# GLOSSARY

Absorption lines - Dark lines that are produced in a spectrum because intervening atoms absorbed photons of specific wavelengths.

Angstrom - A unit of wavelength measure equivalent to $10^{-12}$ meters.

Astronomy - The branch of science focusing on celestial objects, dealing with their size, location, composition, dynamics, origin, etc.

Astrophysics - Investigation, through remote sensing, of the physical principles of astronomical objects.

Binary numbers - A system of numbers that has two as its base and can be used for numerical coding of data.

Black hole - Any object (usually a collapsed star) whose surface gravity is so great that neither matter nor light can escape from it.

Charged coupled device (CCD) - An electronic device that consists of a regular array of light sensitive elements that emit electrons when exposed to light. CCDs are used as the light-detecting element in telescopes, television cameras, etc.

Concave lens or mirror - A lens or mirror that presents an inward curvature to the objective.
Continuous spectrum - A spectrum unbroken by absorption or emission lines.

Convex lens or mirror - A lens with an outward curvature.

Diffraction - The spreading out of light waves as they pass by the edge of a body or through closely spaced parallel scratches in a diffraction grating.

Dispersion - Breaking up of light into its component colors.

Doppler shift (effect) - Changes in the wavelengths of sound or light as the distance between the emitter and the receiver changes.

Earth-based telescope - Telescope mounted on the surface of Earth.

Electromagnetic spectrum - The complete range of all wavelengths of electromagnetic radiation.

Enhancement (computer) - Boosting the color or contrast of a faint image through computer processing.

Excitation - The state that occurs when electrons are raised by an external input, such as light or an electronic current, to higher energy levels.

Fluorescence - A spontaneous emission of a photon of light that occurs when an electron drops down from a higher energy level (See excitation) to its original level in an atom.

Frequency - The number of waves that pass a point in one second. Frequency is usually expressed in units of Hertz (waves or cycles per second).

Gamma rays - Electromagnetic radiation with wavelengths shorter than $10^{-12}$ meters.

Geostationary satellite - A satellite placed in an orbit 35,900 kilometers over Earth's equator that remains in the same place relative to Earth.

Infrared - Electromagnetic radiation with wavelengths ranging from approximately $10^{-4}$ to $10^{-6}$ meters.

Light gathering power (LGP) - The ability of an optical instrument to collect light.

Long wave UV - Ultraviolet light with wavelengths (about $10^{-7}$ meters) just shorter than the optical range of the electromagnetic spectrum.

Microwaves - Electromagnetic radiation with wavelengths ranging around $10^{-3}$ meters.

Nanometer - One billionth of a meter ($10^{-9}$ m).

Neutron star - A star, about 10 kilometers in diameter, composed of neutrons.

Objective lens or mirror - The large lens or mirror of a telescope. Sometimes referred to as the primary lens or mirror.

Ozone layer - A region in Earth's upper atmosphere (between 15 and 30 kilometers) where small concentrations of ozone absorb ultraviolet radiation from the Sun and other celestial bodies.

Persistence of vision - Momentary visual retention of signal in the visual cortex of the brain.

Photometry - Measurement of the intensity of light.

Photon - A quantum or individual packet of electromagnetic energy.

Photosphere - The visible surface of the Sun.

Pixels - The smallest element of a picture.

Planck's Constant - A universal constant ($h$) which gives the ratio of a quantum of radiant energy ($E$) to the frequency ($v$) of its source. It is expressed by the equation $E=hv$ and its approximate numerical value is $6.626 \times 10^{-34}$ joule second.

Pulsars - A stellar radio source that emits radio waves in a pulsating rhythm.

Radio waves - Electromagnetic radiation with wavelengths ranging from approximately $10^{-4}$ to $10^{-2}$ meters.

Refraction - Bending of light rays as they pass through the interface between two transparent media.

Resolution - The degree to which fine details in an image can be seen as separated or resolved.

Resonance - Sympathetic vibration of one body when exposed to vibrations or electromagnetic radiation emanating from another.

Scientific Notation - Scientific notation, or powers of 10, which can simplify writing large numbers. Numbers with positive powers mean the decimal point moves to the right (e.g., $3 \times 10^{6} = 3{,}000{,}000$). A number with a negative power means that the decimal moves to the left (e.g., $3 \times 10^{-6} = 0.000{,}006$).

Short wave UV - Ultraviolet light with wavelengths nearest the x-ray range (around $10^{-8}$ meters) of the electromagnetic spectrum.

Space-based astronomy - Astronomical investigations conducted from above Earth's atmosphere.

Spectrograph - An instrument used for dispersing and recording specific wavelengths of the electromagnetic spectrum.

Spectroscopy - The study of spectra.

Speed of light - The speed at which light travels—300,000 kilometers per second.

Supernova - A stellar explosion which increases the brightness of a star by a factor of several million in a matter of days.

Ultraviolet (UV) - Electromagnetic radiation with wavelengths ranging from approximately $10^{-7}$ to $10^{-8}$ meters.

Visible light - Electromagnetic radiation with wavelengths ranging from approximately 400 to 700 nanometers.

Wavelength - The distance between one wave crest to the next wave crest (or one trough to the next trough).

White dwarf - A small star that is actively fusing helium into carbon and oxygen.

X-rays - Electromagnetic radiation with wavelengths ranging from approximately $10^{-8}$ to $10^{-11}$ meters.