Sky Atlas 2000/Sky Atlas 2000 Companion*, *Turn Left at Orion*, the *Astronomy Magazine Atlas*, and the *DeepMap 600* to be used outside at night, for the sake of keeping them in decent condition — given the amount of dew we’ve dealt with during some of our observing, some of these books wouldn’t hold up to frequent exposure.

Loans: Whereas scopes from the lending library have a three-month term, extended until someone asks for a scope that’s on loan already, books will be on a one-month loan, extended until someone requests an on-loan book. That is, if you “check out” a book, you can borrow it for one month minimum; if someone asks for it after that one month, it should be passed on to the requester. Borrowers must be current with their dues, however!



Gallery

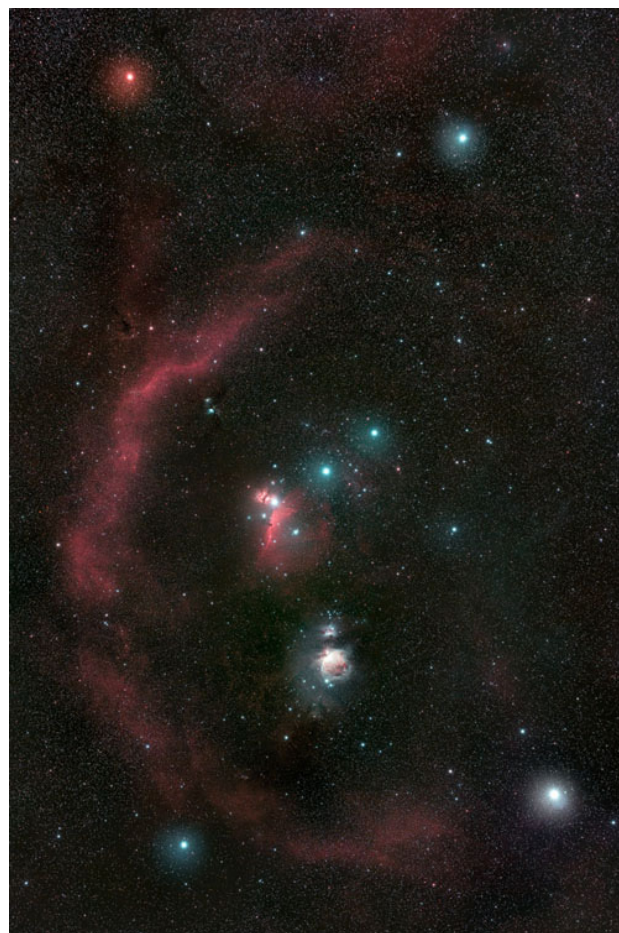
March had some decent weather during the early part of the dark lunar phase, and our astrophotographers got some excellent images. Enjoy!



Above: Crab Nebula in SOH color palette © by Mark Wetzel.

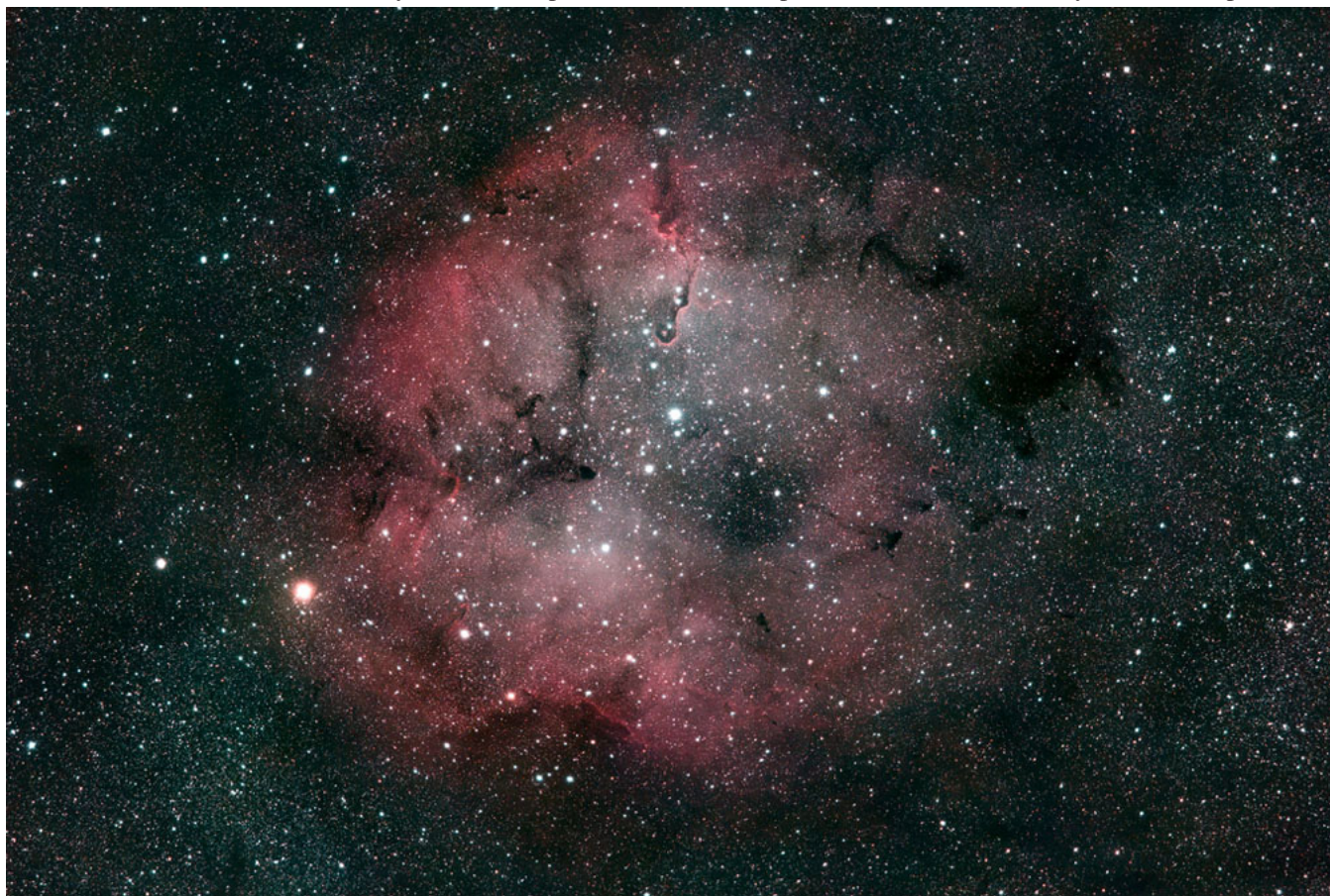
Right: Orion with Barnard's Loop © by Nathan Campbell

Below: The Orion Triplet © by Nathan Campbell





Above: The Rosette Nebula © by Nathan Campbell. Below: The Elephant Trunk in IC 1396 © by Nathan Campbell.

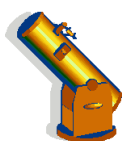




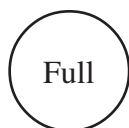
M82, with its jets of gas rushing away from the core. © by Mark Wetzel.



Moonrise on March 20. © by Alan Gillespie.



Observing in April



Apr 1, 3:21 AM	Apr 7, 7:35 PM	Apr 14, 3:56 PM	Apr 22, 7:26 PM
Mercury Rise: 6:09 AM	Mercury Rise: 6:05 AM	Mercury Rise: 6:01 AM	Mercury lost in Sun
Venus Set: 11:54 PM	Venus Set: Midnight	Venus Set: 00:04 AM	Venus Set: 00:03 AM
Mars Rise: 4:09 AM	Mars Rise: 3:58 AM	Mars Rise: 3:46 AM	Mars Rise: 3:31 AM
Jupiter Rise: 3:42 AM	Jupiter Rise: 3:21 AM	Jupiter Rise: 2:56 AM	Jupiter Rise: 2:26 AM
Saturn Rise: 4:02 AM	Saturn Rise: 3:40 AM	Saturn Rise: 3:13 AM	Saturn Rise: 2:43 AM
Uranus Set: 9:35 PM	Uranus Set: 9:13 PM	Uranus Set: 8:48 PM	Uranus lost in Sun
Neptune Rise: 6:10 AM	Neptune Rise: 5:47 AM	Neptune Rise: 5:20 AM	Neptune Rise: 4:49 AM
Pluto Rise: 3:47 AM	Pluto Rise: 3:24 AM	Pluto Rise: 2:57 AM	Pluto Rise: 2:25 AM

All times Pacific Standard Time (November 1, 2020 - March 14, 2021 = UT -8 hours) or Pacific Daylight Time (March 8 - Oct 31, 2020 = UT -7 hours)

Date	Moon Rise	Moon Set	Twilight Begin	Sun Rise	Sun Set	Twilight End
4/1/2020	12:05	03:04	05:13	06:53	19:40	21:21
4/2/2020	13:08	03:56	05:10	06:51	19:42	21:22
4/3/2020	14:19	04:41	05:08	06:49	19:43	21:24
4/4/2020	15:35	05:20	05:06	06:47	19:44	21:25
4/5/2020	16:54	05:55	05:04	06:45	19:45	21:27
4/6/2020	18:14	06:25	05:02	06:44	19:46	21:28
4/7/2020	19:34	06:54	05:00	06:42	19:48	21:30
4/8/2020	20:54	07:23	04:58	06:40	19:49	21:32
4/9/2020	22:13	07:54	04:56	06:38	19:50	21:33
4/10/2020	23:30	08:28	04:53	06:37	19:51	21:35
4/11/2020		09:07	04:51	06:35	19:52	21:37
4/12/2020	00:42	09:52	04:49	06:33	19:54	21:38
4/13/2020	01:47	10:44	04:47	06:31	19:55	21:40
4/14/2020	02:42	11:41	04:45	06:30	19:56	21:42
4/15/2020	03:28	12:42	04:43	06:28	19:57	21:43
4/16/2020	04:05	13:45	04:41	06:26	19:58	21:45
4/17/2020	04:37	14:47	04:38	06:25	20:00	21:47
4/18/2020	05:03	15:49	04:36	06:23	20:01	21:48
4/19/2020	05:27	16:49	04:34	06:21	20:02	21:50
4/20/2020	05:49	17:50	04:32	06:20	20:03	21:52
4/21/2020	06:10	18:50	04:30	06:18	20:05	21:54
4/22/2020	06:31	19:51	04:28	06:17	20:06	21:55
4/23/2020	06:54	20:53	04:25	06:15	20:07	21:57
4/24/2020	07:20	21:56	04:23	06:13	20:08	21:59
4/25/2020	07:49	22:59	04:21	06:12	20:09	22:01
4/26/2020	08:25		04:19	06:10	20:11	22:03
4/27/2020	09:07	00:01	04:17	06:09	20:12	22:04
4/28/2020	09:58	01:00	04:15	06:07	20:13	22:06
4/29/2020	10:57	01:53	04:13	06:06	20:14	22:08
4/30/2020	12:04	02:39	04:11	06:04	20:15	22:10

All times are for Eugene, Oregon Latitude 44° 3' Longitude 123° 06'

Items of Interest This Month

Mars pulls away east from Saturn and Jupiter.

4/3 CANCELLED – First Quarter Friday star party.

4/3 Venus close to the Pleiades.

4/11 Good night to watch Algol dim and brighten again. Minimum is at 9:14 PM.

4/14 Moon, Jupiter, Saturn, and Mars form a 20° arc in south-southeast in early morning.

4/15 Moon underneath Saturn, with Jupiter and Mars on either side. Visible in early AM.

4/16 Moon below Mars in early AM.

4/21-23 Lyrid meteor shower. No moon to interfere. Fireballs possible!

4/25 & 4/26 Good evenings for Earthlight on the Moon just after sunset.

4/26 Moon occults 4th magnitude star (α Tauri) at 9:34 PM. α Tauri is double with an 11th-magnitude secondary, and the brighter component will disappear first, so it might be possible to see a double blink. Separation is 34" at 348°, so the secondary will remain visible for about half a minute. Reappearance at 10:23 PM

4/27 Venus at greatest brightness.

4/29 TENTATIVE – First Quarter Friday

4/30 Additional First Quarter Moon 1:38 PM.