

Sky WAA tch



Image Copyright: Mauri Rosenthal

Starting Year with Messier One

The Crab Nebula (M1) is a distinctive feature of fall and winter skies, found in the constellation Taurus. Initially mistaken for Halley's Comet by the French comet hunter Charles Messier in 1758, it inspired him to create his famous catalogue of faint fuzzies. In 1928, Edwin Hubble made the connection between a supernova recorded by Chinese astronomers in 1054 and the nebula which was now known to be expanding based on the photographic record that started in the nineteenth century. While invisible to the naked eye, it's a colorful target for astrophotography whose appearance varies somewhat based on equipment and technique. Mauri Rosenthal captured this image from his yard in Yonkers in November using a Questar 3.5" telescope and a QHY163 mono Astro-camera with red, green, blue and light pollution filters. The guided exposures totaling 2.5 hours reveal both the ghostly overall structure as well as the web of filaments within the debris cloud formed by the exploding star.

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Events for January

WAA January Lecture

"The Antikythera Mechanism"

Friday January 12th, 7:30pm

Leinhard Lecture Hall, 3rd floor

Pace University, Pleasantville, NY

Our presenter will be David Mestre, who will speak on the Antikythera mechanism. The Antikythera mechanism is an ancient mechanical computer built to predict astronomical events. It was recovered in 1900 from the Antikythera wreck, a roman shipwreck off the Greek island of Antikythera. David Mestre, Director of the Henry B. duPont III Planetarium at the Discovery Museum in Bridgeport, presents the fascinating tale of the Antikythera Mechanism's discovery and its fiendishly clever inner workings. A tale over 2000 years in the making

David Mestre joined the staff of the Discovery Museum in 2003, becoming the Director of the Henry B. duPont III Planetarium. He is also a Manager of STEM Learning Programs. With a background in astronomy and astrophysics from Harvard University and the University of Pennsylvania, David brings his passion for all thing space to his work as educator, stargazer, and scientist. Free and open to the public.

[Directions](#) and [Map](#).

Upcoming Lectures

Leinhard Lecture Hall

Pace University, Pleasantville, NY

Our speaker on February 2nd will be Brother Novak of Iona College. He will speak on the telescopic search for life on Mars. Free and open to the public.

Starway to Heaven

Ward Pound Ridge Reservation,

Cross River, NY

There will be no Starway to Heaven observing dates for January or February. Monthly observing sessions will resume on March 17th (the rain/snow/cloud date is March 24th).

New Members. . .

Daniel Cummings - Croton-On-Hudson

Adam Levenson - Pelham

Jeffrey Borden - Mahopac

Renewing Members. . .

David Weiser - Brewster

Kevin Doherty - White Plains

Daniel R. Poccia - Cortlandt Manor

Warren Lindholm - Cortlandt Manor

Robert Rehrey - Yonkers

Sharon and Steve Gould - White Plains

Robin Stuart - Valhalla

Oliver E. Wayne and Elizabeth Scott - Cliffside Park

Frank Clemens - Larchmont



Courtesy of John Paladini is this image of the December supermoon taken through an 80mm apo refractor (1/1000th second exposure). A so-called supermoon occurs when the Moon reaches perigee (closest approach to the Earth) near the time of the full moon. Supermoons are scheduled to repeat on January 1st and 31st of 2018.

2018 Occultations

The **Moon** does not occult any planets at night, nor any stars brighter than second magnitude for the eastern United States. **Pluto** is occulted (during daytime) on November 12. **Saturn** and its rings occult a +8.8 magnitude star over several hours after midnights July 4-5.

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

ALMANAC

For January 2018 by Bob Kelly



Jan 1



Jan 8



Jan 17



Jan 24

Westchester gets a brief lunar eclipse with the Moon entering the Earth's shadow at 6:48am on the 31st. The Moon sets around 7am, so it's a short eclipse low in the west-northwest (2° above the horizon and at 290° azimuth). It's better as you go further west. See time-and-date.com for an animation of the event. It's the only lunar or solar eclipse in 2018 for the 50 United States.

The full Moon on the evening of January 1st is the largest and brightest full Moon of 2018. Lunar perigee occurs only four hours before full Moon and the Earth/Moon system is closest to the Sun 28 hours later, giving the Moon some extra lighting. A second full Moon in January occurs on the 31st, 23 hours after perigee. Beware of larger than normal tides around and after these January lunar perigees, especially if a nor'easter comes along.

Venus is in conjunction with the Sun on the 9th and out of view for the month. So is Pluto, on the 8th. Venus will be visible in the SOHO C3 instrument https://sohowww.nascom.nasa.gov/data/LATEST/current_c3.gif, but not Pluto.

Jupiter and Mars do their best to stand out in the pre-dawn sky. They will be less than a degree apart for several days around the 6th; go out and compare them in the same telescopic field! The Moon poses with them on the 11th.

Mercury starts off the year brightly at magnitude -0.3 low in the southeast in morning twilight. In a reversal of usual form, use Mercury to find Saturn ½ degree apart on the 13th. Saturn has about the same total brightness, but it looks larger. With that brightness spread over a larger area, the surface brightness is lower. They'll be about 10 degrees to the lower left of the thin Moon, which joins them on the 14th and 15th.

Jupiter's moons do some interesting tricks in the early morning of the 19th. After Jupiter rises about 2:10am, three of its four brightest moons will be visible. From 2:40 to 4:55, Europa's tiny shadow will be visible on Jupiter's cloudtops, joined by Ganymede's shadow starting at 4:43. Europa will blend into Jupiter's clouds by 4:56am. Io will reappear from behind Jupiter at 5:08am. The Great Red Spot also crosses the

disk, visible an hour or so either side of 5:39am. Sunrise is 7:16am.

Moon rise on the evening of January 4th may have a surprise for the unwary with Regulus very close to the Moon that night. Regulus may even be visible in bright twilight on the morning of the 5th, as the proximity of the Moon will make it easier to spot.

The Sun's latest sunrise of the year is on the 4th, so mornings will start getting noticeable brighter by the end of January. This month, sunset will move 44 minutes later from the time of earliest sunset back in early December.

The Sun has been very quiet lately, with no visible sunspots for 100 days in 2017. Some holes in the solar corona allow streams of charged particles to escape, inducing bright aurora in our polar skies from time to time. Some have been seen this far south. Links to prediction sites:

<http://www.gi.alaska.edu/AuroraForecast/NorthAmerica/20171219>

<http://www.swpc.noaa.gov/products/aurora-3-day-forecast>

Asteroid 916America occults a +9.6 star, SAO 74826, during astronomical twilight about 5:50pm on January 20th. The occultation path passes south of Albany. 916America, at magnitude +15.4, won't be visible, but if you are in the path, watching the right star in a medium sized telescope, at the right moment, it will disappear for up to 1.5 seconds. For details, go to: http://www.asteroidoccultation.com/2018_01/0121_916_57812_MapNA.gif. SAO 74826 is between Pisces and Aries, with Triangulum pointing in its direction.

The Quadrantids meteor shower peaks on the evening of the 3rd, but is washed out by the bright Moon.

The International Space Station is visible in the pre-dawn skies through the 17th and the evening skies from the 23rd into mid-February.

Notable Astronomical Events for 2018

Bob Kelly

Full Moons

- Evening of **January 1**: Closest **full moon** the year. Don't be fooled by claims by other "supermoons!"
- **January 31, Partial lunar eclipse**: This blue Moon, the second full Moon of January will feature a lunar eclipse. This eclipse ends at sunrise, before the eclipse becomes total. This is the only lunar or solar eclipse visible in the US in 2018.
- There is **no full Moon in February** for the first time since 1999. This is thanks to the full Moon on January 31 and the fact that February's 28 days is shorter than the length of a lunation, a complete phase-to-phase lunar month.
- **March**, like January has **two full Moons: March 1** and on **March 31**.

Planet Visibility

- **Mercury**: Best morning appearances in early January, late August and mid-December. Best evening appearances in mid-March
- **Venus**: Visible in the evening sky from late February through October, and in the morning sky starting in November
- **Mars**: Will be at opposition on July 27. It will be at its brightest and largest (24 arc seconds wide) in this 15-year cycle. It will appear larger than 20 arc seconds from July through early September, but will be low in our skies. In the fall, Mars will move northward and still be big enough to show details in telescopes in prime-time evening skies
- **Vesta**: The brightest of the dwarf planets this year, peaking at fifth magnitude in June
- **Jupiter**: At opposition and brightest on May 9
- **Saturn**: At opposition is June 27. Saturn's rings are wide open, tilted about 25 degrees toward us
- **Jupiter** and **Saturn** stay low in our skies this year and are getting lower each year
- **Uranus** is at opposition on October 24
- **Neptune** is at opposition on September 7

Best Multi-Planet Photo Opportunities

- **Mars and Jupiter**: January 7, with Moon January 11 (morning)
- **Saturn and Mercury**: January 13, with Moon, January 13 and January 14 (morning)
- **Venus and Mercury**: March 5, with moon March 18 and October 14 (evening)
- **Mars and Saturn**: April 2, with Moon April 7 (morning)
- **Jupiter and Mercury**: December 21 (morning)

Other Events

- **Rosh Hashana, Jewish new year**: 5779 begins September 9
- **Islamic Hijiri new year**: 1440 begins September 11
- **Easter**: April 1
- **Ramadan**: Projected to begin May 16
- **American Daylight Saving Time** begins Sunday, March 11
- **Perseids meteor shower** peaks August 12-13 and is the biggest shower unhindered by the Moon in 2018.
- **American Daylight Saving Time** ends Sunday, November 4
- The **New Horizons** spacecraft's closest approach to Kuiper-belt object 2014 MU69, a possible binary object, occurs just minutes after the new year of 2019 begins.

Sources:

USNO/Her Majesty's Nautical Almanac Office: Astronomical Phenomena for the Year 2018. PDF at:

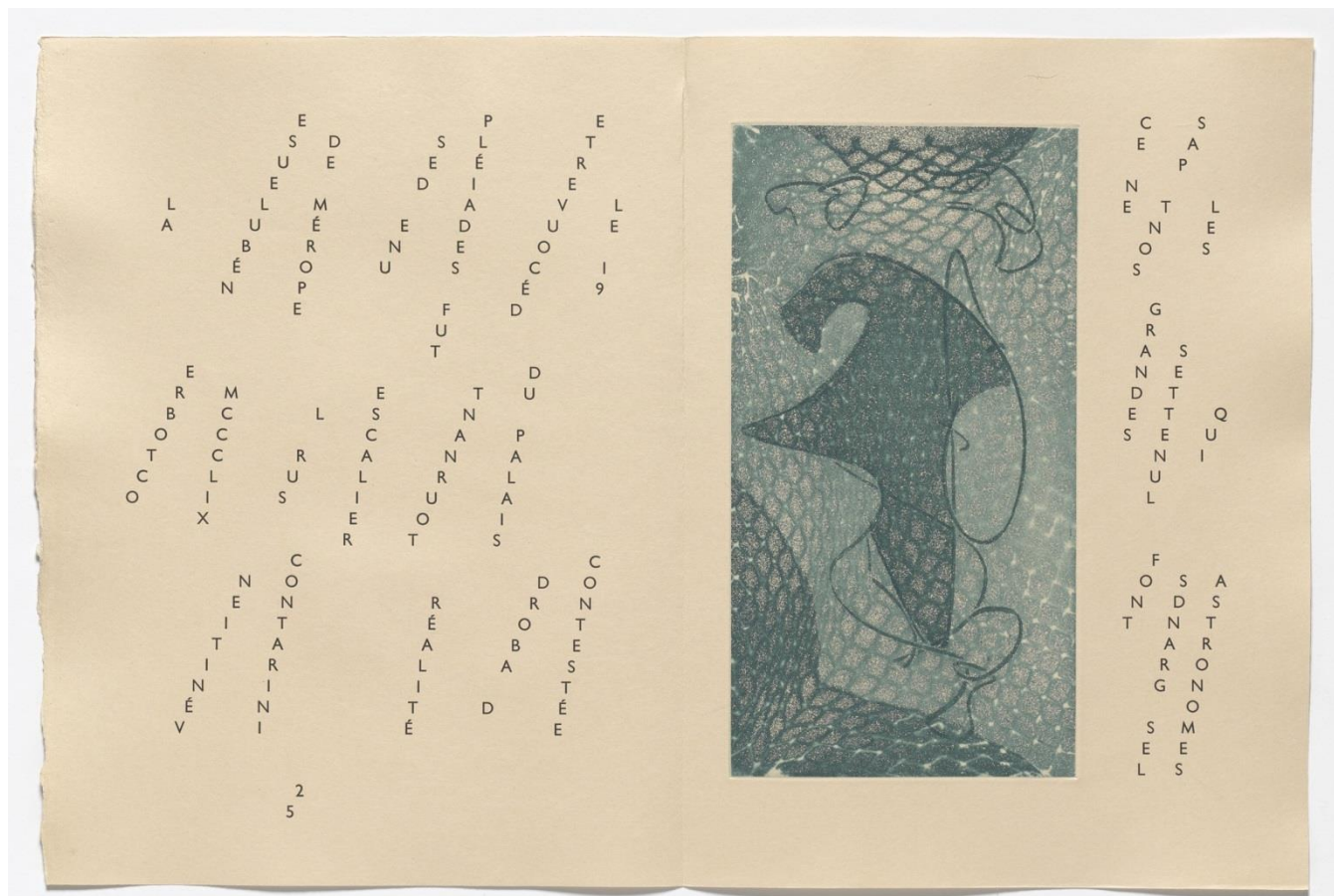
<http://aa.usno.navy.mil/publications/docs/ap.php>

Some items confirmed with:

Royal Astronomical Society of Canada's Observer's Handbook 2018 and Sky and Telescope's SkyWatch 2018.

The Astronomer at the Museum: Max Ernst and Wilhelm Tempel

Larry Faltz



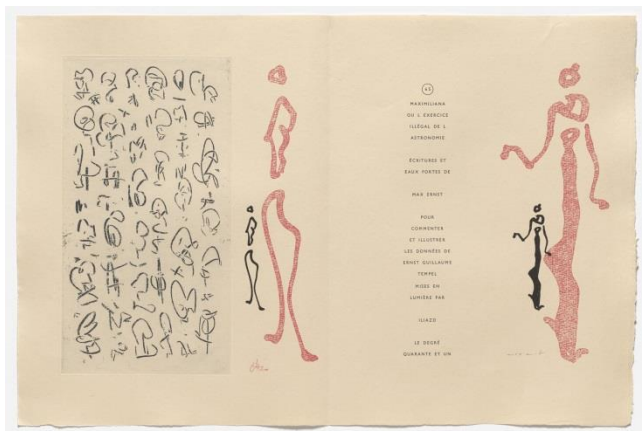
Page 25 of *Maximiliana, or The Illegal Practice of Astronomy*. The text reads "THE MEROPE NEBULA ONE OF THE PLEIADES WAS DISCOVERED THE 19TH OCTOBER MCCCLIX ON THE SPIRAL STAIRCASE OF THE VENETIAN PALAZZO CONTARINI REALITY FIRST CONTESTED IT IS NOT GREAT TELESCOPES THAT MAKE GREAT ASTRONOMERS"

One of the great things about astronomy is how it connects you to so many spheres of human thought and activity, both scientific and cultural. You never know when some unknown link is suddenly revealed, and you learn something remarkable. My latest "astrocultural" discovery was at the Museum of Modern Art, which in the fall of 2017 exhibited a large selection of its extensive holdings of works by the prolific German surrealist artist Max Ernst (1891-1976). Ernst's art was substantially influenced by the two world wars, and he produced many challenging and intricate works in a variety of media. Ernst is known primarily in museums for his large and dense oil paintings and his unusual techniques of collage (pasting), frottage (rubbing), grattage (scraping paint across the canvas to reveal imprints of objects placed beneath) and decalomania (pressing paint between two surfaces) as well as some unusual sculpture. He

was interested throughout his life in print illustrations, where his fine engraving and lithography techniques could be exercised. His magnum opus in book form was *Maximiliana, or the Illegal Practice of Astronomy*. This large format, limited edition engraved art book (only 75 copies were printed) was made in 1964. There are 30 double-folio pages with text in French, Italian and German, written in collaboration with Russian artist and writer Iliazd (Ilya Zdanevich, 1894-1975), arranged in challenging, often non-linear layouts accompanied by Ernst's etchings and unusual and undecipherable symbolic text, called calligrams. Several pages from MOMA's copy were on display in the exhibit.

The subject of *Maximiliana* is the German astronomer Ernst Wilhelm Leberecht Tempel (1821-1889). We think of Tempel today, if we think of him at all, as a discoverer of comets. He found 21 of them, including

55P/Tempel–Tuttle, the parent body of the often-prolific Leonid meteor shower, and 9P/Tempel, which was visited (and shot at) by the NASA probe Deep Impact in 2005. Tempel also discovered five minor planets, including 65/Cybele in 1861. He gave the naming rights for this body to Carl August von Steinheil, a German telescope maker, who named it “Maximiliana” in honor of Maximilian II of Bavaria. However, asteroids had previously been given names from mythology and the name Cybele was eventually officially applied after a good bit of controversy and astronomer sniping. There is an asteroid Maximiliana, number 1217, discovered in 1932 and named for the astronomer Max Wolf, the fixation on classical names having long been ignored by that point. Asteroid 3808 is named for Tempel, as is a crater on the moon.



The frontispiece of Maximiliana

Tempel was born to a poor German family in Saxony. He was scantily educated but was eventually trained as a lithographer, which allowed him to travel through Europe in the 1840's and 1850's. He developed an interest in astronomy but was unable to secure a position at a professional observatory. Eventually, because of his persistence as an amateur observer and his discoveries of comets, asteroids and nebulae, he managed to make inroads into the world of professional astronomy, becoming the employed at Milan's Brera Observatory under Schiaparelli and eventually directing (although unofficially, for he never received the formal appointment) the run-down Arcetri Observatory near Florence, where he had to struggle with poor compensation and little money for equipment.

Tempel's most important discovery was made on October 19, 1859 in Venice. While living in Italy he bought a telescope, a 4" refractor made by Steinheil. He was observing from the famous Scala Contarini del Bovolo, an open staircase attached to a Venetian

palazzo (it's still there), when he noticed a haze around the star Merope in the Pleiades. Now known as the Merope Nebula or NGC 1435, it's also been called Tempel's Nebula.



The Scala Contarini del Bovolo in Venice

The Merope Nebula was the first of a number of disputes that plagued Tempel's career. Many other astronomers could not see the subtle mist surrounding the 4th magnitude star even with larger telescopes, and the discovery was resisted for many years by the established astronomy community. Although he won several prizes and was supported by Dreyer and Schiaparelli, other important astronomers, notably Flammarion and Le Verrier, thought little of Tempel. It probably didn't help that he was sensitive and given to depression.

With his artist's eye and skill as a draftsman, Tempel practiced "the art of seeing" as he called it. He eschewed photography, which became a tool for astronomers a couple of decades after its invention in the late 1830's. Bond and Whipple obtained the first image of a star in 1850. John William Draper made the first reasonable image of the moon in 1840, and his son Henry Draper recorded the absorption line spectrum of Vega (in Hastings, NY) in 1872 and made the first photograph of a nebula (Orion) in 1880. In the 1880's sensitive dry-plate photography made the pro-

cess of acquiring images shorter and much less cumbersome.

Tempel never had great instruments to work with, and so he cultivated a kind of primitive reliance on his own perception, which he refined through constant and concentrated observation. He was critical of the reliance of other astronomers on larger instruments and felt that they were neither critical observers nor critical thinkers. In 1878 he wrote "Just as human memory is less cultivated and exercised, owing to the mass of literature accumulated in the course of centuries, so the art of seeing truly is now being lost by the variety of instruments and artificial aids to vision." True, today we have vastly better ways of seeing the sky, yet there is something ineffable about seeing the actual photons from astronomical objects yourself. But belief in one's own eyes can be deceiving too: as practiced an observer as he was, Tempel was wrong about the Whirlpool Nebula and the Andromeda Galaxy. He doubted their spiral nature (see my article on M51 in the [June 2016 SkyWAatch](#) newsletter) in spite of many reports by his contemporaries, often using those larger telescopes that he disdained, but they revealed the truth about these objects.

What attracted Ernst to Tempel? There are a number of parallels, starting with Tempel's given name Ernst. Neither did much work in their native Germany. Max Ernst moved to Paris after World War I and was very productive between the wars, making paintings, sculpture and illustrated books. When World War II started, he was interned by the French since he was still a German citizen, but his life was no better after the Nazis took over France because his complex, edgy surrealist art was hardly the type that was endearing to the Third Reich. He was forced to leave, moving to the United States with the help of the influential modern art collector Peggy Guggenheim (to whom he was married for several years), settling in the then sparsely populated town of Sedona, Arizona. He returned to France in 1953 with his third wife, the artist Dorothea Tanning, and became a French citizen in 1958. Although Ernst was recognized as an important artist throughout his career it was only upon his return to France that he began to enjoy financial success.

Tempel similarly had left Germany as a young man for his art, in this case lithography. He first went to Copenhagen but eventually he found his way to Marseilles, where he continued to do lithography while futilely trying to get a position at the observatory. He then went to Italy where his amateur observations

bore fruit. He returned to Marseilles and briefly worked at the observatory. He continued to observe mostly on his own until, still a German citizen, he was expelled from France's after that country's ignominious defeat in the Franco-Prussian War and the unrest that followed. He lived the remainder of his life in Italy. He was a talented sketcher of nebulae, but many of his drawings were never published. In 1886 he wrote to the astronomer John Louis Emil Dreyer that "we hitherto have not found an artist capable of copying my nebulae." Dreyer wrote Tempel's obituary in the February 1890 Monthly Notices of the Royal Astronomical Society.



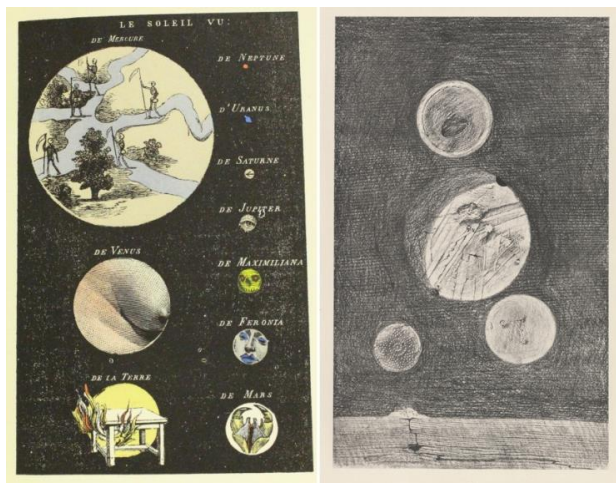
Max Ernst *Of This Men Shall Know Nothing*, 1923, Tate Modern, London, Oil on canvas, 31"x25", depicting representations eclipse umbra and penumbra.

It was undoubtedly Tempel's conception of seeing as an "art" that most appealed to Max Ernst. Ernst's provocative and surrealist artworks are a challenge for the viewer, demanding a more committed form of observation than previous styles. In that respect it would not be surprising that he felt kinship with Tempel.

Ernst must have had an interest in astronomy, having had a broader, more modern education than Tempel, although he was never known to be an observer. Throughout his artistic output there are astronomy-themed works, most of them cryptic or even humorous

surreal takes on the universe, but particularly involving circular or spherical objects like the Sun and planets. Ernst wrote “The significance of the sun, moons, constellations, nebulae, galaxies and space as a whole outside the earth zone have steadily taken root during the last century in human consciousness as well as in my work.”

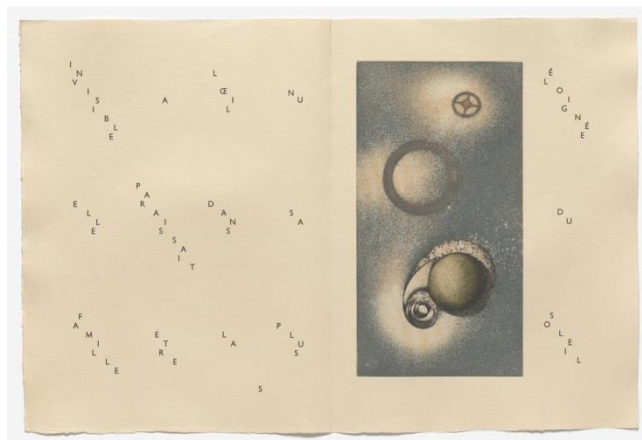
The genesis of the book *Maximiliana, or the Illegal Practice of Astronomy* is difficult to pin down, but Ernst probably first came across asteroid number 65 in Flammarion’s *Astronomie Populaire*, the distribution of which was very widespread for decades after its 1880 publication. In that work, asteroid 65 was identified as Maximiliana and that may have piqued Max’s interest. The asteroid made its way into the 1931 “visible poem” *A l’interieur de la vue*, where Ernst provides a surrealist take on the Sun. The underlying image is a plate from Flammarion’s book of the comparative sizes of the Sun’s disc as seen from the planets and two asteroids. The asteroids were unnamed by Flammarion but were supposed to represent bodies at the inner and outer edges of the asteroid belt. Ernst picked the names Maximiliana and Feronia (asteroid 72, discovered in 1861 by CHF Peters at Hamilton College in upstate New York) for the outer and inner asteroids. Ernst drew fanciful images inside of all the discs (the Sun from Venus shows a female breast, reflecting her mythological qualities). The small image of Maximiliana is a kind of spooky Halloween face.



Two Ernst works on paper: (L) Ernst’s surrealist representation of the sun as seen from 8 planets and two asteroids, from Paul Eluard’s *A l’interieur de la vue*, 1931. (R) *Little Tables Around the Earth*, from the book *Natural History* (Histoire naturelle), 1926

The life of Tempel was little commented upon after his death. Between 1962 and 1964, Iliasz researched the files of observatories in France and Italy for in-

formation on Tempel and produced a short factual biography, *L’art de voir de Guillaume Tempel* (The Art of Seeing of Wilhelm Tempel), only 70 copies of which were printed.



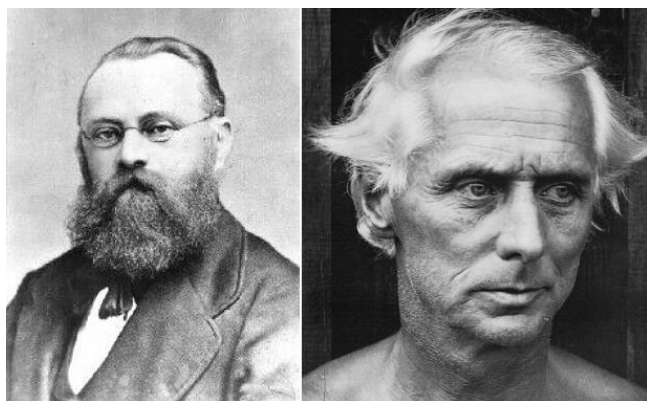
Page 5 of *Maximiliana*. The text reads “Invisible a l’oeil nu elle paraissait dans sa famille etre la plus éloignée du soleil” (“Invisible to the naked eye she seemed to be the furthest member of her family from the sun”)

In 1964, Ernst completed the *Maximiliana* and printed 75 copies (“65+X”). All of the pages are displayed in high resolution on the Museum of Modern Art’s web site¹. The frontispiece says that Ernst is illustrating and commenting on the work of Tempel as brought to light by Iliasz. The text formally begins on page 4 with a checkerboard layout that takes some inspecting to piece together. The text in French simply states that “Maximiliana planet 65 located between Mars and Jupiter was discovered eleven o’clock on Friday, March 8, 1861 on the terrace of the old observatory of Marseille by Ernst William Leberecht Tempel.” Ernst’s surrealist text layout challenges reading and extends the art of seeing to the text, not just the images. Undoubtedly that choice is a consequence of Ernst’s roots in Dadaism and surrealism, which both started out as literary art forms, with journals and magazines featuring all sorts of bizarre layouts and word jumbles designed to deconstruct and amplify language and written imagery. There is no punctuation on any of the pages, and the layout of one, page 28, was so strange that I found it almost impossible to piece the words together to get a coherent understanding of the text.

There are several threads in the text. Pages 10, 12, 14, 16, 18 and 20 are in German and contain Tempel’s 1849 poem “Der Glöckner” (The Bell-Ringer), in

¹<https://www.moma.org/collection/works/illustratedbooks/193125?locale=en&page=1&direction=>

which Tempel muses on his childhood in a melancholy and wistful way. There is no direct relationship to astronomy in this material. These pages have the largest number of inscrutable, untranslatable calligrams.



(L) Wilhelm Tempel (R) Max Ernst

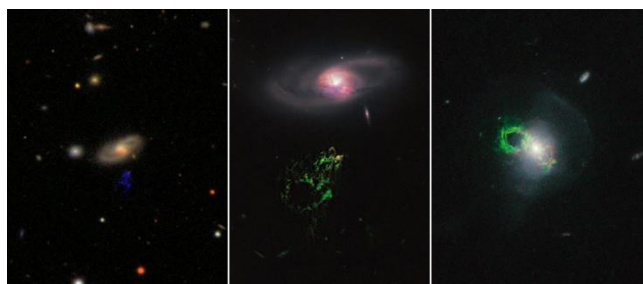
Pages 4-8, 11, 13, 15, 17 and 24-27 are in French and tell two different kinds of stories. One simply reports a number of Tempel's findings, listing his comet and asteroid discoveries and the discovery of the Merope Nebula (see the image of page 24 at the head of this article), along with a comment on the change of the name to Cybele because it provoked "great dissatisfaction of the mythologists." There is also text by Ernst on page 8 commenting on the naming of asteroid 1217 as Maximiliana seventy years after Tempel discovered Maximiliana/Cybele. Pages 11, 13 and 15 are Tempel's observations of clouds and fog over the Mediterranean from his home in Marseilles, illustrating his keen sensitivity to subtle visual phenomena. Pages 19 and 21 are in Italian and are Tempel's detailed observations of the aurora borealis as seen from Milan between 11 pm and midnight on April 9, 1871, again illustrating his perceptive eye. Pages, 3, 9, 23 and 29, contain just etchings and calligrams.

The essence of the entire work is surely the wonderful line "Ce ne sont pas les grandes lunettes qui font les grandes astronomes" (It is not great telescopes that make great astronomers.) which snakes from top to bottom on the right edge of page 24. This summarizes Tempel's commitment to visual observation and belief in his own powers of perception, the source of much of the controversy in his relations with other astronomers, when he claimed that the employment of larger telescopes was somehow corrupting. It's also a definite challenge posed by artists to their viewers starting at the beginning of the 20th century, with the rapid succession of "abstract" movements: cubism, Dada-

ism, surrealism, futurism, abstract expressionism and even op art. It's not hard to figure out the basic point of the Mona Lisa, but try to find the guitar in Picasso's 1912 cubist masterpiece [*Man with a Guitar*](#). It's even harder to find the man!

It's interesting to think what Tempel would make of today's world of astronomic research, which depends almost not at all on the human eye. Large telescopes with big sensitive cameras capture images that are analyzed by computer programs. If there is any human ocular perception applied, it is to on-screen images from those sensors, created and perhaps even chosen for the astronomer by a computer. Tempel only had the visible electromagnetic spectrum to work with, while we can observe in pretty much the entire range of energies and wavelengths.

Yet I suspect Tempel, a financially-challenged, self-taught astronomer with a background physically making art, would appreciate the way in which amateurs use small telescopes and cameras to capture astronomic images and bring the images to life by computer processing, a step that is ultimately more artistic than scientific. The best amateur imagers today are practicing the "art of seeing," aren't they?



(L) Original SDSS image showing Hanny's Voorwerp, a faint smudge just below IC 2497. (C) Hanny's Voorwerp imaged by Hubble. (R) The Teacup Galaxy SDSS 1430 +13 imaged by Hubble. The green color comes from ionized oxygen in an ionization echo.

In addition, perceptive vision, perseverance and a critical mind are still productive. Visual objects can be discovered by the human eye, although not directly through the telescope. Consider Hanny's Voorwerp, the first of a class of objects called "quasar ionization echoes." In 2007, young Dutch schoolteacher Hanny van Arkel was examining images from the Sloan Digital Sky Survey as part of the Galaxy Zoo "citizen science" project, which asked ordinary citizens interested in astronomy to classify galaxies for a statistical analysis of their formation and evolution. She noticed a blob of gas near the spiral galaxy IC 2497 in Leo Minor. No one had ever remarked on this object before. Subsequently, astronomers found at least 19 of

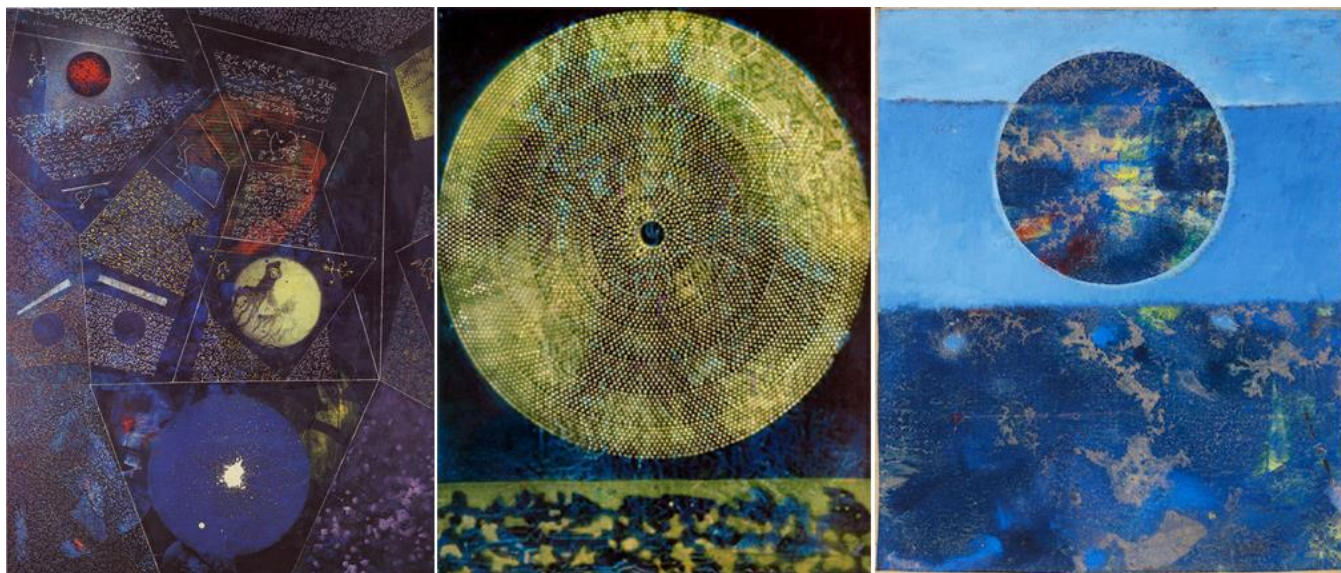
these entities, all near galaxies. They are thought to be concentrations of gas, possibly from a tidally disrupted companion galaxy, excited by radiation from a quasar in the associated galaxy. They were given the name “voorwerpjes,” the Dutch for “small objects.” It’s an exotic name in English, but just a plain and non-committal description in Dutch. Needless to say, amateurs have now imaged Hanny’s Voorwerp.

There seems to be little subjectivity in astronomy today. Astronomers rarely disagree about what they are seeing, arguing only whether their processes for data collection are valid and whether that data supports or refutes theoretical models. Although Jodie Foster listened to the output of the Very Large Array with headphones to receive ET’s broadcast in the movie *Contact*, detection is just not done that way. Analysis of the temperature variations in the cosmic microwave background is done by computers running Fourier transforms, not by people staring at the Planck image and saying “it looks to me like the variance is favored at a distance of one degree. That’s my gut feeling.” LIGO’s recognizes gravitational waves by signals from a computer, not by a bunch of guys listening for the audible tweet that the merger produced, LIGO being turned into a musical instrument just for the purpose of public understanding.

One can ask whether observing through a telescope is now a pointless exercise. For direct astronomical discovery the human eye is no longer an adequate instrument. Its wavelength sensitivity is too narrow and its photonic efficiency is practically nil since it

evolved for photopic rather than scotopic vision, meaning we’re happy to see things in the daytime and at night we might as well sleep. But there is a thrill at having the actual photons from those distant and still mysterious objects directly stimulate your nervous system. There is an “art of seeing” even for amateur astronomers with small telescopes. That’s quite evident when we do outreach events. We have to teach people to be patient at the eyepiece and to learn how to see the surface features of Mars or the Cassini Division between Saturn’s A and B rings, or use averted vision for faint deep sky objects.

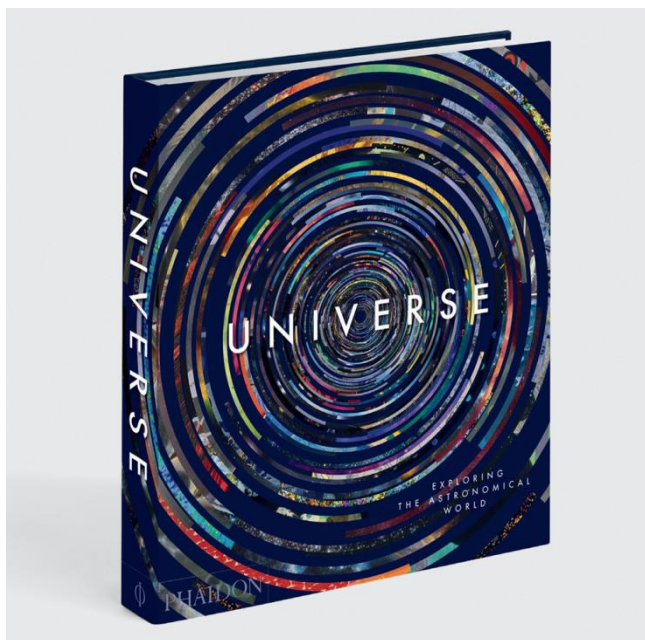
For experienced amateurs, there’s the joy of encountering faint objects under dark skies. That means more planning than just taking the scope out onto the stairway (more likely the driveway for us) like Tempel did in pre-electric light Venice. Last summer, under dark skies at the Medomak Astronomy Retreat in Maine, I saw for the first time the Blue Flash nebula, NGC 6905, an 11.9-magnitude planetary in Delphinus. In my 8” SCT with binoviewer and a pair of Televue 24mm Panoptic eyepieces, it had the promised blue color and even showed some structure. I looked at it for a while on 3 consecutive nights, my appreciation of its subtleties growing each time. In the story “A Scandal in Bohemia” Sherlock Holmes chides Watson: “You see, but you do not observe.” Practicing the “art of seeing,” as Tempel would have us do, makes us into true observers. Looking at challenging art does that as well. ■



Three astronomy-themed paintings by Max Ernst. (L) *The World of the Naïve*, 1962, Centre Pompidou, Paris, Oil 46"x 35". (C) *The Birth of a Galaxy*, 1969, 36"x28", Oil, Fondation Beyeler, Riehen, Germany. (R) *Violette Sonne*, 1962, Oil on wax paper, A mere 8"x7", this work sold for \$88,242 at Bonham's in London in 2012.

Book Review: *Universe* (Phaidon)

Larry Faltz



We love astronomy because the universe is beautiful; because it is contemplated by every culture; because it has been a core motivator of the progress of human knowledge; because it connects with so many other sciences; because it effortlessly stimulates our sense of wonder; and because everyone can take something enriching from it whatever their level of scientific understanding. And, the sky itself is free and open to all.

While I was writing the piece on Max Ernst's *Maximiliana*, I unexpectedly received an email from Phaidon, probably the world's leading publisher of beautiful "coffee-table" creative art books, asking if WAA would be interested in reviewing a new title of theirs, *Universe: Exploring the Astronomical World*. The book compares and contrasts astronomical images with a vast range of artistic and historic objects that explain and extend our perception of the cosmos. It's an exceptional volume: not just beautiful but surprising, intriguing, informative and ultimately inspiring in a way that a large-format book only showing astronomical images, as magnificent as they are, simply cannot be. I'm thinking of volumes like David Malin's *The Invisible Universe* or Michael Benson's *Planetfall*, two treasured books on my coffee table.

The conceit of *Universe* is to counterpoise images on opposite pages in order to expand the context of each. (A few dual pages have a single large image stretched across them.) While there are plenty of astrophotos,

the bulk of the images come from a vast range of cultural, historic and artistic sources. Some are familiar (Copernicus' diagram of the Sun-centered universe from *De Revolutionibus*, Van Gogh's *Starry Night*, the Apollo 8 earthrise photograph, Chesley Bonestell's often-reproduced painting *The Surface of Mercury*) but many are completely unexpected, surprising and even humorous. A print by British artist Carey Young includes a "contract" that states that the item is not to be considered an artwork until it is installed within the lunar crater Plato. It's probably not going to get there. So, is it art, or not?



Some examples of the layout will be helpful. The famous 15,000 year-old Lascaux cave painting of a bull and six dots that are thought to represent the Pleiades faces a fine astrophotograph of the cluster and its nebulosity. That seems obvious enough, but turn the page and an Alexander Calder sculpture called "Universe" is spectacularly contrasted with an artwork by Argentinian artist Pablo Carlos Budassi based on logarithmic maps of the universe (you can find them at <http://www.astro.princeton.edu/universe/>). A few pages later, Buzz Aldrin's famous lunar footprint apposes Andy Warhol's reworking of another famous Apollo 11 photograph.

Wonderful contrasts abound: a 19th century Burmese manuscript showing faces of the Sun is set off against a detailed multi-line solar spectrum from 1984. A Neo-Assyrian planisphere from 650 BC faces a 2016 rendering of the entire sky by the Gaia space telescope, this mapping probe's first image. The Nebula sky disc from 1600 BC, with its representation of the moon, sits opposite a dozen woodblock prints of the moon by 19th century Japanese artist Tsukioka Yoshitshi. A page from Christian Huygens' 1659 *Systema Saturnium* (Huygens was the first astronomer to realize the rings were separate from the planet) faces a Michael Benson-processed image of the rings and the moon Mimas acquired by the Cassini spacecraft.

Works of pure art from ancient to current times reflect the power that the sky has on the creative impulse. The artistic objects, whether paintings, drawings, posters, sky maps, installations or even comic book pages, remind us of how agile the human imagination can be in response to our surroundings.



Infinity Mirrored Room – The Souls of Millions of Light Years Away, 2013, Yayoi Kusama, wood, metal, glass mirrors, plastic, acrylic panel, rubber, LED lighting system, acrylic balls and water, 287.7 x 415.3 x 415.3 cm / 113¼ x 163½ x 163½ in, The Broad, Los Angeles, CA.

The work was assembled by an “international team of experts” who must have had a blast deciding on what to include and how to arrange it. Their editorial and artistic wrangles surely were passionate. I was pleased to see that some of the images I’ve used in my articles made it. Had I been on the panel, I would have insisted on including Giacomo Balla’s 1914 painting *Mercury Passing Before the Sun* (see the [July 2014](#) newsletter). Max Ernst’s *The Birth of a Galaxy*, which I had already chosen for my article in this issue of *Sky-WAAatch*, is included, so maybe I was on the panel in spirit.

There’s a capsule explanation of astronomy in 4½ pages by Paul Murden of Cambridge University and then 300 pages of astounding images, beautifully printed on heavy matte paper. Under each image is a short note that puts the material in context and explains its relevance. At the end, a detailed 16-page timeline of the history of the universe starts with the Big Bang and ends with 2017’s TRAPPIST exoplanet discovery and the Juno mission at Jupiter. David Malin himself contributes a two page essay, “History of Viewing the Universe,” explaining how we’ve advanced from using our eyes, to non-optical instruments, to the telescope, to photography and finally to capturing the invisible parts of the electromagnetic spectrum. There’s a glossary of astronomical terms and short biographies of many of the astronomers and artists.

Why should we care about art? Why aren’t magnificent images from Hubble, Malin or Benson enough?

In the Preface to his (unfortunately titled) 1897 novel *The Nigger of the Narcissus*, Joseph Conrad wrote,

Art itself may be defined as a single-minded attempt to render the highest kind of justice to the visible universe, by bringing to light the truth, manifold and one, underlying its every aspect. It is an attempt to find in its forms, in its colors, in its light, in its shadows, in the aspects of matter and in the facts of life what of each is fundamental, what is enduring and essential—their one illuminating and convincing quality—the very truth of their existence. The artist, then, like the thinker or the scientist, seeks the truth and makes his appeal.

Conrad doesn’t disdain science, but he points out that scientific truth is at its root impermanent, as progress refines and sometimes replaces old knowledge with new. Think of Einstein’s gravity replacing Newton’s. Conrad goes on to say,

The changing wisdom of successive generations discards ideas, questions facts, demolishes theories. But the artist appeals to that part of our being which is not dependent on wisdom; to that in us which is a gift and not an acquisition—and, therefore, more permanently enduring. He speaks to our capacity for delight and wonder, to the sense of mystery surrounding our lives; to our sense of pity, and beauty, and pain; to the latent feeling of fellowship with all creation—and to the subtle but invincible conviction of solidarity that knits together the loneliness of innumerable hearts, to the solidarity in dreams, in joy, in sorrow, in aspirations, in illusions, in hope, in fear, which binds men to each other, which binds together all humanity—the dead to the living and the living to the unborn.

True appreciation of the world depends on having both art and science. When I got to the Bronx High School of Science as a 13 year-old, one of the first things they gave us to read was CP Snow's influential 1959 lecture *The Two Cultures and the Scientific Revolution*, in which Snow rued the division of British higher educational system into apparently mutually exclusive tracks of art or science. He questioned whether the elites who were taught to disdain science could be effective leaders or role models for the future, and he suggested that knowledge of both worlds was easier for scientists. I think the faculty gave that piece to us to impress upon us that we needed to include the humanities in our intellectual lives even while we were becoming scientists. We'd be happier, more productive, better leaders and find life more interesting.

Universe has been added to the ziggurat of books on my coffee table, a worthy companion to Malin and Benson and artistically comfortable with a volume of ballet photographs from the 1930's and 40's by George Platt Lynes, the complete lithographs of Thomas Hart Benton and a collection of abstract photographs by California artist Jay Dunitz, one of which

hangs over our fireplace. Wikipedia blandly describes a coffee-table book as one "whose purpose is for display on a table intended for use in an area in which one entertains guests and from which it can serve to inspire conversation." Surely we want to start a conversation with our guests with something other than "Did you hear what the President tweeted today?" But these volumes also are there to tell our guests something about ourselves. While we are gathering the hors d'oeuvres and pouring the wine, they can catch some of the excitement and wonder that we experience when we engage in our wonderful avocation.

This is a unique and fascinating volume, beautifully printed, worthy of a place on every amateur astronomer's coffee table. It will entertain your guests, and you will be fascinated.

Universe, by the Phaidon editors. New York & London: Phaidon, 2017. Hardback; 290 x 250 mm (11 3/8 x 9 7/8 in); 352 pp; 300 illustrations; ISBN: 9780714874616. List price \$59.95. You can learn more about the book at www.phaidon.com. ■

Quaker Ridge School Spring Outreach Event On Hiatus

Since the early 1990's, WAA has held an outreach program for the 3rd grade class of the Scarsdale school system at the Quaker Ridge School on Weaver Street. The early spring program was correlated with the school district's astronomy curriculum. This event was always a delight, with massive crowds of students, siblings and parents enthusiastically viewing celestial objects for the first time. We always had great member participation, with sometimes as many as a dozen telescopes on the observing field.

In mid-December we received this email from Jennifer Kiley, who took over coordinating the event from Alan Alterman a few years ago:

Dear Larry and Charlie,

I wanted to let you know that due to the adoption of the new NYS Science Standards, we will no longer be teaching our Astronomy unit in 3rd grade.

In a few years, we expect that much of the content that was previously taught in 3rd grade will be pushed to 5th grade. In the interim, while we make our way through the transition, we will not be explicitly teaching Astronomy.

Therefore, for the next few years, we will be taking a break from our annual Telescope Night at the Quaker Ridge School.

We can't thank you enough for continuing to partner with us, year after year, to inspire and engage such a large number of our young learners and their families.

I wish you and your fellow club members a happy holiday season and great health in the new year!

Thanks again for all that you have done for the Scarsdale Schools!

After last year's event, Jennifer told us "It is the knowledge, expertise, and desire to share your passion for the night sky that makes the evening so special every year. Although we were all looking at the same moon, each and every one of you created a unique viewing experience for our students."

When the curriculum is finally migrated and settled, we hope to reinstitute this popular event. In the meantime, we'll be working with libraries and other organizations to present outreach programs during the viewing season. ■



The moon on November 24, 2017 from the parking lot of the Quaker Ridge School on Weaver Street in Scarsdale. Orion 127mm Maksutov, 1540 mm focal length (f/12.1), Canon T3i, ISO 800, 1/125 sec, single frame. No filters. Converted to B/W, very slight wavelet processing in Registax. Transparency 7/10, seeing 5/10.

-- Larry Faltz



Westchester Amateur Astronomers 2018 Calendar

2018 Meetings (Lienhard Hall, Pace University)

Fridays at 7:30 PM

January 12th (second Friday)

February 2nd

March 2nd

April 6th

May 4th

June 1st

September 14th (second Friday)

October 5th

November 2nd

December 7th

2018 Saturday Night Star Parties (Ward Pound Ridge Reservation)

All times EDT except 11/10 EST

Date	Event	Sunset	Moon			
			Illum.	Lunar cycle	Rise	Set
03/17	Primary date	19:02	0.00	New		19:18
03/24	Secondary date	19:11	0.43	Waxing		01:53 (3/25)
04/14	Primary date	19:33	0.05	New		
04/21	Secondary date	19:41	0.29	Waxing		0:50 (4/22)
05/12	Primary date	20:03	0.14	Waning	04:20	
05/19	Secondary date	20:10	0.17	Waxing		00:34
06/09	Primary date	20:26	0.28	Waning	02:49	
06/16	Secondary date	20:29	0.07	Waxing		23:17
07/07	Primary date	20:29	0.43	Waning	01:20	
07/14	Secondary date	20:26	0.01	New		21:53
08/04	Primary date	20:07	0.58	Waning	00:24 (8/5)	
08/11	Secondary date	19:58	0.00	New		20:25
09/08	Primary date	19:15	0.04	New	04:51	
09/15	Secondary date	19:03	0.31	Waxing		22:57
10/06	Primary date	18:28	0.13	Waning	03:44	
10/13	Secondary date	18:16	0.17	Waxing		21:32
11/03	Primary date	17:47	0.24	Waning	02:41	
11/10	Secondary date	16:39	0.06	Waxing		19:08

January 2018

Item	Description	Asking price	Name/Email
Edmund Astroscan reflector	105mm tabletop reflector. In perfect new condition in original box (box is slightly distressed). Edmund 15 mm Plossl eyepiece. A classic.	\$125	WAA ads@westchesterastronomers.org
Celestron Ultima-LX 5 mm eyepiece Celestron Ultima-LX 8 mm eyepiece	70° FOV, fits 2" and 1¼". 16mm eye relief. 28 mm clear aperture eye lens. 8 elements. Rubber coated. Ergonomic contours. Extendable twist-up eyeguards. Takes 1¼" filters. These are large, impressive eyepieces! Like new condition.	\$60 each	WAA ads@westchesterastronomers.org
Televue 2X Powermate	2" version, with 2"-1¼" eyepiece adaptor. 4 elements, 48mm filter thread. Al Nagler's improvement on the Barlow. Big, weighs 22 oz. New condition. In polypropylene bolt case.	\$175	Larry Faltz lfaltzmd@gmail.com
Meade 395 90 mm achromatic refractor	Long-tube refractor, f/11 (focal length 1000 mm). Straight-through finder. Rings but no dovetail. 1.25" rack-and-pinion focuser. No eyepiece. Excellent condition. A "planet killer." Donated to WAA.	\$200	WAA ads@westchesterastronomers.org
Interfit 487 large rolling storage bag	39½x22x16" fabric-sided standing gear bag with rollers, Velcro compartments. Excellent condition. Donated to WAA.	\$50	WAA ads@westchesterastronomers.org
Robotic planetary surface rover	Used. Currently not operational due to repairable mechanical and computer failures. A great do-it-yourself project! When functional, answers to name "Spirit." Pick up at Gusev Crater, Mars.	Free	NASA info@jpl.nasa.gov

Want to list something for sale in the next issue of the WAA newsletter? Send the description and asking price to ads@westchesterastronomers.org. Member submissions only. Please only submit serious and useful astronomy equipment. WAA reserves the right not to list items we think are not of value to members.

Buying and selling items is at your own risk. Commercial listings are not accepted. Items must be the property of the member. WAA takes no responsibility for the condition or value of the item or accuracy of any description. Items are subject to prior sale. WAA is not a party to any sale unless the equipment belongs to WAA (and will be so identified). WAA is not responsible for the satisfaction of the buyer or seller. *Caveat emptor!*