NGC 4755 – The Jewel Box

The open star cluster NGC 4755 in the constellation Crux (Southern Cross), is one of the most beautiful star clusters on the sky. The brightest stars in the cluster are blue super giants, which shine a 1000 times brighter than our sun.

The highlight of the cluster is a single red super giant, which likely caused Sir John Herschel to call this cluster "a box of differently colored precious stones".

NGC 4755 has a distance of 7000 light years. The brightest stars are located in a spatial volume of 25 light years diameter, which is equivalent to 10 arc minutes in the sky. This star cluster is roughly 10 million years old and therefore one of the youngest open star clusters.

NGC 6231 – open starcluster in the constallation Scorpius

The open star cluster NGC 6321 can be already seen with the naked eye in the constellation Scorpion next to the bright star zeta Scorpii. The cluster belongs to a larger group of young and hot stars, which is called Scorpius OB 1 association. The distance from the earth to NGC 6231 is 5700 light years. Assuming a diameter of 15 arc minutes in the sky for the brightest part of the cluster, translates into an absolute diameter of 25 light years. Zeta Scorpii consists of two stars, which, optically, are a double star system. The brighter star is zeta 2 Scorpii, which is a common orange giant star with a distance of 150 light years.

The apparently weaker star, zeta 1 Scorpii, is one of the brightest stars of the milky way but 40 times further away. It belongs to the Scorpius OB 1 association and likely also to the cluster NGC 6231. This star shines 1 million times stronger than our sun and is 60 times more heavy. It belongs to the category of hyper stars, which are the heaviest and brightest existing stars.

Both NGC 6231 and zeta 1 Scorpii are equally influenced by interstellar dust. Interstellar dust dims the light of stars by a factor of six and also leads to a red shift of the light. This is why the young, hot stars of the cluster and 1 Scorpii don't look blue but rather white. The blue component of the light is scattered out by the dust.

Messier 11 – open starcluster in the constallation Scutum

M 11 is a compact open cluster in the constellation Scutum (the Shield). It contains some 2900 stars in a distance of 6300 lightyears. D The diameter of the bright inner part of the cluster is about 10 arcminutes, corresponding to an absolute diameter of 18 lightyears. The distribution if main sequence stars shows that the whole cluster is about three times bigger in diameter, approximately as large as the Moon in the sky. The Age of M 11 is about 250 million years, so it is an "intermediate age" cluster.

The open star cluster NGC 3293

The open cluster NGC 3293 located north-west of the Carina-nebula. The single Red Giant in the cluster gives a similar colour contrast to the blueish hot giants like NGC 4755, the Jewel Box. Furthermore, NGC 3293 is involved in a blue reflection nebula whis gives a furter contrast to the reddish emission nebula Gum 30 in the background.

The cluster contains about 100 young stars at the age of 6 to 20 million years in a distance of 8000 light years

NGC 5139 – Globular cluster Omega Centauri

Omega Centauri is the largest globular cluster of our galaxy. It contains far more than 1 million stars in a spatial volume of 150 light years diameter. In its center the density of stars is 40 times higher than close to the sun. The distance from the earth is approximately 17000 light years.

Recent studies show that Omega Centauri is probably the remnant of a former dwarf galaxy, whose outer stars were absorbed by the milky way. It is possible to clearly see this star cluster as a fuzzy spot in the sky. The brightest part of the cluster covers an area of the size of the moon.

It is fascinating to look at Omega Centauri through a telescope and see thousands of tiny stars on a black, velvety background. It is an experience not to be missed.

NGC 3372 – Eta Carina Star birth region

The picture shows the central section of the bright and big Carina nebula in the constellation Ship's Keel. In comparison to last year's more wide angle image with the 150 mm Zeiss APQ at Onjala one can see the entire magnificence of the delicate brighter and darker parts of the nebula around Eta Carinae (brightest star in the picture) and the Keyhole nebula.

The nebula complex is already visible during late dusk. The Carinae nebula is a hugh star forming region where new stars are born, giving birth to new stars since about 2 Million years. It contains enough 'material' for the creation of about a million stars of different sizes. In the 19th century, the astronomer John Herschel wrote during his observations of the southern sky:

"... Es ist auch nicht einfach, mit Worten einen vollen Eindruck von der Schoenheit und Erhabenheit des Schauspiels zu vermitteln ... so wie es durch solch herrliche und endlose Sternprozession eingeleitet wird, fuer die es eine Art Hoehepunkt bildet ... " Basically, what he wrote is that it is not easy to find words to describe the impression of beauty and grandness one gets when looking at such magnificent and endless star procession for which it is a highlight ...

Eta Carinae is one of the most mysterious and most instable stars known to us and has a very interesting history. It is estimated that Eta shines five million times brighter than

the sun. The history begins in the year 1677 when Edmond Halley did a first scan of stars in the southern sky. Halley registered this star with a brightness of the 4th stellar magnitude and did not note any further specialties.

However later observers of the southern sky noticed that the stars shone brighter than Halley described it. In 1837 John Herschel discovered that Eta Carinae became brighter and brighter. Six years later - in 1843 - the star was almost as bright as Sirius and the second brightest overall. Because the distance of Eta Carinae was well known, one could calculate that the stars was five million times brighter than the sun in 1843. After that the brightness went down to about an 8th stellar magnitude today (1998).

In the 60ies, when infrared astronomy got established, one noticed that Eta Carinae was the brightest single object in the sky at a wavelength of 20 microns. Together with its optical radiation the star's luminosity today is still million times stronger than our sun. What we can observe directly today is in fact not the star itself anymore.

Herschels keyhole nebula

"Herschel's Keyhole Nebula" is right next to Eta Carinae. Its optical appearance is closely connected to the brightness variations of Eta Carinae. The keyhole partly consists of dark clouds which block the view to regions behind. The dark semi-circle shaped upper structure seems to be more of deepening of the dark clouds. This deepening seems to expand and has its own name - the Eta Carinae-II-Ring. In 1843 Herschel also saw bright nebula parts in the southern part of the nebula which are completely vanished today. They are interpreted as reflection nebula which were directly illuminated by Eta Carina back at the time.

Messier 8, the Lagoon nebula

M8 (the Lagoon Nebula) is one of the brightest emission nebulas in the sky and can already be seen with the naked eye within a dark cloud of the milky way. The view at light magnification through the 17'' CDK PlaneWave is truly breathtaking. The gigantic birthplace of stars is located in the zodiacal sign Sagittarius a little bit more than 5000 light years away. The small central piece is also called Hourglass Nebula because of its shape. The viewing field covers the area of about the half a moon diameter.

The Lagoon Nebula owes its name to dark dust band which cuts the nebula into two parts. The Lagoon Nebula is the prototype of an emission nebula and its physics and structure is similar to the big Orion Nebula which can be seen with the naked eye in the northern hemisphere in winter. However one can also find the other types of galactic nebulas within the Lagoon Nebula: absorbing dark clouds, Bok-globules and reflection nebulas. The Lagoon Nebula is an active birthplace for stars still today.

The open star cluster NGC 6530 lies in one region of the nebula. Its age is projected at 'just' 2 million years. The very hot stars of the cluster once generated the bulk of the high-energy UV radiation which lights the Lagoon Nebula's hydrogen gas. Nowadays those stars have been replaced by the star 9 Sagittarii which ionizes big parts of the nebula. It is the brightest star in the telescope's field of view. Its boring catalogue name falls short of the fact that it is one of the half-dozen brightest stars of our galaxy. The

star blasts more energy into space than a million sun-like stars. Its mass is more than a hundred times the mass of our sun and its surface temperature is with 60.000 Kelvin ten times higher than the one of our sun. Although the star is about 6.000 light years away it is not easily observed with the naked eye. Our sun - put into the same distance to earth - could only be made visible with very large telescopes.

On the brightest spot on the other side of the nebula - opposite the star cluster - there is another astronomical superlative. There is concealed - together with a small nebula - one of the youngest known stars, the star Herschel 36. This star is at the most 10.000 years old and still being partly concealed by the gas cloud it was created from. The nebula itself has a characteristic shape. Astronomers call it Hourglass Nebula.

The center of our milky way

The center of our milky way can be seen in the constallation Sagittarius. Distance to our solar system is about 40.000 light years.

The large Magellanic Cloud

The Large Magellanic Cloud (LMC) is visible as a nebulous spot next to the Milky Way in the Southern Sky even to the naked eye. Together with the Small Magellanic Cloud it forms a prominent couple in the Southern Celestial Hemisphere.

LMC's distance is about 170 000 light years. Due to the relatively short distance one can see a number of single stars, star clusters and nebulae in the irregularly shaped companion of our Milky Way. It contains ca. 15 billion single stars. Ferdinand Magellan was the first European to describe the Magellanic Clouds during his round the world sailing tour in 1519. Detailed information about the Magellanic Clouds can be found online at Wikipedia. Wikipedia.

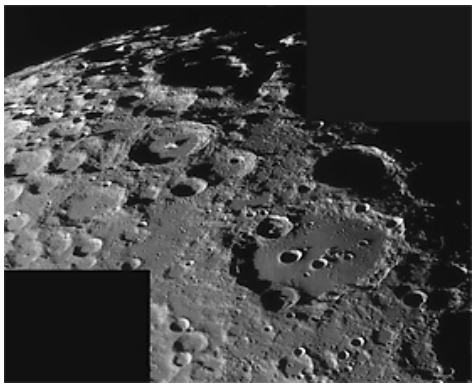
Startrails

Startrail images are long time esposures taken with a Camera with a wide angle lens and a fix position on the ground. Due to the roation of our earth star images are draw to a line.

Especially interesting images can be taken, if the lens is positioned in direction to the celestial south pole.

Three images ouf our Moon

Outside left a general view of our moon showing the big lunar mare.



Obove right: Two of the youngest moon crates Erathostenes (left, diameter about 60km) and right the sunrise above the crater Copernicus (diameter about 100 km).

This image show the south pole of the moon. In the lower right part of the image the very big crater Clavius is shown (diameter about 220km).

We are finishing our service with two images of the dome an one image showing the telescope of Onjala observatory.