

(astrophysical model: apsonis-2009a) "A personal survey of nearby interstellar stars"

Using known physical & basic astronomy formulas and using an Excel sheet as my imaginary space probe, I'll attempt to look at the nearby stars that are around us. I'm want to visualize through the mind's eye what can be seen using only distance, an apparent magnitude, surface tempature of the star and a imaginary sail that induces a vast expanse of space behind me that allows my Excel sheet to move through the stars in minutes without appearing to break the speed of light. (The formulas used, does have one limitation, that it is assumed that the stars is perfectly spherical and rotating very little. But that should not change my readings very much due to the large numbers being used.) I'm checking what the distances from the star that are equivelent to the light intensity of Venus and out to Mars. This makes up the habital zone.

First I'll start with our solar system and use it as a measuring stick. I will also establish the following format as well.

Name: Sun (SOL)

Star Type: G2

Distance: 1.0 Astronomical unit

Apparent magnitude: -26.74

Absolute magnitude: 4.829597246

Surface temp in Kelvin: 5802.1

Luminosity in Watts: 6.298752213E+22

Mass in kg: 1.9981E+30

Surface area in sq meters: 6.18059333E+18

watts per square meter (surface): 10191.17728

electron volts per sq meter (surface): 6.44826E-14

Gravitational escape velocity (km/s): 616.6363054

(miles/sec): 383.1600363

Schwarzschild Radius in km: 2.967064098 (black Hole radius inside Sun)

Habital light zone (light intensity range)

Minimum or closest to the star in km: 1.08910494E+08 Light intensity equivelent to Venus
(in miles): 67,673,843.8

Orbital velocity (km/s): 34.98922351
(miles/second): 21.74129553

Maximum or furthest from the star in km: 2.28640461E+08 Light intensity equivelent to Mars
(in miles): 142,070,596

Orbital velocity (km/s): 24.14863716
(miles/second): 15.00526746

Comments: I believe that life could exist under special conditions outside of this habital zone. Planets that are inside this range have a greater probability to harbor life. Thier are other factors like amout of water, type and amount of atmosphere also plays as factor in creating life on a planet.

And now we leave the solar system on our voyager outward into the interstellar medium in our galaxy.

Alpha Centauri star system

The nearest star system to our sun lays inside the constellation of Centaurus, in the southern hemisphere. This star system is a trinary sun system with one its suns is in a distant elipical orbit takes a million years to orbit the inner suns. The star in the center of this system is Alpha Centauri A

Name: Alpha Centauri A

Star Type: G2V

Distance: 4.365 Light years

Apparent magnitude: 0.01

Absolute magnitude: 4.37616676

Star's diameter in miles: 704,366.4476

Surface temp in Kelvin: 5790

Luminosity in Watts: 9.563717076E+22

Mass in kg: 8.6183E+30 4.3x of the Sun

Surface area in sq meters: 9.30694531E+18

watts per square meter (surface): 10275.89264

electron volts per sq meter (surface): 6.41371E-14

Gravitational escape velocity (km/s): 1424.546855

(miles/sec): 885.1723776

Schwarzschild Radius in km: 12.79763208 (black Hole radius inside the star)

Habital light zone (light intensity range)

one year orbital range (in earth days): 122d 4h 43m 21.62s to 369d 17h 59m 3.9s

Minimum or closest to the star in km: 1.34197454E+08 Light intensity equivelent to Venus
(in miles): 83,386,431.7

Orbital velocity (km/s): 80.53853594
(miles/second): 50.0443261

Maximum or furthest from the star in km: 8.86611927E+07 Light intensity equivelent to Mars
(in miles): 175,059,142

Orbital velocity (km/s): 55.63348981
(miles/second): 34.56904789

Comments: none at this time.

Name: Alpha Centauri B

Star Type: K0V

Distance: 4.365 Light years

Apparent magnitude: 1.34

Absolute magnitude: 5.70616676

Star's diameter in miles: 702,347.9855

Surface temp in Kelvin: 5,260
Luminosity in Watts: 2.809485014E+22
Mass in kg: 1.1842E+29 0.059x of the Sun
Surface area in sq meters: 4.01376855E+18
watts per square meter (surface): 6,999.61889
electron volts per sq meter (surface): 4.36882E-14
Gravitational escape velocity (km/s): 111.6805104
(miles/sec): 69.39505188

Schwarzschild Radius in km: 0.175844837 (black Hole radius inside the star)

Habital light zone (light intensity range)

one year orbital range (in earth days): 771d 11h 24m 26s to 2,328d 1h 43m 6.12s

Minimum or closest to the star in km: 72,833,856 Light intensity equivalent to Venus
(in miles): 45,256,859.9

Orbital velocity (km/s): 6.972130661
(miles/second): 4.332281141

Maximum or furthest from the star in km: 1.52796834E+08 Light intensity equivalent to Mars
(in miles): 94,943,550.6

Orbital velocity (km/s): 4.808227745
(miles/second): 2.987694206

Comments: Alpha Centauri B has been measured to be revolving around "Alpha Centauri A" every 41 days. "B" is in a elliptical orbit around "A" from 1.67 billion to 5.9 billion kilometers distance.

Name: Proxima Centauri

Star Type: M5.5V
Distance: 4.2421 Light years
Apparent magnitude: 11.09
Absolute magnitude: 15.51818349
Star's diameter in miles: 18445.73121
Surface temp in Kelvin: 3,040
Luminosity in Watts: 3.461174535E+22
Mass in kg: 2.4576E+29 0.123x of the Sun
Surface area in sq meters: 4.43202493E+19
watts per square meter (surface): 780.9465402
electron volts per sq meter (surface): 4.87429E-15
Gravitational escape velocity (km/s): 97.96250931
(miles/sec): 60.8710812

Schwarzschild Radius in millimeters: 0.36493738 (black Hole radius inside the star)

Habital light zone (light intensity range)

one year orbital range (in earth days): 51d 23h 16m 6.08s to 155d 23h 59m 34.87s

Minimum or closest to the star in km: 8.20917137E+07 Light intensity equivalent to Venus

(in miles): 51,009,426

Orbital velocity (km/s): 114.914228

(miles/second): 71.40439084

Maximum or furthest from the star in km: 1.70845594E+08 Light intensity equivalent to Mars

(in miles): 106,158,530

Orbital velocity (km/s): 79.65656483

(miles/second): 49.49629466

Comments: This is a red flare star and is the furthest from the two stars. It has a very large ellipse and it has also been estimated to take a million years to make a single orbit.

Name: Tau Ceti

Star Type: G8V

Distance: 11.887 Light Years

Apparent magnitude: 3.49

Absolute magnitude: 5.680726687

Star's diameter in miles: 352,899.0694

Surface temp in Kelvin: 5,344

Luminosity in Watts: 1.378939457E+17

Mass in kg: 1.2854E+29 0.064331114 x of the Sun

Surface area in sq meters: 1.01332479E+18

watts per square meter (surface): 0.136080698

electron volts per sq meter (surface): 8.49349E-19

Gravitational escape velocity (km/s): 245.7869741

(miles/sec): 152.7249452

Schwarzschild Radius in meters: 190.873538 (black Hole radius inside the star)

Habital light zone (light intensity range)

one year orbital range (in earth days): 31d 19h 54m 22.39s to 96d 21h 59m 25.16s

Minimum or closest to the star in km: 1.60107237E+08 Light intensity equivalent to Venus

(in miles): 45,435,220.5

Orbital velocity (km/s): 168.3600382

(miles/second): 104.6140777

Maximum or furthest from the star in km: 3.37260108E+08 Light intensity equivalent to Mars

(in miles): 95,707,443.1

Orbital velocity (km/s): 116.0011991

(miles/second): 72.07980339

Comments: This star is almost the same type of star as our sun. Since the star is a little dimmer, the habitable zone is closer. The outer limit of the zone is a little further than Earth's distance from our sun which is about 92 million miles. Notice that the orbital speeds are faster being closer to the star. A single year on the outer part of the habital zone takes almost 97 days compared to

Earth's 365 days. These calculations are based on earth days.

I will add more stars later.