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**Issue Number 5**
**May 2010**

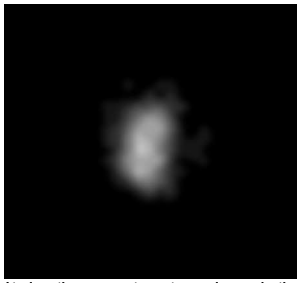


## Curiosity

Saturn is also the name of a planetary nebula (NGC7009) in the Aquarius constellation. (Image: HST)

## Astronomy Calendar

**May 1st: Day 121 of the gregorian calendar.**
**History:** In1949, Gerard Kuiper discovered Nereid.



It is the most external and the third biggest known moon of Neptune.
**Observations:**Can you find the Hercules constellation?
Don't forget your Moonwalkers Contest (see last month's issue) observations!

**May 2nd: Day 122 of the gregorian calendar.**
**Observations:** In May, the Big Dipper is upside-down very high in the northern sky. Its "handle" pints out to bright Arcturus. Arcturus is a giant yellow-orange star of the spectral type K1.5 III.

**May 3rd: Day 123 of the gregorian calendar.**
**History:** It is sometimes said that in 1715, during an eclipse, Edmond Halley was the first to make a record of the phenomena that later was dubbed as *Baily's beads* (because they were

## EDITORIAL

This month the highlight news comes from the Summer Schools that will be organized in Bulgaria and Spain in September. Summer schools are a unique opportunity to share astronomy teaching experiences between teachers.

We also present images that were captured all around Europe by participants in the Sunrise Project.

On the "First Astronomical Observations" section we challenge you to explore the Hercules constellation and try to spot M13.

This month's challenge for "Advanced Astronomical Observations" is Arp248.

On the "Astronomy Software Tools" section we present WinOrbit a software that allows you to make predictions of satellite positions in the sky..

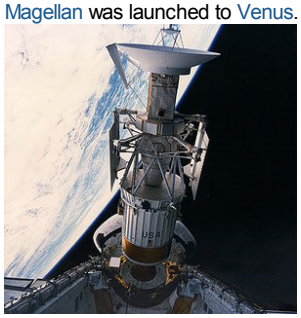
As usual we also have some activities in the Students Corner and we have selected a beautiful astronomical picture of Cat's Eye Nebula for this month.

We wish you all clear skies during the next month.

The EAAE Webteam

undoubtedly seen by Francis Baily in 1836); he also observes the bright red prominences and the east-west asymmetry of the corona, that he assumes to be generated by an atmosphere of the Moon or of the Sun.
**Observations:** How about trying to spot M13?

**May 4th: Day 124 of the gregorian calendar.**
**History:** In 1989 the mission Magellan was launched to Venus.



Its task was to obtain high resolution images of the planets's surface.

**May 5th: Day 125 of the gregorian calendar.**
**History:** In 1961, Alan Shepard becomes the first american in space traveling on the spaceship Freedom 7.
**Observations:** Try to make a picture of Mars with your telescope. Have you considered using a webcam? Try to find out how it can be done.

**May 6th: Day 126 of the gregorian calendar.**
**Observations:** Moon at Last Quarter at 04h16 (TDT). Moon at Apogee at a distance from Earth of 404231 km at 06h22 (TDT).

**May 7th: Day 127 of the gregorian calendar.**
**History:** In 1973, the X-ray Space Observatory Explorer 53 was launched.
In 1992, Space Shuttle Endeavour was launched.

In 1997, the Galileo probe made its fourth flyby to Ganimedes.

**May 8th: Day 128 of the gregorian calendar.**
**History:** In 1962, the first rocket Atlas Centaur was launched.

EAAE News

## EAAE SUMMER SCHOOLS IN 2010

# 14th EAAE-IAU Astronomy Summer School September 1th - 5th 2010 in Varna (Bulgaria)

**Organizers:**

- European Association for Astronomy Education (EAAE)
- International Astronomical Union (IAU)
- Astronomical Observatory and Planetarium-Varna,
- Regional Inspectorate of Ministry of education and science-Varna,
- Bulgarian Astronomical Society,
- Society of Innovative Teachers in Bulgaria,
- National Astronomical Observatory-Rozhen and
- Shumen University.

The Summer School is for school teachers interested in astronomy.

The Summer School is not aimed at experts.

The preliminary theme of this Summer School is " Teaching Astronomy at the beginning of the 21st century".

The aim of the organizers is to promote very active participation and the exchange of ideas.

**General Lectures** will be presented by EAAE and IAU members.
**Workshops** will be held in two groups (each 30 participants).
The objective of WS is to offer teachers very practical and didactic presentations presented by EAAE and IAU members.
**Observation sessions** can be held during the Summer School depending on the weather.
The goal is to introduce the participants to all types of astronomical observations.

The course will offer participants special observations using the Astronomical observatory and planetarium - Varna.

A poster session will be organized, to which participants are invited to contribute by presenting posters of particular astronomical activities.

The posters will be presented during the Summer School.

The language of the Summer School is Bulgarian.

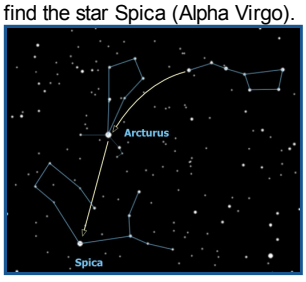
**Observations:** Lunar occultation of Laetitia only visible in northwestern Europe.

**May 9th: Day 129 of the gregorian calendar.**
**Observations:** This month you can observe Venus. If you have a telescope try to see the phases change.

**May 10th: Day 130 of the gregorian calendar.**
**History:** In 1971 Kosmos 419 (USSR) was launched without success. It was unable to reach Earth's orbit.

**May 11th: Day 131 of the gregorian calendar.**
**History:** In 1918 Richard Feynman, was born.
In 1916 Karl Schwarzschild died.

**Observations:**Follow the tail of the Big Dipper and you will find the star Arcturus (Alpha-Bootes). If you continue the arch you will find the star Spica (Alpha Virgo).




**May 12th: Day 132 of the gregorian calendar.**
**History:** In 1965, the soviet probe Luna 5 colides on the Moon.

# 15th EAAE-IAU Astronomy Summer School September 13rd - 17th 2010 in Cadiz (Spain)

**Organizers:**

- European Association for Astronomy Education (EAAE)
- International Astronomical Union (IAU)
- Spanish Distance Learning University (UNED)

The Summer School is not aimed at experts.

The preliminary theme of this Summer School is " Teaching Astronomy at the beginning of the 21st century".

The aim of the organizers is to promote very active participation and the exchange of ideas.

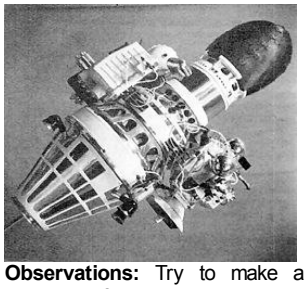
**General Lectures** will be presented by EAAE and IAU members.
**Workshops** will be held in two groups (each 30 participants).
The objective of WS is to offer teachers very practical and didactic presentations presented by EAAE and IAU members.
**Observation sessions** can be held during the Summer School depending on the weather.
The goal is to introduce the participants to all types of astronomical observations.

The course will offer participants special visit to the Royal Astronomy Observatory of San Fernando - Cadiz.
The language of the Summer School is Spanish.

**Summer School chair:** Amalia Williart (member of UNED and EAAE) and chair Rosa M. Ros (Member EAAE and IAU)
e-mail: awilliart@ccia.uned.es

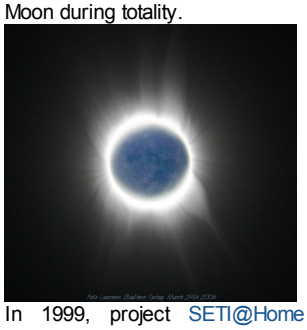
**Registration**:
This Summer School is a COMENIUS course. The title is "**Basic astronomy for everybody**" and the code is **ES 2010-260-001**.

Pre-registration form.



**Observations:** Try to make a picture of Mars with your telescope. Have you considered using a webcam? Try to find out how it can be done.

**May 13th: Day 133 of the gregorian calendar.**
**History:**. In 1733, during a solar eclipse the swedish astronomer Bigerus Vassenius was the first to notice the Earthshine on the Moon during totality.



In 1999, project SETI@Home was launched.
**Observations:** Above Venus, try to spot M35, a globular cluster in the Gemini constellation.

**May 14th: Day 134 of the gregorian calendar.**
**History:** Skylab the first american space station was launched.

This launch was the last trip of a Saturn V rocket.
**Observations:** New Moon at 01h06 (TDT). A new cycle for your Moon observations for the Moonwalkers Contest is about to begin.

**May 15th: Day 135 of the gregorian calendar.**
**History:** In 1713, Nicolas Louis de Lacaille was born.

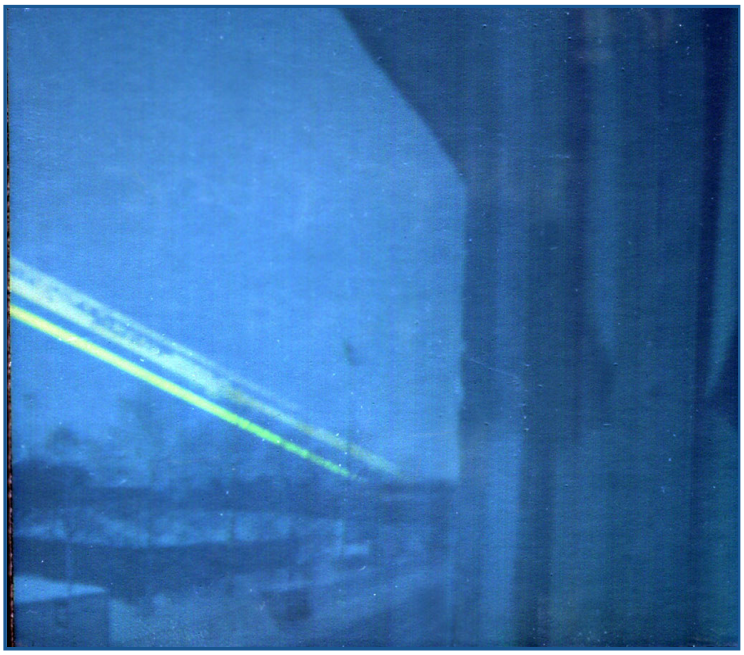
**Link:**
The EAAE Working Group 3 - Summer Schools Webpage

## EAAE SUNRISE PROJECT RESULTS

Close to the Spring Equinox students from several schools all around Europe have built pinhole cameras by themselves. The pinhole cameras were made of matt-black cardboard and other simple material using a design scheme that was provided by Sakari Ekko the project coordinator.

The pictures from these observations have now been released and are presented next. All images are copyright of the authors.

**1a** Sunrise 17.3.-22.3.2010, Rovaniemi, Finland, 66.5ºN 25.7ºE. Very near the Arctic circle. Look at the scanned data sheet series S.
(Click on the image to see a bigger image)



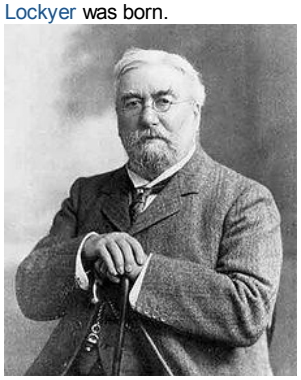
**1b** Sunset, the same location as in 1a. 17.-23.3.2010. Data sheet, series K.
(Click on the image to see a bigger image)

In 1958, Sputnik 3 was launched. In 1960, USSR launched Sputnik 4 In 1963, the last mission of the Mercury Project, Mercury-Atlas 9, was launched with the astronaut Gordon Cooper on board.
**Observations:** A young Moon crescent can be seen right under Venus after sunset.

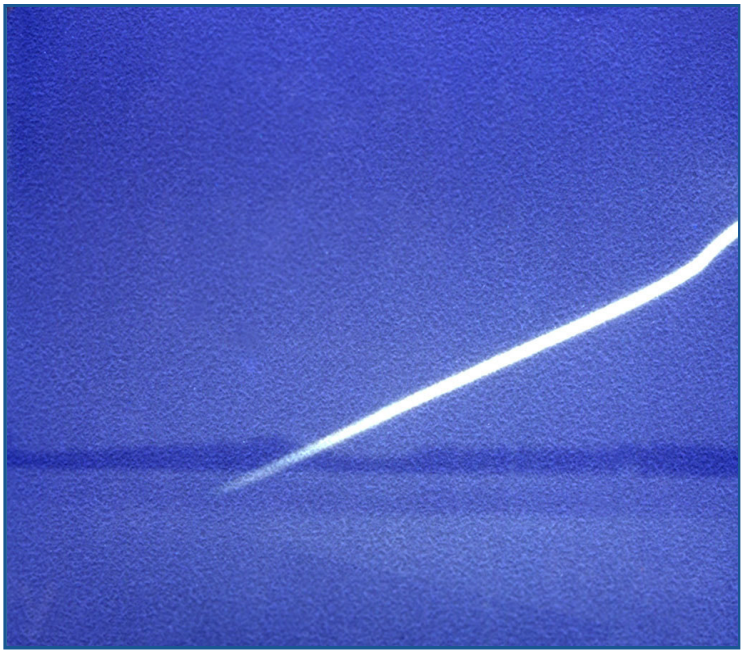
**May 16th: Day 136 of the gregorian calendar.**
**History:** In 1969, the soviet probe Venera 5 lands on Venus. In 1997, the STS-84 docks on MIR for the sixth STS-MIR. in the same year the internet is filled with images of the Hale-Bopp comet.

**Observations:** Venus 0.1°S of Moon with view of occultation at 10h in Eastern Europe(TDT). Venus at perihelion at 23h (TDT).

**May 17th: Day 137 of the gregorian calendar.**
**History:** In 1836 J. Norman Lockyer was born.



In 1882 a comet was discovered in pictures of the solar corona made during an eclipse. In 1969, the soviet probe Venera 6 begins its approach to Venus' atmosphere collecting data before its destruction.
**Observations:** Lunar occultation of Europa at 18h (UT) visible in Europe (tough because it isn't dark yet). Lunar occultation of



**1c** Sunrise 21.3.2010, Rovaniemi, Kivitaipale, Finland, 66.3ºN 25.9º E. The bend towards right is caused by the Sun thawing the snow during the morning; the tripod resting on the snow tilted. Data sheet PV.
(Click on the image to see a bigger image)

**2** Sunset 20.-26.3.2010, Espoo (near Helsinki), Finland, 60.ºN 24.9ºE. Photographer: Irma Hannula, first name.last name@mappi.helsinki.fi.
(Click on the image to see a bigger image)

Fortuna at 22h (UT) visible in western Europe.

**May 18th: Day 138 of the gregorian calendar.**
**History:** In 1910, Earth passed by the tail of comet Halley.
In 1969 Apollo 10 was launched.

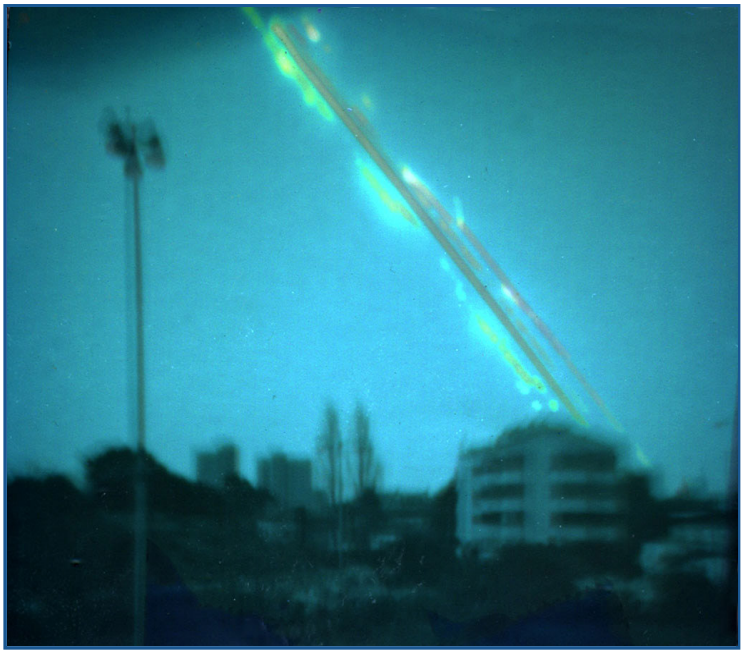
According to the Guinness Book of Records, Apollo 10 has the record of the highest speed that was set by a crewed vessel with 39,897 km/h. This speed was obtained when the ship was returning from the Moon on May 26th, 1969.
**Observations:**.Lunar occultation of Ariadne at 21h (UT) visible in Europe.

**May 19th: Day 139 of the gregorian calendar.**
**History:** In 1900 Cecilia Helena Payne-Gaposchkin was born.

In 1971 the Mars 2 probe (USSR) was launched.
**Observations:** Moon and Mars are close together tonight.

**May 20th: Day 140 of the gregorian calendar.**
**History:** In 1498, Vasco da Gama reached Calcuta (India) on a journey that like Columbus journey to America was the equivalent to the modern space odysseys.

**2b** Sunrise 18.-30.3.2010, Turku, Finland, 60.5oN 22.3oE. Photographers Jessina Nieminen and Stella Tähtinen, teacher Roope Kurkijarvi first name.last name@turku.fi.
(Click on the image to see a bigger image)



**3** Sunset, Cascais, Portugal 38º42'N 9º25'W. Photographer: Salvador M.Bruschy. Teacher: Leonor Cabral, first name.last name.prof@gmail.com.
(Click on the image to see a bigger image)

**4** Sunset 11.-15.4.2010. Location and photographer same as in 2.
(Click on the image to see a bigger image)

**Observations:** Moon at Perigee: 369729 km at 09h (TDT). First Quarter at 23h38 (TDT).

**May 21st: Day 141 of the gregorian calendar.**
**Observations:** Take the night to try to make a nice picture of Saturn with your telescope.

**May 22nd: Day 142 of the gregorian calendar.**
**History:** In 1969, the lunar module of Apollo 10 passed at 8 nautical miles (16 km) from the surface of the Moon.
**Observations:** The Moon is near to Saturn tonight.

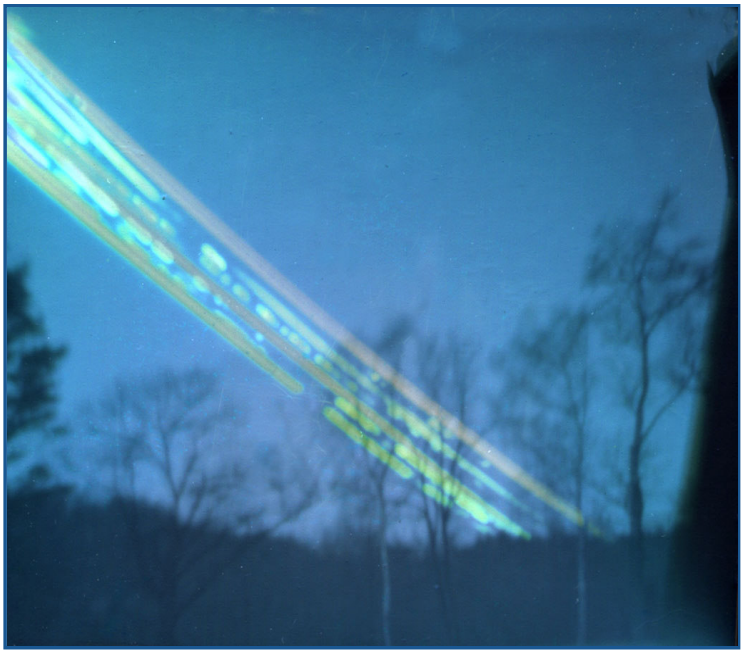
**May 23rd: Day 143 of the gregorian calendar.**
**History:** In 1958, the satellite Explorer 1 stopped emissions.

**Observations:** Sturn 08º N from the Moon at 05h (UT).

**May 24th: Day 144 of the gregorian calendar.**
**History:** In 1543 Nicolaus Copernicus dies.

In 1962, the american astronaut Scott Carpenter of the project Mercury orbits Earth three times on the space capsule Aurora 7.
**Observations:** Make your last observations for your Moonwalkers Contest project.

**May 25th: Day 145 of the gregorian calendar.**
**History:** In 1665 Christiaan Huygens discovered Titan, Saturn's biggest moon.



**5** Sunset 1.-17.4.2010, Bad Honneff, Berlin, Germany, 52.5o N 13.2o E. Photographer: Werner Warland, first name.last name@web.de.
(Click on the image to see a bigger image)

**Link:**
EAAE Sunrise Project Webpage

## It happened last month

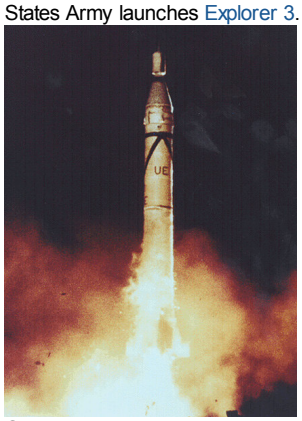
### Last Month's highlights from EAAE News Blog

EAAE News

- NASA To Probe First Moments Of The Universe
- NASA Outlines Big Plans for Humanoid Robot
- Asteroid Ice May Be 'Living Fossil' With Clues to Oceans' Origins
- Earth Microbes May Contaminate the Search for Life on Mars
- Planck highlights the complexity of star formation
- E-ELT Site Chosen
- 15th EAAE-IAU Astronomy Summer School September 13rd – 17th 2010 in Cadiz (Spain)
- 14th EAAE-IAU Astronomy Summer School September 1th – 5th 2010 in Varna (Bulgaria)
- Hubble Anniversary Image Art Astronomy Workshop in Dublin Ireland
- Happy Birthday Hubble
- Global Star Party
- Stunning New Images of the Sun Released by NASA
- Herschel enhances knowledge of stellar formation
- Wet Rocky Planets A Dime A Dozen In The Milky Way
- NASA's Cassini Sees Lightning on Saturn
- Celebrating the ISS and preparing for the future
- Proba-2 shows solar eruption that touched Earth
- Venus is still geologically active
- Planets galore!
- 30 Nights of StarPeace
- EAAE launches Moonwalkers Contest

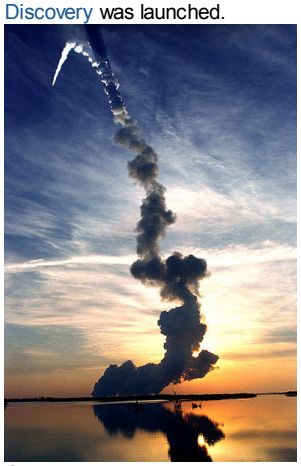
In 1992, the cosmonaut Sergei Krikalev returned to Earth after a 10 month mission on the Mir Space Station.

**May 26th: Day 146 of the gregorian calendar.**
**History:** In 1958, the United States Army launches Explorer 3.



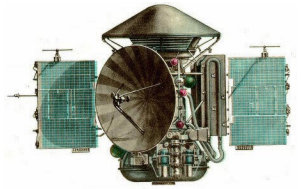
**Observations:** Mercury at Greatest Elongation: 25.1°W at 02h (TDT)

**May 27th: Day 147 of the gregorian calendar.**
**History:** In 1999, the mission STS-96 of the Space Shuttle Discovery was launched.



**Observations:** Full Moon at 23h08 (TDT).

**May 28th: Day 148 of the gregorian calendar.**
**History:** In 1959, two monkeys,Able & Baker, traveled at an altitude of 580 km for 16 minutes.
In 1971 the probe Mars 3 (USSR) was launched.



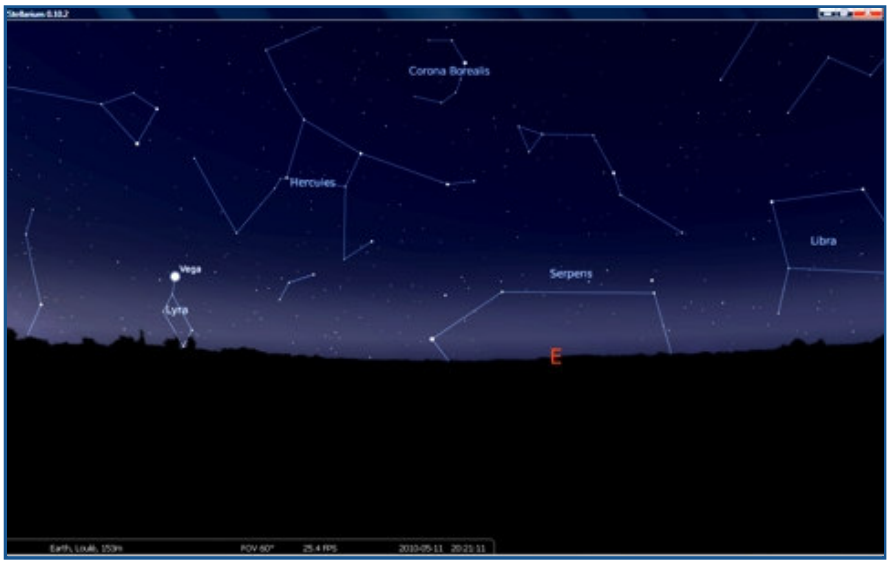
In 1998, the asteroid 1998 KY26

## FIRST ASTRONOMICAL OBSERVATIONS

### Hercules Constellation and M13

PDF Version

If you want to see the Hercules constellation look above the star Vega that is the brightest star of the Eastern sky after dark in the beginning of the night.




Screenshot of eastern view of the sky after sunset created with Stellarium.
(Click on the image to see a bigger image)

**Hercules** is a constellation that is named after Hercules, the Roman mythological hero adapted from the Greek hero Heracles. Hercules was one of the 48 constellations listed by the 2nd century astronomer Ptolemy, and it remains one of the 88 modern constellations today. It is the fifth largest of the modern constellations.

Screenshot of the mythological view of the same area of the sky as the previous image created with Stellarium.

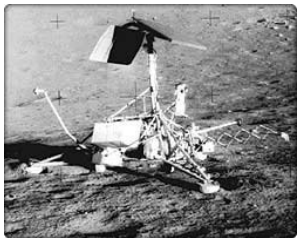
A closer view to the constellation can help you identify the most famous deep-sky object within this constellation. It's a globular star cluster known as M13, because it was the 13th object of Charles Messier's Catalogue.

was discovered by Tom Gehrels. In 2002, Mars Odyssey discovered ice deposits on Mars.

**May 29th: Day 149 of the gregorian calendar.**
**History:** In 1919, a total solar eclipse was observed by two groups of astronomers to try to confirm the Einstein's General Relativity Theory.
In 1974 the Luna 22 (USSR) probe was launched.

In 1999, Discovery Space Shuttle completes its first docking on the International Space Station.
**Observations:** Ceres 0.1ºN from the Moon (occultation) at 22h (UT), not visible from Europe.

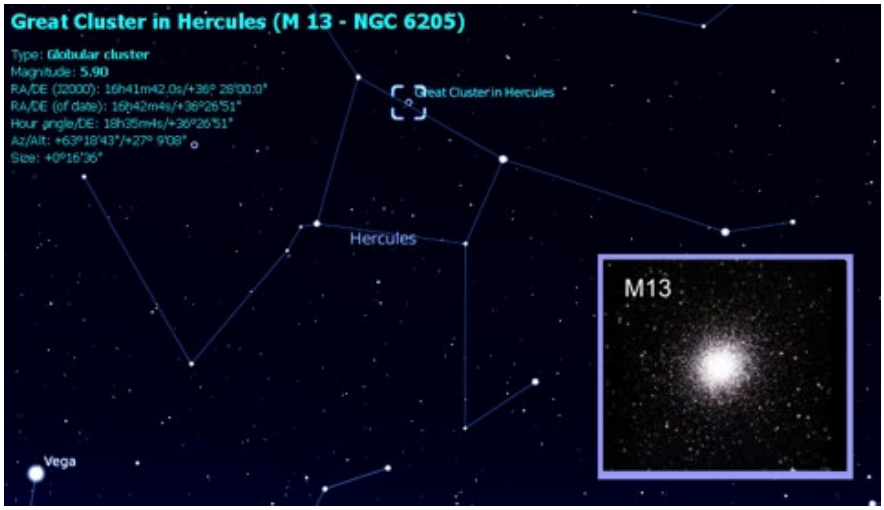
**May 30th: Day 150 of the gregorian calendar.**
**History:** In 1966, Surveyor 1, the first american probe to land on the Moon was launched.



In 1971 Mariner 9 was launched.

**May 31st: Day 151 of the gregorian calendar.**
**History:** In 2001, the Cassini probe ends its flyby to Jupiter and goes on to Saturn.

**Observations:** Today Saturn is stationary .




M13 (Great Cluster in Hercules) a globular cluster in the Hercules constellation.

After the Orion Nebula (M42), that is best seen in the winter, and the Andromeda Galaxy (M31), that is best seen at the end of the summer, the Hercules cluster is the easiest deep-sky object to scope and can be seen with binoculars.

Try to find it and use it to try to make your first pictures with a telescope. If you have a nice one send it to us and we will be pleased to publish it.

Clear skies.

## ADVANCED ASTRONOMICAL OBSERVATIONS

### Arp 248

PDF Version

For this month we have selected a view for the skilled. If you have a large telescope the challenge for this evening will be 5.5 degrees south of Beta Virginis, and half degree to the west ( the celestial equatorial coordinates are Right Ascension 11°46'45" and Declination -03°50'53"). Commonly known as ''Wild's Triplet,'' the Arp 248 group are three very small interacting galaxies. To see them you will need a very steady and clear sky in order to take full advantage of your 9-mm eyepiece. Use wide aversion, and try to keep the star just north of the trio at the edge of the field to cut glare. Be sure to mark your Arp Galaxy challenge list!

Arp248.
Credit: Instituto de Astrofisica de Canárias (IAC).
(Click on the image to see a bigger image)

The best thing is to try to make a picture of the sky area around the triplet.
You can see the location of Arp 248 at Jim Burnell's CCD images webpage.

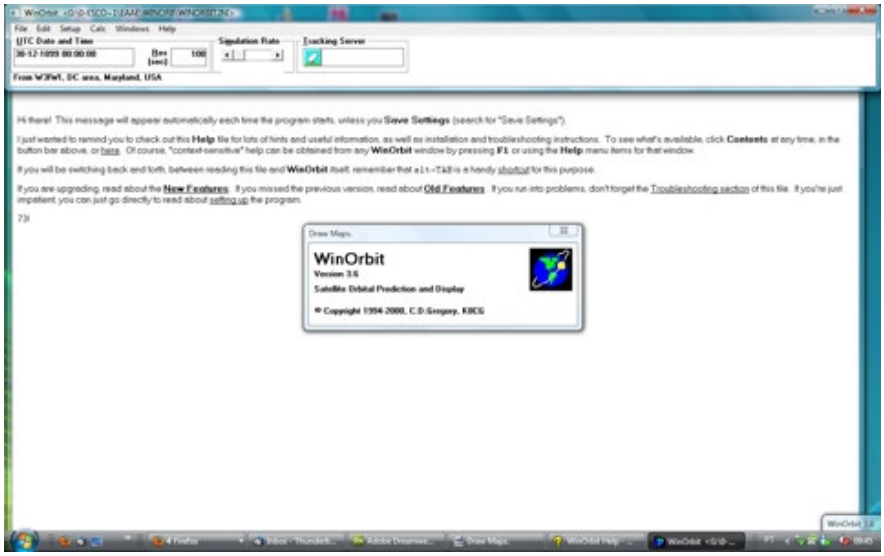
**Links:**
Atlas of Peculiar Galaxies-Wikipedia
Jim Burnell's CCD images webpage
Arp Atlas of Peculiar Galaxies

## ASTRONOMY SOFTWARE TOOLS

### WinOrbit

**PDF Version**

**WinOrbit** is a *free* software package for Microsoft Windows (3.1 or later), which will compute and display the position of artificial earth satellites. This is a program I wrote as a hobby, in order to learn more about satellite orbits and tracking (and programming), but which I thought might also be useful to others.




A screenshot of WinOrbit program launch.

WinOrbit is a program for computing artificial Earth-satellite position and visibility, with the Amateur Radio satellite operator in mind. It was written for the Microsoft Windows 3.1 operating system. WinOrbit is free (not shareware). The latest version is 3.1. WinOrbit has 4 basic functions:

* Graphical display of satellite positions in real-time, simulation, and manual modes.
* Tabular display of satellite information in the same modes.
* Generation of tables (ephemerid ) of past or future satellite information for planning or analysis of satellite orbits.
* Output of current tracking information (az, el, doppler, etc.) to a client program for control of tracking hardware such as antennas, radios, or telescopes.

WinOrbit has a tricky installation, that isn't very user-friendly. You should read the readme file of the ZIP package carefully and fulfil every step.

Have fun.

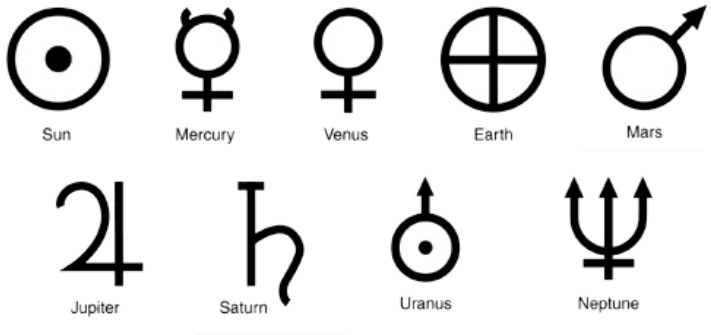
**Link:**
WinOrbit Download
WinOrbit Software webpage

## SOLAR SYSTEM SUDOKU

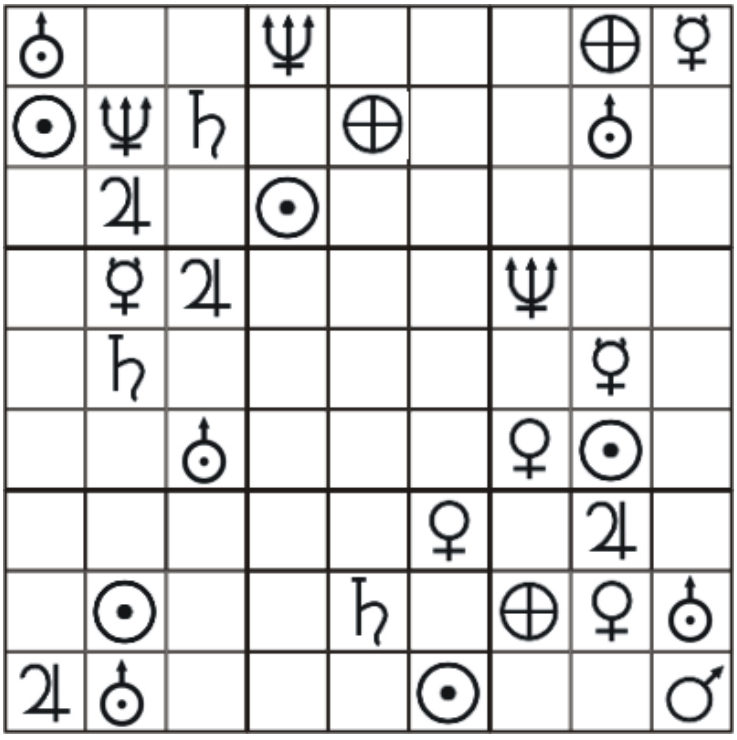
PDF Version

Solar System Sudoku is an EAAE transformation of the famous Japanese Sudoku. You have to put on each the nine symbols on each row, each column and each of the nine small nine spaces squares. This means each one of the nine symbols has to appear nine times on the Sudoku puzzle.

Instead of numbers, we use symbols of the nine major celestial objects of the solar system (Sun, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune).



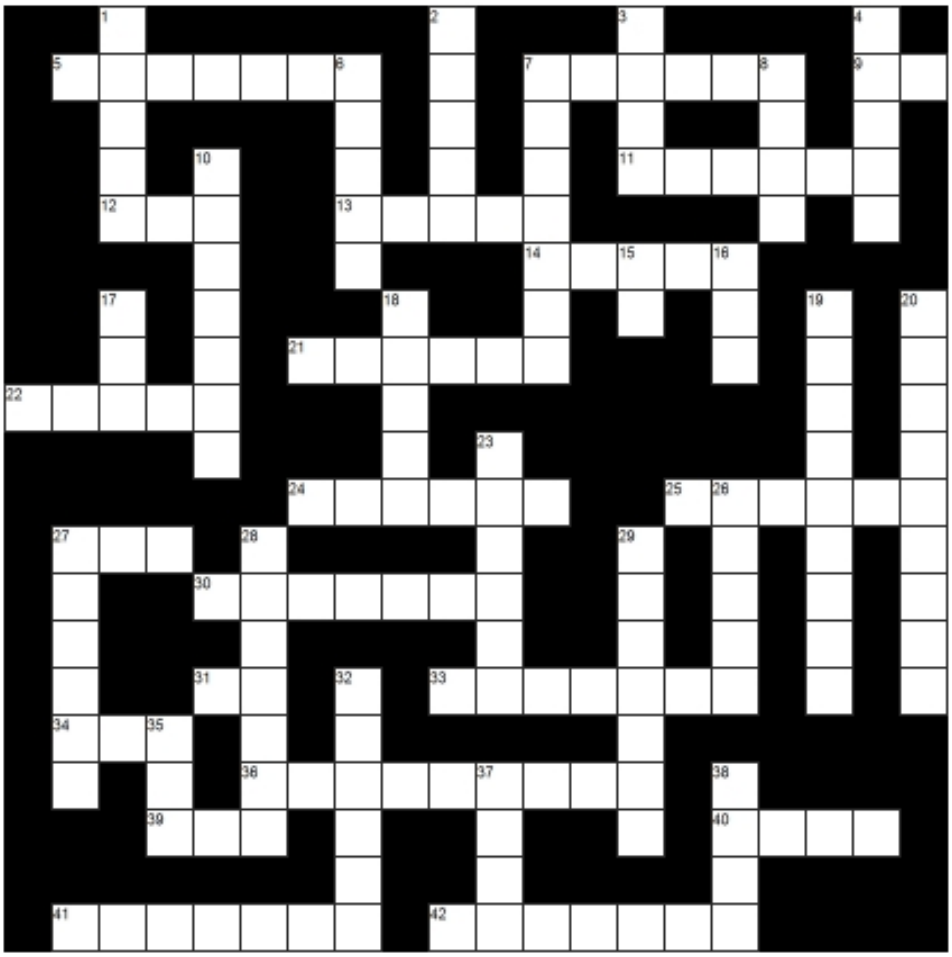

This month's challenge is the puzzle we present bellow.



To confirm and print the solution click here.

## ASTRONOMY CROSSWORD PUZZLE

PDF Version



**ACROSS**

**5** Has a Big Blue spot that was seen for first time by the Voyager probes.
**7** Largest and closest moon of Mars
**9** Volcanic galilean moon
**11** Invented the first reflector telescope.
**12** Small Maggelanic Cloud
**13** Biggest satellite of Saturn
**14** Blue Marble
**21** The author of the HD Catalog of Stars
**22** An example of carbon dioxide's greenhouse effect
**24** Planet that rotates on its belly
**25** Type of Galaxies.
**27** New General Catalog (acronym)
**30** The biggest individual radiotelescope.
**31** Invisible radiation next to visible light in the spectra but with smaller wavelengths
**33** Second largest galilean moon
**34** The initials of an irregular galaxy of the Local Group.
**36** Observation instrument
**39** Period of Earth's rotation
**40** Astronomical Image Processing System (acronym).
**41** Closest Planet to the Sun.
**42** The eighth planet

**DOWN**

**1** Once it was considered the biggest asteroid.
**2** Visible electromagnetic radiation.
**3** Earth's satellite.
**4** Saturn's satellite.
**6** Planet with water in three physical states
**7** Probe thet took a plate about Earth and Man to to salute extrassolar civilizations.
**8** Project for the search of extraterrestrial life
**10** Occurs when the Moon crosses a node between the Sun and Earth.
**15** The Sun (ancient civilization)
**16** Color-Magnitude Diagram (acronym).
**17** Closest G2 Class Star to Earth.
**18** Water level variation due to gravitational pull of the Moon.
**19** A violent death of a star.
**20** Saturn's moon that emits jets of gas and dust and that may harbor liquid water under its south pole region.
**23** Jupiter's galilean moon with water
**26** A former planet.
**27** Cloud of Gas and Dust
**28** Interaction between bodies due to their mass.
**29** Name used for a group of stars or galaxies.
**32** Gravitationally connected structure containing millions of stars, as well as clouds of gas and dust.
**35** Charge Coupled Device (acronym).
**37** Space Telescope that proved the existence of cosmic microwave background radiation.
**38** European Associaton for Astronomy Education.

To confirm and print the solution click here.

## ASTRONOMY WORD PUZZLE

PDF Version

Figure out what words the clues represent. Then find the words in the grid. Words can go horizontally, vertically and diagonally in all eight directions. Two letter words might have more than one option but the valid option doesn't overlap any other selected word.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| N | V | A | N | S | O | N | O | R | C |
| A | A | P | O | L | L | O | M | I | N |
| D | R | O | R | Q | V | R | O | R | C |
| E | X | R | E | E | V | E | U | P | E |
| M | D | U | A | O | S | T | N | L | R |
| O | T | E | R | F | A | I | F | U | E |
| R | S | I | T | S | V | P | W | T | S |
| D | O | M | H | K | C | U | Y | O | C |
| N | N | Z | C | M | X | J | T | L | V |
| A | T | E | L | E | S | C | O | P | E |

**Words:**

1) Andromeda
2) Apollo
3) Ceres
4) Cronos
5) Earth
6) Europa
7) Io
8) Jupiter
9) LMC
10) Orion
11) Pluto
12) Saturn
13) SMC
14) Telescope
15) Venus
16) WISE

To confirm and print the solution click here.

## PICTURE GALLERY

**Cat's Eye Nebula and its halo**- Credit: R. Corradi (Isaac Newton Group), Nordic Optical Telescope

(click on the image to see a bigger version)

This astonishing image presents the Cat's Eye Nebula (NGC 6543) that is one of the best known planetary nebulae in the sky. In the false colour image made with data from the Nordic Optical Telescope in the Canary Islands, the light of the outer part of the nebula was pushed to let us see the enormous but extremely faint halo of gaseous material, over three light-years across, which surrounds the brighter, familiar planetary nebula. Planetary nebulae are accepted as being the final phase in the life of a sun-like star. Only much more recently however, have some planetary nebulae been found to have halos like this one. These halos are probably formed, not at the last ejection of material but the dying star but instead are probably material shrugged off during earlier active episodes in the star's evolution. The planetary nebula phase is thought to last for around 10 000 years, but since the halo is formed previously, astronomers are now accepting that the age of the outer filamentary portions of the halo might be between 50 000 to 90 000 years.

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