

Sky Condition Survey

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OASI Observing Project - Winter 2014

The constellation of Pegasus is the 7th largest constellation in the sky covering 1,121 square degrees of sky. During the autumn it is a dominant feature for naked eye observers. The most prominent part of the constellation is the famous "Great Square of Pegasus" which is made up of reasonably bright stars between 2nd and 3rd magnitude.

The four stars that make up the square are (clockwise from NW corner):

- Scheat (β Peg) - mag. 2.44
- Markab (α Peg) - mag. 2.49
- Algenib (γ Peg) - mag. 2.83
- Alpheratz (α And) - mag. 2.07

Not all of the four stars that make up the square actually are in Pegasus, the NE star and brightest of the four Alpheratz lies in neighbouring Andromeda, however it is generally accepted as being part of both constellations.

Alpheratz

2.07

Scheat

2.44

Square of Pegasus

Markab

2.49

Algenib

2.83

+ ≡ 27° x 19°

Seeing definition

Naked Eye Limiting Magnitude	Number of naked eye stars visible in the square	Seeing
6.5	35	Exceptional
6.25	21	Excellent
6	13	Superb
5.75	9	Very good
5.5	7	Good
5.25	5	Above Average
5	4	Average
4.75	3	Below Average
4.5	1	Poor
≤ 4.00	0	Very Poor

The Bortle Darkness Index

The **Bortle scale** is a nine-level numeric scale that measures the night sky's brightness of a particular location. It quantifies the astronomical observability of celestial objects and the interference caused by light pollution. John E. Bortle created the scale and published it in the February 2001 edition of *Sky & Telescope* magazine to help amateur astronomers evaluate the darkness of an observing site, and secondarily, to compare the darkness of observing sites.

Class	Title	NELM	Description
1	Excellent dark-sky site	7.6–8.0	<ul style="list-style-type: none"> • the zodiacal light is visible and colourful • the gegenschein is visible • the zodiacal band is visible • airglow is readily visible • the Scorpius and Sagittarius regions of the Milky Way cast obvious shadows • many Messier and globular clusters are naked-eye objects • M33 is a direct vision naked-eye object • limiting magnitude with 12.5" reflector is 17.5 (with effort)
2	Typical truly dark site	7.1–7.5	<ul style="list-style-type: none"> • the zodiacal light is distinctly yellowish and bright enough to cast shadows at dusk and dawn • airglow may be weakly visible near horizon • clouds are only visible as dark holes against the sky • surroundings are barely visible silhouetted against the sky • the summer Milky Way is highly structured • many Messier objects and globular clusters are naked-eye objects • M33 is easily seen with naked eye • limiting magnitude with 12.5" reflector is 16.5
3	Rural sky	6.6–7.0	<ul style="list-style-type: none"> • the zodiacal light is striking in spring and autumn, and colour is still visible • some light pollution evident at the horizon • clouds are illuminated near the horizon, dark overhead • nearer surroundings are vaguely visible • the summer Milky Way still appears complex • M15, M4, M5, and M22 are naked-eye objects • M33 is easily visible with averted vision • limiting magnitude with 12.5" reflector is 16
4	Rural/suburban transition	6.1–6.5	<ul style="list-style-type: none"> • the zodiacal light is still visible, but does not extend halfway to the zenith at dusk or dawn • light pollution domes visible in several directions • clouds are illuminated in the directions of the light sources, dark overhead • surroundings are clearly visible, even at a distance • the Milky Way well above the horizon is still impressive, but lacks detail • M33 is a difficult averted vision object, only visible when high in the sky • limiting magnitude with 12.5" reflector is 15.5
5	Suburban sky	5.6–6.0	<ul style="list-style-type: none"> • only hints of zodiacal light are seen on the best nights in autumn and spring • light pollution is visible in most, if not all, directions • clouds are noticeably brighter than the sky • the Milky Way is very weak or invisible near the horizon, and looks washed out overhead • limiting magnitude with 12.5" reflector is 15

Class	Title	NELM	Description
6	Bright suburban sky	5.1-5.5	<ul style="list-style-type: none"> • the zodiacal light is invisible • light pollution makes the sky within 35° of the horizon glows grayish white • clouds anywhere in the sky appear fairly bright • surroundings are easily visible • the Milky Way is only visible near the zenith • M33 is not visible, M31 is modestly apparent • limiting magnitude with 12.5" reflector is 14.5
7	Suburban/urban transition	4.6–5.0	<ul style="list-style-type: none"> • light pollution makes the entire sky light gray • strong light sources are evident in all directions • clouds are brightly lit • the Milky Way is invisible • M31 and M44 may be glimpsed, but with no detail • through a telescope, the brightest Messier objects are pale ghosts of their true selves • limiting magnitude with 12.5" reflector is 14
8	City sky	4.1–4.5	<ul style="list-style-type: none"> • the sky is light gray or orange - one can easily read • stars forming familiar constellation patterns may be weak or invisible • M31 and M44 are barely glimpsed by an experienced observer on good nights • even with a telescope, only bright Messier objects can be detected • limiting magnitude with 12.5" reflector is 13
9	Inner-city sky	4.0	<ul style="list-style-type: none"> • The sky is brilliantly lit • many stars forming constellations are invisible and many fainter constellations are invisible • aside from the Pleiades, no Messier object is visible to the naked eye • the only objects to observe are the Moon, the planets, and a few of the brightest star clusters

Comparison

NELM	Seeing	Description	Bortle Index
6.50	9	Exceptional	4
6.25	8	Excellent	4
6.00	7	Superb	5
5.75	6	Very Good	5
5.50	5	Good	6
5.25	4	Above Average	6
5.00	3	Average	7
4.75	2	Below Average	7
4.50	1	Poor	8
≤ 4.00	0	Very Poor	9

Possible Errors

- Eyesight differences of observer
- Averted vision or direct?
- Imagination?
- Inside or outside the boundary

Method

- Assign location a NGR locator square
- Average results for same locator square
- Plot on map

