

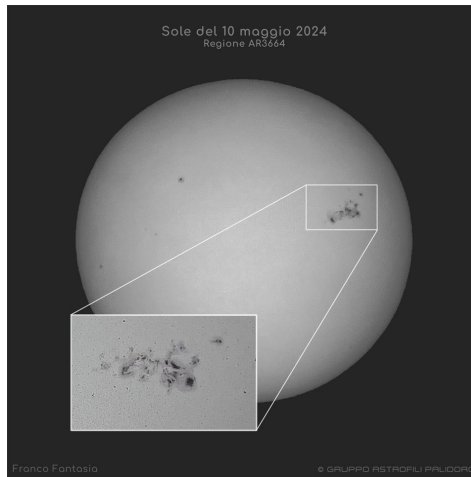
## Red Aurora over Poland



Date: 2024-05-12 Copyright:  
Mariusz Durliej

Northern lights don't usually reach this far south. Magnetic chaos in the Sun's huge Active Region 3664, however, produced a surface explosion that sent a burst of electrons, protons, and more massive, charged nuclei into the Solar System. A few days later, that coronal mass ejection (CME) impacted the Earth and triggered auroras that are being reported unusually far from our planet's north and south poles. The free sky show might not be over -- the sunspot rich AR3664 has ejected even more CMEs that might also impact the Earth tonight or tomorrow. That active region is now near the Sun's edge, though, and will soon be rotating away from the Earth. Pictured, a red and rayed aurora was captured in a single 6-second exposure from Racibórz, Poland early last night. The photographer's friend, seeing an aurora for the first time, is visible in the distance also taking images of the beautifully colorful nighttime sky. Gallery: Global Aurora from Solar Active Region 6443

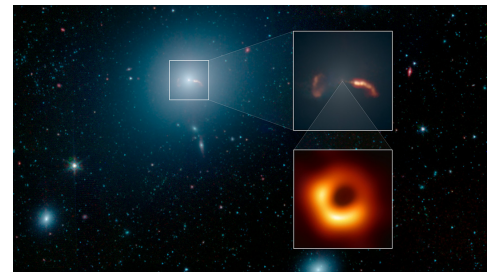
## AR 3664: Giant Sunspot Group



Date: 2024-05-11 Copyright:  
Franco Fantasia &  
Guiseppa Conzo  
(Gruppo Astrofili Palidoro)

Right now, one of the largest sunspot groups in recent history is crossing the Sun. Active Region 3664 is not only big -- it's violent, throwing off clouds of particles into the Solar System. Some of these CMEs are already impacting the Earth, and others might follow. At the extreme, these solar storms could cause some Earth-orbiting satellites to malfunction, the Earth's atmosphere to slightly distort, and electrical power grids to surge. When impacting Earth's upper atmosphere, these particles can produce beautiful auroras, with some auroras already being reported unusually far south. Pictured here, AR3664 and its dark sunspots were captured yesterday in visible light from Rome, Italy. The AR3664 sunspot group is so large that it is visible just with glasses designed to view last month's total solar eclipse. This weekend, skygazing enthusiasts will be keenly watching the night skies all over the globe for bright and unusual auroras. Gallery: Active Region 3664 on the Sun and Associated Aurora

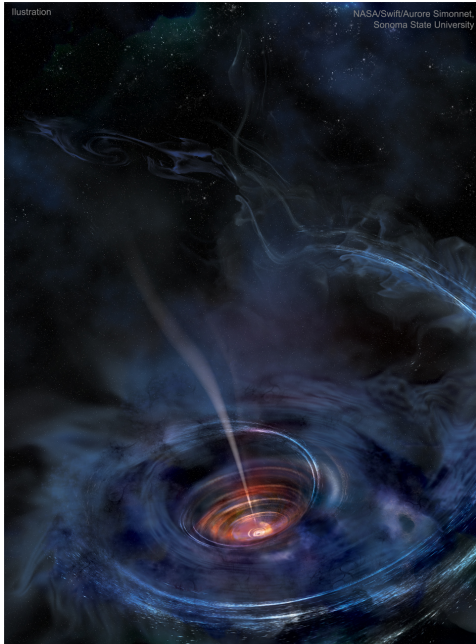
## The Galaxy, the Jet, and a Famous Black Hole



Date: 2024-05-09 Copyright: null

Bright elliptical galaxy Messier 87 (M87) is home to the supermassive black hole captured in 2017 by planet Earth's Event Horizon Telescope in the first ever image of a black hole. Giant of the Virgo galaxy cluster about 55 million light-years away, M87 is rendered in blue hues in this infrared image from the Spitzer Space telescope. Though M87 appears mostly featureless and cloud-like, the Spitzer image does record details of relativistic jets blasting from the galaxy's central region. Shown in the inset at top right, the jets themselves span thousands of light-years. The brighter jet seen on the right is approaching and close to our line of sight. Opposite, the shock created by the otherwise unseen receding jet lights up a fainter arc of material. Inset at bottom right, the historic black hole image is shown in context at the center of giant galaxy, between the relativistic jets. Completely unresolved in the Spitzer image, the supermassive black hole surrounded by infalling material is the source of enormous energy driving the relativistic jets from the center of active galaxy M87. The Event Horizon Telescope image of M87 has been enhanced to reveal a sharper view of the famous supermassive black hole. It's inescapable: Black Hole Week at NASA!

## Black Hole Accreting with Jet



Date: 2024-05-07 Copyright: null

What happens when a black hole devours a star? Many details remain unknown, but observations are providing new clues. In 2014, a powerful explosion was recorded by the ground-based robotic telescopes of the All Sky Automated Survey for SuperNovae (Project ASAS-SN), with followed-up observations by instruments including NASA's Earth-orbiting Swift satellite. Computer modeling of these emissions fit a star being ripped apart by a distant supermassive black hole. The results of such a collision are portrayed in the featured artistic illustration. The black hole itself is depicted as a tiny black dot in the center. As matter falls toward the hole, it collides with other matter and heats up. Surrounding the black hole is an accretion disk of hot matter that used to be the star, with a jet emanating from the black hole's spin axis. Fall towards eternity: It's Black Hole Week at NASA!

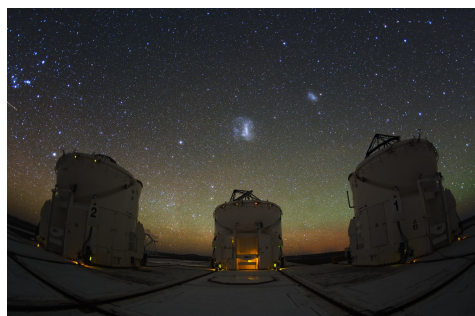
## A Black Hole Disrupts a Passing Star



Date: 2024-05-05 Copyright: null

What happens to a star that goes near a black hole? If the star directly impacts a massive black hole, then the star falls in completely -- and everything vanishes. More likely, though, the star goes close enough to have the black hole's gravity pull away its outer layers, or disrupt, the star. Then, most of the star's gas does not fall into the black hole. These stellar tidal disruption events can be as bright as a supernova, and an increasing amount of them are being discovered by automated sky surveys. In the featured artist's illustration, a star has just passed a massive black hole and sheds gas that continues to orbit. The inner edge of a disk of gas and dust surrounding the black hole is heated by the disruption event and may glow long after the star is gone. Hole New Worlds: It's Black Hole Week at NASA!

## 3 ATs

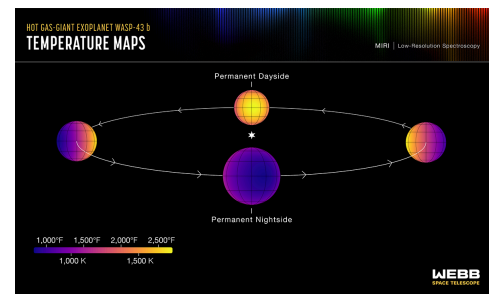


Date: 2024-05-04 Copyright: Yuri Beletsky

Despite their resemblance to R2D2, these three are not the droids you're looking for. Instead, the enclosures house 1.8 meter Auxiliary Telescopes (ATs) at Paranal Observatory in the Atacama Desert region of Chile. The ATs are designed to be used for interferometry, a technique for achieving extremely high resolution

observations, in concert with the observatory's 8 meter Very Large Telescope units. A total of four ATs are operational, each fitted with a transporter that moves the telescope along a track allowing different arrays with the large unit telescopes. To work as an interferometer, the light from each telescope is brought to a common focal point by a system of mirrors in underground tunnels. Above these three ATs, the Large and Small Magellanic Clouds are the far, far away satellite galaxies of our own Milky Way. In the clear and otherwise dark southern skies, planet Earth's greenish atmospheric airglow stretches faintly along the horizon.

## Temperatures on Exoplanet WASP-43b



Date: 2024-05-03 Copyright: null

A mere 280 light-years from Earth, tidally locked, Jupiter-sized exoplanet WASP-43b orbits its parent star once every 0.8 Earth days. That puts it about 2 million kilometers (less than 1/25th the orbital distance of Mercury) from a small, cool sun. Still, on a dayside always facing its parent star, temperatures approach a torrid 2,500 degrees F as measured at infrared wavelengths by the MIRI instrument on board the James Webb Space Telescope. In this illustration of the hot exoplanet's orbit, Webb measurements also show nightside temperatures remain above 1,000 degrees F. That suggests that strong equatorial winds circulate the dayside atmospheric gases to the nightside before they can completely cool off. Exoplanet WASP-

43b is now formally known as Astrolábos, and its K-type parent star has been christened Gnomon. Webb's infrared spectra indicate water vapor is present on the nightside as well as the dayside of the planet, providing information about cloud cover on Astrolábos.