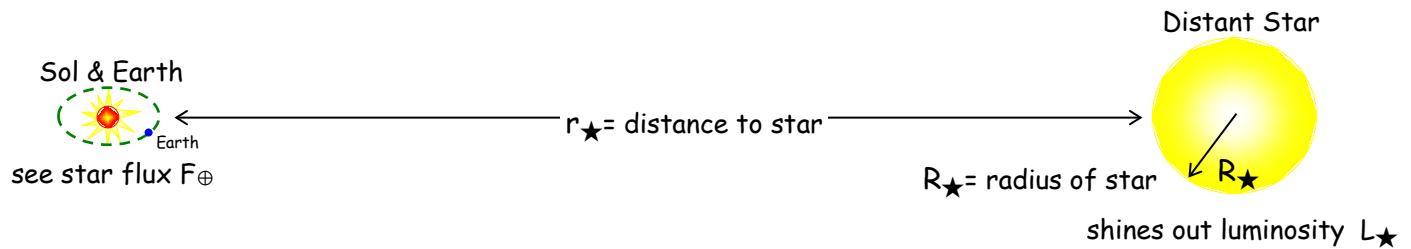


STAR MAGNITUDES, LUMINOSITIES, AND FLUXES

LUMINOSITY AND MAGNITUDES⁵⁶

²The luminosity of a star can be found using that of the sun and their magnitudes: $M_{\text{SOL}} =$ _____

LUMINOSITY COMPARED TO SOL FROM MAGNITUDES $L_{\star, \text{sl}} = \left(10^{\left(\frac{M_{\text{SOL}} - M_{\star}}{2.5} \right)} \right) \text{ Solar Luminosities}$ Eqn. (1)

same (green arrow pointing from $L_{\star, \text{sl}}$ to $L_{\star, \text{W}}$)

LUMINOSITY IN WATTS $L_{\star, \text{W}} = L_{\star, \text{sl}} \times (3.827 \times 10^{26}) \text{ Watts}$ Eqn. (2)

WARNING!! USE $\times 10^x$ OR EE KEY (NOT $\times 10^{(26)}$ SEQUENCE!)

THE FLUX OF A STAR AT EARTH

The relationship between the luminosity of a star and the flux received at Earth is given by the inverse square law,

STAR FLUX AT THE EARTH $F_{\oplus} = \frac{L_{\star, \text{W}}}{4\pi(r_{\star}^2)}$ Eqn. (3)

Annotations:
 $L_{\star}$ must be in Watts!
 $r_{\star}$ must be in meters!

using 1 light year = 9.46×10^{15} meters and $L_{\text{SOL}} = 3.83 \times 10^{26}$ Watts, complete the table²⁸.

STAR	FIELD GUIDE TO THE STARS AND PLANETS APPENDIX A2			CALCULATED			
	V	M_V	$r_{\star}$ (ly)	$r_{\star}$ meters	$L_{\star, \text{SOL}}$ (Eqn. 1) solar lums	$L_{\star}$ (Eqn. 2) Watts	$F_{\oplus}$ (Eqn. 3) W/m^2
Capella (α Aur)	0.08	-0.8	42				
Castor (α CMa)	1.94	0.6	52				
Pollux (α CMa)	1.14	1.1	34				
Procyon (α CMi)	0.38	2.8	11				
Sirius (α CMa)	-1.46	1.5	9				
Rigel (β Ori)	0.12	-6.6	773				
Aldebaran (α Tau)	0.85	-0.8	65				

Does one of these stars impress you? Who and Why? Should we start warning people about possible star-burn²?

Don't Skip This!