SkyWAAtch

North America Nebula

Doug Baum captured this image of the North America and Pelican nebulae in Cygnus. This is a tri-color hubble palette widefield narrowband image taken with a 200mm SLR lens and QSI532wsg CCD camera.

Also known as NGC 7000, the North America is an emission nebula approximately 1600 light years away. The Pelican (IC 5070) is believed to be part of the same, huge gas cloud (perhaps 50 light years in diameter).

Events for September 2010

WAA Lectures

"Member Presentations Night"
Friday September 10th, 8:00pm
Miller Lecture Hall, Pace University
Pleasantville, NY

WAA members will showcase their astrophotos, equipment and other insights. Let us know if you have something to show or tell. Please email the club with a brief idea of what you will be presenting. Free and open to the public.

"Women Astronomers: Reaching for the Stars"
Friday October 1st, 8:00pm
Miller Lecture Hall, Pace University
Pleasantville, NY

Via teleconference, author Mabel Armstrong speaks on women in astronomy over the ages, the topic of her above-entitled book. Ms. Armstrong taught chemistry for twenty-five years. She now lives in rural Oregon where she is hard at work on her next Discovering Women in Science book, about women in chemistry. Free and open to the public.

Upcoming Lectures
Miller Lecture Hall, Pace University
Pleasantville, NY

On November 5th, Caroline Moore will speak on her discovery of a rare supernova. On December 2nd, Charles Scovill with give a talk entitled "A History of the Stamford Observatory, its 22-inch Telescope and the Astronomical Society."

Starway to Heaven

Saturday Sept. 4th, 8:00-10:00pm
Meadow Picnic Area, Ward Pound Ridge Reservation, Cross River

This is our scheduled Starway to Heaven observing date for September, weather permitting. Free and open to the public. The scheduled rain/cloud date is September 11th. Participants and quests should read our General Observing Guidelines.

New Members. . .

Akiko Shiraishi - Tuckahoe
Susan Salant - Monsey

Renewing Members. . .

Anthony Monaco, Jr. - The Bronx
Gerald Mannarino - White Plains
Mario Palmieri - Cortlandt Manor
Michael Cefola - Scarsdale
Kevin Doherty - White Plains
Joseph Geller - Hartsdale

WANTED: Individual to help edit the WAA newsletter. Initial responsibilities to be proof-reading, but eventually seeking someone to co-edit newsletter. Knowledge of Apple Pages would be helpful. Contact:
tom.boustead@westchesterastronomers.org

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

Book Review: Mapping Mars, by Oliver Morton (2002)

by Larry Faltz

I imagine that all astronomers, amateur and professional, love maps. Not just maps of the sky, mind you, and not just maps of the moon, but any kind of map. Maps are at the boundary of the objective and subjective, the space where reality and experience actually happen. They are both art and science. They are seductive for the combination of obvious and hidden knowledge they possess. And there is an arcane and almost alchemical process for making them.

Most maps are made by surveying, but what do we do for places we can only see and not visit? We can draw or take pictures and then translate those into maps, but it takes more than merely transcribing the visual to have a map achieve its ultimate purpose: to describe a place. This transformation is behind Oliver Morton's magnificent book Mapping Mars. Morton, a science writer who lives just a short walk from the Royal Observatory in Greenwich, England, describes the history and development of Martian maps from Schiaparelli and Lowell to the present day (at least as far as 2002 when the book was written).

The story is not merely about how cartographers translated visual observations, first from telescopes, then from orbiters and finally from landers, to draw and refine the maps, but it is also about how the maps led to an ever more profound and enlightened and creative understanding of the nature of Mars itself, as visual information was merged with the ever-increasing scientific information available to observers, all processed through the imagination of those who chose to study this seemingly unreachable object. And the story is not just about Mars but what Mars, as a place, means to the consciousness, intelligence and values of humanity.

The book is filled with wonderful biographies and insights about the individuals involved with Mars, from astronomers, cartographers, geologists, engineers, astrobiologists and even science fiction writers and artists. In lucid and elegant prose, Morton describes how the physical maps lead researchers, enthusiasts and even zealots to draw their conclusions about every aspect of the red planet: its history, evolution, and future, whether there was and/or is water, whether there was or is life, whether we can or should go there, whether it can sustain human colonization and whether we have the ability or even the right (or perhaps even an obligation) to terraform it. Morton is particularly enlightening when describing how science fiction writers utilize details of the Martian world in their stories about the human condition. He sheds light on his subject through parallels with a vast array of human activities: art, history, politics, Antarctic exploration, spelunking, even music. Mars as a place can only be understood through the lens of human activity, thought and sensibility. As an example, it was not a surprise to me that the cover illustration on my paperback edition of the book is not of Mars, but artist Frederick Church's 1862 painting of the Ecuadorian volcano Cotopaxi. Morton's discussion on how we grasped the immensity of Martian volcanoes will make you understand why this makes perfect sense.

The subtitle of Mapping Mars is "Science, Imagination, and the Birth of a World". Morton takes on this enormous challenge with wit, skill and eloquence. The writing is simply terrific. Even when discussing the most arcane aspects of, say, Martian subterranean aquifers, the prose is engaging. Morton's book is among the very best science books I've ever read, because it's not just a science book. It's a knowledge book, and there are parts of it that are almost poetry. And even though it is thorough in its explanations of the Martian world, the book goes further. It ultimately tries to answer the most important of all questions: What does it mean to be a human being?

The Turbulent Tale of a Tiny Galaxy
by Trudy Bell and Dr. Tony Phillips

Next time you hike in the woods, pause at a babbling stream. Watch carefully how the water flows around rocks. After piling up in curved waves on the upstream side, like the bow wave in front of a motorboat, the water speeds around the rock, spilling into a riotous, turbulent wake downstream. Lightweight leaves or grass blades can get trapped in the wake, swirling round and round in little eddy currents that collect debris.

Astronomers have found something similar happening in the turbulent wake of a tiny galaxy that is plunging into a cluster of 1,500 galaxies in the constellation Virgo. In this case, however, instead of collecting grass and leaves, eddy currents in the little galaxy's tail seem to be gathering gaseous material to make new stars.

"It's a fascinating case of turbulence [rather than gravity] trapping the gas, allowing it to become dense enough to form stars," says Janice A. Hester of the California Institute of Technology in Pasadena.

The tell-tale galaxy, designated IC 3418, is only a hundredth the size of the Milky Way and hardly stands out in visible light images of the busy Virgo Cluster. Astronomers realized it was interesting, however, when they looked at it using NASA's Galaxy Evolution Explorer satellite. "Ultraviolet images from the Galaxy Evolution Explorer revealed a long tail filled with clusters of massive, young stars," explains Hester.

Galaxies with spectacular tails have been seen before. Usually they are behemoths—large spiral galaxies colliding with one another in the crowded environment of a busy cluster. Tidal forces during the collision pull gas and stars of all ages out of these massive galaxies to form long tails. But in IC 3418, the tail has just young stars. No old stars.

"The lack of older stars was one tip-off that IC 3418's tail isn't tidal," says Hester. "Something else must be responsible for these stars"Hester and eight coauthors published their findings in the June 10, 2010, issue of The Astrophysical Journal Letters. The team described the following scenario: IC 3418 is speeding toward the center of the Virgo cluster at 1,000 kilometers per second. The space between cluster galaxies is not empty; it is filled with a gaseous atmosphere of diffuse, hot hydrogen. Thus, like a bicyclist coasting downhill feels wind even on a calm day, IC 3418 experiences "a stiff wind" that sweeps interstellar gas right out of the little galaxy, said Hester—gas that trails far behind its galaxy in a choppy, twisting wake akin to the wake downstream of the rock in the babbling brook. Eddy currents swirling in the turbulent wake trap the gas, allowing it to become dense enough to form stars.

"Astronomers have long debated the importance of gravity vs. turbulence in star formation," Hester noted. "In IC 3418's tail, it's ALL turbulence." To many astronomers, that's a surprising tale indeed.

In the ultraviolet image on the left, from the Galaxy Evolution Explorer, galaxy IC 3418 leaves a turbulent star forming region in its wake. In the visible light image on the right (from the Sloan Digital Sky Survey), the wake with its new stars is not apparent.

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

◀ Perseid Meteor

While processing his night's efforts for August 13th, David Parmet discovered this image of a perseid meteor. He used a Nikon D80 camera.

◀ Perseid Meteor

Rick Bria took this image at the August 7th WAA, 'Starway to Heaven' at Pound Ridge. It is a 20 second exposure on a Canon T1i camera with a 28mm lens at F2.8. Notes Rick: I witnessed the meteor in this image, making it my first confirmed meteor image. It shot between star clusters M6 and M7 near the teapot of Sagittarius, as can be seen in the image. I was amazed by how many meteors I saw that night without really looking for them(10?) five days before the Perseid shower peak.

◀ Bubble Nebula

Olivier Prache took this image of the Bubble Nebula in Cassiopeia with an ST8 on a C8 at F/10. He used his new MI-250 mount. Notes Olivier: the framing is poor due to lack of good guide star (and I do not have a rotator). Also I ran out of time (or was it sleep.) and had to synthesize the green channel data from red and blue (1 hour each for red, blue and luminance. Post processed with CCDStack and CS4).

◀ Starway to Heaven

Rick Bria shot these two candid group photos of the WAA Starway to Heaven at Pound Ridge. Notes Rick: These 30 second exposures make the Meadow parking lot look a lot brighter than it is. In the first shot an airplane or satellite is visible.

◀ Starway to Heaven

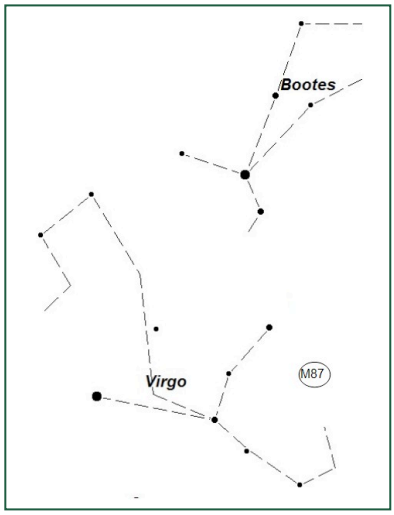
◀ Propeller Nebula

In this photo Doug Baum concentrated on the Propeller nebula (DWB 111) in Cygnus. It is a H-alpha monochromatic image taken with the Takahashi FSQ-106 EDX and QSI532wsg CCD camera.

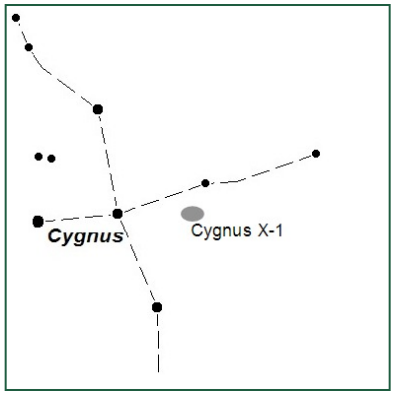
Constellation Corner

by Matt Ganis

One of my favorite things to do is to introduce someone to astronomy. Most people don't need an introduction; they've been looking at the stars and dreaming of space travel most of their lives. But there are always those with questions like: "How far away is that star?" Or "How big is the Universe?". Inevitably I get the Black Hole questions. This month, I thought it might be fun to locate some of the various places in our nighttime sky where astronomers believe there are actually black holes. This way, when someone asks you about them, you can point up and say "see that spot in the sky, that's a black hole" (and yes, then you too can get the blank stare and often heard "WOWwwww…..")



A black hole is a super dense object that has an intense gravitational pull due to its large mass. Imagine a star, which is much more massive than our sun, and which has a mass that is large enough to cause a black hole to form. As the star collapses onto itself due to this immense mass, the question then becomes: What keeps this star from collapsing onto itself and becoming a black hole? The answer is that there is also an intense pressure caused by nuclear reactions within the star pushing outward, balancing the inward "push" of mass.



When the fuel that feeds this nuclear reaction gets used up the massive star cannot support itself anymore and it collapses to form a black hole – a region of incredibly dense material. It is interesting to note that when a black hole is formed by a collapsing star it is actually impossible to watch the final steps of the formation of the black hole from the Earth. In addition, it is impossible to see any object fall into a black hole. This is not to say that everything appears to freeze just before entering a black hole. As an object falls into a black hole it gets increasingly dimmer and dimmer from the point of view of an outside observer. By the time an object gets to the edge of a black hole, it will be completely black. This effect, called a gravitational redshift, is caused by the immense gravity near the outside of a black hole.

This is an interesting problem. How do you prove the existence of something that cannot be observed by definition? There are actually many methods used to see if black holes really exist in our universe. The first method is to look for objects in our universe that have a lot of mass, but are very small. For example we believe that there exists a black hole at the center of M87 in the constellation of Virgo. This object weighs about three billion times more than our sun, but takes up a volume no larger than our solar system.

Several thousand light-years away, near the "heart" of Cygnus two stars are locked in a gravitational embrace. One star, a blue supergiant star is about 30 times as massive as the Sun and 400,000 times brighter. The other star is a star that is 5 to 10 times the mass of the Sun, but it's extremely small. This object must be the collapsed core of a star - Its mass is too great to be a white dwarf or a neutron star, though, so it must be a black hole. This stellar system is called Cygnus X-1 (indicating it was the first source of X-rays discovered in the constellation Cygnus). It's one of the first suspected black holes.

The thought is that the X-rays originate from a disk of gas that's spiraling into the black hole. As the two stars orbit each other at a rate of once every 5.6 days, the black hole's gravitational pull causes the blue supergiant to "bulge" toward the smaller, more dense star. As a result, hot gas flows away from the Blue supergiant toward the black hole. Friction heats the gas to a billion degrees or more, causing it to emit a torrent of X-rays, providing a signpost for our blackhole.

So have a look – and when you see those beginners out there, be sure to show them a blackhole – trust me, they'll love it !

Almanac

For September 2010 by Bob Kelly


Sep 1


Sep 8


Sep 15


Sep 23

Venus, low in the western sky after sunset, is about as bright as she get. Her sparkle calls attention to her dimmer brothers, Mars and Saturn, who are fading in the western evening twilight. On and around September 1st, Mars and Venus make a great sight in binoculars with Virgo's alpha star, Spica. Saturn is well off to the lower right and slips off into bright twilight by the middle of the month. Mars seems to fight the flight and continues to set after sunset through the end of the year. But by the end of the month, Mars is deep in the solar glare.

Can you find Venus before sunset? She's easier to see against a brighter sky, and higher in the sky means less atmosphere and haze in the way. Venus is racing to get ahead of us on her trip around the Sun. Thus, the planet looks larger and more like a crescent as the month goes on.

The Earth makes its closest approach to Jupiter this month. Ok, maybe 370 million miles isn't close, but Jupiter looks large in any scope. This is the best time to encourage people to check out Jupiter's moons, which should be visible even in most binoculars. The "Great Red Spot" will be on our side of Jupiter during our September 4th observing night. Is the spot easier to see without the brown belt usually found at its latitude?

We are also closest to Uranus, a near-naked-eye object. He is found within a degree or so of Jupiter this month. Can you get them in the same field of view? Neptune is next door east of the point of Capricorn, but many times fainter than Uranus. What color, if any, do you see in these two outermost planets in binoculars or telescopes?

The autumnal equinox occurs at 0309 UT on the 23rd, 11:09pm on the 22nd our time. People try to balance an egg on its end at that time. No known cosmic forces make this trick easier at that time. Sprinkling salt on the table always helps at any time of year.

Sunset moves forward from during the month from half past seven to half past six. The morning hours are darker too, making it a good time for Subway Astronomy. From mid-September until daylight time ends in the first week of November, darkness lingers later in the morning. Early morning commuters on elevated platforms get to see Mercury in the eastern sky between 5:30 and 6:00am during the last half of the month. Mercury stays less than the width of your fist held at arm's-length from the horizon. Be careful trying to find Mercury in the daytime, since the Sun follows him in the sky and it will harm your telescope or even your eyes if sunlight gets into your scope.

If early morning Subway Astronomers turn their backs on Mercury, Jupiter beams very low in the opposite part of the sky.

The last quarter Moon makes a splendid appearance high in the morning sky in the first week of September. The first quarter moon 'rides low' in the evening sky around mid-month.

The International Space Station is bright for up to four minutes at a time in the post-sunset sky until the 15th, then in the pre-dawn skies after September 28th.

Bob Kelly has a blog where he posts his monthly Heads UP! guide to bright objects in the sky and his astro photos at: bkellysky.wordpress.com

Members Classified

Send classified ad requests to tom.boustead@westchesterastronomers.org. Ads will only be accepted from WAA members and must relate to amateur astronomy. Please keep to 50 words, include contact info and provide by 20th of month for inclusion in next issue. The newsletter is subject to space limits; so ads may be held to subsequent issues. WAA may refuse an ad at its sole discretion. In particular, price information will not be accepted. The Members classified is a service to members; parties use it at their own risk. WAA and its officers accepts no responsibility for contents of any ad or for any related transaction.