2014

Orion

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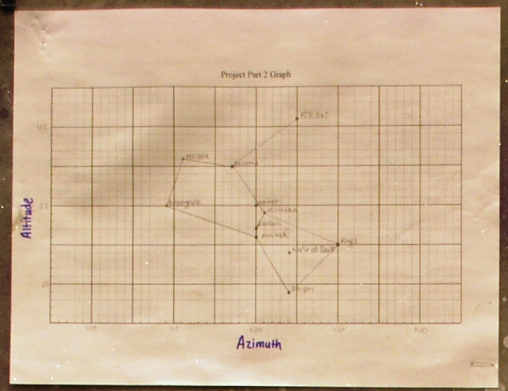
The purpose of this project was to gather information of the stars and objects in certain constellations. Using my favorite constellation, Orion, I learned the procedures to calculating and finding information on stars and how that information is important. This project not only has taught me the azimuth and altitude of stars, but also things like their age, their time remaining, their stellar fate, etc.).



Spatial Relationship

Regarding the distances of the stars in Orion, they are not close to each other in space.
The only two stars that could be considered close to each other are Alnitak (817.43 ly) and Rigel (802.85). These stars are still 45.42 light years away from each other. Another example would be of Pi3 and Na'ir al Saif. Pi3 has a distance of 26.32 ly, while the other has a distance of 2329.00 ly. This shows that even though they appear to be in the same region of space, they are quite a distance from each other.

Future of three stars

Name	HIP#	Spectral Type	Mass	Stage Completed	Completed Lifetimes	Remaining Stages	Remaining Lifetimes	Fate of Stellar Core	Mass Range
Alnilam	26311	B0Ia	44.7	Main Sequence, RGB, HB	5,000,000 years 500,000 years	SN, BH	50,000 years	Black Hole	25 and above solar masses
Pi3	22449	F6V	1.3	none	n/a	Main Sequence, RGB, HB, AGB, PN, WD	5,920,000,000 years 592,000,000 years 6,512,000,000 years	White Dwarf	Under 1.4 solar masses
Rigel	24436	B8Ia	16.9	Main Sequence, RGB, HB	3,500,000 years 35,000,000 years	SN, NS	350,000 years	Neutron Star	1.4-3 solar masses

List of stars.

1. Alnilam
2. Alnitak
3. Bellatrix
4. Betelgeuse
5. Meissa
6. Mintaka
7. Na'ir al Saif
8. Pi3 Orionis
9. Rigel
10. Saiph

Star Name	Azimuth	Altitude	Distance
Alnilam	120	29	1976.71 ly
Alnitak	120	28	817.43 ly
Bellatrix	117	37	252.44 ly
Betelgeuse	109	32	497.95 ly
Meissa	111	38	1055.52
Mintaka	121	31	916.17
Na'ir al Saif	124	26	2329.69
Pi3 Orionis	125	43	26.32
Rigel	130	27	862.85
Saiph	124	21	647.14

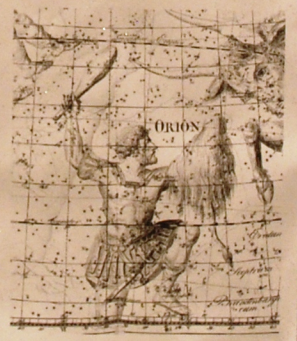
Orion

Mythology

According to the mythology, Orion was a hunter who boasted about his skills. He claimed he could kill any beast with no problem. To show up Orion, a small scorpion stung him on his foot. Some say that this is how Orion dies.

Other versions of the story claim that Orion wasn't stung, but was fleeing the scorpion in the ocean. There, he was spotted by Apollo. Apollo hated Orion so much for pursuing his sister Artemis that he bet her she could not hit the small object in the sea. Upon realizing what she had done, she put Orion's image in the heavens for everyone to see.

Source:
http://www.dibonsmith.com/ori_con.htm



Source:
http://www.ianridpath.com/startales/orion.htm

Artwork

Source: http://chandra.harvard.edu/photo/constellations/orion.html

Source: http://albertosancami.deviantart.com/art/Sailor-moon-Crystal-opening-now-454490080

Data Table

Star Name	HIP #	Spectral Type	Mass	Main Sequence Lifetime	Remaining Lifetimes	Death Order	Fate of Stellar Core
Alnilam	26311	B0Ia	44.7	5,000,000 years	50,000 years	1	Black Hole
Alnitak	26727	O9.5Ib (B0Ib)	39.2	6,500,000 years	65,000 years	3	Black Hole
Bellatrix	25336	B2III	20.6	21,500,000 years	2,585,000 years	9	Neutron Star
Betelgeuse	27989	M2Ib	9.8	104,000,000 years	1,040,000 years	8	Neutron Star
Meissa	26207	O8III	46.5	4,620,000 years	508,200 years	6	Black Hole
Mintaka	25930	O9.5II (B0I)	33.8	8,750,000 years	87,500 years	4	Black Hole
Na'ir Al Saif	26241	O9III	37.3	7,190,000 years	790,900 years	7	Black Hole
pi3	22449	F6V	1.3	5,920,000,000 years	6,512,000,000 years	10	White Dwarf
Rigel	24436	B8Ia	16.9	35,000,000 years	35C,000 years	5	Neutron Star
Saiph	27366	B0.5Ia (B1Ia)	40	8,250,000 years	62,500 years	2	Black Hole

Date	Rise Time for Betelgeuse		
	Hour	Minute	Second
May 23	08	19	30
May 30	07	51	59
June 6	07	24	28
June 13	06	56	57
June 20	06	29	25

To find the length of year, I chose one of the 10 stars in Orion. I chose Betelgeuse. Starting at May 23rd, I recorded the rise time in this chart. I did the same for the 4 weeks following May 23rd.

Then, I calculated how much of a difference the rise time was week to week. As seen below, the change in rise time was 27 minutes 31 seconds for each except 6/13-6/20 when it was 27 minutes 32 seconds. To find the change in time per day, the change in rise time was converted into decimal minutes (27.52 + 27.53). The decimal minutes are then divided by 7, for how many days in a week. The number I got was 3.93 minutes per day for the change. Each week was the same, making that the average.

Dates	Change in Rise Time		Change in Time Decimal Minutes	Change in Time Per Day in minutes/day
	Minutes	Seconds		
5/23-5/30	27	31	27.52	3.93 minutes/day
5/30-6/6	27	31	27.52	3.93 minutes/day
6/6-6/13	27	31	27.52	3.93 minutes/day
6/13-6/20	27	32	27.53	3.93 minutes/day

Using the average (3.93). Dividing the number of mins per day (1440) by (3.93), will give how many days are in the year. Betelgeuse has 366.41 days.