Source:

MEASUREMENTS OF EXTRAGALACTIC BACKGROUND LIGHT FROM THE FAR-UV TO THE FAR-IR FROM DEEP GROUND- AND SPACE-BASED GALAXY COUNTS, Simon P. Driver et al.
http://s3-ap-southeast-2.amazonaws.com/icrar.org/wp-content/uploads/2016/08/09152012/eblfinal.pdf

Definition of terms in this article:

CMB	= **C**osmic **M**icrowave **B**ackground *(radiation left over from the Big Bang)*	
EBL	= **E**xtra-galactic **B**ackground **L**ight	[intro@p1]
COB	= **C**osmic **O**ptical **B**ackground *(star- and AGN-light, AGN = Active Galactic Nucleus*	[intro@p2]
CIB	= **C**osmic **I**nfrared **B**ackground *(attenuated first and, then re-radiated by dust near source)*	

Values/results given this article:

EBL	$\approx$ **CMB**/20	[intro@p1]
COB	= 24 $\pm$ 4 nW/m^2/sr	[§3.7@p12]
CIB	= 26 $\pm$ 5 nW/m^2/sr	[§3.7@p12]

Values from other sources:

CMB density $\approx 4\cdot10^{-14}$ J/m^3 ≙ 400-500 fotons/cm^3

[https://en.wikipedia.org/wiki/Cosmic_microwave_background]

412 $\pm$ 1 fotons/cm^3, energy density = 0.261 eV/cm^3 ≙ $4.66\cdot10^{-31}$ kg/m^3

[Douglas Scott @ http://hypertextbook.com/facts/2004/HeatherFriedberg.shtml]

h	= 6.626 070 040$\cdot10^{-34}$	kg·m^2/s
c	= 299 792 458	m/s
hc	**=** 1.986 445 820$\cdot10^{-16}$	J·nm

Calculations by HR:

formula: *foton flux = foton density times speed of light* (result in fotons per square metre per second)

CMB-foton-flux   = 412 fotons/cm$^3 \times$ *c* = $1.235\cdot10^{17}$ fotons/m^2/s

CMB-energy-flux   = ($4\cdot10^{-14}$ J/m^3) $\times$ *c* = **$1.199\cdot10^{-5}$ W/m^2**

N.B.   http://www.icrar.org/cosmic-suntan (which is about the very same article) mentions:

Leftover from the Big Bang: 10,000,000,000,000,000 photons per square metre per second

==which is about a factor 10 (ten) lower...==

In the following I use the "green foton" with a wavelength of 500 nm as a unit with symbol "gf",

and consider electromagnetic radiation as if it were green light, whatever wavelength it actually has.

Foton energy:	E = $h\cdot\nu$ = hc/λ	
therefore:	1 nJ = $2.5171\cdot10^9$ gf	
and:	1 gf = $3.9729\cdot10^{-19}$ J	

I convert "per steradian" the easy way: we see half of the sky, which occupies 2π sr

==**EBL** = **COB** + **CIB**==   = 50 nW/m^2/sr ≙ $50\times2.517\cdot10^9\times2\pi = 7.91\cdot10^{11}$ ==**$\approx 10^{12}$ gf/m^2/s**==

N.B.   http://www.icrar.org/cosmic-suntan (which is about the very same article) mentions:

Extra-galactic background light: 10,000,000,000 photons per square metre per second

==which is about a factor 100 (hundred) lower than what follows from the article they refer to...==

all-sky **EBL**-energy-flux: $4\pi \times$ 50 nW/m^2 = $6.283\cdot10^{-7}$ W/m^2 ≙ **energy-density** of **$2.096\cdot10^{-15}$ J/m^3**

CMB/EBL (energy-flux)   19.085, which corresponds to the value of 20 mentioned above for EBL = CMB/20.

Conclusions:

- I see no discrepancies in the original scientific publication
  http://s3-ap-southeast-2.amazonaws.com/icrar.org/wp-content/uploads/2016/08/09152012/eblfinal.pdf
  (it assumes nearly all ever tramsmitted photons still exist (**COB**) or have be re-radiated (**CIB**))
- My own calculations in http://henk-reints.nl/astro/documents/aantal-fotonen-in-het-heelal.pdf (in dutch) assumes the same and gives an energy-density of **$4.9\cdot10^{-15}$ J/m^3**, a factor 2.3 higher than what's mentioned above, whch is certainly not bad since it is based only on the age of the universe, the number of stars in the universe ($\approx10^{22}$) and the power of <u>our</u> Sun ($3.828\cdot10^{26}$ W).
- The "suntan"-website http://www.icrar.org/cosmic-suntan shows numbers that differ by factors 10 and 100. It might however be correct if they calculated only the UV part of the spectrum, which is the actual cause of your suntan. But I wouldn't rely on tanning by EBL during the night...