1779phae.proj.1504

KG
11366
v.500

Fundamental Stars.
Observations and Reductions.
B5
From June 24 to Sept 11 1879

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1879pmae.proj..1604

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1879phae.proj 1504

M-A = +13

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1879phae.proj.1604

S

Sun c = 46.719

h m s
6 12 2
+23° 26'

0.11297

1879 June 24

11	18.30		12	32.7	13	35.78		12	50.4		19	22.05		19	11.9
	20.45	22.740		34.4		37.97	40.32		52.6			24.05	26.250		14.1
	22.85	22.74		36.6		40.43	40.33		54.4	54.24		26.30	26.25		16.1
	25.10			39.0		42.85			56.3			28.40			18.2
N	370 27.18			18.43 41.6	20	166 44.80		2	712 57.5		13	125 30.45		805	20.2
	370			1843		166			212			13125			805
	31.80		12	36.86		47.40		12	54.24			34.68		19	16.10
	33.35		−	56.16		50.57		+1	4.08			36.68		+	26.96
	36.08					53.90						38.86			
	38.45	40.695				55.77	58.289					40.97	43.062		
	40.60	40.70				58.40	58.29					43.00	43.06	20	15.4
	43.10	40.71				0.40	58.34					45.15	43.06		17.3
	45.20					2.80						47.30			19.0
	47.40					4.86						49.45			20.9
36628	49.90				52460	7.30					38756	51.47		952	22.6
	36628					52460						38756			952
	52.10					11.78						53.62		20	19.04
	56.65	58694				13.97	16.350					57.80	59.876	−	35.98
	58.62	58.69				16.40	16.35					59.80	59.88		
	1.00	81 43				18.60	11668					1.96	86 13		
29347	3.30		12	3686	8175	21.00		12	54.24		29938	4.10		19	16.10
	29347	11 40.705	−	56.16		8176	13 58.315	+1	4.08			29938	19 43.060	20	19.014
														+	26.96
														−	35.98
															62.914
											13	18 52.04			1.79893
															1.16871
															2.96764
															1.90293
															8.93529
															4 55 27

587

ζ Virginis

h m s
13 18 49.9
− 10° 32'

1.17609 0.11297
9.99262
1.16871

June 24

M 47 53.80 .

M 18 51.05 .

M 59 6.55 .
M 0 26.52 .

0 26.52
79.97

10 32 4.2

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1879phae.proj.1504

183

T Virginis

h m s
13 55 29
+2 8

1879 June 24

1,17609 0.11297
9.99470
1.17079

56 3.05
5.20 7.254
7.25 7.25
7.30
3627 11.47
3627
15.55
17.50
18.58
21.65 23.746
23.75 23.75
25.80 23.76
27.88
28.87
21371 32.00
21371
36.20
38.20 40.270
40.25 40.27
42.30 47.52
20135 44.40
20135 56 23.755

55 54.2
56.2 57.82
57.8 57.8
57.6
2891 1.2
2891
55 57.82
+ 2594
56 56.0
57.3
57.0
0.9
2957 2.5
2957
56 59.14
− 35.38
55 57.82
56 59.114
+ 2594
− 35.38
61.32
1.78760
1.17579
2.96339
1.90499
8.94160
4 59 46

M 19 52.17
M 21 12.50 62.08 .18
R 21 12.42 .10
R 21 12.40 41.01 12
M 21 12.55 .03
21 12.52 .11
80.35

193

γ Bootis

h m s
14 27 12
+38 50

27 41.45
43.45 46.630
46.50 46.63
47.30
23315 51.85
23315
57.23
0.00
2.50
5.20 7.847
7.89 7.85
10.48 7.83
13.10
15.80
61062 18.42
7062
23.67
26.40 29.030
28.98 29.03
31.70 13566
14515 34.40
14515 28 7.840

M 38 4.16
M 39 13.12 41 01 41
R 39 13.42 01
R 39 13.42 42 00 01
M 39 13.40 01
39 13.41 01
69.31

1,17609 0.11297
9.89152
1.06761

27 34.0
36.4
38.6 38.62
40.8
1931 43.3
1931
27 38.62
+ 29.22
28 42.0
45.3
47.5 47.38
49.5
2369 52.4
2369
28 47.38
− 39.54
27 38.62
28 47.738
+ 29.22
− 39.54
68.76
1.83734
1.06761
2.90495
1.84080
8.93585
4 55 50

d

ε Bootis

h m s
14 39 42
+27 35

1,17609 0.11297
9.94760
1.12369

40 14.20
16.40 18.780
18.73 18.78
21.20
9390 23.37
9390
25.00
30.40
32.56
34.90 38.276
37.20 37.27
39.60 37.32
41.95
44.35
33548 46.52
33548
51.23
53.48 55.862
55.96 55.86
58.10 7464
27931 0.55
27931 40 37.295

40 6.8
8.5
10.5
12.3
526 14.5
526
40 1052
+ 26.78
41 8.3
9.8
11.5
13.0
578 15.2
578
41 14.56
− 34.26
40 1052
40 11.56
+ 26.78
− 34.26
61.04
1.78561
1.12369
2.90930
1.84379
8.93449
4 54 55

M 53 4.55
M 54 14.50 51 01.16
R 54 14.32 32
R 54 14.02 .17 15 021
M 54 14.52 18
54 14.34 017
69.79

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198

β Ursae Min

h m s
14 51 4
° '
+74 39

0.11297

199

β Bootis

h m s
14 57 23
° '
+40 52

0.11297

209

α Cor. Bor.

h m s
15 29 34
° '
+27 7

0.11297

1.17609
9.87866
1.05475

1.17609
9.94943
1.12552

50	47.09			50	15.3	50	53.6	57	37.80			57	37.8	30	6.28			30	6.5
	54.78	2.666			21.6		57.3		54.55	57286			38.9		8.50	10822			7.8
	2.95	2.67			30.8		5.8		57.28	57.28			40.4		10.85	10.82			10.4
	10.60				36.7		11.8		0.00				41.9		13.03				11.8
31333	18.00			1518	44.4	3275	19.0	28643	2.80			2021	43.1	35411	15.45			499	13.4
	13333				1518		275		28643				2021		5411				499
	34.07			50	30.36	51	5.56		8.24			57	40.42		18.97			30	9.98
	41.90			+1	34.70	+	59.56		10.88			+	38.67		22.38			+	19.31
	48.30								13.67						24.64				
	57.30	5.086							16.27	19.048					26.90	29.253			
	5.40	5.08		51	54.7	53	1.0		19.80	19.11		58	57.8		29.30	29.25		30	56.7
	12.66	5.03			0.3		9.7		21.70	19.07			0.1		31.57	29.33			57.3
	20.82				8.5		16.7		24.50				2.5		33.87				0.9
	28.39				16.0		25.0		27.22				4.5		36.13				4.0
58577	36.10			3411	21.6	840	31.6	17203	29.95			3122	7.3	26328	38.62			3069	6.0
	4577				411		840		17143				12.2		26328				60
	57.88			52	8.92	53	16.80		35.44			59	2.44		43.20			31	1.38
	58.28	7.390		−	3.16	−1	11.74		38.10	40.862		−	43.35		46.50	47.854		−	32.09
	7.53	7.39							40.80	40.86					47.90	47.85			
	15.30	1006							43.65	15814					6020	5867			
33695	22.96			53	38.7	54	16.3	20431	46.32			57	40.42	23927	53.47			30	9.98
	3695	52	5.055		46.6		30.3		20431	58	19.090	59	2.44		23927	30	29.290	31	1.38
					56.0		30.0					+	38.67					+	19.31
					3.6		36.4					−	43.35					−	32.09
				2771	12.2	1440	41.0						82.02						51.40
	14 57 820				2771		1440					1.91392		15	27 8718			1.71096	
				53	54.42	54	2.880					1.05475						1.12552	
				−1	50.36	−2	23.74					2.96867						2.83648	
												2.14738						1.77107	
												9.17871						8.93459	
												8 34 54						4 54 59	

M	49	51.60		M	35	7.82						M	20	56.82					
M	50	4.07		M	37	28.60	37	23	35			M	21	55.97	101	04	13		
M	50	26.75		R	37	28.02			23			R	21	55.42			42		
M	50	49.27		R	37	28.22	12	10	3			R	21	55.97	10	27	13		
M	51	2.60		M	37	28.15			10			M	21	56.05			23		
M	51	12.60			37	28.25							21	55.85					
		81.00				140.43			18					59.03			29		

74 38 590

27 7 17

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212 α Serpentis

h m s
15 38 18
° ′
+6 48

1.17609 0.11297
9.99693
1.17302

1879 June 24

38 52.70		38 46.2	
54.87	56408	48.1	
56.87	56.91	50.0	
59.00		52.0	
28454 1.10		2502 53.9	
28454		2502	
5.30		38 50.04	
7.33		+ 23.49	
9.37			
11.50	13556		
13.50	13.55	38 41.9	
15.60	13.51	44.0	
17.80		46.0	
19.75		48.2	
12200 21.85		2305 50.4	
12200		2305	
26.00		38 46.10	
28.20	30112	− 32.57	
30.20	30.11		
32.07	14702		
15056 34.27		38 50.04	
15056	39.13530	38 46.10	
		+ 23.49	
		+ 27.43	
		50.92	
15 38 21.95		1.70689	
		1.17302	
		2.87991	
		1.86207	
		8.98216	

M	39 22.57			
M	40 35.32	39 07	4	
R	40 35.35		1	
R	40 35.30	33 03	6	
M	40 35.47		11	
	40 35.36			
	72.79		.45	

6 48 17.4

222 S Ophiuchi

h m s
16 8 0
° ′
−3 23

1.17609 0.11297
9.99924
1.17533

8 34.70		8 30.0	
36.82	38818	31.8	
38.88	38.82	33.7	
40.79		35.8	
19409 42.90		1688 37.5	
19409		188	
47.00		8 33.76	
49.00		+ 21.57	
51.23			
53.27	55287		
55.27	55.29	9 34.0	
57.23	55.37	37.1	
59.43		11153 8.4	
1.50			
49758 3.60		9 37.17	
49758		− 31.84	
7.80	11916		
9.90	192		
11.90	12.31		
13.98	11074		
6158 16.07		8 33.76	
5958	8 55.335	+ 21.66	
		− 31.84	

M	50 28.12			
M	51 51.55	32 23	36	
R	51 51.15		4	
R	51 50.97	06 09	22	
M	51 51.10		9	
	51 51.19			
	8277		.18	

32 γ Androm. 0.11997

h m s
1 56 28
° ′
+41 45

1.17609
9.87247
1.04886

56 56.80		56 57.7	
58.60	1440	59.7	
1.60	1.414	59.0	
4.10		1.0	
30720 7.60		2951 3.7	
720		2951	
12.60		56 59.02	
15.58		+ 24.56	
18.07			
20.87	23618		
23.60	23.62	58 2.5	
26.36	23.55	4.6	
28.18		7.4	
31.97		8.6	
21256 34.70		364 12.3	
21256		364	
40.30		58 7.28	
42.86		− 43.70	
45.58	45.66		
48.30	4710		
22828 51.25		56 59.02	
2828	57 23.585	58 7.28	
45656		+ 24.56	
		− 43.70	
		68.26	
		1.83417	
		1.04886	
		2.88303	
		1.80814	
		8.92511	
		4.4839	

M	43 29.55			
M	44 34.85			
R	44 31.80			
R	44 34.87			
	44 34.84			
	64.29			

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33

α Arietis

h m s
2 0 21
+22 53

0.11297

48

γ Persei

h m s
2 56 2
+53 2

1.17609
9.77913
0.95522

0.11297

52

ζ Persei

h m s
3 15 41
+49 26

0.11297
1.17609
9.81314
0.98923

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1879phae.proj.1604

73

α Tauri

h m s
4 28 59
+16° 16'

1.17609
9.98248 26
1.15857 35

0.11297

1879 June 24

29 30.88		29 24.6	
33.00	35122	26.5	
33.50	35.12	28.5	
37.27		30.0	
17561 37.46		1416 32.0	
2561		1416	
43.70		29 28.32	
45.90		+ 23.98	
48.07			
52.20	52299		
52.25	52.30	30 31.2	
54.40	52.29	32.5	
56.60		34.3	
58.64		35.5	
47069 1.01		1705 37.0	
47069		905	
3.30		30 34.10	
7.30	9.474	− 41.80	
9.45	9.47		
11.60	10459		
4737 13.72		29 28.32	
4737	29 52.295	30 34.10	
		+ 23.98	
		− 41.80	
		65.78	
4 29 0.95		1.81809	
		1.15857 35	
		2.97666 44	
		1.91551	
		8.93885 907	
		4 58 21	

M 11 53.72 .
M 13 16.30 . 116 14 26 .
K 13 16.05 . 50 13 1 .
R 13 15.78 . 26 .
M 13 16.02 . 2 .
13 16.04
8232 . .14

16 16 07 .

S

Sun C = 46,719

h m s
6 16 10
+23° 24'

0.11297

June 25

15 28.20		16 40.5	17 45.74		17 9.4		
30.45	32734	42.4	48.00	50284	11.2		
32.80	32.73	44.1	50.38	50.28	13.3		
35.00		46.0	52.50		15.3		
16367 37.22		2217 48.7	25142 54.80		668 17.6		
1367		217	142		668		
41.88		16 44 34	57.33		17 13.36		
44.22		− 53.50	1.60		+ 55.02		
46.40			3.70				
48.55	50882		6.20	8418			
50.95	50.88		8.47	8.42			
53.07	50.80		10.85	8.34			
55.36			12.76				
57.60			15.58				
45794 59.88			61576 17.45				
794			7576				
1.30			21.80				
6.60	8.880		24.05	26394			
8.80	8.88		26.47	26.39			
11.20	80161		28.60	13667			
4440 13.40		16 44 34	18197 31.10		17 13.36		
4440	15 50.840	− 53.50	13197	18 8.380	+ 55.02		

M 48 12.07 .

M 20 25.42 .

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1879phae.proj.f504

183

τ Virginis

h m s
13 55 29
° '
+2 8

June 23

56 3.70		55 54.5	
5.15	7.556	51.0	
7.88	7.85	51.8	
9.95		53.6	
3928 12.00		2895 1.6	
3928		2895	
16.00		55 57.90	
18.00		+ 2640	
20.00			
22.20	24.256		
24.28	24.25	56 52.3	
26.35	24.36	54.6	
28.44		56.6	
30.55		58.8	
21830 32.50		2831 0.8	
21830		2831	
36.80		56 56.62	
38.85	40.880	− 32.32	
40.87	4088		
42.96	4873		
20444 44.96		55 57.90	
20444	56 24.305	56 56.62	
		+ 26.40	
		− 32.32	
		58.72	
		1.76879	
		1.17579	
		2.94458	
		1.88207	
		8.93749	
		4 56 57	

1.17609 0.11297
9.99970
1.17579

M 19 51.70		
M 21 8.00	58.02	8
R 21 7.80		12
R 21 7.90	55.05	2
M 21 7.97		5
21 7.92		
76.22		.04

193

γ Bootis

h m s
14 27 12
° '
+38 50

27 42.00		27 32.9	
44.50	47.246	35.7	
47.25	47.25	37.3	
49.90		39.4	
23623 52.38		1874 42.4	
23623		1874	
57.88		27 37.48	
0.50		+ 30.94	
3.00			
5.73	8.407		
8.39	8.41	28 39.4	
11.00	8.42	41.5	
13.75		43.4	
16.43		45.8	
61566 18.28		2185 48.4	
7564		2185	
24.30		28 43.70	
27.88	29.590	− 35.28	
31.57	29.59		
3225	13684		
14795 34.85		27 37.48	
14795	28 8.415	28 43.70	
		+ 30.94	
		− 35.28	
		66.22	
		1.82099	
		1.06761	
		2.88860	
		1.82607	
		8.93747	
		4 56 56	

1.17609 0.11297
9.89152
1.06761

M 38 1.50		
M 39 8.47	57.04	3
R 39 8.45		5
R 39 8.55	50.05	5
M 39 8.55		5
39 8.50		
67.00		.04

d

ε Bootis

h m s
14 39 42
° '
+27 35

40 14.78		40 7.0	
17.00	19.344	3.8	
19.35	19.34	11.0	
21.70		13.0	
9672 23.97		548 15.0	
9672		548	
28.70		40 1096	
31.00		+ 27.01	
33.35			
35.60	37.970		
38.00	37.97	41 6.7	
40.30	37.97	9.1	
42.58		11.4	
44.92		13.2	
34173 47.28		557 15.8	
34173		557	
51.96		41 11.14	
54.28	56600	− 33.17	
56.58	5660		
58.88	7594		
28300 1.30		40 1096	
28300	40 37.970	41 11.14	
		+ 27.01	
		− 33.17	
		60.18	
		1.78017	
		1.12369	
		2.90386	
		1.83948	
		8.93562	
		4 55 41	

1.17609 0.11297
9.94760
1.12369

M 53 3.95		
M 54 13.10	08.02	5
R 54 12.98		7
R 54 13.05	01.04	0
M 54 13.07		2
54 13.05		
69.10		.04

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1879phae.proj.1504

1879

198 — β Urs. Min.

h m s
14 51 4
° ′
+74 39

0.11297

June 25

50	42.58		50	20.7	50	50.0
	55.70	3.306		26.3		56.9
	3.50	3.30		33.2		4.0
	10.98			37.7		9.4
31653	18.77		1636	45.7	3166	16.3
	1653			1636		166
	34.70		50	3272	51	332
	42.50		+	3305	+	245
	50.00					
	58.00	5.802				
	5.90	580	52	8.3	52	48.3
	13.70	5.74		15.6		55.6
	21.35			22.0		2.7
	28.27			28.0		9.3
59222	36.80		1110	37.1	3136	17.7
	5222			1110		136
	52.45		52	2220	53	272
	0.60	8.186	−1	1643	−1	5695
	8.18	8.19				
	16.00	11.49				
34093	23.70		53	26.7	54	10.9
	4093	51 5.770		31.8		18.3
				38.8		25.8
				45.5		33.2
			1963	53.5	1301	41.9
14 51 8.17				1963		1301
			53	3926	54	2602
			−2	3349	−3	2025

M	49	52.07
M	50	3.15
M	50	30.60
M	50	43.95
M	50	55.87
M	50	10.22

74 38 59.2

199 — β Bootis

h m s
14 57 23
° ′
+40 52

1.17609
9.87866
1.05475

0.11297

57	52.75		57	59.4	
	54.95	57906		1.8	
	57.93	57.90		4.2	392
	0.60			5.7	
28953	3.30		3196	8.5	
	28953			196	
	8.82		58	392	
	11.48		+	15.76	
	14.25				
	16.95	19681			
	19.70	19.68	58	55.7	
	22.45	19.69		57.9	
	25.10			0.5	
	27.85			2.8	
17713	30.53		3022	5.3	
	17713			22	
	36.00		59	044	
	38.70	41480	−	4076	
	41.50	4148			
	44.20	15938			
20740	47.00		58	3.92	
	740	58 19685	59	0.44	
			+	15.76	
			−	40.76	
				56.52	
				1.75220	
				1.05475	
				2.80695	

M	36	30.42			
M	37	25.30	.22	.08	.16
R	37	25.05			9
R	37	25.07	.06	.01	7
M	37	25.15			1
		25.14			.09

201 — δ Bootis

h m s
15 10 37
° ′
+33 46

0.11297

Lee Min.

11	8.84		11	27.3
	11.40	13810		29.3
	13.73	13.81		31.5
	16.28			33.3
6905	18.80		1569	35.5
	6905			1569
	23.78		11	31.38
	26.25		+	224
	28.78			
	31.25	33648		
	33.67	33.65	12	2.1
	36.00	33.59		4.4
	38.52			6.2
	41.00			8.2
30283	43.58		312	10.3
	30283			312
	48.40		12	6.24
	50.85	53380	−	3262
	53.37	5338		
	55.83	6719		
26690	58.45		11	31.38
	1690	11 33.62	12	6.24
			+	2.24
			−	32.62
				34.86

M	42	43.32			
M	43	20.85	.35	.10	.17
R	43	20.45			23
R	43	20.75	.60	.15	7
M	43	20.65			3
		20.68			.13

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209

α Cor. Bor.

h m s
15 29 34
+27 7

0.11297

30 6.78
9.00 11.376
11.36 11.37
13.67
5688 16.07
5688
20.60
23.10
25.37
27.77 29.951
29.94 29.995
32.20 29.91
34.62
36.86
26956 39.20
26956
43.70
46.18 48.446
48.40 48.45
50.76 5982
24223 53.00
24223 30 29.930

30 27.2
28.2
31.2
33.3
1559 35.0
1559
30 31.18
− 1.25
31 2.9
4.8
6.7
8.7
341 11.0
341
31 6.82
− 3.689
30 31.18
31 6.82
− 1.25
− 3.689
38.14

15 29 37.17

M 21 19.62
M 22 0.78
R 22 0.50
M 22 0.64

27 7 18.8

212

α Serpentis

h m s
15 38 18
+6 48

0.11297

38 53.43
55.50 57500
57.40 57750
59.50
28750 1.47
28750
5.88
7.88
9.88
12.00 14104
14.05 14.10
16.15 14.11
18.25
20.35
12694 22.40
12694
26.52
28.70 30734
30.75 3073
32.80 14823
15367 34.90
15367 39 14.105

38 48.6
48.4
51.3
52.9
2561 54.9
61
38 51.22
+ 2.288
39 40.3
42.5
44.6
46.4
2221 48.3
221
39 44.42
− 30.32
38 51.22
39 44.42
+ 22.88
− 30.32
53.20
1.72591

15 38 21.96

M 39 2.78
M 40 31.78 85 08 0
R 40 31.78 0
R 40 31.67 93 06 11
M 40 31.62 14
40 31.78
89.00 06

6 48 17.7

1.17609
9.99693
1.17302
1.17302
2.89893
1.94939
9.05046
6 24.31

222

S Ophiuchi

h m s
16 8 0
−3 23

0.11297

8 35.23
37.36 39.440
39.44 39.444
41.57
19720 43.60
4720
47.80
49.85
51.80
53.90 5.5910
55.92 55.91
57.92 55.92
8.00
10.35 12410
12.40 12.41
14.50 11185
6205 16.60
6205 8 55.915

8 27.3
31.3
32.9
34.3
1639 36.1
139
8 32.78
+ 2314
9 27.0
29.0
31.0
32.7
1540 34.3
140
9 30.80
− 34.88
8 32.78
9 30.80
+ 23.14
− 34.58
58.02

M 50 25.85
M 51 40.55 56 01 11
R 51 40.27 17
R 51 40.38 32 05 6
M 51 40.58 14
51 40.44
7459 12

1.17609
9.99924
1.17533
8 27.3
+ 2.314
1.76356
1.17533
2.93891
1.87268
8.93377
4 54.26

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S

Sun c = 46.719

h m s
6 20 20
+23° 22

0.11297

1879 June 26

19 38.20			20 56.3	21 55.53			21 17.0		19 23.20			19 15.6			
40.40	42680		57.0	57.85	0.110		18.8		25.25	27356		17.4			
42.60	42.68		58.8	0.10	0.11		21.0		27.30	2736		19.0			
44.96			1.5	2.40			23.2		29.45			21.3			
21340 47.24			2994 3.8	30055 4.67			1055 25.5		13678 31.58			967 23.4			
21340			2994	055			1055		3678			967			
51.70			20 59.88	9.00			21 21.10		35.73			19 19.34			
54.00			− 59.19	11.40			+ 57.00		37.93			+ 2483			
56.20				13.66					40.00						
58.40	0.692			15.80	18106				42.07	44173					
0.70	0.69			18.05	18.10				44.18	44.17		20 12.7			
2.80	0.69			20.35	18.09				46.20	44.17		15.1			
5.00				22.59					48.35			17.0			
7.40				24.80					50.45			19.2			
54623 9.85				16295 27.10					39756 52.55			852 21.2			
623				16295					39756			852			
14.29				31.60					56.87			20 17.04			
16.45	18718			33.90	36080				59.89	0.982		− 3287			
18.50	18.71			36.05	36.08				0.55	0.98					
20.80	12139			38.25	3619				3.00	8834					
9359 23.16			20 59.88	18040 40.60			21 21.10		30491 5.20			19 19.34			
9359	20 0.690		− 59.19	18040	22 18.095		+ 57.00		491	19 44.170		20 17.04			
												+ 24.83			
												− 32.87			
												57.70			
									13 18 52.03			1.76118			
												1.16871			
												2.92989			
												1.87081			
												8.94092			
												4 59 18			

M 50 7.65

M 22 9.62

M 59 8.42
M 0 22.62
R 0 22.65
R 0 22.62
0 22.63
74.27

10 32 41

587

α Virginis

h m s
13 18 47
−10 32

1.17609 0.11297
9.99262
1.16871

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183 τ Virginis

13h 55m 29s

+2° 8′

0.11297

56	4.20		55	54.9
	6.20	8326		56.6
	8.36	8.32		58.0
	10.45			0.1
4163	12.42		2915	1.9
	4163			2915
	16.60		55	58.30
	18.56		+	2650
	20.60			
	22.80	24799		
	24.88	24.80	56	55.3
	26.90	24.80		56.8
	28.85			58.6
	31.00			0.7
22319	33.00		2941	2.7
	22319			2941
	37.23		56	58.82
	39.20	41290	−	34.02
	41.27	41.29		
	43.30	4961		
20645	45.45		55	58.30
	645	56 24.800	56	58.82
			+	26.50
			−	34.02
				60.52
				1.78190

M	19	51.00		
M	20	9.60	61 01	8
R	20	9.50		2
R	20	9.38	44 .06	14
M	20	9.62		10
	20	9.52		
				.08

193 γ Bootis

14h 27m 12s

+38° 50′

0.11297

	27	42.60		27	37.8
45.28		45.40	47896		39.8
		47.88	47.89		42.0
		50.40			44.8
	23948	53.20		2114	47.0
		23948			2114
		55.50		27	42.28
		1.00		+	26.76
		3.80			
		6.30	9.040		
		9.00	9.04	28	34.7
		11.68	9.06		37.0
		14.30			38.9
		17.00			41.7
	62136	19.78		1967	44.4
		8136			1967
		24.97		28	39.34
		27.51	30234	−	30.30
		30.20	30.23		
		32.88	13812		
	15117	35.55		27	42.28
		15117	28 9.050	28	39.34
			−.006	+	26.77
			9.044	−	30.29
					57.06
					1.75633

M	38	5.82		
M	39	3.40	43 03	5
R	39	3.10		25
R	39	3.45	27 .18	10
M	39	3.47		12
	~~39~~	~~3.37~~		
		3.35		.13

d ε Bootis

14h 39m 42s

+27° 35′

0.11297 1.17609 9.94760 1.12369

40	15.32		40	4.0
	17.60	19914		6.1
	19.90	19.91		8.0
	22.22			10.5
9957	24.53		410	12.4
	9957			410
	29.18		40	820
	31.60		+	30.32
	33.80			
	36.05	38507		
	38.50	38.51	41	9.0
	40.80	38.52		10.9
	43.25			12.6
	45.50			15.0
34656	47.88		643	16.8
	34656			643
	52.62		41	1286
	54.80	57130	−	34.34
	57.00	57.13		
	59.48	7704		
28565	1.75		40	8.20
	28565	40 38.515	41	12.86
			+	30.32
			−	34.34
				64.66
				1.81064
				1.12369
				2.93433
				1.87029
				8.93596
				4 5555

M	52	59.95
M	54	14.13
	54	14.13
		74.18

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1879 June 26

198 β Urs. Min.

h m s
14 51 4
+74 39

0.11297

50 48.20		50 21.7	50 53.5	
52.00	3824	26.6	58.0	
3.80	382	33.4	5.0	
11.80		39.8	13.0	
31912 19.32		1674 46.9	3269 17.4	
1912		1674	269	
35.00		50 3348	51 538	
42.60		+1 3271	+1 0.81	
50.30				
58.00	6203			
6.40	620	52 8.6	52 51.2	
14.25	6.18	14.9	58.8	
22.15		22.5	5.4	
29.83		28.3	12.6	
35583 37.30		1103 36.0	3288 20.8	
5583		1103	288	
52.93		52 2206	53 576	
0.30	8.550	− 15.87	− 59.57	
8.50	8.55			
16.47	1237			
34275 24.05		53 32.2	54 5.8	
4275	52 6.190	38.4	12.2	
		46.6	20.6	
		53.9	26.6	
		2329 1.8	1013 36.1	
14 51 8.11		2329	1013	
		53 4658	54 2026	
		−1 4039	−2 1407	

M 49 57.15
M 50 2.90
M 50 29.75
M 50 44.78
M 50 57.22
6607

74 38 57.2

199 β Bootis

h m s
14 57 23
+40 52

0.11297 1.17609
9.87866
1.05475

57 52.90		57 44.6	
55.80	58410	47.0	
58.30	58.41	49.2	4932
1.15		51.8	
29205 3.90		2466 54.0	
29205		2466	
9.20		57 49.32	
11.95		+ 30.86	
14.70			
17.44	20162		
20.10	20.15	58 53.9	
23.00	20.21	56.8	
25.60		58.9	
28.47		1.3	
18146 31.00		2949 4.0	
18146		2949	
36.60		58 5 8.98	
39.32	42020	− 38.80	
41.98	42.02		
44.70	16043		
21010 47.50		57 49.32	
21010	58 20.180	58 58.98	
		+ 30.86	
		− 38.80	
		69.66	
		1.84298	
		1.05475	
		2.89773	
		1.82924	
		8.93151	
		4 52 54	

M 36 15.38
M 37 22.90 | 59 .07 3
R 37 22.75 | 12
R 37 22.78 | 96 .02 9
M 37 23.05 | 18
37 22.87
6749 .11

201 δ Bootis

0.11297

h m s
15 10 37
+33 46

1.17609
9.91976
1.09585

11 9.32		10 58.4
11.80	14264	0.4
14.27	14.26	2.0
16.67		4.0
7132 19.26		3606 5.8
7132		106
24.20		11 212
26.70		+ 3200
29.20		
31.60	34132	
34.25	3413	12 6.6
36.66	34.12	8.8
39.00		9.8
41.50		13.3
30718 44.07		540 15.5
30719		
49.60		12 10.80
51.55	53970	
54.00	5397	
56.40	6823	
26985 58.90		11 2.12
1985	11 34.125	12 10.80
		+32.00
		−36.68
		68.68

M 42 11.20
M 43 24.78 | 80 .02 8
R 43 24.65 | 5
R 43 24.57 | 62 .03 11
M 43 24.82 | 12
43 24.70
73.50 .09

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209

α Cor. Bor.

h m s
15 29 34
+27° 1'

1.17609
9.949443
1.12552

0.11297

30 7.20		29 58.6	38 53.86		38 43.7	8 35.78		8 27.7			
9.50	11.892	0.4	55.97	57.992	45.6	31.78	39.882	29.3			
11.90	11.89	2.2	57.95	57.99	47.4	33.81	39.88	30.5			
14.25		4.3	0.01		49.1	41.94		32.0			
5946 16.58		3120 6.5	28996 2.18		2366 50.8	19941 44.00		1533 33.8			
5946		120	28996		2366	19941		1533			
21.18		30 240	6.30		38 47.32	48.03		8 30.66			
25.48		+ 2802	8.37		+ 27.28	50.80		+ 25.70			
25.80			10.50			52.24					
28.80	30414		12.50	14.604		54.30	56354				
30.40	30.41	31 2.5	14.60	14.60	39 43.4	56.37	5635	9 32.6			
32.80	3042	4.4	16.60	14.59	45.3	58.47	56.38	25.3			
35.01		6.3	18.70		47.1	0.48		27.0			
37.37		8.1	20.87		48.9	2.25		28.8			
27373 39.70		319 10.6	13144 23.80		2360 51.3	50719 4.75		1357 31.0			
27373		319	13144		2360	50719		1357			
4.32		31 6.38	27.07		39 47.20	8.87		9 27.14			
46.70	48964	− 35.96	29.60	31.200	− 32.60	10.80	12892	− 30.78			
48.90	48.96		31.30	3120		12.84	12.89				
51.30	6085		33.30	14919		14.95	11277				
24482 53.60		30 240	15601 35.70		38 47.32	6446 17.80		8 30.66			
24482	30 30.415	31 6.38	15600	39 14.595	39 47.20	6446	8 56.365	9 27.14			
		+ 28.02			+ 20.28			+ 25.70			
		− 35.96			− 39.60			− 30.78			
		63.98			59.88			56.48			
15 37 27.17		1.80604	15 38 21.95		1.77728			1.75189			
		1.12552			1.17302			1.17533			
		2.93156			2.95030			2.92722			
		1.86911			1.89293			1.86853			
		8.93755			8.94263			8.94131			
		4 56 59			5 0 28			4 59 34			

M	20 45.72				M	39 16.85				M	50 22.27			
M	21 59.82	62 00	12		M	40 35.10	06 04	10		M	51 36.30	22 01	15	
R	21 59.57		3		R	40 34.90		10		R	51 35.97		18	
R	21 59.67	62 05	3		R	40 35.00	05 05	0		R	51 36.20	09 11	5	
M	21 59.82		12		M	40 35.02		2		M	51 36.15		0	
	21 59.70					40 35.00					51 36.15			
	73.98		10			78.15		06			73.88		09	

27 7 18.5

6 48 17.8

212

α Serpentis

h m s
15 38 18
+6° 48'

1.17609
9.999693
1.17302

0.11297

222

α Ophiuchi

h m s
16 8 0
−3° 23'

1.17609
9.999241
1.17533

0.11297

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1

α Andron.

h m s
0 2 8
+28 25

1.17609 0.11297
9.944249
1.12033

1879 June 26

2 40.68		2 40.9	
42.95	45.308	43.5	
45.18	45.31	44.7	
47.68		46.8	
22654 50.05		2235 48.6	
22654		2235	
54.70		2 44.70	
57.18		+ 1934	
59.40			
1.70	4.032		
4.01	4.03	3 34.0	
6.40	4.04	35.8	
8.65		38.0	
11.80		40.1	
59629 13.44		1901 42.2	
3629		1901	
18.03		3 38.02	
20.38	22.776	− 33.98	
22.80	22.78		
25.17	128.09		
11388 27.51		2 44.70	
11388	3 4.035	3 38.02	
		+ 19.34	
		− 33.98	
		53.32	

0 8 1050

1.72689
1.12033
2.84722
1.78082
8.93360
4 54 19

3

γ Pegasi

h m s
0 7 0
+14 31

1.17609 0.11297
9.985991
1.16200

7 34.70		7 35.6	
36.80	38942	38.0	
39.00	38.94	40.0	
41.60		42.0	
19470 43.20		1992 43.6	
19471		1992	
47.44		7 39.84	
49.35		+ 16.08	
51.70			
53.80	55.906		
55.90	55.91	8 26.7	
58.00	55.92	28.3	
0.10		30.2	
2.28		32.0	
50315 4.38		1515 34.3	
50315		15	
8.70		8 30.30	
10.75	12.910	− 34.38	
12.90	12.91		
15.10	11185		
6455 17.20		7 39.84	
6455	7 55.915	8 30.30	
		+ 16.08	
		− 34.38	
		50.46	

0 7 2.88

1.70295
1.16200
2.86495
1.80543
8.94048
4 58 59

32

J Andron

h m s
1 56 28
+41 45

1.17609 0.11297
9.985991
1.16200

57 —						57 37.5	
—						57.2	
—						1.0	
—						3.2	
—						3065 5.6	
						65	
41.06	24.71	222.40	13.65			58 1.30	
8.11	24.51	24.711	16.40			− 3662	
5.53	24.73		19.20				
2.74	24.69		21.95	24716			
0.00	24.60		24.80	24.70			
2.76	24.76		27.52				
5.53	24.67		30.20				
8.11	24.56		32.87				
11.08	24.67	22234	35.76				
			22241				
16.39	24.76		123.21	41.35			
19.36	24.67		24642	44.00	46790		
22.19	24.66			46.80	46.79		
24.90	24.60			49.50			
27.75	24.55	23395	52.30	57 24.679	58 1.30		
			23395				

24.676
24.679

M	2 46.75			M	57 9.37			R	41 27.60	R
M	3 47.02	.23	21 10	M	58 13.05	17	12 21	R	41 27.85	R
R	3 47.17		5	R	58 13.52		26			
R	3 46.85	.01	.16 27	R	58 13.17	.34	.04 9			
M	3 47.45		33	M	58 13.30		4			
	3 47.12				58 13.26					
	60.37		.19		63.89		.15			

28 25 284

14 80 588

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198

48

52

γ Persei

β Urs. Min. 2.lo.

α Persei

h m s
2 56 2

h m s
14 51 4

h m s
3 15 41

° '
+53 2

0.11297

° '
+105 21

0.11297

° '
+49 26

0.11297

0 37.30		0 52.8		50 37.35		49 27.4	50 16.9		16 6.00			15 57.4	
56.50	58.704	54.9		45.70	53.390	32.6	20.9		9.23	12.270		6.2	
56.62	58.70	56.5		53.70	53.39	38.7	25.2		12.25	12.27		3.3	
6.90		55.8		0.90		43.5	36.0		15.40			8.16 7.7	
29352 3.20		2838 0.5		26695 9.30		1908 41.3	1433 41.3		6135 18.47			86	
29352		2838		26695		1908	1433		6135			16 17.2	
7.70		0 56.76		24.50		49 38.16	50 28.66		25.15			16 2.15	
9.88		+ 1.982		31.90		+2 17.06	+1 26.56		33.25				
12.07				37.70					37.40				
14.28	1.6581			47.50	55.311				54.55	37.739			
16.60	16.58			52.23	55.31	50 57.9	52 0.4		37.80	37.74		16 32.6	
18.80	16.59			3.20	55.12	4.4	8.7		41.10	37.64		42.2	
21.00				10.97		13.4	16.5		44.10			45.0	
23.25				17.35		18.4	23.5		47.05			46.5	
14923 25.62				49780 26.25		3686 27.5	784 29.3		33965 50.30			2226 48.3	
14923				49780		586	784		33965			2226	
30.06				43.00		51 1.72	52 15.68		56.70			16 44.52	
32.29	34.478			49.60	57.852	+ 43.50	− 20.46		59.70	3.016		− 6.83	
34.48	34.49			57.20	57.85				3.10	3.01			
36.76	15.319			5.26	23.124				6.18	7528			
17249 38.80		0 56.76		28926 13.30		52 37.7	53 21.3		31508 9.50			16 2.15	
17249	1 16.585	+ 1.982		28926	51 55.215	43.9	30.4		1508	16 37.690		16 44.52	
						50.8	40.0					− 6.83	
						58.3	47.3					+ 35.54	
						2550 4.3	1914 52.4					42.37	
						2550	1914		3 15 48.26				
						52 51.00	53 3.828						
						− 55.78	− 1 43.06						

R 34 35.65			M 10 30.05						M 2 40.32						
R 34 35.67			M 10 9.92						M 3 15.78	62 16	8				
35.66			M 9 53.12						R 3 15.75		5				
			M 9 32.95						R 3 15.75	95 00	5				
			M 9 20.97						M 3 15.50		20				
			M 9 6.08							15.70		10			

49 25 46.0

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73

α Tauri

h m s
4 28 59
+16 14

1879 June 26

27 31.22			29 22.8			8 11.45		8 2.8
34.16	36198		24.5			14.52	17406	5.0
36.16	36.19		25.9			17.47	17.40	7.6
38.25			28.0			20.96		10.3
18099 40.50			1309 29.7			8703 23.33		393 13.6
18099			309			8703		393
44.68			29 26.18			29.20		8 7.86
46.95			+ 27.21			32.00		+ 33.12
49.18						35.03		
51.25	53410					37.97	40982	
53.45	53.41		30 24.0			40.85	40.96	9 21.0
55.60	53.37		26.4			43.88	40.99	24.6
57.70			29.2			46.90		27.8
59.80			31.0			50.00		30.7
48069 1.85			1433 32.7			36864 53.84		1390 33.8
48069			1433			36864		1390
6.40			30 28.66			55.77		9 27.80
8.45	10564		− 35.27			1.48	4594	− 46.82
10.57	10.58					4.56	4.59	
12.60	10675					7.56	8199	
5282 14.80			29 26.18			32297 10.60		8 7.86
5282	29 53.390		30 28.66			2297	8 40.975	9 27.80
			+ 27.21					+ 33.12
			− 35.27					− 46.82
			62.48					79.94
4 29 0.42			1.79574			5 7 46.79		
			1.15835					
			2.95409					
			1.88773					
			8.93364					
			4 54 20					

M	11	50.15				M	35	59.17			
M	13	7.40	45	05	3	M	36	11.27	22	05	3
R	13	7.32			5	R	36	11.35			5
R	13	7.25	28	03	12	R	36	11.40	37	03	10
M	13	7.50			13	M	36	11.17			13
	13	7.37					36	11.29			
	77	22			08		36	11.30			08

16 16 08

45 52 25.6

M = 0.98
R = 1.067
M+R = 2.05

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1879phae.proj.1504

We think Date not correct

Sun ☉ = 46.719

h m s
6 24 29
+23 20

1879 June 28

S

Sun ☉ = 46.719

S

Sun

June 26 and 27

h	m		m	d	h	m	m
6	23	47.70	24 59.7	26	5.25	25	18.0
		50.00	52.16 1.8		7.40	9.692	19.9
		52.29	3=2.22 3.5		9.78	9.692	23.4
		54.29	5.0		12.03		26.0
26108		56.80	3865 6.5	4846	14.00	1156	28.3
		1108			4846		1156
		1.20	165		18.68		
		3.27	25 3.30		20.90	25	23.12
		5.50	5812		23.00	+1	4.55
		7.90	10.076		25.50	27.659	
		10.18	10.19		27.58	27.66	
		12.38	10.18		29.95		
		14.68			32.20		
		16.90			34.47		
9168		19.27		24893	36.65		
		9068			24893		
		23.50			41.25		
		25.35	28.150		43.40	45650	
		28.20	28.15		45.67	45.65	
		30.50	14037		47.93	5534	
14075		32.70		22825	50.00		
		14075			22825		

25 3.30
− 53.12
24 10.185

25 23,12
+1 455
26 27.670

Disc Circle Readings
Laredate June 28 in A3

M 52 12.78.

M 24 15.110.

June 28 correct date by A3 = A22

0.11297

38 6.8
8.6
11.0
12.5
526 13.8
52.6
38 10[illegible]52
+ 43.22

5.706
5.70

3756
3.75
3.74

1.794
1.79
1749

38 1052
8 53.745 + 43.22

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1879phae.proj.1604

We think Date not correct

Sun ☉ = 46.719

h m s
6 24 29
+23 20

1877 June 28

Sun ☉ = 46.719

0.11297

33 6.8
706 8.5
70 11.0
12.5
526 13.8
526
38 1052
+ 43.22

756
75
74

794
79
49

38 1052
53.745 + 43.22

18799
46998

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1879phae.proj.1604

We think Date not correct

Sun C = 46.719

h m s
6 24 29
+23 20

1877 June 28

S

Sun C = 46.719

h m s
6 36 33
+23 11

June 30

0.11297

36	13.88			37	26.7	38	31.20		38	6.8
	16.25	18.510			28.8		33.48	35.706		8.5
	18.60	18.51			30.9		35.70	35.70		11.0
	20.85				33.0		37.95			12.5
9255	22.97			1571	37.7	17853	40.20		526	13.8
	9255				1541		17853			526
	27.40			37	3.082		44.83		38	10.552
	29.70			2	5440		46.90		+	43.22
	31.88						49.37			
	34.80	36.378					51.50	53.756		
	36.25	36.38					53.70	53.75		
	38.67	36.45					56.0	53.74		
	40.90						58.25			
	43.00						0.45			
32740	45.50					48380	2.70			
	32740						48380			
	47.90						7.20			
	52.10	54404					9.47	11.794		
	54.47	54.40					11.70	11.79		
	56.65	72.91					14.10	10.749		
27202	58.90			37	31.42	5897	16.50		38	10.52
	2202	36	36.415	−	5.500		5897	38	53.745	+ 43.22

M 1 20.65.

M 9 11.47.

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122

β Geminorum

h m s
7 37 55
+28 19

0.11287

1879 June 30

38 26.84
28.89 31290
31.22 31.10
33.80
1555 36.00
645
40.67
43.60
45.30
47.70 50029
50.05 50.03
52.44 49.88
54.70
57.40
45026 59.40
45026
4.05
6.28 8.660
8.60 8.66
11.00 9.976
4330 13.37
4330 38 49.953

38 25.0
26.8
28.7 28.72
30.8
1446 33.0
1446
38 28.92
+ 21.04
38 49.96

587

α Virginis

h m s
13 18 49
− 10 32

0.11287

19 23.60
28.60 27.690
27.60 27.69
29.80
13845 31.85
13845
36.00
38.05
40.18
42.32 44.386
44.35 4.435
46.50 44.45
48.55
50.65
39947 52.87
39947
57.20
59.00 1.214
1.20 1.21
3.27 8.890
30607 5.40
607 19 44.485

13 18 52.99

1.17609
9.99262
1.16871

17 16.6
18.0
20.0
21.7
1002 23.9
1002
19 20.04
+ 24.38
20 15.3
16.7
18.6
20.5
935 22.4
935
20 18.70
− 34.28
5 86.66
1.994117 1.176834
1.16871 1.16871
3.16285 2.93705
1.87628 1.87628
8.71343 8.93923
4 58 8

193

γ Boötis

h m s
14 27 12
+ 38 50

0.11297

27 42.85
43.47 48.094
47.00 48.09
50.75
53.40
24047
24047
50.75
1.40
3.96
6.48 9.293
9.20 9.29
12.03 9.27
14.60
17.27
62364 18.25
8364
25.26
27.76 30.460
30.48 30.46
33.00 138.55
15230 35.80
15230 28. 9.280

1.17609
9.89152
1.06761

27 32.0
34.2
37.6 37.04
39.8
1852 41.6
1852
27 37.04
+ 3.224
38 45.6
48.0
50.8
52.9
2528 55.5
2528
28 50.56
− 41.28
73.52
1.846 41
1.06761
2.93402
1.87017
8.93615
4 56 2

M 9 11.47.

M 59 8.57.
M 0 23.78.
0 23.78
75.21

M 38 0.15.
M 39 14.22 15 07 6
K 39 14.57. 6
K 39 14.37. 49 10 6
M 39 14.07. 24
39 14.31
74.16 11

10 58 4.0

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198

β Urs. Min.

h m s
14 51 4
+74 39

EN 0.11297

50 48.40		50 16.5	51 1.3
56.50		23.7	14.3
4.00	4.25	29.4	22.0
12.18		36.0	645 26.9
2125 20.17		1480 42.4	645
		1480	1290
35.10		50 29.60	51 16.12
42.85			
50.60			
58.48	6.317		
6.00	6.32	52 27.0	53 13.5
14.15	6.40	36.1	19.4
21.87		42.1	26.2
29.50		48.0	34.3
59685 37.80		2088 55.6	1366 43.2
5685		2088	1366
53.00		52 41.76	53 27.32
1.00	8.720		
9.00	8.72		
16.30			
34360 24.30	52 6.40	53 50.3	54 27.8
4360		55.6	36.5
		5.6	1059 41.6
		14.4	
		3301 21.2	
14 51 7.85		3.01	
		54 6.02	54 3.530

M 49 49.35
M 50 6.37
M 50 36.72
M 50 51.62
M 50 4.25
M 50 13.00

74 38 59.9

200

β Librae

h m s
15 10 30
−8 56

0.11297	1.17609		
	9.99470		
	1.17079		
11 4.97		10 55.0	
7.00	9.154	56.5	
9.20	9.15	57.6	
11.25		59.2	
4577 13.35		2896 1.3	
4577		2896	
17.40		10 57.92	
19.57		+ 27.88	
21.70			
23.18	25.804		
25.86	25.49	11 51.4	
27.38	25.82	58.1	
30.00		59.6	
32.00		1.5	
23214 34.15		2998 4.2	
23224		2998	
38.40		11 59.96	
40.40	42.492	− 34.16	
42.46	42.49		
44.60	51.64		
21246 46.60		10 57.92	
21246	11 25.805	11 59.96	
		+ 27.88	
		− 34.16	
		62.04	
		1.79264	
		1.17079	
		2.96346	
		1.90140	
		8.93794	
		45715	

M 23 25.42
M 24 45.17 .15 02 6
R 24 44.98 13
R 24 45.17 .08 09 9
M 24 45.12 1
24 45.11 .07
79.69

209

α Cor. Bor.

h m s
15 29 34
+27 7

		0.11297	1.17609
			9.94943
			1.12552
30 7.50		30 0.0	
9.90	12.176	2.0	
12.10	12.18	4.6	
14.55		6.5	
6088 16.83		215 8.4	
6088		215	
21.45		30 4.30	
23.66		+ 26.38	
26.00			
28.38	30.670		
30.65	30.67	30 57.6	
32.97	30.69	2.4	
35.30		4.4	
37.67		6.3	
27603 39.95		3214 8.7	
27603		214	
44.60		31 4.28	
46.90	49.210	− 33.60	
49.25	49.21		
51.50	61.39		
24605 53.80		30 4.30	
24605	30 30.680	31 4.28	
		+ 26.38	
		− 33.60	
15 29 37.15		59.98	
		1.77801	
		1.12552	
		2.90353	
		1.83891	
		8.93538	
		45531	

M 20 47.85
M 21 57.00 03 03 14
R 21 56.78 8
R 21 56.60 69 09 26
M 21 57.05 19
21 56.86 17
69.01

27 7 18.9

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212

α Serpentis

h m s
15 38 18
+6° 48'

1.17609
9.99643
1.17252

1879 June 30

38 54.20
56.30 58.364
58.35 58.36
0.47
29182 2.50
29182
6.63
8.67
10.70
12.84 14.924
14.90 14.92
16.96 14.94
19.02
21.20
13432 23.30
13432
25.37
27.50 31.534
31.60 31.53
33.60 14.989
15767 35.60
15767 39 14.930
31534

38 48.6
50.7
52.3
54.0
2616 56.0
2616
38 52.32
+ 22.61
39 46.6
48.3
50.0
51.9
2508 54.0
08
39 50.16
− 35.23
38 52.32
39 50.16
+ 22.61
− 35.23
57.84
1.76223
1.17252
2.93475
1.87169
8.93694
4 58 44 56.35

226

η Draconis

h m s
16 22 21
+61° 47'

22
36.75 37.10
41.17 41.65 45560 45944
45.53 45.92 4556 4594
50.05 50.37 22780
54.30 54.68 22972
22780 22972
3.00 3.45
7.58 7.92
11.69 12.20
16.02 16.42 20408 20832 24
18367 20.40 20.75 20.41 20.83 9.6 9.0
18749 24.77 25.20 20.41 20.82 15.6
29.00 29.47 19.7
33.36 33.78 67.9 23.6
18367 37.85 38.30
18749 24 16.97
46.45 46.85
51.00 51.45 55274 55704
55.56 55.77 55.27 55.70
27637 5.66 0.10 16083 16164
27852 3.90 4.34 22 23.60
27637 27852 23 20410 24 16.97
23 20825 +57.41
−63.85
121.26

228

β Herculis

h m s
16 25 1
+21° 45'

22 16.0
18.5
22.3
26.5
1130 30.7
1150
22 2300
+ 5741

20.41 20.82 24

25 35.80
38.03 40252
40.20 40.25
42.48
20126 44.75
20126
49.00
51.37
53.50
55.73 57925
57.80 57.93
0.20 57.95
2.30
4.60
52135 6.75
52 135
11.23
13.47 15652
15.68 15.65
17.88 11590
7826 20.02
7826 25 57.940

35 39.0
40.8 4268
42.8 42.68
44.4
2134 46.4
2134
25 4268
+ 15.26
26 25.6
20.4
30.0
32.3
1504 37.1
1504
26 30.08
− 32.14
25 42.68
26 30.08
+ 15.26
− 32.14
47.40

M 39 23.07
M 40 37.60 53 7 11
R 40 37.42 7
R 40 37.4745 2 2
M 40 37.47 2
40 37.49
74.42 06

M 41 17.30
M 42 26.20
42 26.20

M 42 59.27
M 43 56.02 13 11 11
R 43 56.10 3
R 43 56.15 13 02 2
M 43 56.25 12
43 56.13
07

6 48 18.3

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597

ζ Ophiuchi

h m s
16 30 30
° '
−10 19

1.17609
9.99292
1.16901

31 5.20		30 55.5	
7.30	9.440	57.3	
9.40	9.44	59.0	
11.60		1.8	
4720 13.70		2951 2.5	
4720		2951	
17.77		30 59.028	
19.90		+ 27.18	
22.07			
24.04	26.192		
26.18	26.19	31 53.5	
28.28	26.20	1.7	
30.37		3.0	
32.50		4.8	
23573 34.69		3155 6.5	
23573		155	
38.80		32 3.10	
40.87	42.958	− 36.90	
42.93	42.96		
45.00	5240		
21479 47.19		30 59.02	
21479	31 26.195	32 3.10	
		+ 27.18	
		+ − 36.90	
		64.08	
		1.80672	
		1.16901	
		2.97573	
		1.91185	
		8.93612	
		4561	

M	46 25.23		
M	47 46 60.69	09	25
R	47 47.05		20
R	47 46.98	02 04	13
M	47 46.78		7
	47 46.85		
	87.63		16

232

η Herculis

h m s
16 38 45
° '
+39 9

1.17609
9.88958
1.06567

39 15.75		39 5.4	
18.30	2.1036	7.5	
21.10	21.04	9.8	
23.73		12.4	
10518 26.40		494 14.3	
10518		494	
31.60		39 9.88	
34.28	42.244		
36.84			
39.60			
42.28	42.249	40 18.7	
44.93		21.5	
47.55		22.9	
50.17		26.0	
38020 52.85		1162 28.1	
		1162	
55.27		40 2.324	
0.80	3472		
3.44	3.447		
6.05	84451		
31736 8.50	39 42.249	39 9.88	
1736		40 2.324	

M	19 5.72		
M	20 19.72	68 04	14
R	20 19.90		32
R	20 20.05	98 07	47
M	20 19.65		7
	20 19.58	1962	
	73.86		25

237

α Herculis pr.

h m s
17 9 78
° '
+14 32

1.17609
9.98588
1.16197

9 43.45		9 38.1	
45.50	4.7636	40.6	
47.65	47.64	42.7	
49.70		45.1	
23818 51.88		2134 46.9	
23818		2134	
56.05		9 42.68	
58.25		+ 21.91	
0.30			
2.37	4563		
4.60	45.6	10 32.2	
6.70	4.62	34.3	
8.83		35.2	
11.10		37.4	
58107 13.00		1789 38.4	
4107		2.89	
17.27		10 35.78	
19.50	2.1604	− 31.19	
21.65	21.60		
23.70	12924		
10802 25.90		9 42.68	
10802	10 4.590	10 35.78	
		+ 21.91	
		− 31.19	
		53.10	
		1.72509	
		1.16197	
		2.88706	
		1.82230	
		8.93524	
		4 55 25	

17 9 11.43

M	56 11.05		
M	57 17.57	49 08	10
R	57 17.62		15
R	57 17.30	46 16	17
M	57 17.40		7
	57 17.47		
	66.42		12

14 31 48.8

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1879phae.proj.1504

32

γ Andom. C=46.689

h m s
1 56 28
+41° 1' 45"

1879 June 30

1.17609 0.11297
9.87277
1.04886

56 57.22
57.95 2256
2.61 2.66
5.40
31328 8.10
1128
13.66
16.30
19.17
21.80 24664
24.64 24.66
27.45 24.73
30.19
32.92
22198 35.75
22198
41.40
44.06 46.806
46.77 46.81
49.50 49.47
23403 52.30
23403 57 24.695

56 48.2
50.3
52.4
55.3
2642 58.0
2642
56 52.84
+ 31.86
87 59.8
2.1
4.6
7.3
3246 10.1
246
58 4.92
− 40.22
56 52.84
38 4.92
+ 31.86
− 40.22
72.08
1.85781
1.04886
2.90667
1.83942
8.92275
4 58 59.475

M 43 22.67.
M 44 31.67.
R 44 31.85.

44 31.76
69.09

33

α Aurigæ

h m s
2 0 21
+22° 53'

0.11297 1.17609
9.87277
1.04886

0 54.24
56.43 58698
58.70 58.69
0.90
29349 3.22
29349
7.63
9.90
12.18
14.40 16621
16.60 16.62
18.85 16.62
21.10
23.28
14959 25.65
14959
30.10
32.36 34.546
34.50 34.55
36.77 15324
17273 39.00
17273 1 16.620

2 0 23.88

M 34 24.35.
M 35 40.62.

35 40.62
76.27

22 58 22.8

198

β Ursæ Min. L.C.

h m s
2 51 4
+105° 21'

0.11297 1.17609
9.96490
1.14049

0 73.8
45.8
47.9
49.7
2387 51.5
2387
0 47.74
+ 2888
1 47.0
48.7
51.2
53.3
2552 55.0
52
1 51.04
− 3442
0 47.74
1 51.04
+ 2888
− 3442
63.30
1.80140
1.14049
2.94189
1.88235
8.94046
4 58 59.

57 23.5
31.5
39.0
46.8 54744
57.8 54.74
2.5
10.5
15.1
4927 26.0
4927
51 54.74
53 36.3
36.2
1185 43.0
53 39.50

R 10 37.17.
R 10 10.85.
R 9 11.42.

49 23.4 50 36.1
29.3 40.5
34.8 43.6
41.7 50.8
1771 47.9 2284 57.4
1771 2284
49 35.42 50 45.68
+2 19.32 +1 9.06
49 35.42 50 45.68
53 39.50 − 1 10.26
+2 19.32
−1 44.76

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1979phae.proj.15004

48

γ Persei

h m s
2 56 2
° ′
+53 2

0.11297

56 24.88
28.30 31.616
31.50 31.61
35.00
15808 38.40
15808
45.26
48.78
52.07
55.47 59.019
59.07 59.02
2.50 59.05
5.87
9.34
53117 12.88
53117
19.67
23.00 26.494
26.50 26.49
29.88 11.810
13247 33.42
13247

56 17.0
20.5
22.9 22.92
25.6
1146 28.6
1146
56 22.92
+ 36.12

56 59.035 + 36.12

R 26 39.70.
R 26 39.87.

52

α Persei

h m s
3 15 41
° ′
+49 26

1.17609 0.11297
9.81313
0.98922

16 6.88
9.28 12.328
12.35 12.32
15.37
6162 18.62
6184
23.00
28.18
31.47
34.49
37.68 37.727
40.85 37.75
44.00
47.17
50.40
56.87
59.88 3.080
3.20 3.18
6.05 7.650
31590 9.40
1540

16 0.8
3.4
6.5
8.8
316 11.9
316
16 6.32
17 15.5
17.7
20.9
23.6
1043 26.6
1043
17 2.086
16 6.32
16 37.727 17 20.86

3 15 43.41

M 2 45.37.
M 3 47.30 .34 04 19
R 3 47.60. 11
R 3 47.70 .65 05 21
M 3 47.37. 12
47.49
62.12 16

49 25 35.9

61

η Tauri

h m s
3 40 18
° ′
+23 44

1.17609 0.11297
9.96162
1.13771

40 39.05
52.37 5.4564
54.60 5.456
56.80
27282 59.00
27282
3.54
5.94
8.18
10.40 12.660
12.70 12.66
14.88 12.68
17.20
19.50
111394 21.60
111394
26.05
27.30 30.590
30.50 30.59
32.95 14.515
15295 35.15
15295 41 12.620

40 40.5
42.3
44.2
46.3
2217 48.4
217
40 44.34
+ 28.28
41 44.6
46.7
48.5
50.3
2421 52.0
2421
41 48.42
- 35.80

M 44 3.85.
M 45 20.67 .80 13 9
R 45 20.75. 1
R 45 20.72 .73 01 4
M 45 20.92. 16
45 20.76
76.91 .08

40 40.5
42.3
44.2
46.3
2217 48.4
217
40 44.34
+ 28.28
41 44.6
46.7
48.5
50.3
2421 52.0
2421
41 48.42
+ 28.28
- 35.80
64.08
1.80679
1.13771
2.94443
1.88598
8.94155
4.59 44

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1879phae.proj 1504

63

ζ Persei

h m s
3 46 32
+31 31

1879 June 30

1.17609 0.11297
9.93060
1.10678

47 2.80
5.20 7.632
7.66 7.63
10.00
3816 12.50
3816
11.38
19.80
22.03
24.50 26.984
26.92 26.98
22.40 26.99
31.88
34.27
24286 36.68
24286
41.60
43.89 46.360
46.31 46.36
48.72 53.99
23180 57.28
23180 47 26.985

46 37.0
53.3
0.7 0.68
2.5
30341 4.9
34
47 0.68
+ 26.30
47 0.3
2.2
4.5
4.6
223 8.7
223
48 4.46
− 37.48
47 0.68

48 4.46
+ 26.30
− 37.48
63.78
1.80468

5 7 46.90

M 56 43.57
M 57 53.40 46 06 5
R 57 53.45 0
R 57 53.45 45 00 0
M 57 53.52 4
57 53.45
69.88 03

86

α Aurigae

h m s
5 7 45
+45 52

1.17609 0.11297
9.84281
1.01890

8 11.34
14.28 17310
17.27 17.31
20.32
8655 23.20
8655
22.00
32.05
35.00
38.03 40949
40.90 40.95
43.96 40.98
46.93
48.80
36854 52.80
36854
58.70
1.63 4.650
4.67 4.65
7.55 8.196
32323 10.50
2325 8 40.965

8 9.0
11.7
14.7
16.5
718 18.9
718
8 14.36
+ 26.60
9 20.4
22.6
25.0
28.7
1279 31.2
1279
9 25.58
− 44.62
71.22
1.85260

9 25.58
+ 26.60
− 44.62
71.22
1.85260
1.01890
2.87150
1.80502
8.93352
4 54 16

M 36 7.38
M 37 11.02 104 02 19
R 37 11.22 2
R 37 11.52 37 15 31
M 37 11.07 14
37 11.21
63.83 17

45 52 25.1

90

β Tauri

h m s
5 18 39
+28 30

1.17609 0.11297
9.84281
1.01890

19 10.18
12.20 14.780
14.87 14.78
17.00
7390 19.55
7390
24.10
26.50
29.13
31.30 33.599
33.50 33.59
35.52 33.54
38.26
40.65
34239 43.00
30239
47.71
49.50 52.312
52.33 52.31
54.62 6709
26156 57.00
26156 19 33.565

M 57 47.60
M 59 3.35 33 02 1
R 59 3.37 3
R 59 3.35 36 01 1
M 59 3.30 4
59 3.34
75.74 02

19 0.0
2.0
4.3
5.9
204 8.2
204
19 4.088
+ 29.48
20 6.5
8.3
10.7
12.4
527 14.8
527
20 10.54
− 36.98
19 4.08
20 10.54
+ 29.48
− 36.98
66.46
1.82256

1.11999
2.94255
1.87933
8.93678
4 56 28

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1879phae.proj.1004

103

β Aurigae

h m s
5 50 39
° ′
+44 56

1.17609 0.11297
9.84999
1.02608

June 30

57 5.88
8.82 11.614
11.43 11.61
14.26
5807 17.45
5807
23.50
26.00
28.00
31.58 34.928
34.20 35.02
37.10 34.95
40.83
43.64
31515 46.70
31435
52.65
55.37 58.294
58.09 58.29
1.25 6990
29147 4.20
29147 51 34.985

50 57.5
1.0
4.2
10.7 8.0
51 2.675
+ 32.310
52 18.3
20.4
23.2
25.5
1158 28.4
158
52 2.316
− 4818
+
52 23.16
− 48.18
+ 32.31
78.49

S

Sun C = 46.699

h m s
6 41 3
° ′
+23 7

0.11297

July 1

40 21.80
23.58 26184
26.18 26.18
28.40
13092 30.56
13092
33.03
34.30
37.70
42.00 44.116
44.00 44.11
46.40 44.12
48.62
50.89
39704 53.13
39704
57.60
59.85 2060
2.00 2.06
4.25 8824
31030 6.60
1030 40 44.115

41 36.7
33.4
40.0
41.6
2007 44.021
2007
41 40.14
− 56.02

42 38.88
41.10 4 3390
43.45 43.39
45.85
21695 47.75
21695
52.43
54.80
57.00
59.30 1.468
1.48 1.447
3.75 1.447
5.97
8.00
55321 10.48
1321
15.03
17.00 19426
18.47 19.43
21.68 12 2.82
9713 23.98
9713 43 1.440

42 12.0
14.3
16.0
18.5
817 20.9
817
42 16.34
+ 45.10
42 16.34
+ 45.11

M 32 24.17.
M 33 37.15 .96 19 19
R 33 36.90 . 6
R 33 37.00 95 05 4
M 33 36.78 . 18
33 36.96
72.79 12

M 5 16.10.

M 37 35.32.

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587 | 198 | 200

α Virginis — h m s 13 18 49; ° ′ −10 32

β Urs Min — h m s 14 51 4; ° ′ +74 39

β Librae — h m s 15 10 30; ° ′ −8 56

0.11297 | 1.17609 0.11297 | 0.11297 1.17609 / 9.99470 / 1.17079

1879 July 1

α Virginis

18 23.25		18 15.4	
25.22	27.366	16.8	
27.30	27.37	18.8	1
29.46		20.7	
13683 31.60		944 22.7	
13683		944	
35.50		18 18.80	
37.90		+ 25.33	
40.00			
42.00	44.146		
44.05	44.14		
46.20	44.12		
48.30			
50.48			
39731 52.58			
39731			
52.65			
58.85	0.880		
0.90	0.88		
3.00	8825		
30440 5.00		18 18.80	
440	18 44.130	+ 25.33	

13 18 52.99

β Urs Min

51 48.00		51 18.4	51 52.4
55.95	3.770	26.3	58.0
52 3.80	3.77	32.3	2.3
11.80		38.0	8.0
31885 19.30		1617 46.7	3191 17.4
1885		1617	191
34.10		51 3234	52 382
42.20		+1 3383	+1 235
50.65			
58.25	6.164		
53 6.28	6.16	53 3.2	53 35.0
13.90	6.18	8.5	41.5
22.20		14.7	47.7
29.70		22.6	55.3
59548 37.40		767 27.7	2408 1.3
5548		767	2408
52.88		53 1534	53 4816
54 0.90	8.592	− 8.17	− 4199
8.48	8.59		
16.40	1286		
34296 24.30	3	54 12.9	54 53.4
4296	53 6.170	20.6	3.0
		29.2	10.0
		35.9	18.5
		1432 44.6	3506 25.7
		1432	506
		54 2864	55 1012
		−1 2247	−2 395
		55 30.5	
		34.4	
		1033 38.4	
		55 34.43	

14 51 7.78

β Librae

12 4.60		12 2.1	
6.70	8810	4.1	
8.85	8.81	5.9	
10.90		8.2	
4403 13.00		303 10.0	
4405		303	
17.20		12 606	
19.28		+ 1943	
21.38			
23.45	25521		
25.50	25.52	12 59.4	
27.58	25.46	1.4	
29.70		3.0	
31.80		5.2	
22969 33.80		3162 7.2	
22969		162	
37.90		13 324	
40.00	42116	− 37.75	
42.20	42.12		
44.20	5093		
21058 46.28		12 6.06	
21058	12 25.490	13 ~~6.32~~	3.24
		+ 19.43	
		− ~~40.83~~	37.75
		~~−6026~~	5718
		~~1.78003~~	
		1.17079	
		~~2.95082~~	
		1.87210	
		~~8.92128~~	8.94407
		~~4 467~~	5 128

M. 59 6.55

M. 49 52.35
M. 50 4.62
M. 50 29.22
M. 50 40.57
M. 50 53.85
M. 51 6.90
M. 51 13.92

M. 23 35.45
M. 24 49.92 .86 06 2
R. 24 49.98 4
R. 24 50.05 .01 04 11
M. 24 49.80 14
24 49.94 .08
74.49

10 32 39 | 74 39 0.0

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1879phae.proj.1004

212

α Serpentis

h m s
15 38 18
° ′
+6 48

0.11297 1.17609 9.99693 1.17302

38 53.90 55.90 57.95 0.05 28985 2.05 28985 6.28 8.26 10.45 12.45 14.50 16.60 18.70 20.70 13094 22.80 13094 25.00 27.00 29.00 31.00 33.20 15550 35.30 550 31100 39 14.540

57970 5797 14589 14555 14.53 31.100 31.10 14907

38 46.7 48.0 50.2 52.3 2513 54.0 13 38 5026 + 2428 39 47.0 48.5 50.6 52.6 2532 54.5 32 39 5064 2 36.10 38 5030 39 50.64 + 24.21 − 36.10 60.35 1.78061 1.17302 2.95363 1.89382 8.94019 4 58 47

15 28 21.98

M 39 20.62.
M 40 39.05 .03 02 12
R 40 38.95. 2
R 40 38.72 .84 12 21
M 40 39.02. 9
40.38.93
78.31 11

6 48 18.4

222

S Ophiuchi

h m s
16 8 0
° ′
−8 23

0.11297 1.17609 9.99924 1.17533

8 35.70 37.80 39.90 41.90 19920 44.00 19920 48.00 50.18 52.35 54.50 56.37 50712 4.60 50712 8.58 10.80 12.95 14.97 6420 17.00 6420

39.840 39.84 56.347 56.35 56.34 12.840 12.84 11268 8 56.345

8 26.8 28.6 30.8 32.4 1532 34.6 32 8 30.64 + 25.70 9 26.5 27.5 29.3 31.5 1486 33.5 1486 9 29.72 − 33.38 8 30.64 9 29.72 + 25.70 − 33.38 59.08 1.77144 1.17533 2.94677 1.86844 8.92170 4 46 64

12 35 10

M 50 25.05.
M 51 38.80 .89 09 6
R 51 38.82. 4
R 51 38.85 .84 01 1
M 51 38.97. 11
51 38.86
73.87 05

226

27 Draconis

h m s
16 22 21
° ′
+61 47

0.11287

22 36.00 40.47 44.85 49.37 22439 53.90 22439 2.00 6.70 10.98 15.35 19.779 12.80 19.78 24.15 19.74 28.58 33.00 17801 37.35 17801 45.80 50.37 54.606 54.46 54.61 58.80 15949 27303 3.60 27303 23 19.760

44878 44.88 1462 36.5 1462 22 29.24 + 50.52 23 28.9 31.1 33.6 35.3 1751 43.2 1751 23 3502 − 15.26 82 29.24 23 35.02 + 50.52 − 15.26 65.78 1.81809

M 41 21.62.
M 42 267.
R 42 2.85.

42 2.76

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1879 July 1

228 β Herculis

h m s: 16 25 1 ; +21° 45′

1.17609 | 0.11297
9.96793
1.14402

25 35.50		25 31.8	
37.60	39756	33.2	
39.80	39.76	34.9	
41.88		37.9	
19878 44.00		1772 39.4	
19878		272	
48.66		25 35.44	
50.88		+ 22.04	
52.98			
55.26	57466		
57.30	57.47	26 29.2	
59.74	57.49	31.1	
2.00		33.3	
4.10		35.2	
51719 6.27		1662 37.4	
51719		162	
10.80		26 33.24	
12.90	15220	− 35.76	
15.30	15.22		
17.40	11498		
7610 19.70		25 35.44	
7610	25 57.480	26 33.24	
		+ 22.04	
		− 35.76	
		57.80	
		1.76193	
		1.14402	
		2.90595	
		~~1.70982~~	1.85278
		~~9.00387~~	8.94683
			5 3 22

M	42 50.30		
M	44 1.50	.53 03	5
R	44 1.65		10
R	44 1.50	.58 08	5
M	44 1.55		0
	44 1.55		
	71.25		05

232 η Herculis

h m s: 16 38 45 ; +39° 9′

1.17609 | 0.11297
9.88958
1.06567

39 15.10		39 10.6	
17.95	20566	12.4	
20.68	20.57	14.7	
23.30		16.6	
10283 25.80		736 19.3	
10283		236	
30.95		39 14.72	
33.90		+ 27.09	
36.44			
39.10	41806		
41.84	41.81	40 13.3	
44.44	41.81	15.6	
47.20		17.8	
49.88		19.6	
37625 52.50		881 21.8	
37625		881	
57.90		40 17.62	
0.30	3050	− 35.81	
3.00	3.05		
5.65	8362		
31525 8.40		39 14.72	
1525	39 41.810	40 17.62	
		+ 27.09	
		− 35.81	
		62.90	
		1.79865	
		1.06567	
		2.86432	
		1.79851	
		8.93419	
		4 54 43	

M	19 11.10		
M	20 13.95	.98 .03	3
R	20 13.95		3
R	20 14.02	.99 .03	4
M	20 14.02		4
	20 13.98		
	62.88		.03

237 α Herculis

h m s: 17 9 18 ; +14° 32′

1.17609 | 0.11297
9.98588
1.16197

9 42.80		9 34.0	
44.97	47190	35.8	
47.23	47.19	37.9	
49.35		39.7	
23595 51.60		1889 41.5	
23595		1889	
55.63		9 37.78	
57.30		+ 26.38	
0.00			
2.20	4148		
4.00	4.15	10 36.3	
6.22	4.17	37.9	
8.40		39.8	
10.55		41.9	
57733 12.50		1999 44.0	
3733		1999	
16.80		10 39.98	
19.00	21162	− 35.82	
21.28	21.16		
23.28	12835		
10581 25.45		9 37.78	
581	10 4.160	10 39.98	
		+ 26.38	
		− 35.82	
17 9 11.42		62.20	
		1.79379	
		1.16197	
		2.95576	
		1.88840	
		8.93264	
		4 53 40	

M	56 5.97		
M	57 23.22	.21 01	9
R	57 23.47		16
R	57 23.37	.42 05	6
M	57 23.20		11
	57 23.31		
	77.34		.11

14 81 45.7

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33

α Arietis

h m s
2 0 21
+22 53 0.11297

0 54.00		0 50.8	
56.30	58530	53.0	
58.55	58.53	55.0	
0.80		57.0	
29265 3.00		2747 58.9	
29265		247	
7.50		0 54.94	
9.80		+ 21.50	
12.00			
14.25	16454		
16.47	16.45		
18.77	16.42		
20.80			
23.00			
14809 25.40			
14809			
28.60			
32.05	34320		
34.30	34.32		
36.50	15285		
17160 38.85		0 54.94	
17160	1 16.435	+ 21.50	

2 0 28.40

198

β Cas. Min. L.C.

h m s
14 57 4
+ 105 21 0.11297

50 36.90	3590	50 28.1	51 27.4		
44.00	52120	34.5	36.1		
52.00	52.12	42.3	40.3		
0.10		48.3	47.1		
26060 7.70		2114 54.2	2067 55.8		
26060		2114	2067		
23.60		50 42.28	51 41.34		
30.75		+1 12.24	+ 13.18		
39.20					
46.83	54442				
54.70	54.44	52 36.3	53 20.9		
1.88	54.59	44.6	28.7		
9.95		49.8	34.9		
17.60		57.8	40.0		
48998 25.30		2570 3.5	1728 48.3		
48998		2570	1728		
42.85		52 57.40	53 34.56		
49.00	57.60	− 56.88	−1 40.04		
56.38	57.06				
4.50	22918				
28530 12.57		53 51.2	51 41.34		
28530	51 54.515		53 34.56		
			+ 13.18		
			−1 40.04		
			113.22		
			2,05 38 5		

48

γ Persei

h m s
2 56 2
+ 53 2 0.11297

56 24.50		56 29.0	
28.00	31500	31.9	
31.65	31.50	34.0	
34.95		36.3	
15750 38.40		1711 39.9	
750		211	
45.15		56 34.22	
48.37		+ 24.62	
52.60			
55.43	58.800		
58.75	5880	57 39.5	
2.20	58.87	41.8	
5.70		43.6	
9.00		46.3	
52920 12.40		2220 50.8	
52920		2220	
18.40		57 44.40	
22.90	26.240	− 45.56	
26.20	26.24		
29.70	11774		
13120 33.00		56 34.22	
13120	56 58.835	57 44.40	
		+ 24.62	
		− 45.56	
		70.18	

R 34 33.37 .
R 34 33.115 .

2 2 58 33.3

M 10 11.17 .
M 9 50.22 .
M 9 25.60 .
M 9 11.60 .
M 9 7.47 .

M 26 118.27 .
M 27 43.80 . 88 08 5
R 27 43.72 . 3
R 27 43.62 . 67 05 13
M 27 43.87 . 12
~~27 43.75~~
27.43.75 08

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1879phae.proj 1504

52

α Persei

h m s
3 15 41
° ′
+49 26

1879 July 1

1.17609
9.81314
0.98923

16 5.80		15 58.0		34 44.40	
9.00	12.180	0.5		47.40	50476
12.20	12.18	2.7		50.48	50.47
15.40		5.3		53.50	
6090 18.50		3157 9.2		25238 56.60	
6090		157		238	
24.95		16 3.14		2.70	
27.98		+ 34.36		5.68	
31.00				8.65	
34.30	38.132			11.80	1.4834
37.45	37.46	17 19.2		14.80	14.83
40.70	37.53	21.4		17.85	14.85
43.73		24.4		20.80	
46.98		26.7		24.00	
33719 50.10		1224 30.7		13351 27.20	
34319		1224		13351	
53.65		17 2.448		33.00	
57.70	2890	2 46.98		36.20	39.230
2.80	289			39.30	39.23
6.00	7507			42.30	149.70
31445 9.20		16 3.14		19615 45.35	
1445	16 37.495	~~17 2.449~~		19615	35 14.840
		+ 34.36			
		− 24.95			
		56.31			
3 15 48.45		1.77313			
		0.98923			
		2.76236			
		1.83429			
		0.07194			

34 38.9		
41.7		
44.8		
46.8		
2217 48.5		
2217		
34 44.34		
+ 30.50		
35 37.4		
39.9		
42.8		
44.8		
2129 48.0		
2129		
35 42.58		
− 27.74		
34 44.34		
35 42.58		
+ 30.50		
− 27.74		
58.24		
1.76522		

1722.45
+34.36
−44.95
79.31
1.89933
0.98923
2.88856
1.83429
8.94573
5 2 36

M 2 42.30.
M 3 50.32. 55 23 26
R 3 50.52. 6
R 3 50.72. 62 10 14
M 3 50.78. 20
3 50.58
68.26 17

45 25 45.7

57

β Persei

h m s
3 34 19
° ′
+47 24

0.11297

47 2.70		46 55.2			
5.02	7.456	57.3			
7.48	7.46	59.4			
9.90		1.6			
3728 12.20		2973 3.8			
3728		2973			
17.03		46 5.946			
19.50		+ 27.32			
21.80					
24.30	2.6763				
26.75	2.676	48 4.3			
29.13	26.79	6.4			
31.60		8.8			
34.06		11.2			
24087 36.60		4440 13.3			
24087		4440			
41.35		48 6.80			
43.65	4.6132	− 42.02			
46.00	4.613				
48.48	5.359				
23066 51.10		46 5.946			
23066		47 26.775		48 8.80	
				+ 27.32	
				− 42.02	
				69.34	
				1.84098	
				1.10678	
				2.94776	
				1.88840	
				8.94064	
				4 59 6	

M 4 29.72.
M 5 21.85. 98 13 12
R 5 22.02. 3
R 5 21.92. 77 05 5
M 5 22.10. 13
~~5 21.97~~
21.94 09

M 56 41.90.
M 57 59.40. 28 12 16
R 57 59.25. 1
R 57 59.15. 20 05 9
M 57 59.15. 9
57 59.24
77.34 09

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79

i Aurigae

h m s
4 49 1.
+32 58

1.17609 0.11297
9.92356 7
1.09958

49 37.40			49 30.5												
40.00	4 2.250		31.9												
42.20	42.25		34.6												
44.65			36.4												
21125 47.00			1727 39.3												
1125			227												
51.95			49 34.54												
54.48			+ 27.30												
56.90															
59.30	1.821														
1.63	1.82		50 36.4												
4.34	1.86		39.2												
6.70			41.7												
9.26			43.9												
35639 11.83			2075 46.3												
1639			75												
16.65			50 41.50												
18.95	21.470		- 39.66												
21.30	21.47														
24.03	12372														
10735 26.40			49 34.54												
10735	50 1.840		50 41.50												
			+ 27.30												
			- 39.66												
			66.96												
			1.82582												
			1.09958												
			2.92547												
			1.85884												
			8.93317												
			4 54 1.												

M 29 45.92															
M 30 58.50	+ 24 26 33														
R 30 58.27	10														
R 30 57.92	10 18 25														
M 30 57.98	19														
30 58.17															
72.25	22														

86

Δ Aurigae

h m s
5 7 45
+45 52

1.17609 0.11297
9.84281
1.01890

8 11.00			7 59.4												
14.00	16990		2.4												
17.00	16.99		4.3												
19.95			6.7												
8495 23.00			3287 8.9												
8495			217												
29.00			8 4.34												
31.80			+ 36.40												
34.88															
37.92	40.811														
40.80	40.81		9 17.5												
43.80	40.68		19.7												
46.60			22.1												
49.90			25.8												
36730 52.60			1146 27.5												
36730			1146												
35.40			9 22.92												
1.35	4.364		- 42.18												
4.30	4.38														
7.80	8137														
32192 10.47			8 4.34												
2182	8 40.745		9 22.92												
			+ 36.40												
			- 42.18												
			76.58												
			1.89531												
			1.01890												
			2.91421												
			1.84973												
			8.93552												
			4 55 37												

M 35 58.20															
M 37 9.05	.93 12 10														
R 37 9.02	7														
R 37 8.90	.96 06 5														
M 37 8.82	13														
37 8.95															
70.75	.09														

5 7 46.78

5 48 37

+7 23

1.17609 0.11297
9.99638
1.17247

48 10.35			49 7.2												
12.40	14496		7.3												
14.55	1449		10.7												
16.60			12.8												
7248 18.58			549 14.9												
2248			549												
22.85			49 1098												
24.85			+ 20.12												
26.80															
28.78	31.083														
31.00	31.08		50 13.3												
33.20	31.13														
35.30															
37.30															
27975 39.47															
27975															
43.70															
45.60	47770														
47.50	47.77														
49.20	6226														
23885 51.95			49 1098												
3885	49 31.105		+ 20.12												

5 48 38.66

M 34 40.82															
M 36 1.55	61 09 14														
R 36 1.90	21														
R 36 1.65	78 13 4														
M 36 1.67	2														
36 1.69															
	.10														

46 52 25.1

7 23 8.1

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8

Sun C = 46.699

h m s
6 45 11
+23° 3'

2.11297

1879 July 2

120

α Can Min.

h m s
7 32 58
+5° 32'

1.17609 0.11297
9.99999
1.17406

44 29.70		45 38.0	46	4556		46 17.1		33 31.00		33 22.0			
31.80	34074	40.3		4893		18.3		33.50	35198	23.6			
33.95	34.07	41.8		5120	51.028	20.0		35.30	35.19	25.0			
36.25		43.2		5355		22.4		37.21		26.5			
17037 38.67		2086 45.3	25514	55.90		1017 23.9		17599 39.42		1250 27.9			153
2037		86				1017		2599		250			
43.00		45 4172		0.28		46 20.34		43.56		33 2500			
45.30		− 48.70		2.45				45.30		+ 26.78			
47.50				4.82				47.60					
49.80	52030			7.80	9247			49.65	51746				
52.00	52.03			9.29	9.25			51.70	51.75	37 25.9			
54.40	52.02			11.38	9.212			53.70	51.82	37.4			
56.45				13.70				55.70		29.4			
58.79				15.95				58.00		30.9			
46827 1.00			8322	18.35				46571 0.30		1461 32.5			
46827				8322				46571		1461			
5.37				22.31				4.36		34 29.22			
7.78	9974			25.00	27328			6.40	8452	− 37.44			
10.80	9.97			27.48	27.33			8.40	8445				
12.25	104.04			29.36				10.50	10364				
4987 14.47		45 41.7	13664	31.80		46 20.34		4226 12.60		33 25.00			
4987	44 52.025	− 49.70	13664	47 9.212				4226	33 51.785	34 29.22			
										+ 26.78			
										− 37.44			
										64.22			
										1.80767			
										1.17406			
										2.98173			
										1.72387			
										8.94214			
										5 0 8			
										7 33 57.29			

M 9 21.25 · M 41 46.92 ·

M 55 33.07 ·
M 56 36.90 ·
R 56 36.92 ·
R 56 57.15 ·
56 56.99
23.92

5 32 04

M

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122

β Geminor

h m s
7 37 55
° '
+28 19

0.11297

38 26.00 +28.45 49.46 38 14.7
28.48 38.78 49.57 247.41 16.0
30.80 30.79 49.56 49.482 17.8
33.20 16.41 49.61
15394 35.46 14.06 49.52
15394
40.00 9.38 49.38 346.38
42.50 7.03 49.53 49.463
44.95 4.68 49.63
47.25 2.32 49.57
49.50 -0.00 49.50
51.80 2.34 49.46
54.00 4.69 49.31

49.472
49.482

38 49.482

M 8 57.72

587

α Virginis

h m s
13 18 49
° '
-10 32

0.11297

20 —
+8.39 43.94 394.67 33.55
6.30 43.86 43.852 37.55
4.19 43.84 39.75
+2.08 43.86 41.78 43857
-0.00 43.93 43.93 43.86
2.05 43.91 45.90
4.20 43.80 48.00
6.30 43.70 50.00
8.41 43.84 39471 52.25
39471
12.59 43.84 219.32 56.43
14.69 43.91 43.865 58.60 0660
16.79 43.96 0.75 0.66
18.89 43.81 2.70
21.05 43.80 30333 4.85
333 20 43.856

43.858
43.856

13 18 52.98

M 0 8.25
M 0 28.90

10 32 38

21 59.7
1.2
3.0
4.5
3148 6.4
148
21 296
— 1910
21 17.3
18.8
20.7
22.3
1037 24.6
37
21 2074
— 3638
21 29.6
21 20.74

198

β Urs. Min.

h m s
14 51 4
° '
+74 39

0.11297

50 47.00 2940
55.10 2.94
3.00
10.90
31470 18.70
1470
34.30
42.00
49.92
57.60 5.419
5.60 5.42
13.25 5.41
20.90
28.60
58877 36.60
4877
52.27
0.40 7878
7.80 7.88
15.65 1082
33939 23.27
3939 52 5.415

14 51 7.71

M 49 47.08
M 50 18.62
M 50 43.45
M 50 56.22
M 51 9.70
~~50 47.00~~

74 39 0.1

50 10.2 51 37.5
16.6 46.3
23.0 52.5
29.0 59.2
1148 36.0 2617 6.2
1148 2617
50 2296 51 5234
+1 4246 + 1308
52 52.9 53 30.0
58.3 38.4
3.8 44.8
12.3 52.6
3276 20.3 2269 1.1
276 2269
53 552 53 4538
—1 010 — 3996
54 13.5 51 5234
21.5 53 45.38
30.0 + 13.08
36.9 —1 39.96
1438 41.9 3.04
1438
54 2876
—2 2334

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201

ρ Bootis

h m s
15 10 37
+33° 46'

1.17609
9.91976
1.09585

1879 July 2

226

η Draconis

h m s
16 22 24
+61° 47'

228

β Herculis

h m s
16 25 1
+21° 45'

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1879phae.proj.1604

232

η Herculis

h m s
16 38 45
+39° 9'

39 14.90		39 36.7		
17.40	20176	39.1		
20.20	20.18	41.8	41.36	
22.85		43.4		
10088 25.50		2068 45.8		
10088		2068		
30.90		39 41.36		
33.35		+ 0.13		
36.23				
38.79	41.499			
41.48	41.46	40 18.6		
44.20	41.48	21.0		
46.80		23.3		
49.35		25.6		
37349 52.50		1169 28.7		
37349		169		
57.50		40 2338		
0.18	2790	− 41.89		
2.80	2.79			
5.47	82907			
31395 8.80		39 41.36		
1395	39 41.490	40 23.38		
		+ 0.13		
		− 41.89		
		42.02		

M 19 38.32			
M 20 20.35			
R 20 20.55			
M 20 20.52			
20 20.47			

237

α Herculis

h m s
17 9 18
+14° 32'

1.17609
9.98588
1.16197

9 42.60			
44.70	46850		
46.85	46.85		
49.00			
23425 51.10			
23425			
53.20			
55.35			
57.70			
1.80	3862		
3.88	386		
6.00	389		
8.00			
10.20			
57476 12.40			
3476			
16.70			
18.86	20942		
21.00	20.94		
23.60	12779		
10471 25.25			
471	10 3.875		

17 9 11.41

M 56 59.5			
M 57 21.32	.25	07	13
R 57 21.62			17
R 57 21.70	.66	04	25
M 57 21.17			28
57 21.45			
7550			.21

14 31 45.7

241

α Ophiuchi

h m s
17 29 19
+12° 39'

9 32.7			
33.4			
34.5			
35.3			
1870 41.1			
1870			
9 37.40			
+ 26.48			
10 33.6			
35.6			
37.4			
39.2			
1866 40.8			
1866			
10 3732			
− 33.44			
9 37.40			
10 37.32			
+ 26.18			
− 33.44			
5992			
1.77757			
1.16197			
2.93954			
1.87795			
9.93841			
4.57.34			

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32 — γ Androm. — 1879 July 2

h m s: 1 56 28; ° ': +41 45

1.17609 | 0.11297
9.87277
1.04886

56 32.65		56 46.0
39.85	2250	48.4
2.25	2.25	50.7
5.00		53.0
31125 7.38		2536 55.5
1125		36
13.35		56 5072
16.00		+ 3364
18.80		
21.60	24363	
24.35	24.36	58 3.2
27.00	24.36	5.4
29.77		7.6
32.70		10.0
21927 35.50		391 12.4
21927		391
40.95		58 782
43.70	46470	− 4346
46.48	46.47	
49.22	4872	
23235 52.00		56 50.72
23235	57 24,360	58 7.82
		+ 33.64
		− 43.46
		77.10
		1.88405
		1.04886
		2.93591
		1.87425
		8.93834
		4 57 31

M 43 19.75
M 44 34.65
R 44 34.57

44 34.61
74.86

33 — α Arietis

h m s: 2 0 21; ° ': +22 53

0.11297 | 1.17609
9.96440
1.14049

0 54.00		0 46.4
56.00	58390	48.2
58.35	58.39	49.9
0.70		51.9
29195 2.90		2507 54.3
29195		07
7.35		0 5014
9.60		+ 2613
11.85		
14.00	16270	
16.27	16.27	1 47.0
18.48	16.24	48.6
20.75		50.8
22.95		52.9
14643 25.18		2548 55.5
14643		48
29.70		1 50.96
31.86	34104	− 3470
34.07	34.10	
36.35	15249	
17052 38.54		0 50.14
17052	1 16.255	1 50.96
		+ 26.12
2 0 23.44		− 34.70
		60.82
		1.78405
		1.14049
		2.92454
		1.86764
		8.94310
		5 0 47

M 34 27.72
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R 35 41.67 22
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50 36.30		50 2.3	50 52.6
44.20	51990	8.8	58.3
52.00	51.99	14.0	7.9
59.85		19.3	14.7
25995 7.60		740 20.6	3364 21.9
25995		740	364
23.30		50 14.80	51 728
31.00		+ 1 39.46	+ 46.98
38.60			
46.40	54198		
54.25	5420	51 26.0	52 36.7
2.00	54.33	33.3	42.4
9.60		42.4	51.3
17.28		49.5	2.3
48778 25.35		2095 55.3	2597 7.0
48778		2095	2597
41.95		51 41.90	52 51.94
48.38	56682	+ 1236	− 57.68
56.60	56.68		
4.38	130867		
28341 12.20		53 31.5	51 728
28341	51 54,265	38.6	52 51.94
		45.0	+ 46.98
		52.5	− 57.68
		2283 59.7	104.66
		2283	
		53 4566	
		−1 51.40	

M 10 19.07
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48 36.85			49 49.6		50 53.95			50 23.5		50 47.75			50 32.4		51 12.0
39.14	41.426		51.4		56.35	58.540		21.9		53.25	3.066		32.0		17.8
41.47	41.43		53.0		58.57	58.54		22.4		2.48	3.07		44.4		24.3
43.77			54.5		0.86			28.6		11.77			53.0		32.0
20713 45.80			2655 57.0		29270 2.77			1369 31.5		31533 18.86			22251 59.3		12147 38.6
20713			155		29270			1369		1533			2251		1247
50.40			49 53.10		7.42			50 27.38		21.30			50 45.02		51 24.64
52.65			- 53.72		9.75			+ 49.10		41.90			+1 20.26		+ 40.34
54.89					11.97					42.87					
57.23	59.378				14.18	16.491				57.30	5.280				
59.46	59.38				16.55	16.49				5.35	5.28		51 58.4		32 42.5
1.51	59.39				18.83	16.48				13.20	5.29		0.8		43.4
3.85					21.50					20.70			8.1		56.4
6.07					23.25					23.50			14.0		3.9
53440 8.36			14842 23.47							58752 36.47			3424 23.12	829	11.7
53440			14842							4752			424		28.29
12.80					28.83					52.1			52 8.048		52 56.58
15.00	17.364				32.73	34424				52.90	7.518		- 2.77		- 57.30
17.44	17.36				37.46	34.42				7.55	7.52				
19.70	11879				36.75	15296				15.29	1059				
8682 21.88			49 53.10		17212 38.90			50 27.38		33759 22.65			53 33.4		54 13.1
8682	48 59.385		- 53.72		17212	51 16.485		+ 49.10		3759	52 5.285		40.2		12.4
													46.4		23.4
													53.5		
													2365 3.0		859
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1879 July 3

11 4.20		10 54.8		38 —
6.30	8.380	56.0		—
8.40	8.38	58.0		—
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4190 12.50		2907 2.0		—
4190		2907		
16.70		10 58.14	+8.21 14.19	127.06 5.88
18.82		+ 26.92	6.23 14.20	14.118 7.97
20.90			4.15 14.05	9.90
22.95	22813		2.06 14.06	12.00
25.00	25.04	11 56.9	−0.20 14.07	14.07
27.00	25.08	59.0	2.07 14.15	16.23
29.27		0.9	4.16 14.14	18.30
31.23		3.0	6.23 14.12	20.35
23132 33.45		3047 4.9	8.32 14.08	22.40
22532		47		
37.60		12 0.94	12.47 14.05	70.50 26.56
39.68	41780	− 35.88	14.54 14.11	14.10 28.65
41.75	41.78		16.63 14.17	30.80
43.87	50.16		18.70 14.10	32.80
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20890	11 25.340	12 0.94		15369
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19649 43.45		1494 33.3
19649		1494
47.60		9 29.88
49.77		+ 25.98
51.80		
53.80	5 5878	
55.88	55.88	10 24.6
57.95	55.85	26.4
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50290		1406
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23 34.95 35.10 — 39.30 39.90 — 44.40 44.85 — 48.70 49.40 — 53.10 53.80 — 22045 22355 — 2.05 2.70 — 6.37 6.80 — 10.70 11.24 — 14.90 15.43 — 19.30 19.85 — 23.70 24.00 — 28.60 28.70 — 32.50 32.90 — 36.30 36.70 — 17382 17835 — 44.84 45.36 — 49.62 50.25 — 54.35 54.85 — 58.75 59.10 — 2.90 3.50 — 27046 27306

23 26.6 24.9 — 44090 44710 23.4 — 44.09 44.71 31.8 — 851 — 23 28.36 — 979 27.5 — 979 — 25 19.58 — 54092 54612 — 54.09 54.61 — 15918 15932 — 24 19.200 25 19.58 — 24 19.740

56 36.60 — 55.27 — 2.10 — 4.88 — 31045 7.60 — 1045 — 13.24 — 15.90 — 18.60 — 21.40 — 24.30 — 26.88 — 29.80 — 32.50 — 21812 35.40 — 21812 — 40.80 — 43.60 — 46.22 — 49.01 — 23152 51.90 — 23152

2090 2.09 — 24236 — 24.23 — 24.19 — 46304 — 46.30 — 4839 — 57 24.210

56 46.7 — 48.8 — 52.1 — 54.7 — 2603 57.0 — 103 — 56 52.06 — 58 1.72 — + 32.15 — − 37.51 — 69.66 — 1.84298 — 1.04886 — 2.89184 — 1.83046 — 8.93862 — 4 57 43

0 53.71 — 55.82 — 58.00 — 0.30 — 29062 2.70 — 29062 — 7.00 — 9.37 — 11.50 — 13.85 — 16.00 — 18.24 — 20.48 — 22.81 — 14421 24.97 — 14421 — 27.30 — 34.60 — 34.03 — 36.05 — 16965 38.50 — 1965 1 16.020

58124 — 58.12 — 16023 — 1602 — 16.02 — 33930 — 3393 — 15205 — 2 0 28.47

0 46.9 — 48.4 — 50.4 — 52.2 — 2599 54.0 — 19 — 0 50.38 — + 2564 — 1 48.8 — 50.8 — 52.9 — 54.6 — 2638 56.7 — 138 — 1 52.26 — − 36.74 — 60.78 — 1.78376 — 1.14049 — 2.92425 — 1.87766 — 8.95341 — 5 7 59

M 41 29.85 — M 42 35.55 .45 10 9 — R 42 35.37 . 9 — R 42 35.57 .47 10 11 — M 42 35.35 . 11 — 42 35.46 — 65.61 .10

3 — M 43 2852 — M 44 36.20 — R 44 36.20 — 45 36.20 — 67.68

M 34 35.70 — M 35 51.10 — R 35 51.20 — 35 51.15 — 75.45

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198 S

β Urs. Min. L. C. — Sun C = 46.690

h m s 14 51 4, +105° 21' — 0.11297 — h m s 6 53 27, +22° 53' — 0.11297

1879 July 3 — July 4

57 46.38, 53.70, 1.80, 9.75, 30853 17.70, 853, 30.95, 40.70, 48.90, 312.35 56.00, 192.95 4.20, 11.60 — 1.706, 171 — 52.06 — 52 52.06

52 1.6, 8.0, 13.4, 20.7, 687 25.0, 687, 52 13.74, 53 4.7, 12.0, 17.2, 24.4, 891 30.8, 891, 53 17.82

52 13.74
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+ 38.32
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52 44.60, 46.88, 49.22, 51.40, 25175 53.65, 24575, 58.20, 0.40, 2.60, 4.84, 7.20, 9.33, 11.50, 13.90, 60401 16.04, 6401, 20.50, 22.85, 25.00, 27.30, 13532 29.67, 2532 — 49150, 50.35, 7.112, 7.11, 7.70, 25.064, 25.06, 13541 — 53 7.405

53 54.2, 56.0, 57.9, 59.5, 2899 2.3, 2899, 53 57.98, − 50.58 — 53 57.98, − 50.58

55 1.60, 3.80, 6.04, 8.25, 3039 10.70, 3039, 15.10, 17.43, 19.76, 21.95, 24.05, 26.30, 28.55, 30.70, 21684 33.00, 21684, 37.40, 39.80, 41.90, 44.30, 20987 46.47, 20987 — 6.078, 6.08, 24.093, 24.09, 24.02, 41.974, 41.97, 4805 — 55 24.055

54 17.4, 20.0, 22.2, 24.2, 1088 25.6, 1094, 54 21.88, +1 2.18 — 54 21.76, + 1 2.30

M 9 40.62
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1879 July 5

50 47.60		50 8.7	50 43.1	
53.40	3.374	13.8	48.2	
3.87	3.39	18.6	56.8	
11.00			4.5	
31695 19.00		411 2843	11.7	
1687		13.7	2843	
35.60			50 5686	
42.55			+1 874	
50.00				
55.00	5.667			
6.03	5.67	51 48.0	52 29.0	
13.40	5.52	55.5	34.3	
21.00		0.6	46.3	
28.45		6.6	51.0	
59100 36.60		2947 14.0	2159 55.3	
5100		47	2159	
52.00		52 094	52 4318	
59.50	7.660	+ 466	− 3758	
7.90	7.66			
15.90	191 05			
33830 23.0		53 32.8	54 8.4	
33830	52 5.595	41.3	13.3	
		47.7	19.2	
		53.9	23.8	
		2405 4.8	969 32.2	
			969	
		53 4810	54 1938	
		− 4250	−2 1378	

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11 4.50		10 54.3	
6.60	8658	56.2	
8.66	8.66	57.7	
10.68		59.8	
4329 12.85		2894 1.4	
4329		2894	
16.90		10 57.88	
19.00		+ 2945	
21.15			
23.30	25.316		
25.20	25.32	11 54.7	
27.47	25.34	56.7	
29.49		58.4	
31.55		0.4	
22784 33.78		2925 2.3	
22784		2925	
37.90		11 58.50	
39.97	42.020	− 3317	
42.00	42.02		
44.05	5068		
21010 46.18		10 57.88	
21010	11 25.330	11 58.50	
		+ 2745	
		− 33.17	
		60.62	
		1.78262	
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50 36.80		49 38.6	51 24.0	
44.00	51.980	45.2	30.2	
51.80	51.97	51.4	36.2	
0.00		57.1	43.0	
25985 8.05		1929	1848 51.4	
25990			1848	
23.62		4822	51 3696	
31.00			+ 1750	
38.88				
46.80	54.484			
54.35	54.48	52 20.3	53 27.4	
2.28	54.44	29.1	30.6	
10.05		33.8	38.3	
17.60		42.2	44.0	
49036 25.78		1762 50.0	1896 49.3	
49036		1762	1896	
41.55		52 3524	53 37.92	
49.55	56.910	− 4078	−1 4346	
52.40	56.91			
4.90	22888			
455 12.15			51 36.96	
28455	51 54.460	52 35.24	53 37.92	
		− 40.78	+ 17.50	
			−1 4346	
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M 50 52.52
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M 23 27.55
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M 10 39.42
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1879 July 5

56 24.90		56 36.7
28.28	31866	37.2
31.85	31.87	40.8
35.40		43.4
15933 38.80		2052 46.0
15933		2052.
42.77		56 41.04
49.25		+ 18.21
52.35		
55.70	59247	
57.15	59.25	57 44.3
2.60	59.25	46.6
6.00		49.4
9.50		53.5
53322 12.90		2517 57.9
53322		2517
16.80		57 50.34
23.27	26628	− 51.09
26.50	2663	
30.07	11850	
13314 33.57		56 41.04
13314	56 59.250	57 50.34
		+ 18.21
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July 6

1 12.75	
15.20	
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M 27	59.05.			
M 28	51.85.	43	08	6
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July 6

See Sheet.

19	23.65		19	29.0	56	4.48		56	1.3		
	25.05	27860		30.8		6.90	88.78		9.2		
	27.80	27.86		32.7		8.85	8.88		11.3		
	30.00			34.0		10.96			12.7		
13930	32.00		1622	35.7	4439	13.00		549	14.4		
	13930			1622		4439			549		
	36.15		19	3244		17.07		56	1098		
	38.36		+	1220		19.10		+	14.30		
	40.40					21.00	25211				
	42.55	44.632				23.17	~~25.89~~				
	44.60	44.63	20	12.2		25.20	25.21	56	52.0		
	46.80	44.64		14.1		27.25	25.34		53.1		
	48.85			15.5		29.38			55.1		
	50.95			17.3		31.40			57.3		
40169	53.00		785	19.4	22690	33.50		2783	59.7		
	40169			785		22690			283		
	57.20		20	15.70		37.60		56	5566		
	59.30	1422	−	31.06		39.80	41796	−	30.38		
	1.40	1.42				41.83	41.79				
	3.47	8928				43.85	5067				
30711	5.64		19	32.40	20898	45.90		56	10.00		
	711	19 44.635	20	15.70		20898	56 25.275	56	55.66		
			+	12.24				+	14.28		
			−	31.06				−	30.38		
				43.30					44.66		

18 18 3.1.94

M	0	17.12	M	20	59.07	M	50	34.92			
M	1	12.78	M	21	57.75	M	50	50.10			
						M	51	0.95			
						M	51	19.78			
						M	51	38.25			
						M	51	54.25			
						M	52	3.70			
								88.78			

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1879 July 6

11 9.90		11 2.4	
12.30	14.700	4.0	
14.70	14.70	6.0	6.29
17.00		8.2	
7350 12.60		310 10.4	
7350		310	
24.57		11 6.20	
27.20		+ 28.29	
29.57			
32.50	34450		
34.50	34.45	12 12.4	
37.07	34.53	14.8	
39.47		17.0	
41.78		19.0	
31005 44.30		—	
31005			
49.57			
51.77	54360		
54.40	54.36		
56.84	6906		
27180 59.22		11 6.20	
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1879 July 8

22 37.00		22 46.5	
41.47	45.710	50.7	
45.80	45.71	54.7	
50.17		59.1	
22855 54.28		2716 2.0	
22855		2716	
3.00		22 5.432	
7.49		+ 26.25	
11.70			
16.23	20.507		
20.39	20.51	24 5.5	
24.83	20.63	8.6	
29.37		12.3	
33.60		15.9	
18456 37.75		625 20.3	
18456		625	
46.68		24 1.250	
51.20	55.552	− 51.93	
55.30	55.55		
0.00	16126		
27776 4.38		22 54.12	
27776	23 20.5%	24 12.50	
		+ 26.45	
		− 51.93	
		76.38	

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α Herculis

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9 43.85		9 36.3	
46.04	48176	38.0	
48.25	48.18	40.0	
50.23		41.4	
24088 52.45		1997 44.0	
24088		1997	
56.61		9 39.64	
58.85		+ 25.26	
1.00			
3.00	5.187		
5.21	5.19	10 32.4	
7.30	5.21	34.4	
9.40		36.2	
11.57		38.0	
58668 13.75		1816 40.6	
4668		1816	
18.00		10 36.32	
20.20	22238	− 31.12	
22.32	22.24		
2437	130.42		
1119 26.50		9 39.94	
1119	10 5.200	10 36.33	
		+ 25.26	
		− 31.13	
		56.36	

17 9 11.40

1.75120
1.16197
2.91317
1.85065
8.93748
4 56 57

M 42 6.65.
M 44 22.27 44 17 20
R 44 22.42. 5
R 44 22.57 50 07 10
M 44 22.60. 13
44 22.47 12

M 42 27.92
M 43 15.92
R 43 15.90.
43 15.91

M 57 0.55.
M 58 11.17. 33 16 28
R 58 11.55. 10
R 58 11.62 58 04 17
M 58 11.48. 3
58 11.45
7090 13

14 31 457

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32

γ Androm.

h m s
1 56 28
+41 45

1.17609 0.11297
9.87277
2.04886

56 37.40 | 56 47.4
1.00 3816 | 48.8
3.00 3.82 | 57.9
6.53 | 34.3
31908 9.35 | 2603 56.9
1908 | 2603
14.90 | 56 52.06
17.66
20.39
23.10 25.903
25.50 25.919 | 55 0.6
28.72 | 2.8
31.40 | 5.0
34.20 | 7.6
23313 36.96 | 261 10.1
42.58 | 261
45.28 48.036 | 58 5.22
47.57 48.03
50.20
24018 53.35 | 56 52.06
24018 57 25.919 | 58 5.22

33

α Arietis

h m s
2 0 21
+22 53

0.11297

0 55.29 | 1 11.0
57.65 59848 | 12.4
59.85 59.85 | 14.2
2.05 | 16.3
29924 4.40 | 722 18.3
29924 | 222
8.90 | 1 1444
11.00 10.70 | + 332
13.28
15.60 17.750
17.80 17.75 | 1 46.9
20.60 17.76 | 47.0
22.27 | 51.1
24.50 | 53.0
15975 26.70 | 2552 55.2
15975 | 2552
32.00 | 1 5104
33.50 35680 | − 3828
35.75 35.68
37.85 15553
17840 40.20 | 1 14.044
17840 1 17.755 | 1 51.044
+ 3.72
− 33.28
37.00

2 0 28.58

198

β Cas. Phi. Lo.

h m s
14 51 4
+105 21

0.11297

51 2.0 | 49 32.2 | 50 26.7
31.9 | 40.4 | 33.0
38.5 5513 | 45.4 | 38.5
47.3 ~~9424~~ | 49.9 | 45.8
55.1 | 2257 57.8 | 1949 50.9
2.8 | 2257 | 1949
11.0 | 49 45.14 | 50 38.98
13.5 | +2 9.99 | +1 16.15
4962 26.1
4962 51 55.13
51 9.9 | 52 8.5
16.8 | 16.3
21.8 | 25.4
27.0 | 30.0
1099 34.4 | 1177 37.5
1099 | 1177
51 21.98 | 52 2.354
+ 33.15 | − 28.41
53 0.8 | 53 29.8
7.0 | 33.8
11.6 | 41.5
19.2 | 47.4
643 26.2 | 2042 52.7
643 | 2042
53 12.86 | 53 40.84
−1 17.73 | −1 45.71

M 44 13.90.
M 45 24.62.
R 45 24.62.

45 24.62
70.72

M 35 49.07.
M 36 32.65.

22 53 33.3

M 11 24.72.
M 11 4.70.
M 11 18.90.
M 11 27.65.
M 11 10.75.
M 11 1.95.

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73

x Sonnè

h m s
4 28 57
+16 16

1879 July 8

29 33.80
35.30 37380
37.38 37.38
39.42
18690 41.88
18690
46.10
48.05
50.20
52.35 54500
54.87 54.50
56.65 54.50
58.78
0.90
49050 3.00
49050
1.30
1.55 11612
1165 11.11 11.61
1380 13.90 10895
5506 16.81
5806 29 54.345 500
+.022
54.478
54.522
4 29 8.47

29 27.5
29.8
30.6
32.5
1543 34.9
1543
29 30.86
+ 23.66
30 23.6
25.4
27.5
29.5
1375 31.5
1375
30 27.50
- 32.98
29 30.86
30 27.50
+ 23.48
- 33.16
56.64

M 12 48.05.
M 12 58.00.
R 12 57.80.

16 16 0.8

0.11297

8 12.60
15.62 18524
18.50 18.52
21.50
9262 24.40
9262
30.30
33.35
36.30
39.25 42256
42.60 42.25
45.34 42.19
48.23
51.20
38030 54.28
38030
0.00
2.94 5868
5.80 5.86
8.80 8438
2934 11.80
2934 8 42.220

5 7 46.14

M 36 53.87.
M 38 5.97.
R 38 5.80.

38 588
70.01

45 52 445

86

x Antiope

h m s
5 7 48.
+15 52

July 8

8 3.9
7.2
10.2
12.3
488 15.2
488
8 9.76
+ 3246
9 22.6
25.3
27.5
30.0
1392 32.8
1392
9 27.84
- 4562
8 9.76
9 27.81
+ 32.46
- 45.62
78.08
1.89254
1.03205
2.92459
1.84516
8.92057
4 45 39

1.17609 0.11297
9.85596
1.03205

?

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S

Sun c=46,690

h m s
7 18 58
+22° 22'

July 9

0.11297

13 18.20		14 28.8	15 35.00		15 0.4	
20.53	22850	30.9	37.10	39380	1.7	
22.80	22.85	32.7	39.40	39.38	2.9	
25.20		34.5	41.60		4.8	
11425 27.50		1632 36.3	19690 43.90		163 6.5	
11425		1632	19690		163	
31.84		14 3264	48.27		15 326	
34.50		− 51.88	50.60		+ 54.04	
36.25			53.00			
38.58	40,761		55.00	57297		
40.70	40.76		57.30	57.30		
43.00	40.76		59.50	57.30		
45.20			1.70			
4750			4.00			
36685 48.78			51567 6.30			
36685			51567			
54.20			10.70			
56.50	58660		13.00	15234		
58.70	58.66		15.20	15.23		
1.90	8151		17.37	11461		
29330 3.00		14 3264	7617 19.90		15 326	
29330	13 40,760	− 51.88	2617	15 57.300	+ 54.04	

M 57 13.70 .

M 23 27.30 .

120

λ Can. Min.

h m s
7 22 58
+5° 32'

33 32.30		33 25.6	
34.38	36436	27.3	
36.42	36.441	29.1	
38.48		31.0	
18218 40.60		1459 32.9	
18218		1459	
44.70		33 2918	
46.80		+ 23.79	
48.80			
50.90	52944		
53.00	52.94	34 23.5	
55.00	53.00	25.2	
57.00		27.0	
59.00		29.3	
47650 1.30		1363 31.3	
47650		1363	
3.35		34 2726	
7.47	9.564	− 34.29	
9.30	9.56		
11.60	10600		
4782 13.70		33 29.18	
4782	33 52.970	34 27.26	
		+ 23.79	
		− 34.29	
		58.08	

7 82 5984

1.76403
1.17406
2.93809
1.86094
8.92285
4479

M 56 31.22 .
M 57 43.90 .
R 57 43.75 .

57 43.82
72.60

5 32 09

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587 | 183 | 198

x Virginis | τ Virginis | β Urs. Min.

h m s
13 18 49
−10 32

0.11297

h m s
13 55 29
° ′
+2 8

0.11297

1.17609
9.99970
1.17579

h m s
14 51 4
° ′
+74 39

0.11297

1879 July 9

x Virginis

	19 24.48	
	26.50	28682
	28.70	28.68
	30.83	
14341	32.90	
	14341	
	37.20	
	39.20	
	41.33	
	43.40	45.526
	45.47	45.52
	47.65	45.48
	49.70	
	51.88	
40973	53.90	
	40973	
	58.16	
	0.20	1266
	2.27	2.27
	4.30	9095
31133	6.40	
	1133	19 45.500

19 18.8
20.8
622 22.6
19 20.73
+ 44.77

13 18 57.91

M 0 4.12

10 32 3.4

τ Virginis

	56 5.40	
	7.65	9666
	9.65	9.67
	11.80	
4833	13.83	
	4833	
	17.90	
	19.95	
	21.95	
	24.00	26109
	26.05	26.11
	28.15	26.18
	30.18	
	32.30	
23498	34.50	
	23498	
	38.55	
	40.70	42690
	42.70	42.69
	44.70	5236
21345	46.88	
	21345	56 26.145

	56 0.0	
	1.7	3420
	3.5	3.42
	4.9	
171	7.0	
	171	
	56 3.420	
	+ 22.72	
	56 57.9	
	59.5	1.340
	1.3	1.34
	3.2	
3067	4.8	
	67	
	57 1.340	
	−.35.20	

56 3.42
57 1.34
+ 22.72
− 35.20
57.92
1.76283
1.17579
2.93862
1.87691
8.93829
4 57 30

M 20 50.52
M 22 5.65
? 22 6.02

22 5.84
75.32

β Urs. Min.

	51 35.7	
	43.2	
	51.3	
	58.9	6.81
	6.6	
	14.8	
	22.5	
	30.3	
6013	38.0	
	613	
	6	52 6.81

10 51 7.18

	50 29.5		51 11.5
	34.0		17.4
	40.1		24.4
	47.1		29.5
2060	53.3	1203	37.5
	2060		1203
	50 4120		51 2406
	+1 25.61		+ 42.75
	52 1.2		52 52.9
	5.3		1.6
	13.8		7.6
	21.8		15.0
686	27.5	3425	25.4
	686		425
	52 1372		53 8.50
	− 6.91		−1 1.69
	53 41.8		54 12.0
	50.4		15.5
	56.2		19.2
	0.6		24.4
2728	3.8		32.0
	2728		38.0
	53 5456		1411
	−1 47.75		54 ~~2822~~ 2352
			−2 16.71

M 50 48.97
M 51 1.67
M 51 18.85
M 51 37.12
M 51 52.32
M 51 0.85

74 39 1.1

M
M
R
R
M

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201 S Bootis

h m s
15 10 37
0 ′ ″
+88 46

0.11297

11 ~~10.47~~		11 23.0	38 55.33		38 52.0	8 37.25		8 32.7			
13.87		25.0	57.47	59.532	54.0	39.35		33.3	37.10		
15.60	15.526	27.0	59.50	59.53	55.9	~~41.40~~	41.360	111.3	40.3		
18.05		29.0	1.66		57.9	43.30					
77.63	20.60	1354 31.4	29766	3.70	2798 0.0	206.80	45.50	8	37.10		
		~~1354~~	~~29766~~		~~2798~~			+	20.52		
25.60		11 27.08	7.75		38 55.96	~~49.74~~					
28.50			9.75		+ 2.04	51.70					
30.40			11.85			53.82					
33.00	35.431		13.88	16.036		55.78					
35.40	35.43	12 9.3	16.00	16.03	39 43.8	57.90	57.82	9	26.7		
38.60	35.40	11.0	18.12	16.07	46.0	57.80			28.9		
40.35		13.4	20.27		139.0 49.2	1.95	57.62		31.4		
42.80		15.5	22.30			4.05			33.4		
31888	45.33	673 18.2	14432	24.40	39 46.33	520.74	6.70	155.9	35.5		
~~31888~~		~~673~~	~~14432~~								
30.23		12 13.46	28.60			10.30		9	31.18		
52.68	55.202		30.60	32.610		12.30	14.430	−	33.56		
53.20	56.20		32.33	32.61		14.45	14.43				
57.70			34.53	15.214		16.50					
27601	0.20	11 35.40	11 27.08	16305	36.75	38 55.96	7215	18.60			
~~27601~~			12 13.46	~~16305~~		39 16.005	+ 2.004	~~7215~~	8 57.62		
						− 30.32					

15 38 21.89

M	43	19.32									
M	44	19.15	25 10 22								
R	44	19.78	31								
R	44	19.60	69 09 13								
M	44	19.35	12								
	44	19.47	22								

M	40	20.32									
M	41	27.35	50 15 29								
R	41	27.92	28								
R	41	27.62	77 15 2								
M	41	27.65	1								
		27.64									
		77.32	.15								

6 48 19.4

M	51	24.20									
M	52	35.69	58 05 13								
R	52	35.52	2								
R	52	35.35	44 09 15								
M	52	35.52	2								
		35.50									
		71.30	.08								

212 α Serpentis

h m s
15 38 18
0 ′ ″
+6 48

0.11297

1.17609
9.99693
1.17302

222 S Ophiuchi

h m s
16 8 0
0 ′ ″
−3 23

0.11297

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226 — η Draconis

h m s
16 22 21
° ′
+61 47

1879 July 9

	22			22			
	37.45	37.90		21.8 20.8		25 —	
	41.90	42.40	46270 46774	24.0		—	
	46.24	46.74	46.27 46.77	27.4		—	
23135	50.61	51.20		30.9	45.55 59.30 118.33	43.85	
23387	55.15	55.63		1373 34.2	13.33 59.03 59.163	45.70	
	23135	23387		1373			
	3.58	4.28		22 27.46	8.89 59.06 531.50	50.17	
	8.30	8.90		+ 53.65	6.66 59.16 59.055	52.50	
	12.30	12.90			4.44 59.04	54.60	
	16.88	17.58	21074 2171	24	2.25 59.05	56.80	59.052
	21.17	21.75	21.07 21.71	27.0 25.4	0.00 59.00	59.00	59.05
	25.48	26.00	21.15 21.72	29.9	2.22 59.18	1.40	
	29.55	30.16		33.6	4.44 59.06	3.50	
18967	33.89	34.61		38.0	6.66 59.04	5.70	
19543	38.52	39.25		1685 41.6	8.89 58.91 53147	7.80	
	18967	19543		1685		53147	
	47.10	47.77		24 33.70	13.33 58.97 294.86	12.30	
	51.76	52.30	56042 56674	− 1 11.98	15.56 58.94 58.972	14.50	
	56.07	56.70	56.04 56.67		17.78 59.00	16.78	16.76
28021	0.55	1.10	16231 16344		19.96 59.04	19.00	
28337	4.80	5.50		22 27.46	22.29 58.91 8378	21.20	
	28021	28337	23 21.110	24 33.70			
			23 21.715	+ 53.65			
				− 1 11.98	59.063		
				125.63	59.083		
				2.09899			
				0.85077			
				2.94976			
				1.88491			
				8.93515			
				4 55 22			

1.17609
9.67468
0.85077

0.11297

M 42 10.55
M 43 27.27

43 27.27
76.72

228 — β Herculis

h m s
16 25 1
° ′
+21 45

0.11297

26 1.6		
3.3		
4.7		
7.3		
259 9.0		
259		
26 5.18		
− 6.12		
26 23.7		
27.5		
29.5		
31.3		
1475 33.5		
1475		
26 29.50		
− 30.44		
26 5.18		
25 59.08	26 29.50	

M 44 18.12
M 44 47.50
R 44 47.50
R 44 47.85

44 47.62

57 — δ Persei

h m s
3 34 19
° ′
+47 24

0.11297

1.17609
9.83051
1.00660

34 47.00		34 38.0	
50.00	52970	41.3	
52.90	5297	44.0	
55.95		46.2	
26485 59.00		2186 49.1	
1485		186	
5.10		34 43.72	
8.00		+ 33.58	
11.20			
14.20	17287		
17.30	17.29	35 57.0	
20.25	17.31	0.2	
23.45		3.0	
26.48		5.3	
15558 29.60		3132 7.7	
15558		132	
35.70		36 26.4	
38.48	41664	− 45.34	
41.60	4166		
44.70	15463		
20832 47.84		34 43.72	
20832	35 17.300	36 26.4	
		+ 33.58	
		− 45.34	
		78.92	
		1.89719	
		1.00660	
		2.90379	
		1.83582	
		8.93203	
		4 53 15	

M 5 21.15
M 6 29.65 78 13 2
R 6 29.67 0
R 6 29.47 57 10 20
M 6 29.90 23

6 29.67 11
68.52

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61 η Tauri

h m s
3 40 18
° ′
+23 44

0.11297

40 32.40
54.47 56860
56.83 56.86
59.00
28430 1.40
28430
5.97
8.25
10.50
12.65 14919
14.88 1492
17.00 1486
19.37
21.70
13427 23.95
13427
28.45
30.65 32870
32.80 3287
35.00 14973
16435 37.45
16435 41 14.890

40 44.6
46.6
48.4
190.1 50.5
40 47.52
+27.37

41 48.4
50.0
52.0
54.2
2611 56.5
2611
41 52.22
− 37.33

41 52.22
− 37.33
7.33

M 45 0.32
M 45 16.02 .13 .11 2
R 45 15.70 30
R 45 16.02 .86 .16 2
M 45 16.25 25
16.00
.15

63 ζ Persei

h m s
3 46 32
° ′
+31 31

1.17609
9.93069
1.10678

47 5.15
7.47 9.914
9.95 9.91
12.30
4957 14.70
4957
19.60
21.95
24.36
26.80 29.218
29.16 29.22
31.60 29.26
34.00
36.49
26296 39.00
26296
43.85
46.20 48614
48.37 48.61
50.95 5852
24307 53.50
24307 47 29.240

46 54.7
57.1
59.4
1.5
2963 3.6
2963
46 59.26
+ 29.98

47 59.3
1.6
3.8
6.2
3189 8.0
189
48 3.78
− 34.54

46 59.26
48 3.78
+ 29.98
− 34.54
64.52
1.80969
1.10678
2.91647
1.85437
8.93790
4 57 14

M 57 32.60
M 58 44.07 .21 14 4
R 58 44.22 11
R 58 43.82 1.02 .20 29
M 58 44.35 24
58 44.18
71.57 .17

73 α Tauri

h m s
4 28 59
° ′
+16 16

0.11297

1.17609
9.98226
1.15835

29 34.05
36.20 38330
38.30 3833
40.50
19165 42.60
19165
47.00
49.00
51.27
53.37 55.524
55.50 5554
57.60 55.52
59.90
1.88
49972 4.20
49972
8.40
10.60 12720
12.75 12.72
14.85 11105
6360 17.00
6360 29 55.530

4 29 05.3

29 24.0
25.7
27.9
30.0
1396 32.0
1396
29 27.92
+ 27.61

30 23.4
25.3
27.0
29.0
1360 31.3
1360
30 27.20
− 31.67

29 27.92
30 27.20
+ 27.61
− 31.67
59.28
1.77291
1.15835
2.93126
1.86911
8.93785
4 57 12

M 12 43.42
M 13 57.40

13 57.40
73.98

16 16 2.0

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79

ι Aurigae

h m s
4 49 7.
+32 58

1.17609 0.11297
9.92376
1.19985

1879 July 9

87

β Orionis

h m s
5 8 43.
−8 21

1.17609 0.11297
9.99537
1.17146

102

α Orionis

h m s
5 48 37.
+7 23

1.17609 0.11297
9.99638
1.17247

49 39.87	+24.60	4.47	49 29.0			9 18.20			9 11.0			49 12.75			49 5.4				
42.30	4.47	4.43	22.37	31.2		20.40	22.426		12.6			14.80	16.944						
44.70	42.79	4.39	4.474	33.3		22.38	22.42		14.0			17.00	16.94						
47.30	17.22	4.52		34.8		24.50			15.4			19.00							
22397 49.80	14.76	4.56	1658	37.4		11213 26.65			705 17.5			8472 21.17							
22 397				1658		11213			705			8472							
54.33	9.83	4.41	49	33.16		30.30			9 14.10			25.30							
58.90	7.37	4.27	39.56			32.85			+ 25.00			27.25							
52.46	4.91	4.37	4.395			35.60						29.47							
2.00	2.51	4.43				36.70	39.098					31.55	33.601						
4.40	−0.02 2.40	4.40	50	37.4		39.00	39.00		10 6.3			33.60	33.60						
6.30	2.45	4.38		39.3		41.20	39.11		8.5			36.58	33.58						
9.20	4.92	4.28		41.5		43.30			10.5			37.70							
11.87	7.37	4.50		43.4		45.35			37.5 12.2			39.78							
57961 14.40	9.83	4.55	206.6	43.0		35188 47.50						30341 41.88							
3961			50	41.52		35188			10 9.37			30241							
17.20	14.76	4.44	13.13	−37.11		51.70			− 30.26			46.10							
21.60	17.22	4.38	4.376			53.70	55808					48.18	50230						
—						55.77	55.81					50.22	50.23						
—						57.87	7823					52.30	6717						
28.88	24.67	4.31	49	33.16		27904 0.00			9 14.10			25115 54.35							
	50 4.41		+ 3125			27904			9 39.105	10 9.37		115	49 33.690						
			− 37.11							+ 25.00		5223							
	4.411		68.36							− 30.26									
	4.412									55.26									

5 48 38.36

M	30	36.05.			M	18	28.17.					M	35	27.70.					M
M	31	50.55.			M	19	40.45.	19	26	39		M	36	41.67.					M
R	31	50.47.			R	19	39.95.			11		K	36	41.25.					
R	31	50.60.			R	19	39.92.	94	02	14		R	36	41.17.					
		50.54			M	19	39.90.			16									
		7449					40.06						36	41.36					
							71.59			20									

7 23 1.2

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5

Sun c = 46,690

h m s
7 18 4
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0.11297

1879 July 10

17 24.90		18 40.2	19 3.6		
27.60	29.320	41.7	5.5		
29.25	29.32	44.2	7.8		
31.65		46.2	9.9		
14660 33.80		2203 48.0	37.9 11.1		
14660		203	19 7.58		
33.00		18 44.06			
40.60					
42.80					
45.00	47.137				
47.10	47.14				
49.38	47.16				
51.95					
53.80					
42423 56.00					
42423					
0.70					
2.80	5.000				
5.00	5.00				
7.00	9.432				
2500 9.50		18 44.06			
2500					

M 58 43.62 ·
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174

S Virginis

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1.17609 0.11297
9.99891
1.17500

50 7.48			50 2.8	
9.52	11586		4.5	
11.60	11.59		6.0	
13.65			8.0	
5793 15.68			313 10.0	
5793			313	
17.70			50 6.26	
21.00			+ 21.78	
23.83				
24.80	28.029			
28.05	28.03		50 5.67	
30.20	28.06		58.2	
32.18			0.2	
34.20			2.0	
25226 36.30			3009 3.8	
25226			09	
40.46			51 0.18	
42.46	44.534		— 32.14	
44.55	44.53			
46.55	5612			
22267 48.65			50 6.26	
22267	50 28.045		51 0.18	
			+ 21.78	
			- 32.14	
			53.92	
			1.73175	
			1.17500	
			2.90675	
			1.84671	
			8.93996	
			4 58.38	

M 25 27.02 ·
M 26 37.55 51 04 27
R 26 37.25 · 3
R 26 36.85 105 20 43
M 26 37.47 · 19
26 37.28
7026 .23

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176 — ε Virginis — h m s 12 56 9 — ° ′ +11 37

587 — α Virginis — h m s 13 18 49 — ° ′ −10 32

198 — β Urs. Min. — h m s 14 51 4 — ° ′ +74 39

1.17609 0.11297
9.99101
1.16710

1.17609 0.11297

1879 July 10

56 45.97 +21.07 7.04 56 38.4 | 19 25.65 | 20 14.3 | 51 36.8 | 50 14.0 50 59.0
48.00 50.75 6.95 34.69 40.0 | 27.68 29.818 | 16.3 | 44.5 | 18.7 6.3
50.15 6.63 6.938 41.9 | 29.80 29.82 | 19.6 | 52.0 | 24.9 12.7
52.30 14.76 7.06 43.6 | 31.90 | 21.6 | 0.1 | 30.9 18.5
25077 54.35 12.64 6.99 45.5 | 14909 34.06 | 945 22.7 | 7.9 | 1278 37.3 3620 25.5
077 2568 47.4 | 14909 | 945 | 15.8 | 1278 620
56 4280 | 38.25 | 20 1890 | 23.2 | 50 25.56 51 1240
0.60 6.32 6.92 49.38 2420 | 40.28 | − 3232 | 31.4 | +1 4230 + 5546
2.90 4.21 7.11 7.0544 | 42.35 | | 39.0
4.95 2.13 7.08 | 44.50 46594 | | 707
7.20 −0.00 7.20 57 38.5 | 46.60 46.59 | | 52 7.86 | 51 51.1 52 51.7
9.12 2.10 7.02 40.5 | 48.72 46.57 | | | 57.9 56.3
11.23 4.19 7.04 121.2 42.2 | 50.70 | | | 4.2 4.9
52.95 | 11.1 12.2
15.45 8.99 7.01 57 40.40 | 41935 55.00 | 2628 18.5 3240 19.4
— 33.40 | 41935 | 228 240
19.70 12.64 7.06 27.97 | 59.18 | 52 456 53 480
6.992 | 1.25 3324 | + 3.30 − 5694
23.90 16.85 7.05 | 3.29 3.32
25.95 18.96 6.99 | 5.40 9314
28.00 21.13 6.87 | 31662 7.50 | 20 1890 | 14 51 7.16 | 53 39.9 54 16.3
1662 19 46.580 + 3232 | 48.4 23.6
6.994 | 55.9 31.0
7.002 | 2.7 37.3
2782 11.3 1531 44.9
13 18 51.90 | 2782 1531
53 5564 54 3062
−1 4778 −2 2276

M 52 18.22 · | M 0 26.90 · | M 50 39.10 ·
M 53 29.50 · | M 1 15.78 · | M 50 56.97 ·
R 53 29.82 · | | M 51 15.15 ·
R 53 29.62 · | | M 51 34.72 ·
| | M 51 51.15 ·
53 29.65 | 10 32 34 | M 52 1.37 ·
70.43

74 39 12

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32

γ Andromedae

h m s
1 36 28
+41° 45'

1.17609 0.11297
9.87277
1.04886

57 0.40		56 47.6		0 57.50		1 1.6	
3.30	6028	49.1		59.75	2.042	3.2	
6.07	6.03	52.3		2.02	2.04	5.0	
8.80		54.9		4.40		7.0	
3014 11.51		2617 57.2		31021 6.56		258 9.0	
3014		2617		1021		258	
17.00		56 52.74		11.00		1 5.16	
18.25		+ 35.82		13.30		+ 14.79	
22.60				15.47			
25.40	28167			17.70	19.952		
28.20	28.17	58 2.0		19.95	19.95	1 46.9	
30.60	28.16	4.5		22.05	19.95	48.5	
33.70		6.5		24.30		50.3	
36.45		8.5		26.60		52.0	
25350 39.30		345 12.0		17957 29.00		2516 53.9	
25350		345		17957		2516	
44.70		58 6.90		32.38		1 50.32	
47.60	50,294	− 38.74		35.62	37864	− 30.37	
50.30	50.29			37.87	37.86		
53.00	56.32			40.00	15990		
25147 55.87		56 52.34		18932 42.35		1 5.16	
147	57 28.165	58 6.90		18932	1 19950	1 50.32	
		+ 35.82				+ 14.79	
		− 38.74				− 30.37	
		74.56				45.16	
		1.87251		2 0 2872		1.65475	
		1.84886					
		2.92137					
		1.85709					
		8.93572					
		4 55 45					

M 44 11.20 .
M 45 23.15 .
R 45 23.17 .

45 23.16
71.96

33

ζ Arietis

h m s
2 0 21
+22° 53'

M 35 35.25 .
M 36 28.65 .

22 58 88.7

57

ρ Persei

h m s
3 84 19
+47° 24'

1.17609 0.11297
9.86694 9.83051
1.04305 1.00660

34 47.95		34 34.0			
51.00	54020	36.7			
54.05	54.02	39.2			
57.02		41.9			
27010 0.08		1961 44.8			
27010		1961			
6.28		34 39.22			
9.30		+ 39.24			
12.35					
15.38	18486				
18.47	18.48	35 33.50			
21.43	18.45	36.8			
24.60		40.0			
27.68		43.6			
16637 30.38		2996 5.2			
16637		2996			
36.33		35 59.92			
39.85	42890	− 41.46			
42.90	42.89				
45.90	15691				
21445 48.85		34 39.22			
21445	35 18.465	35 59.92			
		+ 39.24			
		− 41.46			
		80.70			
		1.90687			
		1.04305	1.00660		
		2.94990	2.91347		
		1.85224	1.85224		
		8.90234	8.93877		
			4 5749		

M 5 15.37 .
M 6 26.52 .
M 6 26.55 .

6 26.53
71.16

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61

η Tauri

h m s
3 40 18
+ 23° 44'

1.17609 0.11297
9.96140
1.13749

1877 July 10

40 53.50		40 58.9
55.31	58.030	1.2
56.17	58.03	3.5
0.30		5.1
29016 2.53		3162 7.5
29015		162
7.00		41 32.4
9.27		+ 12.78
11.50		
13.80	16020	
16.17	16.02	41 52.5
18.39	16.02	54.0
20.55		56.0
22.80		58.0
14418 25.00		2805 0.0
14418		2805
27.60		41 56.10
32.80	34016	− 40.08
34.00	34.01	
36.20	15204	
17008 38.48		41 32.4
17008	41 16.020	41 56.10
		+ 12.78
		− 40.08
		52.86
		1.72313
		1.13749
		2.86062
		1.80161
		8.94099
		4 59.20

63

ξ Persei

h m s
2 46 32
+ 31° 31'

1.17609 0.11297
9.93069
1.10678

47 6.20		46 54.0
1.67	11050	55.7
11.00	11.05	57.3
13.43		58.9
5525 15.90		2873 1.4
5525		2873
20.73		46 54.46
23.24		+ 32.93
25.60		
27.95	30403	
30.40	30.40	48 4.0
32.86	30.38	6.1
35.20		8.3
37.60		10.3
27363 40.05		415 12.8
27363		415
45.00		48 8.30
47.25	49724	− 37.91
49.65	49.72	
52.07	66.77	
24862 54.65		46 57.46
24862	47 30.390	48 8.30
		+ 32.93
		− 37.91
		70.84
		1.85028
		1.10678
		2.95706
		1.89459
		8.93753
		4 56.59

73

χ Tauri

h m s
4 28 57
+ 16° 16'

1.17609 0.11297
9.98226
1.15835

1877 July 10

29 35.30		29 38.9
37.40	39560	30.2
39.50	39.56	32.0
41.70		33.3
19780 43.90		1601 35.7
19780		1601
48.03		29 32.02
50.22		+ 24.70
52.35		
54.60	56692	
56.70	56.69	30 35.4
58.86	56.74	27.0
1.00		28.6
3.12		30.4
51023 5.35		1443 32.9
51023		1443
9.70		30 28.86
11.90	13920	− 32.14
14.00	13.92	
16.00	11348	
6960 18.00		29 32.02
6960	29 56.715	30 28.86
		+ 24.70
		− 32.14
		56.84
4 29 0.63		1.75465
		1.15835
		2.91300
		1.84547
		8.93247
		4 53.33

M 45 15.82		
M 46 18.95	1.08 13 20	
R 46 19.25	10	
R 46 19.17	21 04 2	
M 46 19.22	7	
46 19.15		
63.33	10	

M 57 29.30		
M 58 47.70		
R 58 47.80		
58 47.75		
78.45		

M 12 47.32		
M 13 57.50	47 03 12	
R 13 57.42	4	
R 13 57.20	31 11 18	
M 13 57.45	7	
13 57.38		
70.06	.10	

16 16 21

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1879phae.proj.1504

	S						S					
	Sun	c = 46.690					Sun					
	h m s 7 22 8		0.11297	0.11297			h m s 9 27 57			0.15854	0.15854	
	+22° 7'						+14° 58'					
1879	July 11					1879	Aug 12					
21 30.82		22 41.0	23 47.10		23 5.8		27 —		28 51.3	29 —		29 29.9
33.00	35.264	42.4	49.18	51.502	7.7		—		52.9	—		32.0
35.25	3526	44.5	51.48	51.50	9.2		—		54.7	—		33.4
37.45		46.0	53.75		10.5		—		56.0	—		34.8
17632 39.80		2221 45.2	25751 56.00		451 11.9		—		2731 58.2	—		1661 36.0
2632		221	751		451				231			1661
44.35		22 4442	0.47		23 9.02		—		+8.54 28 5462 52.94	117.97 4.80		29 3322
46.55		− 5131	2.80		+1 0.39	+6.41 1.91	15.21 55.50		6.41 13.11	13.108 6.70		~~20.06~~
48.85			5.00			4.27 1.97	1.901 57.70		4.27 12.97	8.70		+ 39.94
51.00	53178		7.30	9.439		2.11 1.96	59.85		2.11 13.06	10.95	13117	
53.16	53.18		9.45	9.44		−0.00 1.98	1.98		−0.00 13.00	13.00	13.12	
55.40	53.04		11.70	9.38		2.13 1.87	4.00		2.13 13.12	15.25		
57.57			13.98			4.32 1.88	6.20		4.32 13.05	17.37		
59.78			16.00			6.41 1.79	8.20		6.41 13.02	19.43		
47860 1.95			8495 18.25			8.55 1.85	10.40		8.55 13.30	11805 21.85		
47860			8495							11805		
6.50			22.65			12.81 1.79	9.19 14.60		12.81 13.39	66.20 26.20		
8.60	10.830		25.00	27.250		14.95 1.90	1.838 16.85	18.940	14.95 13.20	13.24 28.15	30.342	
10.77	1083		27.30	27.25		17.09 1.81	18.90	18.94	17.09 13.29	30.38	3034	
13.00	10609		29.50	13875		19.23 1.77	21.00		19.23 13.17	32.40		
5415 15.28		22 4442	13625 31.80		23 9.02	21.43 1.92	9470 23.35		21.43 13.15 28 54.62	15171 34.58		29 3322
5415	21 53.110	− 51.31	13625	24 9.410	+ 1 0.39?		9470			15171		
						1.869			13.174			
						1.877			13.155			

M 6' 23.00 · M 38 29.95 · M 14 55.80 · M 47 37.10

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1879phae.proj.1504

237

α Herculis

h m s
17 9 18
+14 32

0.15854

1879 Aug 12

10 4.38		10 23.0		27 37.00		28 22.7		29 55.0			29 44.4				
6.45	8620	24.7		30.60	33954	25.4		57.16	59336		45.8				
8.65	8.62	26.7		33.95	33.95	25.0		57.40	59.34		47.4	47.46			
10.70		28.8		37.35		31.2		1.30			48.0				
4310 12.92		1340 30.8		16977 40.87		1402 32.9		29668 3.62			2373 50.7				
4310		1340		16977		1402		29668			2373				
17.07		10 26.80		47.40		28 28.04		8.00			29 47.46				
18.30		− 1.12		50.65		+ 32.84		10.00			+ 29.03				
21.49				54.05				12.05							
23.63	25697			57.57	0.863			14.35	16486						
25.85	25.70	10 54.4		0.85	0.86	29 26.0		16.57	16.48		30 43.5				
27.82	25.65	56.7		4.30	0.90	29.5		18.70	16.50		45.9				
30.06		58.4		7.60		32.2		21.81			47.0				
32.20		0.0		11.00		35.0		23.90			48.0				
23127 34.18		2905 1.6		54777 14.35		1601 37.4		14837 25.80			2361 50.7				
23127		2911		777		1601		14837			2361				
38.45	686	10 58.22		21.00		29 32.02		27.98			30 47.22				
40.58	42786	− 32.42		24.50	27858	− 31.14		31.52	33670		− 30.73				
42.60	42.69			28.00	2786			33.70	33.67						
44.80	5131			31.99	12181			35.85	153.61						
21343 47.00		10 26.80		13929 34.50		28 28.04		16835 37.80			29 47.46				
21343	10 25.675	10 58.10		13929	29 0.880	29 32.02		1835 30 16.490			30 47.22				
						+ 32.84					+ 29.03				
						− 31.14					− 30.73				
						63.98					59.76				
17 9 11.66				17 27 44.50				4 29 1.48			1.776641				
											1.15835				
											2.93476				
											1.91466				
											8.97990				
											5 27 14				

M 57 11.77		M 5 29.80						M 12 17.30							
M 57 55.27		M L 25.65						M 13 39.72							
								K 13 39.45							
								K 13 39.22							
								13 39.46							
14 81 49.5		32 8.8 39.1						82.16							
								16 16 5.0							

240

β Draconis

h m s
17 27 42
+ 52 23

0.15854

10 4.38		10 23.0		27 37.00		28 22.7		29 55.0			29 44.4				
6.45	8620	24.7		30.60	33954	25.4		57.16	59336		45.8				
8.65	8.62	26.7		33.95	33.95	25.0		57.40	59.34		47.4	47.46			
10.70		28.8		37.35		31.2		1.30			48.0				
4310 12.92		1340 30.8		16977 40.87		1402 32.9		29668 3.62			2373 50.7				
4310		1340		16977		1402		29668			2373				
17.07		10 26.80		47.40		28 28.04		8.00			29 47.46				
18.30		− 1.12		50.65		+ 32.84		10.00			+ 29.03				
21.49				54.05				12.05							
23.63	25697			57.57	0.863			14.35	16486						
25.85	25.70	10 54.4		0.85	0.86	29 26.0		16.57	16.48		30 43.5				
27.82	25.65	56.7		4.30	0.90	29.5		18.70	16.50		45.9				
30.06		58.4		7.60		32.2		21.81			47.0				
32.20		0.0		11.00		35.0		23.90			48.0				
23127 34.18		2905 1.6		54777 14.35		1601 37.4		14837 25.80			2361 50.7				
23127		2911		777		1601		14837			2361				
38.45	686	10 58.22		21.00		29 32.02		27.98			30 47.22				
40.58	42786	− 32.42		24.50	27858	− 31.14		31.52	33670		− 30.73				
42.60	42.69			28.00	2786			33.70	33.67						
44.80	5131			31.99	12181			35.85	153.61						
21343 47.00		10 26.80		13929 34.50		28 28.04		16835 37.80			29 47.46				
21343	10 25.675	10 58.10		13929	29 0.880	29 32.02		1835 30 16.490			30 47.22				
						+ 32.84					+ 29.03				
						− 31.14					− 30.73				
						63.98					59.76				
17 9 11.66				17 27 44.50				4 29 1.48			1.776641				
											1.15835				
											2.93476				
											1.91466				
											8.97990				
											5 27 14				

M 57 11.77		M 5 29.80						M 12 17.30							
M 57 55.27		M L 25.65						M 13 39.72							
								K 13 39.45							
								K 13 39.22							
								13 39.46							
14 81 49.5		32 8.8 39.1						82.16							
								16 16 5.0							

73

α Lyrae

h m s
4 28 59
+ 16 16

0.15854

10 4.38		10 23.0		27 37.00		28 22.7		29 55.0			29 44.4				
6.45	8620	24.7		30.60	33954	25.4		57.16	59336		45.8				
8.65	8.62	26.7		33.95	33.95	25.0		57.40	59.34		47.4	47.46			
10.70		28.8		37.35		31.2		1.30			48.0				
4310 12.92		1340 30.8		16977 40.87		1402 32.9		29668 3.62			2373 50.7				
4310		1340		16977		1402		29668			2373				
17.07		10 26.80		47.40		28 28.04		8.00			29 47.46				
18.30		− 1.12		50.65		+ 32.84		10.00			+ 29.03				
21.49				54.05				12.05							
23.63	25697			57.57	0.863			14.35	16486						
25.85	25.70	10 54.4		0.85	0.86	29 26.0		16.57	16.48		30 43.5				
27.82	25.65	56.7		4.30	0.90	29.5		18.70	16.50		45.9				
30.06		58.4		7.60		32.2		21.81			47.0				
32.20		0.0		11.00		35.0		23.90			48.0				
23127 34.18		2905 1.6		54777 14.35		1601 37.4		14837 25.80			2361 50.7				
23127		2911		777		1601		14837			2361				
38.45	686	10 58.22		21.00		29 32.02		27.98			30 47.22				
40.58	42786	− 32.42		24.50	27858	− 31.14		31.52	33670		− 30.73				
42.60	42.69			28.00	2786			33.70	33.67						
44.80	5131			31.99	12181			35.85	153.61						
21343 47.00		10 26.80		13929 34.50		28 28.04		16835 37.80			29 47.46				
21343	10 25.675	10 58.10		13929	29 0.880	29 32.02		1835 30 16.490			30 47.22				
						+ 32.84					+ 29.03				
						− 31.14					− 30.73				
						63.98					59.76				
17 9 11.66				17 27 44.50				4 29 1.48			1.776641				
											1.15835				
											2.93476				
											1.91466				
											8.97990				
											5 27 14				

M 57 11.77		M 5 29.80						M 12 17.30							
M 57 55.27		M L 25.65						M 13 39.72							
								K 13 39.45							
								K 13 39.22							
								13 39.46							
14 81 49.5		32 8.8 39.1						82.16							
								16 16 5.0							

1.17609
9.98226
1.15835

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79

i Aurigae

h m s
4 49 7.
+ 32° 58'

1.17609 0.15854
9.92375
1.09984

50 0.48
3.00 5442
5.41 5.441
7.88
2721 10.38
2721
15.27
17.65
20.25
22.65 25.089
25.15 25.09
27.55 25.16
30.00
32.48
22580 35.13
22580
37.81
42.20 44770
44.77 44.77
47.23 50.21
22385 49.85
2385 50.25095

49 37.4
53.2
55.2
56.8
2751 59.5
251
49 55.02
+ 30.08
50 25.2
25.4
0.0
2.0
3008 4.2
08
51 0.16
- 35.06
49 55.02
51 0.16
+ 30.08
- 35.06
65.14
1.81385
1.09984
2.91369
1.89586
8.98217
52856

M 30 16.42
M 31 35.02
K 31 35.12
K 31 35.17
31 35.10
78.68

5 7 48.41

86

α Aurigae

h m s
5 7 45
+45° 52'

1.17609 0.15854
9.842281
1.01890

Aug. 12

8 3448
3752 40450
40.45 4.045
43.35
20225 46.45
20225
52.30
55.30
58.28
1.20 4137
4.00 4.134
7.15 4.14
10.10
13.00
57723 16.00
3723
22.10
3435 27830
27.85 27.83
30.80 12828
13915 33.65
13915 9 4.140

8 22.0
23.9
26.0
27.8
1312 31.5
1312
8 26.24
+ 37.90
9 30.1
62.3 32.2
9 31.15
- 27.01
8 26.24
+ 37.90
- 27.01

M 36 32.62
M 37 40.97
37 40.97

45 52 22.7

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S

Sim

h m s
9 31 43
+14 °
0.11854

1879 Aug 13

235

E Mer. Mir.

h m s
16 58 25
+82 °
0.11854

31 27.30			32 42.5	33 38.44		33 2.6		58 30.2			58 15.2	59 10.5	
32.50	31676		43.8	40.50	42464	3.7		5.0			26.2	20.5	
31.78	3168		45.0	42.68	42.66	5.0		29.0			36.2	29.2	
33.30			46.4	44.80		6.3		35.4	50.66		51.5	43.6	
15838 36.00			2459 48.2	21332 46.90		252 7.6		30.6	50.65		1904 1.3	1598 56.0	
15838			259	21332		252		5.3			1904	1598	
40.29			32 45.18	51.20		33 5.04		21.0			58 38.08	59 31.96	
42.44			- 56.41	53.10		+ 54.72		36.5			+1 12.58	+ 18.70	
44.40				55.36				99 59 57.9					
46.50	48.728			57.55	59.640			47.59					
48.60	48.73			59.20	59.64			186	58 50.65		0 27.6	1 38.7	
50.84	48.81			1.75	59.76			455.9			40.3	42.5	
53.00				4.00							52.4	53.5	
55.00				6.00							4.2	13.6	
43855 57.48				53676 8.20							2638 17.3	2809 23.6	
43855				53676							2638	2809	
1.35				12.72							0 52.76	1 56.18	
3.80	5.940			14.70	16.850						-1 2.10	-2 8.52	
6.00	5.94			16.90	16.85								
8.05	9762			18.88									
2970 10.30			32 45.18	8425 21.25	16951	33 5.041					58 38.08	59 31.96	
2970	31 48.770	- 56.41		8425	33 59.755	+ 54.72					0 52.76	1 56.18	

M 33 15.85

M 5 31.62

M 15 49.65
M 16 0.30
M 16 15.72
M 16 27.05

16

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237 α Herculis

h m s
17 9 18
+14° 22'

1.17609
9.98588
1.16197

0.15854

10	4.85		9	58.6							
	6.98	9.106		0.3							
	9.00	9.10		1.8	1.56						
	11.30			3.4							
4553	13.40		3093	5.2							
	4553			93							
	17.70			10 1.86							
	19.77			+ 24.28							
	21.92										
	24.80	26146									
	26.10	26.15		10 52.9							
	28.24	26.14		54.7							
	30.38			56.4							
	32.30			58.0							
23531	34.70		2819	59.7							
	23531			319							
	38.86			10 56.38							
	41.00	43182		− 30.24							
	43.20	43.18									
	4525	5229									
21591	47.52			10 1.86							
	1591	10 26.145		10 56.38							
				+ 24.28							
				− 30.24							
				54.52							

17 9 11.15

1.73666
1.16197
2.89853
1.88389
8.98536
5 31 21

M 56 35.15
M 57 51.47
R 57 51.95
R 57 51.67

57 51.69
76.54

14 31 49.7

240 β Draconis

h m s
17 27 42
+52° 23'

0.15854

28	27.45			28 28.4							
	30.53	34.108		32.2							
	34.20	34.11		34.5							
	37.40			36.8							
17054	40.84		1727	39.8							
	17054			1727							
	47.60			28 34.54							
	51.01			+ 26.56							
	54.30										
	57.70	1.089									
	1.00	1.09		29 13.5							
	4.38	1.10		16.0							
	7.80			18.3							
	11.27			20.6							
54980	14.75		913	22.9							
	980			913							
	21.30			29 18.26							
	24.70	28100		− 17.16							
	28.05	28.10									
	31.55	12221									
14050	34.90			28 34.54							
	14050	29 1.095		29 18.26							
				+ 26.56							
				− 17.16							
				43.72							

17 27 44.48

M 5 34.95
M 6 12.80

52 38.897

241 α Ophiuchi

h m s
17 29 19
+12° 29'

0.15854

30	16.40			30 10.9							
	18.60	20.638		12.3							
	20.54	20.24		14.0							
	22.75			16.7							
10119	24.50		719	18.0							
	10319			219							
	29.00			30 14.38							
	31.35			+ 23.02							
	33.30										
	35.38	37511									
	37.50	37.52		31 14.8							
	39.60	37.29		17.0							
	41.70			50.7 18.8							
	4387										
33760	46.80			31 16.90							
	33760			− 39.50							
	50.08										
	52.30	54.354									
	54.33	54.35									
	56.48	7459									
27177	58.58			30 14.38							
	2177			30 37.405							
				+ 23.02							
				− 39.50							

17 29 22.46

M 49 22.22
M 50 51.02
R 50 51.25
R 50 51.05

50 51.11
88.89

12 89 26

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252

γ Draconis

h m s
17 53 48
+51° 30 1.17609
9.79415
0.97024

0.15854

1879 Aug. 13

54 34.00
37.50 40.694
40.60 40.69
44.00
120347 47.37
20347
53.35
57.35
0.38
3.86 7230
7.97 723
10.50 7.14
13.88
17.29
160507 20.40
6507
27.80
30.15 33590
33.50 33.59
37.00 13428
16795 41.30
16795 55 7.185

54 37.4
30.6
32.8
35.3
1640 37.9
1640
54 32.80
+ 34.38
55 30.3
41.2
43.0
45.7
2169 48.7
2169
55 43.38
− 36.20
54 32.80
55 43.38
+ 34.38
− 36.20
70.58
1.84868
0.97024
2.81892
1.78469
8.96577
5 9.36 1649

17 53 50.63

16 0.86
2.86 4904
4.90 490
6.80
2452 9.00
2452
18.25
15.35
16.35
19.40 21.463
21.50 21.46
23.55 21.42
25.50
27.60
19317 29.67
19317
33.80
35.85 37.948
37.95 37.95
40.07 42.85
18974 42.07
18974 16 21.4440

1.17609 0.15854
9.99943
1.17552

15 54.2
55.8
57.4
59.0
2875 1.1
2875
15 57.50
+ 2.394
16 59.5
0.2
1.9
3.4
3098 5.8
98
17 1.96
− 40.52
15 57.50
17 1.96
+ 23.94
− 40.52
64.46
1.80929
1.17552
2.98481
1.96553
8.98072
5 27.51

M 58 43.87
M 59 44.62
R 59 111.87
R 59 111.85
59 44.78
60.91

57 29 84.3

M 23 37.78
M 25 10.15
25 10.15
92.37

260

α Lyrae

h m s
18 32 50
+38° 40

0.15854

33 43.10
45.15 48.492
48.52 48.49
51.30
24246 53.35
24246
57.60
1.80
4.37
6.80 9.649
9.60 9.65
12.30 9.58
14.50
17.60
62684 20.37
8684
25.30 31352
28.10 31376
30.65 30.67
33.36 13916
15338 36.07
338 34 9.615
8676

33 36.4
38.6
40.1
42.0
2013 44.2
13
33 40.26
+ 29.36
34 37.5
40.4
42.3
44.2
2114 46.6
114
34 42.28
− 3.266
33 40.26
34 42.28
+ 29.36
− 32.66
62.02
1.79253
1.06863
2.86116
1.83759
8.97643
5 24.39

M 48 21.07
M 49 29.87
49 29.87
68.80

38 40 30.5

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111 — 270 — 275

51 H. Cephei L.C. | ζ Aquilae | β Cygni

51 H. Cephei L.C.				ζ Aquilae			β Cygni		
h m s 6 43 16		0.15854		h m s 18 59 51		0.15854	h m s 19 25 50	1.17609	0.15854
+92° 49				+13° 41			+27 42	9.94714	
							Aug 13	1.12323	

37 1.3	37 22.3	36 40.2			0 48.50		0 42.1		26 46.28		26 50.4	
43.3					50.65	52734	44.0		48.60	50976	52.0	
38 25.6	38 25.6	37 32.7			52.75	52.73	45.3		51.00	50.97	54.0	
39 8.0	39 30.0				54.87		46.8		53.30		56.0	
52.0		38 38.0			26367 56.80		2262 48.0		25488 55.70		2699 57.5	
41 16.4	41 38.0		+ 2 34.05	12.1	1367		262		488		109	
59.6		40 0.1			1.05		0 4524		0.30		26 5398	
42 (39.7	42 42.8		+ 1 24.00	6.8	3.36		+ 24.48		2.62		+ 15.61	
43.3		40 42.9			5.44				4.98			
45.5)					7.58	9700			7.23	9598		
43 26.0	43 26.0	42 5.7	+ 4202	8.0	9.72	9.70	1 52.2		9.60	9.60	27 44.1	
44 7.9	44 29.1		-02	7.8	11.85	9.73			11.92	9.58	46.0	
50.3			− 41.92	8.4	14.00		− 42.49		14.33		47.8	
45 33.5	45 33.5		− 1 23.90	9.6	16.00				16.50		49.8	
46 16.4	46 37.2		− 2 6.08	103 8730	18.30				8638 18.90		2392 51.5	
50.0			− 2 48.16	9.8	8730				8638		392	
48 24.5	48 24.5				22.40				23.53		27 4784	
49 7.0	49 26.6			72.8	24.80	26728			25.90	28186	− 38.25	
48.3					26.67	26.73			28.05	28.19		
50 30.8	50 30.8			44 9.10	28.90	13946			30.60	13916		
57 13.8	57 13.8				13364 30.87		0 45.24		14093 32.85		26 53.98	
					13364	1 9.715	+ 24.48		14093	27 9.590	27 47.84	
											+ 15.61	
											− 38.25	
											53.86	
											1.73127	
											1.12323	
											2.85450	
											1.83929	
											8.98479	
											5 30 55	

M 44 51.55	M 47 7.15	M 46 16.70
M 44 46.50	M 48 41.72	M 47 25.65
M 44 41.00		R 47 25.75
M 44 32.75		R 47 25.92
M 44 29.65		
M 44 22.37		47 25.77
		69.07

1879phae.proj.1504

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S

Sim c = 46.964

h m s
9 35 29
+14° 20

0.1.5854

1879 Aug. 14

35	14.35			36	33.4	37	35.27			36	48.4			
	16.60	18.674			35.0		37.40	29.474			50.2			
	18.70	18.67			36.5		39.40	29.47			51.8			
	20.75				37.9		41.60				53.3			
9337	22.97			1323	39.5	14737	43.70			2585	54.8			
	9337				323		14737				85			
	27.20			36	26.46		48.00			36	51.70			
	29.47			−	50.74		40.04			+	54.80			
	31.49						42.12							
	33.55	35.734					44.35	46.484						
	35.78	35.73					46.55	46.48						
	37.87	35.70					48.60	46.51						
	40.00						50.80							
	42.05						52.90							
32161	44.20					41836	55.00							
	32161						41836							
	48.43						57.40							
	50.60	52.736					1.40	3.560						
	52.75	52.74					3.50	3.56						
	54.85	7141					5.60	9303						
26368	57.00			36	26.46	31780	7.90			36	51.70			
	1368	35	35.715	−	50.74		1780	37	46.495	+	54.80			

M 51 32.75 · M 23 54.95 ·

240

ρ Draconis

h m s
17 27 42.
+ 52° 23

0.1.5854

28	28.55							28	17.5					
	31.95	35.290							19.8					
	35.30	35.29							22.3					
	38.75								25.0					
17645	41.90							1127	27.6					
	17645								1127					
	48.80							28	22.54					
	52.18							+	39.74					
	55.34													
	58.80	2.283												
	2.15	2.28						29	10.0					
	5.53	2.27							12.5					
	8.95								14.9					
	12.33								17.1					
56055	15.85							757	20.2					
	2055								757					
	22.50								29 15.14					
	25.85	29.250						−	12.86					
	29.25	29.25												
	32.68	12454												
14625	35.97								28 22.54					
	14625	29	2.275						29 15.14					
									+ 39.74					
									− 12.86					
									52.60					

17 27 44.45

M 5 22.45 ·
M 6 8.57 ·

52 23 39.8

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241		252		256	
α Ophiuchi		γ Draconis		δ Urs. Min	
h m s 17 29 19	1.17609 0.15854	h m s 17 58 48	1.17609	0.15854	h m s 18 11 21
+12° 39'	9.98953	+51° 30'	9.79415		+86° 36'
	1.16562		0.97024		0.15854

α Ophiuchi

30	17.44		30	11.4
	19.60	21.668		13.4
	21.60	21.67		15.3
	23.80			16.7
10834	25.90		751	18.3
	834			251
	30.05		30	15.02
	32.27		+	23.58
	34.27			
	36.50	38.582		
	38.60	38.59	31	11.2
	40.80	38.60		13.3
	42.95			15.3
	44.80			16.9
34724	47.00		755	18.8
	34724			255
	51.38		31	15.10
	53.38	55.526	−	3650
	55.47	55.53		
	57.50	7720		
27763	51.90		30	15.02
	2763	30 38.595	31	15.10
			+	23.58
			−	36.50
				60.08
17 29 22.47				1.77873
				1.16562
				2.94435
				1.92629
				8.98194
				5 28 46

γ Draconis

54	35.00		54	20.7	+2	19.50
	38.35	41.674		22.5	+2	7.65
	41.80	41.67		24.5	+1	56.04
	44.94			27.5	+1	44.34
20837	48.28		1252	30.0	+1	32.77
	837			1252	+1	21.21
	55.00		54	25.04	+1	9.60
	58.40		+	43.18	+0	57.99
	1.56				+0	46.30
	4.90	8.274			+0	34.82
	8.28	8.27	55	47.0	+0	23.19
	11.64	8.18		50.0	+0	11.57
	14.85			52.7	+0	0.02
	18.36			55.6	−0	11.53
61447	21.48		2637	58.4	−0	23.15
	7447			137	−0	34.73
	28.05		55	52.74	−0	46.38
	31.38	34.700	−	4452	−0	58.02
	34.80	34.70			−1	9.52
	38.00	13637			−1	21.21
17350	41.27		54	25.04	−1	32.86
	17350	55 8.225	55	52.74	−1	44.46
			+	43.18	−1	56.03
			−	44.52	−2	7.71
				87.70	−2	19.35
17 53 58.62				1.94300		
				0.97024		
				2.91324		
				1.89564		
				8.98240		
				5 29 7		

δ Urs. Min

10	41.96	10	47.69	17	19.0	13	1.56
	53.43					13	1.08
11	5.55	11	28.48	19	18.9		1.59
	16.00						0.34
	28.00				36.9		0.77
	40.80						1.51
	52.55			20	40.6		2.15
12	3.70	12	27.18				1.69
	15.48						1.78
	27.90						2.72
	38.78						1.97
	50.05						1.62
13	1.44	13	30.43				1.42
	13.70						2.17
	25.00						1.85
	34.70					12	59.97
	48.80					13	1.42
	59.18						1.16
14	11.53	14	35.16				2.01
	23.82						2.61
	35.20						2.34
	47.30						2.84
	57.95						1.92
15	8.80	15	15.19				1.09
	21.58						2.23
							41.71
						13	1.664

M 49 20.87		M 58 33.00		M 53 14.10
M 50 45.17		M 59 51.67		M 54 6.02
R 50 45.32		R 59 51.62	1st micro. (54.0?)	M 54 7.55
R 50 45.30		R 59		M 54 10.57
50 45.26		59 51.64		54
84.39		78.64		
12 39 2.6		51 30 24.5		

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257

ν Serpentis

h m s
18 15 2
−2° 56′

0.15897

1879 Aug. 14

Rehf.
J

260

α Lyrae

h m s
18 32 50
+38 40 1.17609
9.89254
1.06863

		38 44.40		33 36.3	+2	48.36	41 15.57	44	4.33	38	8.7
		46.95	49.654	38.3	2	34.05	29.60		3.65		
		49.65	49.65	40.2	2	20.03	44.53		4.98	39	5.4
		52.27		42.4	2	5.92	57.47		3.39		
	24827	55.00		2019 44.7	1	51.96	42 13.80		3.84		55.1
	24827			19	1	42.63	22.36		9.99		
		0.30		33 40.38	1	23.00	41.30		5.30	47	25.0
		2.86		+ 30.40	1	9.98	56.28		6.26		
		5.50			0	55.88	43 10.28		6.16	48	14.5
		8.00	10.797		0	42.02	23.60		5.62		
		10.87	10.79	34 39.9	0	27.98	38.67		6.65		
		13.40	10.77	42.0	0	13.96	53.03		6.96		
		16.06		43.4	−0	.02	44 6.30		6.28		
		18.70		45.8	−0	13.92	20.78		6.86		
	9717	21.48		2196 48.5	−0	27.94	34.18		6.24		
	9717			196	−0	41.92	48.70		7.78		
		26.62		34 43.92	−0	55.98	45 3.40		7.52		
		29.29	31890	− 33.14	−1	10.02	17.30		7.28		
		31.84	31.89		−1	23.90	31.70		10.80		
		34.50	14154		−1	38.00	46.50		8.80		
	15945	37.20		33 40.38	−1	52.06	45 0.50		8.44		
	945	34 10.780		34 43.92	−2	6.08	14.75		8.67		
				+ 30.40	−2	20.03	23.70		8.67		
				− 33.14	−2	34.13	43.00		8.87		
				63.54	−2	48.16	57.00		8.84		
									17.318		
18	32	58.67		1.80305				44	6.93		
				1.06863							
				2.87168							
				1.85352							
				8.98184							
				5 28 41							

M 18 18.47 ·
M 49 29.85 ·
K 49 29.82 ·
K 49 29.85 ·

49 29.84
71.37

38 40 81.4

M 44 41.85 ·
M 44 37.65 ·
M 44 32.25 ·
M 44 0.05 ·
M 43 37.80 ·

111

51 Lacertae Lt. G.

h m s
6 43 16
+42° 49′

0.15854

Aug. 14

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1879phae.proj:4504

S

Sun C = 46,864

h m s
9 39 14
+14° 2'

0.15859

Aug. 15

39 —		40 4.0			
—		5.5			
—		7.0			
—		8.8			
—		366 11.3			
		366			
16.40	+8.51 24.91	40 7.32			
18.40	6.38 24.78	98.85			
20.38	4.25 24.63	24.714			
22.42	2.11 24.53				
—					
—					
—					
—					
—					
3534	-12.76 2258	66.66			
—		22.22			
—					
41.40	19.14 22.26				
4225	21.33 21.82	40 7.32			
	39 23.64				

23.467
23.644

M 10 602.

S

Sun. C = 46,919

h m s
9 34 10
+12° 46'

0.15854

Aug 19

34 2.00		56 11.66			
4.25	6.286	13.87			
6.30	6.28	16.00	16.006		
8.38		18.18			
3143 10.60		80.03 20.32			
3143					
1470		2458			
16.81		26.76			
19.00		28.90			
20.97	23.172	30.93	33.048		
23.00	23.17	33.00	33.05		
25.30	23.18	35.00			
27.48		37.37	33.040		
29.60		39.45			
20855 31.78		29743 41.60			
20855		29743			
33.90		42.80			
38.00	40090	48.00	50.060		
40.00	40.09	50.00	50.06		
4225	46 37	52.10			
20045 44.30		25030 54.40			
20045	54 23.175	030	56 33.04		

M 16 5425.

M 59 3490.

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240 β Draconis

h m s
17 27 42 0.15854
+52 23

1879 Aug. 19

28	34.10			28	20.0						
	37.56	40.952			22.5						
	41.60	40.95			24.8						
	44.30				27.3						
20476	47.80			1250	30.4						
	20476				1250						
	54.47			28	2500						
	57.85			+	42.97						
	1.25										
	4.63	7.977									
	8.05	7.98		29							
	11.30	7.96									
	14.66										
	17.58										
61179	21.50										
	7179										
	28.20										
	31.63	34.966									
	35.10	34.97									
	38.30	135.92									
17483	41.70				28	25.00					
	17483	29	7.970	+	42.72						

17 27 44.81

M 5 21.15
M 6 26.82

52 23 20.6

241 α Ophiuchi

h m s
17 29 19 0.15854
+ 12 89

30	23.40										
	25.40	27.600									
	27.60	27.60									
	29.70										
13800	31.80										
	13800										
	36.00										
	38.04										
	40.27										
	42.38	44.476									
	44.48	44.48									
	46.60	44.48									
	48.77										
	50.87										
40028	52.87										
	40.028										
	57.00										
	59.30	1.350									
	1.40	1.35									
	3.45	8.895									
30675	5.60										
	675	30	44.480								

17 29 22.40

M 49 23.37
R 49 23.27
R 49 22.95

13 89 3.0

252 γ Draconis

h m s
17 03 48 0.15854
+ 51 80

54	40.80							54	27.0		
	44.00	47.426							29.4		
	47.48	47.43							31.8		
	50.80								34.6		
23713	54.05							1604	37.6		
	23713								1604		
	0.70							54	82.08		
	4.00							+	41.88		
	7.30										
	10.88	13.998									
	14.00	14.00									
	17.40	13.91									
	20.48										
	23.50										
12598	27.40										
	12598										
	33.65										
	36.83	40.396									
	40.35	40.39									
	43.75	14.782									
20198	47.30								54 32.08		
	20198	55	13.955	+	41.88						

17 53 50.51

M 58 35.72
M 59 49.17
R 59 49.02
R 59 49.02

51 30 25.3

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256

δ Ors. Min.

h m s
18 11 21
+86° 36'

0.15854

7	16.00			δ 9.8	
	50.80				
8	24.70			9 22.2	
9	0.55				
	35.40			54.4	
10	46.47	+2	19.50	13 5.97	
	57.22	+2	7.65	4.87	
11	8.44	+1	56.04	4.48	
	18.90	+1	44.34	3.24	
	30.48	+1	32.77	2.25	
	43.00	+1	21.21	4.21	
	53.85	+1	9.60	5.45	
12	6.30	+0	57.99	4.49	
	18.88	+0	46.90	5.18	
	28.58	+0	34.82	3.70	
	39.70	+0	23.19	2.89	
	53.70	+0	11.57	5.27	
13	5.18	−0	0.02	5.16	
	16.50	−0	11.53	4.97	
	28.60	−0	22.15	6.55	
	39.25	−0	34.73	4.82	
	52.43	−0	46.38	6.05	
14	3.35	−0	58.02	5.33	
	13.80	−1	9.52	4.38	
	26.48	−1	21.21	5.27	
	38.05	−1	32.86	6.19	
	49.90	−1	44.46	5.44	
15	0.60	−1	56.03	4.57	
	13.80	−2	7.71	6.09	
	24.50	−2	19.35	5.15	
				121.97	
				13 4.878	

M 33 33.2'
M 53 13.70'
M 53 21.27'
M 53 24.55'

257

η Serpentis

h m s
18 15 2
−2° 56'

0.15854

33	50.20		
	32.80	55.416	
	55.45	55.42	
	57.88		
27708	1.65		
	27708		
	6.01		
	8.78		
	11.34		
	14.00	16.583	
	16.55	16.58	
	19.28	16.54	
	21.80		
	24.31		
14925	27.00		
	14925		
	32.50		
	35.00	37.666	
	37.83	37.67	
	40.30	153.69	
18833	42.95		
	18833	34 16.360	

18 32 38.61

M 48 17.52'
M 49 36.75'
R 49 36.78'
R 49 36.57'

49 36.70
79.18

38 40 32.6

260

α Lyrae

h m s
18 32 50
+38° 40'

1.17609
9.89254
1.06863

0.15854

33	39.2	
	41.8	
	43.3	
	45.1	
2159	47.5	
	2159	
	33 43.18	
+	38.38	
	34 52.1	
	52.1	
	54.5	
	56.5	
2716	58.4	
	216	
	34 54.32	
~	37.76	
	16.56	
	33 43.18	
	34 54.32	
+	38.38	
−	37.76	
	79.14	
	1.85211	
	1.06863	
	2.92074	
	1.89862	
	8.97788	
	5.25.44	

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111

57 Ho. Cephei 2.6

h m s
6 43 16
+92 49

0.15857

1879 Aug. 19

41	26.50	+ 2	48.36	38	16.8	44	14.86
	41.80	+ 2	34.05				14.85
	54.70	+ 2	20.05	39	5.3		14.75
42	9.85	+ 2	5.92				15.77
	22.85	+ 1	51.96		48.9		14.81
	36.88	+ 1	42.63				19.51
	49.58	+ 1	24.00	47	19.2		12.98
43	5.40	+ 1	9.98				15.38
	20.50	+	55.88	48	2.2		16.38
	34.10	+	42.02				16.12
	47.57	+	27.98	49	9.3		15.95
44	3.30	+	13.96				17.26
	17.30	−	.02				17.28
	30.40	−	13.92				16.48
	43.60	−	27.94				15.66
	55.25	−	41.92				16.33
45	13.40	−	55.98				17.42
	27.30	− 1	10.02				17.28
	41.20	− 1	23.90				17.30
	56.20	− 1	38.00				18.20
46	8.85	− 1	52.06				15.79
	23.30	− 2	6.08				17.22
	38.98	− 2	20.03				18.95
	52.80	− 2	34.13				17.67
47	7.20	− 2	48.16				19.04

414.74
44 16.59

M 44 45.25
M 44 40.78
M 44 36.70
M 44 3.40
M 43 40.20
M 43 56.65

270

ζ Aquilae

h m s
18 59 57
+ 18 41

1.17609
9.98750
1.16359

0.15854

	0	55.60			0	49.1		
		57.65	59.790			52.2		
		57.80	59.59			52.8		
		1.90				54.6		
29795		4.00			2640	56.3		
		29895				140		
		8.30			0	52.80		
		10.33			+	23.92		
		12.35						
		14.75	16793					
		16.83	16.79		1	47.2		
		17.00	16.65			49.2		
		21.00				50.9		
		23.10				52.6		
15111		25.28			2539	54.0		
		15114				39		
		32.42			1	50.78		
		31.55	33724		−	34.06		
		33.70	33.72					
		35.95	15331					
16862		38.00				0 52.80		
		16862	1 16.720			1 50.78		
						+ 23.92		
						− 34.06		
						52.98		
						1.76328		
						1.16359		
						2.92687		
						1.90558		
						8.97871		
						5.26 21		

M 47 9.40
M 48 29.85 92 07 1
R 48 29.72 14
R 48 29.87 79 08 1
M 48 30.00 14
48 29.86
80.46 .08

13

γ Cassiop.

h m s
0 49 25
+ 60 4

0.15854

50	13.45				50	1.4		
	17.20	21530				4.8		
	21.55	21.53				9.0		
	25.85					11.7		
10765	29.60				408	13.9		259
	765					408		
	33.85				50	8.16		
	41.80				+	46.34		
	46.40							
	50.30	54.419						
	54.56	54.42			51	16.0		
	58.56	54.58				19.6		
	2.50					24.0		
	6.70					26.0		
48877	11.00				1159	30.3		217
	48977					1.59		
	18.28				51	23.48		
	23.87	27.630			−	28.68		
	27.70	25.63						58
	31.50	10916						
13815	35.30				57	53.7		283
	13815	50 54,495				57.4		
						8.6		
						4.2		
					3024	7.5		
						24		
					52	0.08		
					− 1	5.58		

M 25 24.50
M 26 19.07
M 26 44.30
R 26 44.10

0.98922 6.43046

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20

κ Cassiop.

h m s
1 17 55.
+59° 36'

0.15854

18 43.80
47.88 51.812
51.68 51.81
55.80
25906 59.90
906
1.75
11.85
15.90
20.10 24.179
24.15 24.18
28.40 24.28
32.60
36.35
21761 40.48
21761
48.35
52.65 56.750
5.650 56.60 56.75
0.75 16.856
28375 5.20
28375 19 24.230
−.005
24.225

18 32.3
35.9
38.6
41.7
1933 44.8
1933
18 38.66
+ 45.57
19 32.0
35.2
38.0
41.4
1932 45.6
1932
19 38.64
− 14.41
20 10.9
14.8
17.0
20.3
879 24.9
879
20 17.58
− 53.35

M 52 43.67.
M 53 28.60.
M 53 56.57.

0.98922 6.43046

30

β Ariet.

h m s
1 47 57.
+20° 13' 9.99238
1.14847

0.15854

49 2.80
4.28 6.452
6.55 6.45
8.65 8.75
3226 10.68
3226
15.25
17.38
19.57
21.80 23.964
2405 23.96
26.05 24.00
28.38
30.50
21568 32.70
21568
37.15
39.30 41.560
41.60 41.56
43.75 48.01
20780 46.00
780 49 23.980
−.005
23.975

48 52.7
54.0
56.3
58.4
2814 0.0
2814
48 56.28
+ 27.70
50 1.5
3.5
4.8
6.0
234 7.6
234
50 46.8
− 40.70
48 56.28
50 4.68
+ 27.70
− 40.70
68.40
1.83506
1.14847
2.98353
1.95550
8.97197
.52121

M 15 12.72.
M 16 42.90. .98 08 8
R 16 42.97. 1
R 16 43.00. .98 .02 2
M 16 43.05. 7
16 42.98
90.26 .04

0.15854

57 38.90
31.38 34.186
34.50 34.19
36.30
17093 38.85
17093
45.25
48.04
50.68
53.58 56.288
56.20 56.29
59.00 56.30
1.87
4.68
50659 7.25
50659
12.80
15.60 18.420
18.40 18.42
21.30 11.261
9210 24.00
9210 57 56.295

57 17.0
18.5
20.6
23.7
1074 27.6
1074
57 21.48
+ 34.82
58 31.6
34.4
36.9
38.7
1827 41.1
1827
58 36.54
− 40.24
57 21.48
58 36.54
+ 34.82
− 40.24
75.06
1.87541
1.04886
2.92427
1.90763
8.98336
5 29.50

M 43 46.57.
M 45 7.37.
R 45 7.45.

45 7.41
80.84

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33

α Aquilæ

h m s
2 0 21
+12° 53' 1.17609 0.15857
9.96440
1.14049

1877 Aug. 17

1 23.57		1 38.2			57 45.75			58 56.5	59 56.00			59 21.9	
22.80	30018	40.3			48.05	50100		58.2	58.00	0.000		24.2	
22.97	30.02	43.8			52.80	50.30		58.9	0.00	0.000		25.9	
23.22		46.0			52.25			1.7	2.00			27.6	
15009 23.60		2167 48.3			25150 53.35		2992	2.9	30000 4.00		1286	29.0	
15009		2167			050		2992		0.00			286	
23.70		1 43.34			58.50		58	59.84	8.48			59 25.72	
24.10		+ 4.58			6.70			- 52.78	10.70			+ 51.24	
24.35					2.88				12.80				
25.67	47856				5.40	7.029			14.80	1.6986			
27.80	47.86	2 22.4			7.00	7.03			16.90	16.99			
30.15	47.98	24.3			9.15	7.09			18.00	16.94			
32.37		25.7			11.23				21.30				
34.60		27.6			13.30				23.35				
43070 36.96		1298 29.8			60326 15.50				15290 25.47				
43070		298			6326				15290				
1.10		2 25.96			17.70				27.60				
3.80	5940	- 38.04			21.85	23880			31.80	33880			
5.80	594				23.85	2388			33.90	33.88			
7.97	9596				26.00	13418			36.00	33.88			
2970 10.43		1 43.34			11940 28.00			58 59.84	16940 38.10			59 25.72	
2970	1 47.920	2 25.96			1940	58 7.060		- 52.78	1940	00 16.965		+ 51.24	
		+ 4.58											
		- 38.04											
		42.62											
2 0 3503		1.62961											
		1.14049											
		2.77010											
		1.73448											
		8.96438											
		5 15 49											

S

Sun C = 46,954

h m s
9 57 53.
+12° 26

0.15854

Aug. 20

M 35 21.87.
M 36 19.10 .11 01 3
R 36 19.19 . 4
R 36 19.15 .16 01 2
M 36 19.12 1
~~36 19.13~~ .
19.13 .03
54.26

2 2 53 408.

M 46 45.42.

M 19 11.42.

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587

α Virginis

h m s
18 18 49
° '
−10 32

1.17609
9.99262
1.16871

0.15854

18 53.17
55.00 57.54
57.27 57.25
59.28
28627 1.35
28627
5.70
7.80
9.80
11.93 14.03
14.00 14.00
16.00 14.03
18.17
20.25
12603 22.38
12603
26.56
28.80 30.822
30.80 30.82
33.00 14.807
15411 34.85
411 19 14.015

18 46.3
48.0
49.5
51.0
2474 52.6
2474
18 4948
+ 2454
19 41.3
43.4
44.6
46.3
2238 48.2
238
19 4476
− 3074
18 49.48
19 44.76
+ 24.54
− 30.74
55.28
1.74257
1.16871
2.91128
1.89348
8.98220
52858

13 18 51.46

187

α Doradûs

h m s
14 10 8
° '
+19 49

1.17609
9.97349
1.14958

0.15854

11 12.40
14.60 16754
16.75 16.75
18.92
8377 21.10
8377
25.54
27.83
29.95
32.05 34258
34.20 34.26
36.38 34.24
38.60
40.77
30832 43.00
30832
4745
49.60 51736
51.70 51.74
53.93 6849
25868 56.00
868 11 34.250

11 3.3
5.2
7.1
8.6
341 9.9
341
11 6.82
+ 27.43
12 5.2
6.9
8.9
10.6
444 12.8
444
12 8.88
− 3463
11 6.82
12 8.88
+ 27.43
− 34.63
62.06
1.79281
1.14958
2.94239
1.92500
8.98261
52916

14 10 10.81

d

ε Doradûs

h m s
14 29 42
° '
+27 35

1.17609
9.94760
1.12369

0.15854

40 45.00
47.25 49596
49.56 49.59
51.94
24798 54.23
24798
58.90
1.10
3.48
5.80 8.126
8.00 8.12
10.45 8.17
12.85
15.20
61313 17.45
7313
22.10
24.50 26760
26.80 2676
29.00 13635
13380 31.40
13380 41 8.145

40 37.0
38.4
40.3
42.0
2013 43.6
13
40 4026
+ 2788
41 39.7
41.0
43.0
45.0
2158 47.1
158
41 43.16
− 35.02
6290
1.79865
1.12369
2.92234
1.90703
8.98469
53051

M 59 42.22.
M 1 0.47.

1 0.47
78.25

10 32 0.8

M 39 50.47.
M 41 14.37.47 10 24
R 41 14.92. 21
R 41 14.57.74 17 4
M 41 14.38 4
41 14.60
84.14 .16

19 48 41.8

M 53 35.92.
M 54 56.40.60 20 25
R 54 56.78. 13
R 54 56.62.70 08 3
M 54 56.80. 15
54 56.65
80.73 14

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237

α Coronae

h m s
17 9 18
+14 32

1.17609
9.98588
1.16197

1879 Aug. 20

10 13 30		10 24.3	
15.28	17.476	25.5	
17.40	17.48	27.4	
19.65		28.7	
1.8738 21.75		1365 30.6	
8738		1365	
26.00		10 27.30	
28.15		+ 7.20	
30.35			
32.40	34510		
34.25	3451	11 7.8	
36.60	34.50	9.9	
38.80		11.9	
40.80		13.3	
4.31060 42.95		576 14.7	
31060		576	
47.25		11 11.52	
49.35	51.520	− 37.02	
51.60	51.52		
53.60	69.00		
25760 55.80		10 27.30	
760	10 34.505	11 19.52	
		+ 7.20	
		− 37.02	
		44.22	
17 9 1.05		1.644562	
		1.16197	
		2.807759	
		1.78504	
		8.97745	
		5 15 24	

241

α Ophiuchi

h m s
17 29 19
+12 39

1.17609
9.98933
1.16542

30 24.86		30 14.7	
26.95	29054	16.1	
29.00	29.05	17.9	
31.20		19.5	
14527 33.26		897 21.5	
14527		897	
37.50		30 17.94	
39.70		+ 28.00	
41.70			
43.80	45949		
45.90	45.95	31 13.8	
48.00	45.92	15.6	
50.27		17.1	
52.29		19.0	
41354 54.38		862 20.7	
41354		862	
56.60		31 17.24	
0.70	2800	− 31.30	
2.80	2.80		
4.90	91185		
31400 7.00		30 17.94	
1400		30 45.935	31 17.24
			+ 28.00
			− 31.30
			59.30
			1.77305
			1.16542
			2.93847
			1.92049
			8.98202
			5 28 50

17 29 22.89

256

S Ursae Min.

h m s
18 11 21
+86 36

1.17609
9.98933
1.16542

10 47.60	+2	19.50	6	17.0	13	7.10	
57.25	+2	7.65				6.90	
11 12.35	+1	56.04	7	16.6		8.39	
21.75	+1	44.34				6.09	
34.70	+1	32.77	8	20.5		7.47	
46.88	+1	21.21				8.09	
57.25	+1	9.60	9	27.7		6.85	
12 8.70	+	57.99				6.69	
21.80	+	46.30				8.10	
32.38	+	34.82				7.20	
45.10	+	23.19				8.29	
57.30	+	11.37				8.87	
13 6.88	−	0.02				6.86	
19.20	−	11.53				7.67	
30.00	−	22.15				7.85	
42.10	−	34.73				7.37	
53.10	−	46.38				8.72	
14 5.60	−	58.02				7.58	
17.15	−1	9.52				7.66	
28.70	−1	21.21				7.49	
39.80	−1	32.86				6.94	
51.20	−1	44.46				6.74	
15 4.01	−1	56.03				7.97	
16.00	−2	7.71				8.29	
35.50	−2	19.35				6.45	
						187.53	
					13	7.501	

M 57 3.30
M 58 4.20 15 05 6
R 58 4.52 26
R 58 4.22 27 15 4
M 58 4.10 16
58 4.26
60.96 13

M 49 18.82
M 50 42.25 17 08 16
R 50 42.85 4
R 50 41.97 1.01 04 12
M 50 42.10 1
50 42.06
83.27 08

M 52 56.67
M 53 1.90
M 53 8.25
M 53 15.60
M 53 21.50

14 31 50.3

12 89 81

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257

η Serpentis

h m s
18 15 3
° ′
−2 56

1.17609
9.99943
1.17552

0.15854

16 8.04		16 1.3
11.20	13276	3.2
13.30	13.28	4.8
15.37		6.2
6638 17.47		234 7.9
6638		234
21.50		16 468
23.50		+ 25.18
25.70		
27.75	29802	
29.83	29.91	16 57.9
31.89	29.81	59.6
33.97		1.2
36.03		2.9
26822 38.05		3059 4.3
26822		59
42.23		17 1.18
44.28	46346	− 31.32
46.34	46.35	
48.40	5963	
23173 50.48		16 468
3173	16 29.860	17 1.18
		+ 25.18
		− 31.32
		56.50
		1.75205
		1.17552
		2.92757
		1.91009
		8.98252
		5 29 12

M	23 37.00		
M	24 58.20	20.00	10
R	24 58.47		17
R	24 58.35	41.06	5
M	24 58.20		10
	24 58.30		
	81.30		.11

270

γ Aquilae

h m s
18 57 57
° ′
+13 41

1.17609
9.98831
1.16440

0.15854

0 58.80		0 48.6
59.00	1.110	50.0
1.20	1.11	51.7
3.20		53.4
30555 5.35		2587 55.0
555		87
8.55		0 51.74
11.78		+ 2634
13.75		
15.95	18081	
18.00	18.08	1 57.8
20.20	18.07	53.4
22.40		55.0
24.50		56.7
16273 26.66		2754 58.5
16273		254
30.80		1 55.08
32.95	35030	− 37.00
34.98	35.03	
37.10	3614	
17515 39.32		0 51.74
2515	1 18.075	1 55.08
		+ 26.34
		− 37.00
		63.34
		1.80168
		1.16440
		2.96608
		1.95090
		8.98482
		5 30 56

M	47 7.17	
M	48 36.55	
M	48 36.42	
	48 36.48	
	89.31	

56

ε Eridani

h m s
8 27 14
° ′
−9 52

1.17609
9.99853
1.16962

0.15854

28 19.10		28 28.0
21.18	23356	28.0
23.30	23.36	30.5
25.38		32.2
14678 27.70		1534 33.7
1678		34
32.01		28 3068
34.01		+ 9.45
36.00		
38.10	40182	
40.15	40.18	29 114
42.30	40.08	13.0
4428		14.5
4643		16.3
36164 48.48		732 18.0
36164		232
52.70		29 1464
54.77	56514	− 34.51
56.80	56.81	
58.80	8017	
28407 1.00		28 3068
28407	28 40.130	29 114.64
		+ 9.45
		− 34.51
		43.96
		1.64306
		1.16962
		2.81268
		1.80366
		8.99098
		5 35 38

M	19 44.22		
M	20 47.85	41.06	00
R	20 47.82		3
R	20 47.75	78.03	10
M	20 47.97		12
	20 47.85		
	63.63		.06

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550

S Eridani

63

38 Persei

73

α Tauri

1879 Aug 20

h	m	s		h	m	s			h	m	s						
3	37	30		3	46	32			4	28	57						
	−10	11	1.17609		+31	81	1.17609	0.16854		+16	16	1.17609	0.16854				
			9.99310				9.95069					9.98226					
			1.16919				1.12678					1.15835					
38	32.30		38	34.3		47	35.60		47	25.1		30	4.47		29	55.5		
	34.55	36600		26.0	40500		38.05	40500		27.5			6.60	8.714		0.1	
	36.65	36.60		27.8	40.50		40.60	40.50		28.9			8.70	8.71		1.7	
	38.70			28.3			42.95			30.7			10.80			3.2	
18300	40.80		1382	30.8		20250	45.30		1452	33.0		4357	13.50		3083	4.87	
18300			1382			250			1452			4357				83	
	43.00		38	27.64			50.03		47	29.04			17.23			30 1.66	
	47.18			+ 25.80			52.46			+ 30.83			19.40			+ 24.18	
	49.30						54.90						21.63	25851			
	51.30	53444					57.40	59783					23.70	21847			
	53.45	53.44	39	21.8			59.80	59.89	48	33.6			25.85	25.84		30 55.1	
	55.50	53.43		22.5			2.20	59.85		35.2			28.60	25.85		56.7	
	57.67			25.0			4.60			37.0			30.05			57.7	
	59.75			26.6			7.15			39.1			32.28			59.9	
48100	1.85		1249	28.0		53805	9.46		1862	41.3		23266	34.47		2914	2.0	
48100			249			53805			1862			23266				2914	
	6.18		39	2.498			14.35		48	37.24			38.70		30	58.28	
	8.23	10262		− 31.54			16.85	19210		− 37.37			40.75	42990		− 32.44	
	10.30	10.26					19.18	19.21					43.05	42.99			
	12.30	10686					21.62	11971					45.18	51.70			
5131	14.30			38 2764		9605	24.05			47 29.04		21495	47.27			30 1.66	
	5131	38 53.435		39 24.98			9605	47 59.870		48 37.24			1495	30 25.845		30 58.28	
				+ 25.80						+ 30.83						+ 24.18	
				− 31.54						− 37.37						− 32.44	
				57.34						68.20						56.62	
				1.75846						1.83378		4	29 1.76			1.75297	
				1.16919						1.12678						1.15835	
				2.92765						2.96056						2.91132	
				1.91498						1.92438						1.89265	
				8.98733						8.96382						8.98133	
				5 32 51						5 15 25						5 28 18	

M	37	39.80			M	57	10.07			M	12	25.32		
M	39	2.07	10	03 5	M	58	34.20	11	09 11	M	13	43.35	25	10 7
R	39	2.07		5	R	58	34.15		6	R	13	43.25		17
R	39	182.94	12	20	R	58	34.00	07	04 9	R	13	42.95	1	10 15 47
M	39	2.12		10	M	58	34.02		7	M	13	43.15		27
	39	2.02				58	34.09				13	43.42		
		62.22		10			84.02		08			78.10		25

16 16 5.7

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Sim. C = 46.950 η Serpentis

h m s
10 1 35
+12 6

0.15854

h m s
18 15 3
−2 56

1.17609
9.99986 43
1.17552

0.15854

Aug. 21

1	28.81		2	40.0	3	39.89		3	9.7	16	10.76		16	4.3
	31.90	34.012		41.5		41.90			11.7		12.70	1.4762		6.3
	34.00	34.01		42.8		43.90	44.114		13.5		14.75	14.76		7.8
	36.00			44.0		45.90			15.5		16.80			9.9
17006	38.30		2144	46.1	220.57	47.95		674	17.0	7381	18.80		396	11.3
	17006			144					674		2381			396
	42.32		2	42.88		52.03		3	1.348		23.00		16	7.92
	44.50		−	51.99		54.30					25.10		+	23.32
	46.65					56.38					27.00			
	48.82	50.863				55.42	0.576				32.20	31.233		
	50.86	50.86				0.60	0.58				31.28	31.23	17	0.4
	53.00	50.92				2.70					33.28	31.26		2.7
	55.00					4.85					35.34			4.0
	57.25					6.90					37.50			6.0
45777	58.37				54518	8.00				28110	38.50		205	7.4
	777					518					1110			205
	3.60					13.48					15.60		17	4.10
	5.76	7.832				15.65	17.626				45.65	47.760	−	32.86
	7.80	7.83				17.60	17.63				47.50	47.76		
	10.00	10184				18.70					49.80	6.252		
3916	12.00		2	42.88	8813	21.70		3	13.48	23880	51.95		16	7.92
	3916	1 50.890	−	51.99		8813	4 0.725				23880	16 31.245	17	4.10
													+	23.32
													−	32.86
														56.18
														1.74958
														1.17552
														2.92510
														1.90950
														8.98440
														5 30 37

M 6 39.37

M 39 10.50

M	23	40.55		
M	25	1.85	80 05	11
R	25	1.78		4
R	25	1.57	68 11	17
M	25	1.75		1
	25	1.74		
		81.19		.08

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260

α Lyrae

h m s
18 32 50
+38° 40′ 1.17609 + 0.15854
9.89254
1.06863

1879 Aug. 21

111

57 Ho. Cephei S.C.

h m s
6 43 16
+82° 49′ 0.15854

33 52.80		33 53.3	41 —			38 21.3					
53.45	58.098	53.1	—								
53.11	58.60	57.5	—			39 15.2					
0.74		59.6	—								
29049 3.40		2873 1.8	—			40 11.5					
29049		2873	—								
8.75		33 57.46	27.50			41 2.2					
11.37		+ 21.76	30.20								
13.93			90,153 2.45	42	30.15	+	55.88	44	26.03		
16.50	19.231		41.11		43.661						
19.28	19.23	34 55.4	42.80		43.66						
21.80	19.21	57.5	130,104 6.18		43.36	+	42.02		25.38		
24.55		57.5	54.60								
27.13		1.7	112.70 57.70								
17308 29.77		2980 3.9	39295 0.40	43	56.35	+	27.98		24.33		
17308		2980	39295								
35.00		34 59.60									
37.70	40320	− 46.38									
40.35	40.32										
42.90	15842										
20160 45.65		33 57.46									
160	34 19.220	34 59.60	45 29.80								
		+ 21.76	31.50								
		− 40.38	94.16 32.76	45	31.72	− 1	10.02		21.70		
		62.14	43.30								
18 32 58.53		1.79337	45.68								
		1.06863	138.27 48.29		46.09	− 1	23.90		22.19		
		2.86200	56.36								
		1.84323	176.44 58.70								
		8.98123	46 1.38	46	58.81	− 1	38.00		20.81		
		5 28 14	10.70								
			13.77								
			40.57 16.80		13.52	− 1	52.06		21.46		
			24.80								
			37.70								
			83.70 31.20		27.90	− 2	6.08		21.82		
			43.50								
			44.50								
			132.60 45.10		44.20	− 2	20.03		24.17		
			51.55								
M 48 30.05			52.68								
M 49 39.90			158.43 54.20		52.81	− 2	34.13		18.68		
K 49 39.65			47 6.75								
K 49 39.70			8.30								
M 49			25.25 18.20	47	8.42	− 2	48.16		20.26		
49 39.75											
6970									246.83		
									44 22.44		

38 40 32.9

M 44 43.02
M 44 38.35
M 44 33.35
M 44 28.37

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270

δ Aquilae

h m s
18 39 51
+ 3° 41'

0.15854

0 58.30
0.50 2574
2.45 2.51
4.62
31257 6.70
1257
10.96
13.00
15.20
17.30 19.463
18.40 19.46
21.70 19.45
23.75
25.90
17517 27.76
17517
32.07
34.25 36.398
36.40 36.39
38.57 38.90
18199 40.70
18199 1 19.455

0 34.3
35.7
37.2
38.7
2863 0.2
2863
0 57.26
+ 22.30
1 22.0
24.0
25.4
27.2
1276 29.0
276
1 27.52
− 6.06
1 50.0
51.5
52.7
54.3
2641 55.6
141
1 52.82

275

β Cygni

h m s
19 25 50
+ 27° 42'

1.17609 0.15854
9.94714
1.12323

26 56.10
58.40 0.726
0.75 0.73
3.50
30363 5.38
363
10.05
12.37
14.70
17.00 19.349
19.37 19.35
21.70 19.34
23.97
26.30
17414 28.68
17414
33.23
35.65 37.938
37.90 37.94
40.26 38.67
18969 42.65
18969 27 19.345

26 56.5
58.8
0.2
2.0
3014 3.9
14
27 0.28
+ 19.06
27 51.9
54.0
55.6
57.6
2787 57.6
287
27 55.74
− 36.40
27 0.28
27 55.74
+ 19.06
− 36.40
55.46
1.74398
1.12323
2.86721
1.90741
9.64020
6.1537

M 47 31.47
M 48 29.87 .80 .07 3
R 48 29.85 1
R 48 29.92 .89 .03 8
M 48 29.72 12
29.84
8.37 .06

M 46 29.3
M 47 23.62 .66 04 11
R 47 23.70 3
R 47 23.90 .80 10 17
M 47 23.70 3
47 23.73
80.80 .09

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S 187

Sun C = 46.950 9.99078 α Bootis

h m s 10 5 17 +11° 46′ 0.15854 h m s 14 10 8 +19° 49′ 0.15854

1879 Aug. 22

	5 —		6 24.0	7 21.90		6 52.8		11 —		11 57.9
	—		25.7	24.05	26120	54.0		—		53.7
	—		27.8	26.07	26.12	55.7		—		55.2
	—		29.4	28.14		57.5		—		56.5
	—		1382 31.3	13060 30.44		2791 59.1		—		2753 58.0
			1382	13160		291				253
+8.43 33.53	301.22 25.00		6 2764	34.65		6 5582		—		11 55.06
6.32 33.50	33.466 27.18		−5415	36.75		+ 47.25		—		− 18.56
4.21 33.47	29.26			39.00				—		
+2.08 33.48	31.40	33.479		40.95	43.102			—		
−0.00 33.50	33.50	33.48		43.00	43.10			—		12 17.6
2.15 33.35	35.50			45.28	43.04		−2.19 36.54	146.20 38.73		19.0
4.21 33.54	37.80			47.32			4.39 36.51	36.55 40.90		57.0 20.4
6.33 33.47	39.80			49.45			6.58 36.65	43.23		
8.44 33.43	0131 41.87			38792 51.52			8.78 36.50	45.38		12 19.00
	30131			38792						
12.64 33.56	167.65 46.20			53.70			13.16 36.44	145.79 47.60		− 42.50
14.75 33.53	33.53 48.28	50404		57.90	59.966			36.447 —		
16.87 33.55	50.42	50.40		0.00	59.97		17.55 36.45	54.00		
18.97 33.45	52.42			2.07	8609		19.74 36.46	56.20		
−21.14 33.56	202 54.70		6 2764	29983 4.16		6 5582	−22.00 36.44	58.44		11 55.06
	202	5 33.49		29983	7 43.070	+ 47.25		11 36.50	11 36.50	

33.498
33.491

36.498
36.499

14 10 1079

M 26 18.82 · M 59 17.13 · M 40 52.10 · M 41 25.38 ·

19 48 41.2

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256 | 257 | 260

δ Urs. Min | η Serpentis | α Lyrae

	256 δ Urs. Min	257 η Serpentis	260 α Lyrae
h m s	18 11 21	18 15 3	18 32 50
° ′	+86 36	− 2 56	+38 40

0.15854 · 1.17609 · 9.99943 · 1.17552 · 0.15854 · 1.17609 · 9.89254 · 1.06863 · 0.15854

1879

Aug. 23.

+ 2	19.50	10 44.75	13 4.25	18 25.8		
+ 2	7.65	55.75	3.40			
+ 1	56.04	11 8.05	4.09	19 4.8		
+ 1	44.34	19.80	4.14			
+ 1	32.77	30.80	3.57	19 57.1		
+ 1	21.21	42.63	3.83			
+ 1	9.60	54.40	4.00	21 0.4		
+	57.99	12 6.60	4.59			
+	46.30	17.50	3.80	21 56.7		
+	34.82	28.68	3.50			
+	23.19	40.80	3.99	22 30.0		
+	11.57	51.65	3.22			
−	.02	13 3.77	3.75			
−	11.53	15.40	3.87			
−	22.15	26.38	4.23			
−	34.73	38.38	3.65			
−	46.38	51.20	4.82			
−	58.02	14 2.58	4.56			
− 1	9.52	13.70	4.18			
− 1	21.21	24.75	3.54			
− 1	32.86	37.20	4.34			
− 1	44.46	48.63	4.17			
− 1	56.03	15 0.37	4.34			
− 2	7.71	11.90	4.19			
− 2	19.35	23.00	3.65			
			99.67			
			13 3.99			

η Serpentis

16 12.75		16 7.1	
14.80	16.964	9.2	
17.05	16.96	10.6	
19.05		12.2	
8482 21.17		531 14.0	
8482		536	
25.28		16 1.072	
27.35		+ 2279	
29.40			
31.46	33.529		
33.52	33.53	17 1.0	
35.60	33.49	2.9	
37.65		4.9	
39.70		6.5	
.30176 41.80		233 8.0	
30176		233	
45.85		17 466	
48.04	50.026	− 3115	
50.08	50.03		
52.08	6699		
25013 54.08		16 10.62	
013	16 33.510	17 4.66	
		+ 22.89	
		− 31.15	
		5404	
		1.73272	
		1.17552	
		2.90824	
		1.89070	
		8.98246	
		5 29 10	

α Lyrae

33 53.22		33 43.7	
58.08	0.500	45.6	
0.27	0.50	47.6	47
3.18		49.8	
30250 5.75		2397 53.0	
30250		397	
10.90		33 4744	
13.66		+ 3363	
16.30			
18.90	21.562		
21.51	21.56	34 54.2	
24.18	21.58	57.0	
26.78		59.1	
29.55		1.0	
19406 32.22		2948 3.5	
19406		2948	
37.35		34 5896	
40.00	42.674	− 3739	
42.67	42.67		
45.30	4317		
21337 48.05		33 47.94	
1337	34 21.570	34 58.96	
		+ 3363	
		− 3739	
		41.02	
18 32 58 58		1.89900	1.85138
		1.06863	
		2.96763	2.92001
		1.89900	
		8.93137	8.97899
		4 52 49	5 26 33

M 54 1.35	M 23 41.10	M 48 16.40
M 54 4.67	M 24 58.85	M 49 35.57
M 54 7.95		R 49 35.67
M 54 10.37		R 49 35.80
M 54 14.25	24 58.85	49 35.65
M 54 15.15	77.75	79.25

38 40 82.7

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111		270		275	
51' H. Cephei L.C.		δ Aquilae		β Cygni	
h m s 6 43 16 + 92° 49'	0.15854	h m s 18 59 57 + 13° 41'	1.17609 9.98750 1.16359	0.15854 h m s 19 25 50 + 27 42	1.17609 9.94714 1.12323

1879 Aug 23

		41	36.38			37 40.2	
+ 2	48.36	39.34	40.05	44	27.70		
			41.60			38 20.2	
			50.87				
+ 2	34.05	53.61	53.68		27.66	39 17.2	
			56.27				
		42	5.29			40 16.7	
+ 2.	20.05	7.84	7.60		27.89		
			10.62			41 18.0	
			19.30				
+ 2	5.92	22.07	22.25		27.99		
			24.65				
			33.68				
+ 1	57.96	36.46	36.50		28.42		
			39.20				
			48.17				
+ 1	38.06	50.35	50.37		28.41		
			52.52				
		43	1.46				
+ 1	24.00	4.19	4.05		28.19		
			7.05				
			15.50				
+ 1	9.98	18.52	18.20		28.50		
			21.85				
			30.25				
+	55.88	33.12	32.65		29.00		
			36.47				
			45.04				
+	42.96	47.45	47.63		30.41		
			49.68				
		44	56.70				
+	27.98	0.93	1.30		28.91		
			4.80				
			13.10				
+	13.96	16.05	15.90		30.01		
			19.15				
			26.72				
−	−.02	29.96	30.48		29.94		
			32.68				
			40.68				
−	13.92	43.36	43.35		29.44	M 44 46.25	
			46.05			M 44 42.32	
			53.40			M 44 36.32	
−	27.94	57.68	57.35		29.74	M 44 32.27	
		45	0.30			M 44 26.22	
			10.20				
−	41.92	12.44	12.48		30.52		
			14.65				
			23.40				
−	55.98	26.21	25.67		30.23		
			29.53				
			38.00				
− 1	10.02	40.56	40.27		30.54		
			43.47				
			51.30				
− 1	23.90	54.76	54.70		30.86		
			58.37				
		46	6.30		49.00		
− 1	38.00	8.72	8.48	51.14	51.05	44 30.72	− 2 20.03 44 31.11
			11.38		53.38		
			20.37	47	2.38		
− 1	52.06	23.13	23.28	5.45	5.38	29.07	− 2 34.13 31.32
			25.75		8.60		
			34.15		17.00		
− 2	6.08	37.43	37.77	19.56	19.77	31.35	− 48.16 31.40
			40.37		21.90		

79923

44 29.572

δ Aquilae:

1 0.68		0 55.0	
2.75	4.890	56.6	
4.80	4.89	58.3	
7.05		0.4	
2445 9.17		2920 1.7	
2445		2920	
13.30		0 58.40	
15.50		+ 23.42	
17.68			
19.70	21.812		
21.80	21.81	1 49.2	
23.85	21.83	51.5	
26.00		52.9	
28.20		54.3	
19631 30.28		2644 56.5	
19631		2644	
34.50		1 52.88	
36.60	38.780	− 31.06	
38.80	38.78		
40.90	43.67		
19390 43.10		0 58.40	
19390	1 21.820	1 52.88	
		+ 23.42	
		− 31.06	
		54.48	
		1.73624	
		1.16359	
		2.89983	
		1.88423	
		8.98440	
		5 30 37	

M 47 10.00		
M 48 26.50	52 .02	10
R 48 26.62		2
R 48 26.72	67 05	12
M 48 26.55		5
48 26.60		
76.60		.07

β Cygni:

26 58.40		26 49.2
0.70	3.056	50.8
3.00	3.06	52.8
5.40		54.8
31528 7.78		2643 56.7
1528		143
12.32		26 52.86
14.70		+ 28.77
17.00		
19.27	21.615	
21.58	21.62	27 52.0
24.00	21.64	53.4
26.22		55.3
28.55		57.3
19454 30.90		2773 59.3
19454		273
35.60		27 55.46
37.90	40.232	− 33.83
40.20	40.23	
42.55	43.29	
20115 44.90		26 52.86
20116	27 21.630	27 55.46
		+ 28.77
		− 33.83
		62.60
		1.79657
		1.12323
		2.91980

M 46 0.58		
M 46 19.97	.92 05	05
R 46 20.15		13
R 46 20.10	.12 02	8
M 46 19.87		15
20.02		.10

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277

χ Aquilae

h m s
19 40 20
+10° 19′

1.17609
9.99292
1.16901

41 40.53		41 31.5	
42.67	44740	33.0	
44.74	44.74	33.0	
46.86		36.7	
22370 48.80		1744 38.2	
2370		244	
53.05		41 3488	
53.20		+ 2661	
53.29			
55.45	1484		
1.48	1.48	42 25.6	
3.57	1.50	26.9	
5.67		29.6	
7.75		31.3	
55336 9.90		1465 33.1	
1336		1465	
14.06		42 29.30	
16.20	18268	− 27.81	
18.28	18.27		
20.50	12361		
9134 22.50		41 34.88	
9134	42 1.490	42 29.30	
		+ 26.61	
		− 2781	
		54.42	
19 40 34.81		1.73576	
		1.16901	
		2.90477	
		1.89332	
		8.98855	
		5 33 47	

M 8 53.78	
M 10 12.05	
R 10 12.00	
R 10 11.95	
10 12.00	
78.22	

10 18 34.6

280

ζ Aquilae

h m s
19 44 53
+8° 33′

0.15854

46 3.80		45 54.0	
5.50	7196	55.6	
7.25	7.19	57.0	
9.25		58.7	
3598 11.48		2863 1.0	
3598		2863	
13.50		45 5726	
17.60		+ 2660	
19.68			
21.70	23842		
23.90	23.84	46 51.9	
25.90	23.88	53.8	
28.05		55.1	
30.05		56.9	
21458 32.20		2757 58.5	
21458		257	
36.45		46 5514	
38.48	40574	− 31.28	
40.57	40.57		
42.67	4776		
20287 44.76		45 57.26	
20287	46 23860	46 55.14	
		+ 26.60	
		− 31.28	
		57.88	
19 44 56.74		1.76253	

M 55 0.42	
M 10 23.40	

8 38 14.3

0.15854

h m s
19 49 22
+6° 6′

1.17609 0.15854
9.99753
1.17362

50 32.45		50 22.1	
34.60	36650	23.9	
36.65	36.65	25.4	
38.70		26.8	
18325 40.85		1262 28.0	
18325		262	
44.95		50 2524	
47.00		+ 28.04	
49.30			
51.27	53311		
5330	53.31	51 22.6	
55.44	53.26	24.5	
57.49		26.0	
59.55		27.6	
47980 1.60		1298 29.1	
47980		298	
3.75		51 2596	
7.80	9870	− 32.68	
9.80	987		
12.00	10652		
4935 14.10		50 25.24	
4935	50 53.285	51 25.96	
		+ 28.04	
		− 32.68	
		6072	
		1.78333	
		1.17362	
		2.95695	
		1.94067	
		8.98372	
		5 30 6	

M 21 35.37			
M 23 2.60	60	.00	0
R 23 2.72			12
R 23 2.50	61	.11	10
M 23 2.60			0
232.60			
87.23			.05

6 6 84.0

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287

θ Aquilae

h m s
20 5 4
− ° ′ 1.17609
11 9.99991
1.17600

1879
Aug 28

6 14.20		6 14.5	
16.25	18.310	16.5	
18.30	18.31	17.8	
20.30		19.4	
9155 22.30		896 21.4	
9155		896	
26.30		6 17.92	
28.60		+ 16.88	
30.67			
32.70	34786		
3480	3478	7 1.8	
36.80	34.81	3.8	
39.00		5.4	
41.00		7.2	
31307 43.70		272 9.0	
31307		272	
47.05		7 5.44	
49.30	51306	− 30.64	
51.20	51.31		
53.40	6962		
25653 55.48		6 1792	
653	6 34.795	7 5.44	
		+ 16.88	
		− 30.64	
		47.52	
		1.67688	
		1.17600	
		2.85288	
		1.83372	
		8.98084	
		5 27 56	

M 38 44.57 .
M 39 52.65 .66 01 11
R 39 52.80 . 4
R 39 52.90 .85 05 14
M 39 52.67 . 4
39 52.76
6819 .10

73

ζ Tauri

h m s
4 28 59
0.15854 + ° ′ 1.17609
16 16 9.98226
1.15835

30 8.20		30 1.7	
10.40	12.570	3.2	
12.51	12.51	5.0	
14.63		6.4	
6255 16.75		247 8.4	
6255		247	
21.18		30 49.4	
23.26		+ 24.74	
25.38			
27.48	29.696		
29.45	29.69	30 59.0	
31.90	29.66	0.6	
33.95		2.0	
36.18		3.7	
26726 38.25		3107 5.4	
26726		107	
42.50		31 2.14	
44.66	46818	− 32.46	
46.76	46.82		
48.87	5933		
28409 51.20		30 49.4	
23409		30 29.675	31 2.14
			+ 24.74
			− 32.46
			57.20
4 29 1.79			1.75740
			1.15835
			2.91575
			1.89581
			8.98006
			5 27 21

M 12 24.15 .
M 13 43.02 .98 04 30
R 13 42.55 . 27
R 13 42.80 .68 .12 2
M 13 42.95 . 13
13 42.82
78.67 .15

16 16 58

84

β Eridani 0.15854

h m s
5 1 57
0.15854 − ° ′ 1.17609
15 9.99817
1.17426

3 3.27		2 54.3	
5.30	7.404	56.2	
7.45	7.40	57.9	
9.50		59.5	
3702 11.50		2895 1.0	
3702		2895	
15.70		2 57.90	
17.70		+ 26.04	
19.78			
21.80	23.953		
2400	2395	3 53.3	
26.80	23.92	55.2	
28.10		56.6	
30.20		58.4	
21558 32.25		2836 0.1	
21558		2836	
36.30		3 56.72	
38.40	40450	− 32.78	
40.45	40.45		
42.50	4785		
20225 44.60		2 57.90	
225	3 23.935	3 56.42	
		+ 26.04	
		− 32.78	
		58.82	
		1.76953	
		1.17426	
		2.94379	
		1.92742	
		8.98363	
		5 30 2	

M 42 19.97 .
M 43 37.62 .58 04 4
R 43 37.72 . 14
R 43 37.42 .57 15 16
M 43 37.55 . 3
43 37.58
84.61 .04

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87

ζ Orionis

h m s
5 8 49
− 8 21

0.15854

9 32.32		9 46.0	
34.32	56402	47.5	
36.37	56.40	48.7	
38.40		51.4	
28201 0.60		2452 52.6	
28201		2452	
4.75		9 49.04	
6.77		+ 2401	
8.87			
10.92	13036		
13.10	13.04	10 40.4	
15.12	13.06	42.3	
17.23		43.9	
19.26		45.3	
11732 21.40		2186 46.7	
11732		186	
23.60		10 43.72	
27.60	29.720	− 30.67	
29.70	29.72		
31.80	14612		
14860 33.90		9 49.04	
14860	10 13.050	10 43.72	
		+ 24.01	
		− 30.67	
		54.68	

5 8 45.86 — 1.73783

M 49 2.97 .
M 49 21.45 .31 14 18
R 49 21.20 . 7
R 49 21.25 .23 02 2
M 49 21.17 . 10
49 21.27
.89

8 20 16.7

90

β Tauri

h m s
5 18 39
+ 28 30

1.17609
9.94390
1.11999

0.13854

19 41.65		19 35.5	
43.00	51316	37.2	
45.27	51.31	39.0	
47.66		40.5	
25658 56.00		1945 42.3	
658		1945	
0.68		19 3.890	
3.13		+ 31.16	
5.40			
7.65	10036		
10.04	10.04	20 41.9	
12.32	1007	43.3	
14.70		44.6	
17.00		46.0	
9032 19.40		2234 47.6	
9032		234	
2420		20 44.68	
26.50	28840	− 34.62	
28.90	2884		
31.10	14015		
14420 33.60		19 3890	
14420	20 10.055	20 44.68	
		+ 31.16	
		− 34.62	
		65.78	

5 18 41.81 — 1.81809
1.11999
2.93808
1.91624
8.97816
5 25 56

M 58 19.62 .
M 59 42.00 .05 .05 6
R 59 42.10 . 4
R 59 42.05 .07 02 1
M 59 42.10 . 4
59 42.06
82.44 .04

28 30 16.5

102

λ Orionis

h m s
5 48 37

0.15854

+ 7° 28'

49 46.67		49 31.3	
48.78	50906	33.6	
50.90	50.91	35.7	
53.02		42.0	
25453 55.18		2014 43.8	
453		2014	
57.28		49 40.28	
1.36		+ 27.27	
3.38			
5.47	7.541		
7.53	7.54		
9.55	7.56		
11.68			
13.72			
60787 15.80			
6787			
20.10			
22.10			
24.20	24.21		
26.30	13512		
12105 28.45		49 40.28	
	50 7.550	+ 27.27	

5 48 89.91

M 5 3.17 .
M 5 3.32 .34 02 3
R 5 3.50 . 15
R 5 3.22 .36 14 13
M 5 3.37 . 2
3.33
.08

7 28 7.8

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8

Sun c = 46, 950

h m s
10 12 39
+ 11° 5'

0.18854

1879
Aug 24

12 37.35			13 47.7	14 46.85		14 7.0		1 2.00			0 32.0				423.32
37.70	41.810		50.9	47.00	51.180	7.2		4.05	6.210		33.9				20.87
41.90	41.81		52.4	51.25	51.18	10.8		6.27	6.21		35.3				18.65
43.10			54.0	53.35		12.4		8.30			37.2				16.32
20905 46.70			2631 56.12	55590 55.45		537 14.3		3105 10.45			2774 39.0				19.98 32
905			131	590		537		3105			274				
37.30			13 52.62	57.45		14 10.74		14.70			0 55.48				9.32
52.30			− 53.95	1.62		+ 57.24		16.90			+ 27.72				
54.40				3.72				18.25							
56.36	58662			5.70	7968			21.15	23207						
58.70	58.66			8.00	7.97			23.20	23.21		1 30.7				
0.80				10.20	7.98			25.25	23.19		32.6				
2.90				12.23				27.42			34.0				
5.00				14.23				29.58			35.6				26.49
52796 7.00				61171 16.36				20886 31.70			2705 37.6				9.33
52796				7171				20886			205				
11.25				20.45				33.70			1 54.10				13.54
13.38	15532			22.70	24780			35.87	40180		− 30.90				14.31
15.30	15.53			24.82	24.78			40.18	40.18						18.65
17.68	11734			26.95	13596			4228	4639						30.98
7766 19.85			13 52.62	12390 29.00			14 10.74	20090 44.47			0 55.48				23.95 20
7766			12 58.670	− 53.95	2390		15 7.975	+ 5724	20090	1 23.200	1 54.10				
											+ 27.72				
											− 30.90				
											58.62				
											1.76805				
											1.16359				
											2.93164				
											1.91397				
											8.98233				
											5 29 4				

M 7 32.85 · M 39 47.50 ·

M	47 4.42 ·		
M	48 26.10	40 00	5
R	48 26.57 ·		12
R	48 26.45	51 .06	0
M	48 26.40 ·		5
	48 26.45		
	82.03		.05

269

U Aquilae

h m s
18 59 50
+ 13 41

1.17609
9.98750
1.16359

0.15854

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275 β Cygni 9.94714

19 25 50 0.15854
+ 27 42

277 γ Aquilae

h m s
19 40 30
+10 19

1.17609
9.99292
1.16901

280 ζ Aquilae

h m s
19 44 59 0.15854
+ 8 38 0.15854

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283 β Aquilae

19h 49m 22s
+6° 6′

1879 Aug 24

+20.76 54.86 | 50 34.10 | 50 24.8
18.67 54.77 | 218.59 36.10 | 26.7
54.747 — | 28.0
14.53 54.63 | 40.10 | 30.0
12.45 54.73 | 42.28 | 1407 31.2
1407
8.30 54.65 | 491.72 46.35 | 50 28.14
6.23 54.65 | 54.635 48.40 | + 2653
4.15 54.65 | 50.50
+2.05 54.65 | 52.60 | 54.650
−0.00 54.50 | 54.50 | 5465 | 51 34.1
2.07 54.57 | 56.56 | 35.3
4.15 54.65 | 58.80 | 36.7
6.23 54.77 | 1.00
8.31 54.81 | 49185 3.12
49185
54.691
54.669
50 28.14

19 49 26.18

M 21 37.70
M 23 13.27 | 11 16 41
R 23 12.62 | 24
R 23 12.62 | 62 00 24
M 23 12.95 | 9
23 12.86
95.16 | .25

6 6 34.1

30 β Arietis

1h 47m 57s
+20° 18′
0.15854
1.17609
9.97238
1.14847

49 8.65 | 48 58.4
10.87 | 13044 | 59.8
13.00 | 13.04 | 1.3
15.25 | 3.3
6522 17.45 | 3084 5.6
6522 | 84
21.90 | 49 1.68
24.00 | + 2888
26.17
28.36 | 30543
30.60 | 30.54 | 49 58.0
32.67 | 30.58 | 59.8
34.87 | 1.8
37.00 | 3.9
27489 39.32 | 3094 5.9
27489 | 94
43.80 | 50 1.88
45.95 | 48132 | − 31.32
48.06 | 48.13
50.30 | 6117
24066 52.55 | 49 1.68
24066 | 49 30.560 | 50 1.88
+ 28.88
− 31.32
60.20
1.77960
1.14847
2.92807
~~1.97845~~ 1.90542
~~9.05038~~ 8.97735
~~6 24 27~~ 5 25 20

M 45 12.07
M 46 32.57 | 52 05 7
R 46 32.65 | 15
R 46 32.32 | 49 17 18
M 46 32.47 | 3
46 32.50
80.43 | 11

32 γ Androm.

0.15854
1h 56m 28s
+41° 45′
0.15854
1.17609
9.87277
1.04886

57 35.35 | 57 33.4
37.80 | 4738 | 34.7
40.90 | 40.74 | 36.8
43.47 | 38.6
20369 46.17 | 1868 43.3
369 | 1868
51.75 | 57 37.36
54.75 | + 2550
57.30
0.25 | 2853
2.70 | 285 | 58 38.5
5.56 | 2.86 | 40.9
8.29 | 42.6
11.21 | 44.6
56568 13.87 | 2137 47.1
2568 | 2137
19.50 | 58 4274
21.96 | 24980 | − 3988
25.00 | 24.98
27.84 | 12572
12490 30.60 | 57 37.36
12490 | 58 2.855 | 58 42.74
+ 25.50
− 39.88
65.38
1.81544
1.04886
2.86430
1.83992
8.97562
5 24 3

M 43 56.35
M 45 5.50
R 45 5.55
~~45 5.52~~
45 5.52
69.17

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33

L Arietis

h m s
2 0 21
+ 22 5.8'

0.15854

1	32.20		1	31.0			57	—	57 35.3
	34.40	36.40		33.0				—	36.6
	36.70	36.64		35.6				—	38.4
	38.90			37.2	4.48	29.68	15.20	54.34	39.7
18320	41.10		1761	38.3	12.40	29.66	17.26	29.67	1917 41.7
	18320			1761					1917
	45.58		1	3.522	8.27	29.77	21.50	267.91	57 38.34
	47.80		+	1928	6.26	29.80	23.60	29.54	— 8.68
	50.05				9.93	29.63	25.80		
	52.30	54.551			12.05	29.55	27.50	29.706	
	54.60	54.55	2	22.6	9.70	29.62	29.62	29.70	57 53.3
	56.80			25.2	2.06	29.79	31.85		56.0
	59.00			27.2	4.14	29.74	33.88		57.9
	1.33			29.5	6.20	29.70	35.90		58.7
49096	3.50		1368	31.3	8.24	29.72	26735 38.00		2881 1.2
	49096			1968			26735		2881
	7.84		2	2.736	12.48	29.70	42.10		57 57.62
	10.10	12.368	—	3.286	14.47	29.53	44.80	46.152	— 27.96
	12.35	12.36			16.54	29.66	46.20	46.15	
	14.70	10900			18.61	29.74	48.20	148.40	
6184	16.85		1	35.22	20.74	29.72	23076 50.26	29.60	57 38.34
	6184	1 54.500	2	27.36			23076		57 57.62
			+	19.28					
			—	3286					
				52.14					24.620
2	02516		1.71717				2 56	0.69	29.665

5

M	36	3.22		R	52 10.22
M	36	13.05	17.12 7	R	52 10.00
R	36	12.75	23		
R	36	12.82	79.03 16		
M	36	13.30	32		
	36	12.98			
			20		

22 58 417 — 397 12.5

47

L Cetii

h m s
2 56 57
+ 3 9'

0.15857

57 — — 57 35.3
— 36.6
— 38.4
15.20 54.34 39.7
17.26 29.67 1917 41.7
1917
21.50 267.91 57 38.34
23.60 29.54 — 8.68
25.80
27.50 29.706
29.62 29.70 57 53.3
31.85 56.0
33.88 57.9
35.90 58.7
26735 38.00 2881 1.2
26735 2881
42.10 57 57.62
44.80 46.152 — 27.96
46.20 46.15
48.20 148.40
23076 50.26 29.60 57 38.34
23076 57 57.62

Shell not numbered

56

E Eridani

h m s
3 27 17
— 9 52

0.15854

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138

L Hydrae

9 2 38
−8° 8'

1.17609 0.15854
9.99561
1.17170

18.9

S of 4

22 4.69		22 0.0	21.15	43.40	2 2225			
6.70	8.744	1.6	19.02	43.47	216.97	2445	26480	
8.65	8.74	3.9	16.92	43.37	43.394	26.15	26.48	
10.80		4.4	19.80	43.40		28.60		
4372 12.88		151 6.2	12.68	43.33	13240	30.65		
4372		151				13240		
17.20		22 302				—		
17.20		+ 2238				—		
21.30						—		
23.38	25424		20.8	43.37	26020	111.28		
28.36	25.41	22 52.8	0.60	43.46	43.344	4346		
27.50	25.38	54.2	2.11	43.26		45.37		
29.60		55.5	4.23	43.39		4760		
31.60		57.2	6.34	43.46		49.80		
22874 33.70		2788 58.0	8.47	43.28		51.75		
22882		288						
37.87		22 55.76	12.68	43.22	173.01	55.90		
40.03	42.020	− 30.36			43.232	—		
42.00	42.02		16.91	43.39		0.30		
44.05	50.76		19.03	43.26		2.39		
21010 46.15		22 302	21.21	43.14		4.36		
21010	22 25.395	22 55.76						
		+ 22.38						
		− 30.36	43.364					
		52.78	43.345					
9 21 40.25		1.722214				12 1 57.62		
		1.17170						
		2.89384						
		1.87227						
		8.97843						
		5268						

146

L Leonis

10 1 37
+12 33'

0.15854

M 36 4.57								
M 37 19.10	08 02 1							
R 37 19.12	3							
R 37 19.10	11 01 1							
M 37 19.05	4							
37 19.09								
7452	.02							

AR only

12 88 20.2

8 8 97

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8

Iris C 4,066

h m s
10 56 19
+6° 47'

0.15854

18.9 Sept 5

—		57 46.4	58 44.50		58 4.9		20 15.80		20 9.3			
—		48.3	46.60	48640	6.6		17.67	19894	10.8			
—		50.2	48.60	48.64	8.4		20.00	19.89	12.5			
—		52.0	50.70		9.9		22.08		14.0			
—		2507 53.82	4320 52.80		403 11.5		9947 24.10		626 16.0			
		2507	24320		413		9947		626			
—		57 5014	57.05		58 8.26		28.18		20 12.52			
—			59.00		+ 57.06		30.30		+ 24.09			
—			1.05				32.42					
—			3.23	5314			34.58	36.598				
—			5.30	5.31			36.58	36.60	21 15.2			
—			7.35	5.34			38.65	36.62	16.0			
—			9.55				40.80		16.7			
—			11.60				42.87					
—		58783	13.70				32938 45.80					
			4783				32938					
—			17.80				47.90					
—			19.85	22.048			57.37	53.354				
—			22.05	22.05			53.40	53.35				
—			24.18	13069			55.45	7324				
—		57 5014	11024 26.36	"	58 8.06		26677 57.55		20 12.52			
			11024	59 5.325	+ 57.26		1677	20 36.610	+ 24.09			

18 18 57.88

M 25 11.75 .

M 57 32.82 .

M 59 45.60 .
M 1 16.57 .63 06 11
R 1 16.70 . 2
R 1 16.75 .73 02 7
M 1 16.70 . 2
1 16.68
91.08 .05

10 82 09

587

Virginis

h m s
13 18 49
−10° 32'

0.15854

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187 d 200

α Bootis			ε Bootis 9.94760		β Librae	0.15854
h m s 14 10 8	1.17609	0.15854	h m s 14 39 42	0.15854	h m s 15 10 30	1.17609
+ 19° 49′	9.97349		+ 27° 35′		− 8° 56′	9.99470
	1.14958					1.17079

1879 Sep. 5

11 34.80		11 27.5		41 —		40 11.4		11 57.00		11 46.7	
37.00	39.184	28.9		—				59.15	1.202	48.0	
39.16	39.18	30.6		—				1.18	1.20	49.9	
41.30		32.3		—				3.30		51.5	
19592 43.66		1534 34.1		—				30601 5.38		2492 53.1	
19592		1534						6.01		2492	
48.00		11 30.68	4.31 30.68	214.58 21.37				9.50		11 49.84	
50.18		+ 26.00	6.98 30.78	30.654 23.80				11.67		+ 28.04	
52.27			4.65 30.80	26.15				13.67			
54.50	56683			—				15.80	17.909		
56.68	56.68	12 28.9	0.00 30.60	30.60		41 52.7		18.00	17.91	12 45.7	
58.90	56.69	30.9		—		55.0		20.05	17.86	47.0	
1.00		32.4	4.66 30.62	35.28		57.0		22.05		49.0	
3.25		34.0	6.98 30.62	37.60		58.8		24.22		50.2	
51015 5.47		1622 36.0	9.32 30.48	39.80		2842 0.7		16118 26.22		2438 51.4	
51015		122				2842		16118		2438	
9.75		12 32.44	12.47 30.33	152.72 44.50		41 56.84		30.37		12 48.76	
12.00	14.200	− 35.76	16.30 30.62	30.544 46.92	49.184	− 26.23		32.40	34534	− 30.88	
14.20	14.20		18.63 30.37	49.00	49.18			34.50	34.53		
16.37	11338		20.95 30.53	51.50				36.60	35.73		
7100 18.68		11 30.68	22.35 30.65	24592 54.00				17267 38.80		11 49.84	
7100	11 56.685	12 32.44		24592		41 56.84		17267	12 17.885	12 48.76	
		+ 26.00								+ 28.04	
		− 35.76	30.599							− 30.88	
		60.76	30.608							58.92	
14 10 10.59		1.79071								1.77026	
		1.14958								1.17079	
		2.94029								2.94105	
		1.92763								1.92148	
		8.98734								8.98043	
		5 32 51								5 27 38	

M 39 57.65.		M 54 50.25.	M 24 3.70.	
M 41 22.05.	18 13 25	R 54 50.78.	M 25 27.07.	25 18 9
R 41 22.42.	12		R 25 27.12.	4
R 41 22.40.	41 01 10		R 25 27.05.	08 03 11
M 41 22.32.	2		M 25 27.42.	26
41 22.30			25 27.16	
84.65	12		8346	.13

19 48 40.3

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209

L Ret. Boz.

h m s
15 29 34
+ 21 ° ′

0.15854

30	58.30	723.39	22.46	30	57.3
	1.70	20.86	22.56	89,90	65.7
	3.80	18.86	22.36	22.47	57.6
	6.25	16.24	22.49		59.1
				2885	1.2
					2885
				30	57.70
				+	24.16
	17.83	4.43	22.46	157.15	
	20.20	2.29	22.49	22.47	
	22.32	1.09	22.35		
	24.70	2.11	22.39		
	27.12	4.67	22.46		
	28.50	6.96	22.54		
	31.73	9.29	22.44		
				30	57.70

22.472
22.459
15 29 86.12

M 21 26.70
R 21 26.60

27 7 18.5

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1879phae.proj.1504

256

P Eus, Mem.

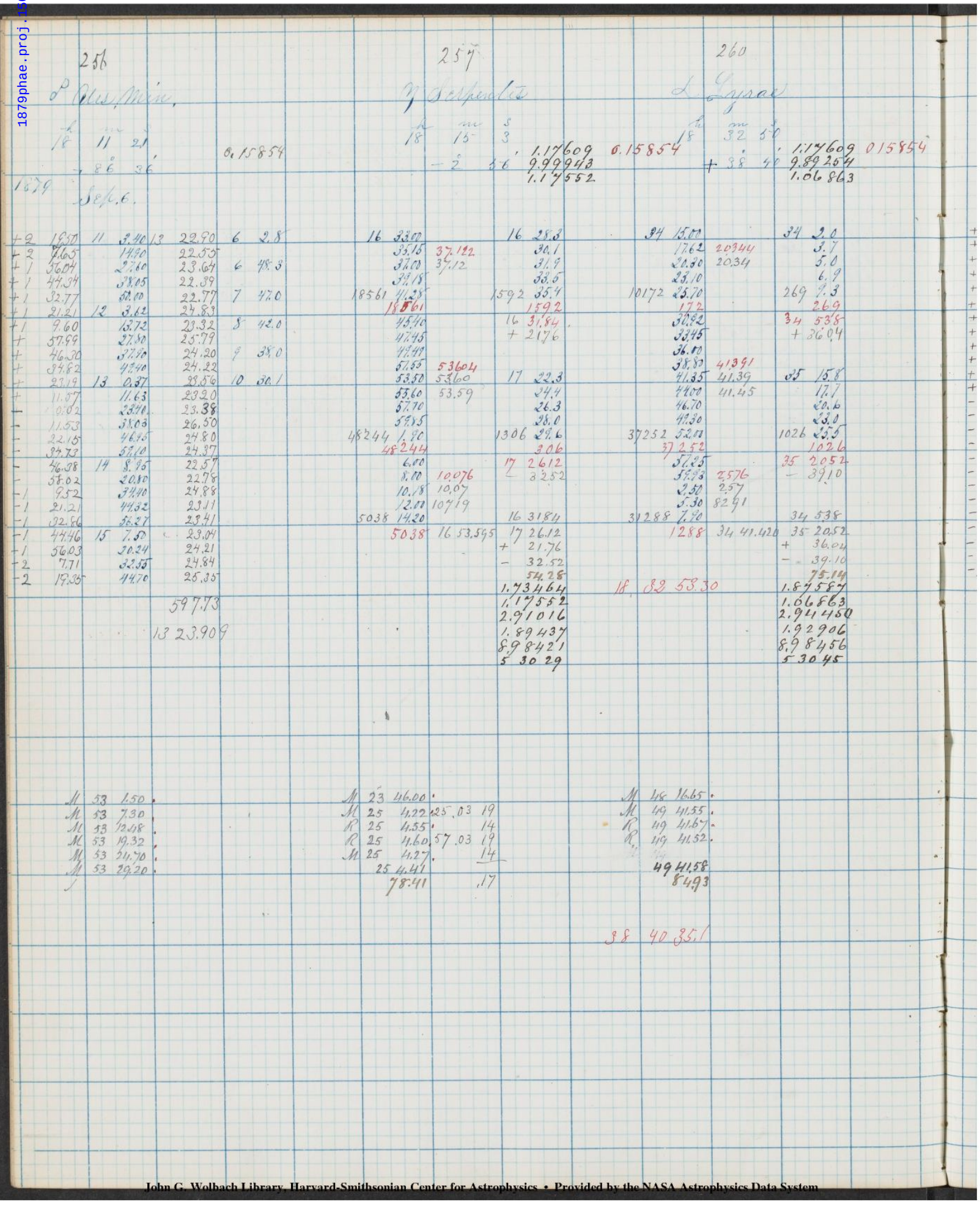
257

Y Delphinis

260

L Lyrae

1879 Sept. 6.



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1879phae.proj.j0004

111

51 Aquilae Z.C.

h m s
6 48 16

1° 49'

0.15854

270

η Aquilae

h m s
18 59 51

+ 1° 41'

1.17609 0.15854
9.98750
1.16359

275

β Cygni 015854

h m s
19 25 50

+ 2° 42'

1.17609
9.94714
1.12323

+2	48.16	41	57.42	44'	45.58	39	33.3		1	20.80			1	14.5		27	18.60		27	13.5
+2	34.13	42	10.68		44.81					22.77	25014			16.2			20.85	23190		15.4
+2	20.03		26.37		46.40	40	15.0			25.00	25.01			17.7	1790		23.15	23.19		17.7
+2	6.08		40.55		46.63					27.25				19.6			25.45			17.9
+1	52.06		54.65		46.71	41	20.0		12507	28.25			895	21.5		14595	27.90		882	21.5
+1	38.08	43	9.95		47.95					2507				895			1505			882
+1	23.90		23.15		47.05	48	2.5			32.40			1	1790			32.45		27	1764
+1	10.02		36.70		46.72					35.76			+	2409			34.70		4	24.12
+	55.98		53.92		49.90	48	52.0			37.88							37.20			
+	41.92	44	7.00		48.92					32.84	41999						39.48	41751		
+	27.94		21.70		49.61	50	0.1			42.10	4190		2	10.7			41.70	41.75	28	16.5
+	13.92		33.30		47.22					44.15	41.99			12.8			44.10	41.78		17.1
−	.02		47.78		47.76					46.18				14.6			46.40			20.6
−	13.96	45	2.60		48.64					48.38				16.6			48.75			22.3
−	27.98		16.30		48.32				37799	50.48			732	18.5		37576	50.38		1025	24.0
−	42.02		32.70		51.68					37799				732			37576			102.5
−	55.84		47.48		51.60					50.13			2	1464			3370		28	2050
−1	9.98		59.50		49.52					56.38	58970		−	32.65			38.00	0366	−	38.74
−1	24.00	46	13.70		49.70					58.25	55877						0.45	0.37		
−1	38.06		28.20		50.84					1.00	83.98						2.61	8.356		
−1	51.96		43.20		51.24				29485	3.27			1	17.90		30183	5.00		27	1764
−2	5.92		58.60		52.68					29485	1	41990	2	14.64			183	27 41765	28	20.50
−2	20.05	47	11.15		51.10								+	2409					+	24.12
−2	34.05		23.60		49.55								−	32.65					−	38.74
−2	48.36		35.30		49.94									56.744						62.86
					1299.90									1.75389						1.79837
				44	49.196									1.16359						1.12323
														2.91748						2.92160
														1.90347						1.90314
														8.98599						8.98154
														5 31.50						5 28.28

M	41	44.57							M	47	12.82					M	46	8.40		
M	41	39.22							M	48	33.05	90	13	16		M	47	28.55	42	13 14
M	41	34.78							R	48	32.97			8		R	47	28.30		11
M	44	4.95							R	48	32.82	90	08	7		R	47	28.18	39	09 7
M	44	2.40							M	48	32.75			14		M	47	28.30		11
M	44	58.27								48	32.89						47	28.41		
											80.07			11				80.01		11

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See Min. on this page.

280

α Aquilae

h m s
19 44 57.9
+8° 38'

0.15854

1879 Sep. 6.

45 32.28		45 12.6	
35.28	27376	13.8	
27.30	27.38	15.1	
22.47		16.3	
13688 31.55		755 17.7	
13688		755	
35.65		45 15.10	
37.83		+ 28.96	
40.00			
42.01	44079		
44.26	44.08	46 12.3	
46.20	44.04	14.2	
48.20		15.6	
50.18		17.5	
39671 52.37		788 19.2	
39671		28.8	
56.48		46 15.76	
58.65	0.700	− 31.70	
0.77	0.70		
2.80	8808		
36350 4.81		45 15.10	
350	45 44.060	46 15.76	
		+ 28.96	
		− 31.70	
		60.66	

19 44 56.63

283

β Aquilae

h m s
19 49 22

+ 6 6

1.17609
9.99753
1.17362

0.15854

49 52.55		49 43.0	
54.68	56736	44.7	
56.75	56.74	46.1	
58.80		42.6	
28368 0.90		2304 42.0	
28368		304	
5.20		49 46.08	
7.10		+ 27.23	
9.20			
11.25	13328		
13.30	13.33	50 40.5	
15.30	13.29	42.4	
17.40		44.2	
19.60		45.6	
11995 21.60		2199 47.2	
11995		199	
25.77		50 43.98	
27.77	29.848	− 30.67	
29.80	29.85		
31.80	146.59		
14924 34.00		49 46.10	
14924	50 13.310	50 43.98	
		+ 27.21	
		− 30.67	
		57.88	

19 49 26.7

1.76253
1.17362
2.93615
1.92381
8.98766
5336

287

ο Aquilae

h m s
20 5 4

− 1 11

6 34.36		6 27.9	
36.36	38504	29.6	
38.52	38.50	30.8	
40.60		32.3	
19252 42.68		1543 33.7	
19252		1543	
46.70		6 30.86	
48.88		+ 24.14	
50.92			
52.82	55009		
54.82	55.01	7 21.9	
57.10	54.98	24.4	
57.20		25.6	
1.24		27.1	
49508 3.20		1277 28.7	
49508		277	
7.40		7 25.54	
9.33	11446	− 30.54	
11.40	11.45		
13.50	10995		
5723 15.60		6 30.86	
5723	6 54.995	7 25.54	
		+ 24.14	
		− 30.54	
		54.68	

1.73783

M 54 59.62
M 55 26.80
R 55 26.78
R 55 26.65
55 26.74

8 33 15.7

M 21 38.95
M 23 2.78 79 01 8
R 23 3.00 14
R 23 2.879 3 06 1
M 23 2.80 6
23 2.86
83.91 .07

6 6 35.3

M 38 37.12
M 38 54.10 44 04 8
R 38 54.67 19
R 38 54.35 51 16 13
M 38 54.18 0
54.48
6 .60

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1879phae.proj.0504

S

Sun c = 46,966 999759

h m s
11 9 39
-6° 2'
0.15854

1879
Sept. 7

3 52.00		4 53.0	5 57.40 +20.75 20.15	5 27.8		
34.80	56.070	54.7	—	20.15 27.5		
56.10	56.07	56.5	—	20.15 30.8		
58.02		57.9	—	32.3		
28035 0.25		2818 59.7	—	1544 34.1		
28035		3.18		44		
4.30		4 56.36	—	5 30.88		
6.41		− 43.68	—	+ 49.73		
8.57			—			
10.65	12.686		—			
12.68	12.68		—			
14.80	12.68		—			
16.80			—			
18.80			—			
14417 21.00			—			
11 417						
25.10			33.20 − 12.45 20.75	103.56		
27.17	29.280		35.22 33.64 20.69	20.71		
29.23	29.28		37.37 37.36 20.77			
31.40	14535		39.43 18.68 20.75			
14640 33.50		4 56.36	18682 41.60 20.81 20.77	5 30.88		
14640	4 12.680	− 43.68	18682			
			20.43			
			20.61			

M 9 41.42 · M 42 28.17 ·

226

Ψ Draconis

h m s
16 22 21
+61° 47'
0.15854

23 55.6		23 48.0	24 35.0			
0.1		57.6	37.7			
4.3		54.6	41.1			
8.7	13,00	58.2	44.3			
12.9		2744 2.0	2070 48.9			
17.4		2744	70			
21.7		23 54.88	24 41.40			
26.0		+18.12	− 28.40			
70 30.3						
1170						
		25 24.5				
		26.5				
		29.7				
		32.3				
		1483 34.3				
		1483				
		25 29.66				
		−1 16.68				
		23 54.88	24 41.40			
		25 29.66				

R 42 16.52 ·
R 42 47.97 ·
R 43 19.38 ·
R 43 19.35 ·

43 19.36

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1879phae.proj.1504

597 — γ Ophiuchi — 16h 30m 30s, −10° 19′

598 — η Ophiuchi 9.98377 — 17h 3m 27s, −15° 34′ — 0.15854

237 — α Herculis 0.15854 — 17h 9m 18s, +14° 32′ — 0.15854

1.17609
9.98588
1.16197

1879 Sep. 7

γ Ophiuchi

32 0.10
2.17 4282
4.29 428
6.35
2141 8.50
2141
12.68
14.90
16.90
19.00 21.076
21.00 21.08
23.20 21.04
25.25
27.32
18968 29.43
968
33.60
35.70 37800
37.80 37.80
39.90 42.08
18900 42.00
3900 32 21.060 + 270

32 15.4
16.5
18.4
20.0
918 21.5
918
32 1836
+ 2.70
32 18.36

η Ophiuchi

5

−4.29 17.91 53.73 22.20
6.43 17.92 17.91 24.35
8.58 17.90 21.48

12.85 17.85 89.20 30.70
14.99 17.91 17.85 32.90 34990
17.14 17.86 35.00 3499
19.28 17.87 37.15
21.49 17.71 17495 39.20
2495

17.880
17.866

5 31.7
33.6
35.4
36.8
1762 38.7
262
5 3524
+ 4263

5 58.3
59.8
1.0
2.2
3046 3.3
46
6 092
− 4305

5 35.24
6 0.92

α Herculis

10 38.20
40.30 42.414
42.40 42.41
44.48
21207 46.69
1207
50.95
53.17
55.20
57.29 59.466
59.49 59.46
1.54 59.46
3.70
5.85
53519 8.00
53519
12.24
14.37 16510
16.55 16.51
18.63 11892
8255 20.76
8255 10 59.460

17. 9 1075

10 30.0
31.6
33.1
34.5
1657 36.5
157
10 3314
+ 2632

11 28.2
29.8
31.5
33.0
1571 34.6
71
11 3142
− 3196

10 33.14
11 31.42
+ 26.32
− 31.96
58.28
1.76552
1.16197
2.92749
1.91153
8.98404
5 30 21

R 47 38.72
R 47 38.85

47 38.78

M 3 1.07
M 3 37.80
R 3 37.75

3 37.78

M 56 39.15
M 58 0.78 72 06 6
R 58 0.90 18
R 58 0.55 73 18 17
M 58 0.67 5
58 0.72
81.57 .12

19 21 57.4

1979phae.proj.1504

241

L Ophiuchi

h m s
17 29 10
+ 12 30
1879 Sept. 7

1.17609
9.98933
1.16542

0.15854

30 49.76
57.87 53.96
53.97
56.10
26978 58.18
1978
2.33
1.45
6.70
8.70 10826
10.84 10.83
12.90 10.83
14.95
17.20
9743 19.28
9743
23.47
25.60 27704
27.75 27.70
29.81 141.66
13852 31.90
13852 31 10.830

30 43.6
43.3
47.1 46.98
48.5
2349 51.2
349
30 46.98
+ 23.85
31 36.9
38.2
39.6
41.0
1987 43.0
1987
31 39.74
− 28.91

30 46.98
31 39.74
+ 23.85
− 28.91
52.76
17 29 22.18
1.72230
1.16542
2.88772
1.87349
8.98577
5 31 40

M 49 27.15
M 50 42.05 78 27 17
R 50 41.90 2
R 50 42.05 98 07 17
M 50 41.52 36
50 41.88
74.73 18

12 89 43

S

Sun c = 46.966 9.99787

h m s
11 7 9
+ 5 40
Sept. 8

0.15854

636.2
37.7
38.3
40.5
1957 42.0
1957
6 39.14

6 39.14

M 32 21.20

50.00 +8.57 38.57

7 7.2
8.6
10.0
12.1
517 13.8
517
7 10.34

7 10.34

M 4 1.82

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d

E Bootis

h m s
14. 39 42
+ 27° 35'

1879 Sept 8

41 11.38
13.70 16006
14.00 16.01
18.35
8003 20.60
8003
23.21
27.67
30.00
32.28 34629
34.65 34.63
36.90 34.63
39.27
41.63
31166 43.93
31160
48.65
50.84 53.254
53.21 53.25
53.58 6926
26627 57.90
1627 41 34.630

41 1.5
3.5
5.4
7.0
262 8 8
262
41 5.24
+ 29.39
42 6.0
7.5
9.2
11.1
470 13.2
470
42 9.40
- 34.77
41 5.24

42 9.40
+ 29.39
- 34.77
64.16
1.80726

R 55 1.80.
R 55 1.82.
~~55 1.81~~

212

L Serpentis

h m s
15 38 18
+ 6° 48'

0.15854

39 50.20
52.30 54410
54.45 54.41
56.50
27205 58.60
2205
2.75
4.80
6.87
8.80 11.036
11.00 11.04
13.20 11.03
15.18
17.25
9932 19.37
9932
23.50
25.63 27.658
27.63 27.66
29.70 14207
13829 31.83
13829 40 11.035

39 42.1
43.8
45.2
46.9
2267 48.7
267
39 45.34
+ 25.70
39 45.34

R 39 57.45.
R 39 57.60.
39 57.52
6 48 22.7

15 38 21.11

0.15854

260

L Lyrae

0.15854

h m s
18 32 54
+ 38 40' 1.17609
9.89254
1.06863

37 17.82
20.55 23198
23.22 23.20
25.70
11599 28.50
1599
33.85
36.32
38.97
41.70 44344
44.33 44.34
46.86 44.34
49.67
52.30
39910 55.00
39910
0.26
2.84 5490
5.55 54.9
8.00 8869
2745 10.77
2745 34 44.340

34 5.2
6.9
8.5
11.0
443 12.7
443
34 8.86
+ 35.48
35 17.0
18.6
22.1
24.1
1083 25.5
1083
35 2.166
- 37.32
34 8.86
35 21.66
+ 35.48
- 37.32
72.80
1.862213
1.06863
2.93076
1.91561
8.98485
5 30 58

M 48 16.72.
M 49 38.90.
R 49 39.27.
R 49 39.02.
49 39.06
82.34

18 32 58.19

38 40 85.7

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111

51 Ari. Cephei 2.C.

h m s
6 43 16

-1 92 49

0.15854

+2	48.36	42	4.25	44	52.61	38	29.8
+2	34.05		14.63		48.68		
+2	20.05		29.30		49.35	39	8.0
+2	5.92		45.40		51.32		
+1	51.96		59.60		51.56	40	10.8
+1	38.06	43	13.28		51.34		
+1	24.00		27.34		51.34	41	17.0
+1	9.98		41.50		51.88		
+0	55.88		55.55		51.43	47	57.5
+	42.02	44	10.30		52.32		
+	27.98		23.58		51.56	48	42.3
+	13.96		38.03		51.99		
-	.02		57.52		51.50		
-	13.92	45	6.78		52.86		
-	27.84		21.20		53.46		
-	41.92		34.70		52.78		
-	55.98		48.30		53.32		
-1	10.02	46	4.00		53.98		
-1	23.90		17.30		53.40		
-1	38.00		32.10		54.10		
-1	52.06		46.00		53.54		
-2	6.08	47	0.10		54.02		
-2	20.03		14.62		54.59		
-2	34.13		28.87		54.74		
-2	48.16		42.20		53.84		

131601

44 53.640

M 44 46.95.
M 44 42.78.
M 44 37.20.
M 44 31.97.
M 44 3.52.
M 44 0.10.

270

γ Aquilae

h m s
18 59 54

+ 13 41

0.15854

1	23.53			1	15.2
	23.53	27.48			16.9
	27.76	27.75			18.2
	27.88				19.7
13874	32.00			916	21.6
	13874				916
	36.23			1	18.32
	38.28			+	26.40
	40.50				
	42.66	44.34			
	44.70	44.73		2	14.4
	46.87	44.71			16.3
	48.88				18.1
	51.19				19.7
40261	53.20			892	20.7
	40261				892
	57.45			2	17.84
	59.57	16.76		-	33.12
	1.68	1.68			
	3.75	8.943			
30838	5.93			1	18.32
	838	1	44.720	2	17.84
				+	26.40
				-	33.12
					59.52
					1.77466
					1.16359
					2.93825
					1.91819
					8.97994
					5 27 16

M 44 47 8.92.
M 48 31.62 79 .07 13
R 48 31.92. 17
R 48 31.72 82 10 3
M 48 31.75. 0
48 31.75
82.83 .08

275

β Cygni

a 15854

h m s
19 25 5.0

1 27 42

0.15854

27	21.45			27	1.20
	23.63	26.16			13.7
	26.00	26.01			15.4
	28.30				17.2
13008	30.70			771	18.8
	13008				271
	35.28			27	15.42
	37.64			+	29.20
	39.97				
	42.25	44.68			
	44.60	44.62		28	15.3
	46.98	44.62			17.3
	49.30				18.8
	51.57				20.9
40156	53.87			953	23.0
	40156				953
	56.55			28	19.06
	0.50	32.28		-	34.44
	3.24	3.23			
	5.60	8.924			
31614	7.85				27 15.42
	1614	27	44.620	28	19.06
				+	29.20
				-	34.44
					63.64
					1.80373
					1.12323
					2.92696
					1.90881
					8.98185
					5 28 42

M 45 2.07.
M 47 22.62 .96 04 21
R 47 23.35. 22
R 47 23.27 81 04 14
M 47 23.00. 13
47 23.13
81.06 .18

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277

γ Aquilae

h m s
19 40 30
+ 10° 19'

1.17609 δ .15854
9.99292
1.16901

1879 Sept. 8

42	8.40			41	55.5						
	5.33	7.670			57.0						
	1.67	7.67			58.7						
	7.80				0.2						
3835	11.35			2932	1.8						
	38.35				2932						
	16.00				41 58.64						
	18.26				+ 25.79						
	30.26										
	32.33	24.436									
	34.38	24.43			42 53.4						
	36.50	24.43			57.7						
	38.64				57.0						
	40.70				0.7						
21992	42.85			2952	2.4						
	21992				2952						
	37.00				42 59.04						
	39.12	41.198			− 34.61						
	41.20	41.20									
	43.27	48.87									
20599	45.40				41 58.64						
	20599	42 24.430			42 59.04						
					+ 25.79						
					− 34.61						
					60.40						

19 40 84.16

1.78104
1.16901
2.95005
1.93430
8.98425
5 30 31

M 8 58.02
M 10 23.90
R 10 24.07
R 10 23.95

10 23.98
85.96 ~~85.96~~

10 19 26.3

280

ζ Aquilae

h m s
19 44 53

+ 8° 83'

1.17609 δ .15854
9.99515
1.17124

46	26.05			46	17.6						
	28.10	30.240			21.2						
	30.05	30.12			22.8						
	32.22				24.2						
15060	34.28			1140	26.2						
	1060				1140						
	37.48				46 22.80						
	40.65				+ 24.02						
	42.68										
	44.73	46.834									
	46.85	46.83		47	20.5						
	48.95	46.81			22.2						
	50.97				24.0						
	53.10				25.7						
42151	55.20			1196	27.2						
	42151				196						
	57.40				47 23.92						
	1.40	3.514			− 37.10						
	3.50	3.51									
	5.62	9.363									
31757	7.65				46 22.80						
	1757	46 46.820			47 23.92						
					+ 24.02						
					− 37.10						
					60.12						

19 44 56.60

1.78618
1.17124
2.95742
1.94176
8.98434
5 30 35

M 55 7.50
M 56 34.75
R 56 35.00
R 56 35.10

56 34.95
87.45

8 33 17.0

283

β Aquilae

δ .15854

h m s
19 49 22

+ 6° 6'

1.17609
9.99753
1.17362

50	55.43			50	45.0						
	57.55	59.606			46.3						
	57.60	59.60			47.7						
	1.70				49.5						
29803	3.75			2392	50.7						
	29803				2392						
	7.90				50 47.84						
	10.00				+ 28.36						
	12.00										
	14.16	16.217									
	16.20	16.22		51	44.4						
	18.30	16.17			46.0						
	20.34				47.5						
	22.30				49.0						
14595	24.35			2374	50.5						
	14595				2374						
	28.60				51 47.48						
	30.70	32.748			− 31.28						
	32.74	32.75									
	34.80	15.235									
16374	36.90				50 47.84						
	16374	57 16.195			51 47.48						
					+ 28.36						
					− 31.28						
					59.64						

19 49 26.04

1.77554
1.17362
2.94916
1.93328
8.98412
5 30 25

M 21 38.00
M 23 3.67 70 03 9
R 23 3.85 9
R 23 3.82 83 01 6
M 23 3.72 4
23 3.76
85.76 .07

6 6 35.04

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1979phae.proj.1504

30

β Arietis

h m s
1 47 5.7
+ 20° 13'

49	30.69			49	44.4										
	32.81				45.8										
	35.00	34.986			47.8										
	37.20				49.5										
174.93	39.30			2394	51.5										
					2394										
	43.95			49	4788										
	46.00			+	4.75										
	48.25														
	50.57	52.672													
	52.70	52.69		50	22.3										
	54.80				24.3										
	57.00				26.0										
	59.25				28.0										
47405	1.50			1303	29.8										
	47.405				303										
	5.80			50	2606										
	8.00	10206		−	33.43										
	10.25	10.21													
	12.38														
5103	14.60	49	52.63	49	47.88										
	5103			50	26.06										

M	15	45.85	·												
M	16	37.22	16	06	8										
R	16	37.15	·		1										
R	16	37.10	12	02	4										
M	16	37.10	·		4										
		34.14													
					.04										

33

λ Arietis

h m s
2 0 21
+ 22° 5.9'

1	54.18			1	44.9										
	56.42	58670			46.8										
	58.75	58.67			49.1										
	1.00				51.1										
29335	3.00			2450	53.1										
	29.335				2450										
	7.67			1	49.00										
	9.85			+	27.58										
	12.00														
	14.30	16572													
	16.70	16.57		2	48.2										
	18.88	16.58			46.9										
	21.15				48.3										
	23.20				50.0										
14915	25.40			2418	51.4										
	14.915				2418										
	30.00			2	4836										
	32.18	34490		−	31.78										
	34.50	34.49													
	36.77	15316													
17245	39.10			1	49.00										
	17.245	2	16.575	2	48.36										
				+	27.58										
				−	31.78										
					5936										
2	0 25.56			1.77349											
				1.14049											
				2.91398											
				1.89232											
				8.97834											
				526 4											

M	34	55.10	·												
M	36	13.12	09	03	2										
R	36	13.20	·		6										
R	36	13.20	20	00	6										
M	36	13.05	·		9										
	36	13.14													
		78.04			.06										

22 53 44.2

358

47 H. Cephei

h m s
2 5.0 +

1.14609 0.15852
9.28319
0.45928

50	26.55														
	36.40	47.190													
	47.00	47.19													
	58.00														
23595	9.01														
	23.595														
	30.35														
	40.35														
	51.80														
	2.30	13.200													
	12.75	13.20													
	23.70	13.14													
	33.35														
	45.27														
65880	55.53														
	118.80														
	18.00														
	29.10	39.100													
	39.37	39.10													
	49.70	14629													
19550	0.43														
	19.550	5×	13.170												

49	30.0	50	17.2												
	31.2		26.0												
	44.7		34.0												
	52.4		41.5												
2266	2.3	1687	50.0												
	2266		1687												
49	4532	50	3374												
+2	2785	+1	3743												
57	6.3	57	56.2												
	12.3		3.1												
	20.0		10.3												
	27.9		18.5												
1014	34.9	3563	28.2												
	1014		563												
51	2025	52	1126												
+	5289	+	1.91												
52	57.3	54	11.7												
	5.2		20.0												
	14.4		29.3												
	22.8		36.0												
3743	34.6	1435	46.5												
	743		1435												
53	1486	54	2870												
−1	169	−2	1553												
57	58.2														
	6.3														
	14.7														
	22.0														
3738	32.6														
	738														
55	14.76														

M	33	17.15	·												
M	33	31.27	·												
M	33	47.55	·												
M	34	59.17	·												
M	34	17.10	·												
M	34	35.35	·												
M	34	46.55	·												
		89.40													

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47 — 56 — 550

L Vela — E. Eridani — S Eridani

1879 Sept. 8

L Vela			E. Eridani			S Eridani		
h m s			h m s			h m s		
2 55 57	1.17609	0.15854	3 27 17	1.17609	0.15854	3 37 30	1.17609	0.15854
+ 3° 37	9.99913		− 9° 52	9.99353		− 10 11	9.99310	
	1.17522			1.16962			1.16919	
57 30.95	57 24.2		28 46.70	50994	28 42.6	39 0.10	38 42.6	
33.11 35188	25.8		48.97	~~38974~~	43.9	2.10 4.166	57.0	
35.18 35.19	27.5		51.00	50.99	45.4	4.18 4.17	52.4	
37.37	28.9		53.15		47.0	6.20	54.4	
17594 37.33	1368 30.4		25497 53.15		2274 48.5	2083 8.25	2632 55.8	
2594	13.68		497		2.74	2083	13.2	
43.30	57 27.36		57.30		28 45.48	12.38	38 52.64	
45.64	+ 24.32		1.37		+ 22.18	14.60	+ 28.26	
47.55 51.696			3.47			16.70		
49.70 1.70			5.53	7.642		18.80 20871		
51.65 ~~5.052~~	58 23.9		7.60	7.64	29 36.7	20.80 20.87	39 48.3	
53.62 51.66	25.9		9.78	7.69	38.7	23.00 20.92	50.0	
55.80	27.9		11.84		40.5	25.00	57.6	
57.80	29.4		13.87		42.2	27.03	53.7	
45826 0.00	1385 31.4		60878 16.00		2021 43.8	18784 29.33	2595 55.9	
46526	13.85		6878		21	18784	9.5	
4.10	58 27.70		20.10		29 40.42	33.68	39 51.90	
6.05 8.134	− 36.02		22.29	24386	− 32.76	35.52 37.688	2 31.00	
8.10 8.13			24.30	24.39		37.60 37.68		
10.22 ~~13~~ 33.32			26.38	13538		39.78 41.85		
4067 12.20 680	57 27.36		12193 28.66		28 45.48	18844 41.86	38 52.64	
4067 57 51.~~80~~	58 27.70		2193	29 7.665	29 40.42	18844 39 20.895	39 51.90	
	+ 23.93				+ 22.18		+ 28.26	
	− 36.41				− 32.76		− 31.00	
	60.34				54.94		59.26	
2 56 1.10	1.78061				1.73989		1.~~78~~276	
	1.17522				1.16962		1.16919	
	2.95583				2.90951		2.94195	
	1.94503				1.89559		1.92742	
	8.98920				8.98608		8.98547	
	5 34 16				5 31 54		5 31 26	
M 50 58.52			M 19 29.52		M 37 39.17			
M 52 26.35			M 20 48.27		M 39 3.62			
R 51 26.97			R 20 48.20		R 39 3.92			
R 51 26.70			R 20 48.10		R 39 3.87			
M 51 26.52			M 20 48.02		M 39 3.70			
52 26.63			20 48.15		39 3.78			
88.11			78.63		84.61			
3 37 15.9								

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63

S

γ Persei 0.15854

Sun c = 46.966

h	m	s
3	46	32

+ 31° 31′ 1.17609 9.93069 1.10678 1879 Sept 8

h	m	s
11	10	45

+ 5° 17′ 0.15854

1879 Sept. 8–9

48 30			47 52.0		12 6.90			13 15.5	14 14.78			13 43.4		
5.55	7.950		53.9		9.00	11.060		16.7	16.89			45.3		
8.50	7.95		55.3		11.00	11.06		18.4	18.92	18.916		47.0		
10.45			57.0		13.15			21.0	21.90			48.4		
3975 12.75			2772 57.0		5530 15.25			925 21.9	94.58 23.16			2338 49.7		
3975			272		5530			925				338		
17.70			47 55.44		17.30			13 18.50	27.30			13 46.76		
20.12			+ 31.88		21.50			− 5086	29.34			+ 48.83		
22.50					23.30				31.38					
24.90	27.377				25.12	27.663			32.57	35599				
27.40	27.30		48 56.3		27.65	27.66			35.60	3500				
29.70	27.35		58.1		29.78	27.62			37.70					
32.27			57.7		31.32				39.80					
34.60			3.3		33.90				41.90					
24569 37.11			3028 5.4		24897 36.00			32039 43.80						
24639			08		24897			32039						
41.95			49 0.56		40.00				48.10					
44.37	46756		− 3324		42.18	44192			50.22	52261				
46.76	46.76				44.20	44.19			52.25	52.26				
47.20	5471				46.30	5525			54.35					
23378 51.50			47 55.44		22096 48.28			13 18.50	26132 56.40			13 46.76		
23378	.48	27.325	49 0.56		2096	12 27.640	− 5086		1132	14 35.59				
			+ 31.88											
			− 32.24											
			65.12											
			1.81371											
			1.10678											
			2.92049											
			1.90988											
			8.98939											
			5 34 25											

M 57 11.00

M 58 32.37

M 58 32.48

M 58 32.28

M 58 31.93

58 32.26

81.26

M 55 2.85

M 27 40.20

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256		257		260	
δ Ursae Min.		η Serpentis		δ Lyrae	
h m s 18 11 21	0.15854	h m s 18 15 3	1.17609	h m s 18 32 50	1.17609
+ 86 36		− 2 56	9.99943	+ 38 40	9.89254
			1.17552		1.06863

1879

Sept. 9

		11 (7.70)		8 44.2	16 37.20		16 33.7	34 19.30		34 6.5	
+2	19.50	9.76 {9.87 (11.70)	13 29.26		39.32	41262	36.0	21.55	24580	8.4	
				9 50.2	41.27	4126	37.5	24.50	2458	9.9	
+2	7.65	18.38	26.03		43.24		39.0	27.28		12.0	
+1	56.04	30.60	26.64	19 35.6	20631 45.28		1867 40.5	12292 29.97		506 13.8	
+1	44.34	41.50	25.84		631		1867	12290		506	
+1	32.77	54.40	27.17	20 26.2	49.60		16 3734	35.18		34 1012	
+1	21.21	12 5.40	26.61		51.57		+ 2044	37.80		+ 3561	
+1	9.60	17.10	26.70	21 19.6	53.70			40.45			
+	57.99	30.38	28.37		55.67	57773		43.11	45737		
+	46.30	40.30	26.60	22 28.2	57.83	57.77	17 25.0	45.73	4574	35 20.7	
+	34.82	52.10	26.82		59.85	57.78	26.7	48.40	45.72	22.8	
+	23.19	13 2.63	25.82		1.87		28.2	51.00		24.7	
+	11.57	14.38	25.95		3.87		29.6	53.66		26.5	
−	0.02	27.25	27.23		51996 6.00		1407 31.2	41162 56.30		1237 29.0	
−	11.53	37.90	26.37		51996		1407	41163		237	
−	22.15	50.33	28.18		10.10		17 2814	1.60		35 2474	
−	34.73	14 2.55	27.82		12.15	14310	− 3036	4.00	6854	− 3901	
−	46.38	14.55	28.17		14.30	14.31		6.87	6.85		
−	58.02	24.60	26.58		16.50	11557		9.60	9143		
−1	9.52	38.20	28.68		7155 18.50		16 3734	3427 12.20		34 10.12	
−1	21.21	48.68	27.47		2155	16 57.775	17 28.14	3427	34 45.730	35 24.74	
−1	32.86	59.30	26.44				+ 20.44			+ 35.61	
−1	44.46	15 10.05	23.59				− 30.36			− 39.01	
−1	56.03	23.68	27.65				50.80			74.62	
−2	7.71	34.68	26.97				1.70586	18 32 53.14		1.87286	
−2	19.35	48.00	28.65				1.17552			1.06863	
							2.88138			2.94149	
			675.67				1.85830			1.92288	
							8.97692			8.98139	
			13 27.024				5251			52821	

M 53 17.62		M 23 48.20		M 48 16.70			
M 53 23.75		M 25 0.45		M 49 40.65	55	10	22
M 54 9.10		R 25 0.27		R 49 40.35			8
M 54 14.42				R 49 40.28	32	04	15
M 54 15.67				M 49 40.45			2
M 54 18.75		25 0.36		49 40.43			
		7216		83.73			.12

38 40 36.0

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111

51 H. Cephei L.C.

h 6 m 43 s 16

+ 92° 49'

0.15854

+2	48.16	42	5.75	44	53.91	39	53.1
+2	34.13		18.60		52.73		
+2	20.03		33.00		53.03	40	25.3
+2	6.08		48.55		54.63		
+1	52.06	43	0.15		52.21	41	28.8
+1	38.00		13.63		51.63		
+1	23.90		28.23		52.15	41	55.5
+1	10.02		43.37		53.39		
+	55.98		58.66		54.64	42	20.2
+	41.92	44	13.60		55.52		
+	27.94		23.18		51.12	42	58.9
+	13.92		41.60		55.52		
−	.02		55.10		55.08		
−	13.96	45	7.30		53.54		
−	27.98		21.17		53.39		
−	42.02		37.42		55.40		
−	55.88		50.80		54.92		
−1	9.98	46	3.60		53.62		
−1	24.00		20.60		56.60		
−1	38.06		32.68		54.62		
−1	51.96		45.30		56.54		
−2	5.92	47	2.65		56.62		
−2	20.05		17.35		57.30		
−2	34.05		30.25		56.20		
−2	48.36		44.55		53.81		
					1358.13		

44 54.325

M 44 41.52.
M 44 39.70.
M 44 33.25.
M 44 44.97.
M 43 59.62.
M 43 58.15.

270

P Aquilae

h 18 m 57 s 57

+ 13° 41'

0.15854

		1	25.00			1	24.3
			27.00	29.30			26.0
			29.10	29.13			25.0
			31.20				29.8
		14565	33.35			1396	31.5
			14565				1396
			37.64			1	27.92
			39.11			+	18.18
			41.96	110			
			44.00	46.~~45.54~~			
			46.10	46.11		2	16.9
			48.20	46.09			18.9
			50.25				20.4
			52.45				21.8
		41499	54.65			1011	23.1
			41499				1011
			58.17			2	2022
			1.50	3048		−	34.12
			3.01	3.05			
			5.15	8216			
		31524	7.32			1	27.92
			1524	1	46.100	2	20.22
						+	18.18
						−	34.12
							52.30
							1.71850
							1.16359
							2.88209
							1.86415
							8.98206
							5 28 51

M 47 20.27.
M 48 33.52 50 02 11
R 48 33.37. 4
R 48 33.27 32 05 14
M 48 33.47. 6
48 33.41
73.14 .09

149

L Geminor

h 7 m 26 s 02

+ 32° 9'

0.15854

		28	24.45			28	14.7
			26.50	29.380			17.3
			27.37	29.34			18.5
			31.80				21.1
		14670	34.18			958	23.0
			14690				958
			37.20			28	19.16
			41.50			+	29.64
			43.70				
			46.38	48.811			
			48.80	48.81		29	20.7
			51.22	48.80			22.0
			53.65				23.6
			56.05				25.3
		43930	58.60			1197	27.9
			43930				197
			3.40			29	23.94
			5.90	8.260		−	35.14
			8.25	8.26			
			10.65	9.760			
		4130	13.10				28 19.16
			4130	28	48.805	29	23.94
						+	29.64
						−	35.14
							64.75
		7	26	58	48		1.81144
							1.10380
							2.91524
							1.89905
							8.98381
							5 30 11

M 19 46.07.
M 21 5.17 31 14 16
R 21 5.35. 2
R 21 5.35 35 00 2
M 21 5.45. 12
21 5.33
79.26 .08

29 9 27

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1879phae.proj 1504

120

L Can. Mun.

h m s
7 32 6.8

1.17609 0.15854
+ 5° 22' 9.99704
1.17406

1879 Sept. 9

34 31.95	6	34 23.5		39 27.75			37 15.0	+2.133	50.15	3	27.00	+24.15	50.15	3	22.0				
34.00	37.80	25.3		27.35	31.692		16.0	14.02	50.42	202.16	31.40	14.02	50.42		24.3				
36.10	36.08	26.8		31.66	31.69		17.3	16.92	50.67	50.540	33.15	16.92	50.67		25.7				
38.15		28.2		34.80			18.0	18.93	50.92		36.12	14.90	50.92		27.0				
18040 40.20		1341 30.3		15846 36.30			883 21.0							1272	28.2				
18040		1341		15846			883								2.72				
41.38		34 26.82		41.00			39 17.66							3	25.44				
46.30		+ 25.82		43.42			+ 32.74							+	24.99				
48.56				45.72				4.22	50.38	352.30	46.16	4.22	50.38						
50.65	52.704			48.00	50.402			2.09	50.34	50.337	48.45	2.09	50.34						
52.80	52.70	35 20.2		50.40	50.40		40 18.8	-1.00	50.33		50.35	-0.80	50.34						
54.75	52.59	22.6		52.80	50.40		20.5	2.11	50.24		52.40	2.11	50.24						
56.80		24.8		55.10			22.7	4.23	50.27		54.50	4.23	50.27						
58.90		26.2		57.48			24.9	6.34	50.36		56.70	6.34	50.36						
47434 1.00		1218 28.0		45362 57.80			11237 26.8	8.47	50.31		58.78	8.47	50.31						
47434		218		45362			137												
5.00		35 24.36		4.45			40 22.74	12.68	50.12	252.31	2.80	12.68	50.12						
7.12	9.200	- 31.72		6.80	9.106		- 32.34	14.80	50.46	50.430	5.28	14.80	50.45						
9.20	9.11			9.00	9.11			16.91	50.59		7.50	16.91	50.54						
11.30	10519			11.40	10080			19.03	50.42		9.45	19.03	50.56	3	25.44				
4600 12.38		34 26.82		4553 13.88			39 17.66	21.21	50.67	3688	11.88	21.21	50.67						
4600	31 52.645	35 24.36		45534	39 50.400		40 22.47				3688								
		+ 25.82					+ 32.74												
		- 31.72					- 32.07	50.445											
		57.54					64.81	50.432											
7 32 6.47		1.75997		7 37 57.56			1.81164			10 1 57 68									
		1.17406					1.12074												
		2.93403					2.93238												
		1.91598					1.92345												
		8.98195					8.99107												
		528 46					535 42												

M 56 12.20
M 57 34.15 47 02 16
R 57 34.75 14
R 57 34.75 75 00 14
M 57 34.50 11
57 34.61
82.411 .14

M 9 43.05
M 11 6.90 90 00 1
R 11 6.85 4
R 11 6.90 88 02 1
M 11 6.90 1
11 6.89
83.84 .02

M 55 7.55

5 32 3.6

28 18 56.0

12 33 19.9

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1879phae.proj:1504

8

Sun e=46.926

h m s
11 14 20
14 54

0.15854

587

L Virginis

h m s
13 18 49
— 10 32

0.15854

1879 Sept 9-10

Sept. 10

15 44.20		16 49.5	17 5.82		17 16.7			20 —									
46.12	48.184	51.6	54.17	56.200	18.0			"									
48.20	48.18	53.3	56.20	56.20	19.7			"									
50.15		54.7	58.31		21.1			"									
24092 52.25		2653 56.4	28100 0.40		983 22.8			"									
24092		2655	28100		983												
56.35		16 53.10	4.63		17 19.66			—									
58.68		— 48.30	6.67		+ 53.16	16.30	43.58	347.46	37.28								
0.70			8.87			4.14	43.37	43.432	39.18								
2.58	4768		10.63	12870		2.08	43.40		41.32								
4.70	4.77		12.67	12.87		6.50	43.35		43.35							21	9.6
6.75	4.82		14.76	12.76		2.04	43.31		45.50								11.0
8.95			17.20			4.20	43.42		47.62								12.8
11.10			19.20			6.30	43.44		49.74								14.6
58291 13.10		11583	21.20			8.41	43.44		51.80							648	16.8
4291			11583														648
17.30			25.20			14.34	43.36	216.74	55.95							21	1206
19.40	21460		27.27	29334		14.64	43.36	43.348	5805	0.150						—	2956
21.45	21.46		29.30	29.33		16.74	43.41		0.20	0.15							
23.55	12964		31.43	14553		18.84	43.36		2.25								
10730 25.60		16 53.10	14667	3347	17 19.66	21.04	43.25	30075	4.30								
730	16 4.795	— 48.30		14669	18 12.815	+ 53.16			0.75							21	10.96

43.390
43.408

13 18 51.30

M 17 41.92.

M 50 19.17.

M 1 1.55.
R 1 1.90.

10 31 59.7

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1879phae.proj.1504

73 — λ Tauri — 4h 28m 59s — 16° 16′

1.17609
9.98226
1.15835

0.15854

84 — β Eridani — 5h 1m 54s — −5° 15′

1.17609
9.99817
1.17426

0.15854

90 — β Tauri — 5h 18m 39s — +28° 30′

0.15854

1879 Sept. 10

λ Tauri

30 34.65
36.70 38.980
39.00 38.98
41.23
19490 43.32
19490
47.62
49.70
51.80
54.25 56.238
56.25 56.24
58.57 56.10
0.58
2.60
50614 4.77
50614
8.87
11.00 13.226
13.26 13.23
15.40 11.221
6613 17.60
6613 30 56.170

30 33.3
35.2
37.0
38.4
1844 40.5
1844
30 36.88
+ 19.29
31 25.2
27.7
28.8
31.6
1476 33.3
1476
31 29.52
− 33.35
30 36.88
31 29.52
+ 19.29
− 33.35
52.64
1.72132
1.15835
2.87967
1.86070
8.98103
5285

4 29 2.41

β Eridani

3 29.60
31.62 33686
33.73 33.69
35.68
16843 37.80
16843
42.00
44.05
46.00
48.20 50221
50.27 50.22
52.30 50.25
54.40
56.40
45199 58.37
45199
2.65
4.75 6810
6.80 6.81
9.00 10050
3405 10.85
3405 3 50.235

3 22.2
23.8
25.5
26.7
1262 28.0
262
3 25.24
+ 25.00
4 21.8
23.2
24.5
25.8
1228 27.5
228
4 24.56
− 34.32
3 25.24
4 24.56
+ 25.00
− 34.32
59.32
1.77320
1.17426
2.94746
1.92588
8.97842
5268

−18.74 36.47 109.36 55.26
21.13 36.52 36.45 57.65
23.58 36.37 55.81

5 20 36.453

5 18 42.40

β Tauri

20

21 10.5
12.0
14.0
15.7
789 16.7
189
21 1.378
− 37.33
21 15.78

M	12 35.55			
M	13 47.87	1.07.20	24	
R	13 48.20		9	
R	13 48.12	16 04	1	
M	13 48.27		16	
	13 48.11		.13	
	72.56			

16 16 7.2

M	42 16.92		
M	43 41.35	28 07	12
R	43 41.07		16
R	43 41.27	17 10	4
M	43 41.22		1
	43 41.23		
	8431		.08

M	59 51.40
R	59 51.45
	59 51.42

28 30 17.0

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93

δ Orionis

h m s
5 25 5.0
−0 2.9

0.15854

27 25.38
27.52 29.510
27.60 29.51
31.50
29.1
14755 32.55
14755
37.80
39.67
41.80
43.76 45.876
45.80 45.88
47.75 45.92
50.00
52.10
41288 54.80
41288
57.15
0.30 2.326
2.28 2.33
4.30 9.184
31163 6.60
1163 27 45.900

27 23.8
25.7
27.8
29.1
1383 31.8
1383
27 27.66
+ 18.24

27 27.66 + 18.24

M 51 26.52.

556

λ Leporis

h m s
5 27 24
−17°

0.15854

28 37.50
57.60 1.780
1.80 1.78
3.90
6.10
30890 8.90
10.47
12.60
14.70
16.80 1.9037
18.75 19.04
21.25 19.04
23.33
25.50
17133 27.70
17133
31.90
34.20 3.6304
36.25 36.30
38.47 3.808
18152 40.65
18152 29 19.040

M 21 45.35.
M 22 58.87. 01 14 18
R 22 59.67. 2
R 22 59.10 08 02 3
M 22 59.15. 10
22 59.05
73.70 .09

5.5 1.17609
9.97841
1.15450

28 57.8
59.0
1.5
3.1
3061 4.7
61
29 1.22
+ 17.82
29 5.6
52.9
54.3
55.7
2721 57.6
221
29 54.42
− 35.38
28 1.25
29 54.42
+0 17.79
− 35.38
53.17
1.72567
1.15450
2.88017
1.86747
8.98730
5 32 49

a

ζ Orionis

h m s
5 34 39
−2° 0

0.15854

36 14.70
16.85 18.930
17.00 18.93
20.95
9465 23.15
9465
26.95
29.17
31.40
33.40 3.5436
35.47 35.43
37.61 35.42
39.63
41.63
31892 43.60
31892
47.75
49.95 5.1920
51.90 5.192
54.00 7085
25960 56.00
960 36 35.425

M 28 17.72.
M 29 44.78. 66 12 8
R 29 44.80. 10
R 29 44.67. 73 06 3
M 29 44.55. 15
29 44.70
86.98 .09

1.17609
9.99974
1.17583

36 7.0
8.7
10.4
12.2
520 13.7
520
36 10.40
+ 25.02
37 8.0
9.6
11.4
12.6
559 14.3
559
37 11.18
− 35.76
36 10.40
37 11.18
+ 25.02
− 35.76
40.78
1.78376
1.17583
2.95959
1.93942
8.97983
5 27 11

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100

K Orionis

h 5 m 42 s

− 9° 43′

1.17609
9.99372
1.16981

0.15854

1879 Sept 10

43 35.83		43 27.6	
38.04	40.054	32.9	
40.60	40.05	31.8	
42.17		33.8	
20027 44.23		1577 35.3	
20027		1577	
48.53		43 31.54	
50.55		+ 25.32	
52.65			
54.70	56.873		
56.82	56.85	44 23.9	
58.90	56.84	25.2	
1.15		26.9	
3.28		28.6	
51186 5.28		1339 29.9	
51186		339	
7.40		44 26.78	
11.65	13.630	− 29.92	
13.45	13.63		
15.65	11.368		
6815 18.00		43 31.541	
6815	43 56.855	44 26.78	
		+ 25.32	
		− 29.92	
		55.24	
		1.74225	
		1.16981	
		2.91206	
		1.89724	
		8.98518	
		5 31 13	

M	10	18.55	
M	11	37.35	35 00 13
R	11	37.62	14
R	11	37.60	61 01 12
M	11	37.35	13
	11	37.48	
		78.93	.13

102

L Orionis

h 5 m 48 s

+ 1° 23′

1.17609
9.99658
1.17267

0.15854

50 13.01		50 4.0	
15.10	17.130	5.7	
17.15	17.13	7.2	
19.15		9.0	
8565 21.25		365 10.6	
8565		365	
25.45		50 7.30	
27.40		+ 26.52	
29.50			
31.60	33.779		
33.87	33.78	51 0.8	
35.95	33.85	2.6	
37.88		4.3	
40.04		5.9	
30401 42.22		216 8.0	
30401		216	
46.35		51 4.32	
48.55	50.584	− 30.50	
50.65	50.58		
52.72	6771		
25292 54.75		50 7.30	
25292	50 33.815	51 4.32	
		+ 26.52	
		− 30.50	
		57.02	
5 48 40.42		1.75603	
		1.17267	
		2.92870	
		1.90859	
		8.97989	
		5 27 14	

				17	—		
					—		
					—		
					—		
					—		
					—		
					—		
0.000	34.50	177.80	35.50			18	8.5
2.23	35.67	35.560	37.90				10.4
4.47	35.53		40.00				12.2
6.70	35.56		42.25				13.8
8.95	35.55		44.50			606	15.7
							606
13.40	35.47	177.87	48.87			18	12.12
15.64	35.36	35.574	51.00	534414			− 36.55
17.77	35.73		53.50	53.1414			
20.11	35.74		55.85				
22.43	35.56	6722	58.00			18	12.12
			1722				

M	5	7.22		
M	6	28.12	26 14	12
R	6	28.22		2
R	6	28.22	22 00	2
M	6	28.40		16
	6	28.24		
		81.02		.08

7 82 68.5

M	55	32.85	
R	55	32.65	
R	55	32.72	
M	55	32.92	
			8
	55	32.78	

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122

β Geminor 0.15854

h m s
7 37 55.

+ 28° 19' 1.17609
9.94465
1.12074

Lee Min.
S
Sun c = 6.926

h m s
11 17 57

+ 4° 32' 8.15854

1879 Sept. 10

39	28.48			39	23.6			20	20.90			21	32.0	22	27.25			21	49.0
	30.77	33016			25.6				23.50	25.342			33.2		31.32	33.332			50.4
	32.93	33.01			24.2				25.45	25.34			34.4		33.28	33.33			52.8
	35.30				27.2				27.38				35.9		35.46				51.0
16508	37.60			1376	31.0			12671	29.48			1743	38.7	16666	37.35			2617	55.5
	16508				1376				12671				2.43		1666				1.17
	42.36			39	27.52				33.60			21	3486		41.77			21	52.34
	44.84				+24.29				35.80				− 5300		43.70				+ 57.62
	47.14								37.80						45.70				
	47.60								39.88	41.789					47.88	49.956			
	51.72	51.837		40	23.4				41.80	41.79					50.00	49.95			
	54.15				25.3				43.88	41.93					52.00	4998			
	56.46				27.4				45.75						54.10				
	58.80				29.0				48.14						56.20				
46653	1.26			1360	30.9			37610	50.05					44960	58.25				
					1360				37610						44960				
	6.05			40	27.20				52.37						2.42				
	8.12	10562			− 35.39				56.40	58.528					4.50	6.628			
	10.48	10.56							58.50	58.53					6.48	6.63			
	12.86								0.72	8387					8.90	9996			
5281	15.30				39 27.52			29264	2.65			21	3486	3314	10.84			21	52.34
	5281	39	51.81		40 27.20				29264	20	41.860	−	53.00		3314	22	49.965	+	57.62

7 37 37.59

I M 9 57.77.

M 40 36.50.

M 13 0.12.

M	10'	10.30	12	18	21
R	10'	10.02			7
R	10'	10.10	06	04	1
M	10'	9.95			14
	10'	10.09			
					11

28 18 55.9

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200

β Librae

h 15 m 10 s 30

−8°

56′

1.17609
9.99470
1.17079

1879 Sept 11

12 5.20		11 57.5	
7.22	9.332	59.1	
9.30	9.33	1.2	
11.36		3.7	
4666 13.38		3047 4.2	
4666		47	
17.72		12 0.94	
19.80		+ 25.08	
21.90			
24.00	26016		
26.00	26.02	12 53.6	
28.10	26.02	55.2	
30.18		56.7	
32.20		58.7	
23414 34.34		2847 0.3	
23414		2847	
38.50		12 56.94	
40.65	42.708	− 30.92	
42.72	42.71		
44.77	6204		
21354 46.80		12 0.94	
21354	12 26.020	12 56.94	
		+ 25.08	
		− 30.92	
		56.00	
		1.74819	
		1.17079	
		2.91898	
		1.90309	
		8.98411	
		5 30 24	

M	24 6.37		
M	25 26.50	45 05	13
R	25 26.32		5
R	25 26.27	29 02	10
M	25 26.40		3
	25 26.37		
	80.00		.08

209

L Coe. Bor.

h 15 m 29 s 34

+27°

7′

1.17609 0.15854
9.99493
1.12552

30 58.0	20.78	1629	39 57.50		39 47.1	
59.8	14.70	13.25	75.54	58.560	47.4	
1.8	16.63	15.08	15.188	58.56	49.7	
3.7	12.33	15.16	0.60		51.4	
3088 5.5	12.17	15.17	29280 2.70		2501 53.5	
8.8			29280		2501	
31 1.76	8.31	7.509	45.37 6.78		39 50.02	
+ 2.875	6.23	15.18	15.123 8.95		− 3484	
	9.15	15.10	10.95			
32 1.1						
3.3						
4.8						
7.0						
252 7.0						
252						
32 5.04						
− 3453						
31 1.76					39 50.02	
32 5.04						
+ 28.75						
− 34.53	15.165					
63.28	15.164					
1.80127						
1.12552						
2.92679						
1.90747						
8.98068						
5 27 49						

15 29 36.05

24530 52.71			
24530		31 30.510	
4			
44.10	49.060		
46.77	5026		
49.10	49.06		
51.32	6102		

M	21 21.72		
M	22 42.57	60 03	4
R	22 42.52		1
R	22 42.42	47 05	11
M	22 42.62		9
	2242.53		
	80.81		.06

27 7 23.8

212

L Serpentis

h 15 m 38 s 18

+6° 48′

0.15854

15 38 21.07

39 57.50			39 47.1		
58.53	58.560		47.4		
59.45	58.56		49.7		
0.60			51.4		
2.70			2501 53.5		
6.78			39 50.02		
8.95					
10.95					

M	39 56.27		

6 48 22.7

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73

L Tauri

h m s
4 28 59

+16 16 0.15854

30 3385
38.05 40.190
40.15 40.19
42.30
20095 44.60
20095
48.80
51.00
53.00
55.00 57.400
57.30 57.40 31 22.8
57.34 57.38 25.0
1.80 27.3
4.00 29.5
51660 6.16 1356 31.0
51660 1356
10.19 31 27.12
12.40 14.562 − 29.73
14.60 14.56 56.85
16.72 11.475
7281 18.90
2281 30 57.390 31 27.12
− 29.73
56.85

4 28 2.44

R 13 40.15
R 13 40.65

13 40.55

16 16 7.4

84

B Eridani

h m s
5 1 54

− 5° 15' 1.17609 0.15854
9.99817
1.17426

3 31.00 3 21.0
33.00 35116 23.5
35.00 3512 25.2
37.38 27.2
17558 39.20 1256 28.7
17558 256
43.28 3 2512
45.48 + 2652
47.52
49.60 51.622
51.60 51.62 4 20.7
53.63 51.65 22.1
55.77 23.6
57.82 25.3
46460 59.90 1195 21.9
46460 195
4.05 4 2.390
6.22 8.176 − 3.226
8.11 8.18
10.20 10330
4088 12.30 3 25.12
4088 3 51.635 4 23.90
+ 26.52
− 32.26
58.78
1.76923
1.17426
2.94349
1.92293
8.97944
5 26.53

M 42 14.05
M 43 37.85 .78.07 7
R 43 37.85 7
R 43 37.78 .81 03 1
M 43 37.70 9
43 37.79
83.74 .06

87

B Orionis

h m s
5 8 43

− 8° 21' 1.17609 0.15854
9.99537
1.17146

10 17.90 10 9.7
22.00 24.106 12.1
24.03 24.10 14.0
26.32 15.3
12053 28.28 676 16.5
2053 6.76
32.35 10 1.352
34.53 + 2.722
36.45
38.65 40.726
40.83 40.72 11 7.5
42.90 40.77 9.8
44.80 11.2
47.00 12.6
36653 48.00 551 14.0
36653 551
52.20 11 1.102
55.37 57.436 − 3.028
57.41 57.44
57.60 8154
28718 1.60 10 13.52
28718 10 40.745 11 11.02
+ 27.22
− 30.28
57.50
1.75967
1.17146
2.93113
1.90244
8.97131
5 20.52

M 47 59.95
M 49 19.75 .79 04 8
R 49 19.85 2
R 49 19.90 .87 03 7
M 49 19.82 1
49 19.83
79.88 .04

8 20 15.6

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90 β Tauri

h m s
5 18 39
+ 28° 30′

1.17609
9.94390
1.11999

0.15854

1879 Sept. 11

20 14.66
17.00 19.292
19.20 19.29
21.75
9646 23.85
9646
28.15
31.00
33.28
35.63 37.920
37.90 37.92
40.25 37.99
42.50
44.82
34128 47.25
34128
51.95
54.35 56.686
56.68 56.69
59.00 7598
28343 1.45
28343 20 37.955

5 18 42.44

20 4.9
7.3
9.5 +16.57 47.64 141.64
10.8 14.45 47.32 47.23
447 12.2 12.38 47.33
447
20 8.94 8.25 47.47 424.96
+ 29.02 6.19 47.19 47.217
4.11 47.11
+2.04 47.14
21 8.3 -0.00 47.25
10.0 2.06 47.24
11.9 4.13 47.19
13.5 6.14 47.20
.586 14.9 8.26 47.24 42503
86
21 11.72 12.38 47.24 236.97
− 33.76 14.44 47.41 47.394
16.51 47.69
18.57 47.73
20 8.94 -26.70 47.28 21957
21 11.72
+ 29.02
− 33.76 47.280
62.78 47.273
1.79782
1.11999
2.91781
1.89647
8.97866
5 26 18

93 δ Orionis

h m s
5 25 50
− 0° 23′

0.15854

27 —
—
30.53
32.87
34.95
39.22
41.00
43.00
45.00 47226
47.25 47.22
49.35
51.32
53.39
55.50
42 503
57.62
1.85 3.914
4.20 3.91
5.90
8.00
1957

27 59.3
0.8
2.2
3.7
3110 5.0
110
28 2.20
− 14.93
28 2.20

96 ι Orionis

h m s
5 29 31
− 5° 59′

0.15854

31 7.80
10.15 12066
12.32 12.07
14.16
6033 16.00
6033
20.00
22.70
24.48
26.30 28.513
28.72 28.51
30.58 28.58
32.32
34.75
25662 36.77
25662
41.00
42.90 45.098
45.18 45.10
47.26 5717
22549 49.15
2549 31 28.545

31 5.6
7.2
9.0
10.8
453 12.7
453
31 9.06
+ 19.48
31 9.06
+ 19.48

M 58 25.15
M 59 43.98 99 01 4
R 59 43.92 2
R 59 43.87 90 03 7
M 59 44.00 6
59 43.94
78.79 ,05

M 52 10.70

M 27 7.20

28 30 17.0

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a

ζ Orionis

h m s
5 34 39

1.17609 0.15854
9.99974
1.17583

36 16.48		31 7.5	
18.30	20.396	9.0	
20.30	20.39	10.6	
22.35		11.9	
10198 24.53		525 13.5	
10198		525	
28.58		36 10.50	
30.55		+ 26.34	
32.60			
34.73	36.796		
36.90	36.79	37 8.1	
38.78	36.89	9.5	
41.00		10.8	
43.00		12.0	
33116 45.00		539 13.5	
33116		539	
49.20		37 10.78	
51.37	53.394	− 33.94	
53.30	53.39		
55.53	73.78		
26697 57.57		36 10.50	
1697	36 36.840	37 10.78	
		+ 26.34	
		− 33.94	
		60.24	
		1.77988	
		1.17583	
		2.95571	
		1.94359	
		8.98788	
		5 33 16	

100

κ Orionis

h m s
5 42 1

1.17609 0.15854
9.99372
1.16981

43 37.45		43 31.4	
39.55	41.644	32.5	
41.60	41.64	34.1	
43.70		36.0	
20822 45.88		1718 37.8	
822		218	
30.02		43 34.36	
57.85		+ 23.92	
54.03			
56.22	58.299		
58.20	58.30	44 36.2	
0.36	58.25	38.4	
2.48		38.7	
4.65		38.9	
52469 6.78		1933 40.9	
52469		1933	
10.80		44 38.66	
12.80	14.860	− 40.38	
14.80	14.86		
16.80	11.650		
7430 18.10		43 34.36	
2430	43 58.275	44 38.66	
		+ 23.92	
		− 40.38	
		64.30	
		1.80821	
		1.16981	
		2.97802	
		1.95875	
		8.98073	
		5 27 51	

102

λ Orionis

h m s
5 48 37

1.17609 0.15854
9.99658
1.17267

50 14.32		50 7.7	
16.50	18.632	9.4	
18.66	18.63	11.2	
20.88		12.6	
9316 22.80		556 14.7	
9316		556	
27.00		50 11.12	
29.00		+ 24.18	
31.10			
33.08	35.302		
35.25	35.30	50 59.0	
37.50	35.30	1.3	
39.55		2.9	
41.65		4.6	
31772 43.77		3140 6.2	
31772		140	
47.83		51 2.80	
50.00	51.976	− 27.50	
52.05	51.97		
54.00	70.60		
25988 56.00		50 11.12	
988	50 35.300	51 2.80	
		+ 24.18	
		− 27.50	
		51.68	
		1.71332	
		1.17267	
		2.88599	
		1.87151	
		8.98552	
		5 31 28	

5 48 40 45

M 28 12.57			
M 29 40.40	48 08 1		
R 29 40.32	7		
R 29 40.30	31 01 9		
M 29 40.57	18		
29 40.36			
87.82	.09		

M 10 19.30			
M 11 49.95	1.10 15 29		
R 11 50.37	13		
R 11 50.40	39 01 16		
M 11 50.25	1		
11 50.24			
90.94	.15		

M 5 9.05			
M 6 23.65	52 13 21		
R 6 23.47	3		
R 6 23.25	36 11 19		
M 6 23.40	4		
6 23.44			
74.39	.12		

7 23 85

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106

μ Geminos

h	m	s
6	15	38

+ 22°

1879 Sept. 11

17	14	35
	16.70	19.134
	12.15	19.13
	21.58	
9567	23.77	
	9.567	
	28.10	
	30.30	
	32.47	
	34.83	37.011
	37.10	37.01
	39.20	37.03
	41.35	
	43.70	
33310	46.05	
	33.310	
	50.46	
	52.70	54.942
	54.90	54.94
	57.10	7.407
27471	59.35	
	2.471	17 37.020

17	5.0	
	6.3	
	8.1	
	10.0	
413	11.9	
	413	
17	8.26	
+	28.76	
18	15.2	
	17.3	
	19.2	
	20.6	
948	22.5	
	948	
18	18.96	
−	41.94	
17	8.26	
18	18.96	
+	28.76	
−	41.94	
	70.70	
1.849412		
1.14150		
2.99092		
2.18873		
9.19781		
857	41	

0.15854

1.17609		
9.96541		
1.14150		

118

β Cam. Min.

h	m	s
7	20	35

+ 8°

22	12.20	
	14.20	16.236
	16.20	16.24
	18.30	
8118	20.28	
	8118	
	24.47	
	26.60	
	28.65	
	30.88	32.904
	32.88	32.90
	35.80	32.92
	37.12	
	39.26	
29614	41.30	
	29614	
	45.35	
	47.57	49.598
	47.62	49.60
	51.72	6584
24799	53.73	
	24799	22 32.910

22	8.1	
	9.5	
	10.7	
	11.6	
535	12.6	
	535	
22	10.70	
+	22.21	
23	5.30	
−	32.39	
	55.10	
1.741115		
1.17126		
2.91241		
1.88767		
8.97526		
8	23	47

0.15854

1.17609		
9.99517		
1.17126		

119

L. Geminice

h	m	s
7	26	52

+ 32°

28	27.15	
	29.60	31.990
	32.05	31.99
	34.27	
15995	36.88	
	995	
	41.70	
	44.20	
	46.60	
	48.90	51.498
	51.53	51.50
	54.00	51.50
	56.50	
	58.73	
46348	1.30	
	46348	
	6.17	
	8.60	11.012
	11.07	11.01
	13.74	10.300
5506	15.86	
	5506	28 51.500

28	17.5	
	19.6	
	21.5	
	23.5	
1084	26.3	
	84	
28	21.68	
+	29.82	
29	26.1	
	27.5	
	28.2	
	31.1	
1466	32.7	
	1466	
29	29.32	
−	37.82	
	67.64	

7 26 55.54

M	53	59.5	
M	55	40.70	55 15 32
R	55	40.25	13
R	55	40.17	21 04 21
M	55	40.40	2
	55	40.38	
		154.43	.17

M	54	28.27	
M	57	45.37.50	13 11
R	57	45.47	1
R	57	45.115	46 01 3
M	57	45.62	14
	57	45.48	
		77.21	.07

M	19	45.60	
M	557	8.35	48 13 6
R	56	8.37	4
R	56	8.30	34 04 11
M	56	8.62	21
		8.41	
			.10

32 9 12.7

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120

L Can Min

h	m	s		
7	32	58		
			1.17609	0.15854
	1	5°	32 9.99797	
			1.17406	

34	34.65		34	25.5			
	36.70	38.786		27.3			
	38.88	38.79		29.1			
	41.03			30.9			
19393	42.87		1451	32.3			
	19393			1451			
	47.00		34	2902			
	49.20		+	2637			
	51.25						
	53.33	55.381					
	55.35	55.38	35	22.0			
	57.50	55.40		23.2			
	59.50			24.4			
	1.60			26.0			
49843	3.70		1232	27.6			
	49843			232			
	7.95		35	2464			
	9.95	12.010	−	2925			
	12.00	12.01					
	14.00	11.080					
6005	16.15		34	29.02			
	6005	34 55.390	35	24.64			
			+	26.37			
			−	29.25			
				55.62			
7 33 052			1.74523				
			1.17406				
			2.91929				
			1.89911				
			6.97982				
			5 32 38				

122

β Geminor

h	m	s		
7	37	55		
				0.15854
	+28	19		

39	29.70			39	24.2		
	32.18	34428			25.7		
	34.40	3443			27.7		
	36.76				29.2		
17214	39.10			1380	31.2		
	2214				1380		
	43.70			39	2760		
	46.18			+	2553		
	48.46						
	50.71	53.116					
	53.10	53.12		40	27.3		
	55.50	53.14			28.9		
	57.80				30.5		
	0.15				32.8		
47804	2.45			1545	35.0		
	47804				1545		
	7.17			40	3090		
	9.55	11.860		−	3777		
	11.80	11.86					
	14.28	10629					
5930	16.80			39	2760		
	5930	39 53.130		40	30.90		
				+	25.53		
				−	37.77		
					63.30		
7 87 5768				1.80140			

M	56	10.60					
M	57	30.05	99 06	18			
R	57	29.80		7			
R	57	29.70	75 05	17			
M	57	29.92		5			
	57	29.87					
		79.27		12			

M	9	51.90					
M	10	12.40	72 18	32			
R	10	12.45		13			
R	10	12.42	44 02	16			
M	10	12.55		3			
	10	12.58					
				16			

28 18 55.8

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(1) Value of the constant - weather below the readings (4 microscopes) of M and R for June 24 to Sept 11

(2) The residuals for two readings of M

" " " " " " R

" " " " four " " $\frac{2M+2R}{4}$.

Results from groups of 5 observations.

Constant M−R	2 for M	2 for R	4 for $\frac{2M+2R}{4}$
+.22"	.07"	.11"	.12"
+.11	.18	.08	.11
+.11	.05	.06	.07
+.18	.02	.07	.10
+.17	.07	.08	.11
−7.	7	5	9
−4	7	5	14
−11	7	7	11
+1.	12	5	8
+0	5	4	6
+3	17	8	13
−24	5	7	.14
+4	12	8	.10
−12	10	12	.14
+15	.12	.11	.16
−6	8	7	9
+2	4	8	10
−2	6	9	11
−2	3	8	12
−2	.x6	8	.x6
+15	8	5	12
−7	12	5	13
−7	5	11	11
−6	5	2	10
−4	8	2	9
−6	12	3	10
+4	4	3	5
+8	13	4	12
28 +006.	.083	.084	.106

M	R	$\frac{M+R_2}{2}$
.083	.064	
+16	13	+106
.099	.077	−5
.088		.101

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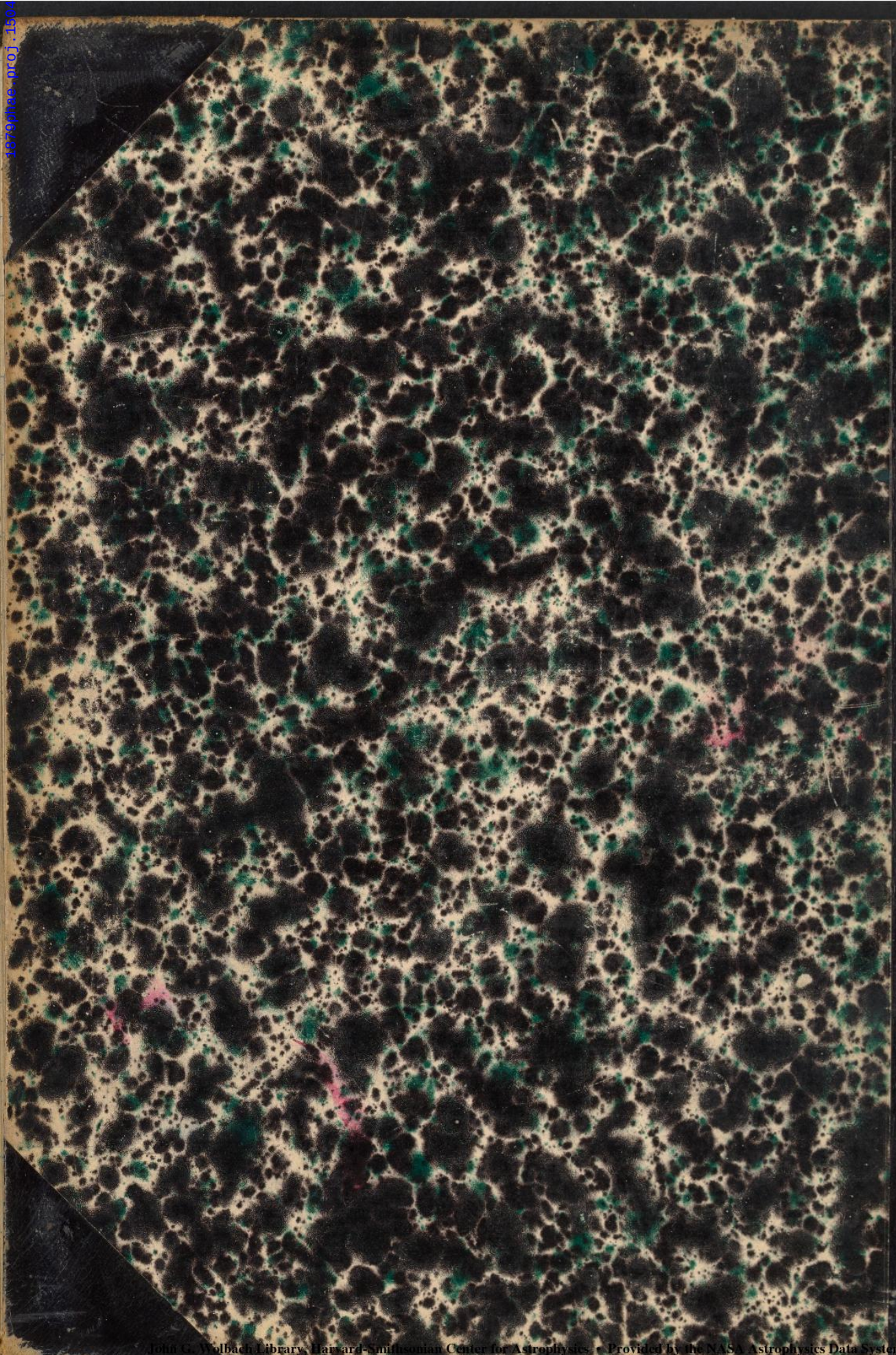
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