

Astronomy (PY 101)

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Project IV: Hertzsprung-Russell Diagram

The following data table shows the spectral type, parallax (when available), and distance D for the twenty bright or nearby stars around the Sun.

Star Name	Spectral Type	Parallax (arcsec)	Distance (pc)	Apparent Magnitude	Absolute Magnitude	Star Class
Sirius (α CMa)	A1	0.37	2.7	-1.46		
Canopus (α Car)	F0	0.033	30	-0.72		
Arcturus (α Boo)	K2	0.091	11	-0.06		
Rigel (β Ori)	B8	--	250	+0.14		
Procyon (α CMi)	F5	0.29	3.4	+0.37		
Betelgeuse (α Ori)	M2	--	150	+0.41		
Achernar (α Eri)	B5	0.050	20	+0.51		
Altair (α Aql)	A7	0.20	5.1	+0.77		
Aldebaran (α Tau)	K5	0.063	16	+0.86		
Spica (α Vir)	B1	0.013	80	+0.91		
Deneb (α Cyg)	A2	--	430	+1.26		
Acrux (α Cru)	B1	0.008	120	+1.39		
Proxima Centauri	M5	0.772	1.30	+11.05		
Barnard's Star	M5	0.545	1.83	+9.54		
Ross248	M6	0.314	3.18	+12.29		
ϵ Eridani	K2	0.303	3.30	+3.73		
Kapteyn's Star	M0	0.256	3.91	+8.84		

Part 1. Calculate the absolute magnitude of each star is calculated by using the formula

$$M = m - 5 \log(D(\text{pc})/10)$$

Part 2. Place each star on the HR diagram (graph paper).

Part 3. Determine the class of each star (MS = Main Sequence, RG = Red Giant, or SG = Super Giant)

