Radiant Energy Units and Symbols*

energy = Joule = Ws **power** = Watt = J s^{-1}

Quantity	**Unit**	**Per Unit Area** (exposure, fluence)	**Per Unit Time** (flux, flow)	**Per Unit Time & Area** (irradiance)
photon	mol	mol m^{-2} (**Y**) (photon exposure)	mol s^{-1} (**A**) (photon flux)	mol s^{-1} m^{-2} (**'** gamma) (photon flux density, photon fluence rate)
energy	Joule	J m^{-2} (**Q** psi) (radiant exposure) (= **DOSE**) H_λ = cumulative energy exposure at a given wavelength **H** = total cumulative energy exposure.	J s^{-1} (= W) (F phi) (radiant flux)	J s^{-1} m^{-2} (= W m^{-2}) (**E**), (irradiance, radiant flux density, energy fluence rate) (= **DOSE RATE**)

* after (Hader and Tevini 1987) see also http://www.bipm.fr/enus/3_SI/si.html

NOTE 1: According to the Système International d'Unités, the basic SI units include the meter (m) for length, the kilogram (kg) for mass, the mole (mol) for the amount of a substance, and the second (s) for time. Hader and Tevini (1987) have a useful discussion comparing the photophysical units used in various fields of study and their relationship to the above SI units. They recommend the use of prefixes for smaller units of energy or quanta to keep the meter as the basic unit of area. For example use units like mW m^{-2} rather than W cm^{-2}.

NOTE 2: **The Biospherical PUV and BIC Instruments used in the UV-Lakes Project measure irradiance in** µW cm^{-2} nm^{-1}. To convert these to SI units, multiply by 0.01:

$$\mu W\ cm^{-2}\ nm^{-1} * 0.01 = W\ m^{-2}\ nm^{-1}$$