

Moonbows in the sky

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Few meteorological sights are more pleasing to the eye than a rainbow, usually seen during or just after rainfall, when emerging sunlight hits the droplets of moisture still present in the air. When it hits the roughly spherical raindrop, sunlight is refracted and dispersed into its constituent colours: red, orange, yellow, green, blue, indigo and violet.

But did you know that rainbows also appear at night time?

The same process occurs due to rainfall at night, but this time the light which is being refracted comes from the Moon instead of the Sun. The resulting phenomenon is not called a rainbow, but a moonbow!

Moonbows are much rarer than their daytime counterparts, because the light from the Moon is much less intense than that from the Sun. For a moonbow to occur, several factors must be in place at the same time:

1. The Moon must be bright;
2. It must be raining in the area opposite the Moon;
3. The sky must be very dark;
4. The Moon must be less than 42 degrees high.

Moonbows are quite often perceived as being white, a fact which has historically given them the name 'white rainbow'. This is simply because at low light intensities, the cone colour receptors in our eyes are not activated, so we are unable to distinguish between the different colours of the spectrum.

Sometimes, moonbows appear to encircle the Moon itself. This is due to moonlight reflecting off ice crystals high in the atmosphere. Folklore tells us that a halo around the Moon means that bad weather is coming. There is actually some truth in this, as the ice crystals indicate the presence of high-altitude cirrus clouds, which typically precede a warm front by one or two days. A warm front is often associated with a low pressure system – commonly referred to as a storm.



Image Credit: Weatherwise.org

A colourful moonbow over Venus in the night sky It's not surprising that this beautiful scene won a prize in an on-line competition for weather photographs in 2004.