SkyWAAtch

The Newsletter of Westchester Amateur Astronomers

August 2019

The Leo Triplet by Rick Bria

This is the "first light" monochrome image from the new SBIG16803 16-megapixel camera on the PlaneWave 14CDK telescope at the Mary Aloysia Hardey Observatory at Sacred Heart University in Greenwich, CT. Acquired during the first testing run of this new instrument, fifteen one minute exposures were stacked and processed in PixInsight. The catalog designations of the galaxies are, clockwise from the top, M65, M66 and NGC 3628. These galaxies contain about 250 billion stars each and are 30 million light years away.

WAA September Lecture

September 13th at 7:30 pm

Lienhard Hall, 3rd floor
Pace University, Pleasantville, NY

Members' Night

We kick off our academic year of lectures with presentations by WAA members. The topics can be anything astronomical: original research, new equipment, imaging, trips, or other experiences relating to our club members' broad range of scientific and intellectual interests.

If you are interested in making a presentation, please contact WAA's Vice President for Programs, Pat Mahon, at waa-programs@westchesterastronomers.org.

Members' Night is one of the consistently popular club meetings. Don't miss it.

WAA October Lecture

October 4th at 7:30 pm

Lienhard Hall, 3rd floor
Pace University, Pleasantville, NY

CCD and CMOS Sensors for Astronomy: An Introduction and Comparison

Jules Insler, Senior Principal for Systems Engineering, BAE Systems

The world of imaging is undergoing constant change and improvement. CMOS sensors are replacing CCDs, the miracle that replaced film. Jules Insler is an expert in imaging devices. He is best known as the inventor of the laser printer, which he patented in 1972.

Pre-lecture socializing with fellow WAA members and guests begins at 7:00 pm!

Starway to Heaven

Ward Pound Ridge Reservation, Cross River, NY

Saturday, July 27
Make-up date: Saturday, August 3rd

Saturday, August 24
Make-up date: Saturday, August 31

Weather permitting

Bring your own telescope or view through members' instruments.

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

New Members

Federico Duay	Briarcliff Manor
Christopher Johnson	Garrison
Khachatur Kocharyan	Toronto, Canada
Marko Kokic	Pleasantville
Mark Mayo	White Plains
Alexander Mold	Tarrytown
James Nagy	Waccabuc

Renewing Members

Eric & Katherine Baumgartner	Redding, CT
Renato Bojanovich	White Plains
Anthony Bonaviso	New Rochelle
Barry Feinberg	Croton on Hudson
Mark Korsten	Hastings on Hudson
Glen & Patricia Lalli	White Plains
Roman Tytla	North Salem
Laura Zapata	Mohegan Lake

Westchester Amateur Astronomers

Also In This Issue

ALMANAC For August 2019

Bob Kelly, WAA VP for Field Events

Jupiter and Saturn call for our attention after sunset. Venus and Mars hide in the glare of the summer Sun. Mercury peeks out into the morning sky, perhaps to see if it's safe for Venus and Mars to come out this Fall, and then goes back to tell them.

If you missed viewing the moon in July, the dates for the best viewing of the Apollo 11 landing site start on August 6 in the evening sky, when the sun angle is nearly the same as seen during the landing of Apollo 11 in Mare Tranquillitatis.

O, Jupiter! Due South before the end of twilight, the planet looks like it wants to leave town fast. Take some time with Jupiter and a telescope; it's as if Jupiter is in the shop for a change of belts and repair of the badly out-of-round tire-shaped Great Red Spot. The Moon sits atop Jupiter on the 9th.

Saturn follows Jupiter, highest between 10 and 11 pm. Titan, Saturn's largest moon, swings out widest from the planet on the 3rd, 11th, 19th, and 27th. The rings tilt 24½ degrees from Earth's point of view. Saturn appears to scoot towards the Moon's north pole on the 12th and 13th.

Mercury is low in the morning sky, getting brighter even as it moves further away from us. Although its size shrinks, more of the innermost planet is illuminated as the month goes on. It swings farthest out from the Sun on the 9th. Venus reaches superior conjunction behind the Sun on the 14th. Mars has one more month to reach its solar conjunction.

On the 30th, a "super" new moon is closest to Earth only 5 hours after New Moon. Let's hope no hurricanes approach land during this and the following days of larger-than-normal tides.

The Perseids meteors peak on the evening of the 12th, with the Moon almost full. Take advantage of the many Perseids that arrive before the peak. Go out early in the month, when the Moon is less bright, get the bright lights out of your eyes, and look for Perseids and other meteors then. Viewing after twilight may be better for this shower than most. Generally, more meteors run into the Earth's atmosphere during the morning, but the apparent source in the constellation Perseus is above the horizon most of the night.

Asteroid 15 Eunomia is the fourth brightest this year, lurking at magnitude +8.2 in the waters of Aquarius. Finding nearby Beta Aquarius will get you in the neighborhood. A finder chart with the asteroid's path will get you home. A good one is at https://in-the-sky.org/findercharts.php?objtxt=A15&duration=5. Magnitude +7.8 Neptune is on the other side of Beta, and brighter. Look in the late evening hours. Uranus is a morning sky object.

The traffic jam in the solar glare continues with major solar system objects near the Sun as seen from Earth. See them with the SOHO C3 viewer, at https://sohowww.nascom.nasa.gov/data/realtime/c3/512/. For the last third of the month, Venus and Mars hang together near the Sun, as close as $^1/_3°$ apart on the 24th. Regulus is background for this scene. Watch for Mercury joining the club late in the month.

The International Space Station is visible evenings through the 8th, and mornings starting on the 24th. China's Tiangong 2 was coaxed to reenter the Earth's atmosphere over the Southern Pacific Ocean on July 19th, 40 years after the USA's Skylab fell in Indian Ocean and on Australia on July 11, 1979.

Bob Kelly lecturing at Greenburgh Library, 7/17/19

WAA Members: Contribute to the Newsletter!
Send articles, photos, or observations to
waa-newsletter@westchesterastronomers.org

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Editor: Larry Faltz
Assistant Editor: Scott Levine
Editor Emeritus: Tom Boustead

Member Profile: Joe Geller

Home town: Born in NYC, live in Hartsdale

Family: Audrey (wife), Josh (son)

How did you get interested in astronomy? I've always been interested in astronomy and science in general. My mother worked as a bookkeeper for the publisher of Isaac Asimov's science books and I read those before his science fiction. The return of Halley's Comet in 1986 motivated me to become active in the field and to buy binoculars and then a telescope.

Do you recall the first time you looked through a telescope? What did you see? It was at a star party at the Haydn Planetarium. The first object was Saturn.

What's your favorite object(s) to view? Saturn is still my favorite object. There is nothing as beautiful as those rings. Other favorites include the Moon, Jupiter, the Ring Nebula, the Pleiades. A long-time favorite is M34 in Perseus – not the most famous open cluster, but one of the prettiest in a small scope. For a one-time event, I'd have to say Comet Shoemaker Levy 9 hitting Jupiter in 1994 and leaving big black spots was so amazing.

What kind of equipment do you have? I currently have a Meade 2045 (4" Schmidt Cassegrain) and 7 X 50 binoculars. I used to have an 8" Celestron.

What kind of equipment would you like to get that you don't have? I wouldn't mind owning one of the Kecks. Or, one of everything (different objects, different needs) – including a 5" APO refractor.

Have you taken any trips or vacations dedicated to astronomy? Tell us about them. I've taken two Eclipse trips. The first was rained out, but was still one of the best trips I've ever taken. It was the 1999 Eclipse. I went to Germany – to Munich, Neuschwanstein, Nürtingen (outside Stuttgart, where I met up with (former WAA president) Paul Renken and some of his family, and where we did not see the Eclipse), the Black Forest and back to Munich. Nothing beats the pretzels in Bavaria (not even the beer and sausages).

The second trip was for the 2017 Eclipse. For that I went on a tour with the Astronomy Cast (podcast) folks. A few days in St. Louis and then to Carbondale to see the eclipse. This one was successful (whew!)

Are there areas of current astronomical research that particularly interest you? Pretty much everything – planetary exploration, cosmology and everything in between.

Do you have any favorite personal astronomical experiences you'd like to relate? I watched the 2004 Venus transit in Alpine NJ off the Palisades Parkway with Bob Davidson, using the club's 6" Refractor and my 8" Thousand Oaks Solar filter (which Bob attached to the scope). Of all the telescopes there that day, I really think that ours had the best view of the event.

What do you do (or did you do, if retired) in "real life"? I do computer work – Software Engineer, Database Administrator, Designer and most especially performance tuning. I also play tennis, softball, electric bass, go to foreign movies, plays, concerts, etc.

Have you read any books about astronomy that you'd like to recommend? *Guideposts to the Stars; Exploring the Skies Throughout the Year*, by Leslie C. Peltier. His most famous book is *Starlight Nights*, but I think *Guideposts* is the best beginner's book for learning the night sky and the constellations. It uses the brightest stars in the sky to orient you and point to other things to see.

How did you get involved in WAA? I've been a member of WAA since around 1990.

What WAA activities do you participate in? I go to most of the monthly lectures. I read the newsletter from cover to cover. It really is the best astronomy club newsletter. I only get to a few of the star parties but would like to go more often.■

Joe's shot of Comet Hale-Bopp (1997)

Conversations with Fredrick Veio and Making the Veio Disk for a Spectro-helioscope

John Paladini

In the fall of 2017, at one of the WAA post-meeting Applebee's dinners, Larry Faltz told me that he had received an e-mail from someone who read my article about how I made a spectroheliograph (SkyWAAtch April 2017) and wanted to contact me. That someone turned out to be Fred Veio who I, and many others, consider to be one of the master builders of spectroheliosocopes (SHS). The difference between a spectroheliograph and a spectrohelioscope is that the former records the Sun's image on a sensor for later display or printing while the latter allows direct visualization with the human eye.

I consider Fred to be one of the great second-generation ATM'ers of the 20th century, Walter Semerau being one of the others.

Let me explain. The first generation of ATM'ers began in the 1920's with Russel Porter, Albert Ingalls and Henry Paul. This was the time when amateur astronomy started to take hold in the United States, but commercial telescopes, mounts and accessories were hard or impossible to come by, and too expensive anyway. These guys wrote the well-known and widely-read series *Amateur Telescope Making* (in 3 volumes), still a treasured resource. Generation One lasted till about 1950. Generation Two began in the 1950's. Fred Veio made many contributions to Sky and Telescope magazine in the 1950's and 1960's. By the 1970's commercial telescopes began to dominate and except for Dobsonians there was little that hadn't already been said in the ATM field.

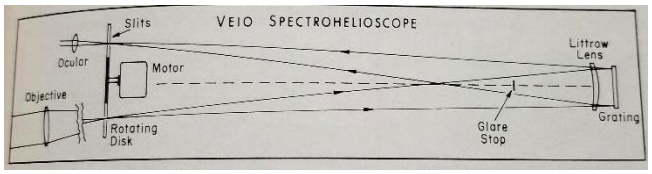
Larry gave me Fred's email address and telephone number and I made contact with him. What follows is the result of our correspondence.

Fred was born in 1930 and grew up in Oakland, California. In 1960 he moved to Lake County in north-central California, where he still lives. He was a medic in the Army and served in the Korean War. He obtained a B.A. degree in bacteriology. He also became partner in his father's vending business.

At age 16 he was taken to the Chabot observatory in Oakland. There he got to observe planets and other celestial objects thru a 20 inch refractor. He also joined the East Bay Astronomical Society (and is still a member). One of his friends bought a 10 inch reflector. They would spend time in the backyard looking at faint fuzzies, clusters, and planets.

His first building project was an astrograph (a fancy term for a camera that takes images of stars). He published article about it in 1955, followed by two further articles in S&T in 1957 and 1965. His interest in solar observing began in 1962 after reading about H-alpha light in Ingalls' Amateur Telescope Making, Vol 1. He then learned how George Ellery Hale invented the spectrohelioscope. Here is where Fred really shined.

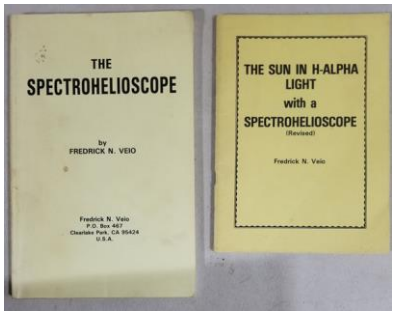
A spectrohelioscope is designed to observe the sun by scanning the solar disc in strips at a set frequency (usually H-alpha) and then building the complete image fast enough so that the human eye sees entire Sun. A telescope presents the image to a rotating slit, which in turn is projected into a grating or prism. In order to get a large image a long focal length is needed. Hale's spectrohelioscope uses a lens with an 18 foot FL. This scope is not exactly ATM-friendly. Fred's first idea was to cut all of Hale's dimensions in half (9 foot FL) for the objective telescope and 6 foot FL for the spectroscope itself, simplifying the overall design to a Littrow type. This design requires one lens and one reflective grating. This saves weight and complexity.



Fred's second idea and one that bears his name (the Veio Disk) is improving Hale's rotating scanning disk. This disk scans the Sun on one side and rebuilds it in the specific frequency on the other. He reduced the size of the disk from Hale's 8 inches to 4 inches, he increased the number of slits from 12 to 24, and he created the slits by painting a glass disk with black lacquer paint and then simply scratching off paint precisely with a homemade ruling machine.

Fred's spectrohelioscope was completed in the fall of 1964. In January 1969 his design concept was published in Sky and Telescope magazine. Fred told me letters started to pour in from all over the world. At

that point he wrote his first book, a 56 page pamphlet *Observing the Sun in H-alpha Light*. The book was revised and reprinted in the 1990's, and was translated into French and German. Much of Fred's literature can be found on-line, including his original printed books.



Having read Fred's books I noticed that while being very precise about the building of the SHS it was a little vague on how to make the Veio disk itself. I discussed this with Fred on the phone and he agreed that he never elaborated on its construction.

It was a privilege to correspond with Fred. After my discussion with him, I came up with the following interpretation of how to make a Veio disk. I was interested in making a prototype rather than trying to complete a finely crafted instrument. Keep in mind that a much better quality ruling device needs to be built than the one I made from foam board. My intent was to check the general approach to the instrument. In spite of the rough edges, I was pleased with result.

What you need

1) A four inch diameter by $^1/_8$ inch thick round glass disk with a ¼-inch hole in the center.

2) A can of black lacquer spray paint. It must be lacquer. Krylon is the most commonly available brand of spray lacquer.

3) A small piece of tape, 1/2 by 1/2 inches, to make the observing window, which passes the Sun's light into the apparatus.

4) A ruling engine. This will have cut two 1-inch slits that are 180 degrees apart. It is important that they are exactly opposite each other or "drag distortion" will result. Keep in mind that using the ruling engine you only remove a thin line of paint which the circumference has been ruled for 15 degrees. You should not cut through or scratch the glass in anyway. The cut must be done in 1 movement; if you try to go twice most likely the slit will not come out right. The slit thickness should be about 100 microns, thinner if possible. This will require a thin cutter like the edge of a double sided razor blade. The slits on the glass disk need to be 15 degrees apart, so 24 in all on the disk.

Steps to make the disk

1) Place the disk on paper

2) Attach blocking tape to make the observing window

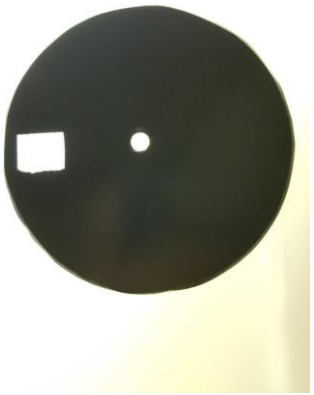
3) Spray paint disk with lacquer. Make multiple thin coats. Make sure it dries completely between sprays. It may take 3 or 4 coats or even more.

4) Once the final coat is on, place the disk in the ruling machine, with the whole apparatus on a paper or foam board on in which you've marked out 15-degree sectors. With one quick motion cut the paint.

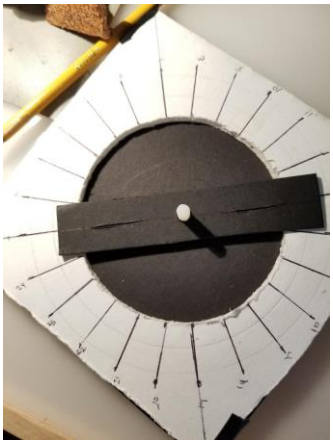
5) Rotate by 15 degrees and repeat until 24 slits are made.

I leave it up to the reader to design a better ruling device, but in general this shows how to make a Veio disk, the critical part of a spectrohelioscope. Good luck. ■

Glass disk before painting



After lacquering



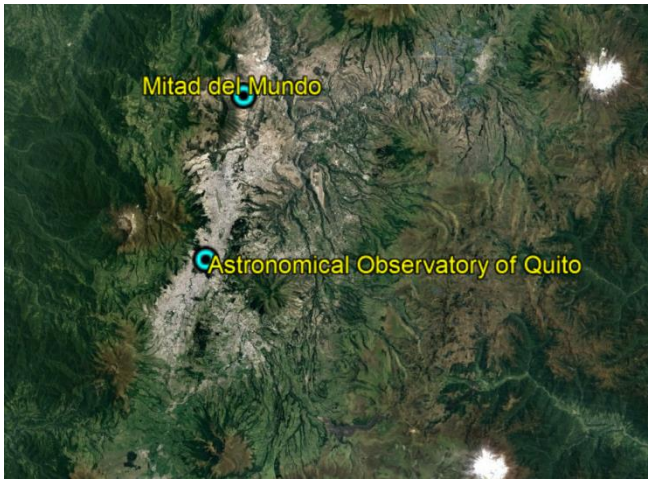
Ruling engine

Completed disc

The Astronomical Observatory of Quito, Ecuador

Larry Faltz

In March, Elyse and I traveled to Quito, Ecuador at the beginning of a voyage in the Galapagos aboard the 16-passenger catamaran *Ocean Spray*, to be followed by a trip to Cuzco and Machu Picchu in Peru. We came a few days early to get some flavor of the bustling city. Quito's 2.7 million inhabitants are wedged into a long valley surrounded by several dormant volcanos (and some not so dormant). The city sits at over 9,000 feet, so prophylaxis with acetazolamide (Diamox) to reduce the discomfort of high altitude was very helpful.

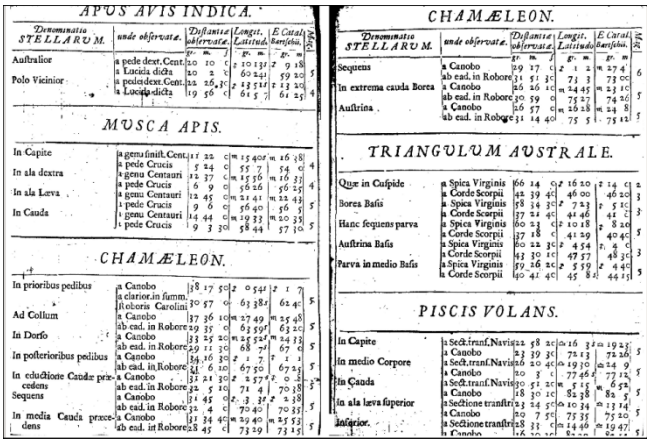


Quito is the light colored area on this Google Earth image. The vertical extent of the image is about 45 miles. Quito lies just south the equator. The monument Mitad del Mundo (Middle of the World), lying almost (but not exactly) on the equator, is located just north of the city.

We stayed at the elegant Hotel Patio Andaluz Quito, in the city's historic center just a block from the main square, a bustle of activity throughout the day. We particularly enjoyed a troupe of young break dancers who entertained on the plaza for an hour one afternoon with spectacular feats of acrobatics, strength, coordination and daring.

On the day after we arrived, we walked from our hotel through the bustling colonial center of the city to the Alameida Park, where the Observatorio Astronómico de Quito is located.

Exploration of the globe by Europeans started in the 15th century, In addition to new geography, exploration opened up new astronomical vistas, particularly because of the need to improve navigation. The southern skies were charted, first with the naked eye and then with telescopes. An incomplete catalog of southern stars was published by Dutch navigator Frederick de Houtman in 1603. De Houtman sailed to the Dutch Indies, and in the process named a dozen new constellations. In 1627, Johannes Kepler published a revision of Tycho Brahe's original catalog. In addition to refined elements for the stars Tycho saw from his observatory Uraniborg on the Danish island of Hven (latitude of 55° 54' N), Kepler added stars catalogued in the second century by Ptolemy, who observed from Alexandria at 31° N latitude, and also included some stars observed on voyages to the southern seas by Amerigo Vespucci, Andreas Corsali, and Pedro de Medina. In 1677, Edmund Halley, then just 20 and still nominally a student at Oxford, went to St. Helena in the Atlantic Ocean to make the first telescopic catalog of the southern hemisphere. St. Helena is at 15 degrees South latitude. Over the course of a year, with modest instruments (and having to sit out a lot of cloudy nights), Halley catalogued the positions and approximate magnitudes of 341 stars, which he published in 1679 as *Catalogus stellarum australium: sive, Supplementum catalogi Tychenici*, in other words a "supplement" to Tycho's catalog. Halley also observed a transit of Mercury on November 7, 1677.


APUS AVIS INDICA.

MUSCA APIS.

CHAMÆLEON.

CHAMÆLEON.

TRIANGULUM AUSTRALE.

PISCIS VOLANS.

Two pages from Halley's 1679 catalog showing southern stars

The first formal government-sponsored observatory in South America was built in Bogota, Colombia in 1803. It was constructed by Spanish physician, botanist and mathematician, José Celestino Mutis, who went to Colombia in 1760 as physician to the newly-appointed Viceroy of New Granada. He remained there the rest of his life. In his later years he was especially interested in botany and had a particular fasci-

nation with the medicinal plant cinchona, whose bark is the source of the important drug quinine. Mutis published little during his lifetime. His enormous collection of botanical and biological specimens, drawings and manuscripts was eventually taken to Madrid, where it was buried in a shed in the botanical gardens. The trove was discovered in the 1860's by Sir Clements Markham, who we remember today mostly in connection with his leadership of England's Royal Geographic Society in the latter half of the 19th century and his sponsorship of explorer Robert Falcon Scott's Antarctic expeditions. Mutis was befriended by the famous German explorer Alexander Humboldt, who wrote a biography of Mutis, published in 1821.

The first decades of the 19th century were a time of political ferment in South America as countries pried themselves free of Spanish governance. In 1805, Mutis entrusted the National Observatory of Colombia to Francisco José de Caldas, an intellectual who was swept up the in the revolutionary movement that began in Colombia (then New Granada) in 1810. He was executed in 1816 and the Observatory went dormant. Colombia was finally liberated in 1819 by Simón Bolívar, who reactivated the facility in 1823.

The Brazilian National Observatory was set up in 1827 in Rio de Janeiro, and the National Observatory of Chile followed in 1852. My visit to the Chilean observatory was reported in the May 2017 SkyWAAtch. State-owned observatories were set up in Cordoba, Argentina in 1871, Quito in 1873 and Caracas, Venezuela in 1888.

Typical of most state-sponsored observatories anywhere in the world prior to the 20th century, these facilities were erected in populated areas, the planners failing to predict the coming of electric light. As a result, they are of little astronomical use today except as museums and centers for public outreach and education, and perhaps for gathering meteorological data, by no means unimportant matters. Many of the historical observatories have been augmented by scientific facilities in more astronomically-hospitable areas of their countries or through international cooperation. The National Polytechnic School is responsible for astronomy research in Ecuador.

Astronomy in Ecuador began in the 1738 with the French mission to measure the distance of one degree at the equator. In addition to their surveying activities, astronomers Pierre Bouguer and Charles Marie de La Condamine tried try to determine the Earth's density (and by extension its mass) by measuring the offset of a plumb line by the bulk of the volcano Chimborazo, some 90 miles south of Quito. (See the article "Weighing the Earth" in the December 2018 SkyWAAtch for more details about how they did this).

The Observatorio Astronómico de Quito

Both the Jesuits and the Franciscans had strong presences in Quito following the conquest of the region by Spain in the early 16th century. The first Franciscans arrived with the founding of the city in 1534, the same year that the Society of Jesus, the Jesuits, was founded in Paris. Jesuits arrived in Quito in 1586. Both orders have spectacular 17th century churches in the city center. The interior of the Jesuit Iglesia de la Compañía de Jesús is covered extensively in gold leaf, to beautiful effect.

The Jesuit order has always a strong interest in science and education. The Astronomical Observatory of Quito was built by the Jesuit Juan Bautista Menten, a German astronomer, mathematician and professor. After studies in Bonn with Friedrich Argelander and later in France, Menten went to Rome and was an assistant to the famed Jesuit astronomer Angelo Secchi, head of the Observatory at the Pontifical Gregorian University and an important developer of spectroscopy. Menten was all set to head the Jesuit observatory in Bombay when in 1870 he was reassigned to Quito as Dean and Director of the Faculty of Science at the Polytechnic School. The school was created by Ecuadorian President (and dictator) Gabriel Garcia Moreno. He was a fervent Catholic who sought close ties to the Pope in Rome. In spite of his authoritarian governance, he was interested in progress and education. Moreno charged Menten with building an observatory. That bit of enlightenment did not help Moreno, who was assassinated by a group of angry citizens in 1875.

Portraying its history in a somewhat unusual way, the Observatory displays full-sized wax figures of Menten and Moreno in two small rooms. Menten is seen dressed in his Jesuit cassock, looking at a floor plan of

the observatory, while Moreno is seated at a desk next to the Ecuadorian flag, upon which are three thick books, *Desarrollo de la Cienca* (Development of Science) and the *Constitution of Ecuador* but I could not read the title of the third. The displays made me wonder if in 100 years there might be a wax effigy of Neil deGrasse Tyson somewhere in the Rose Center.

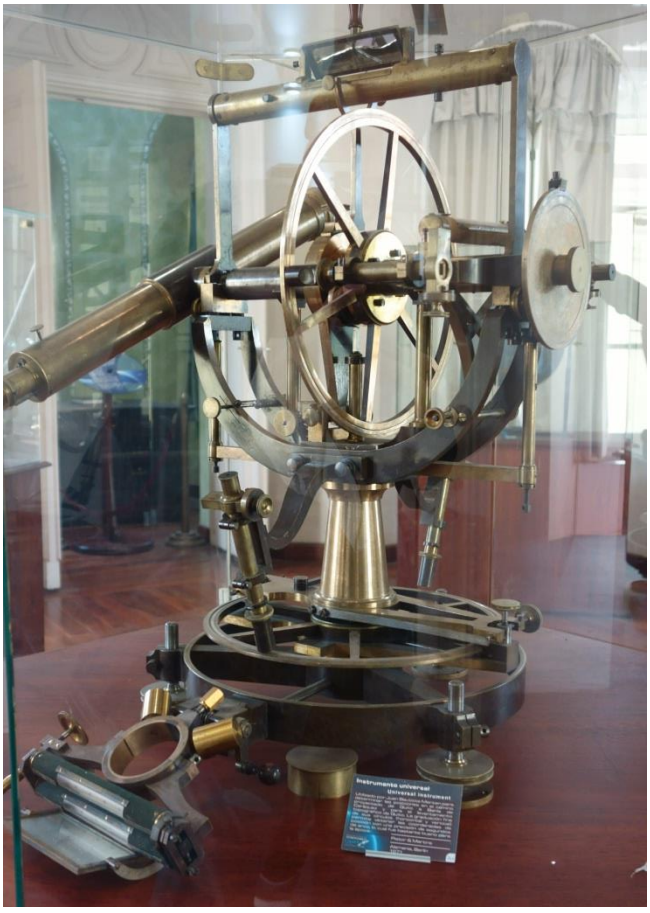
Life-sized figures of (L) Juan Bautista Menten; (R) Gabriel Garcia Menten

Menten modeled the building after the Bonn Observatory, with which he was obviously familiar. Construction began in 1873 but was only completed in 1877. Menten withdrew from the Jesuit order in 1876 and gave up directing the observatory in 1883 (after having observed the 1882 Transit of Venus).

In the 18th and 19th centuries, many observatories studied meteorology and surveying as much as astronomy. Menten determined the elevation of Quito, established the boundaries of Ecuador, made maps and laid out roads. He published some astronomical and meteorological works, as well as a geometry textbook. He was appointed Director of Public Works for Ecuador in 1889. He died in 1900 at age 62.

There is no charge to visit the observatory. Arriving around 10:30 am (the facility is open 10 am to 5 pm every day except Monday), we explained our interest (and our WAA affiliation) to a friendly lady at the front desk, and she offered to have Darwin, a student at the Polytechnic School who wanted to practice his English, show us around. Darwin's English was already pretty good, and he was eager for us to see the range of instruments on display. Since we were leaving in 2 days for the Galapagos, we thought it was a good omen to meet someone named Darwin.

There were several rooms containing a large number of small 19th and early 20th-century surveying and star-charting instruments, meteorological devices and small telescopes. A glass-enclosed book alcove had a number of rather rare 19th century works, including a complete set of the first edition of Pierre-Simon Laplace's *Traité de mécanique céleste* from 1825, said to be the second most important work of physics and mathematics after Newton's *Principia*. I saw a multivolume set of the works of the German mathematician and physicist Karl Friedrich Gauss, published between 1860 and 1873, and several works by Alexander Humboldt and Friedrich Georg Wilhelm von Struve.



Large Universal Instrument by Pistor & Martins, Germany (1871)

Among a collection of lovely brass instruments and small telescopes, an impressive "Universal Instrument," over 24 inches in height, was used by Menten to survey positions on the road he laid out from Quito to Bahia de Caraquez and for his topographic surveys of Quito. The description says that "the graduation of its circles (horizontal and vertical) allows one to obtain the coordinates of position with a precision of seconds of arc, which was good enough for the time." In the next display was a smaller and more portable Pistor & Martins universal instrument.

Other areas on the main floor displayed astronomy information and images typical of what one might expect in a facility dedicated to outreach and education. The building was built before the advent of the plane-

tarium. Large educational gatherings relating to astronomy have to take place at the National Polytechnic School, whose modern urban campus is located just a mile to the northeast.

Repsold Meridian (Transit) Telescope

The most impressive instrument on the observatory's ground floor was the very large and perfectly preserved meridian transit telescope made by Repsold & Sons of Hamburg. The telescope was made in 1889 and installed in 1892 under the direction of Guillermo Wickmann, then Director, who had to reinforce the foundation to stabilize the instrument. There is a narrow slit in the walls and roof covered by a corrugated metal louver, which slides off to allow the telescope to sight the meridian over a full 180 degree range (or at least as low as the surrounding mountains will allow).

We then climbed the two-story spiral staircase that winds around a thick concrete pier in the center of the building, and at the top entered the corrugated aluminum dome on the roof. This structure is more spacious than it looks from the street. It houses a beautiful 7½" Merz refractor, which was installed when the observatory opened. The telescope is on an equatorial mount, but at first I couldn't quite figure out what the horizontal tube below the telescope was for. It looked more like an alt-az mount. Then I realized what I was looking at. I recalled the marker in front of the building that reports the observatory's position: Latitude 0° 12' 53.70" South, 78° 30' 9.20" West, elevation 2815.05 meters (9235.7 feet). The horizontal tube is the polar axis! At the equator, equatorial equals alt-az!

The telescope is used for public outreach on Tuesdays, Wednesdays and Thursdays when the weather is good, although being situated in central Quito only the Moon, planets and some double stars would be effective targets. An on-line reservation system on the observatory's web site, https://oaq.epn.edu.ec/, will accept up to 25 people for a viewing session. Unfortunately, our two evenings in Quito were overcast, which was not unexpected as we were there at the tail end of Ecuador's rainy season.

Darwin with the 7½ inch Merz refractor. He is holding on to the declination axis. The polar axis is in the darker horizontal brass housing below the telescope above the pier.

After two hours in the observatory, we thanked our guide Darwin and the staff, signed the visitors' book and headed off to explore more of Quito.

The Quito Observatory (red arrow) as seen from El Panecillo, a hill 1.5 miles to the southwest. El Panecillo is the site of an enormous (150-foot high) statue of the Virgin of Quito.

Elyse and I try to find historic astronomy facilities on our travels. There's almost always one around somewhere, and they are usually set up as museums to preserve important and/or curious artifacts and instruments. The appeal of astronomy is universal. There's a lot of local pride in these facilities and we get to meet some very nice people who share our interest in the cosmos. ■

Images by Members

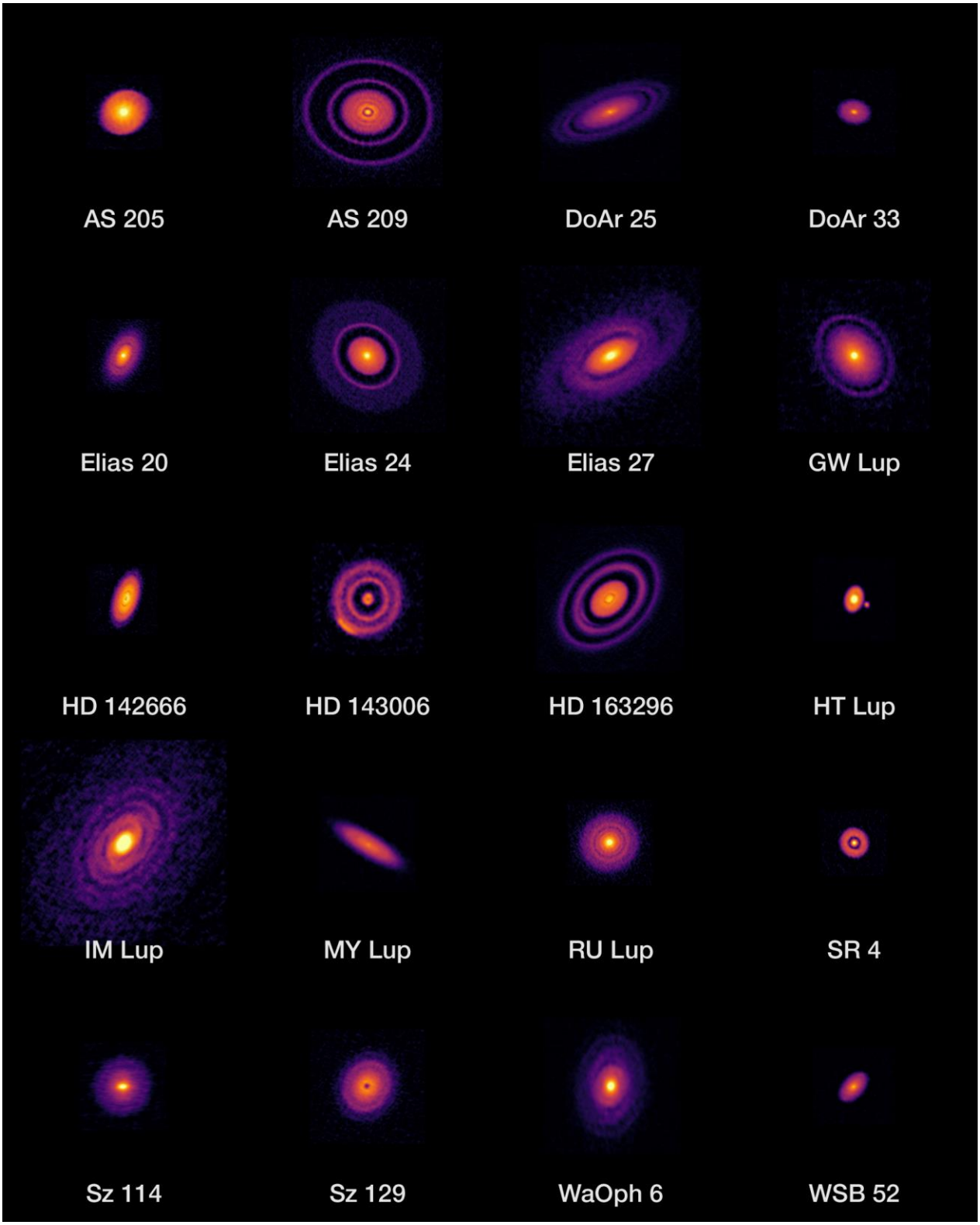
Gary Miller obtained this image of M64, the Black Eye Galaxy in Coma Berenices, in April at Ward Pound Ridge. Canon T7i DSLR, Losmandy GM811G mount. Thirty-five 60-second images (with dark frame subtraction) were stacked and processed in PixInsight.

Arthur Rotfeld went up to Taghkanic State Park in February for this image of the globular cluster M3 in Canes Venatici. He used an 8” Celestron Edge HD f/10 on an alt az tracking mount. It was a single 30 second DSLR exposure.

Jupiter reached opposition on June 10. Mauri Rosenthal captured this image from his Scarsdale yard on June 12 with the gas giant 450 million miles away. That’s the shadow of moon Ganymede; Io has just completed a transit and is moving out to the right. Questar 3.5” with 2.5x Powermate, ZWO 120MC camera, 50 80ms exposures, processed with PIPP, AutoStakkaert!3, Registax 6 and Pixinsight.

Research Highlight of the Month

The Disk Substructures at High Angular Resolution Project (DSHARP) at ALMA, the Atacama Large Millimeter/submillimeter Array in Chile, imaged developing protoplanetary disks surrounding 20 young stars at extremely high resolution. Most of these disks are thought to be less than one million years old.



Member & Club Equipment for Sale

Item	Description	Asking price	Name/Email
Celestron 8" SCT on Advanced VX mount	Purchased in 2016. Equatorial mount, portable power supply, polar scope, AC adaptor, manual, new condition.	$1200	Santian Vataj spvataj@hotmail.com
Celestron CPC800 8" SCT (alt-az mount)	Like new condition, perfect optics. Starizona Hyperstar-ready secondary (allows interchangeable conversion to 8" f/2 astrograph if you get a Hyperstar and wedge). Additional accessories: see August 2018 newsletter for details. Donated to WAA.	$1000	WAA ads@westchesterastronomers.org
Celestron StarSense autoalign	New condition. Accurate auto-alignment. Works with all recent Celestron telescopes (fork mount or GEM). See info on Celestron web site. Complete with hand control, cable, 2 mounts, original packaging, documentation. List $359. Donated to WAA.	$200	WAA ads@westchesterastronomers.org
Explore Scientific Twilight I Mount	Manual Alt/Az, capacity 18 lb. Steel tripod. Excellent condition. Used fewer than 10 times. Great for grab-and-go viewing. Owner upgrading to an EQ mount.	$110	Eugene Lewis genelew1@gmail.com
Televue Plossl 55mm 2-inch	Very lightly used. Excellent condition. Original box.	$110	Eugene Lewis genelew1@gmail.com
Explore Scientific ED127 f/7.5 APO Triplet Refractor Telescope	Purchased new in 2016. Carbon fiber tube, 2" star diagonal, 2" dual-speed Crayford focuser, dew shield, rings with Vixen-style dovetail. Additional accessories available. Over $2250 invested.	$1400	Al Ferrari ferrariguitars@gmail.com
Lunt LS60THa Solar Telescope	Like-new 60mm pressure-tuned scope with B1200 blocking filter and 2-inch Feathertouch focuser. Cost new $2479. Televue Sol-Finder, tube ring and vixen dovetail, original metal case with custom fit high-density foam. Two Plossl eyepieces. Used only 5 or 6 times. Just don't have the time to use it enough to warrant keeping it	$1700	Eugene Lewis genelew1@gmail.com
Celestron 8" SCT OTA	Dark blue 8" f/10 Schmidt-Cassegrain optical tube with Telrad base and ADM dovetail plate installed. No finder.	$250	Dave Parmet david.parmet @westchesterastronomers.org

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 submit only 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. WAA is not responsible for the satisfaction of the buyer or seller. Commercial listings are not accepted. Items must be the property of the member or WAA. WAA takes no responsibility for the condition or value of the item or accuracy of any description. We expect, but cannot guarantee, that descriptions are accurate. 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). Sales of WAA equipment are final. Caveat emptor!