



Exhibition of astronomical photographs

2023

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About the exhibition

When was the last time you actually saw the Milky Way with your own eyes? Have you ever gazed upon the Andromeda galaxy? Surprisingly, here in Israel, we can enjoy dark skies not far from urban hubs.

The exhibition before you is designed to showcase the magical encounter of celestial objects, the camera's sensor, and the technical and artistic skills of the Astro Photographer.

The photographs presented here bridge incomprehensible distances, bringing us closer to the Solar System, the Milky Way, various nebulas, and star clusters—all hundreds and thousands of light years away. In essence, each photograph is a documentation of photons, tiny particles emitted many years ago from distant stars, captured by the camera's lens.

Astronomical photographs are exceptional in an era when thousands of pictures are taken by cellphones every second, because unlike cellphone photography, astronomical photography demands meticulous planning and endless patience. At times, a short exposure at precise timing, using correct parameters, is sufficient, while other times it requires hours of exposure and innovative, sensitive equipment.

The low brightness of most of the photographed objects requires gathering an immense amount of light to distinguish subtle characteristics and singular details.

In Israel there are hundreds of photographers who are held captive by the magic of the night sky. They photograph the skies in the desert chill in moonless nights, aiming to capture the perfect photograph. Through this exhibition, we express our appreciation for all the photographers who document the universe surrounding us.

The Israel Astronomy Association: <http://www.astronomy.org.il>

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The judges of the exhibition

Prof. Yoav Yair, Dean of the School of Sustainability, the Reichman University

Dr. Yigal Pat-El, Cosmos Telescopes

Shelly Harpaz-Greenberg, Planetanya - Planetarium Netanya

Ilan Manolis, head of the observatory at the Weizmann Institute of Science

Dr. Diana Laufer, Director of the Givatayim observatory

Shalom Hananya, Manager of the Givatayim observatory

Michael Tzukran, DeepSky photographer

Moran Nahshoni, photographer and astronomy aficionado

Dr. Andreas Heidenreich, DeepSky photographer

Valentin Grigore, President-Romanian Society for Meteors and Astronomy

Shy Halatzi, the Israel Astronomy Association

Itay Levy, the Israeli Space Agency

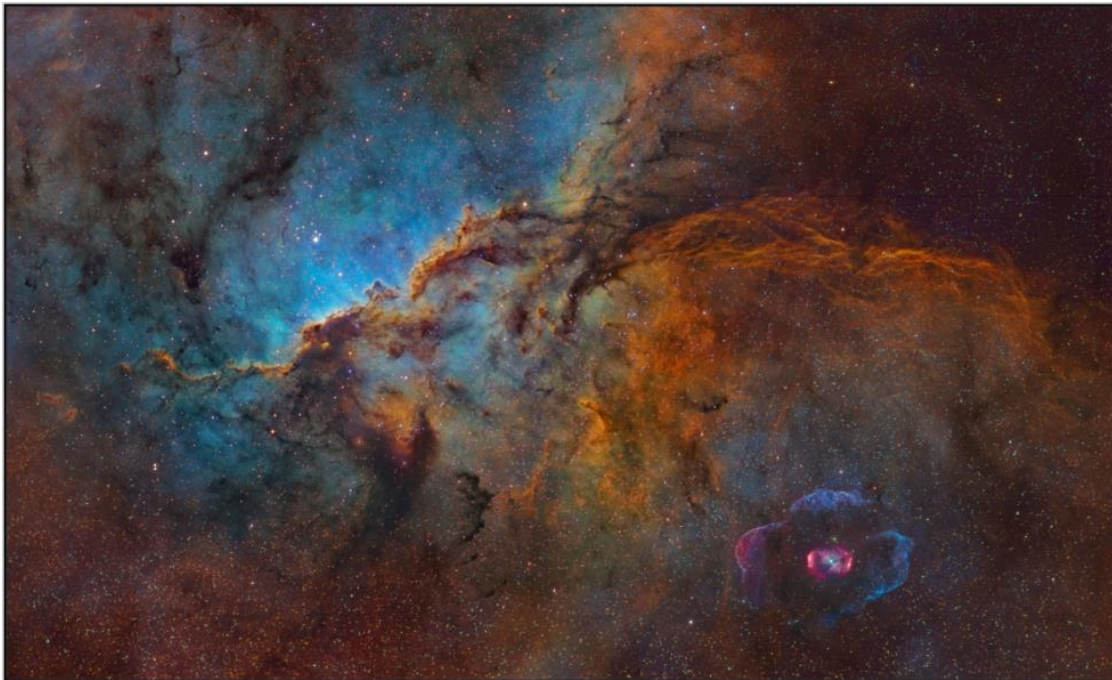
The Israel Astronomy Association

The Israel Astronomy Association is a non-profit organization and its entire activity is fully voluntary. The Association is home for astronomy enthusiasts and fans in Israel with an objective of spreading astronomy throughout the country.

We extend an invitation for you to join field observations organized by the Israel Astronomy Association, taking place at designated sites in the southern parts of Israel. These observations are accompanied by explanations provided by the association's volunteers and are intended for both experienced astronomy enthusiasts and those who have never looked through a telescope before.

The Israel Astronomy Association <http://www.astronomy.org.il>

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The cosmic circle of life

Kfir Simon

NGC 6161-6165,6188 represents one of the most captivating regions in the skies, embodying both creation and death. On the left-hand side of the picture, a zone is depicted where new stars are forming out of hydrogen clouds, while on the right side, an aging star approaches its end, releasing matter that will contribute to the birth of new stars in the future.

This photograph is the result of employing seven different filters. Gas clouds were captured using narrow filters (hydrogen, oxygen, and sulfur) with a conversion to the unique color Hubble Palette to accentuate the nebula's material composition. The lower part of the planetary nebula NGC 6164-6165 was captured using an LRGB filter.

This image marks the First Light of the RASA Celestron 14 telescope, with an overall exposure time of 90 minutes and a QHY 600 PRO camera.

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M42

Uri Bezaleal

The Orion Nebula, also known as M42, is situated approximately 1,300 light years from our Solar System, spanning about 30 to 40 light years. Positioned south of Orion's Belt in the constellation of Orion the Hunter, it is part of the middle star in the scabbard (the three stars south of the belt). On the left side of the photograph, the Running Man Nebula, another blue nebula, is visible. The Orion M42 nebula is among the most well-known and brightest nebulas in the winter skies, observable even in well-lit areas with binoculars or a small telescope.

Capturing this object in visible light (LRGB) is one of the most complex tasks in astrophotography due to its brightness. To reveal its darker details without blurring the brighter ones, many pictures with very short exposure times were necessary.

The photograph was taken using an Asi 1600 mono pro photography camera and a Zwo 120mm telescope camera. The equipment included a William Optics GTF81 81mm Apo Refractor telescope and a ZWO AC 60/280 Guiding Scope, with an overall exposure time of 25 minutes out of an actual 9 hours of photo shooting.

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M16

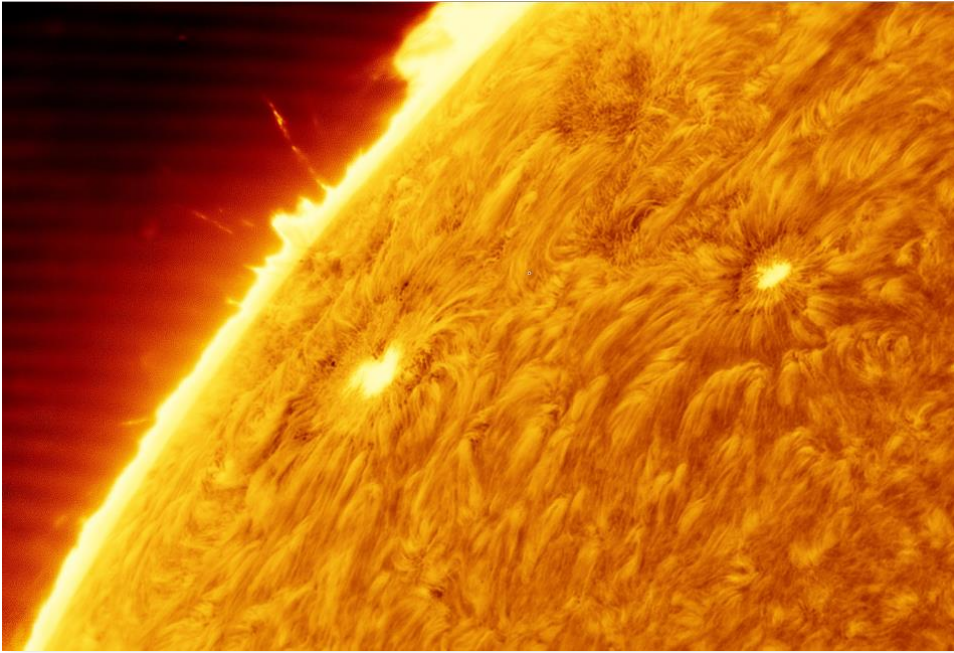
Shimon Avitan

The Eagle Nebula is an open cluster of stars in the constellation Serpens, surrounded by dust and gas clouds that form a diffuse emission nebula. Its name is derived from the eagle-like shape it portrays.

Situated approximately 7000 light years away, this nebula spans a length of 55 to 70 light years. At the center of the photograph, the Pillars of Creation are prominently visible—a dense concentration of matter and gases where new stars are currently forming.

The image was captured using narrowband filters (HA, S2, O3 - hydrogen, sulfur, and oxygen) with conversion to the unique color Hubble Palette, emphasizing the nebula's material composition. Taken from the rooftop of my house in northern Israel (with a light pollution level of 6 in the Bortle scale), this photograph required around 16 hours of exposure time using a William Optics FLT 132 telescope and an ATIK 16200 Mono camera.

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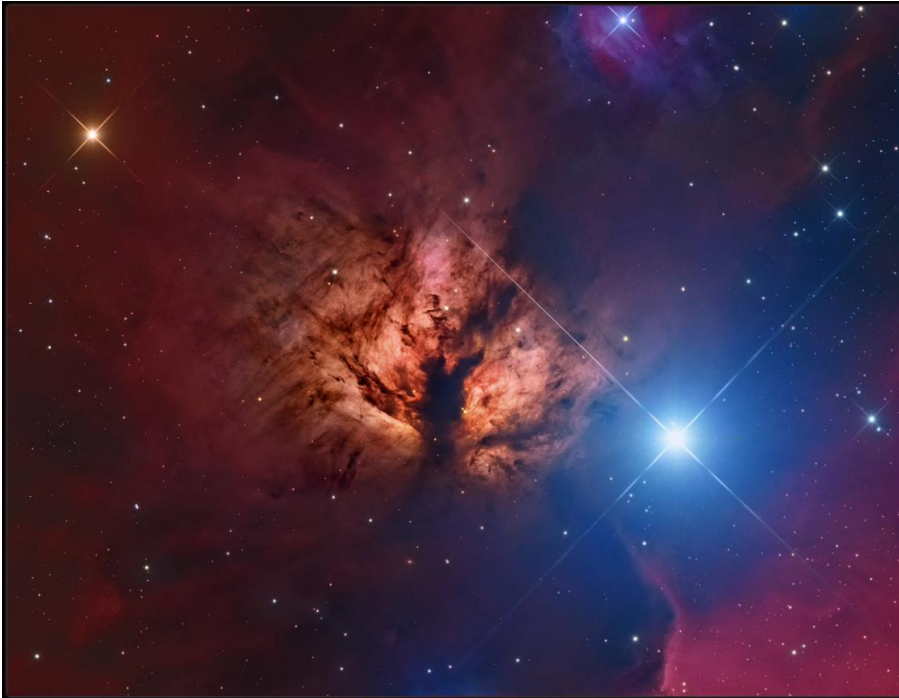
Surface of the sun

Deddy Dayag

This photograph captures the surface of the sun, featuring a pair of colossal sunspots. The diameter of the larger spot on the left is three times that of Earth. The surface temperature of the sun is approximately 6500 degrees Celsius, and these sunspots are in a constant state of flux.

The image was obtained using a 152-mm achromatic refractor telescope equipped with a specialized H-alpha 4 angstrom solar filter..

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The Burning Bush

Kfir Simon

The Flame Nebula, often overshadowed by its proximity to the Horsehead Nebula in the Orion Group, deserves attention in its own right. The bright star on the right, Alnitac, is part of Orion's Belt and is a highly energetic star. Its radiance illuminates the surrounding gas clouds, giving rise to the striking flame image.

The dark stripes across the flame are generated by clouds of dark dust in the nebula's vicinity. Alnitac's intense illumination poses a challenge for astrophotographers aiming to capture detailed images of the nebula. To overcome this, a large number of very brief exposures were taken to accentuate the nebula's intricate details.

The equipment used for this photograph includes a Newtonian 12" telescope with an ASA F3.6 configuration and a FLI ML 8300 camera. The photography involved LRGB processing, with LUM exposures lasting 600 seconds and up to 10-second exposures for each channel in RGB, accumulating a total of 3.5 hours of exposure time.

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Yelek Waterhole

Jonathan Elihis

The Yelek waterhole serves as the collection point for the floodwater of Wadi Yelek, situated at the southern boundary of the Ramon Crater reserve. Once every few years, the waterhole fills up, becoming a crucial water source for the animals in the reserve.

This picture, classified as "star trails", captures the apparent motion of the skies throughout the night. The photograph, taken over three hours, features the reflection of the stars on the water. The central star in the circular trail is Polaris, the Northern Star, the sole star in the celestial sphere that remains stationary.

The photograph was captured using a Canon 5D Mark 4 camera and a Tamron 15-30 lens.

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A comet at the Wise

Yair Arcavi

The photograph was taken on top of the main building of the Tel Aviv University Wise observatory in Mizpe Ramon. It reveals the largest telescope in the observatory (and in the country) with a backdrop of the western skies during the summer of summer 2020. On the right side is comet C/2020 (Neowise F3) named after another Wise telescope, and on the left, the Milky Way and Jupiter. On the left side, one can see the domes of the smaller telescopes of the observatory.

The comet made an appearance during the evening skies of July 2020, and in unlit places, it could even be seen by the naked eye. The panorama photograph is composed of 8 shots taken with a Canon 24-70 lens set on 24 mm, mounted on a Canon 5D Mark IV camera, with an exposure set for 10 second per photograph, a shutter of 2.8 and ISO 5000. This photograph was taken on July 20, 2020.

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The Rosetta Nebula and the open star cluster - NGC 2244

Shimon Avitan

The Rosetta Nebula, also known as Caldwell 49, is an H II region situated near one end of a giant molecular cloud in the Monoceros star cluster. The stars of the open cluster NGC 2244 have been formed from the nebula's matter. The cluster and nebula are located at a distance of 5,000 light-years from Earth and measure roughly 130 light-years in diameter. The radiation from the young stars excites the atoms in the nebula, causing them to emit radiation themselves, producing the emission nebula we see. The mass of the nebula is estimated to be around 10,000 solar masses.

The photograph was taken with narrowband filters: HA, S2, O3 (hydrogen, sulfur and oxygen) with conversion to the unique color Hubble Palette to accentuate the nebula's chemical composition. The photograph, captured from the rooftop of my home in Northern Israel (Bortle 6), lasted approximately 24 hours, using the following equipment: a William Optics FLT 132 telescope and an ATIK 16200 Mono camera.

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The Milky Way over the Arches National

Yair Arcavi

The Milky Way over the Arches National Park in Utah, USA. The spectacular arches were formed over dozens of millions of years through soil movement, water, and geological forces, while the stars above were created over billions of years through nuclear fusion and gravity.

The picture shows the Milky Way, our home galaxy, and Jupiter shining over an arch on the right side. At the center of the arch is a hiker who lit up a torch, and for a moment, became a star on Earth. The arch in the picture, the Delicate Arch, is the most famous of the park, but reaching it requires an arguably challenging hiking. The challenge becomes even greater when doing it with a tripod and photography equipment strapped to one's back.

And if that is not enough, just by the arch, there is a deep drop surrounded by a steep slope that looks like it was placed there to serve as a huge funnel designed to swallow careless photographers in the very dark night. Nevertheless, with some effort, a lot of caution, and a whole lot of luck in the form of a hiker that happened to turn on a flashlight and looked up at the right moment, one special instant can be captured between heaven and Earth, between man and nature.

The photograph was taken with a Canon 16-35 mm lens set on 16 mm, mounted on a Canon 5D Mark IV camera with a 2.8 shutter and exposure time of 20 seconds.

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The road

Amir Ehrlich

Travelers along route 40 from Mizpe Ramon to Eilat pass through the Ramon Crater, the only starlight reserve in Israel. The descent to the crater through the Independence Road is slow and twisting. How many of the travelers on this route have raised their eyes to the sky to watch the Milky Way?

And you, the spectators of this photograph, the next time you take this road, stop at one of the overnight parking lots located within the crater, turn off your vehicle's lights and enjoy the beauty of the sky. Please remember that you are traveling through a unique starlight reserve. Maintain the darkness and avoid damaging the environment.

Camera: Nikon D610, Samyang 14mm, ISO 6400, shutter 2.8, 120 seconds of exposure.

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The Orion Nebula - M42

Michael Kalika

The grand Orion Nebula, also known as M42, is a massive cloud of gas and dust, one of many in our Milky Way galaxy. This is one of the brightest nebulas and can be seen with a naked eye in the night skies in dark areas such as deserts.

M42 is located about 1,300 light years from Earth. This enormous cloud of gas with its 30 to 40 light years diameter, is a nursery to some thousand new stars that are being formed in the "potion cauldron", represented by the gases visible at its center.

Within the nebula, you can see a young open cluster of stars that were born at the same time as part of the nebula and are still bound together by gravity. This cluster is also known as the Trapezium. Keen observers may notice a set of dark nebulous swirls spelling the word "GOD" right over the nebulous core.

This photograph was taken for six nights, using an especially narrow band filter, and a RC 8" telescope with a focal point of 1600 mm (combined with a ZWO ASI-2600MC camera), offering a glimpse into the nebulous core.

This photograph holds particular significance for me as it was taken during a lockdown in 2020 in the area of Rishon Lezion in the light polluted Dan region. It serves as a reminder and symbol that even during complex and tough situations, such as lockdown or epidemic, there are still many options, and with strong determination, even the sky is not the limit.

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Iris Ghosts

Leo Shatz

This is a wide-angled picture of the Iris Nebula (NGC-7023), surrounded by nebulae shaped like ghosts and that were officially named as such. Around it, one can see clouds of dust and cold molecular gas that hide the stars in the backdrop. Within the Iris, at the heart of the nebula, is a young and hot star. The dominant internal color of the nebula is blue, a phenomenon typical of dust grains reflecting the stars' light.

Around the nebula, fibers and clumps of cosmic dust can be seen, glowing in a pale reddish color since other dust grains efficiently convert the star's ultraviolet light to visible red light.

The photograph was taken during a couple of nights, using a 5" telescope and a color camera with an accumulated exposure of over ten hours.

This picture was featured on the website "Astronomy Picture of the Day" (APOD) in October 2021.

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Neowise Comet

Yaron Eini

The comet Neowise (C/2020 F3) was discovered in March 2020 as it made its way towards the Sun and was two astronomical units away from the Sun (twice the distance between the Earth and the Sun). In July, the comet reached to its closest distance to the Sun, a mere 0.3 astronomical units, which is approximately 43 million kilometers.

When comets get near the Sun, they heat up and emit gas, ice and dust that look like tails coming out of the comet. The picture shows two tails: one bright, made of ice and dust, and another pale, made of the gases emitted from the comet. The bright tail is directed against the solar wind that blows the particles from the comet.

this picture was taken in Canada, by a remote lake. Although the photograph was taken after midnight, the twilight colors can be seen on the horizon due to the late sunset in Canada.

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M20 Trifid Nebula

Michael Kalika

The Trifid Nebula, also known as the Three-Lobe Nebula, and Messier 20 is an object easily found using a small telescope or binoculars. The nebula is located in the Sagittarius constellation at the center of the Milky Way, approximately 5,000 light years from Earth. The nebula is about 40 light years in size and is estimated to be just 300,000 years old, making it one of the latest places in the galaxy where new stars are being formed.

This nebula is a unique combination of an open star cluster, an emission nebula (the lower red part), a reflection nebula (the top blue part) and a dark nebula (the dark gaps that can be seen in the emission nebula). Northwest of the nebula (above the left corner) is an open star cluster named Messier 21. M21 is a young and pale cluster and cannot be seen with the naked eye.

All the stars in the background as well as the reddish and yellowish clouds are but a very small area within our Milky Way galaxy.

The photograph was taken in the Negev with a SkyWatcher 150 telescope and a ZWO ASI-2600MC camera, with an overall exposure duration of 3.6 hours.