

October 2010

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October Meeting

The next meeting of S*T*A*R will be on Thursday, October 7th, 2010 and will feature Dr. Steve Bickerton who will speak about “Kuiper Belt Objects”. All are welcome. The meeting will begin promptly at 8:00pm at the Monmouth Museum on the Brookdale Community College campus.

Calendar

- Oct 7, 2010 – Dr. Steve Bickerton “Kuiper Belt Objects”
- Oct 27, 2010 – Sandy Hook Star Party
- Nov 4, 2010 – “Teeter and His Telescopes: 8 years, 72 Scopes, and a Thousnad Stories” presented by Rob Teeter

Sun	Mon	Tues	Wed	Thur	Fri	Sat
					1	2
3	4	5	6	7 New, 14:46	8	9
10	11	12	13	14 First, 17:29	15	16
17	18	19	20	21	22 Full, 21:37	23
24	25	26	27	28	29	30 Last, 08:47
31	Moon Phases October 2010					

November Issue

Please submit articles and contributions for the next *Spectrogram* by October 26. Please email to fowler@verizon.net.

September Meeting Minutes

The September 2nd, 2010 meeting of S*T*A*R Astronomy Club began at 8:05 pm. There were 33 members and non-members in attendance. President Nancy McQuire chaired the meeting and began by welcoming one first time attendee and discussing the evening's agenda and upcoming events. She also discussed reviving the local group observing sessions and noted that the dues are due.

Beginning at 8:14, S*T*A*R was treated to a wonderful talk by Dr. Steve Walters who is an avid astrophotographer and also a former president of S*T*A*R. The title of the lecture was "A Long Time Ago – The 3C273 Story."

Steve started by explaining how his interest in 3C273, a Quasar in Virgo, began with a quest to view the most distant object possible with an amateur telescope. He continued with the history of its discovery and discussing its physical and astronomical properties. The talk concluded at 9:21 at which time coffee break began.

The meeting resumed at 9:53. The following items were discussed.

-Upcoming star party for an Asbury Park School on 10/27. Rain date 11/3.

-Cancellation of the fall Stokes Star Party due to the organizers no longer being interested in astronomy.

-Various star parties were discussed such as Mason Dixon, SJSP and Stella Della.

-Dennis O'Leary asked for assistance for a star party at the Mill Lake School on 11/18 in Monroe Township.

the 50-50 was then drawn and the meeting adjourned at approx 10:35.

Are you a S*T*A*R Member?

S*T*A*R is the proud owner of a **monstrous 25" Dobsonian Obsession reflector – which members can gain access to!**

Meetings are the first Thursday of each month, except July and August, at 8:00 PM at the Monmouth Museum on the Brookdale Community College campus. Meetings generally consist of lectures and discussions by members or guest speakers on a variety of interesting astronomical topics. S*T*A*R is a member of United Astronomy Clubs of New Jersey (UACNJ), the Astronomical League (AL), and the International Dark Sky Association (IDA).

Memberships: () Individual...\$25 () Family...\$35

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

Email _____

Make checks payable to: S*T*A*R Astronomy Society, Inc.
and mail to P.O. Box 863, Red Bank, NJ 07701



SEARCHING THE ASTRONET

Starting Out

By Steve Seigel

When you first enter into the hobby of Astronomy, learning the sky can seem to be an astronomical task. However, once you get a starting point in the sky, someone to help guide you (for example, our Club Members) and some helpful advice from the internet, you will be on your way to learning what's up there in no time. No optics necessary!

To begin, I'm going to give you a starting point in the sky and be your guide. You are going to learn the sky in small parts that are bright under all light conditions. Helpful internet advice will be found within the article as well as at the end. The easiest object to start with is the Big Dipper. This is an asterism which means it is a part of the constellation known as the Great Bear. This bear has a tail. Many constellations are built on fantasy or mythology and the Great Bear is no exception. Asterisms can be found "naked eye," in binoculars or telescopes. I'll leave asterisms for a future article on observing. The bowl of the Big Dipper points to Polaris (North Star). Polaris is found in the Little Dipper (Constellation: Ursa Minor) as seen below: http://www.astropix.com/HTML/SHOW_DIG/038.HTM

More on the Big Dipper and using its pointer stars is found here: <http://homepage.mac.com/kvmagruder/bcp/aster/general/dipper.htm>

Learning The Sky:
This web site is a good place to start: <http://www.synapticsystems.com/sky/learnsky.html>

How to observe along with interesting links: <http://darkskyinstitute.org/observing.html> Note: Click on "Stars and Constellations" lots of interesting items including an interactive sky chart (needs Java)

Free sky map (Monthly)
One of the best sky maps especially for beginners available on the internet for free: <http://www.skymaps.com/downloads.html>

More free sky charts: <http://www.midnightkite.com/starcharts.html>

A site that has great links:
Don't miss this one! <http://stargazing.com/astro.html>

May the light from the heavens always sparkle your imagination.
Steve Seigel

SEARCHING THE ASTRONET

Observing Asterisms

By Steve Seigel

Asterisms are shapes that are caused by the bright stars that we see with our eyes or through optical instruments. These star shapes are formed through our own interpretation of the stars. For example, the Big Dipper can be seen as a drinking gourd, a wagon, and my own modern day interpretation is that of a computer mouse with the bowl as the computer mouse and the wire being the tail.

For an observation log use the first link:
Outside of the logs that can be printed out on the top of the first web site, I couldn't see any other value. The binary star calculator didn't work like I thought it would. The second web site is much more useful because it has complete star charts and other info.

These two sites go together:
<http://www.saguaroastro.org/content/downloads.htm>
<http://www.nightskyatlas.com/asterisms.jsp>
Asterisms Visible With Eyes:
<http://astronomyonline.org/Observation/Asterisms.asp>
Summer Triangle: Altair, Deneb, and Vega:
<http://homepage.mac.com/kvmagruder/bcp/aster/constellations/sumt.htm>

Table of Asterisms:
<http://www.wro.org/ras/asterism.htm>
<http://www.maa.mhn.de/Maps/Const/asterism.html>
NexStar Observation List With Description (Can be used for other telescopes):
<http://www.nexstarsite.com/Asterisms.htm>

A List of Asterisms From Lots of Sources (Drawings made with Starry Night Pro):
http://deepsky.waarnemen.com/asterisms/Asterisms_EN_VE_R4.1.pdf

Drawings and Photos of Asterisms:
http://www.ssoastro.org/STAR_List.htm

Unusual Asterisms (Handmade 8 inch binoculars in a motorized chair-A Ripley's Believe It or Not!):
<http://www.waynesthisandthat.com/stellarasterisms.htm>

Asterisms Related To Archeoastronomy:
<http://members.westnet.com.au/Gary-David-Thompson/page11.html>

Constellations:
Click on your interests-this site shows all the constellations.
<http://www.astronoo.com/en/summerConstellations.html>

Clear skies,
Steve Seigel

SEARCHING THE ASTRO NET -

Star Atlas

By Steve Seigel



As you can see from the photo, I own a few star atlases. My favorite is the SkyAtlas 2000.0 by Will Tirion and Roger W. Sinnott. I own their laminated field edition.



This is a photo of Orion:
The china marker (pictured on top of the Sky Atlas) was used to make the lines of the constellations and its boundaries. The lines they give you are very faint. The lines the china marker makes are so bright that I am able to use this chart with an audience with great success. I can also make notes on the laminated maps with this marker which wipe off with a tissue. (Some people use sticky notes.) There are several editions to this sky atlas but I like the black background because it allows the stars and my notes to be seen easily under a red flashlight. Another benefit to using a laminated version is “dew.” When water gets on it, simply use a tissue and wipe off. If you’re careful, the markings that you made will not be erased.

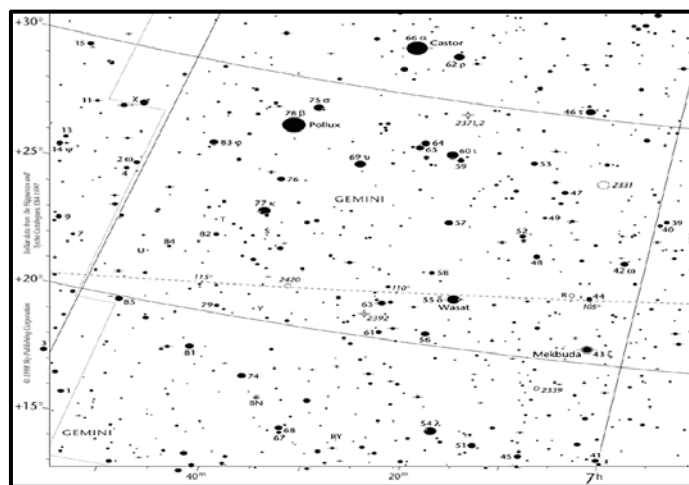
How to use a Star Atlas (Very Basic)

I own 2 telescopes, a go-to (Celestron CG 5 mount with a 120mm refractor) and a dob (8 in. Orion SkyQuest XT8 Classic). I use the sky atlas as though I was “star hopping.” One of the ways I use it is to see where in the sky there are lots of stars and/or objects to look at. I point the dob in that general direction and look around. I may not always know what I’m looking at but the star clusters are amazing. I also form interesting shapes (asterisms) with the stars. Another way for me to use the charts is to take note of the NGC number or other identification and put that into my go to and let it slew there.

For the more advanced amongst us, most of the following is for you:

Understanding “declination” (Dec) and “right ascension” (RA): Declination is simply North to South that is, going from the North Celestial Pole to the South Celestial Pole. Longitude goes around (East-West). Dec is measured in degrees (“o”), minutes (“’), and seconds (“”). The celestial equator is 0 degrees and the North Celestial Pole (Next to Polaris) is 90 degrees. Dec is based on 360 degrees. Anything north of the equator is a positive (+) number anything south is a negative number (-). The number for the South Celestial Pole would be -90 degrees. RA is measured in Hours, Minutes, and Seconds which are equal to 24 hours. The start of RA begins where the Sun passes through the Celestial Equator. This happens to equal Earth’s Longitude aka Greenwich Meridian. Greenwich is located in England.

The SkyAtlas 2000.0 makes looking for objects using the Celestial Coordination system an easy task. First look at the numbers going across the top or bottom of the grid. Then look at the numbers on the side. Match them to the object you want to see. Set them to your equatorial mount or put the coordinates in your “go to” and you’ll have the object in your eyepiece (low power 25+). See image below for an example of where these numbers are located:



In addition to the numbers on the grid there are also designations for magnitude and sizes of the stars and deep sky objects. Some atlases will point out the Milky Way using the color blue. When you are in the main area of the Milky Way, the blue is at its darkest. The desk version of the SkyAtlas 2000.0 or the Pocket Sky Atlas by Roger W. Sinnott has this since they are in color.

Web Sites

Understanding the Celestial Sphere:

http://www.thenightsguy.com/?page_id=141

Understanding Dec and RA

http://wapedia.mobi/en/Right_ascension

Handy Companion For Atlas:

http://www.nightskyinfo.com/sky_atlas_2000/

Sky Maps and Other Great Web Sites:

<http://www.skymaps.com/>

<http://punkastronomy.com/2010/06/23/open-source-star-atlases/>

<http://www.suntrek.org/factory/a.shtml>

Observing Logs (Provides Page Numbers In Atlas 2000)

<http://www.davidpaulgreen.com/software.html>

Cosmic Ice Sculptures



Image credit: Credit: NASA, ESA, and the Hubble Heritage Project (STScI/AURA)

Enjoying a frozen treat on a hot summer day can leave a sticky mess as it melts in the Sun and deforms. In the cold vacuum of space, there is no edible ice cream, but there is radiation from massive stars that is carving away at cold molecular clouds, creating bizarre, fantasy-like structures.

These one-light-year-tall pillars of cold hydrogen and dust, imaged by the Hubble Space Telescope, are located in the Carina Nebula. Violent stellar winds and powerful radiation

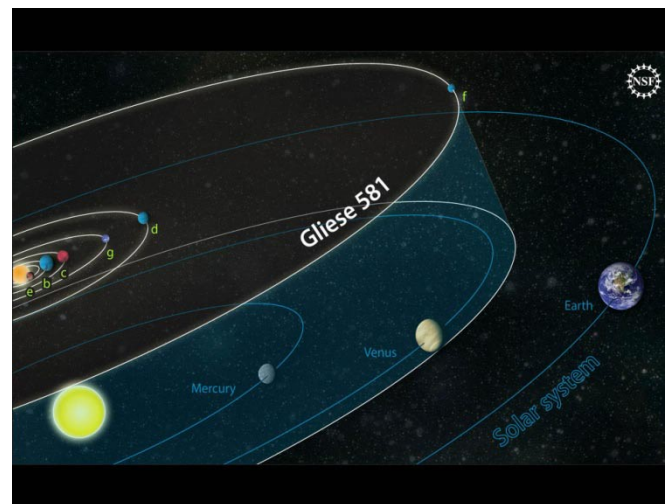
from massive stars are sculpting the surrounding nebula. Inside the dense structures, new stars may be born.

This image of dust pillars in the Carina Nebula is a composite of 2005 observations taken of the region in hydrogen light (light emitted by hydrogen atoms) along with 2010 observations taken in oxygen light (light emitted by oxygen atoms), both times with Hubble's Advanced Camera for Surveys. The immense Carina Nebula is an estimated 7,500 light-years away in the southern constellation Carina.

The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency. NASA's Goddard Space Flight Center manages the telescope. The Space Telescope Science Institute (STScI) conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy, Inc. in Washington, D.C.

NASA and NSF-Funded Research Finds First Potentially Habitable Exoplanet

A team of planet hunters from the University of California (UC) Santa Cruz, and the Carnegie Institution of Washington has announced the discovery of a planet with three times the mass of Earth orbiting a nearby star at a distance that places it squarely in the middle of the star's "habitable zone."



The orbits of planets in the Gliese 581 system are compared to those of our own solar system. The Gliese 581 star has about 30% the mass of our sun, and the outermost planet is closer to its star than we are to the sun. The fourth planet, G, is a planet that could sustain life. Image Credit: National Science Foundation/Zina Deretsky

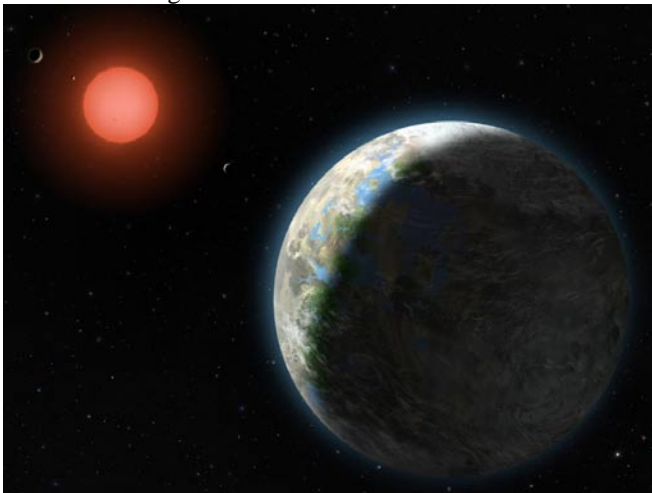
This discovery was the result of more than a decade of observations using the W. M. Keck Observatory in Hawaii,

one of the world's largest optical telescopes. The research, sponsored by NASA and the National Science Foundation, placed the planet in an area where liquid water could exist on the planet's surface. If confirmed, this would be the most Earth-like exoplanet yet discovered and the first strong case for a potentially habitable one.

To astronomers, a "potentially habitable" planet is one that could sustain life, not necessarily one where humans would thrive. Habitability depends on many factors, but having liquid water and an atmosphere are among the most important.

The new findings are based on 11 years of observations of the nearby red dwarf star Gliese 581 using the HIRES spectrometer on the Keck I Telescope. The spectrometer allows precise measurements of a star's radial velocity (its motion along the line of sight from Earth), which can reveal the presence of planets. The gravitational tug of an orbiting planet causes periodic changes in the radial velocity of the host star. Multiple planets induce complex wobbles in the star's motion, and astronomers use sophisticated analyses to detect planets and determine their orbits and masses.

"Keck's long-term observations of the wobble of nearby stars enabled the detection of this multi-planetary system," said Mario R. Perez, Keck program scientist at NASA Headquarters in Washington. "Keck is once again proving itself an amazing tool for scientific research."



This artist's conception shows the inner four planets of the Gliese 581 system and their host star, a red dwarf star only 20 light years away from Earth. The large planet in the foreground is the newly discovered GJ 581g, which has a 37-day orbit right in the middle of the star's habitable zone and is only three to four times the mass of Earth, with a diameter 1.2 to 1.4 times that of Earth. Image Credit: Lynette Cook

Steven Vogt, professor of astronomy and astrophysics at UC Santa Cruz, and Paul Butler of the Carnegie Institution lead the Lick-Carnegie Exoplanet Survey. The team's new findings are reported in a paper published in the *Astrophysical Journal* and posted online at: <http://arxiv.org>

"Our findings offer a very compelling case for a potentially habitable planet," said Vogt. "The fact that we were able to detect this planet so quickly and so nearby tells us that planets like this must be really common."

The paper reports the discovery of two new planets around Gliese 581. This brings the total number of known planets around this star to six, the most yet discovered in a planetary system outside of our own. Like our solar system, the planets around Gliese 581 have nearly-circular orbits. The new planet designated Gliese 581g has a mass three to four times that of Earth and orbits its star in just under 37 days. Its mass indicates that it is probably a rocky planet with a definite surface and enough gravity to hold on to an atmosphere.

Gliese 581, located 20 light years away from Earth in the constellation Libra, has two previously detected planets that lie at the edges of the habitable zone, one on the hot side (planet c) and one on the cold side (planet d). While some astronomers still think planet d may be habitable if it has a thick atmosphere with a strong greenhouse effect to warm it up, others are skeptical. The newly-discovered planet g, however, lies right in the middle of the habitable zone. The planet is tidally locked to the star, meaning that one side is always facing the star and basking in perpetual daylight, while the side facing away from the star is in perpetual darkness. One effect of this is to stabilize the planet's surface climates, according to Vogt. The most habitable zone on the planet's surface would be the line between shadow and light (known as the "terminator").

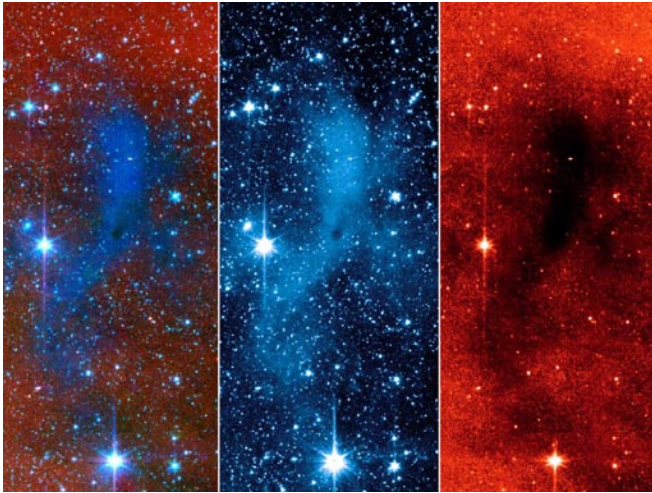
Shining Starlight on the Dark Cocoons of Star Birth

Astronomers have discovered a new, cosmic phenomenon, termed "coreshine," which is revealing new information about how stars and planets come to be.

The scientists used data from NASA's Spitzer Space Telescope to measure infrared light deflecting off cores -- cold, dark cocoons where young stars and planetary systems are blossoming. This coreshine effect, which occurs when starlight from nearby stars bounces off the cores, reveals information about their age and consistency. In a new paper, to be published Friday, Sept. 24, in the journal *Science*, the team reports finding coreshine across dozens of dark cores.

Pagani and his team first observed one case of the coreshine phenomenon in 2009. They were surprised to see that starlight was scattering off a dark core in the form of infrared light that Spitzer could see. They had thought the grains of dust making up the core were too small to deflect the starlight; instead, they expected the sunlight would travel straight through. Their finding told them that the dust grains

were bigger than previously thought -- about 1 micron instead of 0.1 micron (a typical human hair is about 100 microns).



This series of images from NASA's Spitzer Space Telescope shows a dark mass of gas and dust, called a core, where new stars and planets will likely spring up. The image on the far right shows the core as seen at longer wavelengths of infrared light (8 microns); when viewed at this wavelength, the core appears dark. The middle image shows the core as seen at a shorter infrared wavelength (3.6 microns). In this view, the core lights up because it is deflecting starlight from nearby stars. This unexpected light, called coreshine, tells astronomers that the dust making up the core must be bigger than previously thought -- smaller particles would not have been big enough to scatter the light. The image on the left is a combination of the other two images. This particular core lies deep within a larger dark cloud called L183. Spitzer's infrared vision allows it to peer into the dark cloud to see the even darker cores buried inside. The observations were made with Spitzer's infrared array camera. Image credit: NASA/JPL-Caltech/Observatoire de Paris/CNRS

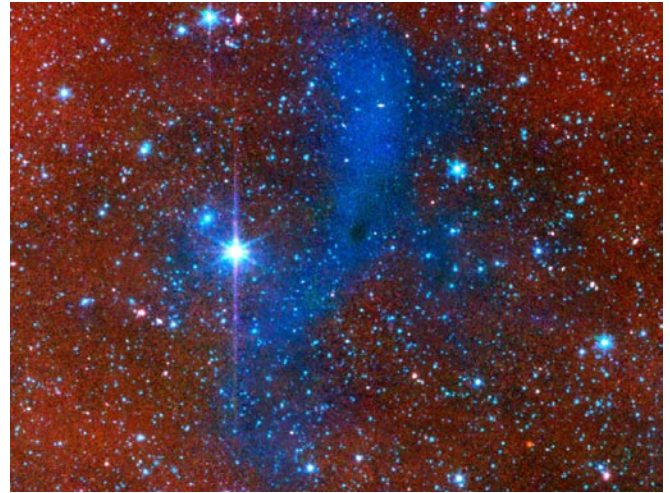
That might not sound like a big difference, but it can significantly change astronomers' models of star and planet formation. For one thing, the larger grain size means that planets -- which form as dust circling young stars sticks together -- might take shape more quickly. In other words, the tiny seeds for planet formation may be forming very early on, when a star is still in its pre-embryonic phase.

But this particular object observed in 2009 could have been a fluke. The researchers did not know if what they found was true of other dark clouds -- until now. In the new study, they examine 110 dark cores, and find that about half of them exhibit coreshine.

The finding amounts to a new tool for not only studying the dust making up the dark cores, but also for assessing their age. The more developed star-forming cores will have larger dust grains, so, using this tool, astronomers can better map their ages across our Milky Way galaxy. Coreshine can also help in constructing three-dimensional models of the cores --

the deflected starlight is scattered in a way that is dependent on the cloud structures.

Said Pagani, "We're opening a new window on the realm of dark, star-forming cores."



This series of images from NASA's Spitzer Space Telescope shows a dark mass of gas and dust, called a core, where new stars and planets will likely spring up. This particular core lies deep within a larger dark cloud called L183. The core is glowing because starlight that originated from nearby stars is being deflected off the core at infrared wavelengths that Spitzer sees. This particular type of glow, termed coreshine, helps astronomers study the age and consistency of a variety of star-forming cores. The Spitzer observations were made with its infrared array camera.

Image credit: NASA/JPL-Caltech/Observatoire de Paris/CNRS

Other authors are Aurore Bacmann of the Astrophysics Laboratory of Grenoble, France, and Jürgen Steinacker, Amelia Stutz and Thomas Henning of the Max-Planck Institute for Astronomy, Germany. Steinacker is also with the Observatoire de Paris, and Stutz is also with the University of Arizona, Tucson.

The Spitzer measurements are based on data from the mission's public archive, taken before the telescope ran out of its liquid coolant in May 2009 and began its current warm mission.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Spitzer Space Telescope mission for NASA's Science Mission Directorate, Washington. Science operations are conducted at the Spitzer Science Center at the California Institute of Technology, also in Pasadena. Caltech manages JPL for NASA. For more information about Spitzer, visit <http://spitzer.caltech.edu/> and <http://www.nasa.gov/spitzer> .

*Whitney Clavin / Guy Webster 818-354-4673 / 6278
Jet Propulsion Laboratory, Pasadena, Calif.*

Group Purchase of Royal Astronomical Society Items

The ASTRA astronomy club is taking orders to try to make a bulk purchase of the Royal Astronomical Society of Canada (RASC) Observer's Handbook and Calendar for the coming year at a discount. The RASC has just set the prices. We will collect the discount price, which includes shipping and handling to ASTRA. If we do not meet the minimum order for discount, the money collected will be refunded.

The *Observer's Handbook* is a 320+ page guide published annually. The sections in the *Observer's Handbook* are of two kinds: **Sections dealing with astronomical events** that occur during the year, e.g. times of sunrise, sunset, moonrise, moonset, eclipses, meteor showers, star occultations by the Moon and by asteroids and a section called "The Sky Month By Month"; and **Sections dealing with astronomical data** and information that does not change from year to year

The *Observer's Calendar* has an astronomical photo for each month, times of sunrise, sunset, moonrise, moonset, phases of the moon, and the most important astronomical events that occur during the year.

Item	Reg. Price & Shipping	Expected Disc. Price & Shipping
Observer's Handbook	\$33.95	\$22.50
Observer's Calendar	\$23.95	\$16.00

Name:
Phone: ()
Member of which astronomy club:

Qty.	Item	Price each	Total
		\$	\$
		\$	\$
Total			\$

Please use this form to list what you want, make a check out to ASTRA, and give it to Randy Walton at an astronomy club meeting, or mail it to ASTRA c/o Robert J. Novins Planetarium, Ocean County College, P.O. Box 2001, Toms River NJ 08754-2001 by Oct. 8. Items will need to be picked up from Randy Walton at a club meeting, hopefully in November.

2010 Oct. Celestial Events

supplied by J. Randolph Walton (Randy)

Day	Date	Time (EDT)	Event
Sat	2	06:00	Mercury Rises
		06:00	Jupiter Sets
		06:57	Sunrise
		15:27	Moon Set
		18:41	Sunset
		18:45	Saturn Sets
		19:30	Venus Sets
		20:03	Mars Sets
Wed	6	05:30	Zodiacal Light visible in E before morning twilight for next two weeks
Thu	7	14:44	New Moon
		18:09	Moon Set
Sat	9	05:30	Jupiter Sets
		06:25	Saturn Rises
		06:30	Mercury Rises
		18:30	Sunset
		19:00	Venus Sets
		19:24	Moon Set
		19:45	Mars Sets
Thu	14	14:07	Moon Rise
		17:27	First Quarter Moon
Fri	15	19:00	Lunar Straight Wall visible
Sat	16	05:00	Jupiter Sets
		06:05	Saturn Rises
		07:09	Mercury Rises
		07:11	Sunrise
		15:10	Moon Rise
		18:19	Sunset
		18:35	Venus Sets
		19:35	Mars Sets
Thu	21	12:00	Orionid meteors (ZHR=20)
Fri	22	17:39	Moon Rise
		21:36	Full Moon
Sat	23	04:30	Jupiter Sets
		05:35	Saturn Rises
		18:09	Sunset
		18:11	Moon Rise
		18:20	Mercury Sets
		19:22	Mars Sets
		21:40	Two shadows on Jupiter
Mon	25	07:15	Moon 1.4 deg S of Pleiades (M45)
Sat	30	04:00	Jupiter Sets
		05:15	Saturn Rises
		07:25	Venus Rises
		07:27	Sunrise
		08:46	Last Quarter Moon
		14:01	Moon Set
		18:00	Sunset
		18:20	Mercury Sets
		19:10	Mars Sets
Sun	31	00:16	Two shadows on Jupiter

In the Eyepiece

Here is a list of objects for this month. This is reproduced from www.skyhound.com with the kind permission of its creator and author of SkyTools Greg Crinklaw.

Object(s)	Class	Con	RA	Dec	Mag
Garnet Star	Multiple Star	Cepheus	21h43m30.5s	+58°46'48"	4.2
Zeta Aqr	Multiple Star	Aquarius	22h28m49.9s	-00°01'12"	3.7
LW Cyg	Multiple Star	Cygnus	21h55m13.8s	+50°29'50"	9.2
M2	Globular Cluster	Aquarius	21h33m28.4s	-00°49'39"	7.3
M15	Globular Cluster	Pegasus	21h30m01.0s	+12°10'12"	7.3
Helix	Planetary Nebula	Aquarius	22h29m38.4s	-20°50'13"	7.6
Humason 1-2	Planetary Nebula	Cygnus	21h33m06.6s	+39°38'17"	12.7
NGC 7139	Planetary Nebula	Cepheus	21h46m08.2s	+63°47'59"	13.0
NGC 7139	Planetary Nebula	Cepheus	21h46m08.2s	+63°47'59"	13.0
Cocoon	Diffuse Nebula	Cygnus	21h53m24.0s	+47°16'00"	10.0
IC 5217	Planetary Nebula	Lacerta	22h23m55.7s	+50°58'00"	12.6
NGC 7094	Planetary Nebula	Pegasus	21h36m53.0s	+12°47'19"	13.7
Stephan's Quintet	Galaxy Group	Pegasus	22h36m00.5s	+33°57'57"	12.0
NGC 7354	Planetary Nebula	Cepheus	22h40m20.9s	+61°17'39"	12.9
NGC 7354	Planetary Nebula	Cepheus	22h40m20.9s	+61°17'39"	12.9
Einstein's Cross	Gravitational Lens	Pegasus	22h40m32.5s	+03°21'48"	17.4