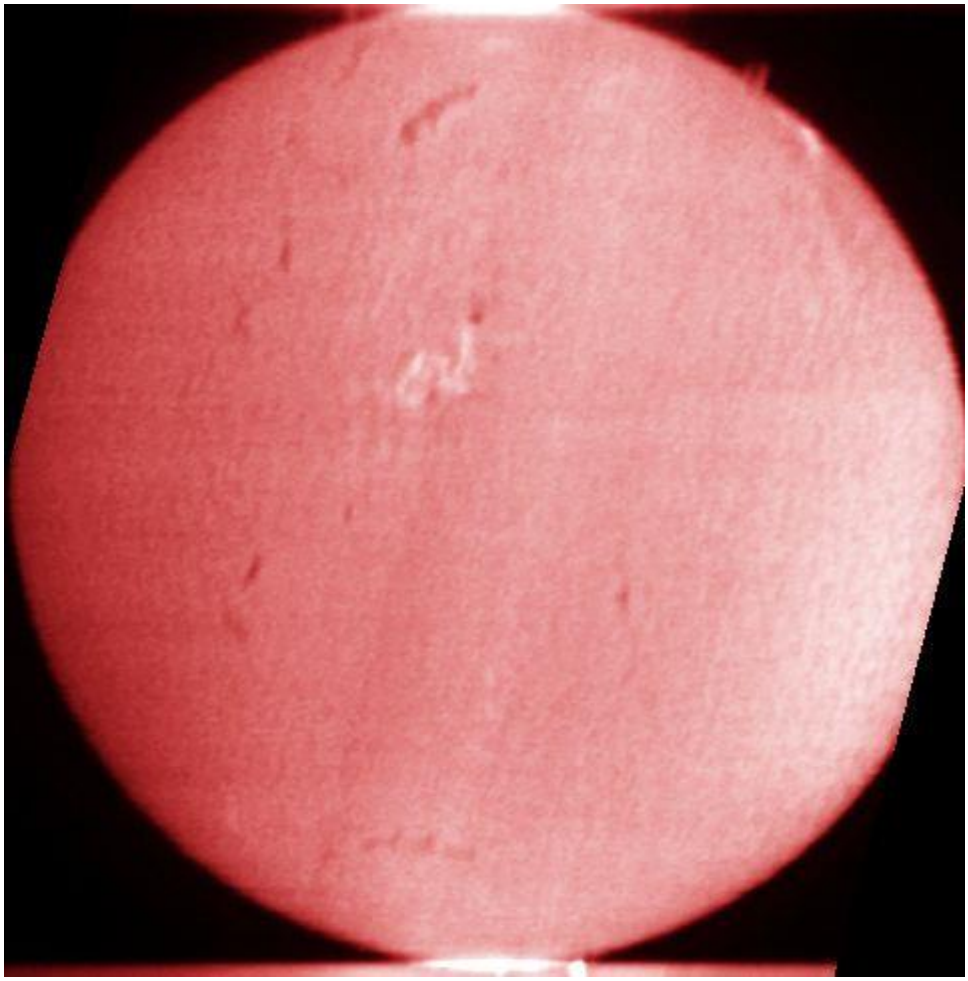
SkyWAAtch



Solar Spectrogram

John Paladini's latest creation is a spectroheliograph—an instrument for imaging the Sun at various wavelengths of light using a diffraction grating (1800 IPMM grating). As John is just starting to explore this technique, the above image is limited to Hα. Still solar flares and prominences are visible. The spectroheliograph is attached to a 40mm scope (pictured on page 11 of this issue). He took an avi sequence and then built the image with software.

In This Issue . . .

Upcoming Lectures

Lienhard Lecture Hall,
Pace University, Pleasantville, NY

As usual, there will be no WAA lectures for the months of July and August. Our Lecture series will resume in September.

Starway to Heaven

Saturday July 11th, Dusk.
Ward Pound Ridge Reservation,
Cross River, NY

This is our scheduled Starway to Heaven observing date for July, weather permitting. Free and open to the public. The rain/cloud date is July 18th. **Note**: By attending our star parties you are subject to our rules and expectations as described here. Directions.

New Members. . .

Meryl Marcus - Hastings on Hudson
Robbin Conner - Millwood
Jordan Webber - Rye Brook

Renewing Members. . .

JDouglas & Vivian Towers - Yonkers
Chris and Regina Di Menna - Brewster
Gary Miller - Pleasantville
William Forsyth - Hartsdale
Glen & Patricia Lalli - White Plains
Sushil Khanna - Katonah
Ernest Wieting - Cortlandt Manor
Barry Feinberg - Croton on Hudson
Arthur Linker - Scarsdale
Charlie Gibson - Scarsdale

RAC SUMMER STAR PARTY
August 7th through August 16th

The Rockland Astronomy Club is sponsoring its summer star party August 7th through August 16th in the beautiful Berkshire Mountains of Massachusetts. This is a wonderful and fun event. For details go to: RAC Summer Star Party.

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

Supernova 1994D

Supernova 1994D, visible as the bright spot on the lower left, occurred in the outskirts of disk galaxy NGC 4526. Supernova 1994D was not of interest for how different it was, but rather for how similar it was to other supernovae. In fact, the light emitted during the weeks after its explosion caused it to be given the familiar designation of a Type 1a supernova. If all Type 1a supernovae have the same intrinsic brightness, then the dimmer a supernova appears, the farther away it must be. By calibrating a precise brightness-distance relation, astronomers are able to estimate not only the expansion rate of the universe (parameterized by the Hubble Constant), but also the geometry of the universe we live in.

Image Credit: High-Z Supernova Search Team, HST, NASA

Credit: APOD

Westchester Amateur Astronomers

Almanac
For July 2015 by Bob Kelly


Jul 1 Jul 8 Jul 15 Jul 24

This month Pluto gets its long-awaited close-up. Venus and Jupiter start the month close up in the twilight sky. And Saturn tilts its rings at a jaunty angle as it tries to get the attention it so rightly deserves.

Pluto may be hard to find even when it comes to opposition this month, but it's served up on a teaspoon. Look to the upper left of the 'teapot' of Sagittarius to see the asterism, which looks like a teaspoon, and Pluto (and its visitor, the New Horizons spacecraft) will be there at the tip of the spoon. So we can point in the right direction when we root for this Pluto-Charon/Kuiper Belt spacecraft.

However, seeing Pluto with your own eyes will take a large telescope, dark skies, a good finder chart and patience. This once and perhaps future planet is magnitude +14 in our skies, distinguishable from the many other faint points of light in Sagittarius by its motion over several days at a time.

New Horizons will sweep past Pluto at 13.8 km /sec (31,000 miles per hour) on July 14th, with only one opportunity to get the photos and data its human masters desire. A day before closest approach, New Horizons is programmed to send a 'contingency sample' of photos, in case it is hit by an errant grain from a Plutonian moon and all is lost. During the time of closest approach, New Horizons' scientists and engineers will wait through 20 hours of silence from the spacecraft, while it performs its complicated ballet of measurements. Shortly after 9pm, Eastern Time, we will stand by to see if New Horizons' "I'm ok" signal reaches Earth after traveling 4½ light-hours from Pluto. If all goes well, on the 15th we'll see some compressed samples of the photos taken by New Horizons. The full versions will take almost a year to send back to Earth, at a 1980's modem rate of 2,000 bits per second. The highest resolution in the uncompressed photos will be from 0.4 to 4 km per pixel. For comparison, that's a little better than the resolution of photos of our Moon taken with a Canon XS camera attached to my 8-inch telescope.

Venus gets larger and skinnier at the same time. Follow Venus as it swings closer to us and get some snapshots as it wanes into a crescent phase. Jupiter (from the Earth's point of view) vainly tries to capture Venus' attention, and settles for hanging together low in the western evening twilight sky. The pair will fall out of the evening sky together by the end of July. Regulus will be the bright background star lyin' around them at mid-month. Compare the crescent Moon and crescent Venus when they are near each other on the 18th.

Fans of the Manhattanhenge will have a second opportunity to see sunset shine all the way down Manhattan's crosstown streets on July 12th or 13th.

Saturn, in the southern sky, is highest just after dark. Its rings are tilted wide open. See how much detail you can see with high power. The inner and outer rings are slightly different shades of off-white. The planet itself has faint cloud bands. If you get great seeing, look for the hexagonal-shaped cloud band wrapped around the polar region, which some photographers have been able to catch.

Mercury scoots past the Sun, showing up in the SOHO's cameras in the last half of July. See sungrazer.nrl.navy.mil and look for LASCO C3 transits for 2015.

Get up early – before twilight starts - on the 12th to see our Moon looking like a boomerang plowing through the V-shaped Hyades cluster. Uranus and Neptune are well placed in the predawn sky all month.

Don't get discouraged looking for Pluto – there's another dwarf planet that's easier to find, and it's also being visited by a space probe, the Dawn spacecraft orbiting the largest member of the asteroid belt. Ceres is near Pluto in the sky, skimming across the lid of the teapot this month at magnitude +7.5, putting in reach of good binoculars and telescopes of all sizes.

The International Space Station is visible in the predawn sky from the 11th through the end of the month. The ISS adds visibility in the post-dusk sky starting on the 30th. The Sun is still close enough to the horizon for satellites to be visible all night in July.

I'm Ready for My Close-up, Mr. DeMille

Larry Faltz

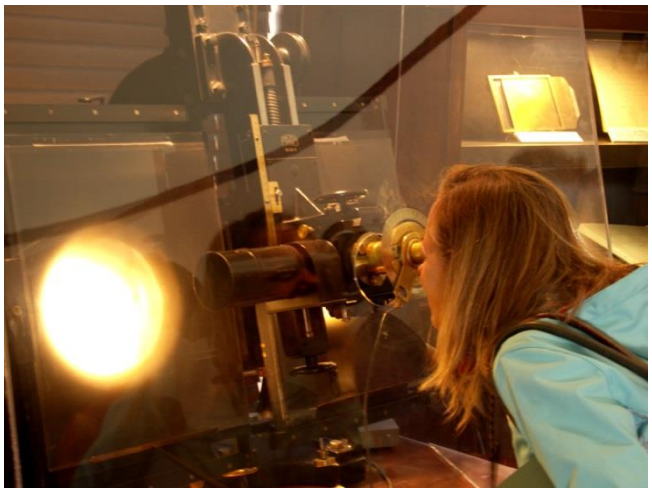
I'm getting used to Pluto not being a planet, or at least not being a full-grown planet. Although the demotion of Pluto initially seemed to be an illogical, ill-tempered insult to astronomy enthusiasts, its downgrade is making more scientific sense as new data comes in from space probes and terrestrial telescopic surveys of aboriginal members of the solar system--asteroids, comets and another newly-christened "dwarf planet," Ceres. When the deed was done by the IAU in 2006, it was hard not to view it as some kind of attack on Clyde Tombaugh's singular hard work and a challenge to our genial enthusiasm for the newest member of the family and our liberal affinity for outsiders and underdogs. We all learned "My Very Educated Mother Just Served Us Nine Pizzas", but the mnemonic no longer made sense. What's our Very Educated Mother going to serve us? Nothing? We'll starve. Mom's not very educated!

Clyde Tombaugh (1906-1997) in a photo taken around the time of the Pluto discovery, 1930

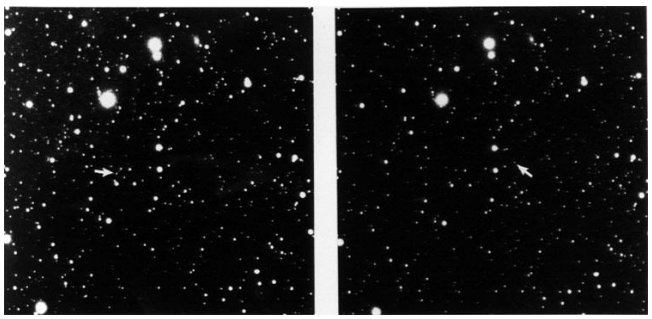
After the discovery of Neptune in 1846 in exactly the location the new science of orbital mechanics suggested it should be, refined calculations for that new planet's trajectory suggested that a more distant body, referred to as "Planet X", might be perturbing its orbit. Many astronomers undertook the search for this object. Percival Lowell, Mars enthusiast and founder of Lowell Observatory in Flagstaff, Arizona, was particularly fascinated by the possible existence of Planet X, even writing a book about it, *Memoir on a Trans-Neptunian Planet*, in 1915. Lowell Observatory continued the project after Lowell's death the following year. The self-educated amateur astronomer Tombaugh came to Lowell in 1929 at age 23 after submitting drawings of Mars and Jupiter that he made from observations with his home-built reflector telescope. Tombaugh spent hundreds of nighttime hours manually guiding Lowell's 13" astrograph refractor, making pairs of images on 14" glass negative plates a week or so apart, and then spent his days comparing the paired images with a monocular blink comparator looking for objects that had changed position between the exposures. In an article in Sky & Telescope in 1960, Tombaugh noted:

> During my share of Lowell Observatory's long-continued searching for trans-Neptunian planets, about 90 million star images were examined in 7000 hours at the blink comparator. Nearly 4000 asteroid images were marked on the plates, 40 of percent of them new, while 1807 variables were noted and 29,548 galaxies were counted. One new globular cluster and six galactic star clusters were byproducts of this search. Only one comet was found, on a pair of plates taken a year earlier. It seems safe to conclude from the Lowell surveys that no unknown planet beyond Saturn exists that was brighter than magnitude 16½ at the time of the search.

As the saying goes, genius is the infinite capacity for taking pains.

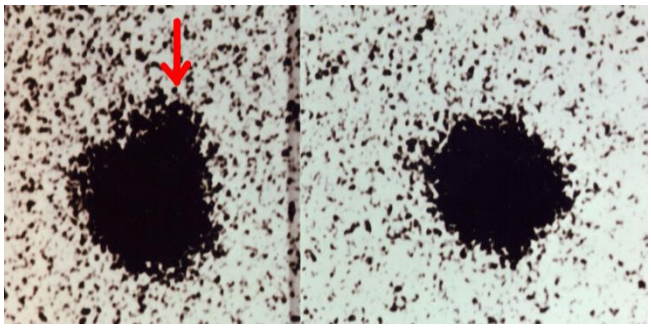


Elyse looking through Tombaugh's blink comparator, on display at Lowell Observatory, 2011 (LF).



Tombaugh's discovery images of Pluto

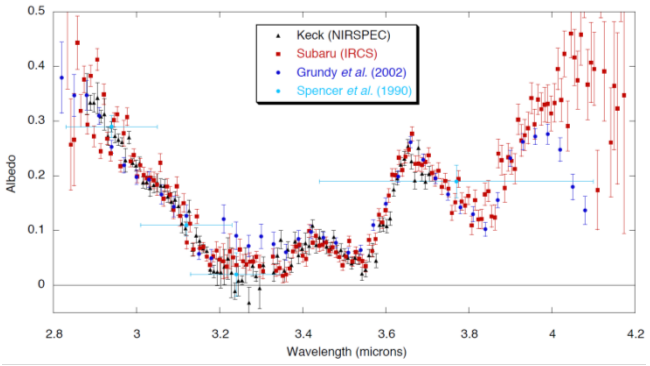
Throughout my childhood in the pre-space flight era, Pluto was one of the most frequently cited avatars of the mystery of the cosmos. Its very existence seemed to mock our attempts to learn anything substantive about very distant worlds. At a time when the 200" Hale telescope at Mt. Palomar was the world's largest and sharpest, Pluto was still just a dot. The pitiful state of knowledge about Pluto up to 1963 is well related in Willy Ley's *Watchers of the Skies*, a book I've referred to in a number of my articles. I admire its scope, detail, organizational clarity and terrific writing, all the more remarkable because Ley, like the great author Joseph Conrad, was not a native English speaker. *Watchers of the Skies* freezes astronomical knowledge as of the date of its publication, so the reader can get a contemporary feel for how the "known unknowns" were conceptualized before the flood of data from modern giant telescopes on Earth and observatories in space. In 1963, what little was known about Pluto suggested it was a "runaway moon" of Neptune that had perhaps been a comet before Neptune captured it in the first place. Ley even presciently writes "The demotion of Pluto from a full-fledged planet to a runaway moon in a planetary orbit explained everything--the nature of the orbit [inclined 17.15° to the ecliptic], the period of rotation [6.39 days], even the small mass, now taken to be about one-thirtieth of that of the earth." [The mass calculation was based on assumptions now known to be wrong. Pluto's mass is now estimated to be just 0.22% that of Earth's.] Pluto's official demotion to "dwarf planet" status by the IAU was not based on these data, but arose from considerations of its relationship to the growing number of similar objects near it, and it's almost certainly not a runaway moon.



Discovery image of Charon. The bulge on the top of Pluto's limb (arrow) is not present on an image taken earlier. It was found on images dating back 13 years and because of its regular periodicity, a moon was identified as its source.

The Hale telescope didn't bother much with Pluto, and I couldn't find any Pluto images from it. Pluto's moon Charon was discovered in 1978 using another instrument in northern Arizona (independent from the Lowell Observatory), the 1.55-meter Kaj Strand Astrometric Reflector at the United States Naval Observatory Flagstaff Station. Exactly what the Navy was doing looking at Pluto is beyond me. It's unlikely that you have to worry about sailing an aircraft carrier into it. Anyway, the discovery of Charon allowed Pluto's mass to be estimated much more accurately.

Spectroscopic observations by terrestrial and space telescopes in the modern era have been able to provide some interesting details about Pluto. Surface ices of H_2O, CH_4, N_2, CH_3OH, C_2H_6, CO, CO_2, NH_3, and HCN have been found on Pluto and other trans-Neptunian bodies; water ice is by far the most common chemical species. Even more detail about its surface properties has been derived from recent data. For example, in 2007 a team using data from the Keck and Subaru telescopes on the summit of Mauna Kea examined Pluto in the near infrared region of the spectrum.



Combined spectrum of Pluto and Charon (C. B. Olkin et al. 2007; *The Astronomical Journal* 133: 420)

Based on a variety of models, they concluded that:

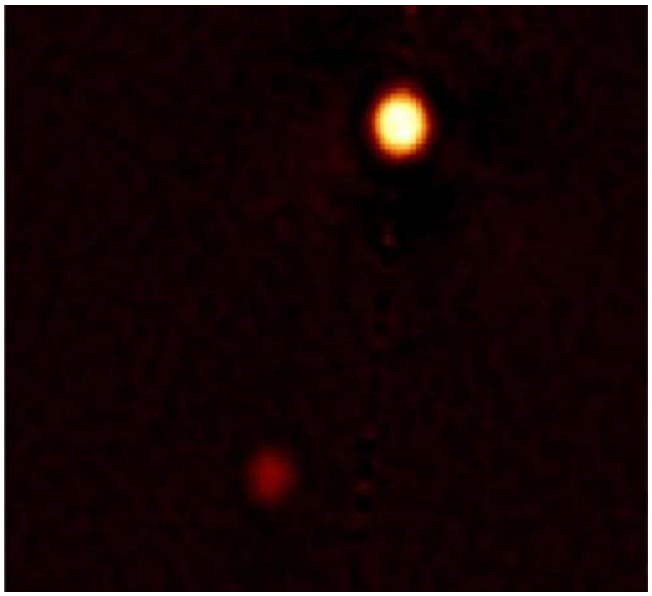
> The surface area of pure nitrogen frost (as opposed to nitrogen with dissolved methane) is constrained to be 6% or less. The areal fractions of pure methane and methane dissolved in nitrogen are almost equal. The grain size of pure methane is constrained to be near 200 μm. An additional surface component with spectral properties similar to Titan tholin was necessary to fit the entire 1-4.2 μm spectrum; our best-fit model requires 21% of Pluto's anti-Charon hemisphere (by area) to be this Titan tholin component. Contrary to Sasaki et al.'s spectra of Pluto's sub-Charon hemisphere, we find no evidence for other hydrocarbons on this face of Pluto from data in the 3-3.3 μm region.

In 2014, using archived data acquired in the 1990's by SCUBA, the Submillimeter Common-User Bolometer Array on the James Clerk Maxwell Telescope, a 15-meter dish near the summit of Mauna Kea, Scottish astronomer Jane Greaves and her undergraduate stu-

dent Alisa Whitelaw found a signal at a wavelength of 0.85 mm that they think is generated by a layer of frozen nitrogen and methane under a patch of water ice and tholins.

The domes of the James Clerk Maxwell Telescope (R) and the 10.4 meter Caltech Submillimeter Telescope on Mauna Kea (photo by the author, 2012)

Tholins are carbon-nitrogen polymers that form under the influence of ultraviolet radiation. They are not found on Earth, but are common on the surface of comets and icy outer solar system bodies, particularly abundant on the surface and in the atmosphere of Saturn's moon Titan, where they are responsible for its yellow-red color. They may be the source of much of the carbon and nitrogen on the nascent Earth, as inputs into the development of life. It's amazing that these deductions can be made from Earth. They are a testament to the quality of the instruments, the ingenuity of the astronomers and the connections that science fosters through open publication and free discussion.

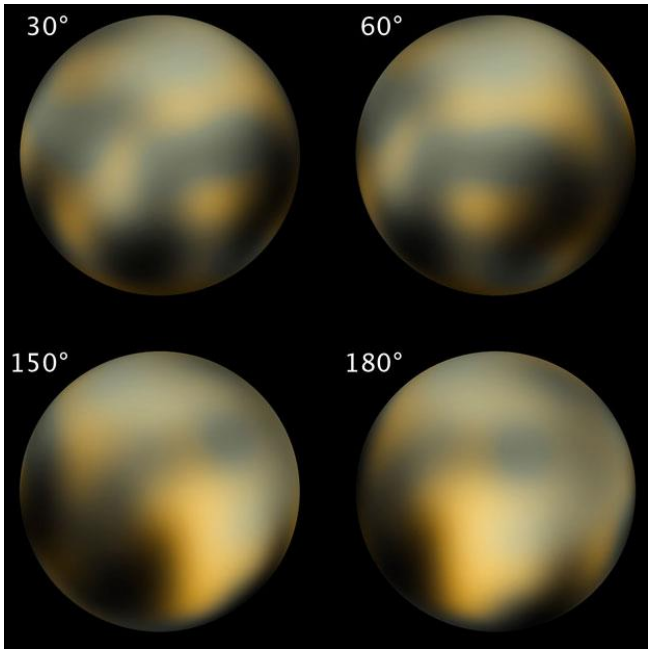


Gemini North image of Pluto and Charon

In spite of these details, the mystery of Pluto has not lessened very much. For that we need to see the planet as a world, not as a graph of spectral data. Voyager gave us fabulous images of the gas giants and their moons, but that only heightened frustration that Pluto, not reachable by either Voyager spacecraft, was still just a mysterious and unknowable speck. We could measure it, but we couldn't really *see* it.

Improvements in terrestrial telescopes in the 1990's turned Pluto from a dot to a larger but still featureless blob. The best photo of Pluto from Earth, taken with the 8.1-meter Gemini North telescope from the top of Mauna Kea using a technique called reconstructive speckle imaging, shows of the planet and its largest moon Charon as featureless smudges.

Even the Hubble Space Telescope's view of Pluto shows only the barest hint of surface details, albedo differences of uncertain origin.

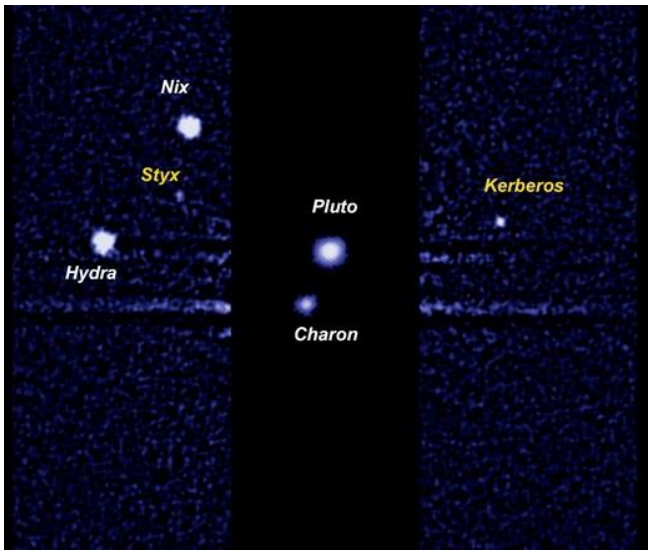


Hubble images of Pluto

But that will change soon. We're about to get a close-up look at Pluto. On July 14th, NASA's New Horizons spacecraft will pass through the system, acquiring images and scientific data with detail that was previously unimaginable.

The name Pluto itself was suggested by Venetia Burney, an 11-year-old girl from Oxford, UK. It was the winner among many names that were mailed and telegraphed in to Lowell Observatory after the discovery was announced on March 30, 1930. It's consistent with the Roman names given to the other planets, ex-

cept for Uranus, which is a Greek name (the Roman name is Caelus). Tombaugh liked the name Pluto because he wanted to honor Percival Lowell. The first two letters of Pluto are Lowell's initials, and its symbol is an interlocking P and L: ♇. It is not true that the body was named after Mickey Mouse's dog. Pluto the cartoon character made his debut in September 1930, after the debut of Pluto the planet (oops, dwarf planet). The names of Pluto's 5 satellites, 4 of which were discovered recently by the HST, are taken from Greek mythological characters related to the underworld, of which Pluto is the (Roman) god. That the names are Greek and not Roman is a little inconsistent, but I expect that the Romans would probably not have been terribly upset. Greek culture and language were held in high esteem in ancient Rome. Some astronomers think that New Horizons will discover more moons and even perhaps some thin rings. We're already delving into the rather obscure recesses of Greek mythology to name them. We'd better start reading Ovid's *Metamorphoses*, the primary source for the most famous Greek myths.



The Pluto system, combined images by Hubble

The IAU asked the public to suggest names for features on Pluto and its satellites that will be discovered by New Horizons. IAU naming conventions are fairly strict, but at least they are consistent. Names will have to meet the following criteria for each body:

Pluto [Roman name for the god of the underworld]

- Names for the Underworld from the world's mythologies.
- Gods, goddesses, and dwarfs associated with the Underworld.
- Heroes and other explorers of the underworld.
- Writers associated with Pluto and the Kuiper Belt.
- Scientists and engineers associated with Pluto and the Kuiper Belt.

Charon [boatman who ferried the dead to the underworld]

- Destinations and milestones of fictional space and other exploration.
- Fictional and mythological vessels of space and other exploration.
- Fictional and mythological voyagers, travelers and explorers.

Styx [the river into the underworld]

- River gods.

Nix [goddess of darkness and night, mother of Charon]

- Deities of the night.

Kerberos [the 3-headed guard dog of the underworld]

- Dogs from literature, mythology and history.

Hydra [9-headed monster that guarded the underworld]

- Legendary serpents and dragons.

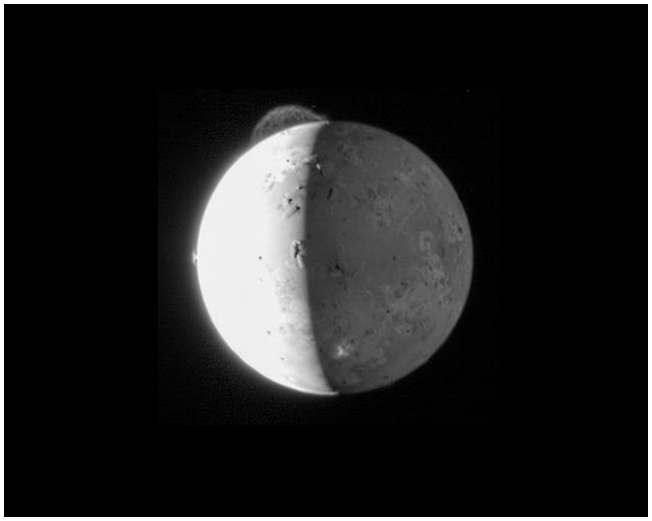
Unfortunately the window for suggesting names closed on April 24th. At least forty thousand appellations were submitted. I imagine practically every historical or literary dog name is already on the list. I would love to see a crater on Kerberos (you may be more familiar with the Roman name, Cerberus) named "Santa's Little Helper" after the Simpson's pet (hey, the Simpsons count as literature in my book!) A mountain on Hydra named "Godzilla", "Mothra" or "Rodan" would suit me just fine too. It would help for the IAU to show a sense of humor.

New Horizons was approved in 2001 after a succession of even more complex and expensive missions to Pluto were rejected for budgetary reasons. At $700 million over the life of the project, New Horizons is actually a bargain. Consider that the James Webb telescope project will cost almost $9 billion and these days Medicare spends $700 million in about 12 hours.

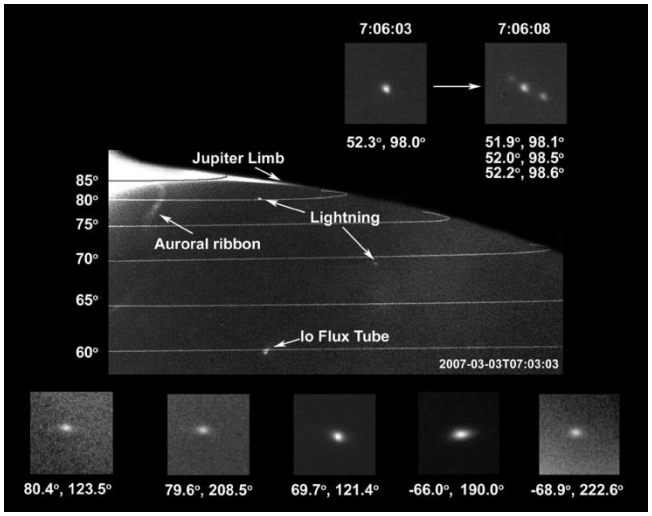
The half-ton New Horizons was launched on January 19, 2006 aboard an Atlas V rocket. It achieved the highest launch velocity of any man-made space vehicle, reaching 36,373 miles per hour (16.26 km/sec). It took only 9 hours to pass the moon's orbit. New Horizons passed Jupiter on February 28, 2007, using it for a gravity assist. This maneuver added 9,000 mph to its velocity, reducing the time needed to get to Pluto by at least 2 years. After using its scientific instrumentation to examine the giant planet and some of its satellites, the probe was put into a hibernation mode, with annual wake-ups for tests and readjustments of its trajectory, until it was fully reactivated on December 6, 2014.

The Jupiter fly-by was actually a thorough 4-month examination of the Jovian system with instruments

much newer and more sophisticated than those aboard the Galileo mission that scrutinized Jupiter from 1995 to 2003. New Horizons observed lightning and auroras in the planet's atmosphere, imaged volcanic eruptions on Io, and measured the Jovian magnetosphere, the bubble of charged particles that surrounds the entire system.



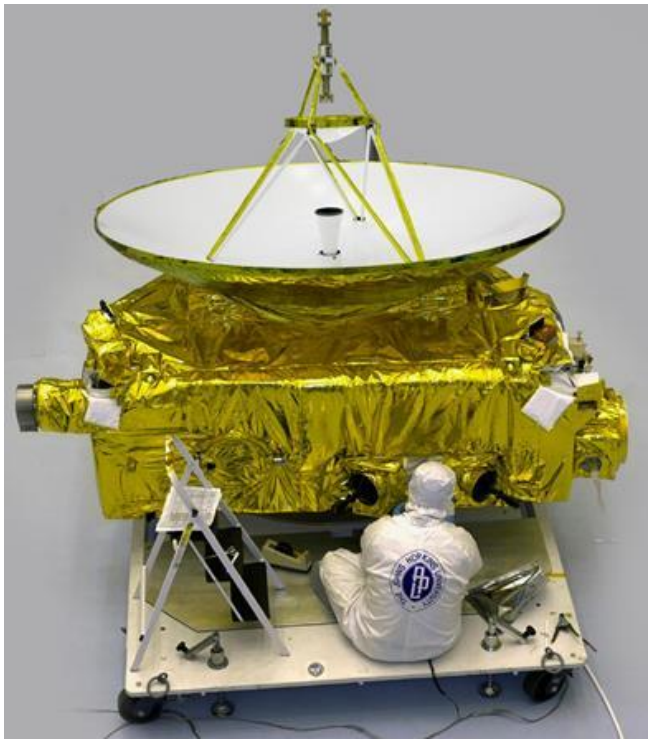
Eruption of the Tvashvar volcano on Io from New Horizons



Lightning on Jupiter as imaged by LORRI. *Science* 2007; 318: 226-229

Solar panels are useless at Pluto's distance, so New Horizons is powered by a radioisotope thermoelectric generator. Its thrusters utilize hydrazine, as is common on NASA's spacecraft.

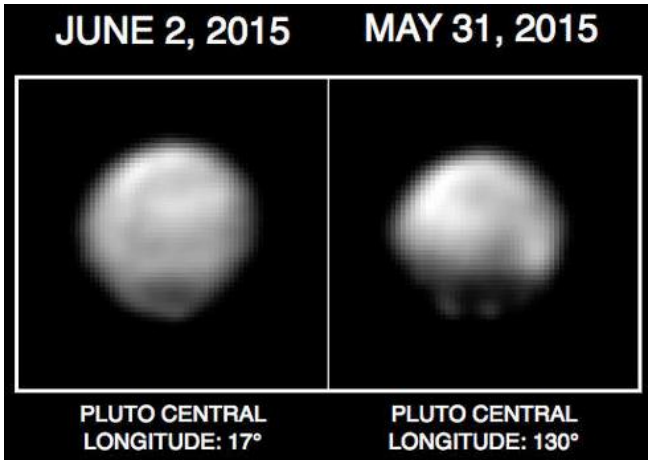
The probe carries a number of instruments designed to make a thorough survey of the Pluto system. Imaging and spectroscopy will encompass infrared, visible and ultraviolet wavelengths. The scientific goals are to map the surface composition of Pluto and its satellites, characterize their geology and morphology, investigate the atmosphere of Pluto and determine its escape rate and interaction with the solar wind, search for an atmosphere around Charon, record surface temperatures, search for rings and additional satellites, and, if possible, conduct similar investigations of one or more Kuiper Belt objects to which the spacecraft might be targeted after the Pluto flyby.



New Horizons nearing final completion

A unique instrument is the Student Dust Counter, built and operated by students from the University of Colorado. The device consists of panels of polyvinylidene difluoride facing in the direction of the probe's travel. They register a voltage when impacted by dust particles. The students named the SDC for Venetia Burney. To honor Pluto's discoverer, New Horizons carries a small vial of Clyde Tombaugh's ashes.

The main camera is the Long Range Reconnaissance Imager (LORRI), an 8.2-inch Ritchey-Chretien telescope with optics made of silicon carbide, to which is attached a cooled 1024x1024 pixel CCD imager. Resolution is about 1 arc-sec. LORRI images as far back as July 2014 showed the rotation of Pluto and Charon around a common barycenter. In April 2015, higher resolution images clearly show the phenomenon. It may be that the Pluto-Charon system should properly be called a "double dwarf planet." Albedo variations on Pluto were evident on LORRI images by April.



LORRI images of Pluto

When New Horizons reaches Pluto on July 14, 2015 at 11:50 UT (7:50 EDT), it will be travelling at 30,800 mph (13.78 km/sec). Pluto will be 32.9 astronomical units from Earth. The spacecraft will get within 6,200 miles of Pluto and 17,000 miles of Charon. New Horizons is programmed to do a da

nce as it passes through the system. The craft will use its thrusters to rotate in a complex set of maneuvers to allow its instruments to inspect the various members of the system. The complicated choreography can be seen in a downloadable NASA simulation video. I was reminded of Catherine Zeta-Jones' gyrations among the lasers beams in the film *Entrapment*.

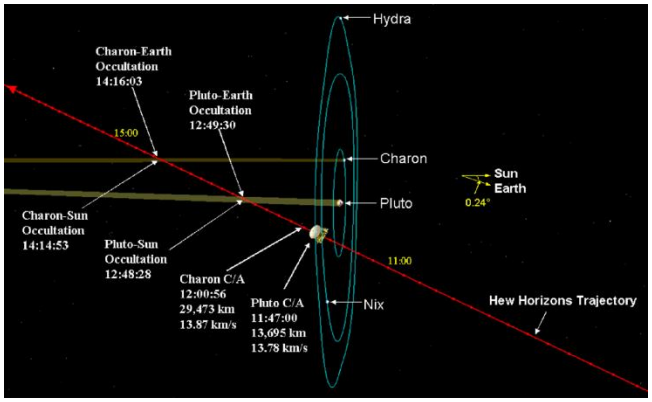
When the Hubble Space Telescope detected the first of the smaller moons of Pluto in 2011, mission planners had to consider whether New Horizons might encounter rings or debris from collisions of small objects with Pluto or the other moons. They calculated a 0.3% possibility of a catastrophic impact. An object as small as a grain of rice could be fatal. There are contingency plans to minimize damage by reorienting the probe, possibly flying it closer to the surface of Pluto where the amount of space rubble would be minimal. The observing plan would have to be modified in that case. More will be known as New Horizons gets closer to the planet and new scans using LORRI are processed.

Radio signals broadcast from Earth will be attenuated and then blocked as the probe passes behind Pluto. Measurement of this "radio eclipse" will permit refinements in Pluto's diameter and its atmospheric density and composition.

Pluto is 4½ light-hours distant. We will probably see the first images on the morning of July 15th. New Horizons sends data at 768 bits/second. The first images will be compressed so that we can see *something* and slake our curiosity and anticipation. Over the next 9 months, larger uncompressed data files from the various instruments will be transmitted at a rate determined primarily by traffic on NASA's Deep Space Network of radio telescopes, which also has to receive data from other space missions. After the Pluto encounter, New Horizons will search for other Kuiper Belt objects to study. Right now, 2014 MU_{69}, an object discovered by the HST in 2014, looks to be the most likely candidate. New Horizons could pass by this body in January 2019 when it is 43.4 AU from the Sun. 2014 MU_{69} is thought to be 19-56 miles in diameter, based on its magnitude of 26.8 and an expected albedo of 4-10%.

This year we stand to learn a lot about the early solar system. Three missions (Dawn orbiting Ceres, Rosetta flying along with Comet 67/P Churyumov–Gerasimenko and New Horizons at Pluto), each bold and technologically sophisticated, are studying objects that have seen relatively little change in their composition since the formation of the Solar System 4½ billion years ago. Some surface alterations due to solar and cosmic ray activity and physical collisions with other bodies have certainly occurred, but tectonic processes don't have a place in the evolution of these worlds. The observations will help settle questions about the origin and evolution of the Solar System and ultimately have a bearing on the question of how planetary systems form around protostars, although it is almost certain that new mysteries will arise as discoveries are made.

Many more pre-encounter images will have been published since this article was written in early June. You can follow the mission on the Johns Hopkins Applied Physics Laboratory or NASA web sites.



New Horizons' trajectory through the Pluto system

World Science Fair
Claudia Parrington

Kevin and I were able to take part in the 2015 World Science Festival recently—"Night Lights, Big City: Stargazing". The event took place at Brooklyn Bridge Park right by the water. Along with stargazing, there was music. Additionally, several astrophysicists and NASA personnel gave lectures (see World Science Festival). One woman was there with a robot that danced; it was interesting to see everyone's reaction to a dancing robot.

We set up our scope early and we were able to take advantage of the view of the Brooklyn Bridge, the Statue of Liberty and the Freedom Tower. There were a variety of different scopes at the event; so many it was difficult to talk to everyone. There was someone that had an older reflective telescope that was quite interesting; it was brass in color and extremely fragile. We had my Celestron SLT 90mm and Kevin's 11" Celestron. There were members from Amateur Astronomers Association of New York (AAA) and the ASO that also brought their scopes.

We had originally thought that we weren't going to have a good night, but the clouds held out until we packed up around 11pm. It was hard for everyone to align their scopes—the crowds kept getting bigger and we just didn't have the time.

It was easiest for Kevin and me to just align our scopes to the planets and the Moon. I had my scope on the Moon most of the time because it was the best view.

Kevin looked at Venus and Saturn, with Saturn being the favorite. I had put my scope on Saturn. But the view wasn't as nice since we didn't bring our zoom lens. It was interesting to be in between Kevin's large scope and the antique scope. Most people just passed my little guy without looking. This is the third time we have attending this event and it's something that we look forward to year after year.

Kevin Parrington at the telescope

Kevin discusses his C11

Sidewalk Astronomy
Claudia Parrington

It was a nice night on June 24th; so Kevin and I decided to do some sidewalk astronomy on Mamaroneck Avenue in Mamaroneck, near the Radio Shack. It was really hot and humid the night before but this night, the weather was great. We had packed up the 90mm SLT, and we were set up within 10 minutes. At first it was still light out so we were just looking at the moon. People were coming over and amazed at how they could see the craters on the moon. We found out that Mamaroneck had their high school graduation; so the town was busy. Once it got darker we were able to see Venus and then Jupiter and finally Saturn. Sharon and Steven Gould had met up with us so we were having our own little party. Sharon had some questions about an eyepiece she was thinking of purchasing and wanted to ask Kevin about it. We continued to get crowds of people. Even though the street was lit up, people were still having a great time. We were able to

get the WAA name out there to locals who didn't know about us.

Kevin was in his zone. He loves these types of events and was eager to answer the questions that everyone had. I did find it amusing that people were able to spot which bright object was Venus and which was Jupiter. We had put Venus in the scope. But it wasn't exciting; so we then moved to Jupiter. Here the detail in the largest planet fascinated people.

Even though it was bright out, people were still able to see about 3-4 of Jupiter's moons. At one point, we had a police officer come up, and we were worried that he was going to ask us to leave. But it wound up that he was just as intrigued as everyone else. He even called another officer over. Over all, the excitement that we received from everyone makes us love side-walk astronomy even more!

Kevin and Claudia Parrington showing passersby the night sky

Photos

John Paladini's Heliospectrocope

Larry Faltz took this image of Venus from Wainwright House in Rye (shot with a cell phone, accounting for the noisy image.)

Spring WAA Outreach Activities

The club had a busy spring of outreach events for old and new friends.

Quaker Ridge School, Scarsdale—3/23—Our annual viewing event for the entire 3rd grade class in the Scarsdale school system (with their siblings and parents) was, as usual, a huge success. At least 8 members brought telescopes to this well-attended event, first-time telescope viewing for most of the attendees.

Yorktown Heights Scouts—4/24—Dede Raver led a group of WAA members in a viewing session at the Yorktown Grange for cub scouts, brownies and their families.

Chappaqua STEM Fest—4/25—WAA member Mayan Moudgill invited us to take a table at this very-well attended science fair. I set up both white-light and H-alpha solar scopes outside the Bell Middle School and showed the sun to at least 75 kids and their families.

Greenburgh Library—5/4—I answered questions about the Rosetta mission after a screening of last fall's Nova special on the project.

Stars over the Harbor, Rye—5/22—Our 3rd annual lecture and viewing at historic Wainwright House. Members brought six telescopes ranging from 90 mm to 14" (Mike Lomsky's brand-new Orion truss-tube Dobsonian).

Sidewalk Solar Astronomy, Larchmont—5/23—Charlie Gibson and I did an impromptu solar star party at the Larchmont Farmer's Market. Charlie's Baader-filtered Stellarvue 80 mm f/6 triplet showed a crisp white-light view and I used my Lunt 60 H-alpha scope.

Ethical Culture School, White Plains—5/29—Charlie Gibson, Bob Kelly and I showed the moon, Venus and Jupiter to a group of kids and their parents.

Maplewood Street, Larchmont—6/7—I often view the sun from the sidewalk in front of my house, engaging occasional dog walkers and other passers-by. My neighbor's young daughters were excited to get their first look through a telescope, an H-alpha view of the solar disk on a particularly transparent day with good seeing. They graciously made their own thank-you notes.

Larry Faltz