

**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/arcsec<sup>2</sup>) 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 <sup>2</sup>
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/arcsec<sup>2</sup> = magnitudes per square arcsecond; SQM = Sky Quality Meter

### Examples of Typical Illuminance and Apparent Magnitude

Location	Classification	Illuminance <sup>(a)</sup> (lux)	Sky Brightness <sup>(b)</sup> (mag/arcsec <sup>2</sup> )
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 <sup>(a)</sup> (lux)	Sky Brightness <sup>(b)</sup> (mag/arcsec <sup>2</sup> )
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/arcsec<sup>2</sup>

mag/arcsec<sup>2</sup> = magnitudes per square arcsecond; lux = luminous flux per unit area