

APPENDIX 3.10-1
Sky Glow Information and
Comparisons

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Sky Glow Information and Comparisons

The earliest measures of sky glow, also called sky brightness, were based on a scale upon which the magnitude of stars visible to the human eye is divided into six levels. The brightest star is a magnitude 1, and the dimmest (faintest) star is a magnitude 6. More recently, the magnitude scale was modified to express astronomical surface brightness (stars, planets, etc.) in units known as magnitudes per square arcsecond (mag/arcsec²) as measured by a Sky Quality Meter (SQM). The measurement scale is inverse and logarithmic and is generally used in small area photometry and astronomy (Bortle 2001).

Sky Glow Comparison Table

Class	Title	Approx. SQM mag/arcsec ²
1	Excellent dark-sky site	21.7–22.0
2	Typical truly dark site	21.5–21.7
3	Rural sky	21.3–21.5
4	Rural/suburban transition	20.4–21.3
5	Suburban sky	19.1–20.4
6	Bright suburban sky	18.0–19.1
7	Suburban/urban transition	
8	City sky	< 18.0
9	Inner-city Sky	

Source: Bortle, John E. 2001. Gauging Light Pollution: The Bortle Dark-Sky Scale. Sky & Telescope. Sky Publishing Corporation. Accessed May 29, 2020. <https://skyandtelescope.org/astronomy-resources/light-pollution-and-astronomy-the-bortle-dark-sky-scale/>.

mag/arcsec² = magnitudes per square arcsecond; SQM = Sky Quality Meter

Examples of Typical Illuminance and Apparent Magnitude

Location	Classification	Illuminance ^(a) (lux)	Sky Brightness ^(b) (mag/arcsec ²)
Outdoor	Bright Sun	100,000–130,000	>0.1
	Hazy Day	32,000	1.3
	Partly Cloudy	25,000	1.6
	Cloudy	10,000	2.6
	Overcast	1,000	5.1
	Sunrise/Sunset on Clear Day	400	6.1
	Full Moon	0.1	15.1
	Moonless Clear Night Sky	0.001	20.1
	Moonless Overcast Night Sky	0.0001	22.6
	Starlight	0.00005	23.3

Examples of Typical Illuminance and Apparent Magnitude

Location	Classification	Illuminance ^(a) (lux)	Sky Brightness ^(b) (mag/arcsec ²)
Indoor	Typical TV Studio	1,000	5.1
	Bright Office with Large Contrast	400	6.1
	Hall Way	80	7.8
	Living Room	50	8.3
	Good Street Lighting	20	9.3
	Poor Street Lighting	1	12.6

Notes:

^(a) G. R. Elion and H. A. Elion, 1979. Electro-Optics Handbook. CRC Press.

^(b) Calculated based on conversion from lux to mags/arcsec²

mag/arcsec² = magnitudes per square arcsecond; lux = luminous flux per unit area