

Sky WAA tch



The Big Dipper

Rick Bria provided this image of one of the best known asterisms in the night sky--the Big Dipper. Also known as the Plough, the Big Dipper is part of the constellation Ursa Major (the "Great Bear"). Clearly visible as the second "star" in the handle are the double stars (Alcor and Mizar). They are both members of the Ursa Major Moving Cluster (Collinder 285), but it is unknown if they are a couple that is gravitationally bound. Can you split this double without optical aid?

This shot was taken with a Cannon T1i at F/5. The lens focal length was 15mm (a 25 second exposure). The bench and fence in the foreground were illuminated with a flashlight using a process called 'painting'.

Events for December 2010

WAA Lectures

"A History of the Stamford Observatory"

Thursday December 2nd, 8:00pm

**Miller Lecture Hall, Pace University
Pleasantville, NY**

Charles Scovil will speak on the history of the Stamford Observatory, its 22-inch telescope and the Astronomical Society. Mr. Scovil won the Stellafane Blue Ribbon for a special folded refractor in 1966. He has other awards from the Astronomical League and the AAVSO. Free and open to the public.

Upcoming Lectures

**Miller Lecture Hall, Pace University
Pleasantville, NY**

On January 7th, Ruben Kier will speak on the best winter targets for astrophotography. On February 4th, the speaker will be David High, who will talk on Voyager and its exit from the Solar System.

Starway to Heaven

Saturday December 4th, 6:30-9:00PM

**Meadow Picnic Area, Ward Pound
Ridge Reservation, Cross River**

This is our scheduled Starway to Heaven observing date for December, weather permitting. Free and open to the public. The scheduled rain/cloud date is December 11th. Participants and guests should read our [General Observing Guidelines](#).

Non-WAA Events

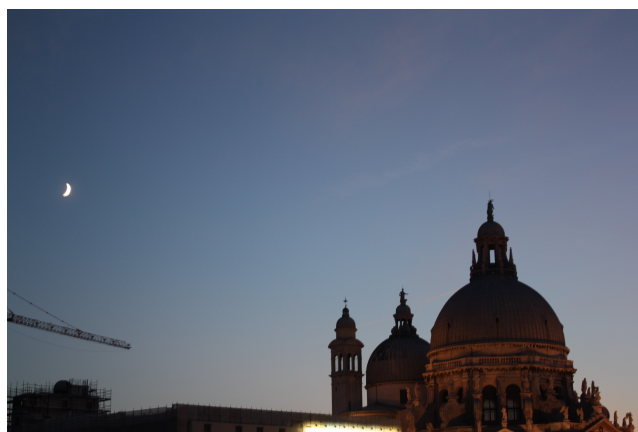
On Sunday December 19th at 2:30pm the Hudson River Museum planetarium will host Joe Rao, who will talk on the December 21st Lunar eclipse.

New Members. . .

Max Solomon - Ardsley
Vince Quartararo - Katonah
Sharon Gould - White Plains
Peter Knipp - Bedford

Renewing Members. . .

Dave Parmet - Pound Ridge
Hans Minnich - Bronx
Daniel Poccia - Cortlandt Manor
Robert Rehrey - Yonkers
Kevin Shaw - Yonkers
Larry and Elyse Faltz - Larchmont
Bob Kelly - Ardsley
Curtis Jones - Pleasantville
James Cobb - Tarrytown
Kevin Parrington - Babylon, NY



Quarter moon over the churches of Venice
courtesy of Bob Kelly



The Andromeda galaxy (M31) through an 80mm refractor using a Mallincam (stack of 10 14-second frames). Courtesy of Larry Faltz.

Westchester Amateur Astronomers, Inc., a 501(c)(3) organization, is open to people of all ages with the desire to learn more about astronomy. The Mailing address is: P.O. Box 44, Valhalla, New York 10595. Phone: 1-877-456-5778. Observing at Ward Pound Ridge Reservation, Routes 35 and 121 South, Cross River. Annual membership is \$25 per family, and includes discounts on *Sky & Telescope* and *Astronomy* magazine subscriptions. Officers: President: Mike Virsinger; Vice President: Charlie Gibson; Vice President Programs (lectures): Pat Mahon; Treasurer: Doug Baum; Vice President Membership: Paul Alimena; Vice President Field Events: David Butler; Newsletter: Tom Boustead.

Articles and Photos

Book Review: *Digital Apollo* by David A. Mindell (MIT Press, 2008) by Larry Faltz

At the November club meeting, WAA President Mike Virsinger mentioned the Cradle of Aviation Museum in Long Island, which has a large number of wonderful exhibits illustrating the history of flight and the particular contribution of Long Island to that rich heritage. The products of the Grumman Corporation, once Long Island's largest employer, occupy a major place in the museum's collection. In addition to its important World War II airplanes, Grumman was responsible for the construction of the Apollo Lunar Excursion Modules (WAA member Karen Seiter's grandfather worked on the LEM project). A complete LEM, the one constructed for the canceled Apollo 19 mission, is on display, in addition to the actual LEM simulator and other artifacts of the mission. I was excited to see the DSKY computer console, the critical element of Apollo's guidance system, displayed in three exhibits: in the simulator, in a separate mock-up of the LEM bridge and in a stand-alone display. DSKY was the device that linked man and machine on these historic missions. Perhaps there's a fourth DSKY inside the LEM, but they wouldn't let me climb up to see.

David Mindell, the author of *Digital Apollo*, is the Dibner Professor of the History of Engineering and Manufacturing at MIT. He has an interest in the interface between man and machine, and has written several books on the subject. This interface was a particularly critical design challenge in the Apollo program, since crucial piloting tasks were going to have to take place a quarter of a million miles from Earth in machines of unique and essentially untested complexity. The story begins with a conflict familiar to anyone who's seen the movie *The Right Stuff*: are astronauts going to be pilots or passengers? Apollo engineers knew that while most of the missions'



functions needed to be controlled by computers, which could respond faster and more accurately than human beings, there were going to be unforeseen difficulties that needed human judgment and input. As it turns out, in all 6 Apollo landings the pilots took over from the computers to set the landers down safely.

Mindell describes the contribution of the Instrumentation Laboratory, the MIT division that engineered Apollo's computers. He discusses the critical X-15 missions that tested computer-guided re-entry and explains the design and operation of surprisingly strange Apollo test vehicles. There is an enormous amount of information about the critical thinking processes that led to final design decisions, and there are breathtaking play-by-play descriptions of the actual Apollo landings, all of which depended on DSKY and experienced both the genius and limitations of the system's design.

Some elements of the book are technical, but the overall story is so fascinating, and so well told, that non-engineer/non-computer-literate readers will have no problem in following the story. Compared to today's computers, the DSKY was incredibly primitive. There's a neat interactive Java applet at <http://www.apollo.spaceborn.dk/dsky-sim.html> if you want to see how it worked.

If you have an interest in space flight, you'll enjoy *Digital Apollo*, which is both scholarly and readable.



◀ *It's a Wonderful Life*

A happy holiday to all WAA'ers. To help the mood, consider this image of Stephan's Quintet in Pegasus, which was featured in the Jimmy Stewart classic movie.

Credit: Hubble Legacy Archive, ESA and NASA.



◀ *Soul Nebula*

This image of the Soul Nebula (IC 1848) in Cassiopeia was taken by Doug Baum. Doug used H-alpha, SII and OIII filters with his QSI 532 ccd camera paired with a 200mm SLR lens.



◀ *Little Dumbbell*

Olivier Prache provided this photo of M76, the Little Dumbbell nebula in Perseus. To image this faint planetary nebula, Olivier used a SBIG ST-8 camera on his C8 at F/10 (3 hours total exposure).

Constellation Corner

by Matt Ganis

I just got in from a little time at the telescope – WOW – it's cold out there. With warm thoughts on my mind, I thought I might talk about a few of the southern constellations – but which ones? Well, I'm writing this just before Thanksgiving, so how about "Birds of the Southern skies"?

The set of Southern Constellations is a relatively large group of 32 constellations, many of them named in modern times by European scientists exploring the southern hemisphere for the first time (typically during the age of exploration that followed the voyages of Columbus in 1492). Although many of these objects can be interesting, they are not visible from North America or Europe, and can only be viewed by traveling south of the equator.

Starting at the "center" of the southern skies – the south circumpolar constellations, we come upon the constellation of Apus. Apus (or the Bird of Paradise) is one of the 15 circumpolar constellations in the southern hemisphere. It was created by German astronomer Johan Bayer in the 17th century, and was named after the legendary Greek Swallow. Apus was originally one of the constellations used by European navigators from the sixteenth century after the beginning of European exploration around the bottom of Africa. Interestingly the name Apus literally means 'without foot' (a-, 'without' and -pus, 'foot') as it represents a bird-of-paradise (which were once believed to lack feet).

Another winged constellation in the south is Grus, or the Crane. This is a faint cross of stars, which, when joined in a certain way, resembles a large bird with long neck and stick-like legs. Grus or 'the crane' made its debut in the 1603 Uranometria star catalogue by Johann Bayer. However, historically the constellation has also represented the stork (Anastomus), the heron (den Reygher) and the flamingo (as Phoenicopterus) – A bird of many names! Regardless of what you call it, there is lots of activity in this constellation. There have been several extrasolar planetary systems found in the

constellation Grus over the years, the most recent in 2009.

The crane is one of a dozen constellations created by Dutch astronomers Pieter Dirkszoon Keyser and Frederick de Houtman during their voyage to the southern seas between 1595 and 1597. They drew up five star patterns to represent birds: Grus; Apus (bird of paradise); Pavo (the peacock); Phoenix (the mythological firebird) and Tucana (the toucan).

Finally, since I spent so much time "looking around" in the constellation of Pavo during my grad school years, I have to give this beautiful constellation a little "air" time. Pavo probably represents not the common blue (or Indian) peacock generally seen in parks but the larger, more colorful, and more aggressive cousin, the Java green peacock which Keyser and de Houtman would have encountered in the East Indies.

In mythology, the peacock was the sacred bird of Hera, who drove through the air in a chariot drawn by peacocks. The eyes on the tail of the Peacock have an interesting origin (according to myth). As the story goes, the eye of Argus was placed on the tail of the peacock by Hera to continually watch over Io, the subject of her husband, Zeus', desire after Hermes lopped off the head of Argus at his father's request.

So while you may not get to see any of these constellations, I think it's interesting to know what constellations are "down under". Of course now I'm warm – and hungry – Bring on the Turkey!

Call: 1-877-456-5778 (toll free) for announcements, weather cancellations, or questions. Also, don't forget to periodically visit the WAA website at:

<http://www.westchesterastronomers.org/>.

Almanac

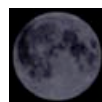
For December 2010 by Bob Kelly

The Main Event for December is the total lunar eclipse early on a Tuesday morning of Tuesday, the 21st, from 2:41 to 3:53am. This is an awe-inspiring spectacle for everyone, even without optical aid. You can see this event even from inside a house (in a darkened room) if you have a view of the sky to the west, one-third to half-way up from the horizon. But the best views are when you get outside and see the field of stars that would normally be invisible with full moonlight blaring in the sky. The red glow from a ring of sunlight bent through the Earth's atmosphere is amazing, but can you see patches of bluish tint from the Earth's ozone layer? It may be easier to see during the partial phases. Don't miss this event - the next total lunar eclipse for our area is April 15, 2014, also in the early morning hours, the week before Easter. The only other lunar eclipses for our area between now and 2014 are two events where the moon is only in the dusky, barely detectable, penumbral shading of the Earth's shadow, so this month's event is the one to see.

Jupiter continues its grand evening prime time show. For this month's feature attraction, use your high power eyepieces to watch the shadows of Jupiter's Galilean moons on the planet. Uranus tries to steal a bit of attention, sneaking into the same telescopic view, leading up to its closest approach on January 2nd. There are signs that Jupiter's dark South Equatorial Belt is about to return. Tracking this event should delight owners of telescopes of all sizes.

Tucked away in the bright evening twilight, on the horizon, are our smallest planets, Mercury and Mars. The Moon joins them on the 6th. If you are in favored parts of the USA to our south and west, the Moon passes in front of Mars on the western horizon right after sunset. If you can't see Mercury and Mars' conjunction on the 13th, higher in the sky that night is a first quarter Moon making a pretty scene with Jupiter less than one fist-width away.

This month, Venus attains a brilliance that other planets can only envy. The morning star is startlingly bright in the morning twilight; easily findable right up to sunrise. With optical aid, its partial phase gets easier to see as the sky gets brighter. Seeing Venus in a telescope during daylight, when it's higher in a clearer sky, can be hazardous since the Sun follows Venus into the telescope of the unwary or distracted observer, resulting in damage to the scope and the observer's eyes.



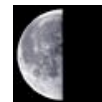
Dec 5



Dec 13



Dec 21



Dec 27

The morning sky is worth getting up for, with the aforementioned Venus plus Saturn and its rings opening up and looking more 3D in a telescope now. The waning Moon joins them for the last few days of the month and the start of the New Year.

The Milky Way arcs across the sky from east to west this month. This arm of our galaxy gets in the way of our view of objects beyond our universe. But some extra-galactic objects are visible, like the Andromeda Galaxy straight overhead. When the hunter, Orion, rises in the east, it gives the appearance of a giant rising from his slumber. Of course, perhaps you've see the scene of Orion and the twins, Gemini, as an officer with his nightstick chasing a pair of fleeing felons. Since they are lying on their sides, might they look more like they are in a swimming race?

The winter solstice at 6:38pm on the 21st gives us the longest night of the year. Thanks in part to the changing speed of the Earth in its elliptical orbit as we approach perihelion on January 2nd, the earliest sunsets are two weeks before the solstice and the latest sunrise is in early January. There's more to this story – did you know the length of the solar day changes? That's an interesting story I'll leave for the reader to pursue.

The Geminid meteor shower peaks on the 14th. This is generally a very productive shower. Its particles are generated from an asteroid named Phaethon, not a comet. While you can always see more meteors in the early morning hours, the shower's radiant is well above our horizon by 10pm, so a number of bright meteors can be seen before midnight, even with the glare of the first quarter moon.

Also streaking through the sky is the International Space Station, visible in the dawn sky through the 16th, and the dusk sky from the 23rd. The next launch window for the Space Shuttle Discovery is from December 3rd through 7th. Updates at my blog at:

<http://bkellysky.wordpress.com/>.