March 2012

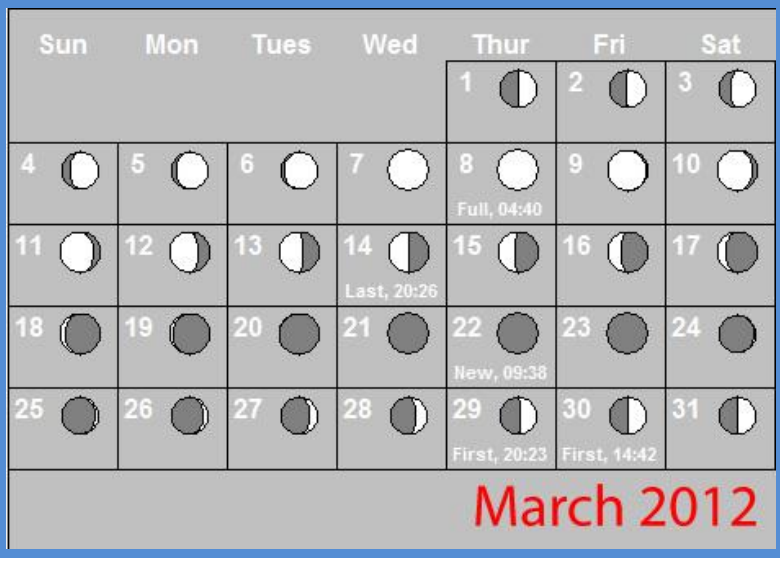
Inside this Issue:

March Meeting

The next meeting of S*T*A*R will be at 8pm on Thursday, March 1st , 2012. The speaker will be William Anthony, Research Director for the New Jersey Astronomical Association, whose talk is titled "Venus, Volcanoes, and ALPO." Named after the Goddess of Love, the planet Venus is home to one of the most brutally harsh environments in the solar system. Shining like a diamond in the evening sky, Venus has been noted for strange phenomena in recent years. This presentation will tie together Venus; work done by the Association of Lunar Planetary Observers (ALPO) and the volcanic system of Venus.

Calendar

- February 29th 2012 – Mill Lake Elementary School Star Party
- March 1st 2012 – March meeting



April Issue

Please submit articles and contributions for the next *Spectrogram* by March 27th. Please email to fowler@verizon.net.

Star Parties:

Astronomy Night

Mill Lake Elementary School in Monroe Township is holding their annual Astronomy Night on Tuesday, February 29th 2012. They have asked if we could set up several telescopes for the students and parents. The school is located at 115 Monmouth Road, Monroe Township, NJ 08831.

We can arrive and set up in the rear of the school at 6:00. In the past there was pizza, subs and soda for the astronomers. The students will start to arrive at 6:30 and it should end about 8:30.

This event goes on rain or cloud. There are indoor stations where the students are engaged in hands-on activities supervised by the teachers. There will be a Starlab Planetarium and an exhibit of Moon rocks. There are about 180 students plus parents and siblings but they will come out to observe in class sized groups.

The last two years we were able to observe but the two previous years the skies were overcast and the astronomers did the observations through breaks in the clouds or came inside the gym and showed the students how their telescopes worked and viewed pictures of galaxies across the room.

Please post if you can help.
Please monitor "Events and Observation Plans" link on our web site for updates.

Russ Drum and Dennis O'Leary are contacts for the Club.

Are you a S*T*A*R Member?

S*T*A*R, The Society of Telescopy, Astronomy, and Radio, has promoted amateur astronomy since 1957 when it was organized by an energetic group of observers who participated in Project Moonwatch, a program in which a worldwide network of observers tracked the path of Sputnik among the stars of the night sky to obtain information on how the earth's atmosphere affects satellite orbits. This group soon evolved into an amateur astronomy club which was incorporated under its present name in 1969.

Today, S*T*A*R is the focal point for amateur astronomy in Monmouth County, NJ, attracting members of all ages, occupations and educational backgrounds. Its objectives are to promote the enjoyment of astronomy, and to increase the level of astronomical knowledge among its members and the public. The club achieves these goals through its regular meetings, observing nights, field trips, cooperation and exchange of information with other clubs, and special activities such as assisting Bayonet Farm in Holmdel and other park systems in conducting public astronomy programs.

S*T*A*R meetings are held on the first Thursday of the month from September to June, at 8 pm at the Monmouth Museum on the campus of Brookdale Community College, Lincroft, NJ. Programs generally consist of lectures and discussions by members or guest speakers on a variety of interesting topics on astronomy. Refreshments are served during the meeting and, weather permitting, a short observing session may occur afterwards.

The club owns 8" f/8, 13" f/4.5 and 25" f/5 Dobsonian telescopes which are available for use by members. Because of its large size use of the 25" requires the supervision of two qualified operators. To borrow a telescope or become a qualified operator of the 25", please contact the Vice President.

The current officers of S*T*A*R are:

President	Rob Nunn
Vice President	Kevin Gallagher
Secretary	Steve Fedor
Treasurer	Arturo Cisneros
Member at Large	Dave Britz

S*T*A*R is a member of United Astronomy Clubs of New Jersey (UACNJ), the Astronomical League (AL), and the International Dark Sky Association (IDA).

Memberships:
( ) Individual....$35
( ) Family...$45
( ) Student… $15

Name_____

Address_____

City_____State___Zip_____

Phone_____

Email_____

Make checks payable to: S*T*A*R Astronomy Society, Inc. and mail to P.O. Box 863, Red Bank, NJ 07701

February Meeting Minutes

The February 2, 2012 meeting of S*T*A*R Astronomy Club began at 8:10 p.m. The meeting was held in the Nilson Gallery of Monmouth Museum and was attended by about 45 people. President Rob Nunn chaired the meeting and began by presenting the agenda and asking if there were first-time attendees. Six new attendees introduced themselves. Some had heard of S*T*A*R through friends, and others through the club web site.

Rob then introduced the speaker for the evening. Dr. Tad Pryor is a professor in the department of physics and astronomy at Rutgers University. His talk was titled "Measuring the Motions of Satellite Galaxies with the Hubble Space Telescope." He began by illustrating the positions of about a dozen satellite galaxies, and describing how they were discovered. Some, such as the Magellanic Clouds, are visible to the naked eye, while some dwarf galaxies are very faint and required advanced search techniques. Distances to the galaxies were determined by observation of cepheid variable stars. The objective of Dr. Pryor's research is to discover the mechanism by which the Milky Way and its satellite galaxies formed. In this effort he works with Professor Rachel Sommerville of Rutgers, who simulates clumping of dark matter. (Dr. Pryor noted that Professor Sommerville might be willing to speak to the club about her research.) Galaxies are known to be associated with dark matter, so the distribution of dark matter should suggest the distribution of galaxies. While the number of small observed galaxies is less than the number of small simulated clumps of dark matter, there appears to be good correlation with the simulation results for the larger galaxies. After finding the galaxies, the next step is to measure their motions in order to check agreement with the simulations. Since motions are small, determining them in a period of a few years requires careful analysis. Dr. Pryor has developed techniques to detect motions that correspond to about 0.005 times the size of a single pixel of the detector. His first results from a few years of observing show indications of a rotation of the satellite galaxies around the Milky Way. Dr. Pryor's talk was very well received, and he addressed many questions through the talk and through the break.

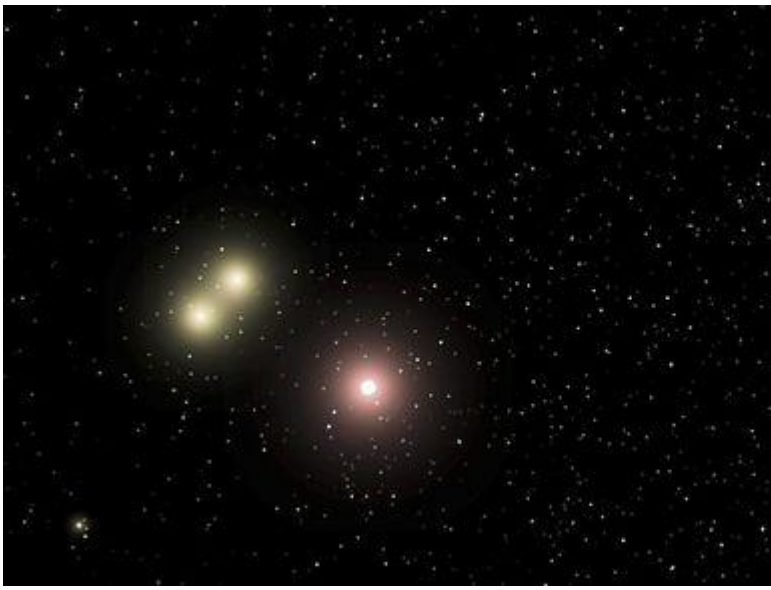
Following a 25-minute break, Ken Legal presented an explanation of the use of the Skygazer Almanac in the January issue of Sky and Telescope magazine. The almanac shows that Venus will reach an unusually large angular distance from the sun this spring. Ken noted that comet Garradd will be near M92 Friday, and another club member noted that the ice caps of Mars are visible.

After Ken's talk, Rob mentioned the club's effort to regain access to Coyle Field, and Russ Drum announced the Mill Lake School star party to be held on February 29. George Plumfield suggested that the 25-inch telescope be advertised in Astromart for possible sale at NEAF in April.

The winning ticket for the 50/50 drawing was held by one of the new attendees, who won $17. The meeting concluded about 10:30 p.m.

New "Super Earth" Found at Right Distance for Life

Dim star would give any atmosphere red glow, like "evening all the time."



An artist's depiction of GJ 667Cc orbiting a red dwarf, with its binary companion stars in the distance.

A new planet—probably a rocky super-Earth—has been found squarely within its star's habitable zone, making it one of the best candidates yet to support life, its discoverers say.

The planet, dubbed GJ 667Cc, orbits a red dwarf star 22 light-years from Earth, in the constellation Scorpio. A binary pair of orange dwarf stars are part of the same system.

The new planet has a mass 4.5 times that of Earth and orbits its host star every 28 days.

The red dwarf is relatively dim, so the planet receives slightly less light from its star than Earth does from the sun. But most of the star's light is infrared, so the planet should absorb more of its incoming energy than Earth does from sunlight.

That means if the planet has a rocky surface—which is predicted for planets less than ten times Earth's mass—and an atmosphere, it could support liquid water and maybe life,

said co-discoverer Guillem Anglada-Escudé, who conducted the work while at the Carnegie Institution for Science in Washington, D.C.

"If it has an atmosphere, it's probably reddish all the time, because the star is really red," Anglada-Escudé said. "It would be like being evening all the time."

For any hypothetical observers on the surface, the binary stars in the distance would be "very prominent in the sky, and it would be an exotic thing."

Rocky Planet Around Unexpected Star

Anglada-Escudé and colleagues found the new planet using public data from the European Southern Observatory, which hosts telescopes that can measure wobbles in a star's orbit caused by a planet's gravitational tug.

The new super-Earth was somewhat unexpected, because some planetary-formation models say that metal-poor stars such as GJ 667C shouldn't have terrestrial planets around them.

In stellar terms, metals are elements heavier than hydrogen and helium. Such heavy atoms—including carbon, oxygen, and nitrogen—are the "building blocks" for rocky planets. If a young star has fewer metals, the theory goes, so does its disk of planet-forming debris.

Still, the results might not be that surprising, said Aki Roberge of NASA's Goddard Space Flight Center, who wasn't part of the study team.

"We know it's more likely to have a gas giant planet around a metal-rich star, but we don't really know if that holds to [lower mass, rocky planets], because we haven't found enough of them yet," Roberge said.

But smaller objects, such as asteroids and comets, have been found around low-metal stars, so "there doesn't appear to be any favorability for being a low- or high-metallicity star," she said.

For metal-poor stars, "maybe it's easier to form smaller things, [like] small rocky bodies, [than] to form a massive giant planet."

New Super-Earth May Be First of Many

Study co-author Anglada-Escudé, who is now a postdoc at the University of Gottingen in Germany, would like to eventually confirm that GJ 667Cc is in fact a potentially habitable super-Earth.

That would require a transit observation, when astronomers measure the dimming of the host star's light as the planet passes in front of the star, as seen from Earth.

Transit data can help astronomers determine a planet's density—and thus its composition—and possibly observe its atmospheric characteristics.

With our current view of the red dwarf, a transit of GJ 667Cc has about a one-percent chance of happening, he said.

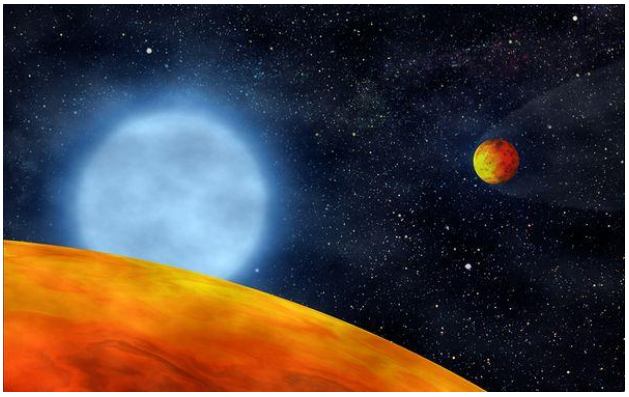
But so far, planets outside our solar system have been discovered in so many different configurations that it's possible GJ 667Cc is the first of many super-Earths orbiting metal-poor stars, Anglada-Escudé said.

"What we expect with new instruments coming online is we can find 20 or 30 of these objects" in the near future, he said. "So within two or three years, one of them has to transit."

The new super-Earth will be described in an upcoming issue of the Astrophysical Journal Letters.

Two Earth-Size Planets Born of Battered "Jupiter"?

Worlds orbiting a dying star may be pieces of a broken gas giant, study hints.



An artist's impression of two planets orbiting close to a hot subdwarf star. Illustration courtesy S. Charpinet

Two Earth-size worlds orbiting perilously close to their dying star may be the fractured remnants of a Jupiter-like gas giant, a new study suggests.

The planetary pair—discovered using NASA's Kepler space telescope and announced in the journal Nature last December—are just under Earth's radius. Both orbit a so-called subdwarf B star dubbed KIC 05807616, which sits about 4,000 light-years away.

When sun-like stars run out of hydrogen fuel, they enter a red giant phase, in which their gas envelopes can swell to several hundred times their original size.

Eventually a red giant's gas envelope will slough off entirely, leaving behind a dense stellar corpse known as a white dwarf. Sometimes, however, a red giant will lose its gas envelope prematurely to form a subdwarf B star, like KIC 05807616.

The scientists who discovered the roughly Earth-size planets in Kepler's data had proposed that both worlds were once gas giants, like Jupiter or Saturn, that had been pulled nearer to their star when it ballooned during the red giant phase.

Plowing through the dying star's swollen atmosphere burned away the planets' liquids and gases, that team suggested, leaving behind the two rocky pits that Kepler sees as Earth-size worlds.

But a new study, by astrophysicists Ealeal Bear and Noam Soker of the Israel Institute of Technology, offers an alternate explanation.

It's possible that both worlds actually come from a single gas giant planet at least five times more massive than Jupiter that was stripped naked by the dying star, the researchers say.

The lone planet's rocky core was then ripped apart by the star's gravity into several Earth-size chunks.

Planets' Resonance a Problem?

Bear and Soker developed the new theory because of their concerns over the Earth-size planets' orbital resonance, a gravitational interaction that involves two objects orbiting a third body in a predictable pattern.

The Kepler planets have an orbital resonance that's almost exactly 3:2—that is, one of the planets completes three orbits around the star in the time it takes the other planet to complete two orbits.

The planets' discoverers had suggested at the time that the worlds had already been in a 3:2 resonance before they were engulfed by their star's envelope of hot gas.

But Bear and Soker argue that such a scenario is improbable, because the act of being swallowed by the bloated star would likely have destroyed any existing resonance between the planets.

The engulfment process "is a violent one that proceeds rapidly," Soker said.

According to the new study, the lone giant planet would have also played a major role in the evolution of its parent star.

As it was consumed, the planet deposited energy into the stellar envelope, which helped strip away the star's gas layers, leaving behind a naked stellar core.

In this scenario, at least two of the pieces of the gas giant's core survived and continued to orbit the star, while the others may have fallen into the star or been ejected out of the system altogether.

More Worlds May Circle Dying Star

Valerie Van Grootel is an astronomer at the University of Liège in Belgium and one of the original discoverers of the Earth-size planets. She said the new idea was an "interesting alternative interpretation" of her team's results.

"Their objection to our explanation is relevant," Van Grootel said. "It's probably difficult to explain that the two planets kept their 3:2 resonance along the whole evolution process."

She added, however, that it's also possible the 3:2 resonance was acquired after the engulfment phase.

Study co-author Soker countered by saying that the presence of a possible third planet in the system—hinted at by the Kepler data—is more easily explained by his theory than by the two-planet model.

Our model "naturally accounts for three—and even more—planets in the system," since those worlds could be more pieces of the original gas giant, he said.

Rory Barnes, an astronomer at the University of Washington in Seattle, called the new hypothesis a "credible alternative" to the two-planet model, but he said that more detailed computer modeling will be needed to determine which scenario is more likely.

"A few more objects like KIC 05807616 would also be welcome" to add more data to the models, Barnes said.

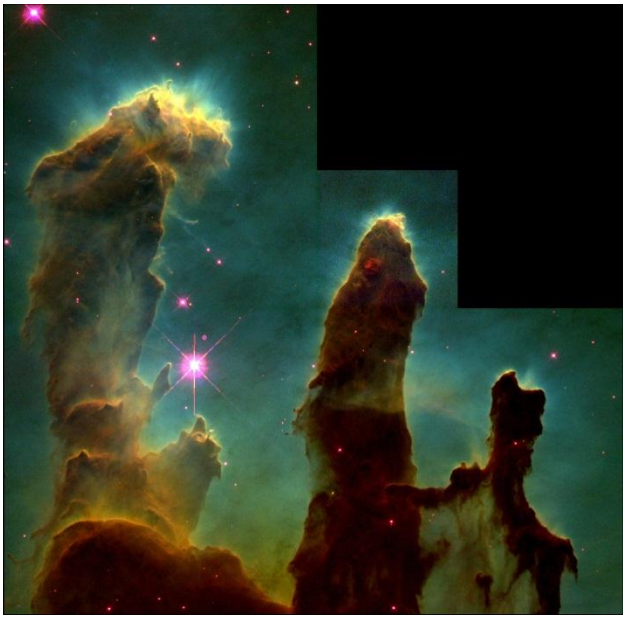
Bear and Soker presented their research at the Planets Around Stellar Remnants conference in Puerto Rico in January and have submitted their study to a scientific journal for review.

Pillars Of Creation Are Gone

MessageToEagle.com - Every time you look at the beautiful and famous image of the Pillars of Creation taken by Hubble back in 1995, you are actually admiring something that no longer exists.

In fact, the Pillars of Creation were already long gone by the time the image was captured!

Pillars of Creation refers to a photograph taken by the Hubble Telescope of elephant trunks of interstellar gas and dust in the Eagle Nebula



This 1995 Hubble Space Telescope image of the 'Pillars of Creation' is probably the most famous astronomical image of the 20th Century. Taken in visible light using a combination of SII/H-alpha and OIII filters, it shows a part of the Eagle Nebula where new stars are forming. The tallest pillar is around 4 light-years high Credits: NASA/ESA/STScI, Hester & Scowen (Arizona State University)

According to astronomers, the pillars which measure up to 4 light years in length were destroyed about 6,000 years ago by the shock wave from a supernova.

Since this is how long it takes to light to travel across such vast distances, we can currently see the shock waves approaching the pillars but we won't actually see their destruction for another thousand years or so!

For us, the shockwave has not reached the Pillars of Creation yet.

For our senses, they are still there.

In one thousand years, there will be a spectacular event in cosmos.

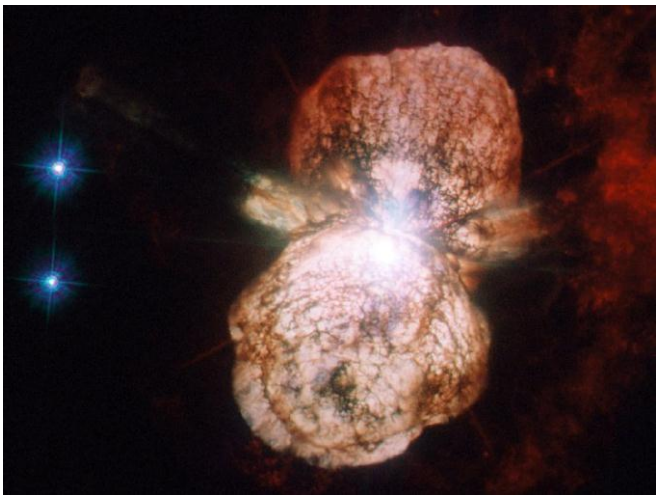
The shockwave will arrive to the Pillars of Creation and, just like they were created, they will be destroyed once again, obliterated by the force of a dead star.

Will we then remember that this show actually already happened a very long time ago?

Perhaps, not. Perhaps we will simply just admire the destruction of the Pillar of Creation, just as we today keep admiring Hubble's beautiful photograph of something that does not longer exists.

The Universe can be just as mind-boggling as the vast distances which prevent us from seeing objects in real-time.

Preview of a Forthcoming Supernova



(PhysOrg.com) -- NASA's Hubble Telescope captured an image of Eta Carinae. This image consists of ultraviolet and visible light images from the High Resolution Channel of Hubble's Advanced Camera for Surveys. The field of view is approximately 30 arcseconds across.

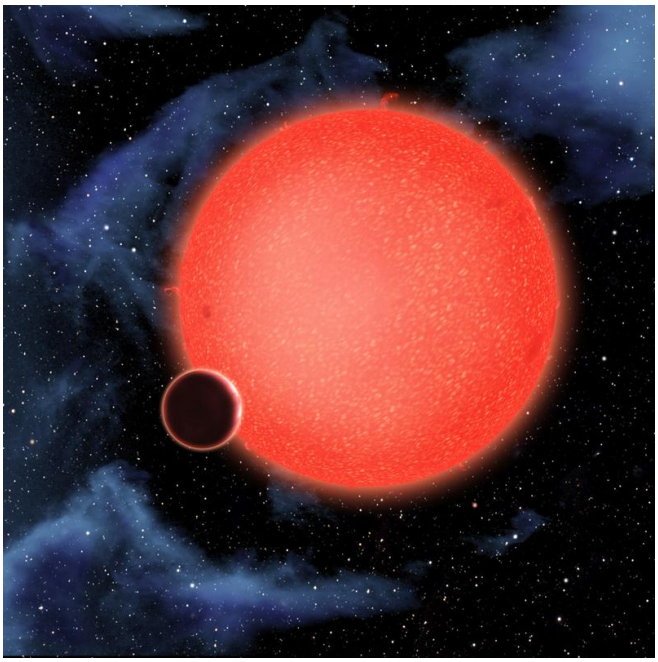
The larger of the two stars in the Eta Carinae system is a huge and unstable star that is nearing the end of its life, and the event that the 19th century astronomers observed was a stellar near-death experience. Scientists call these outbursts supernova impostor events, because they appear similar to supernovae but stop just short of destroying their star.

Although 19th century astronomers did not have telescopes powerful enough to see the 1843 outburst in detail, its effects can be studied today. The huge clouds of matter thrown out a century and a half ago, known as the Homunculus Nebula, have been a regular target for Hubble since its launch in 1990. This image, taken with the Advanced Camera for Surveys High Resolution Channel, is the most detailed yet, and shows how the material from the star was not thrown out in a uniform manner, but forms a huge dumbbell shape.

Eta Carinae is one of the closest stars to Earth that is likely to explode in a supernova in the relatively near future (though in astronomical timescales the "near future" could still be a million years away). When it does, expect an impressive view from Earth, far brighter still than its last outburst: SN 2006gy, the brightest supernova ever observed, came from a star of the same type, though from a galaxy over 200 million light-years away.

In distance space, a water world: Hubble reveals a new class of extrasolar planet

(PhysOrg.com) -- An international team of astronomers led by Zachory Berta of the Harvard-Smithsonian Center for Astrophysics (CfA) made the observations of the planet GJ 1214b.



GJ1214b, shown in this artist's view, is a super-Earth orbiting a red dwarf star 40 light-years from Earth. New observations from the NASA/ESA Hubble Space Telescope show that it is a water world enshrouded by a thick, steamy atmosphere. GJ 1214b represents a new type of planet, like nothing seen in the solar system or any other planetary system currently known. Credit: NASA, ESA, and D. Aguilar (Harvard-Smithsonian Center for Astrophysics)

"GJ 1214b is like no planet we know of," Berta said. "A huge fraction of its mass is made up of water."

The ground-based MEarth Project, led by CfA's David Charbonneau, discovered GJ 1214b in 2009. This super-Earth is about 2.7 times Earth's diameter and weighs almost seven times as much. It orbits a red-dwarf star every 38 hours at a distance of 2 million kilometres, giving it an estimated temperature of 230 degrees Celsius.

In 2010, CfA scientist Jacob Bean and colleagues reported that they had measured the atmosphere of GJ 1214b, finding it likely that it was composed mainly of water. However, their observations could also be explained by the presence of a planet-enshrouding haze in GJ 1214b's atmosphere.

Berta and his co-authors, who include Derek Homeier of ENS Lyon, France, used Hubble's Wide Field Camera 3 (WFC3) to study GJ 1214b when it crossed in front of its host star. During such a transit, the star's light is filtered through the planet's atmosphere, giving clues to the mix of gases.

"We're using Hubble to measure the infrared colour of sunset on this world," Berta explained.

Hazes are more transparent to infrared light than to visible light, so the Hubble observations help to tell the difference between a steamy and a hazy atmosphere.

They found the spectrum of GJ 1214b to be featureless over a wide range of wavelengths, or colours. The atmospheric model most consistent with the Hubble data is a dense atmosphere of water vapour.

"The Hubble measurements really tip the balance in favour of a steamy atmosphere," Berta said.

Since the planet's mass and size are known, astronomers can calculate the density, of only about 2 grams per cubic centimetre. Water has a density of 1 gram per cubic centimetre, while Earth's average density is 5.5 grams per cubic centimetre. This suggests that GJ 1214b has much more water than Earth does, and much less rock.

As a result, the internal structure of GJ 1214b would be extraordinarily different from that of our world.

"The high temperatures and high pressures would form exotic materials like 'hot ice' or 'superfluid water', substances that are completely alien to our everyday experience," Berta said.

Theorists expect that GJ 1214b formed further out from its star, where water ice was plentiful, and migrated inward early in the system's history. In the process, it would have passed through the star's habitable zone, where surface temperatures would be similar to Earth's. How long it lingered there is unknown.

GJ 1214b is located in the constellation of Ophiuchus (The Serpent Bearer), and just 40 light-years from Earth. Therefore, it's a prime candidate for study by the NASA/ESA/CSA James Webb Space Telescope, planned for launch later this decade.

A paper reporting these results has been accepted for publication in the *Astrophysical Journal* and is available online.

More information: Research paper: http://www.spacete … heic1204.pdf

Young Stars Flicker Amidst Clouds of Gas and Dust

This new view of the Orion nebula highlights fledging stars hidden in the gas and clouds. Image credit: NASA/ESA/JPL-Caltech/IRAM

PASADENA, Calif. – Astronomers have spotted young stars in the Orion nebula changing right before their eyes, thanks to the European Space Agency's Herschel Space Observatory and NASA's Spitzer Space Telescope. The colorful specks -- developing stars strung across the image -- are rapidly heating up and cooling down, speaking to the turbulent, rough-and-tumble process of reaching full stellar adulthood.

The rainbow of colors represents different wavelengths of infrared light captured by both Spitzer and Herschel. Spitzer is designed to see shorter infrared wavelengths than Herschel. By combining their observations, astronomers get a more complete picture of star formation. NASA's Jet Propulsion Laboratory in Pasadena, Calif., manages the Spitzer mission for NASA, and also plays an important role in the European Space Agency-led Herschel mission.

In the portion of the Orion nebula pictured, the telescopes' infrared vision reveals a host of embryonic stars hidden in gas and dust clouds. These stars are at the very earliest stages of evolution.

A star forms as a clump of this gas and dust collapses, creating a warm glob of material fed by an encircling disk. In several hundred thousand years, some of the forming stars will accrete enough material to trigger nuclear fusion at their cores, and then blaze into stardom.

Herschel mapped this region of the sky once a week for six weeks in the late winter and spring of 2011. To monitor for activity in protostars, Herschel's Photodetector Array Camera and Spectrometer probed long infrared wavelengths of light that trace cold dust particles, while Spitzer gauged the warmer dust emitting shorter infrared wavelengths. In this data, astronomers noticed that several of the young stars varied in their brightness by more than 20 percent over just a few weeks. As this twinkling comes from cool material emitting infrared light, the material must be far from the hot center of the young star, likely in the outer disk or surrounding gas envelope. At that distance, it should take years or centuries for material to spiral closer in to the growing starlet, rather than mere weeks.

A couple of scenarios under investigation could account for this short span. One possibility is that lumpy filaments of gas funnel from the outer to the central regions of the star, temporarily warming the object as the clumps hit its inner disk. Or, it could be that material occasionally piles up at the inner edge of the disk and casts a shadow on the outer disk.

"Herschel's exquisite sensitivity opens up new possibilities for astronomers to study star formation, and we are very excited to have witnessed short-term variability in Orion protostars," said Nicolas Billot, an astronomer at the Institut de Radioastronomie Millimétrique (IRAM) in Grenada, Spain who is preparing a paper on the findings along with his colleagues. "Follow-up observations with Herschel will help us identify the physical processes responsible for the variability."

Herschel is a European Space Agency cornerstone mission, with science instruments provided by consortia of European institutes and with important participation by NASA. NASA's Herschel Project Office is based at JPL. JPL contributed mission-enabling technology for two of Herschel's three science instruments. The NASA Herschel Science Center, part of the Infrared Processing and Analysis Center at the California Institute of Technology in Pasadena, supports the United States astronomical community. Caltech manages JPL for NASA.

Whitney Clavin
Jet Propulsion Laboratory, Pasadena, Calif.

ASTRO APPS FOR i PHONE

by Steven Seigel

My company purchased a new i Phone for me ($199.00 for 16 gigs). I am amazed by the amount of astronomy programs there are. Many have costs associated with them but there are many excellent free ones. Here are the apps I am using.

1. **Sky Walk:** A friend of mine who owns an i Phone uses this app so I purchased it. For only $2.99 complete (no data charges) you can search the night/day sky. The app will identify the brightest stars and can provide lots of information about it including additional spellings, name and location of satellites, information and location of all 110 "M" objects and many NGC objects, solar system objects including comets, and pictures of the day. You can also see the sky in a variety of light: Gamma, X-Ray, Visible, H-Alpha, Infrared, Microwave, and Radio. The music can be turned off.
2. **3D Sun:** Thinking of setting up your equipment to look at the Sun? You can go to your computer and look here: http://sohowww.nascom.nasa.gov/home.html or you can simply turn on this app and take the Sun with you! You can see the Sun in its current conditions under different forms of wavelengths. The "Help" menu will guide you through this app. It's free from NASA.
3. **Moon Globe:** Free App. You can observe the Moon and all its features from the phone. There are telescope views so you can set up the Moon to match the view from your telescope. You can also get the location of all the Moon landings and the names of the major terrain.
4. **Mars Globe:** Free app. This app takes you over the terrain of Mars. This app is similar to the Moon Globe.1
5. **Messier List:** Free app. A list of all 110 objects, their photos and if it's visible from your location. (Use the "Sky Walk" app to show location.)
6. **NGC Catalogue:** Free app but has ads at bottom. This app has info on all 7,840 NGC objects. It does not contain photos.
7. **Cosmic:** Free app courtesy of the Museum of Natural History. Contains lots of information about the stars, clusters, comets and others. This app also contains many photographs and opens up with a mosaic of Saturn which is awesome. As you enlarge the mosaic to the individual photographs, you will see the "Info" button which provides information regarding the photograph.
8. **Astronomy Picture Of The Day (APOD):** Free app. I took photos from this app and put them on my i Phone. Lots of great pictures.

As you can see, my i Phone is quickly becoming my new eyes to the sky!

NASA's Chandra Finds Milky Way's Black Hole Grazing on Asteroids

WASHINGTON -- The giant black hole at the center of the Milky Way may be vaporizing and devouring asteroids, which could explain the frequent flares observed, according to astronomers using data from NASA's Chandra X-ray Observatory.

For several years Chandra has detected X-ray flares about once a day from the supermassive black hole known as Sagittarius A*, or "Sgr A*" for short. The flares last a few hours with brightness ranging from a few times to nearly one hundred times that of the black hole's regular output. The flares also have been seen in infrared data from ESO's Very Large Telescope in Chile.

"People have had doubts about whether asteroids could form at all in the harsh environment near a supermassive black hole," said Kastytis Zubovas of the University of Leicester in the United Kingdom, and lead author of the report appearing in the Monthly Notices of the Royal Astronomical Society. "It's exciting because our study suggests that a huge number of them are needed to produce these flares."

Zubovas and his colleagues suggest there is a cloud around Sgr A* containing trillions of asteroids and comets, stripped from their parent stars. Asteroids passing within about 100 million miles of the black hole, roughly the distance between the Earth and the sun, would be torn into pieces by the tidal forces from the black hole.

These fragments then would be vaporized by friction as they pass through the hot, thin gas flowing onto Sgr A*, similar to a meteor heating up and glowing as it falls through Earth's atmosphere. A flare is produced and the remains of the asteroid are swallowed eventually by the black hole.

"An asteroid's orbit can change if it ventures too close to a star or planet near Sgr A*," said co-author Sergei Nayakshin, also of the University of Leicester. "If it's thrown toward the black hole, it's doomed."

The authors estimate that it would take asteroids larger than about six miles in radius to generate the flares observed by Chandra. Meanwhile, Sgr A* also may be consuming smaller asteroids, but these would be difficult to spot because the flares they generate would be fainter.

These results reasonably agree with models estimating of how many asteroids are likely to be in this region, assuming that the number around stars near Earth is similar to the number surrounding stars near the center of the Milky Way.

"As a reality check, we worked out that a few trillion asteroids should have been removed by the black hole over the 10-billion-year lifetime of the galaxy," said co-author Sera Markoff of the University of Amsterdam in the Netherlands. "Only a small fraction of the total would have been consumed, so the supply of asteroids would hardly be depleted."

Planets thrown into orbits too close to Sgr A* also should be disrupted by tidal forces, although this would happen much less frequently than the disruption of asteroids, because planets are not as common. Such a scenario may have been responsible for a previous X-ray brightening of Sgr A* by about a factor of a million about a century ago. While this event happened many decades before X-ray telescopes existed, Chandra and other X-ray missions have seen evidence of an X-ray "light echo" reflecting off nearby clouds, providing a measure of the brightness and timing of the flare.

"This would be a sudden end to the planet's life, a much more dramatic fate than the planets in our solar system ever will experience," Zubovas said.

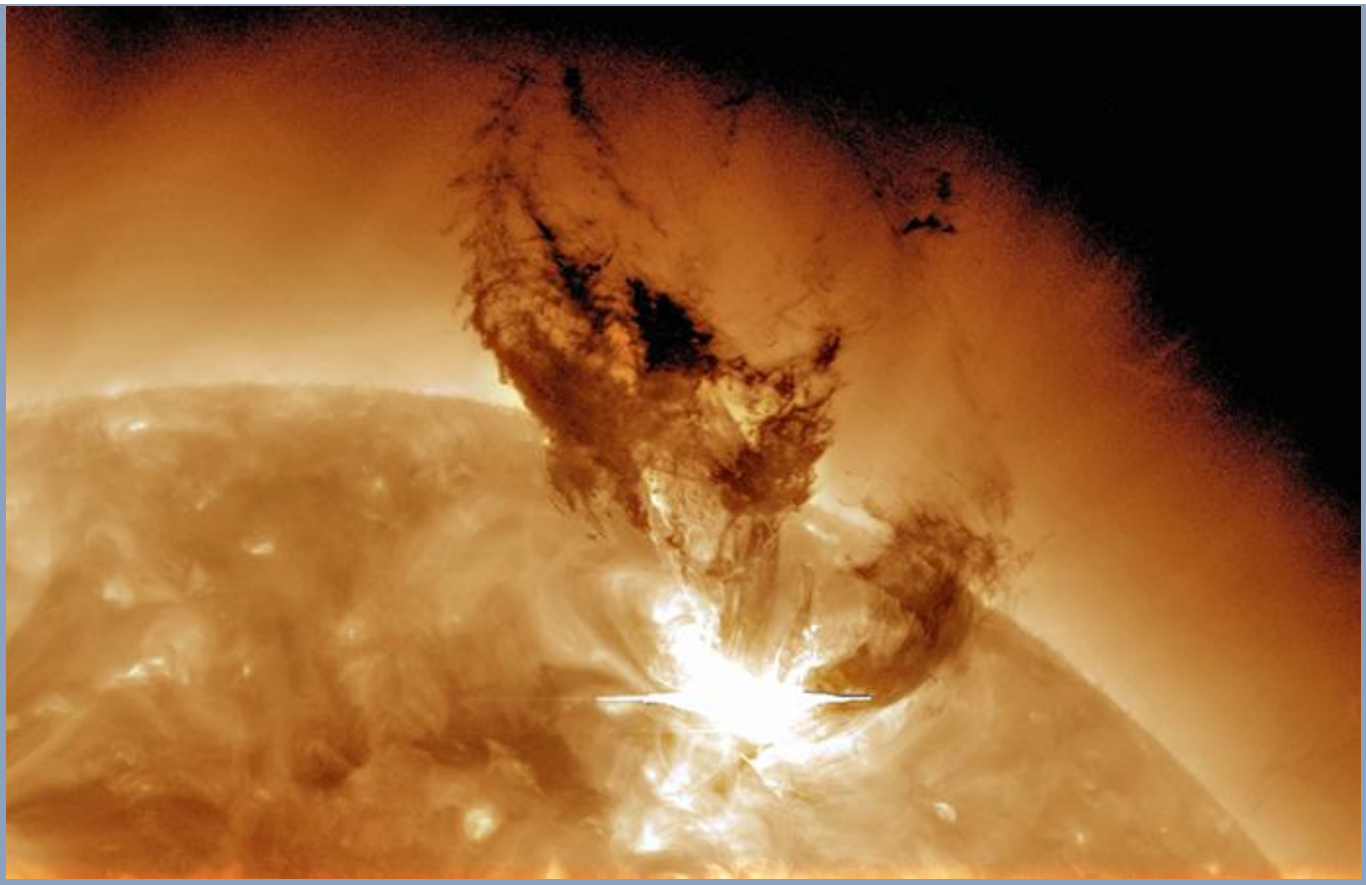
Very long observations of Sgr A* will be made with Chandra later in 2012 that will give valuable new information about the frequency and brightness of flares and should help to test the model proposed here to explain them. This work could improve understanding about the formation of asteroids and planets in the harsh environment of Sgr A*.

NASA's Marshall Space Flight Center in Huntsville, Ala., manages the Chandra program for NASA's Science Mission Directorate in Washington. The Smithsonian Astrophysical Observatory controls Chandra's science and flight operations from Cambridge, Mass.

For Chandra images, multimedia and related materials, visit:
http://www.nasa.gov/chandra

For an additional interactive image, podcast, and video on the finding, visit:
http://chandra.si.edu

Year of the Solar System
Shadows of the Sun



The sun. Image credit:SDO/NASA

We have an intimate relationship with our sun. Its light, gravity and storms profoundly affect our planet's motions, weather, oceans, and life, as well as all other objects in our solar system. Ancient cultures observed and worshipped it. Galileo observed sunspots as evidence of imperfections. Modern scientists use solar missions to study it as an example of the closest star, and examine how its radiation, energetic particles, and powerful magnetic field affects our planet. Others try to model the complex layers and processes within the sun, and analyze particles from the sun to learn more about the formation of the solar system. (For more information about the sun's influence on our magnetic field, check out November 2011's topic: Magnetospheres)

And like those ancient cultures, people around the world still observe the sun, particularly during special events where an object blocks part of our view of the sun -- during eclipses by the Moon, and transits of the planets Mercury and Venus.

Beginning in the 17th century, scientists used the transit of Venus across the sun's face to make increasingly accurate measurements of the sun's distance from the Earth.

A transit of Venus was observed by Jeremiah Horrocks in 1639.

Join us this month as we celebrate Sun-Earth Day and prepare for a rare transit of Venus! Between June 5-6, 2012, people around the world will see the planet Venus move across the front of the sun, creating the last Venus transit as seen from Earth until the year 2117 -- check out the resources this month in our Classroom, Event, and Organization sections as you prepare to experience the transit, spend time observing our sun and hold or attend a Sun-Earth Day event.

2012 Mar. Celestial Events: supplied by J. Randolph Walton (Randy)

Day	Date	Time (EDT)	Event
Sat	3	06:30	Sunrise
		13:02	Moon rise
		17:55	Sunset
		All night	**Mars largest apparent size in 2012**
		19:25	Mercury Sets
		21:40	Venus Sets
		21:25	Saturn Rises
		22:20	Jupiter Sets
Thu	8	04:39	**Full Moon**
		18:44	Moon rise
Sat	10	06:19	Mars Sets
		19:20	Mercury Sets
		21:00	Saturn Rises
		21:11	Moon rise
		21:50	Venus Sets
		22:00	Jupiter Sets
Sun	11	02:00	**Daylight Saving Time begins**
		After 20:30	**Zodiacal Light** visible in W after evening twilight for next two weeks
Wed	14	11:22	Moon Set
		21:25	**Last Quarter Moon**
Thu	15	19:26	**Double shadow transit on Jupiter**
Sat	17	06:45	Mars Sets
		07:08	Sunrise
		14:31	Moon Set
		19:45	Mercury Sets
		21:30	Saturn Rises
		22:40	Jupiter Sets
		23:05	Venus Sets
Tue	20	01:15	**Spring Equinox**
Thu	22	10:37	**New Moon**
		19:37	Moon Set
		20:31	**Double satellite transit on Jupiter**
Sat	24	06:10	Mars Sets
		06:56	Sunrise
		19:17	Sunset
		21:00	Saturn Rises
		21:34	Moon Set
		22:20	Jupiter Sets
		23:15	Venus Sets
Thu	29	10:55	Moon rise
		21:00	**Lunar X near crater Werner**
Fri	30	11:50	Moon rise
		21:00	**Lunar Straight Wall visible**
		15:41	**First Quarter Moon**
Sat	31	05:35	Mars Sets
		06:00	Mercury Rises
		06:45	Sunrise
		12:50	Moon rise
		19:24	Sunset
		20:30	Saturn Rises
		22:00	Jupiter Sets

In the Eyepiece

Here is a list of objects for this month. This is reproduced from www.skyhound.com with the kind permission of its creator and author of SkyTools Greg Crinklaw.

Object(s)	Class	Con	RA	Dec	Mag
M 81 & M 82	Galaxies	Ursa Major	09h55m34.1s	+69°03'59"	7.8
NGC 3511	Galaxy	Crater	11h03m23.7s	-23°05'11"	11.5
The Spindle	Galaxy	Sextans	10h05m14.1s	-07°43'07"	10.1
Ghost of Jupiter/Eye	Planetary Nebula	Hydra	10h24m46.1s	-18°38'32"	8.6
NGC 2903	Galaxy	Leo	09h32m09.7s	+21°30'03"	9.6
M95	Galaxy	Leo	10h44m00.0s	+11°41'57"	10.5
M96	Galaxy	Leo	10h46m48.1s	+11°48'54"	10.1
The Leo I Dwarf	Galaxy	Leo	10h08m30.6s	+12°18'07"	11.2
Markarian 421	Galaxy	Ursa Major	11h04m27.4s	+38°12'34"	14.8
Arp 270	Galaxy Pair	Leo Minor	10h49m52.4s	+32°58'35"	12.4
NGC 2818	Planetary Nebula in Open Cluster	Pyxis	09h16m01.5s	-36°36'37"	13.0
The Twin Quasar	Quasar	Ursa Major	10h01m20.8s	+55°53'54"	17.0
Hickson 44	Galaxy Group	Leo	10h18m00.4s	+21°48'44"	10.0
Abell 33	Planetary Nebula	Hydra	09h39m09.2s	-02°48'35"	13.4

Coordinates are epoch 2000.0