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**March 2011**



## Curiosity

Earth's rotation is gently slowing down due to it's gravitational interaction with the Moon. It is thought that in 5 thousand million years Earth's days will last 48 hours. But of course that will be the time the Sun will die so it will not matter anyway.

## Astronomy Calendar

PDF Version

**March 1st: Day 60 of the Gregorian calendar.**
**History:** In 1927, George Abell, that catalogued 2712 galactic clusters was born.
In 1967, the Russian probe Venera 3 became the first to impact on another planet when it reaches Venus and fails before sending any data back.
In 1980, the Voyager 1 probe confirms the existence of Janus, a moon of Saturn.
In 1982, the Russian probe Venera 13 send back the first colored images of Venus (Venera 14 followed her 4 days later).

In 2002, mission STS-109 was launched with the task of making the maintenance of Hubble Space Telescope.
**Observations:** At dawn Venus is near to the thin waning crescent Moon.
Tonight Algol is at minimum brightness four about two hours.

**March 2nd: Day 61 of the Gregorian calendar.**
**History:** In 1972, the American probe Pioneer 10 is launched. It

## EDITORIAL

This month, besides making the follow-up of EAAE's projects that are active at this moment, we present you two projects organized by other organizations that can be used in schools for student motivation. Remember: You are still on time to participate on "Catch a Star".

As usual, we also bring you a summary of the most relevant posts published on EAAE News so that you can read them if you haven't read them before.

Our Monthly Issues about observations are dedicated to observing the planets that can be seen in naked eye, for beginners. We also selected two real challenges for more advanced observations: NGC2489 and NGC2539. If you think you are getting handy with binoculars and telescopes and you have really dark sky you should try to find them.

This month's selected software is "Celestia", software tool that allows you to travel all around the Universe in 3D. This is a must.

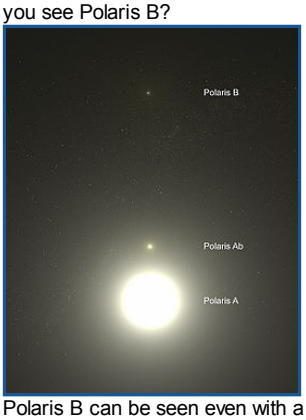
We hope you enjoy the games we present on the Students Corner section, this month with an Astronomy Word Puzzle, an Astronomy Crossword and a new interactive game called Solar System Genius. Have fun solving them with your students if you have an Astronomy Club.

Clear Skies.

The EAAE Webteam

should be the first probe to reach planet Jupiter Jupiter in 1973 and the first to leave the Solar System. Pioneer 10 transports a plate drowned to identifying its origin. In 2003, the emissions from Pioneer 10 were heard for the last time.
**Observations:** Here is an observational issue for tonight. A question that is frequently made by beginners is *"How can I distinguish Ursa Minor and Ursa Major?"* The answer for this is that, if you're seeing only one dipper, it's probably the Big Dipper in the constellation Ursa Major. This asterism is very familiar to astronomers because it really does look like a dipper. Ursa Minor, which contains the Little Dipper asterism, is much harder to see. Because the dipper shape isn't so obvious and its stars are fainter. North Star is the last star in its handle of the Little Dipper and usually two other stars (Kochab and Pherkad that are the front of the dipper) can be seen even in small cities. See how you might find them tonight here.

**March 3rd Day 62 of the Gregorian calendar.**
**History:** In 1959, the probe Pioneer 4, was launched to study the Moon Moon with success. It missed the Moon by 59,500 km instead of the expected 32,000 km.
**Observations:** Use the Big Deeper to find Polaris and observe using a telescope. Can you see Polaris B?




Polaris B can be seen even with a modest telescope and was first noticed by William Herschel in 1780.

**March 4th: Day 63 of the Gregorian calendar.**
**History:** In 1835 Giovanni Schiaparelli, director of the Osservatorio de Milano was born. Schiaparelli made the Mars Canali famous.
In 1979, the probe Voyager 1 discovers Jupiter's rings.
In 1999, Earth's flyby of the asteroid 1998 VD35(distance 0.169 UA).
**Observations:** New Moon at 20h46 (UTC). During the night Algol is at a minimum for about two hours centered at 01h52 (UTC) of the 5th.

## EAAE News

### EAAE PROJECT'S EVOLUTION

After launching "Catch a Star" and "Sunrise Project" last month, EAAE is preparing new initiatives for the next months. One of the most expected is the repetition of the "Eratosthenes Project" with registration opening that will probably be announced next month.

Wile "Sunrise Project" registrations are now officially closed, you still have time to work with your students on "Catch a Star".

"Catch a Star!" includes more than one competition, so there is something for everyone. The idea of the program is to encourage students to work together, to learn about astronomy and discover things for themselves by researching information.

**The goal** of the European Astronomy Contest "Catch a Star" is to stimulate the creativity and independent work of students, to strengthen and expand their astronomical knowledge and skills, and to help spread the use of information technologies in the educational process.

All students who have studied in European countries during the current year and have a strong interest in astronomy and information technology can send works.

The students will write a report about an astronomical object, phenomenon, observation, scientific problem, or theory, etc. The students may also wish to include practical activities such as their own observations. They will create the project's report as PDF document and upload it online on the website's application form.

The student teams who prepare the best projects will receive exciting prizes like the special grand prize is one observational session on the 2-meter Faulkes telescopes or free remote 3x60 minutes observational sessions National Astronomical Observatory "Rozhen" in Bulgaria using the 2-meter RCC telescope; the 50/70 cm Schmidt telescope and the Cassegrain telescope "Zeiss-600".

There will also be astronomical books and 10 astronomical DVD for honor mentions.

**Links:**
Catch a Star 2011 webpage

## Educational Project's Worldwide

### Worldwide "Star Challenge" Astro Relay

*Submitted by* Maria Kravchenko

In early February, the second phase of the Worldwide "Star Challenge" Astro Relay began. This event is dedicated to the 50th anniversary of the first manned flight into space by cosmonaut Yuri Gagarin.

The "Star Challenge" became known to the world at last year's official launch ceremony in Paris, which was held at the Russian representation at UNESCO. More than 50 thousand young people from all over the world took part in the first round, with the most active among them being adolescents from Russia, the USA, India, France and other countries.

The Worldwide Astro Relay aims to stimulate youth from around the world to take a greater interest in outer space and space-related issues, bringing it to a new level. The most popular topics, as expressed by the participants in the Astro Relay, include the environment, space exploration, and promoting friendship with extraterrestrial civilizations.

The site of the Worldwide "Star Challenge" Astro Relay, found at www.starchallenge.org, consists of a large number of topical interactive rubrics: "CosmoBrainers" is the main section, where most inquisitive participants of the Olympiad are able to demonstrate their knowledge in the spheres of physics, astronomy and mathematics; "CosmoWriters" is the creative part, which involves a variety of posts on a given topic;

**March 5th: Day 64 of the Gregorian calendar.**
**History:** In 1512 Gerardus Mercator, a famous cartographer was born.

In 1979 the first gamma ray burst, from magnetars was observed. in the same year, the Voyager probe made its biggest approach to Jupiter when it approached at 206,700 km from the top of the planet's clouds.
**Observations:** Mercury can be found at lower left of tiny waxing crescent of the Moon immediately after sunset.

**March 6th: Day 65 of the Gregorian calendar.**
**History:** Today we celebrate the 1787 birth on this date of Joseph Fraunhofer that can be considered the father of astronomical spectroscopy. While designing the achromatic objective lens for telescopes that is still used today , he saw the spectrum of sunlight as it passed through a thin slit and the dark emission lines. Fraunhofer recognized that they could be used as wavelength standards. He designed and built the very first diffraction grating and is known for giving letters to the main lines in the high resolution spectrum of the Sun.
**Observations:** Jupiter is left of the crescent Moon.

**March 7th: Day 66 of the Gregorian calendar.**
**History:** In 1837 Henry Draper, was born. He was the first astronomer to make pictures of the stellar spectrum . An important catalog of stars is also named after him.

**Observations:** Try to find Arcturus the "herald" of Spring.

**March 8th: Day 67 of the**

"CosmoArtists" is a section where participants in the Astro Relay represent their world in a popular way – through comics. Participants also have the opportunity to obtain answers to the most interesting questions from a number of legendary cosmonauts, including the first man to walk in space, two-time Hero of the Soviet Union Alexei Leonov, Hero of the Soviet Union Georgi Grechko, hero of the soviet union Alexander Serebrov, in addition to many others.

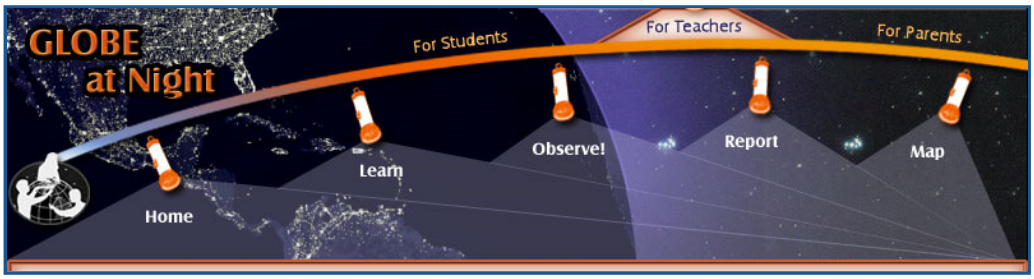
In the second stage of the Worldwide "Star Challenge" Astro Relay, apart from demonstrating their theoretical knowledge, participants will also have the opportunity to express their imagination through creative projects, modelling and simulation projects, etc. In cooperation with Microsoft, in the "CosmoWriters" part of the competition, participants can make posts involving the use of unique images of outer space, taken with the World Wide Telescope. The second stage of the "CosmoArtists" competition involves the realization of a science fiction theme in cinematic form.

Following the second round and the final distance-based stage, the 20 top-ranking participants of the "Star Challenge" will be chosen. These fortunate enthusiasts will be able to attend the finals in Paris. The absolute winner will be given the opportunity to attend and observe a unique space launch at the Baikonur Cosmodrome. The winners in the categories "CosmoArtists" and "CosmoWriters" will receive trendy multimedia devices.

*The Worldwide "Star Challenge" Astro Relay is being carried out within the framework of the "Star Odyssey" educational programme of the Federal Agency for CIS Affairs, Compatriots Living Abroad, and International Humanitarian Cooperation (ROSSOTRUDNICHESTVO) with the support of the Federal Space Agency (ROSCOSMOS), as well as the United Nations Educational, Scientific and Cultural Organization (UNESCO).*

Link:
Star Challenge's webpage

## 6th worldwide GLOBE at Night 2011 campaign until March 6th

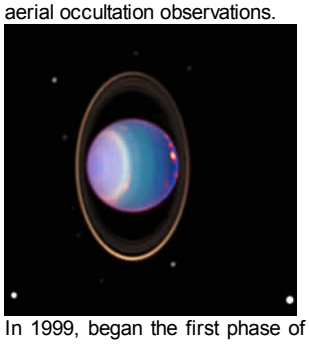



Submitted by Veselka Radeva, Ph.D.
Original post by Constance E. Walker, Ph.D.

With half of the world's population now living in cities, many urban dwellers have never experienced the wonderment of prestigiously dark skies and maybe never will. This loss, caused by light pollution, is a concern on many fronts: safety, energy conservation, cost, health and effects on wildlife, as well as our ability to view the stars. Even though light pollution is a serious and growing global concern, it is one of the easiest environmental problems you can address on local levels.

Participation in the international star-hunting campaign, GLOBE at Night, helps to address the light pollution issue locally as well as globally. This year, 2 sets of campaigns are being offered. For the first campaign has began on February 21st and will end on March 6th, 2011, everyone all over the world is invited to record the brightness of the night sky. The second campaign will run from March 22nd until April 4th in the Northern Hemisphere and March 24th through April 6th in the Southern Hemisphere. The campaign is easy and fun to do. First, you match the appearance of the constellation Orion in the first campaign (and Leo or Crux in the second campaign) with simple star maps of progressively fainter stars found. Then you submit your measurements, including the date, time, and location of your comparison. After all the campaign's observations are submitted, the project's organizers release a map of light-pollution levels worldwide. Over the last five annual 2-week campaigns, volunteers from more than 100 nations contributed 52,000 measurements, one third of which came from last year's campaign.

**Gregorian calendar.**
**History:** In 1977 Uranus rings were discovered during NASA's aerial occultation observations.

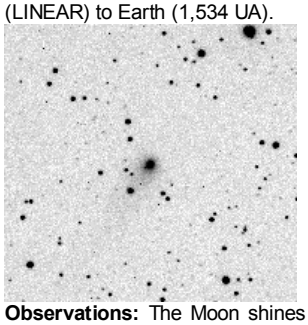


In 1999, began the first phase of Mars mapping by the probe Mars Global Surveyor.
**Observations:** Tonight point your telescope to the Orion Nebula.

**March 9th: Day 68 of the Gregorian calendar.**
**History:** In 1564, David Fabricius was born.,He discovered the first variable star (Mir a, aka Omicron City).
In 1974, flyby of Mars by the Russian probe Mars 7.

**Observations:** Because spring is coming the Summer Triangle - composed by the stars Vega, Deneb and Altair - can be be seen at East before dawn at northern temperate latitudes. It will rise from East earlier from month to month until the middle of the summer, when you can see it high in the sky in the sky early in the night.

**March 10th: Day 69 of the Gregorian calendar.**
**History:** In 1999, closest approach of comet C/1998 M5 (LINEAR) to Earth (1,534 UA).



**Observations:** The Moon shines close to the Pleiades star cluster.

**March 11th: Day 70 of the Gregorian calendar.**
**History:** In 1811, Urbain Le Verrier, that predicted the existence of Neptune, was born.

To learn the five easy steps to participate in the GLOBE at Night program, see the GLOBE at Night website. You can listen to last year's 10-minute audio podcast on light pollution and GLOBE at Night. Or download a 45-minute PowerPoint and accompanying audio. GLOBE at Night is also on Facebook and Twitter.

The big news is that children and adults can submit their measurements in real time if they have a smart phone or tablet. To do this, you can use the web application. With smart phones and tablets, the location, date and time are put in automatically. And if you do not have a smart phone or tablet, there are user-friendly tools on the GLOBE at Night report page to find latitude and longitude.

For activities that have children explore what light pollution is, what its effects are on wildlife and how to prepare for participating in the GLOBE at Night campaign, see the Dark Skies Rangers activities. Monitoring our environment will allow us as citizen-scientists to identify and preserve the dark sky oases in cities and locate areas where light pollution is increasing. All it takes is a few minutes during the 2011 campaign to measure sky brightness and contribute those observations on-line. Help exceed the 17,800 observations contributed last year. Your measurements will make a world of difference.

**Star Maps:** http://www.globeatnight.org/observe_magnitude.html
**Submitting Measurements:** http://www.globeatnight.org/report.html
**GLOBE at Night:** http://www.globeatnight.org/
**Audio Podcast:** http://365daysofastronomy.org/2010/02/03/february-3rd-the-globe-at-night-campaign-our-light-or-starlight/
**PowerPoint:** http://www.globeatnight.org/files/NSN_GaN_2011_slides.ppt
**Accompanying Audio:** http://www.globeatnight.org/files/NSN_GaN_2011_audio.mp3
**Facebook:** http://www.facebook.com/GLOBEatNight
**Twitter:** http://twitter.com/GLOBEatNight
**Web App for Reporting:** http://www.globeatnight.org/webapp/
**Dark Skies Activities:** http://www.darkskiesawareness.org/DarkSkiesRangers/

## It happened last month

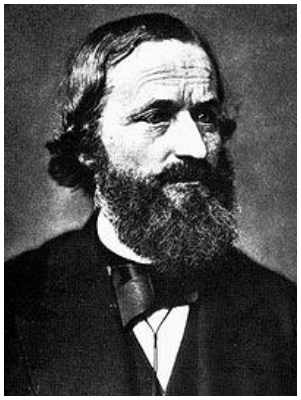
### Last Month's highlights from EAAE News

EAAE News

- Discovery Docks to ISS
- SDO captures huge prominence of the Sun
- Cassiopeia A: NASA'S Chandra Finds Superfluid in Neutron Star's Core
- Europe's ATV supply ship docks safely with Space Station
- ESO makes probable first planet formation detection
- Stardust NExT encounter with comet Tempel 1
- Orrery of Kepler's Exoplanets
- Shaping a transition from rocket fuel to oil rigs
- VLBA measures farther than ever before
- Messenger captures Solar System Family Portrait
- Messenger prepares Mercury orbit insertion
- Flocculent spiral NGC 2841
- Herschel finds less dark matter but more stars
- M78 - Reflected Glory
- The Valentine's flyby of Stardust- Image Release
- Mars500 crew is walking on 'Mars'
- A Nebula by Any Other Name
- SDO Sundog Mystery
- "Lover's Island" seen from Space
- Arp 147: Giant Ring of Black Holes
- Educational Astronomy Project Awarded Grant of 1.9 Million Euros
- First STEREO Images of the Entire Sun
- Europa Jupiter System Mission (EJSM)
- Mars Express puts craters on a pedestal
- Titan's smog creates surprise: Cirrus-Like Clouds
- XMM-Newton technology on new telescopes
- NASA Finds Earth-Size Planet Candidates In Habitable Zone, Six Planet System
- NASA's NEOWISE Completes Scan for Asteroids and Comets
- CryoSat ice data now open to all

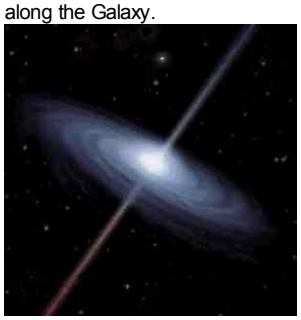
In 1897, a meteorite entered in the atmosphere over New Martinsville (West Virginia) and its debris smashed all over this town with heavy loss.
**Observations:** The Moon is close to Aldebaran.

**March 12th: Day 71 of the Gregorian calendar.**
**History:** In 1824, Gustav Kirchhoff was born.



**Observations:** First Quarter of the Moon at 23h45 (UTC).

**March 13th: Day 72 of the Gregorian calendar.**
**History:** In 2000, lonely black holes were discovered drifting along the Galaxy.



**Observations:** Moon passes in front of the Winter Circle.

**March 14th: Day 73 of the Gregorian calendar.**
**History:** In 1879, Albert Einstein was born.

## FIRST ASTRONOMICAL OBSERVATIONS

### PLANET OBSERVATIONS

Since the time of the most ancient civilizations it has been observed that there are seven "wanderers" that move relative to the other stars along the year and that can be seen without any optical instrument. Those "wanderers" were the Sun, the Moon, Mercury, Venus, Mars, Jupiter and Saturn. Superstition about these seven celestial objects was so big that until today the number seven is considered mystical for many people and influenced western cultures in things like the number of days of the week, the colours that are said to occur in rainbows or the number of notes of the musical scales.

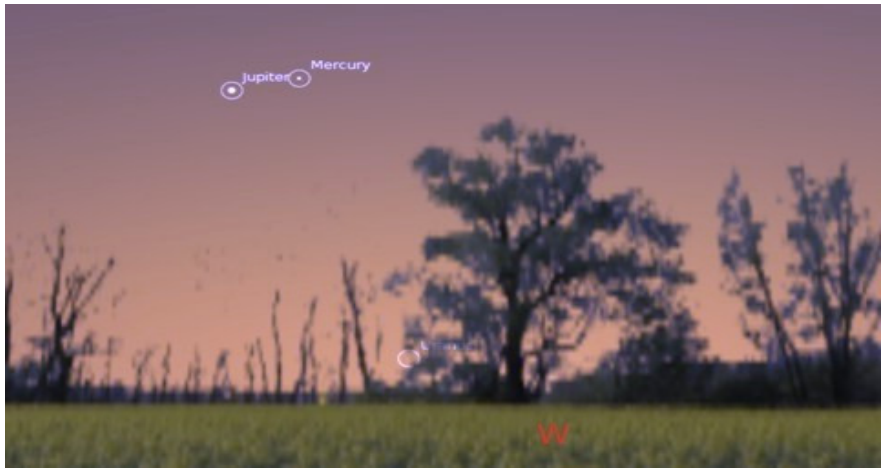
The days of the week are even related to the adoration of the Mesopotamian Civilizations to the "wanderer gods". In English you can find the weekend days Satur(n)day and Sunday (Sontag for the German) and Mo(o)nday, and for Latin countries you can find the week days ( for Monday you have Lundi in French, Lunes in Spanish and Lunedi in Italian, for Tuesday (Mars' Day) you have Mardi in French, Martes in Spanish and Martedi in Italian, for Wednesday(Mercury's Day)you have Mercredi in French, Miercoles in Spanish and Mercoledi in Italian, for Thursdays (Jupiter's Day) you have Jeudi in French, Jueves in Spanish and Giovedi in Italian, and for Friday (Venus' day) you have Vendredi in French, Viernes in Spanish and Venerdi in Italian).

The challenge is to try in see them all during the next months until the end of the school though you will have to rise early to see Mars in May or June. Let's see how the planets are this month.

#### MERCURY

You can see Mercury at the west horizon after the first week of March. Mercury will part away from the Sun until its maximum eastern elongation that will occur on March 23rd when Mercury is approximately 19º E of the Sun.

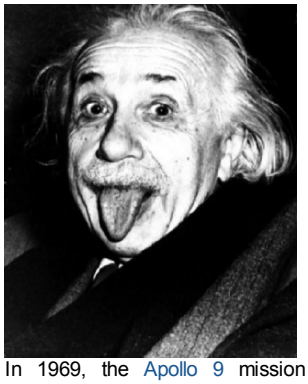
Mercury is very elusive and hard to observe. It is said that Copernicus at his last moments had a great regret of never have seen it during his lifetime. So this gives you the idea how elusive it is how easy it is to miss it or confuse it for a star. Nonetheless this year it will be very close to Jupiter on March 14th and 15th, which might help you to spot it if it's your first time. After you have seen it once you will never miss it again. On these days Mercury will be between 2º and 3º apart of Jupiter to the right (North), and you will see Jupiter slightly above Mercury on the 14th and slightly bellow Mercury on the 15th.




Jupiter and Mercury at dusk on March 15th, 2011.

#### VENUS

Venus will be the "Morning Star" this month, shining low at east-southeast during dawn. After its maximum west elongation it's now "approaching" the Sun and at the end of March it will only rise about 1h40 before sunrise. Since it has began its wanning phase, brightness will decrease until -3.9 at the end of the month.



In 1969, the Apollo 9 mission returned to Earth after testing the lunar module.
**Observations:** The Moon and the Gemini are high in the South.

**March 15th: Day 74 of the Gregorian calendar.**
**History:** In 1713 Nicolas Lacaille was born. His measurement, confirmed that Earth was not a perfect sphere; he gave the name to 14 constellations of the Southern Hemisphere.

In 1972, NASA announced its Space Shuttle Program.
**Observations:** Jupiter and Mercury are very close above the horizon at dusk. This is the easiest time all year to try and spot Mercury.

**March 16th: Day 75 of the Gregorian calendar.**
**History:** In 1926, a rocket launched by Robert H. Goddard becomes the first rocket running on liquid fuel and convinces Goddard that one day Man will eventually land on the Moon.

In 1966 the Gemini 8 was launched and makes the first space docking (with Agena).
In 1999, the team of the Lunar Prospector at NASA Ames

Venus at dawn on March 30th, 2011, under a very small crescent Moon.

**MARS**

Mars is now passing behind the Sun and therefore it will be hidden by the Sun's glare during the hole month.

**JUPITER**

Jupiter will be close to Mercury in the western sky as we said before. As it approaches its conjugation on April 6th, by the end of the month it will be so close to the Sun that it will not be possible to see it in the afterglow of dusk.

**SATURN**

Saturn is rising more and more earlier and at the end of March I can be seen at the beginning of the night. It is presently in constellation of Virgo and will reach its maximum diameter (19.3" wide) and brightness (+0.4) at the end of March.

Saturn at East after sunset on March 30th, 2011.

A good project, as we already suggested last year, would be to try and see the retrogradation of Saturn before and after opposition. The opposition of Saturn will occur on April 3rd, 2011.

Since Saturn's retrogradation period is of about 138 days, retrogradation has started slowly on January 27th and now is a good time to make observations observations with students of its position relative to background stars because now the movement can be well seen if you are accurate on spotting it in your

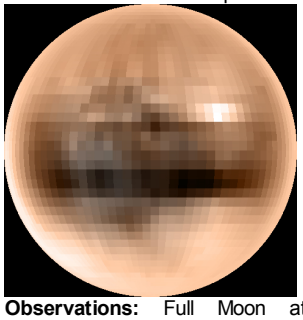
Research Center announces that most of the Moon is material ejected from Earth as result of an impact with an object of nearly the size of Mars.
**Observations:** Tonight try to find M50. Mercury and Jupiter are in conjunction tonight, which means that from an Earth centered perspective they are north and south of one another.

**March 17th: Day 76 of the Gregorian calendar.**
**History:** In 1958, Vanguard 1, the first probe working on solar power was launched.
**Observations:** Use your telescope and camera, a webcam or a CCD and make some pictures of the Moon. You can send them to us and we will post them on the EAAE Moonwalkers Project webpage with due credit.

**March 18th: Day 77 of the Gregorian calendar.**
**History:** In 1965, Aleksei Leonov becomes the first man to walk in space after leaving Voskod 2 for about 12 minutes.

In 1980, a Vostok rocket prepared for refueling explodes on the launch platform killing 50 persons.
**Observations:** Use your telescope and camera, a webcam or a CCD and make some pictures of Mercury. Mercury is now more than 10º above the horizon shining for about half an hour after sunset. You can send them to us and we will post them on the EAAE webpage with due credit.

**March 19th: Day 78 of the Gregorian calendar.**
**History:** In 1915, Pluto was photographed for the first time but it was not identified as a planet.



**Observations:** Full Moon at 18h10 (UTC).

**March 20th: Day 79 of the Gregorian calendar.**
**History:** In 1916, the Theory of General Relativity was published.
In 1964 ESRO (European Space Research Organization) was founded. This agency was the the first step for the birth of ESA (European Space Agency).

notes. During the month of March Saturn will increase its westward separation relative to Spica from 9º to 11º and will approach Porrima (Gamma Virginis).

Enjoy watching the planets. If you take nice pictures send them to us that we will publish them with due credit.

## ADVANCED ASTRONOMICAL OBSERVATIONS

### OPEN CLUSTERS NGC2489 AND NGC2539

During this month we challenge to find two open clusters in Puppis. These are real challenges and you will need dark nights for it so do it in the beginning or the end of March to avoid Moonlight.

For the first one you should look south-southeast of Rho Puppis and center the finder on a small collection of stars to locate NGC 2489.

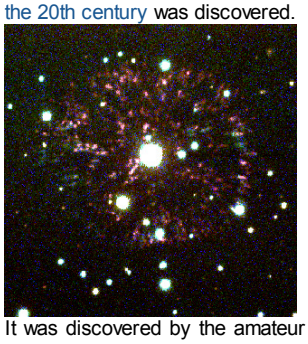
At magnitude 7.9, NGC 2489 is a beautiful collection that can be seen using binoculars. Note that there are many stars on your field of view but not all of them belong to the cluster. In fact, only the small patch of stars in the center is gravitationally linked as an open cluster. Under aperture and magnification you will find it to be a loose collection of around two dozen stars formed in interesting chains.

NGC 2489. Image credit: Digital Sky Survey.
(Click on the image to see a bigger image)

For the second cluster begin at Alpha Monoceros and drop about four fingerwidths southeast to the 19 Puppis to find NGC2539. This open cluster averages around 6th magnitude and is a great catch for binoculars as an elongated hazy patch with 19 Puppis on the south side. Telescopes will begin resolution on its 65 compressed members, as well as split 19 Puppis – a wide triple of magnitude 5.

**Observations:** The March equinox marks the beginning of Spring on that special moment when the sun crosses celestial equator, on its apparent from south to north. It happens during this night at 00h21(UTC) of March 21st. Spica is near the Moon from shortly after dark until dawn.

**March 21st: Day 80 of the Gregorian calendar.**
**History:** In 1901 the first nova of the 20th century was discovered.



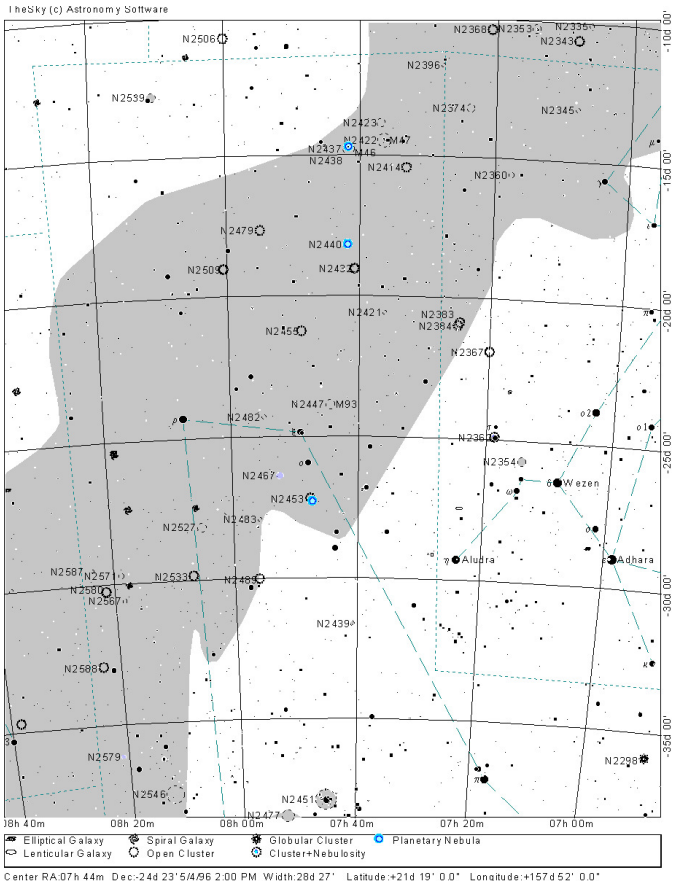
It was discovered by the amateur astronomer T. D. Anderson and was the first nova to be studied photometrically.
**Observations:** Spring equinox is at 00h21 (UTC).
Use your telescope and camera, a webcam or a CCD and make some pictures of M50 as suggested in "Advanced Astronomical Observations". You can send them to us and we will post them on the EAAE webpage with due credit.

**March 22nd: Day 81 of the Gregorian calendar.**
**History:** In 1799 F.W.A. Argelander was born.
In 1995, the cosmonaut Valeryiv Polyakov returns to Earth after breaking the record of the longest stay on Mir (438 days).
In 1996, the STS-76 mission of Space Shuttle Atlantis was launched carrying aboard Shannon Lucid that became the first woman aboard a Space Station.
**Observations:** Near the equinox is the best time to see the zodiacal light at moderate northern latitudes. Zodiacal light is seen as vague but tall pyramid of light that is seen in dark places looking westward about 80 minutes after sunset.

**March 23rd: Day 82 of the Gregorian calendar.**
**History:** In 1840 the first picture (daguerreotype) of the Moon was taken.
In 1912 Wenher Von Braun was born.
In 1965, the USA launched the Gemini 3 probe up to orbit carrying Virgil (Gus) Grissom and John W. Young.
In 2001, Space Station Mir, at the age of 15, was taken out of orbit and brought back to Earth.

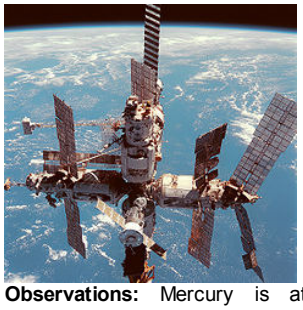
NGC 2539. Image credit: Digital Sky Survey.
(Click on the image to see a bigger image)

To have a printable sky map to help you find these clusters click on the map bellow and print it.




Puppis sky map. Credit: Sky Astronomy Software
(Click on the image to see a bigger printable image)

Clear skies!

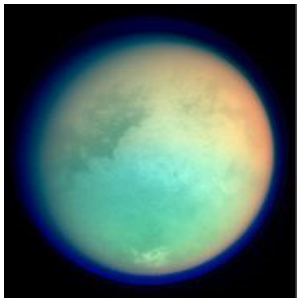


**Observations:** Mercury is at maximum elongation 19º east from the Sun so it's the best time to observe it.

**March 24th: Day 83 of the Gregorian calendar.**
**History:** In 1893, Walter Baade was born.

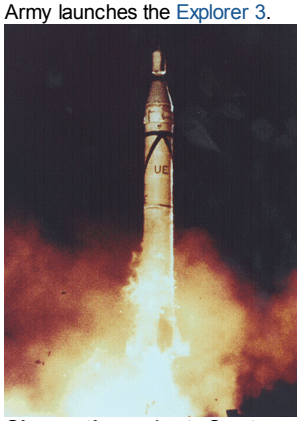
**Observations:** The Moon is near Scorpius before dawn.

**March 25th: Day 84 of the Gregorian calendar.**
**History:** In 1665 the biggest moon of Saturn, Titan was discovered.



**Observations:** Use binoculars to look at the Pleiades. Try to make a picture of them.

**March 26th: Day 85 of the Gregorian calendar.**
**History:** In 1958, United States Army launches the Explorer 3.



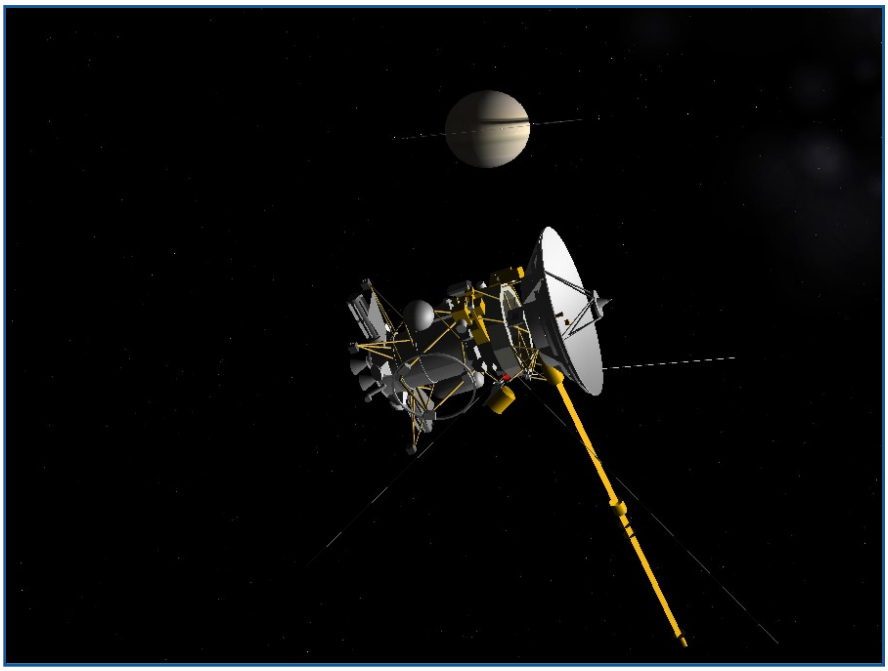
**Observations:** Last Quarter of the Moon at 12h07 (UTC).

**March 27th: Day 86 of the**

## ASTRONOMY SOFTWARE TOOLS

### CELESTIA

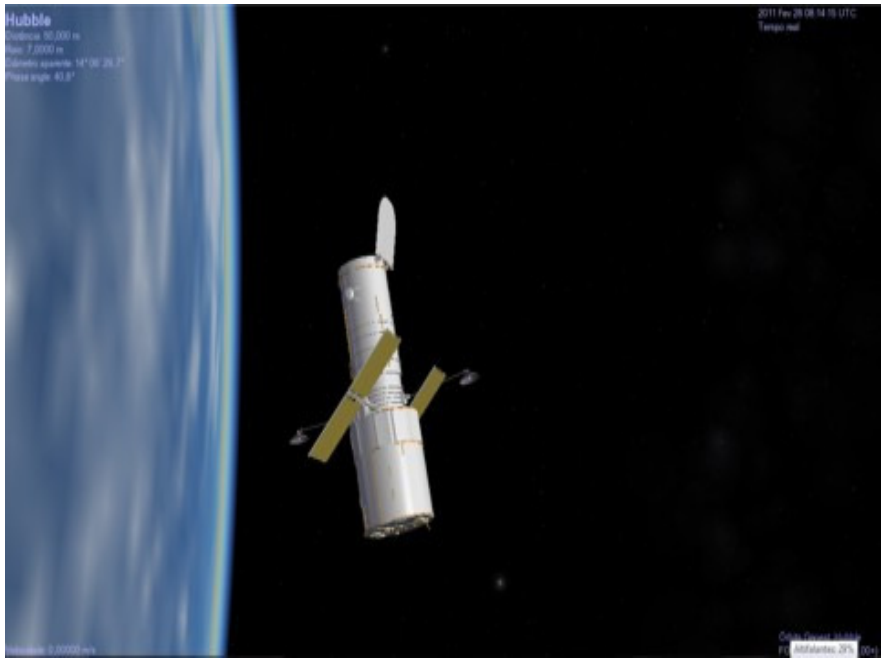
Celestia is a space simulation that allows you to take 3.dimensional tours within the solar system, out to the stars, and even beyond the Milky Way galaxy. There are more than 100,000 stars, nearly one hundred solar system, and sixty recently-discovered extrasolar planets that you can use as destinations for your tours.



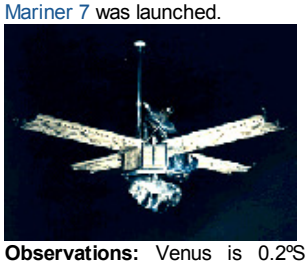
A screenshot of Saturn seen from the Cassini probe using Celestia.
(Click on the image to see a wider view)

Celestia is a superb tool for educational purposes and enthusiastic astronomers with additional data available in overlays and labels, such as planet names and constellations. The highly confirmable display features let you add or remove detail at will. The default installation enables you to select any of the catalogued objects using a built-in browser and 'fly' directly to it. Moving around through the solar system and beyond to other galaxies can be achieved using a combination of keyboard shortcuts or mouse movements. Celestia uses OpenGL to render realistic real-time animations of space travel.

Celestia would be impressive even if it was just a model with all this information. But Celestia allows you more. Every object in Celestia is moving synchronised to your computer's time and date, and flowing along their paths. You can speed up time, watch perfectly animated shadows move around planetary bodies or even probes like Cassini or Space telescopes like Hubble, moons fly through their orbit or follow an asteroid on its journey through space. You can even select some comets like comet Halley and from the proper distance see its coma and tail being created as it approaches to the Sun in 2061.

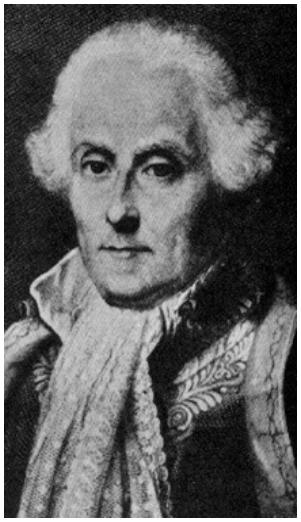


**Gregorian calendar.**
**History:**. In 1969, the probe Mariner 7 was launched.



**Observations:** Venus is 0.2ºS from Neptune at 02h (UTC).

**March 28th: Day 87 of the Gregorian calendar.**
**History:** In 1749 Pierre Laplace was born.



In 1993 supernova remnant in galaxy M81 (Ursa Major) was discovered by the Spanish amateur astronomer Francisco Garcia Diaz.
**Observations:** Vesta is 1.2ºS from the Moon at 08h (UTC).

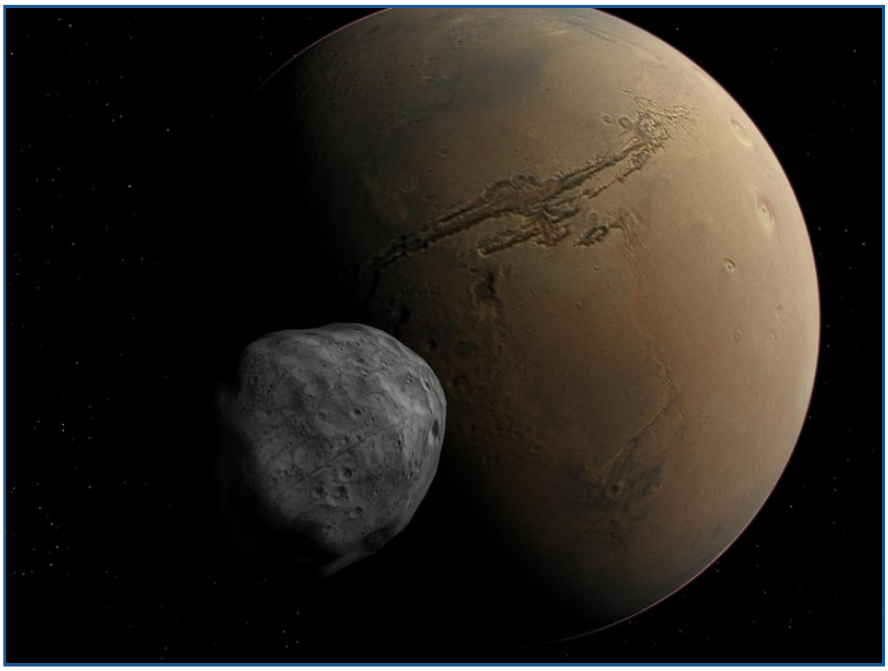
**March 29th: Day 88 of the Gregorian calendar.**
**History:** In 1807, Vesta, the brightest asteroid of the Solar System was discovered by Olbers.

In 1974, first flyby of Mercury by the Mariner 10 probe.
**Observations:** Tonight make some pictures of the Orion constellation. Try to pickup Canis Major and the Hyades in the same picture as well.

**March 30th: Day 89 of the Gregorian calendar.**
**History:** In 240 BC was recorded for the the first time the observation of Halley's comet at perihelion .

A screenshot of Hubble Space Telescope from a distance of 50m using Celestia.

Celestia works as if it was a version of Google Earth, not only for the entire solar system, but for many stellar systems beyond. Real-time 3D orbits and asteroid paths, add-on scripts and high resolution imagery. This phenomenal open-source project takes data gathered by the European Space Agency, including imagery, telemetry and positional data for planets, asteroids and stars, and then maps it in 3D.



A screenshot of Mars seen from behind Photos using Celestia.
(Click on the image to see a wider view)

The satellite imagery bundled with Celestia is fairly low resolution, breaking down as you zoom in more closely to planet surfaces. Nonetheless, there are free add-on packs that map Google Earth-like detail on to the planetary bodies found in the program. You can also download scripted tours, expanded data, and even add fictional spacecraft to the base installation. A collection of these can be found at www.celestiamotherlode.net.

What an incredible tool!

**Link:**
Celestia Webpage

**Observations:** Mercury is stationary at 18h (UTC).

**March 31st: Day 90 of the Gregorian calendar.**
**History:** In 1781, William Herschel finds Uranus, the first planet to be discovered since the Babylonian civilization.

**Observations:** Venus is lower right of the thin crescent of the Moon. Neptune is 5ºS of the Moon at 03h(UTC). Venus is 6ºS of the Moon at 14h(UTC).

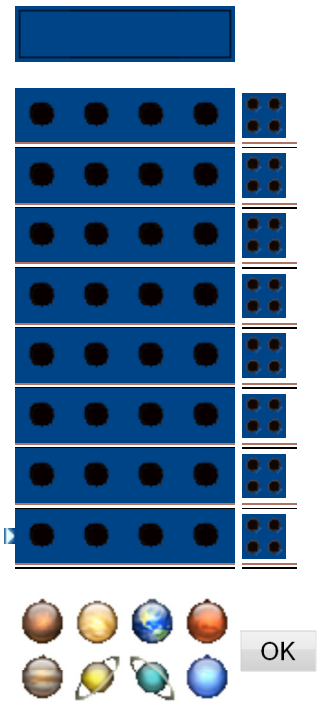
## SOLAR SYSTEM GENIUS

This month we bring you a new game that has been prepared for the Project Students Corner to be launched in October 2011.

This game that in its final version will be called Planet Explorer Genius is a variation of the classical MasterMind game. You can constraint the number of attempts for the solution between 8 and 20 attempts.

To insure the game can be played by people of all ages it is possible to generate variations of the game with more or less complexity. You can select how many planets can be used in the solution from 4 to 8 and also the length of the solution from 4 to 8. You can choose if planets can be repeated or not and also if blank spaces can be part of the solution. For small children it can be also an option to show which planets are on the right places and which are not.

Have fun!




Allowed attempts: 8

Number of Planets: 8

Solution length: 4

Allow blanks?

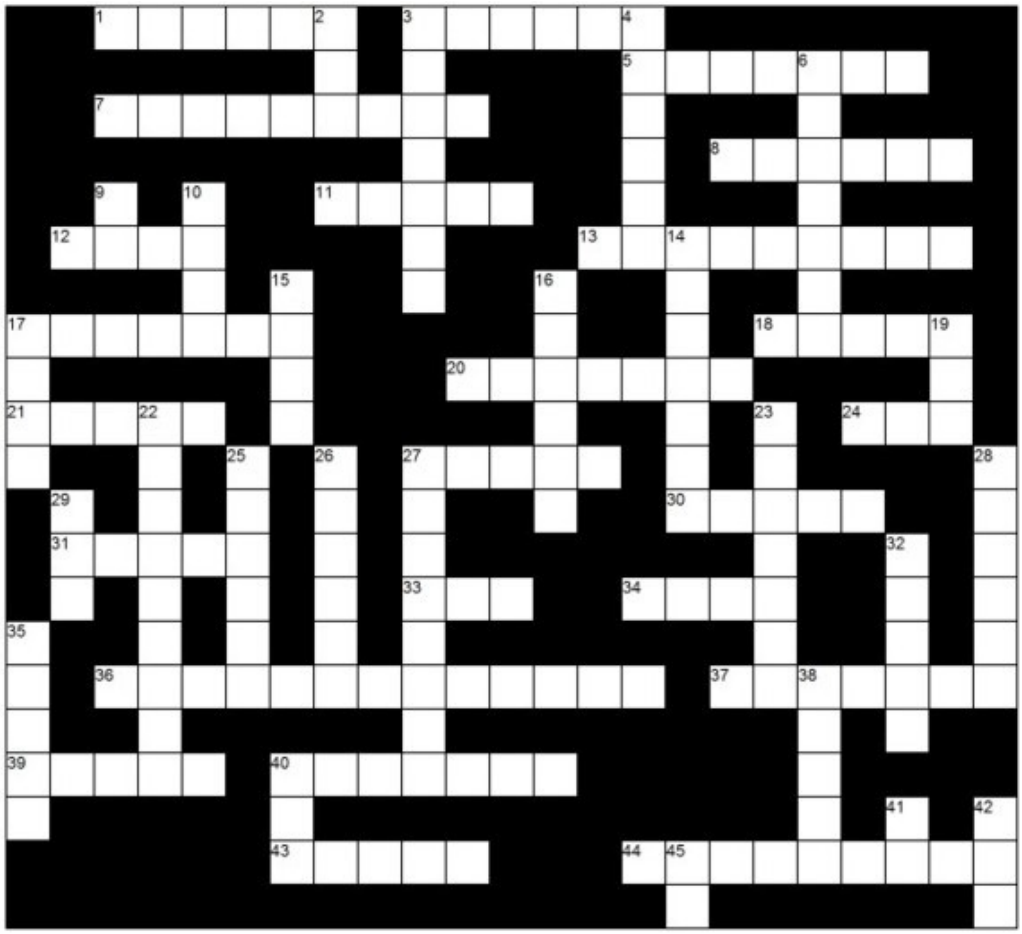
Allow same colours?

Mark in ball position?

New Game

Quit Game

## ASTRONOMY CROSSWORD PUZZLE



### CLUES

**ACROSS**

**1** Type of Galaxies.
**3** Invented the first reflector telescope.
**5** Occurs when the Moon crosses a node between the Sun and Earth.
**7** Observation instrument
**8** Pointer for sundials
**11** A former planet.
**12** European Associaton for Astronomy Education.
**13** Biggest moon of the solar system
**17** The biggest individual radiotelescope.
**18** The hunter (constellation)
**20** Interaction between bodies due to their mass.
**21** Orbit that passes by the poles.
**24** Small Maggelanic Cloud
**27** Once it was considered the biggest asteroid.
**30** Planet with water in three physical states
**31** Water level variation due to gravitational pull of the Moon.
**33** Color-Magnitude Diagram (acronym).
**34** Earth's satellite.
**36** Satellite that has a 24h orbital period.
**37** Closest Planet to the Sun.
**39** Biggest satellite of Saturn
**40** Name used for a group of stars or galaxies.
**43** Saturn's satellite.
**44** A violent death of a star.

**DOWN**

**2** The initials of an irregular galaxy of the Local Group.
**3** Has a Big Blue spot that was seen for first time by the Voyager probes.
**4** Cloud of Gas and Dust
**6** Probe thet took a plate about Earth and Man to to salute extrassolar civilizations.
**9** The Sun (ancient civilization)
**10** Project for the search of extraterrestrial life
**14** The eighth planet
**15** Space Telescope that proved the existence of cosmic microwave background radiation.
**16** The author of the HD Catalog of Stars
**17** Astronomical Image Processing System (acronym).
**19** New General Catalog (acronym)
**22** Largest galaxy of the Local Group
**23** Moon of a former a planet
**25** Planet that rotates on its belly
**26** Jupiter's galilean moon with water
**27** Stars with a standard period luminosity relation
**28** Gravitationally connected structure containing millions of stars, as well as clouds of gas and dust.
**29** Large Maggelanic Cloud
**32** An example of carbon dioxide's greenhouse effect
**35** Blue Marble
**38** Wheeled vehicle used to explore planetary surfaces.
**40** Charge Coupled Device (acronym).
**41** Volcanic galilean moon
**42** Period of Earth's rotation
**45** Invisible radiation next to visible light in the spectra but with smaller wavelengths

To confirm and print the solution click here.

## ASTRONOMY WORD PUZZLE

Find the words presented bellow on the grid. Words can go horizontally, vertically and diagonally in all eight directions.

P I O M K H W I S E T N M N H
O L F A Y E P O C S E L E T M
L T M T D N D G N B H M C R K
A W S E R E C T U L D V E C A
R O T U L P M L I V L H C S P
I B T V F D A O O T T H E E O
S A G F E L C R R A A D W P R
S U T N A N I G E D E N K O U
O R N C O O U W T M N E N C E
T S O A N M J S I E S A E S L
S L R V R Y O N P R O R P E A
I K M A D U A N U C B T T L R
L S P C M G L X J U O H U E I
A M A P O L L O C R H Y N T P
C C S O N O R C K Y P N E B S

**WORD LIST**

Biggest galaxy of Local Group
Manned missions to the Moon
Second largest galilean moon
Largest body of the asteroid belt
Father of Jupiter (Zeus)
Has water in three physical states
Jupiter's galilean moon with water
Biggest moon of the solar system
Pointer for sundials
volcanic galilean moon
Biggest planet of the Solar System
Large Maggelanic Cloud
Our group of Galaxies (first word)
The red planet
Closest planet to the Sun
Cloud of Gas and Dust
The eighth planet
Great Nebula also known as M42
Largest moon of Mars
Formerly a planet
The Northern Star
The less dense planet
Small Maggelanic Cloud
Galaxies like the Milky Way
Observation instrument
Astronomical Instrument
Saturn's largest moon
Planet that rotates on its belly
The hottest planet in the Solar System
Very Large Telescope
What conditions observation
IR mission to map the entire sky

To confirm and print the solution click here.

## PICTURE GALLERY

**NGC1999 - A beautiful nebula south of Orion** - Credit: Adam Block, MT. Le mm on Sky Center, U. Arizona

(click on the image to see a bigger version)

At a distance of 1,500 light-years, in the south part of the Orion Nebula, lies bright blue reflection nebula NGC 1999, illuminated by the embedded variable star V380 Orion is. The nebula that spans over a 10 light-years region has a dark sideways Tzu-po marked near the center. The dark shape was once assumed to be an obscuring dust cloud seen in silhouette against the bright reflection nebula. Recent infrared images have nonetheless indicated that the shape is probably a hole blown through the nebula itself produced by the energetic young stars that can create jets and outflows that generate luminous shock waves. Cataloged as Herbig Haro(HH) objects after the astronomers George Herbig and Guillermo Haro,on this image the shock regions appear bright red. The stellar jets and outflows push through the surrounding material at speeds of hundreds of kilometers per *second*.

2010 - EAAE - European Association for Astronomy Education. Edited by Alexandre Costa. The contents of the links were active at the date of the publication of this newsletter, but some of them cannot be taken as granted to work in the future. Please don't answer to this e-mail.

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