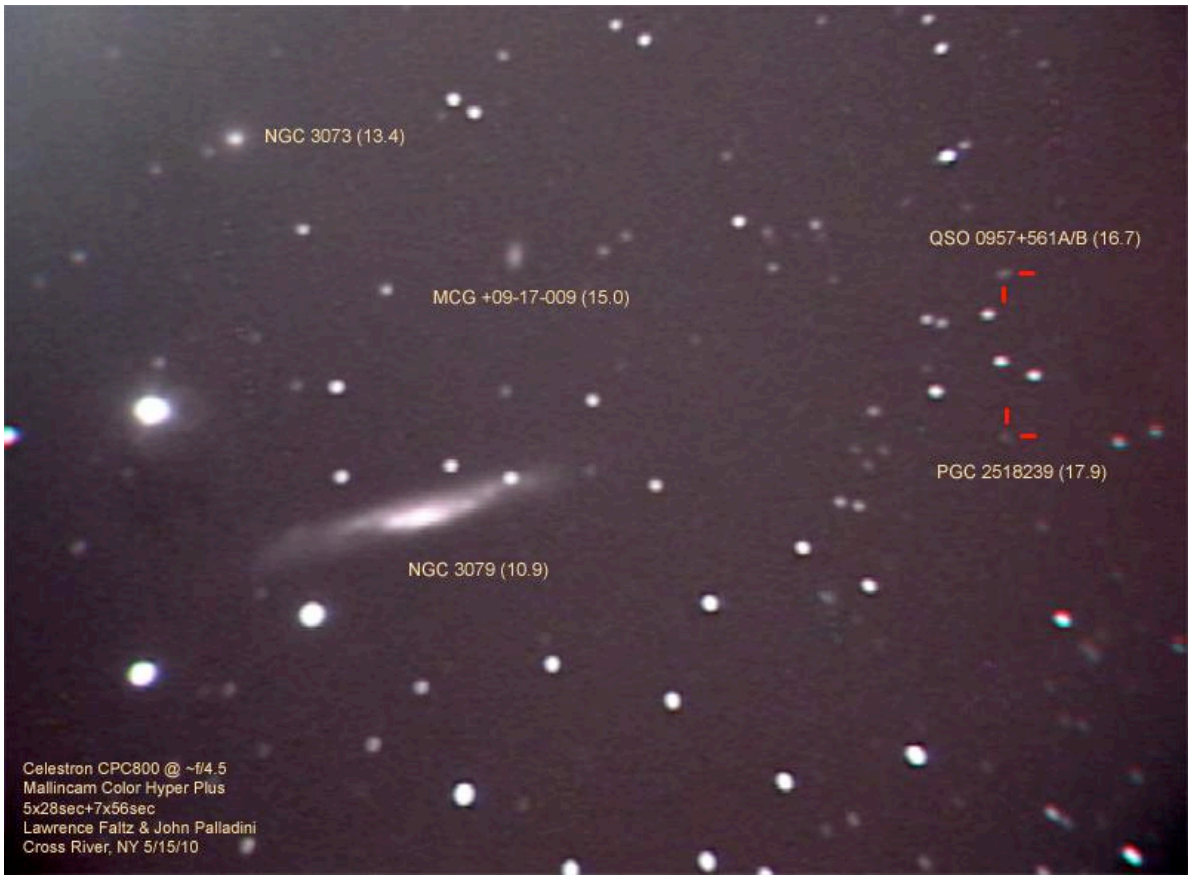
SkyWAAtch



Quasars

Larry Faltz and John Palladini found the Twin Quasar in Ursa Major at the WAA Starway to Heaven event at Ward Pound on May 15th, using an 8" Celestron telescope and a Mallincam video camera. The object was easily visible in the LCD monitor on the scope with just 28 seconds of integration. QSO 0957+561 is gravitationally lensed by an intervening galaxy, visible only by the Hubble telescope. The two images are separated by 6", not resolved on this photo. The quasar is 7.8 billion light years distant with a red shift of 1.412. It's light started towards us when the universe was less than half its present age. This image was captured on a netbook and processed with Deepsky Imaging. Some of the dimmest galaxies on it are as faint as magnitude 17.9.

Events for June 2010

WAA Lectures

"Allen Array"
Thursday June 10th, 7:00pm
Miller Lecture Hall, Pace University
Pleasantville, NY

Dr. Seth Shostak, Senior Astronomer at the SETI Institute, will discuss (via teleconference), SETI research using the new Allen Array, a pioneering centimeter-wavelength radio telescope. Dr .Shostak is the 2004 winner of the Klumpke Roberts Award awarded by the Astronomical Society of the Pacific in recognition of his outstanding contributions to the public understanding and appreciation of astronomy. He has a doctorate in astronomy from the California Institute of Technology and has published approximately sixty papers in professional journals.

Directions

The best way is to enter the Campus is through Entrance 2, and follow the road around to Miller Hall. The meeting will be held on the ground floor in the Miller Lecture Hall. For directions and a campus map go to:

http://www.pace.edu/pace/about-us/all-about-pace/directions-to-all-campuses/pleasantville-campus/

Starway to Heaven

Saturday June 5th, 9:00-11:00PM
Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River

This is our scheduled Starway to Heaven observing date for June, weather permitting. Free and open to the public. The scheduled rain/cloud date is June 12th. Participants and quests should read our General Observing Guidelines.

New Members. . .

Bill Caspe - Scarsdale
Andre Stevens - Bronx

Renewing Members. . .

Mary Pat Hughes - Briarcliff
Armen Balemian - Cortlandt Manor
Tom Crayns - Valhalla
John Le Var - Briarcliff Manor
Dante Torrese - Ardsley
Jonathan Gumowitz - White Plains
Deborah Bernstein - North Salem
Gondek Family - Hastings on Hudson
Steven Petersen - Briarcliff Manor
Mike and Angela Virsinger - Seaford
Lori Wood - Yonkers

WAA Club Picnic

Saturday June 5th, 2PM
Trailside Museum, Ward Pound Ridge

The event is for WAA members and their guests only. Club members are encouraged to bring side-dishes, salads and desserts. RSVP to Charlie Gibson at: charlie.gibson@westchesterastronomers.org.

Tell guard at gatehouse you are going to WAA Picnic. Rain-date: June 12th.

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/.

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

Video Astronomy
by Larry Faltz

The human eye is not a very good night sky sensor. It was designed for daylight viewing. Eyes grow more inefficient with age because of reduced pupillary dilation and lens transparency. Vision is subject to tiring with continued use. The spectral response under low light conditions is narrow, and as a result unless we deliver an enormous number of photons to our eyes by having a very large telescope, we see deep sky objects only in a boring grayish green.

We can overcome these limitations with advanced imaging cameras and processing techniques. Once amateur imaging was liberated from film photography and computer processing power became cheap, amateurs began to make images that rivaled those of professionals. But astrophotography is a difficult and exacting pursuit, requiring precise alignment, tracking and focusing, lengthy exposures through multiple filters and substantial processing time (and knowledge) at the computer. Expensive, too: although nice images can be obtained with DSLR cameras, the big boys use specialized high quantum-efficiency cameras that cost thousands.

For most of us, we just want to see better than our eyes in real time; we don't want to take days to see an image and we don't need to challenge Hubble. Video astronomy is the solution. Stellacam (black and white) and Mallincam (color) are the two most used devices. These are high-sensitivity security cameras that have been modified for astronomic use. Even with small telescopes the Mallincam can show brighter DSO's in color (the Orion Nebula, the Ring, the central core of M82) and they capture enough photons to effectively more than double your scope's aperture. The cameras cost a little over $1,000 and the images can be displayed with inexpensive monitors or even a laptop. They work by integrating the video frames to make exposures of up to one minute duration (a new Mallincam, the VSS, can go to two minutes).

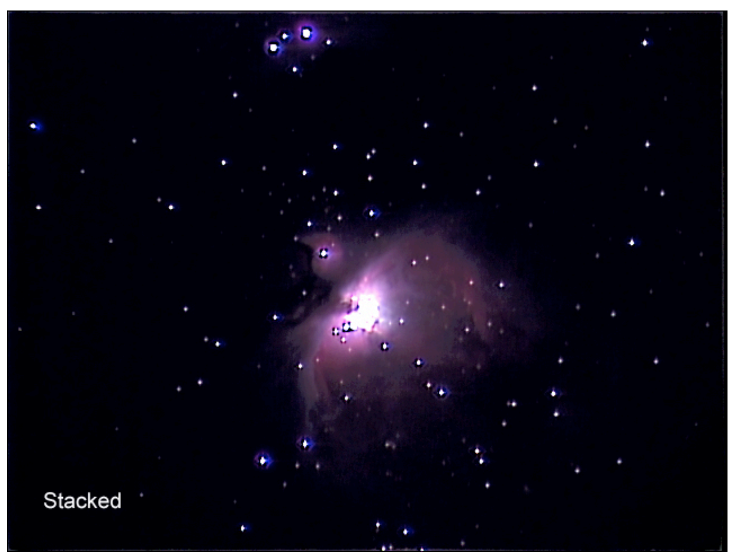
I received my Mallincam in early 2009, and promptly went out to a ball field in light-polluted Scarsdale with an 80 mm f/6 refractor on a tracking alt-azimuth mount. Using a laptop with a $35 USB-video capture device, the camera's first light was this 2-second image of M42. This is a single video frame and it's just like what it looked like on the monitor.

Using my 8" scope a few weeks later at Ward Pound, I went for M81. Visually in the telescope, M81 is merely a fuzzy, featureless blob, but the video image clearly shows the central core and, faintly, some stellar knots along the outer spiral arms.

John Paladini and I used the Mallincam to show a variety of deep sky objects to Fordham astronomy students at the WAA "Stairway to Heaven" event at Ward Pound in April this year. Using my 8" Celestron (on its computer-guided alt-az fork mount) we displayed 28 and 56 second images on an inexpensive 7" LCD video monitor mounted on the scope. The sky was remarkably dark and transparent for our neck of the woods, and the images were glorious. The spiral arms of M51 (left) and their stellar knots, as well as the nebulosity surrounding companion NGC 5195, were easily resolved. M82 (right) showed color and structure in the central core.

We easily saw the "black eye" of M64, the spiral arms of M99, the Leo triplet, the central star of M97 (magnitude 16!) and the dust lane of M104 among other deep sky sights.

Using free software easily obtainable on the web, you can stack saved images automatically. After a minimal amount of brightness and contrast tweaking in Photoshop, here is a stack of 50 2-second frames of M42. This image was taken with just a 3.1" scope on an alt-az mount! It's not real "high-definition" astrophotography, but it's very easy and enhances the enjoyment of the objects. But the main value of the Mallincam is for real-time viewing. It helps to use focal reduction, since the chip is small. By lowering the focal ratio, more light is delivered. A variety of relatively inexpensive focal-reduction lenses are available. Many Mallincam users claim a CRT monitor is best, but powering one in the field would be daunting, so I stick with a 12-volt LCD monitor.



If you're frustrated with our light-polluted skies and suffer from the inevitable ocular limitations of aging, think about video astronomy. To see the capabilities of these systems, check out www.nightskiesnetwork.com, a web site where amateur astronomers from around the US and Canada broadcast live with integrating video cameras on scopes ranging from 3 to 28 inches.

Ancient Supernova Riddle, Solved
by Dr. Tony Phillips

Australopithecus squinted at the blue African sky. He had never seen a star in broad daylight before, but he could see one today. Was it dangerous? He stared for a long time, puzzled, but nothing happened, and after a while he strode across the savanna unconcerned.

Millions of years later, we know better.

That star was a supernova, one of many that exploded in our corner of the Milky Way around the Pliocene era of pre-humans. Australopithecus left no records; we know the explosions happened because their debris is still around. The solar system and everything else within about 300 light-years is surrounded by supernova exhaust—a haze of million-degree gas that permeates all of local space.

Supernovas are dangerous things, and when one appears in the daytime sky, it is cause for alarm. How did Earth survive? Modern astronomers believe the blasts were too far away (albeit not by much) to zap our planet with lethal amounts of radiation. Also, the Sun's magnetic field has done a good job holding the hot gas at bay. In other words, we lucked out.

The debris from those old explosions has the compelling power of a train wreck; astronomers have trouble tearing their eyes away. Over the years, they've thoroughly surveyed the wreckage and therein found a mystery—clouds of hydrogen and helium apparently too fragile to have survived the blasts. One of them, whimsically called "the Local Fluff," is on the doorstep of the solar system.

"The observed temperature and density of the Fluff do not provide enough pressure to resist the crushing action of the hot supernova gas around it," says astronomer Merav Opher of George Mason University. "It makes us wonder, how can such a cloud exist?"

NASA's Voyager spacecraft may have found the answer.

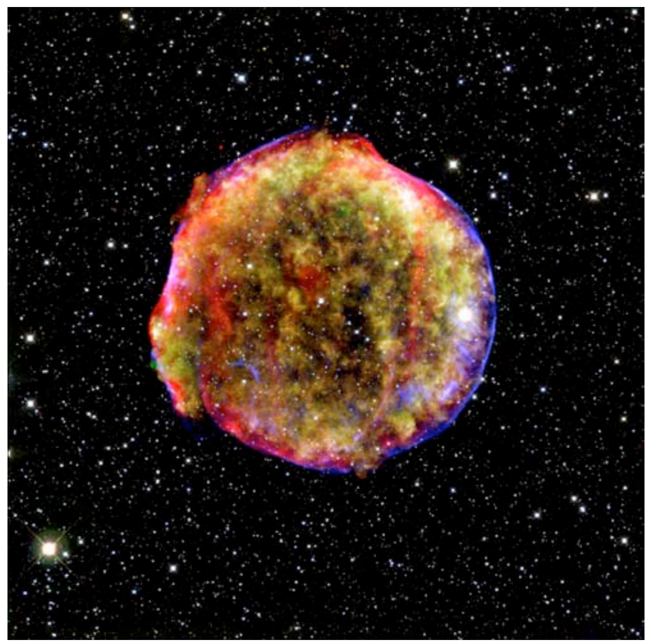
NASA's two Voyager probes have been racing out of the solar system for more than 30 years. They are now beyond the orbit of Pluto and on the verge of entering interstellar space. "The Voyagers are not actually inside the Local Fluff," explains Opher. "But they are getting close and can sense what the cloud is like as they approach it."

And the answer is …"Magnetism," says Opher. "Voyager data show that the Fluff is strongly magnetized with a field strength between 4 and 5 microgauss. This magnetic field can provide the pressure required to resist destruction."

If fluffy clouds of hydrogen can survive a supernova blast, maybe it's not so surprising that we did, too. "Indeed, this is helping us understand how supernovas interact with their environment—and how destructive the blasts actually are," says Opher.

Maybe Australopithecus was on to something after all.

Opher's original research describing Voyager's discovery of the magnetic field in the Local Fluff may be found in Nature, 462, 1036-1038 (24 December 2009).



Left-over cloud from the Tycho supernova, witnessed by Tycho Brahe and other astronomers over 400 years ago. This image combines infrared light captured by the Spitzer Space Telescope with x-rays captured by the Chandra X-ray Observatory, plus visible light from the Calar Also Observatory in Spain.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

◀ *Jellyfish Nebula*

Doug Baum took this image of the Jellyfish nebula (IC 443) in Gemini. He used used a Takahashi FSQ-106 EDXII refractor and a QSI532wsg CCD camera. It is a tri-color Hubble Palette Narrowband image. 3.5 hours total exposure through H-alpha, OIII and SII filters.

The Jellyfish is a supernova remnant located about 5000 light years away and is about 50 arcmins in diameter.

◀ *The Whirlpool*

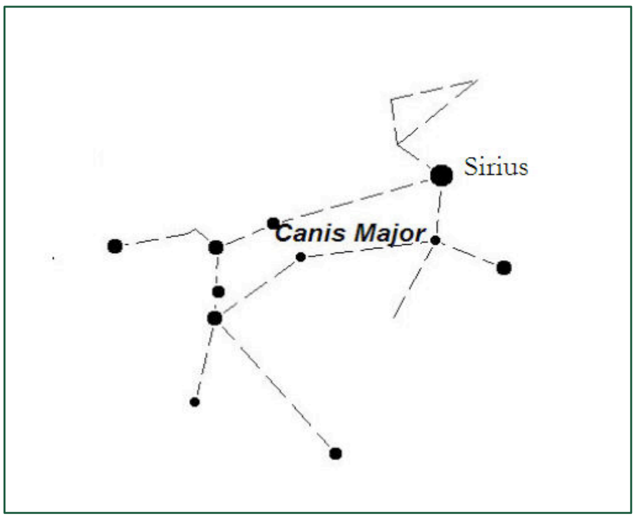
Olivier Prache took this color image of M51 (the Whirlpool galaxy in Canes Venatici) in mid-May with a Celestron 8 at F/10 on a Losmandy G11. The camera is a SBIG ST8 and guiding was done with a 50mm guide scope (30 minutes per primary color and 20 minutes luminance).

Constellation Corner

by Matt Ganis

Welcome to Summer! As the hot weather rolls into our region, I thought it might be fun to look to the sky for a sign that Summer was indeed here. I didn't really find much in the constellations (oh, sure, I could say that Cygnus and Lyra are rising in our eastern skies, but that's no fun ;-) What I am reminded of however is the bright star Sirius, and the mythology behind this bright star.

Sirius is the sky's brightest star. It's nearly 3½ times brighter than Arcturus, the next-brightest star in the sky that is easily visible from northern latitudes. Typically Sirius is visible during the evenings from winter to mid-spring. So why talk about it now, when its summertime?



The Star Sirius has been known since ancient times when its name meant "scorching" or "sparkling." The ancient Egyptians noted that Sirius rose just before the sun each year immediately prior to the annual flooding of the Nile River. Although the floods could bring destruction, they also brought new soil and new life. Interestingly, Osiris, whom Sirius may have represented, was a god of life, death, fertility and rebirth of plant life along the Nile.

Sirius is also well known as the Dog Star, because it is the Alpha star in the constellation Canis Major, or the Big Dog. The star is so bright that the ancient Romans thought that the earth received much of its heat from the fact that two "Suns" graced their skies. In the Egyptian summer, Sirius, the "dog star," rises and sets with the sun. During late July Sirius is in conjunction with the sun, and the ancients believed that its heat added to the heat of the sun, creating a stretch of hot and steamy weather. They named this period of time, from 20 days before the conjunction to 20 days after, "the dog days" (or as we like to call it, "The Dog Days of Summer").

At 8.6 light-years away, Sirius is one of the nearest stars to us after the sun (remember, a light year is nearly 6 trillion miles!). This star is the nearest star easily visible to the unaided eye from most of the northern hemisphere. It is classified by astronomers as an "A" type star, which is much hotter than our sun, boasting a surface temperature of about 17,000 degrees F (the sun is only about 10,000 degrees F). Sirius contains more than twice the mass of the sun within an area that is just less than twice its diameter. Even with smaller surface area, Sirius still puts out about 26 times more energy than the sun. It is also relatively young, normal (main sequence) star - meaning that it produces most of its energy by converting hydrogen into helium through nuclear fusion.

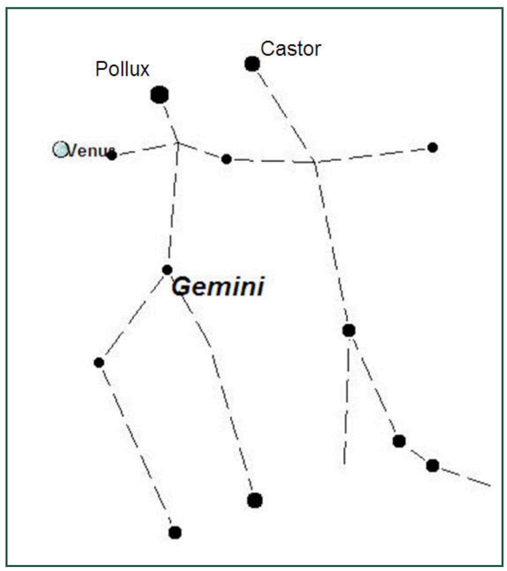
Sirius is also a double star. It has a small, faint companion star (Sirius B) more appropriately called "The Pup" and while the name seems to imply "youth," it is in fact is a dead star called a "white dwarf." According to the The Bright Star Catalog Sirius B has an effective temperature of about 57,000° F making it much hotter than the sun while emitting about 900 times more radiant energy per square meter of surface than the sun does. The very small luminosity of the star then must mean that the star has a very small surface area, that is, the star is quite small in size. Once a mighty star, today it is an earth-sized ember too faint to be seen without a telescope shining about magnitude of about +9.0

Almanac

For June 2010 by Matt Ganis

The only problem with Summer time astronomy is that we can't get started until later in the night. Compounding that problem is the time needed for the atmosphere to cool off enough to make the visibility tolerable. Sigh. Well, lets talk about what we'll see when we finally get out there under the stars.

By far the brightest object in our evening skies is the planet Venus, located high in our western skies. The planet is shining at an impressive magnitude -4.0!! Venus is making its way from Gemini into the constellation of Cancer over the course of June. On the 10th of June, look for Venus to form a straight line, together with the two bright stars, Castor and Pollux in Gemini. Then, by the 20th of June, Venus will move to within 1° of the Beehive cluster in the constellation of Cancer, making for a wonderful visual event in binoculars.



On the evening of June 6th, a little father to the west of Gemini we find the bright red planet Mars, located about ½ of a degree from the bright star Regulus in the constellation of Leo. Throughout the month of June, Mars, shining at about magnitude of about +1.3 moves along the feet of Leo toward the constellation of Virgo.

If you follow an imaginary line from Regulus (in Leo), through Mars and then into the constellation of Virgo, you'll stumble upon Saturn, shining at about a +1.0 magnitude. Her rings are almost "edge on" tilted by a mere 1.7° but they are slowing opening to us, expanding to about 2.1° by month's end.

Comet C/2009 R1 McNaught, the 51st comet to bear the name of Robert H. McNaught (Siding Spring Observatory, Australia), promises to brighten to 7th or even 6th magnitude during the Moon-free period in the middle of June this year. Unfortunately, it will be visible only low in the predawn sky from our mid-northern latitudes.

Let's have a look at the path of the comet this month. On the morning of June 5th the comet skims just north of the large, loose open cluster NGC 752 in the constellation of Andromeda. Then On June 6th and 7th it should be within about 2° of the 2nd-magnitude double star Gamma Andromedae. Lucky for us, the Moon will be much thinner then, although a little closer to the comet.

The helpful conjunctions continue as the comet passes about 1° north of the open cluster M34 in Perseus on the morning of June 10th and 3° south of 1.8-magnitude star Alpha Persei on the 13th. McNaught is predicted to reach magnitude +6.3 as it moves into the constellation of Perseus. The Comet will still be about 15° high in the northeast in the sky as daylight approaches on June 15th, and will appear roughly 1° lower every day after that. The comet will then pass the zero-magnitude star Capella on the June 21st. By this time Comet McNaught may be as bright as 4th or 5th magnitude, but moonlight will be returning to our skies. The comet will be lost to view by June's end - just before it reaches perihelion on July 2nd

On a closing note, don't forget that the Summer Solstice occurs here in the Northern Hemisphere at 7:28am on June 21st. The word "Solstice" derives its meaning from a combination of Latin words meaning "sun (or Sol)" + "to stand still (stice)" As the days lengthen, the sun rises higher and higher until it seems to stand still in the sky. Bring on the heat !