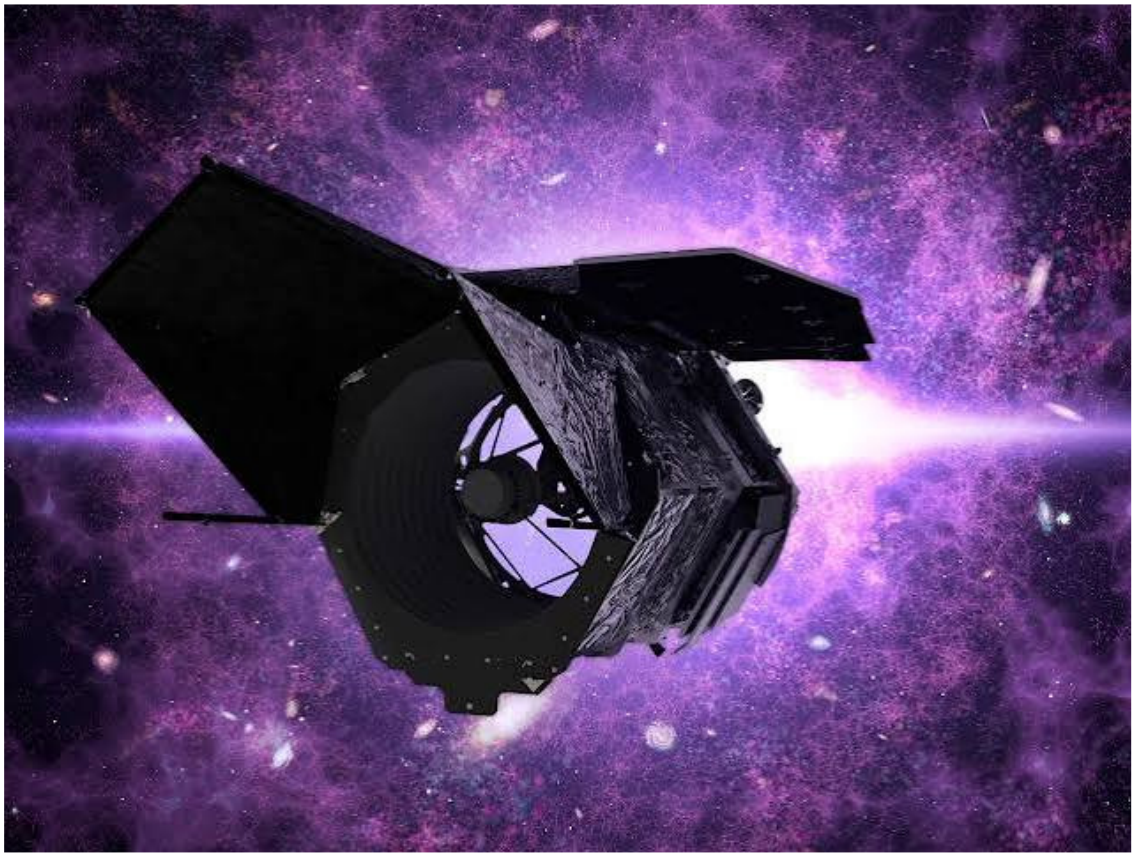
The Newsletter of Central Valley Astronomers of Fresno September-October 2026

The Observer

NASA's Next Great Observatory:

Nancy Grace Roman Telescope Launched

To Study Dark Matter and Exoplanets



The Nancy Grace Roman Telescope, commonly known as RST, was launched on August 30 aboard a Falcon Heavy rocket from the Kennedy Space Center. It is the newest of NASA's deep sky telescopes, with a 2.4 meter primary mirror that matches the resolution of Hubble, but with a field of view almost one hundred times greater. Named after Nancy Grace Roman, NASA's first chief astronomer in the 1960s and 70s, who played a major role in the development and building of the Hubble Space Telescope, the RST will be put into a halo orbit at LaGrange Point 2, the same area as the James Webb Space Telescope, for a five(and possibly ten)-year mission(con't on inside)

Number of Exoplanets found as of August 2026-
Confirmed-6,336
How many more are out there-
Tens of thousands?
Millions?

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(con't from front page)

to study Dark Matter, Dark Energy, exoplanets, and many other deep space mysteries. The RST is actually ahead of schedule; it was not planned to be launched until June 2027.

The Nancy Grace Roman Telescope program began in 2012 and was made possible by a donation a few years earlier of two optical surveillance (i.e., spy) satellites given to NASA by the National Reconnaissance Office. Build by Harris Aerospace in the early 2000s, they sat in a clean room facility in upstate New York until NASA had available funding and could figure out what to do with them. The second telescope is still in New York; it may be used in the 2030s.

CVA's Dark Sky Festival Night on Friday, September 11

This year sees a slight change in CVA's annual participation in the Sequoia-Kings Canyon Dark Sky Festival. Instead of being on Saturday night, this year it will be on Friday night, September 11. The site will be the same-The Big Stump parking lot, and there will no doubt be crowds at it, as in the past. So, lots of CVA astronomers will be needed. Bring your telescopes and get ready to wow visitors with clear-sky mountain views of the heavens.

Image by John Lefay

Science is the process of going up alleys to see if they are blind-Marston Bates

The President's Message

By Hubert Cecotti

As the Central Valley's long summer gradually gives way to autumn, September and October offer cooler evenings, earlier darkness, and several excellent reasons to take a telescope outside. Highlights include Neptune and Saturn at opposition, a nearly moonless Draconid meteor shower, the return of Orion to the morning sky, and prime viewing of the Andromeda Galaxy (M31) and the Triangulum Galaxy (M33), which are great targets for all the CVA members who are into astrophotography.

During September, the Summer Triangle remains prominent after sunset. Vega, Deneb, and Altair form its three bright corners, with the Milky Way passing through the region. From a dark location outside Fresno's urban glow, binoculars can reveal rich star fields extending from Cygnus toward Aquila and Sagittarius. Follow the guidelines and presentations of our CVA member, Garrett Weimer, to better appreciate what can be seen with binoculars and low-aperture telescopes. Early in the month, the waning crescent Moon passes near Mars on September 6 and Jupiter on September 8. Look toward the east before sunrise. Mars appears distinctly orange, while much brighter Jupiter is easy to identify. A small telescope will reveal Jupiter's four Galilean moons, whose positions change noticeably from night to night.

The new Moon occurs on September 10, providing the month's best period for viewing faint deep-sky objects. It will also be the weekend of the Dark Sky Festival at Sequoia and Kings Canyon National Park, where CVA will be present on September 11 at the Big Stump parking lot. It is a very busy event with the public; to appreciate the sky on your own, it is worthwhile to stay multiple nights. We should all take advantage of the dark evenings around this date to once more explore the Lagoon Nebula, Swan Nebula, and the globular clusters of Sagittarius before they sink too far into the southwestern sky, and we will have to wait until next year to see them again.

Saturday, September 19, is International Observe the Moon Night. The Moon will be just past first quarter, an especially favorable phase for telescopic observation. Along the lunar terminator, the boundary separating day and night, low-angle sunlight casts long shadows that emphasize craters, mountains, and valleys. Even a small telescope should show impressive detail. Autumn officially begins in Fresno at 5:05 p.m. PDT on September 22, when the Sun crosses the celestial equator moving southward. Despite the name "equinox," daylight and darkness are not exactly equal because of atmospheric refraction and the apparent size of the solar disk. The full Harvest Moon arrives on September 26. We can watch it rise in the east around sunset, when atmospheric scattering may give it a deep yellow or orange color. On the following evening, September 27, the Moon appears close to Saturn. Furthermore, Neptune is also in the same general region, although it is much too faint to see without optical assistance.

Neptune reaches opposition on September 26. At opposition, a planet lies opposite the Sun in our sky, rising around sunset and remaining visible throughout the night. Neptune will shine at approximately magnitude 7.8, so a telescope and a detailed finder chart are essential. At moderate magnification, it resembles a tiny, slightly bluish disk rather than an ordinary point-like star. The principal planetary event of the season occurs on October 4, when Saturn reaches opposition. The ringed planet will rise near sunset, remain visible all night, and reach its highest position around the middle of the night. It will be easily visible to the unaided eye as a steady, pale-yellow point of light. Almost any telescope will reveal Saturn's rings. Larger amateur instruments may also show the dark Cassini Division within the rings, subtle atmospheric bands, and several moons. Titan is the easiest moon to identify, while Rhea, Tethys, Dione, and Iapetus become accessible with sufficient aperture and favorable conditions. Saturn remains an excellent evening target throughout both September and October, so opposition night is not the only opportunity to observe it.

The Draconid meteor shower peaks around October 8–9, shortly before the new Moon on October 10. Unlike most meteor showers, the Draconids are best observed during the evening rather than before dawn. Face generally north or northwest and watch as much of the sky as possible without optical equipment. The shower normally produces only a handful of meteors per hour, but its activity is unpredictable and has occasionally included dramatic outbursts. The nearly moonless sky makes 2026 a particularly favorable year to watch. Mars passes through the Beehive Cluster, M44, around October 10–12. This attractive pairing is best viewed in the late-night or early-morning sky. Binoculars should show orange Mars surrounded by the scattered stars of the cluster, while a wide-field telescope will provide a particularly attractive view.

The Orionid meteor shower peaks during the night of October 21–22. Orionids are fast meteors produced by particles left behind by Comet Halley. Under ideal dark skies, observers may see approximately 10–20 meteors per hour. Unfortunately, a bright waxing gibbous Moon will interfere in 2026, washing out many of the fainter meteors. The brightest Orionids may nevertheless be visible after midnight. Do not stare directly at Orion; instead, look roughly 45 to 90 degrees away from the radiant, where the meteor trails appear longer.

The full Moon occurs on October 25. By the end of the month, the seasonal transition is unmistakable: the Summer Triangle is moving toward the west, Pegasus and Andromeda dominate the evening sky, and Taurus and Orion are returning in the east later at night.

Whether you observe from your Fresno backyard or travel beyond the city lights into the foothills, at Eastman Lake, or at Big Stump, September and October reward patience. Allow at least 20–30 minutes for your eyes to adapt to darkness, avoid looking at white lights or phone screens, and remember that Central Valley haze can reduce contrast near the horizon. It is worth remembering that a clear autumn night can reveal everything from lunar mountains and Saturn's rings to ancient light arriving from another galaxy.

Clear Skies-
Hubert

CVA Calendar for September-October

September 4-CVA monthly meeting at Round Table Pizza, First and Bullard, Fresno. Begins at 7pm

September 11-CVA's night for the Dark Sky Festival at Big Stump

September 18-Riverpark public starwatch event

October 2-CVA monthly meeting at Round Table Pizza

October 10-CVA monthly club starwatch and Fall Star-B-Que at Eastman Lake.

October 16-Riverpark public starwatch event

What are the primary elements of a sense of humor? - Sulfur, Argon, Calcium, and Samarium. Otherwise known as SArCaSm

From Fatherly.com

Profiles in Astronomy
Thomas Grubb 1800-1878

In the U.S., the name Alvyn Clark is associated with telescopes of outstanding quality and reliability. However, he had a European counterpart, Thomas Grubb, whose telescopes were of such high quality that some of them are still used today, almost 200 years after they were first built.

Grubb was born in County Waterford, Ireland, and after attending local schools, migrated to Dublin, where in 1830, he established a billiard-table factory. He had always had an interest in astronomy, though, and soon began making telescopes along with pool tables. His first was for his own observatory in Dublin, next to his factory. That brought him some notice from the scientific community, and consequently his first major contract, a refractor telescope with a 13.3" lens, was for the Markree Observatory in County Siglo in the west of Ireland. For a time, it was the largest telescope in the world. Over the next few years, his company designed and built several more telescopes for observatories in Ireland, England, France, and Spain. In 1845, he played a major role in building the "Leviathan of Parsonstown," Lord Rosse's giant 72" reflector telescope, which was used to study the Whirlpool Galaxy. In 1854, he built the telescope for the Aldershot Observatory. In 1866, he was involved in building the Melbourne Telescope, with a 48" mirror, which is now at the Mt. Stromlo Observatory in Australia and was used until 2003). In 1875, his last major project was the Great Vienna Telescope, a refractor with a 27" main lens; again, it was for a time, the largest telescope in the world. Today, it is on display at the University of Vienna.

Besides his telescope building, Grubb did many other things. In 1839, at the request of the college, he designed and built several magnetometers for the physics department at Trinity College, Doublin. For a few years in the 1840s, he worked for the Bank of Ireland, designing and building machines that could print banknotes quickly and efficiently.

Thomas Grubb died in 1878, and the company was taken over by his son Howard Grubb. It continued to make telescopes, including the 10" refractor at Armagh Observatory, which John Dreyer used in revising the New General Catalogue, and the 28" refractor for the Royal Observatory at Greenwich. During World War I, the Grubb Company designed and built periscopes for British submarines, among many other war-related products.

In 1925, the 4th Earl of Rosse(Lord Rosse's grandson) bought the company and renamed it Grubb-Parsons. It is still involved in optics and astronomy-related products and services today; one of its recent projects was refurbishing the William Herschel Telescope on the Canary Islands.

It is estimated that Thomas Grubb built close to 50 telescopes while he was alive, and his company built many more after his death. Several, including the Armagh Telescope and the Royal Greenwich Telescope, are still used today, and the Grubb-Parsons company has retained a reputation for high quality, long-lasting optics.

Longtime CVA member and past president Randy Steiner Passes Away

Randy Steiner, who was a member of CVA for over forty years, died on July 27, just a few days before his 74th birthday. Even though he was paralyzed from the waist down, he made substantial contributions to the club, serving in several offices, including president for three years in the early 2000s. He was a regular at starwatches, and his "Steiner-vision", being able to see objects other members could not, became legendary in the club.

Above-Randy(at right) at a star-b-que c. 2010-
At left is Louis Mendoza, who was a member of CVA for over 60 years.

Current secretary-treasurer Steve Harness, who knew Randy well, sent out an email to club members which reads:

"Randy was a long time fixture at the club star parties. He was known for his Steiner-vision, being able to spot comets and very faint objects before anyone else could. He claimed that he saw Pluto through my 12-inch Meade. I never did.

Randy became paraplegic in 1970 from a car accident but he did not let that stop him. He went on and graduated from Fresno State and earned the President's medal. He taught for 1-2 years but it turned out to be too physically demanding for him.

I first met him in the spring of 1986 as part of Project Astro. This program was implemented by the Astronomical Society of the Pacific and connected local astronomers with teachers and families. He was the one that spurred my interest in astronomy and astronomy education. He attended every star party and school event.

Randy wanted to be known for some sort of great scientific discovery. He collected several rocks that he thought were meteorites and sent them off to be cut open and identified. Unfortunately none were meteorites. He was determined to find at least one companion star that would make our Sun a binary star or even part of a triple star system. He had page after page of calculations, none of which I could follow.

He was also excited about collecting fossils from the Kettleman Hills and Coalinga region. I accompanied him on many of his adventures. Once when he went solo he got his wheelchair stuck and had to wait for about an hour before a local rancher stopped and helped him.

When the Great Leonid meteor storm of 2002 came Randy was in a nursing care facility. He was given permission to leave and went up to the Fresno State Range with the club to observe. A Fresno Bee Photographer took his picture and it was in the newspaper.

When he was able well enough, he brought a lot of excitement to the club. For those who knew him, he will be missed."

I can only add one word to Steve's eloquent eulogy: Amen. Yes, he will be missed.

CVA's Tentative 2027 Calendar

Monthly meetings-at Round Table Pizza, Bullard and First Street-begin at 7pm

January 8
February 5
March 5
April 2
May 7
June 4
July-no meeting
August-no meeting
September 3
October 1
November 5
December 3

Club star parties

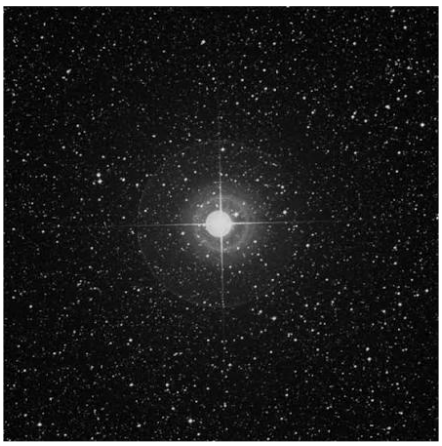
January 9	**Eastman Lake**
February 6	**Eastman Lake**
March 6	**Eastman Lake**
April 10	**Eastman Lake**
May 8	**Big Stump-Spring Star-B-Que**
June 5	**Big Stump/Courtright Reservoir**
July 3	**Big Stump/ Courtright Reservoir**
July 31	**Big Stump/Courtright Reservoir**
September 4	**Big Stump**
October 2	**Eastman Lake-Fall Star-B-Que**
November 27	**Eastman Lake**
December 4	**Eastman Lake**

Public outreach events- The dates for the Millerton Lake star watches will be added later

February 12	**Riverpark**
March 12	**Riverpark**
April 16	**Riverpark**
May 14	**Riverpark**
June 11	**Riverpark**
July 9	**Riverpark**
August 6	**Riverpark**
September 10	**Riverpark**
October 8	**Riverpark**

Star Stories

Ascella



Ascella is one of the stars that forms the handle of the teapot in Sagittarius. Also known as Zeta Sagittari, it is actually the third brightest star in the constellation, after Kaus Australis and Nunki. It has an apparent magnitude of 2.59 and an absolute magnitude of 1.1. The latest measurements show it to be 88 light years from Earth.

Ascella is actually a multiple star system, with at least three components. The inner pair consists of two stars, known as Z Sgaittari Aa and Ab. Both are type A stars with the same size and mass, roughly 1.8 times that of our Sun. The third star, known as Z Sagittari B, forms a binary with the inner two. It is the largest of the three stars, with a mass of 2.2 times the Sun, it is also classified as a type A, and as such, all three will probably evolve into a red giant phase some 700 million years from now.

According to scientists, Ascella was once much closer to Earth than it is now, due to its high proper motion. It is estimated that it was only 35 light years from Earth about a million years ago, and as such, was one of the brightest stars in the sky at the time.

The name Ascella comes from Latin and originally meant *Armpit,* a reference to the constellation resembling a centaur using a bow and arrow. In Arabic, it was called *Thalath al Sadrith,* which means the Third Returning Ostrich. In Chinese it was called *Duo Su Yi*, the First Star of the Dipper.

Galaxy in the Eyepiece

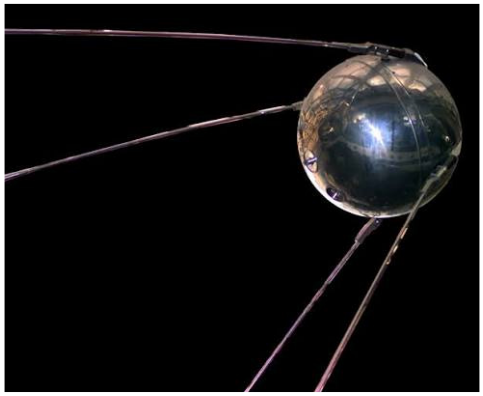
NGC 5474

NGC 5474 is one of several satellite galaxies associated with and under the gravitational influence of M101. It is, in fact, the galaxy closest to M101, commonly known as the Pinwheel Galaxy. What makes 5474 interesting to scientists is that M101 is distorting its mass and essentially turning it into a mini-spiral galaxy; officially, the galaxy is classified as a dwarf spiral, a type that is extremely rare in the known universe. Also, because of this influence, the nucleus is offset, yet the spiral arms still show regular motion around it.

According to the latest measurements, 5474 is about 22 million light years from Earth and is 27,500 light years in diameter, about a fourth the size of the Milky Way , and is estimated to contain about 20 billion stars.

Space Age Archeology

Sputnik 1



Sputnik 1, of course, is in history books as the first artificial satellite to orbit the Earth. Launched on October 4, 1957, it jolted the West, and especially the United States, into a reexamination of its entire technological and scientific purpose. Sputnik's launch changed the world in so many ways. Yet, it almost wasn't so. The full history of the Sputnik project, which was not made public until after the fall of the Soviet Union in 1991, shows a complex picture of both delays and achievements leading to such an epic event.

The Sputnik 1 story begins in late 1954, when Sergei Korolev, the director of OBK-1, the Soviet Union's main rocket and missile agency, proposed putting a satellite into space as the next step after developing the powerful R-7 ballistic missile. Several months later, in July 1955, President Eisenhower announced that the U.S. would put a satellite into orbit as part of the International Geophysical Year, starting in July 1957. Although it did not gain much attention in the West, a week later the Soviet Union announced that it, too, would launch a satellite into orbit as part of the IGY. Korolev's OBK-1 bureau was given the satellite assignment, which would come to be known as Object D. By mid-1956, Korolev and his team had completed the initial design of Object D; it was an extremely complex device which would carry several scientific experiments(all at the request of the Russian Academy of Sciences) and weigh between 2,000-3,000 Earth pounds. Because of it, Korolev would have to make major modifications on the R-7 rocket, all of which would take time. In early 1957, Korolev reported to the Soviet political leadership that Object D would not be ready for launch until at least the Spring of 1958. Since Soviet intelligence reports indicated the U.S. would launch its satellite by the end of 1957, Korolev was told to develop another satellite which could be quickly built and launched. Thus, Sputnik 1.

While work on Object D went on(it would eventually be launched as Sputnik 3 in May 1958), Korolev and his team designed what would be known as Sputnik 1 in less than a month in April 1957. It had one purpose only: to beat the United States in putting a satellite into Earth orbit. It was a no-frills craft which could be easily built and launched on an existing R-7 rocket. Its basic shape was a sphere, made from an aluminum-magnesium-titanium alloy, 23 inches in diameter, with four antennas sticking out. It carried no scientific instruments at all; the only device on it was a tracking radio transmitter. Otherwise, most of the interior was taken up by batteries. The craft had an Earth weight of 183 pounds. It was originally designated PS-1, for *Prosteishiy Sputnik,* or "Elementary Satellite number 1."

Along with the satellite, Korolev and OBK-1 looked around for a launch site for the R-7 rocket and its payloads and found it in a semi-desert area in Kazakhstan east of the Aral Sea near the town of Tyuratam(named after a Kazakh chieftain who was a descendent of Genghis Khan). Work began on the Tyuratam site in late 1955, but the first launch did not occur until May 1957. After several test launches of the R-7 from Tyuratam, it was certified to carry PS-1.

PS-1 was launched on October 5, 1957 Russian time, into a roughly elliptical orbit of 320 miles by 500 miles, with a 65 degree inclination relative to the equator. Once it separated from the rocket, ground crews had no control at all over it. Within a few hours of launch, Soviet radio and television reported on it and Western media also gave it significant coverage. At first, the Soviets said that amateur radio operators could listen into signals(and millions did) through common broadcast frequencies. The military and intelligence agencies monitored the satellite's orbit continuously throughout its lifetime.

It is now known that the Eisenhower Administration, through intelligence sources and U-2 overflights of the Tyuratam area, had been aware for some time that the Soviets would launch an artificial satellite in early October. The American public, however, was surprised and shocked that the Russians had put a satellite into space before the U.S, and almost immediately began talking about the "knowledge gap," and the need to bring science up to speed. This would result in a major push in the sciences in American schools and universities in the 1960s and 70s.

As to the satellite, it remained operational, doing nothing but broadcasting "beeps" for three weeks until its batteries died. It then remained in orbit until January 4, 1958, when atmospheric drag pulled it into the lower atmosphere where it burned up. It did its job, though, the first satellite to be orbited around the Earth and heralding the beginning of the Space Age.

***Until the fall of the Soviet Union in 1991, Russian scientists, engineers, and technicians who were involved in the space program always called the launch center Tyuratam; however, the Soviet government officially designated it Baikonur, after a city 150 miles away, to mislead Westerners about its true location and purpose. Today, it is still known as Baikonur and is now in the independent nation of Kazakhstan. Roscosmos, the Russian Space Agency, pays an annual fee to the Kazak government to continue using it.**

Siderostatic and Heliostatic Telescopes

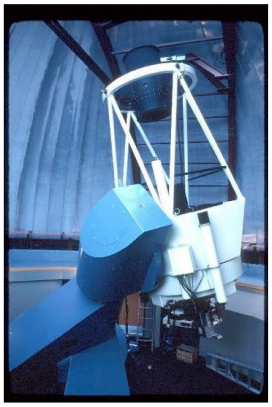
The last issue of *The Observer* mentioned a siderostatic telescope at the University College Cork Observatory in Ireland. A number of people have asked what it was exactly, so here is an explanation of it and some modern telescopes which still use its technology The siderostatic telescope was invented by the French physicist Jean Leon Faucault(1819-1868), who is best known for his pendulum studies, around 1860. He envisioned a telescope which, instead of the entire apparatus moving with the sky, employed a single flat mirror that would move(at one rotation every 24 hours) and direct its light down a fixed tube and off another mirror, and eventually come to a focus. To him, the advantage was that only one part of the telescope would have to move, not the whole thing, reducing the possibility of malfunction. Also, he saw that, on cold nights on mountaintops, the astronomer could stay warm inside the telescope building instead of pending all night in a cold dome. Only the mirror would be outside, focusing the light down into the telescope tube. Faucault died in 1868, before he could build a practical working model of his telescope, but others picked up on it, and several siderostatic(meaning "fixed star") telescopes, as they were called, were built in the mid and late 1800s. Although they had some advantages and were briefly trendy, astronomers also learned they were limited in their field of view and their focus, so they

never really gained a hold as dark sky viewing instruments. Only a few, like the University College Cork telescope(above), are still around today, relics from an earlier age of technology.

At the same time, though, solar astronomers realized that modifying siderostatic telescopes slightly would make them extremely useful for sun viewing. As a result, a number of solar tower telescopes appeared in the late 1800s and early 1900s, using flat mirrors that followed the Sun and directed its image down a tube and into different instruments. The Mount Wilson Observatory solar towers, which were designed and built by George Hale, and use what is now known as the heliostatic(for "fixed sun") telescope, are still in use today. Many other observatories throughout the world use heliostatic telescopes; the best-known is the McMath Solar Telescope at Kitt Peak in Arizona. A flat mirror at the top of the almost 500 foot tube shines sunlight down into an underground observation and research room. Such an arrangement offers unprecedented views and details of our star.

Another in a continuing series on lesser-known, but still important, astronomical observatories throughout the world

Mont Megantic Observatory



The Mont Megantic Observatory is located 120 miles east of Montreal, Canada, atop Mont Megantic at 3,600 feet. Established in 1978, it is jointly run by the physics and astronomy departments of the University of Montreal and Laval University and has the second largest telescope in Canda after the David Dunlap Observatory. Professors and students at both universities have access to the 1.6 m(63 inch) Richey-Chrétien telescope, which can be used as both a visual device and a spectroscope. Over the past several years, the observatory has found several asteroids, the most prominent being 4843 Megantic. The total solar eclipse of April 8, 2024 passed directly over the observatory, giving the astronomers at it unprecedented views and research opportunities. **Right-the 1.6 m telescope at Mt. Megantic**

Some Great Astro images
By John LeFay

M64-the Blackeye Galaxy

M31-The Great Galaxy in Andromeda

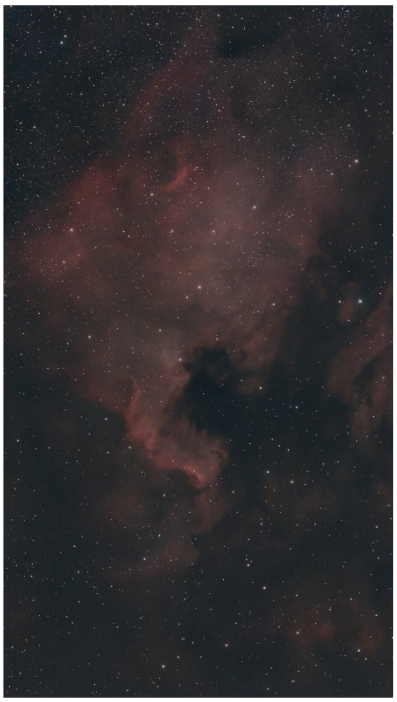
Comet Tempel 2

M11-the Wild Duck Cluster

M22-the Globular Cluster in Sagittarius

NGC 869-884 The Double Cluster in Perseus

Some more great images by Hubert Cecotti



The North American Nebula	The Veil Nebula-“Witch’s Broom”	The Eagle and Swan Nebulas
NGC 7000, Caldwell 20	NGC 6960, Caldwell 34	M 16 and M 17