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v.502

astrophysics_prog_1506

Fundamental Stars.
Observations and Reductions.
By

From Oct. 13 to Nov. 30. 1879

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1879phae..proj..1366.

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1879phae.proj.1506.

146 — α Leonis

h m s 10 1 56; +12° 33′

1879 Oct. 13

1.17609 0.16056
9.98950
1.16559

4 12.40, 14.50, 16.50, 18.80, 8298 20.78, 8298, 25.10, 27.00, 2 29.35, 31.47, 33.50, 35.60, 37.80, 39.90, 30168 42.06, 30178, 46.30, 48.30, 50.40, 52.53, 25213 54.60, 25213

16.598, 16.59; 33 531; 33.52; 33.50; 50.426, 5042, 6701; 4 33.510

4 11.6, 12.9, 14.8, 16.8, 747 18.6, 247, 4 1494, + 1857
5 2.6, 3.9, 5.6, 7.2, 280 8.7, 280, 5 5.60, − 32.09
4 1494
5 5.60
+ 18.57
− 32.09
5066
1.70467
1.16559
2.87026
1.85745
8.98719
5 32 44

10 1 58.84

M 55 21.87
M 56 33.85
R 56 34.02
R 56 33.90
M 56 33.80
56 33.89
72.02

12 33 16.1

148 — ζ Leonis

h m s 10 9 57; +24° 1′

1.17609 0.16056
9.96067
1.13676

12 13.30, 15.50, 17.70, 20.00, 8873 22.23, 8873, 26.73, 29.00, 31.27, 33.60, 35.80, 38.08, 40.32, 42.64, 32241 44.97, 32241, 49.40, 51.67, 54.00, 56.07, 26946 58.32, 1946

17.746, 17.75; 3 5.823, 35.82, 35.82; 53852, 53.89, 7164; 12 35.820

12 0.7, 2.4, 3.7, 5.2, 7.2, 280 8.8, 280, 12 5.60, + 30.22
13 11.5, 13.1, 15.0, 16.9, 752 18.7, 252, 13 15.04, − 39.22
12 5.60
13 15.04
+ 30.22
− 39.22
69.44
1.84161
1.13676
2.97837
1.96175
8.98338
5 29 51

56.144 5619; 56.146 5617; 5608; 28043 5606; 56.046 5620; 5618; 5603; 5596; 56.116; 56.104

M 27 43.82
M 29 15.22
R 29 15.72
R 29 15.22
29 15.39
91.57

C — γ′ Leonis C = 46.875

h m s 10 13 18; +20° 27′

0.16056

15 — — — — — — — — — — —

441 0.60, 661 2.78, 882 4.90, 1321 9.27, 1540 11.60, 1762 13.80, 1982 15.85, 6857 18.15, 6857; 2209; 13714, 13.71

10 13 20.76

16 10.8, 12.9, 14.7, 16.4, 732 18.4, 232, 16 1464, − 1853
16 35.2, 36.9, 38.8, 40.0, 1921 41.7, 1921, 16 3842, − 3231
16 1464
16 38.42

M 2 . 43.57
M 3 16.10
R 3 16.05
R 3 16.00
M 3 16.05
3 16.05
248

20 26 56.1

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156

St Louis

h m s
11 7 40
° ′
+21 11

1.17609 0.16056
9.96962
1.14571

1879. Oct. 13.

9 58.80		10 1.5	
58.17	0.474	3.0	
0.53	0.47	5.3	
2.77		6.6	
303237 4.50		249 8.5	
62.37		249	
9.26		10 4.98	
11.40		+ 13.12	
13.67			
15.75	1.8072		
18.03	18.07	10 46.7	
20.20	18.13	48.0	
22.50		50.0	
24.74		51.6	
16265 27.00		2493 52.0	
16265		2493	
31.88		10 49.86	
33.35	3.5788	− 31.76	
35.77	35.79		
38.02	3.626		
17894 40.22		10 4.98	
17894	10 18.100	10 49.86	
		+ 18.12	
		− 31.76	
		44.88	
11 7 42.91		1.65205	
		1.14571	
		2.79776	
		1.78718	
		8.98942	
		5 34 27	

M 18 3.12
M 19 4.05
R 19 4.32
R 19 4.40
M 19 4.75
19 4.38
61.26

21 10 54.2

164

B Louis

h m s
11 42 53
° ′
+15 15

1.17609 0.16056
9.98443
1.16052

45 9.50		45 3.3
11.40	1.3636	4.5
13.53	13.64	6.2
15.85		7.5
6818 17.90		312 9.7
6818		312
22.36		45 6.24
24.36		+ 24.52
26.40		
28.60	3.0751	
30.70	30.75	46 3.6
32.80	30.76	5.0
35.02		6.3
37.28		7.8
27676 39.35		320 9.8
27676		320
42.60		46 6.40
45.70	4.7882	− 36.64
47.86	47.88	
50.00	6152	
23941 52.25		45 6.24
23941	45 30.755	46 6.40
		+ 24.52
		− 36.64
		60.16
11 42 55.47		1.77931
		1.16052
		2.93983
		1.92783
		8.98800
		5 33 21

M 13 55.50
M 15 20.10
R 15 20.12
R 15 20.50
M 15 20.05
15 20.19
8.469

15 14 38.6

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S

No Sheet

187

Sun C = 46826

L Bootis

h	m	s			h	m	s		
13	17	33			14	10	8		
	°	′	0.16057			°	′	0.16057	
	−8	12				+19	49		

1879 Oct. 13 — 14 Oct. 14

18	35.62		19	48.0	20	42.60		20	8.4	
	37.68	39.798		50.0		47.90	49.548		9.9	
	39.85	39.79		51.7		49.73	49.84		11.5	11.5
	41.88			52.8		51.97			13.3	
19899	43.96		2573	54.8	24924	54.04		577	14.6	
	19899			73		24924			577	
	48.20		19	54.46		58.17		20	11.54	
	50.27			55.00		0.30		+	55.10	
	52.80					2.50				
	54.86	56.484				4.60	6.603			
	56.45	56.48				6.48	6.66			
	58.60	56.44				8.67	6.62			
	0.70					10.76				
	2.70					13.05				
50836	4.84				599.43	14.90				
	50836					6043				
	8.90					19.20				
	11.15	13.092				21.30	23.394			
	13.10	13.06				23.35	23.39			
	15.05	11288				25.62	13323			
6546	17.36		19	5146	1697	27.50		20	11.54	
	6546	18 56.460	−	55.00		1697	21 6.640	+	55.10	

M 23 21.65.

M 56 6.57.

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		256				111				493		
	P Urs. Min.				57 H Cephei	L.C			v	Draconis		
	h 18	m 11 s 21	0.16056		h 6	m 43 s 16		0.16056	h 18	m 55 s 52	0.16056	
		+86° 36′				+92° 49′				+71° 8′		
	1879	Oct. 14										
	—		16 27.0	+2 4836	43 11.45	45 59.81	36 9.0		57 26.50		57 22.2	57 55.5
	—			2 3405	25.18	59.23			32.85	39.160	25.3	0.1
	—		17 49.0	2 2005	37.40	57.46	38 1.8		39.00	39.16	30.6	5.6
	—			2 592	52.96	58.88			45.55		35.2	9.2
	—		18 51.2 (39.01)	1 51.96	44 6.77	58.73	38 53.5		19580 51.90		1533 40.0	3246 14.2
			47.0	1 3906	20.80	59.86			19580		1533	246
	—			1 2400	35.70	59.70	40 16.6		4.87		57 30.66	58 2492
	—		19 46.2	1 998	49.70	59.68			11.10		+1 5950	+ 25.24
	—			+ 5588	45 3.68	59.56	41 22.0		17.25			
	—		20 38.2	4202	17.40	59.42			23.90	30158		
13 51.12	13 16.30	+ 3482		2798	32.37	59.35	42 43.5		30.22	30.16	59 2.5	59 47.7
53.32	30.13	+ 2319	21 41.3	1396	46.25	60.21			36.60	30.16	7.2	52.2
51.97	40.40	+ 1157		− 0.02	46 1.48	61.46			42.98		13.1	56.8
52.05	52.07	− 0.02		− 1392	15.20	61.28			49.00		17.1	1.3
52.02	14 3.55	− 1153		2794	28.48	60.54			27142 55.50		623 22.4	2801 8.1
53.13	15.28	− 2215		4192	43.60	61.68			27142		623	2861
52.42	27.15	− 3473		5598	57.60	61.62			8.40		59 1246	59 57.22
53.12	39.50	− 4638		−1 1002	47 11.05	61.03			14.80	211.84 62	− 4230	−1 27.06
52.98	57.00	− 5802		−1 2890	25.50	61.60			21.24	21.16		
52.43	15 1.95	−1 952		−1 3800	40.00	62.00			27.50	18032		
52.88	14.09	−1 2121		−1 5206	53.60	61.54			10581 33.87		0 20.9	58 4.92
52.54	25.40	−1 3286		−2 608	48 8.80	62.72			10581	58 30.160	25.5	59 56.02
51.64	36.10	−1 4446		−2 2003	23.00	62.97					31.4	+ 25.24
52.45	48.48	−1 5603		−2 3413	36.30	62.17					36.0	−7 85.86
52.29	16 0.00	−2 7.71		−2 4816	50.68	62.52					1575 43.7	111.10
13 51.92	11.27	−2 19.35									1575	
83828						46 0.60					0 3150	
13 52.39											−2 1.34	

M 53 57.35	M 45 7.57	M 21 11.90
M 54 3.32	M 44 57.20	M 21 28.32
M 54 7.15	M 44 50.45	M 21 59.82
M 54 10.87	M 44 43.60	M 22 21.10
M 54 13.60	M 44 38.15	M 22 33.97
M 54 16.80	M 44 33.90	22 5.80

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Schwerdebek (?)

270 — S Aquilae

18ʰ 59ᵐ 50ˢ
−5° 4′

2 —		2	18.0
—			19.2
—			20.7
—			22.3
—		1042	24.0
			42
2879 9.29 19.50	251.30	2	20.84
2791 6.21 21.70	27.922	+	7.08
2794 414 23.80			
2792 205 25.87	27.928		
2800 — 28.00	27.93	2	57.3
2798 − 207 30.05			58.9
2794 414 32.08			0.4
2794 621 34.15			1.9
25135 36.20		3023	3.8
2690 9.30 25135			23
2791 1243 40.34		3	0.46
2787 1450 42.37	44442	−	32.54
2744 1656 44.40	44.44		
2869 1781 46.50	139.54		
2773 2221 48.60	27.908	2	20.84
20.87 2221		3	0.46
	27.915		
	27.917		

0.16056

271 — S Draconis

19ʰ 12ᵐ 31ˢ
+67° 27′

14	15.60		14	7.6	14	32.6
	21.25	26454		12.3		35.1
	26.30	26.45		15.0		39.2
	31.92			19.0		43.5
13227	37.20		792	25.3	1991	48.7
	13227			792		1991
	47.90		14	1584	14	3982
	53.50		+	5354	+	2956
	58.70					
	4.05	9386				
	9.60	9.38	15	14.9	16	12.6
	14.51	9.38		19.4		15.7
	20.05			23.7		21.4
	25.60			27.5		25.2
62447	31.00		1187	33.2	1038	28.9
	8447			1187		38
	41.50		15	2374	16	2076
	47.00	52310	−	1436	−1	1138
	52.30	52.31				
	57.75	13876				
26155	3.00		14	15.84	14	39.82
	26155	15 9.380	15	23.74	16	20.76
			+	53.54	+	29.56
			−	14.36	−	11.38
				67.90		40.94
				1.83187		1.61215

0.16056

116 — Gr. 1308 L.C.

7ʰ 18ᵐ 16ˢ
+111° 17′

19	58.55		19	7.3	19	38.5
	4.03	9.716		10.2		44.0
	9.70	9.72		15.9		45.7
	15.30			19.0		50.3
34858	21.00		739	21.5	348	55.3
	4858			739		2348
	32.65		19	1478	19	4696
	38.00		+1	4038	+1	820
	43.66					
	49.50	55.160				
	55.15	55.16	21	9.7	22	3.9
	1.00	55.17		13.4		6.1
	6.48			18.3		10.0
	12.23			22.0		14.3
49644	17.81		900	26.6	545	20.2
	49644			900		545
	29.30		21	1800	22	1090
	35.00	40622	−	2284	−1	1574
	40.37	40.62				
	46.20	17034				
20311	52.24		19	14.78	19	46.96
	20311	20 55.165	21	18.00	22	10.90
			+1	40.38	+1	8.20
			−	22.84	−1	15.74
				123.22		143.94

0.16056

M 32 1.80
M 32 59.00
R 32 58.95

32 58.97

M 2 15.80
M 2 29.07
M 2 53.70
M 3 23.95

M 15 17.00
M 14 58.10
M 14 10.37
M 13 42.82

~~143710~~

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303

ζ Cygni

h m s
21 7 47

1879 Oct. 14

	° ′	1.17609	0.16056
	+29 44	9.93869	
		1.11478	

10	2.70		9	57.5	
	5.00	7.408		53.2	
	7.40	7.41		54.7	
	9.76			56.3	
3704	12.18		2741	58.4	
	3704			241	
	16.90		9	5482	
	19.30		+	31.60	
	21.65				
	24.05	2.6409			
	26.38	2641	10	53.9	
	28.80	26.43		57.8	
	31.20			58.3	
	33.50			1.3	
23768	35.90		2977	3.4	
	23768			2977	
	40.50		10	5954	
	43.00	45.450	−	33.12	
	45.45	46.45			
	47.80	5286			
22725	50.80		9	54.82	
	22725	10 26.420	10	59.54	
			+	31.60	
			−	33.12	
				64.72	
				1.81104	
				1.11478	
				2.92582	
				1.91030	
				8.98448	
				5 30 41	

M	44	23.65	
M	45	44.85	
R	45	45.10	
R	45	44.98	
M	45	45.02	
	45	44.99	
		81.34	

307

β Aquarii

h m s
21 25 11

	° ′	1.17609	0.16056
	−6 6	9.99753	
		1.17362	

27	27.70		27	22.2	
	31.80	33900		23.5	
	33.90	33.90		25.5	
	36.05			27.4	
16950	38.05		1279	28.9	
	1950			279	
	42.16		27	25.58	
	44.25		+	2487	
	46.25				
	48.30	50420			
	50.45	5042	28	21.7	
	52.53	50.46		23.3	
	54.57			24.9	
	56.60			26.8	
45378	58.67		1245	28.3	
	45378			245	
	2.72		28	2490	
	4.92	7034	−	3445	
	7.00	7.03			
	9.10	10093			
3517	11.23		27	25.58	
	3517	27 50.450	28	24.90	
			+	24.87	
			−	34.45	
				59.32	
				1.77320	
				1.17362	
				2.94682	
				1.93556	
				8.98874	
				5 33 55	

M	33	45.82	
M	35	12.02	
R	35	12.02	
R	35	12.05	
M	35	12.02	
	35	12.03	
		86.21	

309

ε Pegasi

h m s
21 38 14

	° ′	1.17609	0.16056
	+9 19	9.99423	
		1.17032	

40	23.50		40	26.3	
	25.50	37120		27.7	
	27.10	37.12		29.4	
	29.20			31.0	
18560	41.20		1470	32.6	
	18560			1470	
	43.50		40	2940	
	45.55		+	2443	
	47.68				
	49.74	53831			
	52.76	53.83	41	27.3	
	53.75	53.83		28.8	
	55.80			30.5	
	0.20			32.0	
48448	2.10		1526	34.0	
	48448			1526	
	6.39		41	3052	
	8.50	10546	−	3669	
	10.57	10.55			
	12.60	10767			
5273	14.67		40	29.40	
	5273	40 53.830	41	30.52	
			+	2443	
			−	36.69	
				61.12	
				1.78618	
				1.17032	
				2.95650	
				1.94389	
				8.98739	
				5 32 54	

M	8	44.75	
M	10	12.37	
R	10	12.78	
R	10	12.33	
M	10	12.62	
	10	12.63	
		87.88	

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311 | 116 | 118

α Aquarii

h m s
21 59 34
° ′
−0 54

1.17609 0.16056
9.99995
1.17604

1 52.80		1 43.9	
54.95	56950	45.0	
57.00	56.95	46.4	
59.00		48.0	
28475 1.00		2337 50.4	
28475		2337	
5.24		1 4674	
7.26		+ 26.70	
9.30			
11.40	13422		
13.40	1342	2 39.6	
15.50	13.46	41.1	
17.50		42.8	
19.50		44.5	
12080 21.70		2143 46.3	
12080		2143	
25.50		2 4286	
27.50	29980	− 29.42	
30.00	29.98		
32.00	14693		
14990 34.10		1 46.74	
14990	2 13.440	2 42.86	
		+ 26.70	
		− 29.42	
		56.12	
21 59 38.28		1.74912	
		1.17604	
		2.92516	
		1.90650	
		8.98134	
		5 28 19	

M 22 7.05
M 23 27.52
R 23 27.85
R 23 28.00
M 23 27.35
23 27.68
80.63

0 54 0.5

Gr. 1308

h m s
7 18 16
° ′
+68 43

0.16056 0.16056

20 6.00		19 38.9	20 4.7
11.60	17304	42.2	9.4
17.00	17.30	46.6	14.7
22.15		50.3	19.5
8652 28.77		2340 56.0	707 22.4
8652		2340	707
40.18		19 4680	20 1414
45.87		+1 15.96	+ 48.62
51.55			
57.30	2803		
2.80	2.80	21 27.5	
8.60	2.71	32.2	
14.18		35.6	
19.50		40.6	
56523 25.25		1828 46.9	
2523		1828	
36.85		21 3656	
42.60	48134	− 33.80	
48.00	48.13		
53.80	12543		
24067 59.42		19 46.80	20 14.14
24067	21 2.755	21 36.56	+ 48.62
		+1 15.96	
		− 33.80	
		109.76	

M 47 8.72
M 47 23.85
M 48 7.82

β Can. Min. 016056

h m s
7 20 35
° ′
+8 32

1.17609
9.99517
1.17126

22 53.75		22 44.2
55.80	57976	45.9
58.00	57.98	47.8
0.11		49.3
28988 2.22		2382 51.0
28988		2382
6.30		22 4764
8.45		+ 27.04
10.60		
12.52	14678	
14.63	14.68	23 42.5
16.70	14.67	44.1
18.90		45.4
21.00		47.1
13210 23.00		2278 48.7
13210		278
27.20		23 4556
29.30	31360	− 30.88
31.40	31.36	
33.40	14934	
15680 35.50		22 47.64
15680	23 14.675	23 45.56
		+ 27.04
		− 30.88
		57.92
		1.76283
		1.17126
		2.93409
		1.92340
		8.98931
		5 34.22

M 56 24.47
M 57 48.37
R 57 48.40
R 57 48.22
M 57 48.22
57 48.30
83.83

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1879phae.proj.1506.

497

Gr. 2900 L.C.

h m s
19 28 59
° ′
+100 38

0.16056

1879 Oct. 14

29	27.40			29	54.3	30	47.5								
	41.00				7.7		54.8								
	53.97				16.0		0.7								
26270	3.78	52540			23.4		12.3								
	15.55			3712	29.8	3168	21.5								
					712		168								
	38.06			30	14.24	31	3.36								
	49.00														
	0.30														
	11.30	22703													
	22.70	22.70		31	155	32	42.7								
	34.10				52.4		54.3								
	45.60				58.2		3.9								
	56.27				4.2		14.3								
74433	7.50			3059	19.6	3176	22.4								
	20433				59		176								
	29.60			32	1.18	33	3.52								
	42.00	52.060													
	53.80	52.06													
	5.00														
26030	13.90			30	14.24	31	33.6								
	26030	31 2270		32	1.1.18	33	3.52								

M 53 29.30
M 53 15.95
M 52 59.65
M 52 43.67

52 59

120

L Can. Mer.

h m s
7 22 58
° ′
+5 32

1.17609
9.99797
1.17406

35	16.38					35	6.0								
	18.42	20510					8.0								
	20.48	2051					9.8								
	22.58						11.5								
10255	24.69					483	13.0								
	102.53						483								
	28.75					35	9.66								
	30.91					+	27.46								
	33.00														
	35.01	37.103													
	37.05	37.10				86	8.3								
	39.30	37.15					10.4								
	41.17						12.0								
	43.35						13.7								
33393	45.40					601	15.7								
	33393						601								
	49.70					36	12.02								
	51.65	53.790				−	34.90								
	53.70	53.79													
	55.80	7430													
26895	57.80					35	9.66								
	1895	35 37.125				36	12.02								
						+	27.46								
						−	34.90								
							62.36								
							1.79491								
							1.17406								
							2.96897								
							1.94689								
							8.97792								
							5 25 45								

7 83 146

M 56 12.50
M 57 40.92
R 57 41.12
R 57 41.12
M 57 40.82
57 40.99
88.49

5 82 2.6

148

E Lewis

h m s
10 9 54
° ′
+24 1

0.16056

12	14.12					12	4.4								
	16.23	18546					6.0								
	18.33	18.55					7.8								
	20.50						9.6								
9273	22.08					395	11.7								
	9273						395								
	27.60					12	7.90								
	29.80					+	28.70								
	32.06														
	34.28	36.628													
	36.62	36.63													
	38.52	36.56													
	41.22														
	43.45														
32965	45.60														
	32965														
	50.10														
	52.30	64580													
	54.57	54.58													
	56.85	7313													
27290	59.18					12	7.90								
	2290	12 36.595	+	28.70											

M 27 47.92
R 27 48.15
R 27 48.30
M 27 48.05

27 48.10

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C

Y Leonis

h m s
10 13 18

1.17609 0.16056
+20 27 997173
1.14782

Oct. 14

15 38.23
37.20 39454
39.40 39.45
41.60
19727 43.84
19727
48.05
50.40
52.60
54.83 57001
57.02 57.00
59.20 57.03
1.40
3.70
51301 5.81
51301
10.17
12.34 14616
14.65 14.61
16.88 11406
7308 19.02
2308 15 57.015

15 20.4
29.9
31.6
33.0
1578 34.9
1578
15 31.56
+ 2546

16 28.0
29.2
31.1
32.9
1547 34.5
1557
16 3114
− 34.12

15 31.56
16 30.94
+ 2546
− 33.92
59.38
1.77364
1.14782
2.92146
1.90542
8.98396
5 30 17

10 18 20.78

M 1 46.15.
M 3 6.78.
R 3 6.52.
R 3 6.65.
M 3 6.37.
36.58
80.43

20 26 55.5

S

Sun ☉ = 46,826

h m s
13 21 16
−8 ° ' 0.16056
34

Oct. 14–15

22 19.50
21.15 23780
23.75 23.78
26.05
11890 27.95
18.90
32.00
34.20
36.17
38.30 40356
40.40 40.35
42.34 40.49
44.50
46.57
36320 48.70
320
53.07
56.10 57.200
57.24 57.20
59.26 8698
28600 1.40
28600

23 31.5
33.4
35.0
36.4
1748 38.56
248
23 3496
− 5454

24 30.00
31.80 33980
34.00 33.98
36.05
6990 38.05
1990
42.39
44.37
46.50
40.58 50683
50.72 50.68
52.74 50.71
56.10
56.50
45615 59.05
45615
5.29
5.29 7.448
7.56 7.45
9.50 14143
3724 11.60
3724

23 53.3
55.4
56.6
58.4
2838 0.1
2838
23 5676
+ 53.94

23 56.76

M 45 38.70.

M 18 26.25.

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280 α Aquilae

h m s
19 44
+ 8° 33'
0.16056

1879 Oct. 15

47 11.45			
13.45	15592		
15.52	15.59		
17.64			
7796 19.50			
2796			
24.06			
26.08			
28.10			
30.21	32254		
32.16	32.25	47 53.7	
34.25	32.25	54.0	
36.45		55.8	
38.40		0.6	
29029 40.55		2943 2.2	
29029		2943	
44.70		47 58.86	
46.85	48920	− 26.61	
49.00	48.92		
51.05	6451		
24460 53.50			
24460	47 32.250	47 58.86	
		− 26.61	

19 44 56.05

R 26 21.62.
R 26 21.78.

26 21.70
8 33 7.4

287 θ Aquilae

h m s
20 3 4
− 1° 11'
0.16056

7 22.50			
24.68	26652		
26.60	26.65		
28.68			
13326 30.80			
13326			
34.95			
36.90			
39.00			
41.00	43.142		
43.20	43.14	8 12.3	
45.25	43.16	14.0	
47.20		15.4	
49.30		17.0	
38828 51.40		777 19.0	
38828		777	
55.58		8 18.54	
57.60	59.676	− 32.39	
59.70	59.67		
1.75	8632		
29838 3.80			
29838	7 43.150	8 15.54	
		− 32.39	

R 39 2.40.
R 39 2.07.

607 α_2 Capricorni

h m s
20 11 20
− 12° 55'
0.16056

13 38.76		13 32.1	
40.95	43040	30.5	
42.00	43.04	31.7	
45.20		32.6	
21526 47.29		1607 35.8	
1520		1607	
51.50		13 32.14	
53.60		+ 27.80	
55.70			
57.60	59952		
0.00	59.95		
2.07	59.93		
4.20			
6.20			
53957 8.40			
53957			
12.53			
14.70	16820		
16.87	16.82		
19.00	11986		
8410 21.00		13 32.14	
8410	13 59.940	+ 27.80	

20 11 24.81

R 22 33.87.
R 22 33.72.

22 33.79
12 54 54.5

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303 ζ Cygni

h m s
21 7 47
° ′
+29 44

1.17609 0.16056
9.93869
1.11478

10	3.48		9 53.0
	5.77	8.214	55.3
	8.20	8.21	56.6
	10.70		58.4
4107	12.92		2832 59.9
	4107		332
	17.70		9 56.64
	20.20		+ 30.60
	22.40		
	24.90	27.244	
	27.25	27.24	10 58.2
	29.60	27.24	58.4
	32.00		1.0
	34.35		2.1
24520	36.80		3003 3.6
	24520		03
	41.53		11 00.6
	43.90	46.264	− 32.82
	46.18	46.26	
	48.64	54.47	
23132	51.06		9 56.64
	23132	10 27.240	11 0.06
			+ 30.60
			− 32.82
			63.42
			1.80223
			1.11478
			2.91701
			1.90671
			8.98970
			5 34.39

M	44	24.82		
M	45	44.80		
R	45	45.05		
R	45	44.98		
M	45	44.72		
	45	44.89		
		80.67		

309 ε Pegasi

h m s
21 38 14
° ′
+9 19

1.17609 0.16056
9.99423
1.17032

40	33.77		40 22.6
	35.98	37.962	25.0
	37.70	37.96	26.7
	40.03		28.0
18981	42.03		1330 29.7
	18981		330
	46.33		40 26.60
	47.45		+ 28.10
	50.56		
	52.63	54.718	
	54.80	54.72	41 23.7
	56.82	54.68	25.7
	58.90		27.2
	0.92		29.0
49246	3.05		1365 30.9
	49246		1365
	7.30		41 27.30
	9.30	11386	− 32.60
	11.40	11.39	
	13.38	109.35	
5693	15.55		40 26.60
	5693	40 54.700	41 27.30
			+ 28.10
			− 32.60
			60.70
			1.78319
			1.17032
			2.95351
			1.93455
			8.98104
			5 28.5

M	8	40.05		
M	10	5.87		
R	10	6.40		
R	10	6.27		
M	10	5.72		
	10	6.06		
	8	46.01		

311 α Aquarii 0.16056

h m s
21 59 34
° ′
−0 54

1.17609
9.99995
1.17604

1	53.80		1 46.6
	55.81	57.912	47.4
	57.90	57.91	48.7
	59.95		50.0
28956	2.05		2434 51.7
	28956		2434
	6.15		1 48.68
	8.26		+ 25.68
	10.26		
	12.33	14.361	
	14.27	14.36	2 42.0
	16.40	14.37	45.0
	18.48		46.7
	20.50		49.0
12925	22.60		2339 51.2
	12925		2339
	26.70		2 46.78
	28.72	30.856	− 32.42
	30.89	30.84	
	32.97	14.874	
15419	35.80		1 48.68
	15428	2 14.365	2 46.78
			+ 25.68
			− 32.42
			58.10
21 59 88.27			1.76418
			1.17604
			2.94022
			1.92033
			8.98011
			5 27.24

M	23	8.62		
M	23	31.65		
R	23	31.87		
R	23	32.07		
M	23	31.85		
	23	31.86		
		83.24		

0 54 0.5

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322

η Pegasi

h m s
22 37 20
+29° 25′ 1.17609 9.93934 1.11543

1879 Oct. 15

39 37.10		39 31.0	
32.30	41.774	33.0	
41.80	41.77	35.0	
44.50		37.1	
20887 46.47		1767 40.0	
887		1767	
57.30		39 35.34	
53.60		+ 25.38	
52.05			
55.35	0.711		
0.10	0.71	40 32.2	
3.80	0.73	33.5	
5.40		35.0	
7.70		36.6	
54640 10.30		1753 38.0	
640		2.53	
15.00		40 35.06	
17.28	19.702	− 34.34	
19.78	19.70		
22.00	121.47		
4851 24.45		39 35.34	
9851	40 0.720	40 35.06	
		+ 25.38	
		− 34.34	
		59.72	
		1.77612	
		1.11543	
		2.89155	
		1.88519	
		8.99364	
		5 37 41	

M 52 59.87
M 54 16.52
R 54 16.92
R 54 16.82
M 54 16.37
54 16.66
76.77

329

α Pegasi

h m s
22 58 44
+14° 23′ 1.17609 9.98584 0.16056

1 3.40		1 1.8	
5.33	7.668	2.9	
7.70	7.67	4.0	
9.76		6.0	
3834 11.95		217 7.0	
3834		217	
16.17		1 4.34	
18.30			
20.40			
22.45	24.663		
24.50	24.66	1 54.2	
26.95		56.0	
29.00		57.7	
31.00		59.8	
22197 33.20		2895 1.8	
22197		2895	
37.40		1 57.90	
39.55			
41.80			
4405			
4620		1 4.34	
	1 24.701	1 57.90	

M 54 51.40
M 56 7.52
R 56 7.62
R 56 7.55
M 56 7.47
56 7.54
76.14

14 88 49.0

1

α Andromedae 0.16056

h m s
0 2 8
+28° 25′ 1.17609 9.94424 1.12033

4 26.00		4 20.9
28.45	30.746	22.5
30.88	30.75	24.4
33.00		26.6
15373 35.40		1224 28.0
373		224
40.20		4 24.48
42.46		+ 25.04
44.70		
47.16	49.506	
49.50	49.51	5 18.7
51.85	49.52	20.6
54.28		22.8
56.60		24.7
44555 58.80		1138 27.0
4555		138
3.60		5 22.46
5.90	5.290	− 38.24
8.26	8.29	
10.67	9.964	
4145 13.02		4 24.48
4145	4 49.515	5 22.46
		+ 25.04
		− 33.24
		58.28
		1.76652
		1.12033
		2.88585
		1.86841
		8.98256
		5 29 14

M 2 59.78
M 4 13.52
R 4 13.87
R 4 13.80
M 4 13.37
4 13.64
73.86

28 25 53.4

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3

γ Pegasi

h m s
0 7 0
+14° 31' 1.17609 0.16056
9.98594
Oct. 15 1.16200

9 20.00		9 23.0				12 —		12 43.7	
22.10	24.298	24.7				—		44.7	
24.28	24.30	25.9				—		46.5	
26.56		27.5	94.83	47.47	15.36	32.11		48.4	
12149 28.58		1304 29.3	47.415	47.36	13.16	34.20		2333 50.0	
2149		304						2333	
32.74		9 26.08				—		12 46.66	
34.88		+ 15.24	380.44	47.73	6.58	41.15		+ 0.84	
37.00			7.661	47.58	4.38	43.20			
39.36	41.348			47.57	+2.17	45.40			
41.40	41.35	10 9.5		47.63	−0.00	47.63		13 24.2	
43.40	41.31	11.5		47.51	−2.19	49.70		26.0	
45.60		13.1		47.47	4.39	51.86		27.1	
47.85		14.6		47.48	6.58	54.06		30.6	
37213 49.90		650 16.3		47.52	8.78	56.30		1417 31.8	
1213		6.50						1417	
54.05		10 13.00	297.24	47.42	1.316	0.58		13 28.34	
56.30	58.326	− 31.68	47.458	47.45	1.535	2.80	4.954	− 40.84	
58.38	58.32			47.37	1.754	4.92	4.95		
0.35	8.262			47.73	1.974	7.20			
29163 2.55		9 26.08		47.27	2.197	9.27		12 46.66	
29163	9 47.320	10 13.00			2.477			13 28.34	
		+ 15.24							
		− 31.68		47.478					
		46.92		47.504					
0 7 4.93		1.67136			14 10 10.81				
		1.16200							
		2.83336							
		1.82769							
		8.09433							
		~~7.85~~ 5 38 13							

M	57 34.48		M	40 40.20	
M	58 41.57		M	41 36.98	
R	58 42.67				
R	58 41.92				
M	58 41.37		19	48 36.8	
	58 41.73				
	67.26				

14 31 10.1

187

α Bootis C = 46.826

h m s
14 10 8
+19° 49' 0.16056

Oct. 16

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277

γ Aquilae

h m s
19 40 30

° ′
+10 19

1879 Oct. 18

42 57.76
53.80 55948
55.75 55.95
57.05
27974 0.18
27974
4.25
6.40
8.50
10.70 12.712
12.70 12.71
14.86 12.71
16.90
19.00
11441 21.10
N 441
25.28
27.32 29.470
29.30 29.47
31.35 14542
14735 33.70
14735 43 12.710

42 41.4
42.8
44.2
45.6
2214 47.3
214
42 44.28
+ 28.43
43 44.2
46.0
47.5
49.0
2374 50.7
2374
43 44.48
− 34.77
42 44.28
43 47.48
+ 28.43
− 34.77
63.20
1.80072
1.16904
2.96973
1.95437
8.98764
5 33 5

1.17609
9.99292
316.901

19 40 38.53

280

ζ Aquilae

h m s
19 44 53

° ′
+8 33

0.16056

47 14.15
16.35 18368
18.38 18.37
20.40
9184 22.36
9184
26.70
28.75
30.85
32.90 35024
35.00 35.02
37.15 35.06
39.15
41.24
31522 43.38
31522
47.50
49.65 51754
51.77 51.75
53.85 7012
25877 56.80
877 47 35.040

47 6.1
7.6
9.3
10.8
462 12.4
462
47 9.24
+ 25.80
48 7.4
9.5
10.7
12.5
545 14.4
545
48 1.90
− 35.86
47 9.24
48 10.90
+ 25.80
− 35.86
61.66
1.79000
1.17124
2.96124
1.95139
8.99015
5 35 0

1.17609
9.99515
1.17124

19 44 55.98

283

β Aquilae

h m s
19 49 22

° ′
+6 6

0.16057 0.16052

57 43.73
45.88 47930
47.94 47.93
50.05
23965 52.05
23965
56.00
58.26
0.32
2.40 4471
4.48 4.47
6.58 4.51
8.70
10.70
58024 12.80
4024
17.80
19.90 21100
21.10 21.10
23.17 12903
10550 25.23
10550 52 4.490

57 35.4
36.9
38.5
40.0
1926 41.8
1926
51 38.52
+ 25.97
52 30.8
32.5
33.8
35.7
1701 37.3
201
52 3.402
− 29.53
51 38.52
52 34.02
+ 25.97
− 29.53
55.50
1.74429
1.17362
2.91791
1.89851
8.98060
5 27 46

1.17609
9.99753
1.17362

19 49 25.43

M 8 54.22.
M 10 24.70.
R 10 25.02.
R 10 24.90.
10 24.87
90.65

10 19 27.8

M 35 5.07.
M 56 34.22.
R 56 34.78.
R 56 34.45.
56 34.48
89.41

8 38 17.4

M 21 42.40.
M 23 1.42.
R 23 1.92.
R 23 1.65.
M 23 1.27.
23 1.56
79.16

6 6 36.6

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1879phae.proj.11506

287

δ Aquilae

h m s
20 3 4
−1 11 1.17609 0.16056
9.99991
1.17600

7 25.80			7 26.7			13 41.70			13 21.7			9 6.50			8 52.9
27.56	2.9656		28.5			43.80	45940		33.1			8.80	11.252		59.1
27.72	29.66		30.6			45.50	45.94		34.4			11.28	11.25		1.6
27.75			32.2			47.05			36.2			12.68			2.4
14828 28.75			1513 33.3			22970 50.25			1733 37.9			5626 16.00			3033 4.3
14828			1513			22970			2.33			5626			3.3
31.50			7 30.26			54.40			13 34.66			20.75			9 0.66
40.07			+ 15.88			56.50			+ 2.822			23.18			+ 2.958
42.07						58.70						25.15			
44.16	46131					0.70	2.883					27.50	30.250		
46.10	46.13		8 13.9			2.90	2.88		14 34.2			30.20	30.25		10 0.3
48.10	46.14		15.7			5.00	2.88		36.0			32.60	30.23		1.8
50.20			17.3			7.15			37.6			35.20			3.7
52.30			19.0			9.20			39.0			37.30			5.7
41518 54.25			862 20.3			56595 11.40			1873 40.6			27225 39.67			193 7.8
41518			862			2595			1873			27225			193
58.30			8 17.24			15.60			14 3.746			44.48			10 3.86
0.50	2.630		− 31.10			17.70	19.814		− 34.58			46.80	49.206		− 33.62
2.65	2.63					19.82	19.81					49.18	49.21		
4.70	9224					21.80	12575					51.37	6046		
31315 6.80			7 3026			99907 24.05			13 34.66			24603 54.10			9 0.66
1315	7 46.135		8 17.24			9907	14 2.880		14 37.46			24603	9 30.240		10 3.86
			+ 15.88						+ 28.22						+ 29.58
			− 31.10						− 34.58						− 33.62
			46.98						62.80						63.20
			1.67192			20 11 24.25			1.79796						1.80072
			1.17600						1.16496						1.11478
			2.84792						2.96292						2.91550
			1.83353						1.94265						1.90244
			8.98561						8.97973						8.98694
			5 31 32						5277						5 32 33

M	38 50.15			M	22 31.07			M	44 24.55					
M	39 58.12			M	23 58.72			M	45 44.35					
R	39 58.65			R	23 58.92			R	45 44.72					
R	39 58.37			R	23 58.75			R	45 44.37					
M	39 58.10			M	23 58.42			M	45 44.27					
	39 58.31				23 58.70				45 44.43					
	68.16				87.63				79.88					

12 87 54.6

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209

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1879
Oct. 19

31	53.80			31	45.1										
	53.27	57.612			46.8										
	52.62				48.1										
	52.92				50.5										
28806	2.25			2435	52.2										
	28806				2435										
	6.80				48.70										
	9.28														
	11.60														
	13.92														
	16.12														
	18.46														
	21.81														
	23.20														
	25.45														
	30.03														
	32.40														
	34.73														
	37.10														
	39.38														
					31	48.70									
		32 06.170													

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				40	40.20			40	49.6						
					42.00	44200			51.4						
					44.05	44.20			53.0						
					46.35				54.3						
				22100	48.60			2644	56.1						
					2100				144						
					52.60			40	52.88						
					54.70			+	7.94						
					56.80										
					58.78	0848									
					0.85	0.85		41	27.8						
					2.88	0.78			29.5						
					4.92				31.1						
					7.10				32.7						
				54763	9.08			1552	34.1						
					763				52						
					13.25			41	31.04						
					15.29	17368			− 30.22						
					17.40	17.37									
					19.40	12154									
				8684	21.50				40 52.88						
					8684	41 a.815			41 31.04						
									+ 7.94						
									− 30.22						
									38.16						
									1.58161						

				42	53.20					42	49.5				
					53.20	57260					51.2				
					57.25	57.26					52.9				
					59.28						54.7				
				28630	1.37					2642	55.9				
					28630						142				
					5.10					42	52.84				
					7.75					+	2.19				
					10.00										
					12.00	14036									
					14.00	14.02				43	44.5				
					16.05	14.02					46.3				
					18.22						47.8				
					20.30						49.3				
				12632	22.30					2386	50.7				
					12632						2386				
					26.60					43	47.72				
					28.70	30776					− 33.69				
					30.78	30.78									
					32.90	14804									
				15388	34.90						42 52.84				
					388	43 14.030					43 47.72				
					776						+ 21.19				
											− 33.69				
											54.88				
											1.73941				
											1.16901				
											2.90842				
											1.89476				
											8.98634				
											5326				

19 40 38.87

R	21	29.62		R	41	19.98		M	9	40.2					
R	21	30.00		R	41	19.65		M	10	22.22					
R	21	29.90		R	41	19.90		R	10	22.78					
	21	29.84			41	19.84			10	22.50					
										7848					

27 7 17.6

10 19 27.8

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280

α Aquilae

h m s
19 44 33
° ′ 1.17609 0.16056
+8 33 9.99515
1.17124

47 15.55		47 8.8	
17.68	19.746	10.7	
19.70	19.75	12.2	
21.50		14.2	
9873 23.90		618 15.9	
9873		618	
25.05		47 12.36	
30.15		+ 24.02	
32.20			
34.20	36379		
36.31	36.38	48 4.9	
37.28	36.38	7.2	
40.58		8.6	
42.76		10.1	
32741 44.68		426 11.8	
32741		426	
48.93		48 8.52	
51.00	53016	− 32.14	
52.00	53.02		
55.00	7277		
26508 57.15		47 12.36	
1508	47 36.380	48 8.52	
		+ 24.02	
		− 32.14	
		56.16	
19 44 56.95		1.74943	
		1.17124	
		2.92067	
		1.91142	
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		5 35 28	

M	55 6.25.	
M	56 27.62.	
R	56 27.97.	
R	56 27.82.	
	56 27.80	
	81.53	

8 88 17.3

283

β Aquilae

h m s
19 49 22
° ′ 1.17609 0.16056
+6 6 9.99733
1.17362

57 42.00		57 35.3	
47.18	49.206	36.7	
48.15	49.21	38.2	
51.30		39.9	
24603 52.40		1923 42.2	
24603		1923	
57.51		57 38.46	
59.70		+ 27.36	
1.68			
3.78	583		
5.80	5.83	52 34.6	
7.92	5.80	36.7	
9.88		38.2	
12.07		40.5	
59247 14.14		1920 42.0	
5247		1920	
18.33		52 38.40	
20.30	22.388	− 32.58	
22.46	22.39		
24.37	13160		
11194 26.48		57 38.46	
1194	52 5.815	52 38.40	
		+ 27.36	
		− 32.58	
		59.94	
19 49 25.42		1.77772	
		1.17362	
		2.95134	

M	21 38.70.	
M	22 4.10	
R	22 4.27	
R	22 4.30	
M	22 4.12	
	22 4.20	

6 6 86.5

287

δ Aquilae

h m s
20 5 4
° ′ 0.16056
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Cant read-

M	39 11.05	
M	40 3.52	
R	40 3.70	
R	40 3.72	
M	40 3.48	
	40 3.60	

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607

α^2 Capricorni

h m s
20 11 20
° ′
−12 55 1.17609
9.98887
1.16496

0.16056

1879 Oct. 17

13 43.18
45.20 47.314
47.25 47.31
49.47
23657 51.47
23657
52.70
53.88
55.98
57.24 4.248
59.22 4.25
6.30 4.20
8.50
10.58
57823 12.73
3823
16.85
19.00 21.092
21.15 21.09
22.10 12.840
10546 25.36
546 1H 4.225

13 33.6
35.1
36.8
37.1
1852 40.6
1852
13 37.048
+ 27.18

14 33.6
35.2
36.5
38.0
1830 39.7
3.30
14 3660
− 32.38

13 37.04
14 36.60
+ 27.18
− 32.38
59.56
1.77495
1.16496
2.93991
1.91876
8.97885
5 26 27

20 11 24.23

M 22 30.55
M 23 53.57
R 23 53.52
R 23 53.57
M 23 53.30
23 53.49
8.294

12 54 54.6

303

β Cygni

h m s
21 7 47.
° ′
+29 44 1.17609
9.93869
1.11478

0.16056

10 7.85
10.16 12.572
12.55 12.57
14.83
6286 17.37
6286
22.18
24.47
26.85
28.18 31.540
31.45 31.54
32.90 31.58
36.23
38.60
28386 41.00
28386
45.70 50598
48.27 50.58
50.60 50.60
52.80 6317
25299 55.42
25299 10 31.560

10 0.2
2.8
4.2
6.0
209 8.2
209
10 4.18
+ 2738

11 2.4
4.6
6.4
8.9
330 10.7
3.30
11 6.60
− 35.04

10 4.18
11 6.60
+ 27.38
− 35.04
6242
1.79532
1.11478
2.91010
1.89415
8.98405
5 30 21

M 44 26.50
M 45 41.67
R 45 45.10
R 45 45.05
M 45 44.65
45 44.87
78.37

307

R Aquarii

0.1636

h m s
21 25 11
° ′
−6 6 1.17609
9.99753
1.17362

0.16056

27 34.85
36.70 39.000
38.60 39.00
41.00
19500 42.25
19500
47.32
49.58
51.55
52.70 55.566
53.65 55.56
57.70 55.61
59.72
1.82
49999 3.95
50099
8.12
10.17 12.224
12.17 12.22
1430 11.22
6112 16.36
6112 27 55.585

27 25.0
26.4
27.8
29.6
1402 31.4
1402
27 28.04
+ 27.54

28 24.0
25.5
26.9
28.5
1351 30.2
1351
28 27.02
− 31.44

27 28.04
28 27.02
+ 27.54
− 31.44
58.98
1.77040
1.17362
2.94432
1.92578
8.98146
5 28 24

M 33 38.62
M 35 2.90
R 35 3.07
R 35 2.93
M 35 2.75
35 2.91
84.29

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309

ε Pegasi

h m s
21 38 14

° ′
+9 19 1.17609
9.99423
1.17032

40 38.12
40.15 42264
42.25 42.26
44.30
21132 46.30
11.32
50.60
52.70
54.85
56.95 58.977
59.01 58.98
1.00 58.99
3.11
5.24
53079 7.34
53079
11.30
13.60 15730
15.70 15.73
17.81 11799
7865 20.05
7865 40 58.985

40 28.6
30.6
32.0
33.5
1594 34.7
1594
40 31.88
+ 27.10

41 28.9
30.7
32.1
33.7
1614 36.0
1614
41 32.28
− 33.30

40 31.88
+ 27.10
− 33.30
60.40
1.78104
1.17032
2.95136
1.73757
8.98621
5 32 00

M 8 36.78
M 10 3.37
R 10 3.80
R 10 3.42
M 10 2.98
10 3.39
86.61

311

α Aquarii

h m s
21 59 34

° ′
−0 54 1.17609 0.16056
9.99995
1.17604

1 58.17
0.20 2240
2.35 2.24
4.18
31120 6.30
1120
10.38
12.46
14.50
16.50 18628
18.66 18.63
20.66 18.65
22.81
24.80
16765 26.85
16765
31.00
33.00 35064
35.00 35.06
37.22 37.30
17532 39.10
17532 2 18.640

1 48.1
47.8
51.9
53.9 9.64 4.91
2596 55.9 4.82 4.73
96
1 51.92 44.85 5.17
+ 26.72 4.983 4.99
4.94
5.01
2 0.05 5.10
52.0 5.03
53.4 4.92
54.8 4.93
2667 56.0 4.86
2667
2 53.34 24.66 5.01
− 34.70 4.932 4.90
4.92
4.93
1 51.92 4.961
2 53.34
+ 26.72
− 34.70 4.884
61.42 4.911
1.78831
1.17604
2.96435
2.16967
9.20532
9 6 54

M 21 2.92
M 23 30.72
R 23 30.78
R 23 30.72
M 23 30.62
23 30.71
147.79

21 59 88.22

0 54 0.5

See Min on Sheet 322

η Pegasi

h m s
22 37 20

° ′
+29 85 1.17609 0.16056
9.99934

— 56.1
— 55.3
— 59.1
1661 48.30 1.6
1423 50.50 2991 3.4
2996
949 55.65 59.92
712 57.87
494 4.74 0.20
501 2.85 2.66 4.999
5.10 −000 5.10 4.33 35.3
503 −237 7.40 36.8
492 4.75 9.67 38.1
493 7.12 12.05 40.9
4866 7890 14.36 1951 43.4
4499 1951
1424 1.25 3.902
1660 21.50 23.928
1898 2390 23.93
2136 26.29
1964 28.70 59.82
2288 1964 39.02

M 53 24.30
M 54 13.80
R 54 14.15
R 54 13.92
M 54 13.72
54 13.90

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619

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329

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1879 Oct. 19

	18.60		10.3		1	7.77		1	4.6		4	30.50		4	21.3
	20.80	23216	12.2			9.80	11964		6.4			32.90	35200		22.6
	23.50	23.21	15.0			12.00	11.96		8.2			35.60	3520		24.5
	25.68		17.2			14.10			9.3			37.60			26.5
11608	27.00		18.0	737	5982	16.15		394	10.9		17600	40.00		1236	28.7
	1608		237			5982			394			17600			236
	32.75		14.74			20.60		1	7.88			4461			2472
	35.10					22.80		+	21.22			4696			
	37.50					25.00						49.25			
	39.88	42311				27.00	29157					51.57			
	42.34	42.31	15.1			29.15	29.15	1	57.1			54.00		5	28.1
	44.71	42.31	16.6			31.33	29.05		58.9			56.35			30.1
	47.10		18.1			33.48			0.8			58.70			32.0
	49.50		20.0			35.40			2.5			0.85			34.0
38080	51.62		921 22.3		26236	37.60		533	4.0			322		1602	36.0
	38080		921			26236			33						1602
	56.50		18.42			41.90		2	0.66			7.80			32.04
	57.10	1412				44.00	46146	−	3156			10.40	12660		
	1.38	1.41				46.20	46.15					12.60	12.66		
	3.70	8462				48.25	5811					14.95			
30706	6.18		14.74		23073	50.38			7.88		6330	17.35			24.72
	706	42.310	18.42			23073	1 29.100		1.07			6330	4 53.939		32.04

22 51 2.82

22 58 48.25

0 2 12.68

M	41	21.12		M	54	47.52		M	2	−	3 mens read				
M	42	40.80		M	56	3.27		M	4	16.87					
R	42	40.87		R	56	3.52		R	4	17.15					
R	42	41.07		R	56	3.45		R	4	17.15					
M	42	40.82		M	56	3.07									
	42	40.89			56	3.33			4	17.06					
	79.77				75.81										

30 15 27.4

17 33 47.7

28 25 54.0

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3

γ Pegasi

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9	24.92		9	21.7	24	1.85		23	59.8
	26.15	28802		24.0		3.70	5764		56.5
	28.57	28.80		25.9		5.70	5.76		58.0
	30.87			27.2		7.77			0.0
16401	32.90		1276	28.8	2882	9.80		2906	1.3
	14401			276		2882			2906
	37.50			9. 25.52		1403			23 58.12
	39.60			+ 20.32		16.06			+ 24.23
	41.70					18.20			
	43.70	45893				20.27	22352		
	45.80	45.89	10	15.7		22.40	22.35		
	47.97	45.79		17.3		24.38	22.35		
	50.18			18.9		26.50			
	52.23			20.2		28.52			
41304	54.36		947	22.6	20116	30.80			
	41304			9217		20116			
	56.50			10 18.94		32.80			
	0.70	2796		− 33.10		36.90	38944		
	2.90	2.79				38.90	38.94		
	4.88	9159				41.00	4470		
31398	7.00			25.52	19472	43.12			
	1398	9 45.840		18.94		19472	24 22.350		

0 7 4.98

M	57	27.95	R	36	?	M	13	53.82	
M	58	41.22	R	36		M	15	18.20	
R	58	41.05				R		18.30	
R	58	40.50				R		17.98	
M	58	40.98				M		18.27	
	58	40.94					15	18.19	
		7299							

14 81 10.4

9 21 41.23

8 8 10.2

138

α Hydræ

h m s
9 21 38
0 ' 0.16056
−8 8

No such Observation -
165

β Leonis

h m s
11 42 53
0.16056
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13 40 0
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1879

Oct. 19 − 20

41 9.35
11.20 13344
13.25 1334
15.37
6672 17.55
6672
21.80
24.05
26.05
28.10 30221
30.20 30.22
32.27 30.22
34.40
36.62
27199 38.50
27199
42.87
45.00 48304
47.10 47.10
49.20 6044
23550 51.33
241572 41 30.220 −

42 25.8
27.4
28.7
30.3
1441 31.9
1441
42 28.82
− 58.60
42 28.82 29128
58.60

43 2016
22.50
24.74
26.88
28.90
33.00
35.22
37.30
39.30 41489
41.48 41.47
43.65
45.65
47.80
37320 50.00
37340
54.00
56.22 58.256
58.27 58.26
0.39
2.40
29128

43 7.4
9.6
11.3
12.8
561 15.0
561
43 11.22
43 11.22

187

α Bootis

h m s
14 10 8
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+19 49

0.16056

Oct. 20

12 —

260.74 5228 −000 52.28
52.148 5201 −2.19 54.20
5201 4.39 56.40
5222 6.58 58.80
5222 8.78 1.00
261.33 5224 13.16 5.40
52.266 5225 15.35 7.60 9.826
5230 17.55 9.85 9.83
5226 19.74 12.00
5228 49138 14.28
2913

52.207
52.207 14 10 10.81

12 57.3
0.4
2.4
4.0
3129 6.8
129
13 25.8
− 10.37
13 34.0
35.4
37.0
38.5
1849 40.0
1849
13 36.98
− 44.77
13 2.58
13 36.98

M 35 5.00.

M 8 27.00.

M 40 56.87.
M 41 44.85.
R 41 45.17.
R 41 45.17.
M 41 45.37.
41 45.14

19 48 33.7

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ε Bootis

h m s
14 39 42
+27° 35'

0.16056

42 2.65		41 57.6	
5.50	7276	59.1	
7.23	7.28	1.3	
9.60		3.7	
3638 11.50		3071 5.4	
3638		.71	
16.60		42 1.42	
18.38		+ 2448	
21.15			
23.64	25924		
25.98	25.92	42 43.4	
28.28	25.88	45.1	
30.52		46.9	
32.97		48.3	
23332 35.20		2340 50.3	
23332		2340	
32.80		42 4680	
42.24	44484	− 2090	
44.63	44.48		
46.70	5176		
22242 48.15		42 1.42	
22242	42 25.900	42 46.80	
		+ 2.448	
		− 20.90	
		45.38	
		1	

M 53 59.62
M
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R
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ε Con. Bor.

h m s
15 29 34
+27° 7'

0.16056

1.17609
9.94943
1.12552

31 34.40		31 44.8	
56.75	59014	46.4	
59.00	59.01	48.2	
1.32		49.8	
29507 3.60		2409 51.7	
29507		2409	
8.30		31 4818	
10.70		+ 2936	
13.00			
15.20	17539		
17.50	17.54	32 48.0	
19.85	17.54	50.0	
22.10		52.1	
24.40		53.7	
15785 26.80		2594 55.6	
15785		94	
31.45		32 5188	
33.70	36070	− 3434	
36.10	36.07		
38.40	15508		
18035 40.70		31 48.18	
18035	32 17.540	32 51.88	
		+ 29.36	
		− 3434	
		63.70	
15 29 35.50		1.804114	
		1.12552	
		2.92966	
		1.91450	
		8.98484	
		5 3057	

M 21 28.50
M 22 50.82
R 22 50.62
R 22 50.52
M 22 50.58
22 50.63
82.13

27 7 17.7

ε Serpentis

0.16056

h m s
15 38 18
+6° 48'

1.17609
9.99693
1.17302

40 41.70		40 34.8	
43.58	45656	36.5	
45.60	45.66	38.1	
47.70		39.7	
22828 49.70		1901 41.1	
2828		1951	
53.55		40 3802	
56.05		+ 24.22	
58.24			
0.20	2313		
2.28	2.20	41 34.3	
4.40	2.28	35.9	
6.40		37.9	
8.60		39.5	
55982 10.70		1880 41.4	
2082		1890	
14.73		41 3780	
16.90	18902	− 35.56	
18.88	18.90		
21.10	12456		
9451 23.00		40 38.02	
9451	41 2.240	41 37.60	
		+ 24.22	
		− 35.36	
		59.58	
15 38 20.65		1.77520	
		1.17302	
		2.94822	
		1.93520	
		8.98698	
		5 3235	

M 40 1.95
M 41 27.95
R 41 28.04
R 41 28.25
M 41 28.10
41 28.09
86.14

6 48 20.4

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307 β Aquarii

1879 Oct. 20

h m s
21 25 11
° ′
−6 6 1.17609 9.99753 1.17362 0.16056

27	36.00			27	30.6										
	35.05	40220			32.0										
	40.28	40.22			33.4										
	42.37				34.8										
20110	44.40			1671	36.3										
	20110				1671										
	48.54			27	33.42										
	50.64			+	23.38										
	52.70														
	54.70	56806													
	56.73	56.81		28	24.9										
	58.97	56.80			26.3										
	0.51				28.0										
	3.00				29.6										
51125	5.00			1404	31.6										
	51123				1404										
	9.18			28	28.08										
	11.26	13378		−	31.28										
	13.50	13.38													
	15.40	113.60													
6689	17.33			27	33.42										
	6689	27 54.805		28	28.08										
				+	23.38										
				−	31.28										
					54.66										
					1.73767										
					1.17362										
					2.91129										
					1.89332										
					8.98203										
					5 28.50										

M	33	46.85													
M	35	4.90													
R	35	5.47													
R	35	5.20													
M	35	4.72													
	35	5.07													
		78.22													

309 ε Pegasi

h m s
21 38 14
° ′
+9 19 1.17609 9.99423 1.17032 0.16056

40	32.40			40	30.8										
	41.40	43580			32.2										
	43.60	43.58			33.7										
	45.80				35.2										
21790	47.70			1687	36.8										
	21790				1687										
	51.90			40	33.74										
	54.00			+	26.54										
	56.05														
	58.19	0.270													
	0.23	0.27		41	28.7										
	2.40	0.30			30.0										
	4.48				31.4										
	6.50				33.2										
54243	8.68			1583	35.0										
	243				1583										
	12.70			41	31.66										
	15.00	17.028		−	31.38										
	17.04	17.03													
	18.20	12.061													
8514	21.20			40	33.74										
	8514	41 0.285		41	31.66										
				+	26.54										
				−	31.38										
					57.92										
					1.76283										
					1.17032										
					2.93315										
					1.92397										
					8.99082										
					5 35.31										

M	8	40.57													
M	10	3.85													
R	10	3.72													
R	10	3.57													
M	10	3.32													
	10	3.61													
		83.04													

311 α Aquarii

h m s
21 59 34
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−0 34 1.17609 9.99995 1.17604 0.16056

1	55.20			1	53.3										
	1.23	3386			54.8										
	3.50	3.39			56.4										
	5.50				58.2										
31693	7.50			2824	59.7										
	1693				324										
	11.77				56.48										
	13.68			+	23.44										
	15.82														
	17.80	19.938													
	19.87	19.94		2	42.3										
	22.00	19.89			43.5										
	24.04				51.1										
	26.08				52.7										
17944	28.18			2546	54.0										
	17944				46										
	32.30			2	50.92										
	34.27	36.400		−	31.00										
	36.38	36.40													
	38.50	39.79													
18200	40.55			1	56.48										
	18200	2 19.915		2	50.92										
				+	23.44										
				−	31.00										
					54.44										
					1.73592										
					1.17604										
					2.91196										
					1.89719										
					8.98523										
					5 31.15										

21 59 38.31

M	22	10.25													
M	23	29.35													
R	23	29.40													
R	23	29.12													
M	23	28.82													
	23	29.17													
		78.92													

0 54 0.5

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485

35 Draconis L.6.

h m s
17 54 52
+103 1

0.16056

256

S Ors. Min. L.6.

h m s
18 11 21
+93 24

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106

μ Cygnus

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0.16056

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—				57 18.5		58 21.2	+2	1950	10	50.15	13	9.65	9	2.9		18 3.28			17 53.7
—				23.9		28.0	2	765	11	0.48		8.13				5.55	7.716		55.4
—				32.9		37.2	1	5604		13.52		9.56	10	1.0		7.65	7.72		57.0
—				38.7		42.4	1	4434		34.68		9.02				9.90			57.1
—				1660 51.0		1798 51.0	1	3277		36.95		9.72	21	38.0		3858 12.20			2858 1.0
				1660		1798	1	21.21		49.36		1057				38.58			28.58
—				57 33.20		58 35.96	1	9.60		58.62		9.22				16.51			17 57.16
—				− 10.17		−1 12.93	0	57.99	12	11.97		4.96				18.87			4 28.41
—								4630		23.78		10.08				21.02			
57 14.80	+9.14	23.94						8482		35.48		10.50				23.35	25.596		
22.80	−0.02	22.78		59 17.3				2319		46.00		9.19				25.66	25.59		18 59.7
134.04 31.40	9.07	22.33		21.7			+	1157		58.15		10.32				27.87	25.55		1.5
23.173 41.18	18.30	22.88		26.4			−	0.02	13	11.60		11.58				30.06			3.3
52.50	27.79	23.01		65.4				11.53		23.17		11.64				32.38			4.9
0.75	36.65	24.10		59 21.80				22.15		34.30		12.13				23036 34.58			3160 6.6
				−1 58.77				34.73		45.55		11.22				23036			160
114.27 18.38	54.96	23.42						4638		56.80		10.42				38.98			19 3.20
22.856 27.15	36.156	64.16	22.99				−0	58.02	14	8.90		10.85				41.22	43.388		37.63
36.15	36.16	73.38	22.82				−1	9.52		21.02		11.50				4337	43.39		
45.10	82.42	22.68					−1	21.21		34.20		12.99				4562	51.11		
18078 54.00	−91.64	22.96		57 33.20		58 35.96	−1	32.86		42.48		9.62				21694 47.75			17 57.16
18078							−1	44.46		54.32		9.86				21694	18 25.570		19 3.20
							−1	56.03	15	7.38		11.35							+ 28.41
							−2	7.71		17.68		9.97							− 37.63
23.014							−2	19.35		27.60		10.25							66.04
23.028							−2												1.81981
												259.38							1.14150
											13	10.37							2.96131
																			1.94156
																			8.98025
																			5 27.30

M 30 14.15
M ~~30~~ 55.95 } prob. 29
M ~~30~~ 42.72
R ~~30~~ 42.72
R ~~30~~ 42.42
M ~~30~~ 42.37

30
29 42.57

M 8 3.10
M 8 58.30
M 8 26.97
M 7 3.72

M 54 11.30
M 55 38.67
R 55 38.75

55 38.41
8.741

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259

Draconis L.C.

h m s
18 23 14
+107 19
1879 Oct. 20

0,16058

24	40.80			24	32.0	25	29.4												
	46.38	53.556			37.1		34.4												
	53.50	53.56			42.5		39.7												
	0.30				49.7		46.7												
26778	7.60			2180	56.7	2031	52.9												
	26778				2180		2031												
	2.80			24	4360	25	4062												
	20.30			+1	554	+	852												
	35.40																		
	42.08	49.218																	
	49.68	49.22		26	28.0	27	22.5												
	53.70	49.06			32.8		30.0												
	3.00				38.8		32.4												
	10.15				43.0		36.9												
44296	16.65			1906	48.0	1623	40.5												
	44296				1906		162.3												
	2176			26	3812	27	3246												
	37.33	44.546		−	48.98	−	1 4332												
	44.20	44.55																	
	51.85	9.811																	
22273	58.65			24	43.60	25	40.62												
	22273	25 49.140		26	38.12	27	32.46												
				+1	5.54	+	8.52												
				−	48.98	−	1 43 32												
					114.52		111.84												

M	13	21.15	
M	12	56.92	
M	12	31.98	
M	12	10.15	

107

Geminor

h m s
6 30 43
+16 30

1.17609.08
9.98174
1.15783

0.16036

33	8.55					32	59.7	+2	4836	44	16.60	47	4.96	39	1.0				
	10.80	12540					1.1		2 3405		32.82		7.87						
	12.80	12.84					2.4		2 20.05		46.80		6.05	40	40.2				
	15.80						4.1		2 8.92		59.56		5.48						
6420	17.05					3132	5.9		1 56.96	45	11.27		3.23	41	24.3				
	6420						133		1 3906		27.38		644						
	21.40					33	264		1 24.00		41.00		500	43	17.5				
	23.60					+	2746		1 9.98	5644	55.15		642						
	25.95										56.73			50	26.6				
	28.07	30103							0 55.88	46	12.00		7.88						
	30.07	30.10				34	1.7		4202		25.48		7.50	51	14.9				
	32.25	30.09					2.5		2798		42.27		10.25						
	34.54						5.0		1896		57.07		10.96						
	36.47						6.7	−	0.02	47	7.00		6.98						
27093	38.52					247	7.8	−	13.92		24.32		10.40						
	27093						247		27.94		36.70		8.76						
	4288					34	4.94		41.92		51.86		9.94						
	45.22	47338					− 3484		55.98	48	6.12		10.14						
	47.28	47.34						−1	1002		18.30		8.28						
	49.52	6018						−1	2390		30.10		11.20						
23669	51.75					33	264	−1	38.00		46.65		8.65						
	23669	33 30.095				34	4.94	−1	52.06	49	2.80		10.24						
						+	27.46	−2	608		17.70		11.62						
						−	3484	−2	20.03		27.29		9.26						
							62.30	−2	34.13		41.68								
							1.79449	−2	48.16		55.15		1099						
							1.15783												
							2.95232						47 8.27						
							1.93414												
							8.98182												
							5.28 40												

M	58	25.50	
M	59	51.57	
R	59	51.55	
R	59	51.20	
M	59	51.42	
	59	51.43	
		85.93	

111

51 Cephei L.C.

h m s
6 48 16
+87 14

0.16056

44	16.60	47	4.96	39	1.0														
	32.82		7.87																
	46.80		6.05	40	40.2														
	58.56		5.48																
45	11.27		3.23	41	24.3														
	27.38		644																
	41.00		500	43	17.5														
5644	55.15		642																
	56.73			50	26.6														
46	12.00		7.88																
	25.48		7.50	51	14.9														
	42.27		10.25																
	57.07		10.96																
47	7.00		6.98																
	24.32		10.40																
	36.70		8.76																
	51.86		9.94																
48	6.12		10.14																
	18.30		8.28																
	30.10		11.20																
	46.65		8.65																
49	2.80		10.24																
	17.70		11.62																
	27.29		9.26																
	41.68																		
	55.15		1099																

M	16	28.15	
M	16	38.07	
M	16	40.95	
M	16	52.35	
M	17	21.30	
M	17	23.57	
		5.42	

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566 — ε Can. Maj.

h m s
6 58 52
° '
−28 48

1.17609 0.16056
9.94266
1.11875

56 13.23		56 5.1	
15.42	17.830	7.5	
17.68	17.83	9.1	
20.15		11.1	
8915 22.67		469 13.5	
8915		469	
27.15		56 9.38	
29.67		+ 27.36	
31.95			
34.38	36776		
36.77	36.78	57 6.8	
39.19	36.71	8.3	
41.55		9.9	
44.02		11.7	
33098 46.30		504 13.7	
33098		504	
50.75		57 10.08	
52.18	55586	− 33.34	
53.70	55.59		
58.00	7342		
27793 0.30		56 9.38	
27793	56 36.745	57 10.08	
		+ 27.36	
		− 33.34	
		60.70	
		1.78319	
		1.11875	
		2.90194	
		1.89254	
		8.99060	
		5 35 21	

M 14 25.30
M 15 43.27
R 15 43.35
R 15 43.32
M 15 43.38
15 43.38
78.08

568 — δ Can. Maj.

h m s
7 3 28
° '
−26 12

1.17609 0.16056
9.95292
1.12901

5 50.20		5 42.0	
52.15	54650	44.4	
54.70	54.65	46.8	
57.00		48.9	
27325 59.20		2326 50.5	
2325		2326	
3.65		5 46.52	
6.05		+ 26.52	
8.28			
10.67	12949		
13.00	12.95	6 45.0	
15.27	13.12	47.1	
17.55		49.0	
19.82		50.9	
11654 22.25		2450 53.0	
11654		2450	
26.78		6 49.00	
29.00	31390	− 35.96	
31.40	31.39		
33.70	14604		
15695 36.07		5 46.52	
695	6 13.035	6 49.00	
		+ 26.52	
		− 35.96	
		62.48	
		1.79574	
		1.12901	
		2.92475	
		1.90374	
		8.97899	
		5 26 33	

M 38 28.20
M 39 48.07
R 39 48.52
R 39 48.20
M 39 48.50
39 48.32
80.12

271 — δ Draconis

h m s
19 12 31
° '
+112 33

0.16056

14 16.22		13 24.3	14 51.5
21.70	26764	29.0	54.0
26.30	26.76	31.7	56.7
32.00		35.4	1.0
13382 37.60		1604 40.0	2882 5.0
13382		1604	
48.25		13 32.08	14 2882
53.67		+1 37.62	14 57.64
58.72			+ 12.06
14.29	24.29		
9.80	9.61	16 11.9	
15.00	9.78	14.7	
20.15		18.4	
25.65		23.6	
62653 31.00		958 27.2	
653		958	
42.20		16 19.16	
47.70	52816	−1 9.46	
52.70	52.81		
58.05	13957		
26408 3.43		13 32.08	14 57.64
26408	15 9.695	16 19.16	+ 12.06
		+1 37.62	
		−1 9.46	
		167.08	
		2.22298	

M 1 40.87
M 59 51.07
M 59 4.80

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273

T Deaconis

h m s
19 17 52
° ′
+106 52

0.16056

1879
Oct. 20

15 16.70		18 23.3	19 20.0	
28.90	31.090	31.0	23.4	
31.10	31.09	37.3	34.6	
33.20		42.0	39.4	
15545 45.35		1841 42.5	1619 44.5	
15545		1841	1619	
59.60		18 36.82	19 32.38	
6.05		+1 51.12	+ 55.56	
6284				
20.95	27.967			
27.40	2797	21 21.2		
35.20	27.90	40.6		
42.80		46.9		
49.45		50.9		
79170 56.35		2296 0.0		
25170		2296		
10.45		21 45.92		
17.40	24722	−1 17.98		
24.80	24.72			
31.76	17581			
12361 38.20		18 36.82	19 32.38	
12361	20. 27.935	21 45.92	+ 55.56	
		+ 1 51.12		
		− 1 17.98		
		189.10		

M 40 48.25.
M 40 23.55.
M 39 26.78.

118

B Can. Mom.

h m s
7 20 38
° ′
78 32

0.16056

23 0.75		22 54.8		
2.80	4.850	57.5		
4.80	4.85	59.5	5926	
6.95		1.8		
2425 8.95		2963 3.2		
2425		2963		
8.00		22 59.26		
15.20		+ 22.24		
17.32				
19.50	21.502			
21.50	21.50	23 58.0		
23.60	21.50	59.7		
25.70		1.0	1.02	
27.80		2.4		
19352 29.90		3051 4.0		
1352		51		
34.50		24.102		
36.07	38164	− 39.52		
38.18	38.16			
40.20	4301			
19082 42.37		22 59.26		
19082	23 21.580	24 1.02		
		+ 22.24		
		− 39.52		
		61.76		

3 minutos

M 56 −
M 57 59.72.
R 57 59.85.
R 57 59.82.
M 57 59.70.
57 59.77

120

L Can. Mom. 0.16056

h m s
7 32 38
° ′
+6 32

1.17609
9.99797
1.17406

35 23.15		35 15.3	
25.36	27.400	16.6	
27.50	27.40	18.2	
29.40		19.5	
13700 31.60		908 21.2	
13700		908	
33.80		35 18.16	
37.90		+ 25.87	
39.80			
41.98	44.051		
43.98	44.05	36 21.9	
46.22	44.01	23.7	
48.20		25.3	
50.28		26.7	
39646 52.30		1254 27.8	
39646		254	
56.35		36 2.508	
58.62	0.618	− 4105	
0.80	0.62		
2.66	8802		
30309 4.66		35 18.16	
309	35 44.030	36 25.08	
		+ 25.87	
		− 41.05	
		66.92	
		1.82556	

7 32 61.64

1.17406
2.99962
2.18512
9.18550
8H2 53

M 53 16.80.
M 57 49.82.
R 57 50.12.
R 57 50.05.
M 57 49.82.
57 49.95
158.15

5 33 1.5

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282

Very poor Observation

570

146

ε Draconis

ι Argus

α Leonis

h	m	s		h	m	s		h	m	s	
19	48	34	0.16056	8	2	23	0.16056	10	1	56	0.16856
	+11 0	2			-28	37			+12 33		

			51 22.5	4 20.00		4 13.2	
			28.3	22.15	24.252	14.8	
			31.3	24.28	24.25	16.2	16.52
			38.3	26.33		18.1	
			1636 43.2	12126 28.50		826 20.3	
			1636	2126		826	
			51 3272	32.78		4 1652	
			- 2006	34.85		+ 2466	
				37.00	41.207		
				39.17	~~41.172~~		
			52 23.6	41.30	41.21		
-6.00	12.60	51 18.60	29.8	43.30	41.15		
12.06	12.52	50.33 24.57	35.5	45.38			
18.49	12.34	12.582 30.83	39.8	47.45			
24.13	12.87	37.10	1738 45.1	37086 49.63			
			1738	1086			
36.14	12.86	63.58 49.10	52 3476	53.80			
42.16	12.84	12.716 55.10 0.940	-1 2210	56.10	58.062		
48.19	12.76	0.95 0.94		58.05	58.06		
54.21	12.54	6.75		0.18	8231		
-60.42	12.583	0470 12.00	51 3272	29031 2.28		4 16.52	
		470	52 3476	29031	4 41.180	+ 24.66	
12.649							
12.656							

10 1 58.52

M	29	57.02	M	23	5.87	R	55	17.02
M	29	27.95	M	25	24.72	R	55	16.75
R	29	27.90	R	[illegible]	24.75			
R	29	27.87	R		24.72		55	16.88
M	29	27.60	M		24.60			
	29	27.83		25	24.70			

12 33 15.0

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1879phae.proj.1506.

1879phae.proj.1506.

148

Z Leo.

h m s
10 9 37.
0 ' "
+2 41

+24

0.16056

1879 Oct. 20.

12 20.80			
22.00	25356		
25.25	25.36		
27.63			
12678 29.50			
2678			
34.43			
36.72			
38.91			
41.18	43459		
43.40	43.46	13	12.5
45.70	43.44		13.6
48.05			15.3
50.24			17.0
39113 52.50		774	17.0
39113			2.74
57.00		13	15.48
59.26	1516	−	32.03
1.47	152		
3.80	8.688		
30758 6.05			
758	12 43.450	13	15.48
		−	32.03

R 29 9.27.
R 29 9.22.

29 9.24

c

D'Arrest

h m s
10 13 18
0 ' "
+20 27

0.16056

15 41.57				
43.88	46098			
46.05	46.00			
47.32				
23049 50.67				
23049				
55.80				
57.20				
59.38				
1.60	3818			
3.80	3.82		16	16.3
6.03	3.76			17.6
8.25				19.6
10.50				21.7
57436 12.60			986	22.4
3436				9.86
17.80			16	19.72
19.28	21426		−	15.93
21.40	21.43			
23.65	12753			
10713 25.80			16	19.72
10713	16 3.790		−	15.93

10 13 20.93

R 2 43.98.
R 2 43.85.

2 43.91
20 26 54.0

156

S Leonis

h m s
11 7 40
0 ' "
+21 11

0.16056

3.50 10 3.88		9	56.0
5.90	8.158		57.8
8.10	8.16		59.7
10.37			1.3
4079 12.54		2983	3.5
4079			2983
16.80		9	59.66
19.00		+	26.12
21.28			
23.50	25726		
25.75	25.73		
28.00	25.82		
30.03			
32.49			
23153 34.68			
23153			
39.10			
41.30	43480		
43.40	43.48		
45.70	5164		
24740 47.90	1	9	59.66
1740	10 25.775	+	26.12

11 7 42.06

R 17 48.67.
R 17 48.72.

17 48.69
21 10 52.8

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S

Sun - $\odot$ = 46,791

	h m s			h m s				
	11 42 53			13 43 48				
	+15° 15'	0.16056		−10° 45'		0.16056		
	Oct. 20			Oct. 20 - 21				
	Corr.							
	45 57.00			47 18.5	48 8.27		47 41.9	
	59.00	1214		20.2	10.70	12.674	44.0	
	1.20	1.21		21.7	12.60	12.67	45.8	
	3.22			23.2	14.80		47.0	
	30607 5.55			1090 25.7	6337 17.00		2267 48.0	
	607			90	6337		267	
	9.66			47 21.80	21.20		47 45.34	
	11.87			−1 3.72	23.30		+ 44.26	
	13.88				25.30			
	16.00	18.107			27.50	29.593		
	18.00	18.11			29.50	29.59		
	20.20	18.06			31.70	29.62		
	22.25				33.77			
	24.48				35.90			
	16296 26.62				26634 38.17			
	16296				8634			
	30.67				42.35			
	3285 34.914				44.50	46570		
	34.95	3491			46.50	46.57		
	37.60	36'12			48.60	5924		
	17457 39.10			47 21.80	23285 50.90		47 45.34	
	2457	46 18.085	−	3.72	23285	48 29.605	+ 44.26	
	M 56 43.05.				M 29 35.40.			

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182

η Bootis

h m s
13 48 53
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0.16056

209

α Cor. Bo.

h m s
15 29 34
° ' 1.17609
+27 7 9.94943
1.12552

0.16556

277

γ Aquilae

h m s
19 40 30
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+10 19

0.16056

1879 Oct. 21

52 18.48		52 8.5		31 55.60		31 51.0		42 53.37			42 57.9				
20.60		9.7		58.80	0.150	52.9		57.60	59.614		58.4				
22.72		11.7		32.10	0.15	53.0		57.62	59.61		54.7				
25.00		12.6		32.35		58.1		1.67			56.1				
27.25		589 15.4		30075 4.70		2732 58.2		29807 3.80			2740 57.9				
		589		075		2.32		29807			2.40				
31.60		52 11.78		4.40		31 54.64		8.00			42 54.80				
33.70				11.78		+ 2.401		10.00			+ 2.56				
35.75				14.04				12.18	16.350						
38.05	40.293			16.20	18.642			14.22	29.970						
40.29	40.29			18.80	18.64	32 46.8		16.80	16.35						
42.50				21.05	18.66	48.7		18.40	16.36						
44.60				23.35		50.2		20.60							
47.00				25.60		52.2		22.68							
36264 49.15				16778 27.84		2523 54.4		14715 24.77							
264				16778		23		14715							
68.46				32.50		32 50.46		28.91							
55.60	57.810			34.88	37.172	− 31.81		31.00	33.120						
57.80	57.81			37.18	37.17			33.10	33.12						
0.00				39.40	3732			3529	15273						
28905 2.20		52 11.78		18586 41.90		31 54.64		16560 37.38			42 54.80				
28905	52 40.302			18586	32 18.650	32 50.46		1560	43 16.353		+ 21.56				
						+ 24.01									
						− 31.81		1940 83.48							
						55.82									
18 48 57.43				15 29 35.49		1.74679		19 44 56.94							
						1.12552									
						2.87231									
						1.86100									
						8.98869									
						5 33 53									

M 28 36.67.				M 21 36.57.				M 9 5.60.							
				M 22 49.27.				R 9 6.02.							
				R 22 49.30.											
				R 22 48.98.											
				M 22 49.15.											
19 0 3.2				22 49.18				9 5.81							
				72.61											
								10 19 27.8							
				27 7 17.0				8 33 17.8							

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280

α Aquilae

h m s
19 44 53
° ′ ″
+8 33 9.9515

1.17609 0.76856
1.17124

47 17.90		47 12.9	
20.00	22.060	14.4	
22.00	22.06	15.8	
24.18		17.3	
1030 26.22		793 18.9	
1.30		2.93	
30.28		47 15.86	
32.53		+ 22.90	
34.62			
36.74	38.762		
38.80	38.76	48 12.7	
40.75	38.76	14.4	
42.96		16.0	
45.00		17.9	
34886 47.18		807 19.7	
34886		307	
51.25		48 16.14	
52.38	55466	− 37.38	
53.48	55.47		
57.52	7753		
27733 59.70		47 1586	
2733	47 38.760	48 16.14	
		+ 22.90	
		− 37.38	
		60.28	

19 44 56.94

1.78017
1.17124
2.95141
1.93470
8.98329
5.2947

M 55 11.98	
M 56 38.02	
56 1138.02	
86.04	

8 33 17.8

282

ε Draconis

h m s
19 48 34
° ′
+69 38

0.16056

Oct 21

50 19.90		50 1.1	50 58.2						
25.75	31.830	6.2	58.8						
31.80	31.83	11.3	1.2						
37.85		15.9	6.4						
15915 43.85		537 19.2	3096 12.0						
1591.5		37	96						
57.20		50 10.74	51 1.92	+8.55	40.53	24336	22.00		
2.00		+1 9.30	+ 18.12			40.538			
6.80				4.27	40.55		36.28		
12.93	20048								
20.60	20.05	51 44.9	52 25.9						
26.60	20.02	49.5	39.0	−2.13	40.87		43.00		
32.20		54.3	34.7	4.28	40.59		44.87		
38.00		59.2	39.0	6.42	40.18		47.00		
72043 44.10		2722 4.3	1736 45.0	8.57	40.63		49.20		
18043		2722	1736						
56.28		51 54.44	52 34.72	12.33	40.57	202.86	53.40		
2.40	8.216	+ 3440	−1 14.68	19.97	40.33	40.378	53.50	57.700	
8.20	8.22			17.11	40.39		57.70	57.70	
14.00	16.005			19.29	40.63		59.90		
34108 20.20		53 11.4	51 1.92	21.45	40.55	850	2.00		
4108	51 20.035	15.0	52 34.72				28.50		
		18.0	+ 18.12						
			−1 14.68	40.568					
		444	92.80	40.567					
		148							

M 31 32.52	
M 31 58.55	
M 32 24.45	
M 32 43.15	
M 58 60.70	
32 8.18	

164

β Lyrae

h m s
11 42 53
° ′
+33 15

0.16056

Oct. 22

45 —								45 11.5	
—								12.7	
—								14.3	
—								16.0	
—								728 18.3	
								228	
						24336	22.00	45 14.56	
						40.538	—	+ 2601	
				4.27	40.55		36.28		
							—		
							—	46 10.0	
				−2.13	40.87		43.00	11.5	
				4.28	40.59		44.87	13.3	
				6.42	40.18		47.00	14.9	
				8.57	40.63		49.20	666 16.9	
								166	
				12.33	40.57	202.86	53.40	46 13.32	
				19.97	40.33	40.378	53.50	57.700	− 3275
				17.11	40.39		57.70	57.70	
				19.29	40.63		59.90		
				21.45	40.55	850	2.00	45 14.56	
							28.50	46 13.32	

40.568
40.567

11 42 55.65

M 13 56.12	
M 15 19.75	
R 15 19.67	
R 15 19.78	
M 15 19.62	
15 19.70	
83.58	

15 14 36.8

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Sheet not No. 303 — S Cygni — h m s 21 7 47 — +29° 44′ — 0.160 56

Sheet No. 138 — L Cygni — h m s 9 21 38 — −8° 8′ — 0.160 56

Sheet No. 142 — E Lacerta — h m s 9 38 [illegible] — +24° 20′ — 0.160 56

1879. Oct. 23

9	12.60		9	23.6	24	6.15		23	59.7			—							
	14.90	17.280		25.3		8.40	10466		1.2			—							
	17.20	17.28		27.1		10.50	1047		3.1			—							
	19.65			28.6		12.60			4.6			—							
8640	22.05		1356	31.0	5233	14.68		3151	6.5			—							
	8640			1356		5233			151										
	26.80			27.12		18.80		24	3.02	9.86	46.66	438.67	37.60						
	29.10					20.85				6.78	48.84	48.741	42.05						
	31.37					23.00				4.32	48.57		44.05						
	33.90	36227				25.00	27.101			2.24	46.64		46.40	4 8739					
	36.27	3623	10	7.7		27.10	27.10	24	56.5	0.06	46.60		48.80	48.74		21.2			
	38.56	36.22		9.9		29.18	27.13		58.7	2.26	46.74		51.00			22.9			
	40.94			11.6		31.15			59.7	4.33	46.69		53.22			24.4			
	43.35			13.6		33.38			1.0	6.79	46.71		55.50			26.0			
32604	45.75		584	15.6	24391	35.45		2985	2.6	9.01	48.02	4 3865	58.03		1720	27.5			
	32604			584		24391			2985				43865			220			
	50.40			11.68		37.50		24	59.70	12.54	46.81	243.92	2.40			34.40			
	52.75	55156				41.80	43790			15.85	48.70	48.784	4.65	6.936					
	55.15	55.16				43.75	43.79			18.12	46.71		6.83	6.93					
	57.48	72.44				45.86	5426			20.38	46.62		9.30						
27578	0.00			27.12	21895	48.05			3.02	22.72	46.78	3468	11.50			34.40			
	27578	9 36.225		11.68		1895	27.115		59.70				3468						

48.762
48.756

9 21 41.884

M	44	51.82	M	36	2.62	M	10	46.02			
M	45	48.05	M	37	23.20	R	10	45.75			
R	45	48.20	R	37	23.42	R	10	45.90			
R	45	48.10	R	37	23.27	M	10	45.72			
M	45	47.93	M	37	23.00						
	45	48.07		37	23.22		10	45.85			
					80.60						

8 8 10.87

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146

α Leonis

h m s
10 1 56
° ′
+12 33

0.16056

4	23.80		4	20.3
	25.90	27.984		22.0
	28.00	27.98		23.3
	30.05			25.0
13992	32.17		1174	26.8
	13992			174
	36.36		4	23.48
	38.53			
	40.60			
	42.75	44.877		
	44.90	44.88	5	19.9
	47.00	44.87		21.5
	49.18			23.5
	51.18			25.4
40389	53.40		11173	27.0
	40389			173
	57.60		5	23.46
	59.68	1770		
	1.72	1.77		
	3.80	8675		
30885	6.05			23.48
	885	44.875		23.46

10 1 58.59

M 55 20.12
M 56 44.62
R 56 44.98
R 56 44.75
M 56 45.02
56 44.84
84.72

12 38 14.5

ε

γ' Leonis

h m s
10 13 18
° ′
+20 27

0.16056

15	45.65		15	37.4
	47.68	49936		39.6
	49.90	49.94		41.2
	52.15			43.2
24968	54.80		2065	45.1
	24968			65
	58.77		15	41.30
	0.93			
	3.05			
	5.37	7538		
	7.52	7.54	16	36.4
	9.80	7.54		38.0
	12.00			39.7
	14.05			41.4
60784	16.35		1988	43.3
	6784			1988
	20.60		16	39.76
	22.96	25150		
	25.20	25.15		
	27.36	13509		
12575	29.63			41.30
	2575	7.540		39.76

10 13 21.01

M 1 45.25
M 3 4.88
R 3 4.92
R 3 5.37
M 3 4.82
3 5.00
79.75

20 26 53.7

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277

γ Aquilae

h m s
19 40 30

1879 Oct. 25

42 0.85		41 57.0			
2.60	4688	52.9			
4.55	469	55.0			
6.87		57.3			
2344 8.87		2736 59.4			
2344		236			
12.50		41 6472			
15.30		+ 26.74			
17.35					
19.60	21.520				
21.60	21.52	42 30.0			
23.65	21.41	52.0			
25.58		54.5			
27.70		58.0			
19368 29.90		2712 57.7			
1368		212			
33.72		42 5424			
36.13	38138	− 32.78			
38.19	38.14				
40.17	4283				
14069 42.28		41 54.72			
19069	42 21.465	42 54.24			
		+ 26.74			
		− 32.78			
		59.52			
19 40 33.41		1.774466			
		1.16901			
		2.943367			
		1.935500			
		8.991331			
		5 3584			

0.16056

h m s
19 40 30
+10 19 9.99292
1.16901

M 8 55.95.
M 10 22.05.

10 22.05.
86.10

10 19 27.7

280

λ Aquilae

h m s
19 44 53

0.16056

h m s
19 44 53
+8 33 9.99516
1.17124

46 22.95			46 17.0		
25.80	27090		18.4		
27.00	27.09		20.2		
29.00			21.7		
13545 31.50			1003 23.2		
3545			05		
35.62			46 2.010		
37.53			+ 23.74		
39.83					
41.67	43.880				
43.90	43.88		47 12.8		
46.08	43.80		14.4		
48.05			16.0		
50.14			17.7		
39492 52.18			803 19.4		
39492			303		
38.28	0.312		47 1.606		
38.62	~~0.312~~		− 32.22		
0.56	0.51				
2.40	8760				
30150 4.80			46 20.10		
156	46 43.840		47 16.06		
			+ 23.68		
			− 32.28		
			55.96		
			1.744788		
			1.17124		
			2.915912		
			1.90881		
			8.98969		
			5 3439		

M 55 6.78.
M 56 27.80.
R 56 28.05.
R 56 27.85.
M 56 27.67.
56 27.84.
81.06

8 38 17.2

283

β Aquilae

h m s
19 49 22

0.16056

h m s
19 49 22
+6 6

50 52.15			51 10.3		
54.60	56640		12.3		
56.80	56.64		14.5		
58.80			16.1		
28320 0.85			712 18.0		
28320			212		
4.88			51 14.24		
7.03			− 0.97		
9.82					
11.15	13264				
13.40	13.28		51 41.5		
15.45	13.26		43.2		
17.40			45.4		
19.40			47.0		
11938 21.45			22541 48.3		
11938			2541		
25.67			51 45.08		
27.60	29884		− 31.87		
29.90	29.88				
31.80	14652				
14942 34.05			51 14.24		
14942	51 13.270		51 45.08		
			− 0.97		
			− 31.81		
			32.78		

M 22 19.37.
M 23 3.45.
R 23 3.45.
R 23 3.32.
M 23 3.20.
23 3.35.
~~3.98~~

6 6 36.4

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c

182

γ Leonis

η Bootis

h m s
10 13 18

1.17609 0.16056
+20 27 9.97173
1.14782

h m s
13 48 57

° '
+19 0

0.16056

15 48.00			15 44.2	+21.83	46.01	51 24.18			51 20.0				
50.20	52256		45.4	18.63	46.03	229.32	26.33	28.360	21.6				
52.07	52.26		46.8	17.47	45.84	45.864	28.37	28.39	22.8	23.00			
54.35			48.2	15.28	45.75		30.47		24.5				
26128 56.73			2341 49.5	13.84	45.69	14195	32.60		1130 26.0				
1128			341			14195			150				
1.25			15 46.82	6.73	45.63	413.47	37.20		51 23.00				
3.25			+ 23.09	6.39	45.97	45.941	39.42		+ 2290				
5.55				4.36	45.80		41.54						
7.60	9869			2.16	45.86		43.70	45.946					
9.80	9.87		16 50.2	1.00	45.85		45.95	45.95					
12.05	9.94		52.0	2.15	45.84		48.12						
14.25			53.7	4.97	45.83		50.30						
16.47			55.0	6.35	46.03		52.58						
8882 18.60			2670 56.1	8.74	45.86	1351	54.70						
8882			170				41.351						
2.00			16 53.40				—						
25.83	2626		− 43.49				—						
27.72	27.62						—						
29.78	13988			19.64	45.86	91.77	5.50						
13813 32.10			15 46.82	21.89	45.91	45.885	7.80						
13813	16 9.905		16 53.110										
	+.007		+ 23.08										
	9.911		− 43.50	45.896									
			66.58	45.904									
10 13 20.07			1.82334			13 48 57.86							
			1.14782										
			2.97116										
			1.94295										
			8.97179										
			~~5 34 40~~	5 21 13									

M 1 50.32
M 3 47.70
R 3 15.12
R 3 18.17
M 3 15.05
3 18.01
87.69

M 28 47.32

20 26 53.0

19 0 23

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8

Sun ☉ = 44.789

h m s
14 2 52
° ′
−12 30

0.16056

1879

Oct. 25 — 26

4	6.00			5	17.5	6	18.37			5	54.4			
	8.12	10258			19.2		20.60	22.730			55.7			
	10.27	1026			20.8		22.70	22.73			57.3			
	12.40				23.3		24.78				58.8			
5129	14.50			1056	24.8	11365	27.20			2870	0.8			
	5129				56		1365				2870			
	18.78			5	21.12		31.30			5	57.40			
	20.98			−	5384		33.36			+	4228			
	23.00						35.35							
	25.18	27320					37.60	39.699						
	27.27	27.32					39.70	39.69						
	29.50	27.25					41.72	39.68						
	31.60						44.06							
	33.70						46.08							
24588	35.87					35729	48.13							
	24588						35729							
	39.94	41.242					52.40							
	42.18	~~43.72~~					54.47	56640						
	44.29	44.24					56.58	5664						
	46.30	5450					58.75	7937						
22121	48.50			5	21.12	28320	1.00			5	57.40			
	2121	4	27.285	−	5384		28320	6	39.685	+	4228			

M 41 7.20 . M 44 19.00 .

187

2 Bootis

h m s
14 10 8
° ′
+19 49

1.17609 0.15056
9.97349
1.14958

Oct. 26 — 26

12	37.20						12	32.6						
	39.25	41518						34.1						
	41.42	41.52						36.0						
	43.75							37.7						
20759	45.97						1799	39.5						
	759							299						
	50.28						12	35.98						
	52.53						+	23.08						
	54.70													
	56.95	59.089												
	59.00	59.08					13	32.4						
	1.30	59.03						34.0						
	3.45							36.0						
	5.68							38.3						
53174	7.85						1824	41.7						
	53174							1824						
	12.05						13	36.48						
	14.37	16540					−	37.42						
	16.50	16.54												
	18.80	118.06												
8270	20.98							12 35.98						
	8270	12	59.055					13 36.48						
								+ 23.08						
								− 37.42						
								60.50						
								1.78178						
								1.14958						
								2.93134						
								1.93636						
								9.00502						
								5 46 36						

M 40 28.20 .
M 41 54.42 .
R 41 54.62 .
R 41 54.48 .
M 41 54.75 .
41 54.57 .
86.37

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d

ε Bootis

h m s
14 39 42
+27° 35
Oct. 26

1.17609
9.94760
1.12369

42 10.00
11.95 14.198
14.05 14.20
16.29
7099 18.70
2099
23.50
26.03
28.21
30.67 32909
32.00 32.91
35.25 32.84
37.50
39.80
29618 42.22
29618
46.90
49.00 51466
51.50 51.47
53.75 6567
25733 56.18
733 42 32.875

42 1.3
2.8
4.8
7.0
249 9.0
249
42 4.98 +8.31 9.11
+ 27.90 6.23 9.10
4.15 9.03
2.06 9.06
43 2.2 6.00 9.03
3.8 2.07 9.12
5.9 4.16 9.12
7.6 6.23 9.07
290 9.5 8.32 9.15
290
43 5.80 12.67 8.93
− 32.92 13.59 9.08
16.43 9.17
18.78 9.20
42 4.98 20.85 9.07
+ 27.90
− 32.92 9.810
60.82 9.784

41 0.8
8164 2.87
9.076 4.87
7.08 9.090
9.03 9.09
11.19
13.38
15.30
8181 17.47
8181
45.43 21.60
9.086 23.62 25.764
25.50 25.76
27.70
2882 29.90
2882

41 18.0
9.5
20.9
22.5
852 24.3
52
41 18 1704

1.78405
1.12369
2.90774
1.90217
8.99443
5.3818

14 10 10.88

α Serpentis

h m s
15 38 18
+6° 48

0.16056

15 38 20.61

M 53 54.55
M 55 14.22
R 55 14.30
R 55 14.38
M 55 14.62
55 14.38
79.83

M 40 55.40
R 40 55.40
R 40 55.27
M 40 55.65
40 55.43

19 48 32.4

6 48 19.5

ε Pegasi

h m s
21 38 14
+9 19

0.16056

40 40.36
48.40
58.35
52.21
54.40
54.66
0.75
2.90
4.90 6989
7.00 6.99
9.03
11.17
13.20
60290 15.30
6290
17.40
21.48 2 3586
23.57 23.59
25.67
11793 27.81
1793

40 57.5
59.0
1.0
3.1
3049 4.3
4.9
41 0.98
41 39.8
41.5
43.3
44.7
2158 46.5
158
41 43.16
41 0.98
41 6.981 41 43.16

M 9 11.67
M 10 11.95
R 10 12.07
R 10 12.10
M 10 12.15
10 12.07
60.40

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311

λ Aquarii

h m s
21 59 34

	1.17609	0.16056
−0 54	9.99995	
	1.17604	

1879 Oct. 26

2 6.05		1 57.0			
8.05	14.60	58.7			
10.12	10.16	0.8			
12.28		2.3			
5080 14.30		3029 4.1			
5080		29			
18.50		2 0.58			
20.50		+ 2608			
22.62					
24.62	26.659				
26.62	26.66	2 57.5			
28.68	26.65	56.2			
30.70		57.1			
32.77		57.0			
23993 34.92		2883 0.9			
23993		288.3			
37.10		2 57.66			
41.10	43148	− 31.00			
43.21	43.15				
45.18	53.31				
21574 47.35		2 0.58			
1574	2 26.655	2 57.66			
		+ 26.08			
		− 31.00			
		57.08			
21 59 38.18		1.75648			
		1.17604			
		2.93252			
		1.91677			
		8.98425			
		5 30 31			

M 22 7.35.
M 23 29.75.
R 23 30.02.
R 23 30.07.
M 23 29.80.
23 29.91.
82.56

0 54 0.6

322

η Pegasi

h m s
22 37 20

	1.17609	0.16056
+29 35	9.93934	
	1.11543	

39 49.26				39 38.3	
51.64	53970			39.9	
53.98	53.97			41.7	
56.32				43.4	
26985 58.65				2087 45.4	
1985				87	
3.38				39 41.74	
5.70				+ 3115	
8.16					
10.50	12875				
12.90	12.88			40 42.1	
15.37	12.90			43.5	
17.57				45.0	
20.02				46.5	
N590 22.30				2258 48.7	
11590				258	
27.03				40 45.16	
29.50	31834			− 3227	
31.70	31.83				
34.17	14580				
15917 36.77				39 41.74	
917	40 12.890			40 45.16	
				+ 31.15	
				− 32.27	
				63.42	
				1.80223	
				1.11543	
				2.91766	
				1.90293	
				8.98527	
				5 31 17	

M 52 54.07.
M 54 14.00.
R 54 14.05.
R 54 14.15.
M 54 13.98.
54 14.04.
79.97

619

λ Piscis Aust. 0.16056

h m s
22 30 58

	1.17609	
−30 16	9.93636	
	1.11245	

53 26.32				53 15.0	
28.81	31208			17.2	
31.20	31.21			19.7	
33.60				21.6	
15604 36.04				976 24.1	
604				976	
40.70				53 19.52	
43.30				+ 3081	
45.62					
47.92	50350				
50.38	50.35			54 20.0	
52.73	50.31			22.3	
55.00				24.6	
57.50				26.5	
45315 0.00				1223 28.9	
45315				223	
4.56				54 24.46	
7.04	9416			− 34.13	
9.34	9.42				
11.85	100.63				
4708 14.24				53 19.52	
4708	53 50.330			54 24.46	
				+ 30.81	
				− 34.13	
				64.94	
22 51 2.42				1.81251	
				1.11245	
				2.92496	
				1.91121	
				8.98625	
				5 32 2	

M 41 20.30.
M 42 41.82.
R 42 41.85.
R 42 41.87.
M 42 41.70.
42 41.81.
81.51

30 15 28.7

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329 α Pegasi

22h 58m 44s

+14° 23'

1.17609 0.16056
9.98584
1.16193

1	15.75		1	12.8									
	17.90	20010		21.4									
	19.98	20.01		23.4									
	22.18			25.0									
10005	24.24		1161	26.5									
	10005			161									
	28.75		1	23.22									
	30.66		+	13.78									
	32.75												
	34.80	36970											
	36.97	36.97	2	1.3									
	39.10	37.02		2.0									
	41.30			5.0									
	43.35			7.0									
33273	45.45		248	8.5									
	33273			248									
	49.30		2	4.96									
	51.75	54020	−	27.96									
	54.10	54.02											
	56.05	7403											
27010	58.36		1	23.22									
	2010	1 36.995	2	4.96									
			+	13.78									
			−	27.96									
				41.74									
22	58	48.19		1.62055									
				1.16193									
				2.78248									
				1.77779									
				8.99531									
				5.28859									

M 55 0.60
M 56 0.35
R 56 0.55
R 56 0.65
M 56 0.65
56 0.55
59.95

14 33 49.0

1 α Androm.

0h 2m 8s

+28° 25'

0.16056

4	38.38				4	32.0							
	40.68	43040				33.6							
	43.02	43.04				35.6							
	45.37					37.3							
21520	47.75				1773	38.8							
	1520					273							
	52.36				4	35.46							
	54.80				+	2635							
	57.10												
	59.40	1.801											
	1.70	1.80			5	17.8							
	4.15	1.82				19.7							
	6.40					21.8							
	8.70					23.7							
55621	11.37				1086	25.4							
	1621					86							
	1570				5	21.72							
	18.26	20608			−	19.91							
	21.58	2061											
	23.70	12365											
10304	25.30				4	35.46							
	304	5	1.810		5	21.72							
					+	25.35							
					−	19.91							
						45.26							
0	2	12.60											

M 2 56.82
M 3 55.15
R 3 55.20
R 3 54.98
M 3 55.02
3 55.09

3 γ Pegasi 0.16056

0h 7m 0s

+14° 31'

1.17609
9.98591
1.16200

9	22.30				9	23.0							
	24.58	3667				24.5							
	36.70	36.68				25.8							
	38.88					28.0							
18338	41.10				1309	27.6							
	3338					309							
	43.18					2618							
	47.26					+ 27.52							
	49.40												
	51.60	53723											
	53.73	53.72			10	19.4							
	55.88	53.69				21.0							
	58.04					22.5							
	0.15					24.0							
48351	2.27				1128	25.9							
	48351					128							
	6.47				10	2256							
	8.62	10700			−	28.86							
	10.66	10.70											
	12.80	10738											
53350	14.95				9	26.18							
	5350	9	53.705		10	22.56							
					+	27.52							
					−	28.86							
						56.38							
0	7	4.91				1.75113							
						1.16200							
						2.91313							
						1.89697							
						8.98384							
						5.30112							

M 57 17.98
M 58 36.98
R 58 37.00
R 58 36.75
M 58 36.70
58 36.86
78.88

14 31 10.8

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138 α Hydrae

142 ε Lozonis

146 α Lozonis

0.16056

h m s
9 21 38

° ′
−8 8

1.17609
9.99561
1.17170

1879 Oct. 26

h m s
9 38 59

° ′
+24 20

1.17609
9.95960
1.13569

0.16056

h m s
10 1 56

° ′
+12 33

1.17609
9.98950
1.16559

24	2.17			34	2.5	41	23.72			41	27.8	4	26.48			4	36.2
	11.27	13.294			3.8		31.20	33.480			29.3		28.50	30.690			38.1
	13.22	13.29			5.2		33.59	33.48			31.0		30.62	30.69			39.6
	15.35				6.7		35.74				32.7		32.85				41.4
6647	17.46			269	8.17	16740	37.90			1556	34.8	15345	33.80			1978	42.5
	1647				269		1740				56		345				1978
	21.60			24	5.380		42.50			41	31.12		39.20			4	3.556
	23.70			+	24.58		44.70			+	20.38		41.35			+	18.08
	25.80						47.00						43.45				
	27.70	29.969					49.20	51.474					45.60	47.640			
	30.00	29.97		24	57.0		51.47	51.47		42	31.8		47.67	47.64		5	14.9
	32.07	29.95			38.3		53.70	51.52			33.7		47.88	47.61			16.2
	34.17				57.9		56.00				35.6		51.88				17.9
	36.18				1.4		58.20				36.7		54.00				18.5
26972	38.30			3001	3.5	46327	0.50			1762	38.4	42903	56.80			903	21.8
	26972				01		46327				262		42903				903
	42.48			25	0.02		5.00			42	35.24		1.24			5	1.806
	44.55	4.6608		+	30.06		7.25	9.562		−	43.74		2.39	4.526		−	30.42
	46.62	46.61					9.50	9.56					4.50	4.53			
	48.62	5.990					11.87	10.304					6.70	9.522			
28304	50.77			24	5.38	4781	14.15			41	30.72	2263	8.80			4	39.56
	3304	24 29.960		25	0.02		4781	41 51.495		42	35.24		2263	4 47.640		5	18.06
				+	24.58					+	20.78					+	8.08
				−	30.06					−	43.74					−	30.42
					54.64						64.52						38.50
9	21 41.43				1.73751						1.80969	10	158.68				1.58546
					1.17170						1.18569						1.16559
					2.90921						2.99538						2.75105
					1.89873						1.91334						1.73701
					8.98952						8.96796						8.98606
					5 34.31						5 17.43						5 31.53
											18 24						

M	36	2.96				M	9	24.05				M	55	41.75			
M	37	22.20				M	10	45.92				M	56	36.38			
R	37	22.20				R	10	46.02				R	56	36.30			
R	37	22.47				R	10	45.92				R	56	36.42			
M	37	21.78				M	10	46.00				M	56	36.27			
	37	22.16					10	45.96					56	36.34			
		79.20						81.91						54.59			
8	8	11.0										12	8	8	14.6		

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148

G Leonis

h m s
10 9 37

+24 1

1.17609 0.16056
9.96067
1.13676

12 37.40		12 22.7
36.60	31828	24.5
31.78	31.83	26.0
34.06		27.7
15914 36.30		1302 22.3
914		302
40.80		12 26.04
43.20		+ 23.85
45.40		
47.62	49.921	
48.87	49.92	13 18.6
52.20	49.86	20.1
54.40		22.0
56.60		24.0
44929 57.80		1106 25.9
44929		106
3.39		13 22.12
5.60	7.898	− 32.23
7.95	7.90	
10.10	9973	
3949 12.45		12 26.04
3949	12 49.890	13 22.12
		+ 23.85
		− 32.23
		56.08
		1.74881
		1.13676
		2.88557
		1.86623
		8.98066
		5 27 48

M 27 58.00.
M 29 11.32.
R 29 11.60.
R 29 11.55.
29 11.49.
7349

c

γ Leonis

h m s
10 13 18

+20 27

1.17609 0.16056
9.97173

15 48.35		15 —
52.50	52694	42.3
52.70	52.69	42.7
54.92		45.0
26347 57.00		46.8
1347		
1.50		
3.70		
5.88		
8.04	10.266	
10.24	10.27	16 39.5
12.45	10.22	41.4
14.70		43.4
16.86		44.9
9239 19.02		2173 47.7
9239		173
22.20		16 43.46
25.70	27.880	− 33.22
27.90	27.76	
3005	14645	
13880 32.25		
13940	16 10.245	16 43.46
		− 33.22

M 1 48.00.
M 3 9.02.
R 3 8.85.
R 3 9.10.
M 3 8.80.
3 8.94.
80.94

h m s
10 13 18

+20 27

1.17609 0.16056
9.97173

10 10.13		10 5.3
12.30	14526	6.5
14.53	14.52	8.0
16.75		9.8
7263 18.90		411 11.5
2263		411
23.24		10 8.22
25.55		+ 23.96
27.78		
30.02	32164	
32.20	32.16	
34.40	32.21	
36.50		
38.75		
28948 41.04		
28948		
43.34		
47.70	49.912	
49.90	49.91	
52.16	6443	
24956 54.27		10 8.22
24956	10 32.185	+ 23.96

R 17 53.90.
R 17 53.95.
17 53.92.

10 18 21.10

20 26 32.7

11 7 43.20

11 7 40 0.16056

+21 11

21 10 51.6

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164

B Lyrae

S

Sun C = 46,759

h	m	s
11	42	53

°	′	
+15	15	9.98443
		1.16052

1879 Oct. 26.

0.16056

h	m	s
14	6	43

°	′	
−12	50	

0.16056

Oct. 26–27

45? 23.40			45? 32.0		57.24			9.80			
25.38	27.640		34.6		58.28	1454		12.00	14.050		
27.60	27.64		36.5		1.40	1.45		14.00	14.05		
29.77			37.7		3.60			16.00			
13820 32.05			1820 40.2		30727 5.75			7025 18.35			
13820			1820		727			7025			
36.25			45 36.40		10.00			22.60			
38.40			+ 8.34		12.05			24.70			
40.45					14.05			26.70			
42.63	44.739				16.35	18.447		28.70	30.988		
44.70	44.74		13.8		18.30	18.45		31.00	30.99		
46.83	44.74		15.6		20.60	18.40		33.13			
49.00			17.3		22.70			35.23			
51.10			19.0		25.00			37.37			
40265 53.29			869 21.2		16602 26.97			27889 39.40			
40265			369		16602			889			
57.35			1738		31.00			43.87			
59.73	1.852		−32.64		33.30	3.5350		45.96	48.000		
1.88	1.85				35.35	35.35		48.00	48.00		
4.00	8.949				37.50	3.680		50.05			
30926 6.10			45? 36.40		17675 39.60			24000 52.12			
926	45?) 44740		46? 17.38		2675	18.425		24000			
			+ 8.34								
			− 32.64								
			40.98								
11 42 55.72			1.61257								
			1.16052								
			2.77309								
			1.75770								
			8.98461								
			5 30 47								

M 14 22.75.

M 15 20.08

R 15 20.18

R 15 19.90

M 15 19.80

15 19.99

57.24

M 1 26.78

M 34 16.17.

15 14 36.7

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187

α Bootis

h m s
14 10 8
° ′ 6.16056
+19 49

Oct. 27

12	37.82		12	30.4							
	38.80	42.036		32.4							
	42.04	42.04		34.4							
	44.16			36.5							
21018	46.36		1719	38.2							
	1018			219							
	50.75		12	34.38							
	53.00			+25.20							
	55.15										
	57.33	59.567									
	58.58	59.57	13	28.9							
	1.80	59.60		30.5							
	4.10			32.4							
	6.20			34.1							
53610	8.28		1620	36.1							
	53610			120							
	12.80		13	32.40							
	15.00	17.160		− 32.82							
	17.20	17.16									
	19.30	11920									
8580	21.50			34.38							
	3580	12 59.585		32.40							

14 10 10.83

M 40 10.42.
M 41 32.42.
R 41 32.25.
R 41 32.20.
M 41 32.22.
41 32.27.
81.85

14 48 32.0

309

ε Pegasi

h m s
21 38 14
° ′
+9 19

40	46.30										
	48.50	50.604									
	50.66	50.60									
	52.75										
25302	54.82										
	302										
	57.00										
	1.00										
	3.15										
	5.15	7.244									
	7.12	7.24									
	9.30	7.30									
	11.50										
	13.40										
60520	15.58										
	6520										
	18.77										
	21.60	23996									
	24.40	2400									
	26.86	13460									
11998	28.25										
	11998	41 7.270									

1.17609 0.16056
9.99423
1.17032

40	35.8		
	40.6		
	42.2		
	43.6		
2103	45.1		
	103		
40	4206		
+	25.21		
41	35.3		
	36.5		
	38.1		
	39.8		
1917	42.0		
	1917		
41	36.34		
−	31.07		
40	4206		
41	3834		
+	25.21		
−	31.07		
	56.25		
1.75035			
1.17032			
2.92067			
1.90439			
8.98372			
530			

M 8 44.22.
M 10 4.27.
R 10 4.57.
R 10 4.60.
M 10 4.42.
10 4.46.
8024

0 54 0.7

311

α Aquarii

0.16056

h m s
21 59 34
° ′
−0 54

2	6.46										
	8.50	10478									
	10.46	10.48									
	12.40										
5239	14.57										
	5239										
	16.66										
	20.74										
	22.87										
	25.80	26952									
	26.90	26.95									
	29.00	26.95									
	31.00										
	33.18										
24257	35.22										
	24257										
	37.28										
	41.40	43432									
	43.40	43.43									
	45.50	5391									
21716	47.58										
	21716	.226950									

1.17609
9.99995
1.17604

1	57.6		
	55.8		
	0.3	0	
	1.6		
3018	3.5		
	18		
2	0.36		
+	26.54		
2	56.8		
	58.2		
	58.1		
	1.3		
2995	3.3		
	2995		
2	5490		
−	32.95		
2	0.36		
2	59.90		
+	26.59		
−	32.95		
	59.54		
1.77481			
1.17604			
2.95085			
1.93080			
8.97995			
527	16		

M 22 8.82.
M 23 33.95.
R 23 34.30.
R 23 34.12.
M 23 34.00.
23 34.09.
85.27

21 59 38.12

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322

η Pegasi

h m s
22 37 20
+29 35 9.93934
1.11543

1879 Oct. 27

39 41.50		
51.80	54.214	
54.25	54.21	
56.60		
27107 58.72		
2107		
3.81		
6.03		
8.38		
10.82	13.209	
13.26	13.21	
15.60	13.16	
17.92		
20.37		
11888 22.70		
11888		
27.36		
29.80	32.118	
32.08	32.12	
34.50	14633	
16059 36.85		
1059	40 13.185	

39 38.0		
40.2		
42.0		
43.7		
2105 45.5		
105		
39 42.10		
+ 31.08		
40 43.8		
45.0		
46.5		
48.5		
2342 50.9		
342		
40 46.84		
− 33.66		
39 42.10		
40 46.84		
+ 31.08		
− 33.66		
64.74		
1.81117		
1.11543		
2.92660		
1.90961		
8.98301		
5 29 34		

M 52 51.28
M 51 15.48
R 51 15.60
R 51 15.50
M 54 15.38
54 15.49
81.21

619

ζ Piscis Aust.

h m s
22 50 38
−30 16 9.93636
1.11245

0.16056

53 26.70		
29.10	31474	
31.45	3147	
33.85		
36.27		
737		
41.60		
43.48		
45.82		
48.25	50.620	
50.65	50.62	
53.00	50.59	
55.45		
57.83		
45558 0.20		
45558		
4.90		
7.28	9.720	
9.70	9.72	
12.14	10119	
4860 14.58		
4860	53 50.605	

53 20.9		
22.2		
23.7		
26.0		
1208 28.0		
208		
53 24.16		
+ 26.44		
54 20.1		
21.7		
23.5		
25.8		
1186 27.5		
186		
54 2.372		
− 33.12		
53 24.1.16		
54 23.72		
+ 26.44		
− 33.12		
59.56		
1.77495		
1.11245		
2.88740		
1.87379		
8.98639		
5 32 8		

M 41 30.85
M 42 45.88
R 42 45.68
R 42 45.48
M 42 45.48
42 45.63
74.78

22 51 24.3

30 15 28.8

329

ζ Tucanæ

h m s
22 58 44
+14 33 9.98584
1.16193

0.16056

1 16.50		
18.18	20296	
20.30	2029	
22.45		
10148 24.58		
148		
26.70		
30.55		
33.15		
35.20	37307	
37.28	37.31	
39.38	37.30	
41.52		
43.68		
33576 45.80		
33576		
50.10		
52.20	54.316	
54.30	54.32	
56.40	7461	
27158 58.68		
2158	1 37305	

1 12.4		
14.4		
16.3		
17.7		
800 19.2		
300		
1 1600		
+ 2130		
2 7.0		
8.5		
10.0		
11.5		
500 13.0		
500		
2 1.000		
− 32.70		
1 16.00		
2 10.00		
+ 2130		
− 32.70		
54.00		
1.73239		
1.16193		
2.89432		

M 54 50.82
M 55 7.15
R 7.78
R 7.42
M 7.27
55 7.40
58
~~7.40~~

14 33 49.1

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1

α Androm.

h m s
0 2 8

+28 25

0.16056

3

γ Pegasi

h m s
0 7 0

+14 31

1.17609 0.16056
9.98594
1.16200

			4 —		4 65.8		9 32.76		9 27.7		
			—		57.7		34.94	37.024	29.3		
			—		59.6		36.96	37.02	31.3		
			—		1.3		38.18		33.1		
+1.04	1.92	3 1.92	47.85		2977 3.3		18512 41.28		1556 34.2		
		1.92			2977		3.512		56		
9.89	2.19	19.36	52.80		4 59.54		45.48		9 31.12		
7.08	2.26	2.04	55.22		+ 2.51		41.70		+ 22.90		
5.69	2.16		57.47				44.77				
2.92	2.17		59.85	2.147			51.92	54.023			
−0.00	2.20		2.20	2.15	5 32.4		54.00	54.02	10 24.1		
2.34	2.04		4.38		34.8		52.15	54.03	26.2		
4.64	2.11		6.80		36.5		58.20		27.6		
7.09	2.11		9.15		38.6		0.39		29.9		
9.90	2.87	5 5934	11.47		1830 40.7		48621 2.60		1384 31.2		
			1934		330		48621		3.84		
19.08	2.05	10.41	16.13		5 36.60		6.80		10 27.68		
16.72	2.13	2.082	18.55	20.866	− 34.55		8.97	11.044	− 33.66		
18.77	2.03		20.80	20.87			11.00	11.04			
21.13	2.13		23.26				13.12	10806			
23.83	2.87	7 10434	25.60		4 59.54		5522 15.33		9 31.12		
			10434		5 36.60		5522	9 54.025	10 27.68		
									+ 22.90		
									− 33.66		
									56.56		
									1.75251		
									1.16200		
									2.91451		
									1.89988		
									8.98537		
									5 31 21		

2.031
2.049

0 3 12.89

0 7 4.90

M	3	27.42	
M	4	14.52	
R	4	15.05	
R	4	15.00	
	4	1486	

M	57	25.65	
M	58	44.95	
R	58	45.15	
R	58	45.27	
M	58	44.88	
	58	45.06	
		79.41	

28 25 55.2

14 31 0.9

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156 δ Leo. — h 11 m 7 s 40 — ° +21 ′ 11. — 0.16056

164 β Leonis — h 11 m 42 s 53 — ° +15 ′ 15 — 0.16056

182 η Bootis — h 13 m 48 s 55 — ° +19 ′ 0 — 0.16056

1879 Oct. 28

δ Leo.

10 10.35
12.40 14706
14.68 14.71
16.90
7353 19.20
2353
23.50
25.75
28.00
30.20 32429
32.36 32.43
34.75 32.38
36.70
39.00
29186 41.40
29186
45.60
47.80 50036
50.05 50.04
52.25 6475
25018 54.48
018 10.32.405

11 7 43.25

10 35.2
37.1
38.7
40.6
1936 42.0
1936
10 38.72 +8.55 44.89
− 6.32 6.42 44.90
4.27 44.87
2.12 45.07
11 5.6 0.00 45.00
7.0 2.13 45.07
9.0 4.28 45.00
10.8 6.42 45.03
452 12.8 8.57 44.98
452
11 9.04 12.83 44.87
− 36.64 14.97 44.90
17.11 44.94
19.25 45.00
10 38.72 21.45 44.91
11 9.04
− 6.32
− 36.64 44.961
42.96 44.966

β Leonis

45 —
—
—
—
—
404.81 36.34
44.977 38.48
40.60
42.95 44983
45.00 4498
47.20
49.28
51.45
40485 53.55
40485
224.72 57.70
44.944 59.87 2.046
2.05 2.05
4.25
31023 6.36
1023

11 42 55.76

45 43.3
45.5
47.6
48.9
2358 50.5 +13.09 49.77
2358
45 47.16 8.73 46.78
− 2.19 6.55 46.85
4.36 46.63
2.16 46.63
46 18.9 0.00 46.54
20.4 2.18 46.82
22.0 4.37 46.63
23.5 6.55 46.65
1100 25.2 8.74 46.64
100
46 22.00 13.09 46.81
− 37.03 15.27 46.76
17.46 46.54
19.64 46.41
45 47.16 21.83 46.58
46 22.00
47.348
46.858

η Bootis

51 —
—
—
—
49.77
49.77 49.77 36.68
420.14 38.05
46.682 40.30
42.27
44.47 46687
46.54 4669
49.00
51.00
53.20
42018 55.35
42018
232.96 59.90
46.592 2.03 4062
4.00 64.06
6.05
32031 8.23
2031

13 48 57.49

51 21.9
23.7
25.2
26.7
1260 28.5
260
51 25.20
+ 21.66
51 25.20

R 14 16.07.
R 14 16.22.
14 16.14.

21 10 51.1

M 14 37.78.
M 15 26.82.
R 15 26.85.
R 15 26.75.
M 15 26.90.
15 26.83.
9.05

15 14 35.9

M 28 46.92.

19 0 1.5

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S

Jun c = 46.759

h m s
14 14 27
° '
−18 30

Oct. 28 - 29

15	41.20			16	5.24	17	5.20			17	23.1			10	16.18			10	8.5	
	43.37	45436			5.46		6.28	58444			25.0				18.50	20932			11.0	
	45.37	45.44			5.45		5.40	5844			26.9				20.94	20.93			12.7	
	47.37				5.54		0.57				28.5				23.36				14.1	
22718	49.67			2825	0.6	29222	2.77			1335	30.0			16466	25.68			620	15.7	
	2.718				2.825		2.9222				3.335				4.66				12.0	
	53.80			16	56.50		6.90			17	26.70				30.42			10	12.40	
	55.70				− 54.16		9.05			4	48.78				32.80				+ 27.55	
	57.80						11.20								35.20					
	0.30	2.294					13.20	15.461							37.35	39960				
	2.20	2.29					15.98	15.46							40.04	39.96			11.01	
	4.50	2.38					17.57	15.50							42.33	39.94			11.6	
	6.40						19.80								44.70				13.6	
	8.70						21.95								47.14				15.6	
56065	10.85					13915	24.05							35964	49.46			684	17.6	
	2.065						2.3915								3.5964				1.84	
	15.20						26.28								37.18			11	13.68	
	17.12	19.322					30.50	32562							56.53	58.956			− 33.73	
	19.28	19.32					32.50	32.56							57.07	58.96				
	21.44	12476					34.65	15100							1.30	79.89				
9661	23.57			16	56.50	16281	36.85			17	26.70			29478	3.80			10	12.40	
	9.661	16	2.335	−	54.16		1.281	18	15.480	+	48.78				2.9478	10	39.950	11	13.68	
																		+	27.55	
																		−	33.73	
																			61.28	
																			1.78732	
																			1.11478	
																			2.90210	
																			1.89053	
																			8.98843	
																			5 33 41	

M 41 40.78

M 14 48.35

383

G Cygni

h m s
21 7 47
° '
+29 44

1.17609 0.16056
9.93869
1.11478

Oct. 29

10	16.18			10	8.5										
	18.50	20932			11.0										
	20.94	20.93			12.7										
	23.36				14.1										
16466	25.68			620	15.7										
	4.66				12.0										
	30.42			10	12.40										
	32.80				+ 27.55										
	35.20														
	37.35	39960													
	40.04	39.96		11	1.01										
	42.33	39.94			11.6										
	44.70				13.6										
	47.14				15.6										
35964	49.46			684	17.6										
	3.5964				1.84										
	37.18			11	13.68										
	56.53	58.956			− 33.73										
	57.07	58.96													
	1.30	79.89													
29478	3.80			10	12.40										
	2.9478	10	39.950	11	13.68										
				+	27.55										
				−	33.73										
					61.28										
					1.78732										
					1.11478										
					2.90210										
					1.89053										
					8.98843										
					5 33 41										

M 41 28.92

M 45 46.60

R 45 46.60

R 45 46.75

M 45 46.62

454664

77.72

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307

β Aquarii

h m s
21 25 11

1879 Oct. 29

° ′	1.17609	0.16056
−6 6	9.99753	
	1.17362	

37 42.35		27 33.8	
45.40	47.500	35.2	
47.50	47.50	36.8	
49.55		38.2	
23750 51.70		1842 40.2	
23750		1842	
55.90		27 36.84	
57.90		+ 27.24	
59.80			
2.00	4.117		
4.15	4.12	28 32.2	
6.20	4.04	33.7	
8.30		35.6	
10.30		36.9	
57705 12.40		1770 38.6	
3705		270	
16.40		28 35.40	
18.40	20.580	− 31.32	
20.60	20.58		
22.70	12.808		
10290 24.80		27 36.84	
290	28 4.080	28 35.40	
		+ 27.24	
		− 31.32	
		58.56	
		1.76760	
		1.17362	
		2.94122	
		1.92117	
		8.97995	
		5 27.16	

M	33 44.70
M	35 8.07
R	35 8.02
R	35 8.35
M	35 7.95
	358.10
	83.40

309

ε Pegasi

h m s
21 38 14

° ′	1.17609	0.16056
+9 18	9.99423	
	1.17032	

40 46.40		40 37.8	
48.58	50.702	39.0	
50.85	50.70	40.8	
52.88		42.2	
25351 54.85		2037 43.9	
351		37	
59.00		40 40.74	
1.15		+ 26.68	
3.30			
5.40	7.450		
7.52	7.445	41 36.0	
9.55	7.39	37.3	
11.65		39.2	
13.68		40.7	
60705 15.80		1960 42.8	
6705		1960	
18.92		41 39.20	
22.00	24.090	− 31.78	
24.05	24.09		
26.18	13.479		
12045 28.30		40 40.74	
2045	41 7.420	41 39.20	
		+ 26.68	
		− 31.78	
		58.46	
		1.76686	
		1.17032	
		2.93718	
		1.91803	
		8.98085	
		5 27.57	

M	8 43.12
M	10 5.80
R	10 6.02
R	10 5.95
M	10 5.92
	10 5.92
	82.80

311

ζ Aquarii

h m s
21 59 34

° ′	1.17609	0.16056
−0 34	9.99995	
	1.17604	

2 6.33		1 57.0	
8.35	10582	0.4	
10.55	1058	1.8	
12.60		3.6	
5291 14.68		3106 5.7	
529		106	
18.80		2 2.12	
21.00		+ 24.98	
23.00			
25.00	2.7118		
27.18	2712	2 57.0	
29.26	27.08	58.7	
31.36		0.4	
33.28		1.9	
24406 35.28		3014 3.4	
24406		14	
39.40		3 0.28	
41.53	43.586	− 33.18	
43.58	43.59		
45.70	5417		
21793 47.70		2 2.12	
1793	2 27.100	3 0.08	
		+ 24.98	
		− 32.98	
		57.96	
21 59 88.10		1.76313	
		1.17604	
		2.93917	
		1.91939	
		8.98022	
		5 27.28	

M	22 11.57
M	23 34.62
R	23 34.80
R	23 34.62
M	23 34.50
	23 34.63
	83.06

0 54 0.7

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322

ν Pegasi

h m s
22 37 20
+29° 35 1.17609 0.16056
9.93934
1.11543

39	47.65		39	38.6				
	52.08	54406		40.5				
	54.38	54.40		42.2				
	56.75			43.7				
27203	59.17		2106	45.6				
	2.203			106				
	3.82		39	42.12				
	6.23		+	31.26				
	8.60							
	11.03	13.379						
	13.32	13.38	40	44.0				
	15.15	13.37		45.7				
	18.10			47.7				
	20.53			49.4				
12041	22.94		2385	51.7				
	12041			38.5				
	27.55		40	47.70				
	29.88	32336	−	34.32				
	32.35	32.34						
	34.65	14674						
16168	37.15		39	42.12				
	1168	40 13.375	40	47.70				
			+	31.26				
			−	34.32				
				65.58				
				1.81677				
				1.11543				
				2.93220				
				1.91482				
				8.98262				
				5 29 17				

M	52	52.95	
M	54	15.12	
R	54	15.12	
K	54	15.40	
M	54	14.93	
	54	15.14	
		82.19	

619

δ Piscis Aust.

h m s
22 15 50 58 1.17609 0.16056
−30° 16 9.93636
1.11245

53	26.88		53	17.0				
	28.22	31.594		19.2				
	31.60	31.59		21.5				
	32.90			23.3				
15797	36.37		1066	25.6				
	797			1066				
	41.20		53	21.32				
	42.56		+	29.40				
	46.00	50749						
	48.42	75						
	50.72	50.86	54	21.1				
	53.17	50.68		22.7				
	53.50			24.5				
	57.87			21.0				
45774	0.30		1231	20.8				
	45674			231				
	5.80		54	2.462				
	7.30	9.772	−	38.90				
	9.88	9.77						
	12.08	10036						
4886	14.60		53	21.32				
	4886	53 50.716	54	24.62				
			+	29.45				
			−	38.85				
				63.30				
				1.80140				
				1.11245				
				2.91385				
				1.79321				
				8.97936				
				5 26 50				

22 51 2.40

M	41	29.50	
M	42	47.70	
R	42	47.72	
R	42	47.78	
M	42	47.62	
	42	47.70	
		78.20	

80 15 29.0

329

δ Pegasi

0.16056

h m s
22 38 44
+14° 33 1.14609
9.98584
1.16193

/	16.17			1	5.6			
	18.30	20420			7.0			
	20.40	20.42			8.5			
	22.55				10.0			
10210	24.65			429	11.8			
	210				429			
	32.00			1	8.58			
	34.00			+	28.87			
	35.25							
	35.30	37.456						
	37.45	37.45		2	8.4			
	39.50	37.45			10.4			
	41.70				12.2			
	43.90				13.7			
33710	46.00			604	15.7			
	33710				6.04			
	50.28			2	12.08			
	52.27	54480		−	34.63			
	54.32	54418						
	56.70	7490						
27240	58.71			1	8.58			
	2240	1 37.450		2	12.08			
				+	28.87			
				−	34.63			
					6.350			
					1.80277			
					1.16193			
					2.96470			
					1.95400			
					8.98930			
					5 34 21			

22 58 48.17

M	54	39.85	
M	56	9.70	
R	56	9.87	
R	56	9.60	
M	56	9.82	
	56	9.80	
		89.95	

14 38 49.1

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1

α Andeam

h m s
0 2 8

1879 Oct. 29.

° ′
+28 25

1.17609
9.94424
1.12033

0.16086

4 38.50		
41.15	43.534	
43.50	43.53	
45.86		
21767 48.26		
21767		
52.90		
55.18		
57.45		
59.81	2231	
2.22	223	
4.50	2.25	
6.90		
9.35		
56008 11.60		
2008		
16.26		
18.67	20976	
21.00	2098	
23.35	12451	
10488 25.60		
10488	5 2.240	

4 31.5	
32.9	
35.8	
37.5	
1770 39.3	
270	
4 35.40	
+ 26.84	
5 34.9	
36.8	
38.6	
40.4	
1934 42.7	
1934	
5 38.68	
− 36.44	
4 35.40	
5 38.68	
+ 22.84	
− 36.44	
59.28	
1.77291	
1.12033	
2.89324	
1.90320	
9.00996	
5 50 32	

0 2 12.58

M 2 55.50.
M 4 15.07.
R 4 15.70.
R 4 15.80.
4 15.52
80.02

3

γ Pegasi

h m s
0 7 0

° ′
+14 31

1.17609
9.98591
1.16200

0.16086

9 32.80		
36.80	37.070	
37.00	37.07	
37.22		
18535 41.33		
18535		
43.68		
47.74		
49.80		
52.80	54.127	
54.05	54.13	
56.25	54.12	
58.40		
0.50		
48714 2.62		
48714		
6.85		
9.00	11.180	
11.26	11.18	
13.34	10825	
5590 15.45		
5590	9 54.125	

9 33.8	
35.6	
27.4	
29.0	
1366 30.8	
1366	
9 27.32	
+ 26.80	
10 28.9	
25.7	
27.5	
29.0	
1373 31.2	
373	
10 24.46	
− 33.34	
9 27.32	
10 27.46	
+ 26.80	
− 33.34	
60.14	
1.77916	
1.16200	
2.94116	
1.92490	
8.98374	
5 30 7	

0 7 4.87

M 57 19.50.
M 58 13.50.
R 58 43.88.
R 58 43.78.
M 58 13.33.
58 43.62
84.12

138

ζ Hydrae

0.16056

h m s
9 21 38

° ′
−8 8

1.17609
9.99561
1.17170

24 9.60		
11.70	13.740	
13.75	13.74	
15.80		
6870 17.85		
6870		
22.02		
24.10		
26.20		
28.20	30.380	
30.20	30.38	
32.30	30.39	
34.55		
36.60		
27342 38.75		
342		
42.85		
44.90	47.040	
47.00	47.04	
49.15	6078	
23520 51.20		
3520	24 30.385	

24 0.5	
2.5	
4.2	
5.6	
202 7.4	
202	
24 4.04	
+ 2634	
24 57.4	
57.4	
1.0	
2.8	
3052 4.6	
52	
25 1.04	
− 30.66	
24 4.04	
25 1.04	
+ 26.34	
− 30.66	
57.00	
1.76587	
1.17170	
2.93757	
1.89583	
8.97126	
5 20 50	

9 21 41.52

M 36 6.40.
M 37 25.67.
R 37 25.62.
R 37 25.62.
M 37 25.58.
37 25.62
79.22

28 25 55.4

14 31 11.0

8 8 11.3

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142

E Lozenis

146

L Lozenis

148

G Lozenis

0.16056

h m s
9 38 59
+24° 20'

1.17609 0.16056
9.96960
1.13569

h m s
10 1 56
+17° 33'

0.16056
12

h m s
10 9 57
+24° 1'

1.17609
9.96067
1.13676

4h3 28.60
31.80 34012
34.80 34.01
36.28
17006 38.38
2006
43.05
45.39
47.60
49.88 52151
52.18 52.15
54.40 52.13
56.60
58.80
46936 1.26
46936
3.75
7.97 10258
10.25 10.26
12.52 10427
5129 14.80
5129 4h? 52.1440

4h3 20.6
22.0
24.0
26.0
1204 27.8
204
24080
+ 2806

42 21.4
25.1
26.7
28.7
1311 29.2
311
42 26.22
− 34.08

+4.22 48.16
2.89 48.14
0.06 48.08
2.11 48.17
4.23 48.12
6.34 48.13
8.47 48.08
12.68 47.97
14.80 48.50
16.91 48.03
19.03 48.07
21.21 47.97

4h? 24.08
42 26.22
+ 28.06
− 34.08
62.14
1.79334
1.13569
2.92906
1.90827
8.97921
5 26 43

48.064
48.073

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336.84 43.93
48.120 46.05
48.05
50.28
52.35
54.47
56.55
240.04 0.65
48.008 2.80
4.98
7.10
2471 9.18
2471

4.942
4.94

5 8.7
10.5
12.2
13.4
604 15.6
604
5 12.08
− 2.401

5 27.3
28.8
30.3
31.7
1510 32.9
310
5 30.20
− 42.13

5 12.08
5 30.20

12 27.40
30.05 32318
32.24 32.32
34.60
16159 36.80
1159
41.33
42.58
45.80
48.05 50367
50.37 50.37
52.62 50.38
54.90
57.20
45330 59.40
330
4.60
6.23 8436
8.40 8.44
10.60 10076
4218 12.95
4218 12 50.377

12 17.4
20.8
22.6
24.4
1136 26.4
136
12 22.72
+ 27.66
− 32.76
60.42
1.78118
1.13676
2.91794
1.90129
8.98335
5 29 50

12 27.72
12 22.72
13 23.14
− 32.76

M 9 12.27
M 10 33.02
R 10 33.17
R 10 33.38
M 10 33.35
10 33.23
80.96

M 56 — 3 micros read.
M 56 54.30
R 56 54.45
R 56 54.38
M 56 53.92
56 54.26

M 27 53.42
M 29 13.00
R 29 13.32
R 29 13.15
M 29 12.90
29 13.09
79.67

12 38 13.3

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156

S Leo.

h m s
11 7 40
° '
+21 11

0.16056

1879 :: Oct. 29

10 10.60		10 5.2
12.70	14962	6.7
14.55	14.96	8.2
17.16		9.9
7481 19.40		418 11.8
2481		418
23.85		10 8.36
26.04		+ 24.29
28.23		
30.87	32662	
32.62	32.66	11 2.0
34.87	32.64	3.7
37.10		5.3
39.30		7.1
29396 41.58		270 8.9
29396		270
43.78		11 5.40
48.05	50326	− 32.75
50.30	50.32	
52.55	6528	
25163 54.75		10 8.36
25163	10 32.650	11 5.40
		+ 24.29
		− 32.75
		57.04
		1.75618

11 7 43.27

R − 11.45		
R 11.22		
R 11.32		
	11.33	

21 16 57d

P Leonis

h m s
11 42 53
° '
+15 13

0.16056

1.17609
9.98443
1.16052

45 22.76		45 14.2
25.88	28000	15.5
28.04	28.00	17.0
30.04		18.7
14000 32.28		861 20.7
14000		861
36.56		45 17.22
38.76		+ 27.90
40.88		
4200	45129	
45.16	45.13	46 15.2
47.28	45.12	17.0
49.39		18.7
51.50		20.8
40616 53.70		931 21.9
40616		931
55.80		46 18.62
0.13	2250	− 33.50
2.20	225	
4.37	90 25	
31125 6.55		45 17.22
1125	45 45.125	46 18.62
		+ 27.90
		− 33.50
		61.40
		1.78817

11 42 55.77

1.16052
2.94869
1.93095
8.98226
5 29 0

M 13 57.40	
M 15 22.32	
R 15 22.75	
R 15 23.07	
M 15 22.70	
15 22.41	
85.31	

15 14 35.5

P Bootis

h m s
13 48 85
° '
+19 0

0.16056

51 25.22		51 18.5
27.20	2 9410	19.9
29.33	29.41	21.3
31.60		22.6
14705 33.70		1068 24.6
4705		69
36.05		51 21.38
40.30		+ 25.45
42.37		
44.63	4 687	
46.80	46.82	52 18.0
49.00	46.84	19.3
51.22		21.0
53.38		22.6
42135 55.60		1057 24.8
42135		57
57.78		52 21.14
2.04	4,272	− 34.31
4.20	4.27	
6.48	9368	
32136 8.66		51 21.36
2136	51 46.830	52 21.14
		+ 25.47
		− 34.31
		59.78
		1.74656

18 48 57.49

M 28 40.00	
M ~~29~~30 1.70	
R ~~29~~30 1.90	
R ~~29~~30 1.82	
M ~~29~~30 1.55	
~~29~~30 1.74	

19 0 1.0

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Sun. C = 46,791

h m s
14 18 20
° ′
−13 30

D, 16056

Oct. 29 — 30

19	34.32			20	55.9	21	47.57	+21.27	4.84	21	15.7				
	36.40	38492			57.7						17.6				
	38.50	38.49			59.2						19.7				
	40.50				0.9						21.4				
19246	42.74			2971	3.4					971	22.7				
	19246				2971						971				
	47.00			20	5942					21	1942				
	49.30			−1	3.82					+	59.42				
	51.46														
	53.50	55630													
	55.68	55.63													
	57.73	55.56													
	59.90														
	1.92														
50067	4.18														
	50067														
	8.27														
	10.50	12634													
	12.70	12.63													
	14.80	12.112													
6317	16.90			20	59.42					21	19.42				
	6317	19 55.595		−1	3.82										

27	42.40			27	36.0										
	45.38	47486			37.5										
	47.30	47.49			39.0										
	49.35				40.3										
23743	51.60			1948	42.0										
	3743				1948										
	53.80				273896										
	55.77				+ 23.06										
	57.71														
	2.80	4.014													
	4.03	4.01		28	32.8										
	6.05	4.02			35.4										
	8.13				37.2										
	10.18				39.3										
57613	12.20			1857	41.0										
	3613				1857										
	16.38				28 3714										
	18.58	20552			− 33.12										
	20.50	2055													
	22.68	12804													
10276	24.70				27 3896										
	276	28 4.015			28 37.14										
					+ 25.06										
					− 33.12										
					58.18										
					1.76477										
					1.17362										
					2.93839										
					1.92614										
					8.98985										
					5 34 46										

M 1 40.10

M 34 31.98

M	33	45.90													
M	35	10.55													
R	35	10.58													
R	35	10.98													
M	35	10.58													
	35	10.67													
		84.77													

Bellagarde

h m s
21 25 11
° ′ 1.17609 0.16056
−6 6 9.99753
1.17362

Oct. 30

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311 α Aquarii

h m s
21 59 34
−0° 34' 7.17609 0.16056
34 9.99995
1.17604

1879 Oct. 30

2 6.37		1 58.4			
8.47	10580	59.8			
10.53	10.53	1.4			
12.43		3.0			
5265 14.65		3074 4.8			
5265		74			
16.47		2 148			
20.90		+ 25.56			
22.95					
25.11	27061				
27.00	27.06	2 530			
29.12	27.03	31.7			
31.23		36.3			
33.20		38.0			
24355 35.25		2815 39.5			
24355		315			
37.25		2 5630			
41.40	43536	− 29.26			
43.60	43.54				
45.58	43407				
21768 47.75		2 148			
1768	2 27.045	2 56.30			
		+ 25.56			
		− 29.26			
		54.82			
21 59 38.10		1.73894			
		1.17604			
		2.91498			
		2.14376			
		9.22878			
		9.36142			

M 21 9.30			
M 23 28.50			
R 23 28.90			
R 23 28.65			
M 23 28.10			
23 28.54			
139.24			
0.7			
0 54 [illegible]			

322 ν Pegasi

h m s
22 37 20
+29° 35' 1.17609 0.16056
9.99334
1.11543

39 49.70		39 40.4			
52.04	54426	42.0			
54.40	54.43	43.9			
56.78		45.9			
29213 59.21		2201 47.9			
2213		201			
3.90		39 4402			
6.28		+ 2940			
8.74					
11.00	13410				
1340 13.41		40 41.4			
15.85	13.42	42.5			
18.10		45.0			
20.52		47.0			
12069 22.90		2259 49.0			
12069		259			
27.70		40 45.8			
30.05	32412	− 31.76			
32.45	3241				
34.70	14684				
16206 37.16		39 44.02			
1206	40 13.415	40 45.18			
		+ 29.40			
		− 31.76			
		61.16			
		1.78647			
		1.11543			
		2.90190			
		1.88536			
		8.98346			
		52955			

M 52 56.20			
M 54 12.70			
R 54 13.22			
R 54 13.12			
M 54 12.95			
54 13.00			
76.80			

619 α Piscis Aust.

h m s
22 50 58
−30° 16' 1.17609 0.16056
9.93636
1.11245

53 21.80		53 16.8			
25.28	31622	18.4			
27.63	31.62	20.7			
29.92		22.7			
15811 32.38		1025 24.4			
811		1025			
41.22		53 2050			
43.58		+ 3020			
46.06					
48.28	50739				
50.70	5074	54 19.2			
5312	50.65	21.5			
55.48		23.3			
57.95		26.4			
45665 0.26		1172 27.8			
45665		172			
4.97		54 23.44			
7.20	9.694	− 32.74			
9.70	969				
12.10	10131				
4847 14.50		53 20.50			
4847	53 50.695	54 23.424			
		+ 30.20			
		− 32.74			
		62.94			
22 51 2.39		1.79503			
		1.11245			
		2.91138			
		1.89476			
		8.98338			
		52951			

M 41 26.90			
M 42 45.17			
R 42 45.60			
R 42 45.62			
M 42 45.12			
42 45.38			
78.48			
30 15 29.1			

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329

α Pegasi

h m s
22 38 44
+14° 33' 1.17609 0.16856
9.98584
1.16193

1 16.17		1 7.0	4 38.80		4 28.0	9 32.83		9 34.4
18.28	20.402	8.5	41.80	43.438	29.7	34.90	37.100	35.9
20.40	20.40	10.3	43.45	43.44	31.2	37.17	37.10	37.5
22.50		11.8	45.76		33.0	39.20		38.9
10201 24.66		510 13.4	21719 48.18		1569 35.0	18530 41.40		1872 40.5
10201		510	21719		69	18550		1872
25.72		1 1020	52.90		4 31.38	45.62		9 37.44
31.00		+ 27.26	55.20		+ 30.86	47.74		+ 16.69
33.20			57.60			49.90		
35.35	37.460		59.95	2.261		52.06	54.127	
37.47	37.46	2 6.8	2.22	2.26	5 31.8	54.06	54.13	10 23.1
39.57	37.45	9.0	4.62	2.22	34.8	56.23	54.13	24.7
41.75		10.6	6.96		35.9	58.38		26.4
43.88		12.2	9.27		38.0	0.40		28.0
33714 46.00		526 13.9	56035 11.63		1800 39.9	48714 2.75		1322 30.0
33714		526	2035		300	48714		1322
30.29		2 1052	16.80		5 36.00	6.88		10 26.44
32.32	54.512	− 33.06	18.66	21.012	− 33.76	9.03		− 32.31
34.52	54.51		21.02	21.01		11.23	11.16	
36.63	7491		23.38	12445		13.30	10826	
27256 38.77		1 10.20	10506 25.70		4 31.38	5581 15.37		9 37.44
2236	1 37.455	2 10.52	506	5 2.240	5 36.00		9 54.130	10 26.44
		+ 27.26			+ 30.86			+ 16.69
		− 33.06			− 33.76			− 32.31
		60.32			64.62			49.00
22 58 48.16		1.78046	0 2 12.58		1.81037	0 7 4.89		1.69020
		1.16193			1.12033			1.16200
		2.94239			2.93070			2.85220
		1.93029			1.91524			1.83670
		8.98790			8.98454			8.98450
		5 33 18			5 30 44			5 30 42

M	54 42.82		M	2 57.38		M	57. 34.52	
M	56 7.85		M	4 ~~43.62~~ 14.10		M	58 43.05	
R	56 7.87		R	4 13.80		R	58 43.38	
R	56 8.08		R	4 13.78		R	58 43.02	
M	56 8.15		M	4 13.40		M	58 43.27	
	56 7.99			4 13.65 77			58 43.18	
	85.17			82.27			68.66	

14 38 49.1 28 25 55.5 14 31 11.0 5

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146

α Leonis

h m s
10 1 36

+12 23 1.17609 0.16056
9.98956
1.16559

1879 Oct. 30

4 24.50
28.90 31060
31.03 31.06
32.15
15530 33.35
530
34.35
41.62
43.70
46.10 48009
48.25 48.01
50.15 47.98
52.22
54.34
43208 56.45
43208
0.38
2.80 4.900
4.72 4.90
7.03 9.596
2450 9.20
2450 4 47.995

4 18.4
19.7
21.5
23.0
1076 25.0
1076
4 21.52
+ 26.48
5 15.0
17.2
16.7 ?
20.2
910 21.9
910
5 18.20
- 20.20
4 21.52
5 18.20
+ 26.48
- 30.20
56.68
1.75343
1.16559
2.91902
1.91991
9.00089
5 42 43 5 43 20

M 55 14.50
M 56 37.62
R 56 37.72
R 56 37.62
- 56 37.67
5637.66
83.16

10 1 58.79

12 38 16.4

148

ζ Leonis

h m s
10 9 57

+24 1 1.17609 0.16056
9.96067
1.13676

12 27.70
30.00 32234
32.23 32.23
34.47
36.77
16117 1117
41.30
43.55
45.77
48.03 50309
50.30 50.31
52.55 50.29
54.78
57.10
45278 59.40
45278
3.87
6.13 8.350
8.25 8.35
10.60 10.058
4175 12.90
4175 12 50.300

12 18.0
19.6
21.2
23.1
1067 24.8
67
12 2.134
+ 28.96
13 19.7
21.2
23.2
25.0
1158 26.7
158
13 2.316
- 32.86
12 21.314
13 23.16
+ 28.96
- 32.86
61.82
1.79113
1.13676
2.92789
1.91046
8.98257
52914

M 27 51.78
M 29 12.92
R 29 13.38
R 29 13.20
- 29 13.12
29 13.15
81.37

156

δ Leo

h m s
11 7 40

+21 11 0.16056

10 10.49
12.62 14.854
14.85 14.85
17.03
7427 19.28
2427
23.70
26.00
28.18
30.25 32562
32.53 32.56
34.72 32.54
36.98
39.20
29306 41.40
29306
45.85
48.00 50234
50.20 50.23
52.45 6508
25117 54.67
117

11 2.0
4.6
6.3
7.7
312 9.6
312
11 6.24
- 33.69
10 32.550
11 6.20
- 33.65

11 7 43.80

R 19 12.70
R 19 12.38
R 19 12.42
19 12.50

21 10 50.6

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β Leonis

h	m	s			
11	42	33			
	+ 15°	′	1.17609	0.16056	
		15	9.98443		
			1.16052		

45	23.70		45	17.0	
	25.18	27.946		18.7	
	28.00	27.95		20.5	
	30.05			22.2	
13973	32.20		1023	23.7	
	13973			1023	
	36.47		45	2046	
	38.58		+	24.57	
	40.75				
	42.85	45.017			
	45.00	45.02	46	11.6	
	47.10	45.04		13.0	
	49.30			14.7	
	51.47			16.1	
40515	53.65		730	17.6	
	40515			230	
	57.89		46	1460	
	60.00	2.130	−	29.57	
	62.03	2.13			
	64.21	9008			
31065	66.45		45	2046	
	1065	45 45.030	46	14.60	
			+	24.57	
			−	29.57	
				54.14	
11	42	55.80		1.73352	
				1.16052	
				2.89404	
				1.82053	
				8.92649	
				4 4933	

M	14	40.35	
M	15	16.20	
R	15	16.82	
R	15	16.62	
M	15	16.25	
	15	16.47	
		66.12	

15 14 55.4

587

α Virginis

h	m	s			
13	18	49			
	− 10°	′	1.17609	0.16056	
		32	9.99262		
			1.16871		

21	18.30		21	15.0	
	21.30	23.350		16.3	
	23.30	23.35		18.0	
	25.40			19.5	
11675	27.45		895	20.7	
	1675			395	
	31.78		21	1790	
	33.90		+	2222	
	35.90				
	37.95	40.120			
	40.05	40.12	22	9.3	
	42.27	40.13		10.6	
	44.30			11.8	
	46.38			13.4	
36108	48.55		604	15.3	
	36108			604	
	52.88		22	1208	
	54.84	56.924	−	31.96	
	56.90	56.92			
	59.00	8.027			
28462	1.20		21	19.90	
	28462	21 40.125	22	12.08	
			+	20.22	
			−	31.96	
				52.18	
10	18	51.46		1.71750	
				1.16871	
				2.88621	
				1.88377	
				8.99756	
				5 4044	

M	59	57.10	
M	1	7.82	
R	1	7.65	
R	1	7.55	
M	1	7.48	
	1	7.62	
		46.52	

10 31 59.8

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5

Sun. c = 46,791

h m s
14 22 14
° '
−14 10

0,16056

1879 Oct. 20 – 31

23 28.15		24 40.2	25 41.50		24 59.2	
30.10	32.250	42.2	43.05	45774	1.3	
32.10	32.25	43.8	45.72	45.77	2.7	
34.30		45.3	48.00		4.6	
16125 36.50		2186 47.1	2887 50.10		138 6.0	
1125		186	2887		138	
40.70		24 43.72	54.40		24 276	
42.95		−54.43	56.40		+2 0.08	
44.75			58.60			
47.18	49.264		0.70	2843		
49.38	49.26		2.80	284		
51.50	49.32		4.98	2.83		
53.50			7.05			
55.80			9.18			
44338 57.82		56559	11.48			
44338			2559			
2.00			15.70			
4.30	6.390		17.75	19.906		
6.40	6.39		19.90	19.91		
8.50	9864		21.98	12567		
3195 10.75		24 43.72	9953 24.20		24 276	
3195	23 49.290	− 54.43	9953	26 2.835	+2 0.08	

M 20 57.18

M 53 19.70

502

K Cephei

h m s
20 12 56
° '
+77 21

0.16056

1879 Nov. 5

14 6.64		13 24.8	14 22.5	15 36.7	
16.08	25386	31.2	27.3	43.8	
25.00	25.39	38.9	38.7	52.0	
34.86		45.7	44.9	58.4	
12693 44.35		1946 54.3	1871 57.7	2586 7.7	
12693		1946	1871	2586	
2.55		13 3892	14 3742	15 51.72	
12.95		+1 2.10	+ 3.60	−1 10.70	
22.40					
31.58	41.112				
41.00	41.11	16 31.4	17 27.8	18 10.5	
51.29	4094	39.0	37.3	17.4	
56.64		47.7	45.3	26.8	
5.18		54.2	53.0	32.5	
37001 19.02		2365 4.2	2243 0.8	1306 42.4	
37001		2365	2243	1306	
37.60		16 4730	17 44.86	18 2612	
47.30	56492	−2 6.28	−3 3.84	−3 45.70	
56.20	56.49				
5.88	8188				
28246 15.48		13 3892	14 3742	15 51.72	
28246	14 41.025	16 47.30	17 44.86	18 26.12	
		+1 2.10	+ 3.60	− 1 10.70	
		− 2 6.28	− 3 3.84	− 3 45.10	
		188.38	187.44	2958	

M 8 29.22
M 8 48.00
M 9 12.60
M 8 28.92
M 8 46.55
M 8 58.67

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α Urs. Maj. L. C.

8h 20m 12s
+118° 53'

0.16056

22 16.78		22 39.1	
21.19		42.9	
25.60		45.4	
29.80		48.9	
34.30		2293 53.0	
		2293	
42.40		22 45.86	
47.17			
51.30			
55.38	59.680		
57.67	59.68	23 38.4	
3.90		41.4	
8.22		44.4	
12.36		48.9	
53712 16.52		2260 52.9	
53712		2260	
25.33		23 45.20	
29.38	33.824		
33.75	33.82		
38.06			
16912 42.40		22 45.86	
16912	22 59.674	23 45.20	

M 40 54.82.
M 40 43.35.

291 Cephei

20h 24m 33s
+62° 35'

0.16056

29 34.30		29 14.4	
39.50	43.450	17.5	
43.40	43.45	21.5	
47.50		24.8	
21725 52.65		1069 28.7	
21725		69	
1.35		29 21.38	
6.80		+ 57.91	
10.28			
14.85	19.319		
19.40	19.32	30 20.8	
23.85	19.26	24.5	
28.33		27.3	
32.80		30.7	
17387 37.20		1375 34.2	
17388		375	
46.15		30 24.50	
50.67	55.070	− 8.21	
55.03	55.07		
58.60	158.52		
28535 3.50		31 11.3	
27535	30 19.290	15.0	
		18.6	
		21.6	
		935 27.0	
		935	
		31 18.70	
		− 3.941	

M 53 39.75
M 54 23.67
M 58 57.58

299 Cephei

20h 42m 50s
+61° 22'

0.16056

Nov. 5.

44 53.65		44 41.7	
57.71	2.026	44.4	
1.90	2.02	48.1	
6.27		51.0	
31013 10.60		2394 54.2	
1013		394	
19.16		44 47.88	
23.24		+ 48.54	
27.82			
32.20	3.6400		
36.30	36.40	45 57.8	
40.75	36.441	0.5	
45.11		4.0	
49.23		7.7	
32760 53.90		3113 11.5	
32760		215	
2.28		46 4.30	
6.68	10.872	− 27.88	
10.90	10.87		
15.10	72.89		
5436 19.58		46 37.2	
5436	45 36.420	41.0	
		43.6	
		46.7	
		2199 51.4	
		2199	
		46 43.98	
		−1 7.56	

M 6 49.00
M 7 41.80
M 8 8.32

4 25.06

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1879phae.proj.1506.

		413				415				303		
		ρ Urs. Maj. Lo. C.			o² Urs. Maj. Lo. C.					ξ Cygni		
		h 8 m 51 s ~~45~~ 36		0.16056		h 8 m 59 s 43		0.16056			h 21 m 7 s 47	0.16056
		+111° 53′				+112° 23′					+29° 44′	
	1879	Nov. 5										
53 28.80		52 46.0	53 12.0		1 36.28		1 12.2	1 42.3		10 10.60		10 12.2
34.35	39.900	49.2	15.8		41.92	47.298	17.6	45.5		13.00	15.374	13.8
39.97	39.90	54.6	19.9		47.40	47.30	21.2	50.7		15.35	15.37	17.2
45.40		58.2	22.6		52.76		24.2	54.5		17.70		19.8
50.98		2697 1.7	975 27.2		23649 58.13		1029 27.7	2527 59.7		7687 20.22		
19950	19950	2697	975		23649		1029	27		7687		630
1.98		52 53.94	53 19.50		8.95		1 20.58	1 50.54		24.80		10 15.75
7.50		+1 30.04	+1 4.48		14.40		+1 10.04	+ 40.08		27.30		+ 18.58
13.00					19.73					29.50		
18.40	23.991				25.00	30.594				31.84	34.327	
24.07	23.99	54 25.4	55 3.3		30.50	30.59	3 4.5	3 35.3		34.35	34.33	11 2.4
29.47	23.98	28.7	5.7		36.00	30.64	7.3	38.3		36.60	34.33	4.2
35.00		33.8	11.4		41.67		12.4	44.7		39.10		6.3
40.50		37.2	15.3		47.00		17.8	47.4		41.50		7.9
46.00		1661 41.0	552 19.5		27535 52.10		640 22.0	2183 52.6		30894 43.95		308 10.0
− 21592	21592	1661	552		27535		640	2183		30894		308
57.00		54 33.22	55 11.04		3.20		3 12.80	3 43.66		48.60		11 6.16
2.66	8.058	− 9.24	− 47.06		8.68	13.988	− 42.18	− 13.04		50.90	53.286	− 31.83
8.10	8.06				13.90	13.99				53.12	53.29	
13.53	16796				19.46	18129				55.61	6866	
4029 19.00		55 40.0	53 19.50		1994 24.70		1 20.58	1 50.54		26643 58.20		10
4029	54 23.985	41.5	55 11.04		6994	2 30.615	3 12.80	3 43.66		26643	10 34.330	11 6.16
		42.5	+1 4.48				+1 10.04	+ 30.08				
		43.7	− 47.06				− 42.18	−1 13.04				− 31.83
		2122 44.5	111.54				112.22	103.12				
		122										
		55 42.44										
		−1 18.46										

M 38 47.62		M 10 8.12	M 44 43.02
M 38 33.15		M 9 51.45	M 45 44.52
M ~~36~~ 52.55	prob. 37	M 9 7.25	R 45 44.92
M ~~36~~ 32.62		M 8 48.98	R 45 44.85
M ~~38~~ 16.95			M 45 44.50
			45 44.70
			61.68

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306

α Cephei

h m s
21 15 41

+62 1'

0.16056

Nov. 5

	17 44.82		17 31.0		50 55.95			52 15.0	53 15.30			52 31.7	
	49.30	53626	34.8		2.07	4.208		16.8	17.15	19.490		33.2	
	53.68	53.62	38.4		4.18	4.205		18.6	19.40	19.49		34.6	
	57.98		42.3		6.36			19.9	21.30			36.4	
	26813 2.35		1925 46.0		32104 8.48			920 21.7	9745 23.80			1747 38.6	
	26813		1925		21.04			920	9745			1747	
	11.00		17 38.50		12.58			52 18 40	23.25			52 34.94	
	15.67		+ 50.27		14.80			− 56.99	30.20			+1 1.82	
	20.00				17.10	21.381			32.37				
	24.22	28.719			19.30	5 8486			34.57	36761			
	28.70	28.72	18 16.0		21.45	21.38			36.68	36.76			
	32.90	28.82	19.0		23.80	21.44			38.50	36.75			
	37.73		23.4		25.50				40.55				
	41.95		26.0		27.90				43.40				
	25847 46.30		1142 29.8		19243 30.00			33085 45.50					
	25847		1142		19243			33085					
	53.28		18 22.84		34.17				45.75				
	57.69	4018	+ 5.93		36.62	38690			51.70	54006			
	4.03	402			38.63	38.69			53.90	54.01			
	8.35	17764			40.83	42.89			56.18	73.50			
	32009 12.74		19 33.8		19345 43.15			52 18 40 27003	58.30			52 34.94	
	2009	18 28.770	41.7		19345	51 21.410		− 56.99	27003	53 36.755		+1 1.82	
			45.1										
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			2301 53.0										
	21 16 42.97		2301										
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1879 Nov. 9

9	57.57			9	48.4			45	11.10			45	8.0	
	0.00	2266			50.3				13.18	15.276			4.6	
	2.29	227			52.7				15.22	15.28			6.3	
	4.47				54.0				17.38				7.8	
31133	6.60			2611	55.7			7638	19.50			311	9.4	
	1133				111				2638				311	
	11.07			9	52.22				23.50				6.22	
	13.30			+	27.72				26.00				+26.15	
	15.54								28.05					
	17.76	19952							30.20	32.359				
	20.00	19.95		11	0.3				32.36	32.36		46	1.6	
	22.18	19.93			1.7				34.48	32.39			3.0	
	24.37				2.8				36.60				4.3	
	26.57				4.2				38.80				6.0	
17957	28.15			145	5.5			29123	40.90			229	8.0	
	17957				145				29123				229	
	32.20			11	2.90				45.15				458	
	35.38	37586		−	42.96				47.37	49468			−32.21	
	37.55	37.59							49.45	49.51				
	39.80	3986							51.60	6479				
18793	42.00			9	52.22			24754	53.77				622	
	18793	10 19.940		11	2.90				24734	32.375			458	
				+	27.72									
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11 7 48.57					1.84930			11 42 56.04						
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51	45.40			51	46.8									
	50.50	52540			47.9									
	52.60	52.541			49.4									
	54.53				51.0									
26270	56.67			2480	52.9									
	26270				480									
	0.75			51	4960									
	2.85			+	12.42									
	4.90													
	7.00	9.006												
	9.05	9.01		52	43.4									
	11.00	9.03			44.6									
	13.10				45.8									
	15.15				47.3									
8105	17.25			2305	48.4									
	8105				305									
	21.40			52	4610									
	23.45	25530		−	3708									
	25.50	2553												
	27.60	13807												
12765	29.70				4960									
	2765	9.020			46.10									

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58	26.67			58	18.3										
	28.83	30910			20.1										
	30.50	30.91			21.6										
	32.10				23.3										
15455	35.15			1085	25.2										
	455				1085										
	39.40			58	2.470										
	41.40				+26.10										
	43.67														
	45.70	47838													
	47.80	47.84		59	10.5										
	50.05	47.75			12.2										
	52.05				14.0										
	54.10				15.7										
43054	56.27			704	18.0										
	43054				204										
	0.50			59	1.408										
	2.46	4598			−26.28										
	4.48	459													
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2299	8.85				21.70										
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20	6.55					20	5.5								
	8.68	10.664					6.9								
	10.68	10.69					8.7								
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5347	14.79					419	11.3								
	5347						419								
	19.03					20	8.38								
	21.00						+ 18.98								
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	25.28	27318													
	27.25	27.32				21	55.6								
	29.40	27.40					57.0								
	31.45						58.3								
	33.60						0.2								
24586	35.70					2930	1.9								
	24586						2930								
	39.90					21	58.66								
	42.05	44116					− 3.24								
	44.05	44.12													
	46.28	54.81													
22058	48.30						838								
	2058		27.360				58.60								

M 59 56.47.
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51	12.18					57	5.0								
	14.10	16302					6.6								
	16.15	16.30					8.8								
	18.40						10.4								
8151	20.68					428	12.0								
	3157						428								
	23.00					51	8.56								
	27.17														
	29.37														
	31.48	33709													
	33.75	33.71				52	0.6								
	35.98	33.70					2.8								
	38.10						4.0								
	40.20						5.4								
30338	42.33					195	7.5								
	30338						195								
	46.60					52	3.90								
	48.87	51100													
	51.18	51.11													
	53.38	6741													
25558	55.55						856								
	55051	33.709					3.90								

M 28 43.10.
M 29 59.20.
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41	38.50		41	49.8				33.0		13.80			
	57.20	1540		51.7				35.0		16.05	18.194		
	1.50	1541		53.5				36.7		18.23	18.19		
	3.90			55.3				38.2		20.37			
30770	6.20		2675	57.2			1826	39.7	9097	22.52			
	770			175				326		9097			
	10.75		41	5350				3652		26.50			
	13.15		×	2657						29.00			
	15.40									31.35			
	17.75	20059								33.40	35567		
	20.05	20.06	42	48.6						35.60	3554		
	22.35	2008		50.3						37.70	35.55		
	24.70			52.0						39.80			
	27.10			53.9						42.10			
18053	29.38		2608	56.0					32010	44.25			
	18053			2608						5010			
	32.97		42	5216						47.40			
	36.23	38620	−	3209						50.78	52908		
	38.60	3862								52.90	52.91		
	41.10	4016								55.16	7116		
19310	43.30			5350				3652	26454	57.30			
	193104	20.070		52.16						1454	35.560		

M	54	2.60.	
M	55	20.07.	
R	55	20.40.	
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13 57.87		13 18.6	14 13.4	
7.70	16930	24.6	19.0	
17.10	16.93	31.9	24.4	
25.88		38.5	33.2	
8465 33.90		1602 46.6	1301 40.1	
8465		1602	1301	
34.23		13 32.04	14 26.02	
3.97		+1 0.22	+ 6.24	
13.47				
22.67	32246			
32.06	32.24	15 46.6	16 32.5	
42.06	32.28	53.0	40.0	
51.55		59.8	46.0	
0.50		7.9	52.0	
29021 8.80		3026 15.3	2315 1.0	
29021		26	2315	
28.50		16 05.2	16 46.30	
38.46	47622	−1 28.26	−2 14.04	
47.38	4762			
57.00	6455			
23811 6.37		17 17.9	18 18.1	
23811	14 32.260	24.2	24.8	
		32.0	34.0	
		40.2	44.3	
		1629 48.6	1723 57.1	
		1629	1983	
		17 32.58	18 39.66	
		−3 0.32	−4 3.40	

M 8 26.70
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22 5.00		21 38.3		
13.30	17636	43.3		
17.80	1764	47.5	4690	
22.50		51.6		
8818 26.08		2345 53.8		
8818		2345		
34.72		21 4690		
38.90		+ 4.88		
43.20				
47.50	51767			
51.75	51.77	23 3.8		
56.00	51.80	7.4		
0.35		10.3	1050	
4.60		13.4		
46590 8.85		525 17.6		
46590		525		
17.30		23 10.50		
21.80	25956	− 1.872		
25.90	25.96			
30.25	1960			
12978 34.50		23 41.8		
12978	22 51.785	45.8	4862	
		48.9	48.62	
		52.0		
		2431 54.6		
		2431		
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30.58	34974			
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6.20	10651			
10.70	1065			
15.30	10.80			
19.75				
23.63				
63586 28.58				
9586				
37.50				
42.20	46636			
46.68	46.64			
51.00	14161			
23318 55.50				
23318	30 10.725			

29 18.7	30 14.0			
22.5	17.9			
26.4	21.1			
30.5	93.9			
1317 33.6	1051 28.2			
1317	51			
29 26.34	30 21.02			
+ 44.38	− 10.30			
31 2.0	31 25.3			
5.8	28.4			
9.3	32.0			
12.1	35.9			
458 16.6	1614 38.8			
458	114			
31 9.16	31 32.28			
− 58.44	+ 21.56			
29 26.34	30 21.02			
31 9.16	31 32.28			
+ 44.38	− 10.30			
− 58.44	+ 21.56			
102.82	91.86			
2.10221	1.96313			
0.83928	0.83928			
2.94149	2.80241			
1.79428	1.79428			
8.85279	8.99180			
4 4 32	5 36.16			

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34 25.19			33 55.7	35 5.9			44 44.80			44 28.6	45 19.8			53 20.80			52 35.7	53	7.7
33.03	40796		0.9	12.2			49.16	53426		31.6	22.3			26.19	31.786		39.4		11.3
40.73	40.79		8.0	18.3			53.40	53.43		34.7	26.0			31.70	31.79		43.6		15.2
45.73			12.9	24.2			57.70			38.2	28.7			37.34			47.9		18.3
398 56.80			3371 19.6	921 21.5			26713 2.07			1751 42.0	1291 32.3			15893 42.90			2188 52.2	770	24.0
20 398			371	921			26713			1751	1291			15893			2188		77
11.75			34 2.742	35 1842			10.65			44 35.02	45 25.82			54.10			52 43.76		15.4
16.40			+1 35.19	+ 24.19			14.97			+ 52.79	+ 1.99			57.56			+1 32.28	+1	06
27.26							19.40							5.00					
34.77	42618						23.57	27804						10.65	16.058				
42.49	42.62		36 7.0	36 58.2			27.80	27.80		46 9.9	46 46.2			15.95	16.06		54 57.6	55	25.2
50.35	42.60		11.4	2.3			32.05	27.82		13.2	47.8			21.54	16.02		58.4		28.8
58.26			17.8	9.7			36.30			17.4	49.2			27.00			3.4		30.4
3.80			24.0	14.4			40.55			20.3	50.4			32.52			6.1		32.0
356 13.48			902 30.0	3460 21.4			25024 44.95			853 24.7	2454 51.8			89452 38.20			3111 11.6	1494	33.6
38 38.354			902	460			25024			855	2454			14 13452			111		140
28.90			36 18.04	37 9.20			53.60			46 17.10	46 49.08			47.33			55 2.22		29.8
36.70	44420		− 35.43	-1 26.59			57.88	2222		− 49.29	-1 21.27			52.80	0.248		− 46.18	−1	13.8
44.53	44.42						2.80	2.22						0.16	0.25				
52.05	20521						6.48	17565						5.68	152.04				
22210 59.90			37 28.3	35 1842			31111 12.90			44 35.02	45 25.82			30124 11.25			52 43.76		53
22210	35 42.610		34.8	37 9.20			1911	45 27.810		46 17.10	46 49.08			124	54 16.040		54 2.22		55
			42.0	+ 2419						+ 52.79	−1 21.27						+1 32.28		+1
			47.8	-1 2659						− 49.29							− 13.82		−1
			2076 24.7	110.78						102.08							106.10		13
			2076																
			37 41.52																

M 56 46.58		M 6 42.07		M 38 36.38					
M 57 14.75		M 7 18.112		M 38 18.65					
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22.60 31.942
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41.90 31.86
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82748 10.50
28748
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39.20 48960
48.78 48.96
58.78 6372
24480 8.70
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8 29.5 9 40.0
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49.4 1.3
2137 56.4 2748 11.0
2137 2748
8 4274 9 5496
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10 32.2 11 46.3
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2348 2.0 3126 19.0
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2159 1.4 173.68
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4.14	50.09	50.143	45.95
2.05	50.10		48.05
−0.00	50.18		50.18
2.07	50.16		52.23
4.14	50.13		54.27
6.23	50.15		56.38
8.31	50.19		58.50
12.45	50.10	250.45	2.55
14.59	50.01	50.09	4.58
16.60	50.14		6.74
18.67	50.13		8.80
20.82	50.06	3355	10.88
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27 51.3
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27 54.56
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28 27.36
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β Cephei

36.25	44.33	30	20.58	
42.29	44.21	221.73	26.50	32.726
48.35	44.25	44.342	32.60	32.73
54.39	44.56		38.95	
60.62	44.36	16363	45.00	
			16363	

44.346
21 27 6.16

30 48.0
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6.34	40.09	40.032	33.70		
4.26	40.16		35.90		
2.11	40.01		37.80	40.033	
-0.00	40.05		40.05	4003	
2.11	40.09		42.15		
4.26	39.94		44.20		
6.39	39.91		46.30		
8.54	39.96	36030	48.50		
			36030		
12.79	39.86	199.54	52.65		
14.92	39.98	39.908	54.90	56974	
17.05	39.80		56.86	56.97	
19.18	39.98		59.16		
21.38	39.88	5487	1.30		
			28487		

39.970
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M 57 47.72
M 58 44.70
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β Cephei S.C.

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37.00	37.01	29 30.0	
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49.00		25.8	
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33308 1.50		1355 36.3	
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1.20		29 2.70	
19.05	25.296	+ 9.98	
25.45	25.29		
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420

Gr. 1564

h m s
9 31 51
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+69 47

1.17609 0.16056
9.53854
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1879 Aug. 10

33 36.08
41.86 47.966
48.05 49.97
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23 23.983
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29.70 35598
35.76 35.60
41.60 35.70
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32 32038
11.50
17.37 23.434
23.50 23.43
29.40 19140
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33 5.9
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33 10.14
+1 25.51
35 26.0
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1801 47.3
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35 36.02
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165.88
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33 37.5
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2281 54.3
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33 46.62
+ 50.03
36 22.4
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1263 27.9
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36 25.26
−1 49.61
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41 34.5
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68341 44.60
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7.02 14.354
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21.50 3.108
37177 28.70
7177 50 15.670

48 29.0
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M 2 58.75
M 3 19.02
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128

E Lewis C=46,711

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1.17609 0.16056
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12 9.72
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M 27 58.10.
M 29 15.72.
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182

J Bootis

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M 30 10.55.
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36.80 36.93
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			19.4		21.82				38.0				—			56.7	
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					41.30					12.09	36.93		48.50			35.9	
					42.30					17.72	37.18		54.90			38.9	
				33183	45.50					24.20	36.80		1.00		1756	44.0	
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					50.05					36.25	36.85	184.47	12.10		30	35.12	
					52.00	54280				42.29	36.88	36.894	19.17	25.274	+	182	
					54.25	54.28				46.26	37.05		25.70	25.27			
					56.50	7404				49.89	37.01		31.40				
		8	17.50	27140	58.60			8	35.82	60.62	36.60	6.37	37.30		31	9.9	
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24.06 30322
30.40 3032
36.40 20067
15161 42.80
15161 42.40.380

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41 34.6
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329 α Pegasi

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1879 Nov. 15

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+21.32 15.32 0 54.00
19.18 15.18 15.50 56.00
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M 54 47.82.

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516 11 Cephei Lc. C.

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41 30.56
36.30 42.812
43.00 42.81
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21406 55.20
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26.74 32.741
32.56 32.74
39.00 32.79
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29467 57.84
29467
10.30
16.60 22.760
22.50 22.78
28.80 18559
11390 35.70
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41 23.3 | 42 27.9
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41 33.22 | 42 38.26
+ 59.54 | − 5.50
43 12.4 | 44 2.3
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1100 32.2 | 242 7.2
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43 22.00 | 44 4.84
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41 33.22 | 42 38.26
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M 18 17.78.
M 17 47.05.
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421 Gr. 1586

h m s
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4035 22.60
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48 19.9 | 48 52.5
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1555 42.3 | 3191 14.3
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48 31.10 | 49 3.82
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1589 44.3 | 2705 7.2
1589 | 2705
50 31.78 | 51 54.10
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h m s
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+117 48

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24 Cephei Le. Co.

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h m s
10 9 57
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Ex Sheet.

425	150	429
30 H. Camel.	9 H. Draco.	35 H. Urs. Maj.
h m s 10 16 11	h m s 10 24 46	h m s 10 34 23
° ′ +83 10	° ′ +76 20	° ′ +69 42
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1879 Nov. 15

18 23.73
40.67 58.014
57.75 58.01
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30 H. Camel.:

17 6.0 | 18 36.8
20.9 | 46.6
32.5 | 0.7
46.2 | 17.2
1626 57.0 | 3105 29.2
1626 | 105
17 32.52 | 19 2.10
+1 25.49 | − 4.09

19 58.1 | 20 53.8
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3194 10.2 | 3214 15.0
194 | 214
20 3.88 | 21 4.28
−1 5.87 | −2 6.27

21 39.5 | 22 30.0
40.7 | 34.2
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2611 47.6 | 36
2611 | 22 40.72
21 ~~54.22~~ 43.51 | −3 42.71
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34.53 23.93 | 26 49.00
26.20 24.47 | 58.27
17.44 24.29 | 218.45 6.80
8.64 24.14 | 24.328 15.50 24.286
0.01 24.30 | 24.30
8.71 24.58 | 33.30
17.07 24.23 | 41.30
26.20 24.70 | 50.90
34.96 24.30 75857 | 57.20
20857

9 H. Draco.:

25 29.6 | 26 22.7
34.0 | 29.0
41.7 | 37.6
48.0 | 42.2
2073 54.0 | 45.9
2073 | 49.9
25 41.46 | 2273
+1 42.87 | 26 37.88
| + 56.45

27 43.0 | 28 22.5
57.4 | 27.4
57.9 | 35.4
4.5 | 42.8
2902 13.4 | 1795 57.4
2902 | 1795
27 58.04 | 28 35.90
+ 33.71 | −1 11.57

29 33.2 | 30 4.8
36.6 | 6.0
40.5 | 7.4
43.1 | 9.0
1985 45.1 | 372 10.0
1985 | 372
29 39.70 | 30 7.44
−2 15.37 | −2 48.11

35 H. Urs. Maj.:

36 34.80
40.50
46.03
52.20
58.00
4.20
10.00
16.00
22.00
28373
36 31.526
36 58.19

35 36.2 36
39.6
45.0
49.2
2240 54.0
2240
35 44.80
+1 13.39

37 22.4 38
25.9
32.7
37.2
1606 42.4
1606
37 32.12
− 33.93 −1

38 57.3
53.0
55.0
56.8
2730 57.4
230
38 54.60
−1 56.41

Right margin (partially visible): 17. 23. 27. 30. 35. 134 13 26 +37 23. 29. 34. 37. 43. 167 167 385 353 36 38

M 20 32.35
M 20 48.45
M 20 59.00
M 21 8.82
M 21 13.85
M 21 23.25
J

M 10 14.20
M 10 34.40
M 10 2.30
M 11 14.22
M 11 35.78
M 11 42.85

M 47 39.85
M 48 1.82
M 48 34.45
M 49 3.82
J
~~48 13.36~~

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325

i Cephei Le. 6

h 22 m 45 s 22
+114° 26′

47	1.15	
	5.38	10344
	10.00	10.34
	15.22	
5172	19.97	
	5172	
	30.27	
	35.40	
	41.00	
	45.00	50213
	50.33	50.21
	54.90	50.09
	0.25	
	4.77	
45192	10.00	
	45192	
	20.35	
	24.97	29844
	29.80	29.84
	34.50	10018
14922	39.60	
	14922	47 50.015

46	55.2	
	59.9	282
	3.3	282
	6.8	
3141	9.5	
	141	
47	282	
+	47.20	
47	38.7	
	42.2	
	45.5	
	50.8	
2301	52.9	
	2301	
47	4602	
+	400	
48	50.5	
	52.8	
	54.5	
	58.0	
2768	1.0	
	2768	
48	5536	
−1	534	

M 7 39.22.
M 7 12.00.
M 6 33.78.

62 23 36.7

0.16056

184

α Urs. Maj.

h 10 m 56 s 15
+62° 24′

58	30.67
	35.14
	39.50
	43.90
	48.27
	52.62
	57.38
	1.70
43495	5.77
	43495
	48328

10 56 18.64

57	47.5	58	12.7
	57.4		14.8
	55.0		17.8
	57.9		20.3
2724	0.6		22.7
	2724	1150	26.7
57	5448		1150
+	5385	58	2300
		+	2533
58	59.3	59	35.3
	2.7		38.4
	6.1		42.9
	9.0		45.7
3306	13.5	2125	50.2
	306		2125
59	612	59	4250
−	1779	−	5417
0	5.6		
	9.8		
	13.9		
	17.0		
669	20.4		
	667		
0	1334		
−1	25.01		

M 5 46.95
M 6 4.62
M 6 36.38
M 7 0.42
M 7 18.98
~~7 15.10~~

0.16056

156

δ Leonis C = 46.775

0.16056

h 11 m 7 s 40
+21° 11′

1.17609
996962
1.14571

9	49.20		
	51.33	53562	
	53.58	5359	
	55.85		
26796	58.00		
	1796		
	2.42		
	4.58		
	6.80		
	9.00	11259	
	11.37	11.26	
	13.40	11.31	
	15.55		
	17.97		
10132	20.23		
	10132		
	24.60		
	26.72	29026	
	29.12	29.03	
	31.29	14262	
14513	33.40		
	14513	10 11.285	

11 7 48.77

9	40.2
	41.8
	43.5
	44.9
2173	46.9
	173
9	4346
+	2782
10	32.6
	34.6
	36.3
	37.9
1812	39.8
	312
10	3624
−	2496
9	4346
10	36.24
+	27.82
−	24.96
	52.78
	1.72247
	1.14571
	2.86818
	1.85236
	8.98418
	5.30 27

M 17 53.15.
M 19 4.45.
R 19 4.42.
R 19 4.35.
M 19 4.12.
19 4.33
71.18

21 10 47.0

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8

Sun C=46.775

0.16056

1879

Nov. 15-16

20.44		—	37.70		—		
22.36	2.4760	—	39.80	42.010	—		
24.80	24.76	—	42.05	42.01	—		
27.00		—	44.27		—		
12380 29.20		—	21005 46.23		—		
2380			21005				
32.30			50.80				
35.78			53.16				
38.04			55.30				
40.06	42.304		57.50	59.601			
42.26	42.30		59.56	59.60			
44.50	42.27		1.60	59.52			
46.70			4.05				
48.90			6.10				
38074 51.00			53641 8.34				
38074			53641				
55.40			12.62				
57.68	59.788		14.85	17.038			
59.78	59.79		17.50	17.04			
1.88	84.55		19.27	11.905			
29894 4.20			8519 21.45				
29894	42.285		8519	59.560			

306

2 Cephei

21h 15m 41s

+62° 4'

0.16056

Nov. 16.

17 27.55			17 19.3				
32.30	3.6650		21.5				
36.60	36.65		24.6	2.526			
41.00			28.3				
18325 45.40			1263 32.6				
18325			1263				
54.11			17 2.526				
58.60			− 4.654				
3.00							
7.30	1.1800						
11.80	11.80		18 1.5				
16.24	11.80		4.0				
20.65			7.7				
25.00			11.1				
64620 29.50			389 14.6				
10620			389				
38.14			18 7.78				
42.60	4.6952		+ 4.02				
47.00	46.95						
51.32	14.360						
23476 55.70			18 59.8				
23476	18 11.800		58.6				
			1.8				
			5.5				
			31.04 9.7				
21 15 42.57			1041				
			19 2.08				
			− 50.28				

27.60
18.01
12.24
6.12
0.00

6.08
12.27
18.05
24.37

36.84
43.01
49.16
55.25
61.43

A Kouly

M 24 30.05.
M 24 59.15.
M 25 36.55.

62 4 57 6

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418 — d Urs. Maj. L.C.

h m s
9 23 45
0.16056

+109 38

	25	—		26	1.6	
		—			6.5	
		—			13.0	
		—			17.3	
		—		642	25.8	
					642	
24.60	15.95	57.35	140.49	26	12.84	
18.01	15.38	57.37	15.610	+	27.8	
12.24	15.66	3.37				
6.12	15.67	9.55	15.604			
-0.00	15.60	15.60	15.60	26	46.5	
6.08	15.67	21.75			49.9	
12.27	15.73	28.00			54.6	
18.05	15.50	33.55			0.2	
24.57	68044	39.90	15.33	2784	7.2	
	14044		78.18		2784	
36.84	15.61	52.45	15.636	26	55.68	
43.01	15.36	58.37	4754	—	40.06	
49.16	15.62	4.78	4.76			
55.25	15.67	10.92				
61.43	32377	17.25	15.82	27	37.3	
	2377				38.2	
					39.0	
	15.623				39.8	
	15.619			1949	40.6	
					1949	
				27	38.98	
				-1	23.36	

M 53 5.05 ·
M 53 44.78 ·
M ~~53~~ 27.28 · prob 52

308 — β Cephei

h m s
21 27 5
0.16056

+70 2

		29	—		29	28.4
			—			33.0
			—			38.0
			—			41.5
			—		1908	49.9
						1908
			—		29	38.16
18.13	36.18	291.13	18.05			
12.07	36.37	36.391	24.30			
5.98	36.55		30.57			
-0.00	36.60		36.60		31	1.0
6.03	36.40		42.43			5.2
12.09	36.38		48.47			10.0
18.13	36.35		54.48			15.8
24.20	36.30		0.50		534	21.4
						534
36.26	32.75	148.47	9.00		31	10.68
42.29	30.89	29.794	13.18	18.074		
48.35	28.87		17.22	18.07		
54.39	28.61		23.00			
60.62	27.35	9037	27.97		29	38.16
			9037		31	10.68
33.092						
33.815						

21 27 5.81

M 27 47.82 ·
M 28 7.70 ·
M 28 32.45 ·

28 20.08

70 2 22.0

420 — Gr. 1564 L.C.

h m s
9 31 51
0.16056

+110 13

33	22.40		32	44.3	33	21.6
	28.40	34.234		48.4		26.9
	34.30	34.23		51.4		29.9
	40.15			57.0		36.0
17117	45.92		2624	1.3	1560	41.6
	17117			2624		1560
	51.95		32	52.48	33	31.20
	3.80		+1	29.36	+	50.64
	10.00					
	15.90	21.847				
	22.00	21.85	34	43.4	35	44.9
	27.98	21.84		48.8		46.3
	33.72			53.9		47.7
	39.72			59.9		49.2
73662	45.55		2687	2.7	2391	51.0
	19662			2687		2391
	57.47		34	53.74	35	47.82
	3.40	9.454	—	31.90	-1	25.98
	9.30	9.45				
	15.50	16368				
4727	21.60		32	52.48	33	31.20
	4727	34 21.845	34	53.74	35	47.82
			+1	29.36	+	50.64
			—	31.90	-1	25.98
				121.26		136.62

M 19 27.90 ·
M 19 8.45 ·
M 18 25.95 ·
M 17 59.58 ·

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516

11 Cephei

h m s
21 40 8
+70° 45'

1879
Nov. 16

41 36.90		41 12.3	41 57.5
42.90	49576	17.5	56.6
49.75	49.57	21.7	0.2
56.05		25.2	4.1
788 2.28		1067 30.0	3012 8.8
24 24788		1067	12
14.60		41 21.34	42 0.24
20.90		+1 18.38	+ 29.48
27.00			
33.50	39.743		
37.57	39.74	42 59.2	44 0.6
46.07	39.72	5.1	6.3
52.20		9.0	10.8
58.60		13.8	16.0
35769 4.85		3449 17.8	560 22.3
35769		3449	560
17.70		43 8.98	44 11.20
23.50	29.860	− 29.26	−1 31.48
30.05	29.86		
36.05	29.43		
930 42.30		41 21.34	42 0.24
14930	42 39.723	43 8.98	44 11.20
		+1 18.38	−1 31.48
		− 29.26	
		107.64	

M 43 39.28
M 43 58.38
M 43 431.38
M 43 459.58

421

Gr. 1586 L.c.

h m s
9 47 32
0.16056
+73° 27'

48 48.85		47 58.9	48 27.9
56.05	3536	2.9	35.5
3.40	3.54	9.8	41.3
11.10		13.8	45.3
31768 18.28		3426 17.2	2006 50.6
1768		426	2006
22.00		48 8.52	48 40.12
37.90		+1 52.90	+1 21.30
46.65			
54.00	1.392		
0.80	1.39	49 37.9	51 28.6
8.72	1.44	41.3	34.4
15.52		47.9	40.7
23.34		52.8	47.0
55253 30.20		2398 59.9	2028 52.1
1253		2398	2028
45.17		49 47.96	51 40.56
52.23	59.345	+ 13.46	−1 39.14
57.48	59.35		
6.36	242.89		
29674 12.50		48 8.52	48 40.12
29674	50 1.415	49 47.96	51 40.56
		+1 52.90	+1 21.30
		− 13.46	−1 39.14
		126.36	180.44

M 59 5.90.
M 58 54.28.
M 58 23.02.
M 57 38.78.

311

α Aquilae

h m s
21 59 54
0.16056
−0° 54'

0 44.05		0 35.2	
46.05	48210	36.8	
48.05	48.21	37.6	
50.30		38.9	
24105 52.60		1890 41.0	
24105		1890	
55.50		0 34.80	
58.75		+ 26.88	
0.60			
2.60	4.683		
4.60	4.68		
6.75	4.68		
8.70			
10.75			
58215 12.90			
4215			
17.00			
19.00	21.140		
21.17	21.14		
23.23	12.935		
10570 25.30		0 37.80	
10570		1 4.680	+ 26.88

21 59 87.86.

M 22 8.18.

0 54 1.4

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520

20 Cephei

h m s
22 1 20
+62° 12'

0.16056

2 6.90
11.20 15.640
15.50 15.64
20.05
24.55
7820 7820
33.30
37.70
42.20
46.60 51.083
51.00 51.08
55.75 51.03
0.00
4.40
45975 8.80
45975
17.48
22.00 26426
26.45 26.43
30.90 102.07
13213 33.80
13213 2 51.055

1 57.0
0.3
4.8
8.2
3209 10.6
209
2 41.8
+ 46.87
2 56.4
59.1
2.1
6.0
3131 9.5
131
3 26.2
− 11.57
4 5.5
6.9
9.0
12.0
482 14.8
48.2
4 9.64
−1 18.59

M 17 5.92.
M 17 46.62.
M 18 30.22.

18 8.42.
62.50

521

24 Cephei

h m s
22 9 28
+71 45'

0.16056

7 54.88
1.37 8.118
8.20 8.12
14.85
34059 21.29
4059
34.60
40.85
47.35
54.27 0.780
0.65 078
7.35
14.00
20.65
54702 26.80
702
40.40
46.70
53.60
0.00
26070 6.00 52.14
9 0.753

7 41.0 8 11.2
44.4 15.8
48.6 22.0
54.0 26.4
2472 57.2 1070 31.6
2472
7 49.44 8 21.40
9 14.5 10 20.7
21.6 28.5
25.6 33.5
29.9 38.5
1278 36.2 1657 44.5
278
1657
9 25.56 10 33.140
7 49.444 8 21.40
9 25.56 10 33.14

M 44 16.98.
M 44 32.58.
M 45 0.98.
M 45 31.22.

7424

15P

9 M. Draco - L.C.

h m s
10 24 46
+103° 40'

0.16056

24 45.65
54.77 3808
4.00 3.81
12.62
22.00
31904 1904
38.77
47.74
56.50
5.50 13716
13.28 13.71
22.15 13.65
30.88
39.72
66344 48.70
12344
6.60
14.60 23500
23.50 23.50
32.40 27.31
11750 41.00
11750 25 13.680

24 28.3 25 27.4
31.0 32.2
41.2 37.8
44.6 44.8
1928 50.7 1946 52.4
1928
1946
24 38.56 25 38.92
+ 35.12 − 25.24
26 29.0 27 57.0
37.0 2.2
42.4 10.8
47.0 17.9
50.0 3519 25.0
2610 55.6 51.9
+0 28 10.38
261.0 − 25.24
435.0 −256.70
201.94
24 38.56 25 38.92
+ 35.12 28 10.38

M 51 30.58.
M 51 8.50.
M 50 46.78.
M 50 16.78.

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429

35 H. Urs. Maj. Se. C.

h m s
10 34 23

° '
+110 18

1879 Nov. 16

0.16056

34 51.60 | 34 33.9
57.34 9524 | 39.5
3.75 352 | 42.9
9.43 | 46.4
31762 15.50 | 2136 50.9
17 3962 | 2136
27.45 | 34 4272
33.15 | +1 8.24
39.00 48
45.10 5095 | 35 44.3
51.00 50.95 | 48.9
56.90 50.98 | 53.2
3.00 | 56.0
8.75
45853 14.28 | 2630 0.6
45853 | 2630
26.56 | 35 5260
32.44 38448 | − 1.64
38.37 38.45
44.30 10197
19224 50.57 | 36 57.5
19224 35 50.965 | 3.7
8.1
13.7
3395 16.5
395
37 790
−1 16.94

M 14 29.00
M 13 55.80
M 13 19.02

325

i Cephei

h m s
22 45 22

° '
+62 54
+65 33

0.16056

46 5.17 | 46 25.7 | 46 49.3
10.30 15266 | 29.2 | 53.3
15.30 15.27 | 32.7 | 57.6
20.28 | 35.8 | 0.7
7633 25.28 | 1641 40.7 | 2867 5.8
7633 | 1641 | 2867
35.38 | 46 3282 | 46 57.34
40.18 | + 22.30 | − 2.22
45.15 49
50.05 5518
55.18 55.15 | 47 37.1 | 48 25.8
0.20 55.10 | 40.6 | 27.3
5.30 | 45.5 | 28.6
9.90 | 49.0 | 29.8
49634 15.00 | 2254 53.2 | 1426 31.1
49634 | 254 | 1426
24.80 | 47 4508 | 48 2852
29.90 34934 | − 4996 | −1 3340
34.90 34.93
40.07 11020
17467 45.00 | 46 3282 | 46 57.34
17467 46 55.125 | 47 45.08 | 48 28.52
+ 22.30 | + 2.22
− 49.96 | − 1 33 40
72.26 | 95 62

M 55 20.48
M 55 35.30
M 56 3.42
M 56 28.08

56 2.27

619

l Pisces Aust.

0.16056

h m s
22 50 58

° '
−30 16

0.16056

1.17609
9.93636
1.11245

52 4.55 | 52 8.0
6.90 9.246 | 10.6
9.28 9.25 | 12.6
11.60 | 14.5
4623 13.90 | 622 16.6
4623 | 622
18.75 | 52 1244
21.03 | + 15.88
23.53
25.86 28299
28.27 28.30 | 52 56.0
30.80 28.35 | 58.3
33.00 | 0.7
35.50 | 2.6
25469 37.95 | 3022 4.7
25469 | 22
42.70 | 53 044
45.00 47452 | − 3212
47.50 47.45
49.90 5670
23726 52.16 | 52 1244
23726 52 28.325 | 53 0.04
+ 15.88
− 31.72
47.60

22 51 2.14

1.67761
1.11245
2.79006
1.78039
8.99033
535 8

M 41 46.20
M 42 46.38
R 42 46.72
R 42 46.42

42 46.51
60.31

30 15 21.1

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329

α Pegasi

h	m	s
22	58	44

+14° 33′ 0.16056

59 52.30		59 47.8
55.78	58090	49.6
53.04	58.09	57.2
0.16		52.6
29045 2.38		2554 54.2
29045		54
6.67		59 51.08
8.77		+ 24.04
10.92		
12.88	15124	
15.00	15.12	
17.28	15.12	
19.40		
21.48		
13612 22.60		
13612		
27.97		
30.00	32.158	
32.06	32.16	
34.30	15025	
16079 36.46		59 51.08
1079 0 15.120		+ 24.04

22 58 47.96

R 44 48.60.
R 44 48.60.

44 48.60

14 38 49.3

1

α Andromedæ

h	m	s
0	2	8

+28° 25′ 1.17609 0.16056
9.94424
1.12033

4 16.57		4 4.8
18.88	21.282	5.8
21.26	21.28	7.2
23.70		8.6
10641 26.50		362 9.8
6641		362
30.60		4 7.24
32.80		+ 32.76
35.37		
37.70	40.002	
40.00	40.00	5 11.6
42.85	39.99	12.8
44.70		15.8
47.00		17.5
36002 49.80		784 17.7
002		284
54.05		5 15.68
56.30	58.710	− 35.68
58.78	58.71	
1.60	7999	
29355 3.47		4 7.24
29355		4 39995 5 15.68
		+ 32.76
		− 35.68
		6844

0 2 13.44

1.83531
1.12033
2.95564
1.94379
8.98816
5 33 28

M 2 47.90.
M 4 15.62.
R 4 15.82.
R 4 15.85.

4 15.76
89.86

28 25 57.1

3

χ Pegasi

h	m	s
0	7	0

+14° 31′ 1.17609 0.16056
9.98591
1.16200

5 10.65		9 8.4
12.68	14814	6.2
14.82	14.81	6.8
16.92		8.6
7407 19.00		344 10.4
2407		344
23.37		9 6.88
25.56		+ 25.02
27.66		
29.80	31.909	
31.95	31.91	10 7.5
34.04	31.88	9.2
36.16		11.0
38.28		12.7
28718 40.38		547 14.8
28718		547
44.70		10 10.94
46.80	48.940	− 39.04
48.90	4894	
51.00	6375	
24470 53.30		9 6.88
4470	9 31.895	10 10.94
		+ 25.02
		− 39.04
		6406

0 7 4.78

1.80659
1.16200
2.96859
1.95134
8.98275
5 29 23

M 57 23.12.
M 58 52.55.
R 58 52.60.
R 58 52.72.
M 58 52.22.
58 52.52
89.40

14 31 11.5

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164 β Leonis — 11h 42m 53s, +15° 15′ — 1879 Nov. 16

45 — — — — — — — —

+2.12	23.42	140.22	21.30	
-0.00	23.35	23.37	23.35	45 41.2
2.06	23.29		25.35	43.0
4.13	23.27		27.40	45.0
6.19	23.41		29.60	46.1
8.27	23.48		31.75	2235 48.2
				2 35
12.38	23.62	118.42	36.00	45 44.70
14.45	23.55	23.684	38.00 40.216	− 21.18
16.54	23.74		40.28 40.22	
18.58	23.72		42.30	
20.71	23.70	108	44.60	
			108	45 44.70

23.527
23.516

11 42 56.23

R 15 9.82
R 15 9.80
15 9.81
15 14 81.7

584 δ Corvi — 12h 23m 37s, −15° 50′ — 0.16056

25 43.95		25 36.0	1.17609 0.16056
46.00	48.158	37.5	9.98320
48.10	48.16	39.1	1.15929
50.26		40.5	
24079 52.48		1951 42.0	
24079		1951	
56.61		25 39.02	
58.90		+ 26.26	
1.00			
3.12	5267		
5.37	527	26 35.7	
7.40	5.30	37.5	
9.50		38.8	
11.70		40.3	
58740 13.90		1944 42.1	
4740		1944	
18.10		26 38.88	
20.30	22446	− 33.60	
22.40	2245		
24.66	13061		
11223 26.78		25 39.02	
1223	26 5.285	26 38.88	
		+ 26.26	
		− 33.60	
		59.86	
		1.77714	
		1.15929	
		2.93643	
		1.92387	
		8.98744	
		5 32 56	

M 18 12.65
M 19 36.70
R 19 36.62
M 19 36.55
M 19 36.42
19 36.57
8392

172 γ Virginis — 0.16056 — 12h 35m 32s, −0° 47′

37 40.30		37 50.5	1.17609
42.40	44500	52.0	9.99996
44.50	4450	53.2	1.17605
46.60		54.4	
22250 48.70		2663 56.2	
2250		163	
52.82		37 53.26	
54.96		+ 7.72	
56.85			
58.90	1.017		
1.00	102	38 38.7	
3.00	0.95	39.8	
5.10		40.9	
7.27		41.8	
54915 9.25		2040 42.8	
915		40	
13.27		38 40.80	
15.36	17406	− 39.82	
17.40	17.41		
19.50	12191		
8703 21.50		37 53.26	
8703	38 0.985	38 40.08	
		+ 7.72	
		− 39.10	
		46.82	
		1.67043	
		1.17605	
		2.84648	
		1.84173	
		8.99525	
		5 38 56	

12 35 34.55

M 15 57.67
M 17 7.25
M 17 7.02
17 7.13
6946

0 47 26.3

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174 ζ Virginis

h m s
12 49 30
° '
+4 3

1.17609 0.16056
9.99891
1.17500

57	32.16		57	27.6	
	41.20	4 3342		36.0	
	43.38	43.34		37.6	
	45.38			39.5	
21671	47.60		1885	40.8	
	1671			1885	
	51.53		51	37.70	
	53.64		+	22.14	
	55.77				
	57.85	59.840			
	59.88	59.84	52	24.6	
	1.92	59.84		26.2	
	3.90			27.8	
	6.00			29.4	
53856	8.05		1393	31.3	
	53856			393	
	12.24			52.786	
	14.26	16.340	−	28.02	
	16.30	16.34			
	18.40	11.968			
8170	20.50			51 37.70	
	8170	51 59.840		52 27.86	
			+	22.14	
			−	28.02	
				50.16	
				1.70036	
				1.17500	
				2.87536	
				1.86332	
				8.98796	
				5 33 20	

M	25	22.35	
M	26	35.55	
M	26	35.15	
	26	35.35	
		73.00	

176 ε Virginis

h m s
12 56 9
° '
+11 37

1.17609 0.16056
9.99101
1.16710

58	17.65		58	8.8	
	19.60	21.780		10.7	
	21.75	21.78		12.4	
	23.90			14.0	
10890	26.00		615	15.6	
	890			115	
	30.24		58	12.30	
	32.20		+	26.30	
	34.36				
	36.48	38.588			
	38.53	38.59	57	5.8	
	40.70	38.61		7.3	
	42.80			9.4	
	44.94			11.2	
34729	47.00		469	13.2	
	34729			469	
	51.25		59	9.38	
	53.30	55444	+	26.30	
	55.42	55.44			
	57.60	7722			
27722	59.65			58 12.30	
	2722	58 38.600		59 9.38	
			+	26.30	
			−	30 28.78	
				57 47.08	
				1.67284	1.75648
				1.16710	2.92358
				2.83994	
				1.90714	
				9.06720	8.98356
				6 39 30	5 29 59

M	52	14.72	
M	53	35.42	
M	53	35.52	
	53	35.47	
		80.75	

587 α Virginis 0.16036

h m s
13 18 49
° '
+10 32

1.17609
9.99262
1.16871

20	57.20		20	46.9	
	59.27	1.342		48.8	
	1.30	1.34		50.6	
	3.38			52.0	
30671	5.36		2522	54.0	
	671			2522	
	9.75		20	50.44	
	11.90		+	27.70	
	13.98				
	16.00	18.163			
	18.18	18.16	21	48.4	
	20.24	18.13		50.1	
	22.38			52.1	
	24.47			54.0	
16347	26.57		2606	56.0	
	16347			106	
	30.78			21 52.12	
	32.86	3 4933	−	33.98	
	34.80	34.93			
	37.00	3627			
17466	39.20			20 50.44	
	2466	21 18.145		21 52.12	
			+	27.70	
			−	33.48	
				61.68	
				1.79014	
				1.16871	
				2.95885	
				1.94537	
				8.98652	
				5 32 14	

M	59	44.08	
M	1	12.48	
M	1	12.05	
	1	12.26	
		88.18	

13 18 51.80

10 32 13

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5

Sun C=46.765

h m s
15 20 14
° '
-19 2

0.16056

1879
Nov 16-17

1

d Andromm

h m s
0 2 8
° '
+28 26

1.17609 0.16056
9.94424
1.12033

Nov. 17

31 28.28 | 32 41.2 | 23 45.40 | 33 7.2 | 4 16.05 | 4 9.8
30.54 32.594 | 42.8 | 47.80 49.920 | 9.1 | 18.30 20.674 | 10.9
32.65 32.59 | 44.8 | 50.00 49.92 | 10.7 | 20.65 20.67 | 12.0
34.75 | 46.2 | 52.05 | 12.2 | 23.00 | 15.0
16297 36.75 | 2230 48.0 24960 54.35 | 534 14.2 | 10337 25.37 | 649 16.7
1297 | 230 | 24960 | 534 | 337 | 149
41.35 | 32 44.60 | 58.60 | 33 10.68 | 30.66 | 4 12.98
42.60 | − 54.48 | 1.00 | + 56.81 | 32.27 | + 26.41
45.90 | 3.00 | 34.70
48.00 50.159 | 5.26 7.504 | 37.50 39.377
50.20 50.16 | 7.57 7.50 | 39.40 39.38 | 5 12.4
52.35 50.07 | 9.80 7.48 | 41.73 39.40 | 14.2
54.48 | 11.97 | 44.05 | 15.7
56.65 | 14.00 | 46.38 | 17.5
45143 58.90 | 60754 16.34 | 35439 48.80 | 796 17.8
143 | 67.54 | 35439 | 296
3.00 | 20.60 | 53.80 | 5 15.92
5.37 7.554 | 22.88 2.5042 | 55.75 58.132 | − 36.53
7.62 7.55 | 25.03 25.042 | 58.30 58.13
9.88 15014 | 27.30 13496 | 0.58 7880
3777 11.90 | 32 44.60 12521 29.40 | 33 10.68 | 29066 2.78 | 4 12.96
3777 | 31 50.115 − 54.48 | 2521 | 34 7.490 + 56.81 | 29066 | 4 39.390 | 5 15.92
+ 26.43
− 36.53
62.96
0 2 12.43 | 1.79906
1.12033
2.91939
1.90417
8.98478
5 30 55

M 13 4.70 | M 46 10.45 | M 2 56.40
M 4 16.65
M 4 16.55

4 16.60
80.20

28 25 57.1

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1879phae.proj.1506.

5

Sun c = 44.765

h m s
16 0 0
−20° 36'

0.16054

Nov. 23 – 24

0	40.20			1	59.7	2	57.53			2	24.2				
	42.38	44.590			1.7		1.70	3.852			25.7				
	44.52	44.59			3.2		3.80	3.85			27.5				
	46.85				4.7		6.05				29.7				
22295	49.00			3155	6.2	31926	8.18			1379	30.8				
	295				155		1926				379				
	53.55			2	3.10		12.60			2	27.58				
	55.60			−1	0.82		14.90			+	58.94				
	57.90						17.10								
	0.10	2.277					19.20	21.498							
	2.27	2.28					21.25	21.50							
	4.35	2.29					23.65	21.55							
	6.75						26.05								
	8.97						28.08								
56049	11.00					19348	30.55								
	2049						19348								
	15.60						37.73								
	17.83	20006					37.00	39.246							
	20.00	2000					39.20	39.25							
	22.10	12459					41.50	4310							
16003	24.50			2	3.10	19623	43.80			2	27.58				
	003	1	2.285	−1	0.82		19623	3	21.525	+	53.94				

M 46 41.02

M 19 50.98

420

Gr. 1564 Lo. 6

h m s
9 31 57
+110° 13'

0.16056

Nov. 24

33	15.80											32	42.1	33	27.6
	2065	2.6990											41.0		30.5
26.50	27.30	2699											52.2		33.4
	33.00												57.0		37.4
13495	39.00											2619	1.0	1746	43.7
	3495												2619		1746
	50.60											32	52.38	33	34.92
	58.70											+1	22.28	+	39.74
	2.65														
	8.53	14.622													
	14.65	14.62										34	23.5	38	21.3
	20.70	14.77											30.0		26.5
	26.50												34.5		31.5
	32.80												37.4		36.0
67160	38.45											1681	42.7	1567	41.4
	13160												1681		1567
	50.56											34	33.62	35	31.34
	56.68	2.548										−	18.96	−1	16.68
	2.50	2.55													
	8.50	2954													
31274	14.50											32	52.38	33	34.92
	1274	34	14.695									34	33.62	35	31.34
			−040									+1	22.32	+	39.78
			14.655									−	18.92	−1	16.64
													101.24		11642

M 19 37.05
M 19 15.15
M 18 44.18
M 18 16.82

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516

11 Cephei

h m s
21 40 8
+70° 45'

0.160 58

1879 Nov. 24

421

Gr. 1586 - L. 6

h m s
9 47 32
+106° 23'

311

α Aquarii

h m s
21 59 34
−0° 84'

0.160 56

0.160 56

41 28.05 | 41 — | 41 44.2 | 48 41.90 | 47 50.9 | 48 40.9 | 1 — | 1 58.8
34.28 40576 | 5.3 | 48.4 | 49.30 56460 | 53.1 | 46.9 | 38.80 | 0.0
40.70 4058 | 10.4 | 63.6 | 56.50 56.46 | 2.0 | 57.1 51.32 | 39.90 | 2.4
46.86 | 14.3 | 57.8 | 3.60 | 6.0 | 53.7 | 42.00 | 3.9
52.00 | 20.6 2662 2.2 | 28230 11.00 | 3077 12.7 2566 2.0 | 44.08 | 3803 5.2
20288 20288 | 506 2662 | 28230 | 77 2566 | 103
5.67 | 12.6 41 5324 | 25.40 | 48 1.54 48 5192 | 48.27 | 2 2.06
12.00 + 37.44 | 32.60 | + 1 5278 +1 200 | 50.32
16.05 | 39.80 | 52.27
24.25 30.734 | 47.00 54342 | 54.50 56462
30.97 30.73 | 42 47.3 43 — | 54.30 54.34 | 49 34.7 50 49.7 | 56.40 56.48 | 2 27.4
36.97 30.64 | 51.8 — | 1.98 54.30 | 41.2 59.6 | 58.50 | 28.9
43.30 | 56.2 58.4 | 8.70 | 47.3 1.4 1.04 | 0.60 | 30.4
49.70 | 0.7 3.0 | 16.80 | 52.5 7.5 | 2.70 | 31.9
55.70 | 2832 7.2 8.7 | 48908 23.30 | 2328 57.1 3052 12.0 | 60834 4.76 | 1523 33.9
27661 27661 | 2832 | 48908 | 2328 52 | 50834 | 25
8.30 | 42 56.64 | 19 0.1 | 37.97 | 49 46.56 51 1.04 | 8.80 | 2 30.50
14.25 20.710 | − 25.96 | 63.4 | 44.80 52148 | + 7.76 −1 6.72 | 10.75
20.80 20.71 | 52.80 52.15 | 13.53 12.97
27.00 18.129 | 57.55 22.861 | 18.10
33.20 | 41 53.244 | 26074 6.42 | 57 39.3 | 48 51.32 6485 | 2 2.06
10355 42 30.685 | 42 56.64 + 37.44 | 26074 | 49 54.320 | 40.2 | 51 1.04 | 2 30.50
10355 | + 3.00
− 25.96 | 41.4 | − 1 6.72 | 42.334
42.9 | 129.72 | 42.330
2078 44.0
78
51 47.56
−1 47.24

M 43 45.20.
M 44 6.28.
M 44 36.12.
M 45 4.15.
~~44 15.62~~

M 55 18.12.
M 59 56.65.
M 58 32.68.
M 58 2.70.
M 57 45.80.
58 24.46
6.34

M 22 55.88.
M 23 36.52.

2159.8776

0 54 1.7

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520

20 Cephei 9.66875

h m s
22 1 20
+62 12

0.16056

521

24 Cephei

h m s
22 7 28
+71 45

0.16054

424

~~30~~ 30 Urs. Maj. Lo. Co.

h m s
10 15 23
+113 49

0.16056



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1

α Androm.

h m s
0 2 8
+28° 25' 1.17609 0.16056
9.94424
1.12033

1879 Nov. 24.

4 8.16
10.25 12754
12.77 12.76
15.80
6377 17.60
6377
20.18
24.58
26.73
29.00 31560
31.50 31.56
34.05 31.53
36.30
38.60
28404 40.90
28404
43.76
47.97 50306
50.40 5031
52.70 6306
25153 55.00
153 4 31.545

3 36.9
38.3
39.9
41.9
3008 43.8
3008
4 0.16
+ 31.38
4 51.9
53.9
55.7
56.9
2770 58.6
270
4 5540
− 23.86
4 55.40
+ 31.38
− 23.86
55 11.24 1.74225
2.06160 2.06160
1.84211 1.12033
1.12033 2.86258
2.96244 1.84211
8.97953
5 26 57

0 2 12.37

3

γ Pegasi

h m s
0 7 0
+14° 21' 1.17609
9.98591
1.16200

9 2.30
4.45 6526
6.45 6.53
8.63
10.80 3263
3263
15.00
17.10
19.25
21.36 23528
23.60 2353
25.70 23.55
27.84
29.90
21175 32.00
21175
36.30
38.48 40578
40.58 4058
42.68 4711
20289 44.85
289 9 23.540

8 56.5
58.3
0.0
1.7
2999 3.4
2999
8 5048
+ 23.56
9 57.3
52.7
54.4
56.2
2729 58.3
229
9 5458
− 31.04
8 59.98
9 54.58
+ 23.56
− 31.04
54.60
1.73719
1.16200
2.89919
1.88784
8.98865
5 33 51

0 7 4.78

138

α Hydrae

h m s
9 21 38
0.16056 −8° 8' 1.17609 0.16056
9.99561
1.17170

28 39.40
41.20 43410
42.50 43.41
45.40
21705 47.55
1705
51.80
53.80
55.80
58.05 0.069
0.20 0.07
2.07 0.07
4.15
6.20
54062 8.35
062
12.38
14.71 16.740
16.78 16.74
18.80 12015
8370 21.00
8370 24 0.070

23 37.4
38.8
40.7
42.2
2031 44.0
2031
23 4062
+ 19.45
24 378
37.5
41.0
42.7
2053 44.3
53
24 41.06
− 40.99
40.99
1.78132
1.17170
2.95302
1.93013
8.97711
5 259

9 21 43.85

M 2 51.50.
M 4 1.15.
R 4 1.08.
R 4 1.12.
M 4 0.75.
4 1.02
469.52

28 25 57.4

M 57 25.62.
M 58 43.00.
R 58 42.82.
R 58 42.92.
M 58 42.70.
58 42.86
77.24

14 31 11.4

M 36 15.48.
M 37 40.62.
37 40.62
85.14

8 8 15.7

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308

β Cephei Lc.

h m s
21 27 5
° '
+109 58

0,16056

29 38.80
43.70
2.48
5.70
14.62
20.40

29 53.8
58.9
1.4
6.1
3152 15.0
152
30 3.04
30 23.9
34.3
37.8
43.7
1944 48.7
44
30 40.88
30 3.04
30 38.58

420

Gr. 1564

h m s
9 31 54
° '
+69 47

0,16056

33 20.50
26.60 32520
32.68 32.52
38.37
16260 44.05
16260
36.37
3.33
8.18
14.70 20264
20.55 20.26
26.40 20.11
31.68
38.08
18238 44.17
18238
33.85
2.06 7.714
7.77 7.71
13.40 16623
33857 19.50
3857 34 20.185

32 58.6
4.6
9.2
13.8
3448 19.1
448
33 8.96
+1 11.22
24 8.0
7.3
11.5
17.7
615 22.0
615
34 12.30
+ 7.88
35 39.5
45.7
51.0
53.2
2501 58.7
2501
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41 20.20
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32.97 33.10
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16552 43.65
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20898 48.18
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6.73 13.252
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19.35 4635
6626 25.95
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40 27.0
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40 34.02
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41 1.766
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43 18.18
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M 34 15.52.
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M 43 0.75.
M 43 34.22.
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48 48.67
55.65 3210
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57.18 1222
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57.88 59100
59.03 59.10
6.40 24231
29550 12.57
29550 50 1.185

48 41.2 49 8.9
44.5 15.6
53.7 22.5
57.8 29.8
2595 2.3 1111 34.3
2595 1111
48 51.90 49 22.22
+1 9.28 + 38.96
50 36.4 51 27.2
41.8 33.5
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2416 0.0 2008 52.6
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50 48.32 51 40.16
- 47.14 -1 38.98
48 51.90 49 22.22
50 48.32 51 40.16
+1 9.28 + 38.96
- 47.14 -1 38.98
116.42 137.94

M 3 15.58.
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2 52.00
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8.39 12.504
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6252 21.20
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2 53.6
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3 2.62
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4 15.50
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8 38.20
45.50 51.220
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7 55.5 8 26.1
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3343 16.4 1788 45.3
345 1788
8 6.90 8 35.76
+1 37.10 +1 8.24
9 57.4 11 1.7
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10 8.32 11 11.80
- 24.32 -1 27.80
8 6.90 8 35.76
10 8.32 11 11.80
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- 2432 -1 27.80
121.42 156.04

M 18 10.52.
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16 58.50		16 38.6		26 —		27 9.4	28 6.0	33 50.40		33 5.8	
3.45	8500	41.7		—		16.0	13.8	58.50	5790	10.2	
8.60	8.50	46.4		—		22.7	22.8	5.70	5.79	13.2	
13.35		50.7		—		30.6	29.7	13.35		16.7	
34250 18.60		2316 54.2		—		N72 28.5	1103 28.0	32895 20.00		18.9	
4250		2316				1172	1103	2895		872 22.9	
24.00		16 46.32		—		27 23.44	28 22.06	23.88		872	
34.00		+1 2.96		—		+ 51.89	− 6.73	41.00		33 1744	
39.16			+17.49	15.19	104.26 57.70			48.05		+1 4480	
44.35	49264		8.64	15.99	15.465 6.75			53.00	2.179		
49.20	49.28	17 54.7	4.01	15.539	15.40	28 56.0	29 54.2	2.38	2.18	34 41.4	
54.20	49.27	59.6	8.71	15.64	23.75	3.7	53.4	9.75	2.29	47.7	
59.30		3.2	17.07	15.93	33.00	13.7	58.0	16.30		53.7	
4.40		7.1	24.20	15.30	41.50	18.8	0.4	22.20		57.2	
44338 9.77		3155 10.9	34.18	16.02	50.20	3601 27.9	2904 2.4	55961 30.05		2632 1.2	
44338		1.55				601	2904	1961		2632	
15.85		18 3.10	52.40	15.85	75.75 7.25	29 12.02	29 58.08	45.10		34 52.64	
24.70	30046	− 13.82	04.13	15.17	15.15 16.20	24876 − 56.69	−1 42.75	57.53	58.790	+ 9.60	
30.85	30.05		69.88	14.70	24.58	24.88		58.75	58.79		
35.00	9855		78.61	14.79	83.40			5.80	124.58		
150232 70.30		18 53.4	87.60	15.28	2438 42.85	27 23.44	28 22.06	29395 12.76		35 55.0	
15023	1749.275	56.7			12438	28 12.02	29 58.08	29395	35 2.235	2.5	
		1.4								8.7	
		4.7	15.307							140	
		3065 10.3	15.334							3387 18.5	
		6.5								38.7	
		19 1.30								36 77.4	
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		+70 2	9.53336			+110 13					+70 45	
	1879	Nov. 25	0.70945									
28 24.90		28 12.1	29 21.0		33 13.40		32 53.1	34 2.9	41 25.75		41 34.4	42 17.2
31.00	36926	15.0	26.0		19.28	25248	58.9	6.2	32.30	38506	39.5	22.9
36.76	3693	19.6	30.8		25.10	2525	2.3	11.2	38.65	38.50	43.3	28.0
42.97		23.9	34.6		31.36		6.2	15.8	44.68		48.0	32.4
318463 49.00		1004 29.8	1538 41.4		12624 37.20		3119 11.4	538 17.7	19253 51.15		2192 54.0	1377 37.2
18463		1004	1538		12624		119	538	19253		2192	1377
1.37		28 2008	29 3076		49.20		33 2.38	34 1076	3.45		41 4384	42 27.54
7.00		+1 511	− 557		55.10		+1 1064	+ 226	9.80		+ 4472	+ 1.02
13.00					1.17				16.05			
19.15	25.204				7.20	13113			22.35	28576		
25.26	25.20	30 28.8	31 0.8		13.27	1310	34 43.3	35 39.4	28.75	28.58	43 38.6	44 26.2
31.18	25.18	34.4	4.3		19.18	12.95	47.8	40.4	34.90	28.55	44.3	27.7
37.38		38.8	9.7		24.90		53.5	42.6	41.30		50.0	29.6
43.24		45.0	14.3		31.00		59.4	44.0	47.20		53.8	31.3
322684 49.26		1988 51.8	498 20.7		65802 37.00		2670 3.0	2116 45.2	25718 53.38		2467 0.0	1477 32.9
22684		1988	498		11802		2670	116	25718		2467	1477
1.30		30 3976	31 996		48.83		34 6340	35 4232	6.05		43 4934	44 2954
7.50	13.444	−1 1457	−1 4477		54.50	0.646	− 4038	−1 2930	12.40	18.610	−1 2078	−2 0.98
13.65	13.44				0.80	0.65			18.68	18.61		
19.50	17037				6.55	14590			24.62	17711		
216722 25.27		28 20.08	29 30.76		30323 12.53		33 2.38	34 10.76	9305 31.30		41 43.84	42 27.54
6722	29 25.190	30 39.76	31 9.96		323	34 13.015	34 53.40	35 42.32	9305	42 28.565	43 49.34	44 29.54
		+1 5.11	− 5.57				+1 10.64				+ 44.72	+ 1.02
		−1 14.57	−1 44.77				− 40.38				−1 20.78	− 2 0.98
		139.68	110.34				111.02				125.50	122.00
21 27	5.26	2.14514	2.04274									
		0.70945	0.70945									
		2.85459	2.75219									
		1.85727	1.85727									
		9.00268	9.10508									
		54445	71532									

M	27 16.85	M	19 21.22	M	44 58.32
M	27 52.60	M	18 47.80	M	44 19.30
M	28 25.83	M	18 25.88	M	45 57.08
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	28 28.84				45 17.25
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48 40.17		48 1.0	48 39.1	
47.40	54704	7.8	44.7	
54.75	54.70	13.7	51.4	
1.95		15.3	55.4	
27352 9.25		656 23.8	2573 8.7	
27352		656	2573	
33.60		48 13.12	48 51.46	
31.50		+1 39.44	+1 1.10	
38.28				
45.30	52.594			
52.60	52.59	50 30.0	51 18.6	
59.80	52.52	36.3	26.8	
7.28		44.0	32.2	
14.15		48.8	38.4	
47336 21.35		2137 54.6	1600 44.0	
47336		2134	1600	
35.80		50 42.74	51 32.00	
43.19	50.344	− 50.18	−1 39.44	
50.33	50.34			
57.45	10504			
25172 4.55		48 13.12	48 51.46	
25172	49 52.555	50 42.74	51 32.00	
		+1 39.44	+1 1.10	
		− 50.18	−1 39.44	
		149.62	160.54	

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1 33.95		1 26.5	
36.80	38050	28.0	
38.18	38.05	29.9	
40.10		31.1	
19025 42.10		1484 32.9	
19025		1484	
46.28		1 29.68	
48.30		+ 24.84	
50.38			
52.50	54.523		
54.50	54.52		
56.60	54.53		
58.70			
0.70			
49071 2.75			
49071			
6.90			
8.90	11.016		
11.00	11.02		
13.10	10907		
5508 15.18		1 29.68	
5508	1 54.525	+ 24.84	

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2 36.40		2 47.2	
0.90	5160	49.7	
5.10	5.16	54.5	
9.50		58.9	
32580 13.90		2694 1.1	
2580		2694	
22.90		2 53.88	
27.15		+ 46.58	
31.70			
36.17	40.466		
40.40	40.45	4 14.9	
44.80	40.48	19.7	
49.28		24.0	
53.65		27.2	
36410 58.05		1169 31.1	
36410		1169	
6.90		4 23.38	
11.40	15.808	− 42.92	
15.80	15.81		
20.20	8097		
7904 24.64		4 41.1	
7904	3 40.465	44.4	
		48.3	
		52.4	
		2417 55.5	
		2417	
		4 48.34	
		−1 7.88	

M 17 8.42.
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18 16.60
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8 43.60		8 19.2	8 54.4		
50.20	56944	24.3	0.4		
57.80	56.94	28.3	5.0		
3.82		32.8	9.0		
2 10.20		1440 32.4	3244 15.6		
2 28 472		1440	2.44		
23.30		8 28.80	9 4.88		
37.98		+1 20.78	+ 44.70		
36.30					
48.00	49618				
49.70	49.62	9 37.5	10 44.0		
56.80	49.54	55.0	54.2		
2.78		59.4	59.8		
9.30		5.9	5.1		
15.40		3022 10.4	2231		
44656 44656		22	55.8		
29.00		10 0.44			
35.40	42146	− 10.86			
42.40	42.15				
48.76	219.09				
3 55.17		11 47.0	9 4.88		
21073 21073	9 49.580	49.0	+ 44.70		
		52.3			
		57.8			
		2606 57.5			
		2606			
		11 5212			
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M 44 14.42.
M 44 31.10.
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16 52.35		16 16.9			
57.20	2356	20.3			
2.48	2.36	24.6			
7.40		27.0			
31178 12.35		1205 31.7			
1178		1205			
22.50		16 24.10			
27.85		+1 19.04			
32.90					
38.08	43153				
43.00	43.15	17 42.4			
48.45	43.14	46.0			
53.30		49.2			
58.60		52.0			
38838 3.40		2486 59.0			
38838		2486			
13.55		17 49.72			
18.52	23928	− 6.58			
23.85	23.93				
29.15	8629				
11964 34.17		18 26.7			
11964		17 43.145	30.4		
			35.5		
			40.0		
		1768 44.2			
		18 35.36			
		− 52.22			

M 43 28.12.
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25 27.85		25 0.4			
46.85	55330	8.1			
55.25	55.33	12.5			
4.05		20.2			
27665 12.65		676 25.4			
27665		676			
30.03		25 1.52			
38.60		+ 51.43			
47.50					
53.77	4870				
5.80	4.87	26 15.9			
13.78	5.03	21.4			
22.20		28.6			
31.10		34.4			
58383 39.85		1453 45.0			
4383		1453			
57.25		26 29.06			
5.88	14730	− 24.11			
14.64	14.73				
23.60	13006				
37365 32.28		27 47.9			
7365	26 4.950	51.4			
		0.2			
		8.3			
		3005 12.7			
		05			
		28 0.80			
		−1 53.75			

M 57 39.58.
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33 58.00			33 28.0		33 57.2														
5.20	12.168		31.9		4.0														
12.25	12.17		36.8		9.8														
19.35			42.0		14.4														
36084	26.04		1864	47.7	3461	20.7													
6084			1864		461														
40.38			33	37.28	34	9.22													
47.20			+1	31.36	+	59.42													
54.57																			
1.60	8.583																		
8.57	8.58		34	35.4	35	87.8													
15.63	8.70			41.1		2.5													
22.80				46.7		9.6													
29.67				57.7		15.0													
61725	36.83		2329	58.0	3452	20.8													
7725			2329		452														
57.10			4658	4778	36	9.04													
57.50	5.236	+	2.06		−1	0.40													
5.25	5.24																		
12.25	13741																		
32618	19.68		33	37.28	34	9.22													
2618	35 8.640		34	46.58	36	9.04													
			+1	31.36	+	59.42													
			+	22.06	−1	0.40													
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5424			343																
20.30			4	6.86															
22.60			+	22.75															
24.90																			
27.30	29626																		
25.65	29.63																		
31.58	29.59																		
34.30																			
36.60																			
26663	39.00																		
26663																			
43.70																			
46.00	48.342																		
48.30	48.34																		
50.65	5919																		
24171	53.06		4	6.86															
24171			4	29.610	+	22.75													

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2.40	4526		55.6																
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2273	8.76		2867	1.2															
2263			2867																
13.00			8	57.34															
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17.30																			
19.50	21550																		
21.60	21.55																		
23.70	21.55																		
25.80																			
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19395	30.05																		
19395																			
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36.38	38560																		
38.57	38.56																		
40.75	4311																		
19280	42.80		8	57.34															
19280	9 21.580	+	24.21																

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5 46.8
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2441 52.4
2441
6 48.87
− 36.39
5 5042
6 48.82
+ 22.01
− 36.39
58.40
1.76641
1.143141
2.90982
1.89609
8.98627
5 32 2

M 24 7.08.
M 25 25.82.
R 25 25.78.
25 25.80
78.72

584
ν Corvi

h m s
12 23 37
° ′
−15 50
0.16056

25 33.15
35.30 37400
37.40 37.40
39.40
18700 41.75
18700
45.90
48.05
50.20
52.35 54.444
57.47 54.44 26 19.6
58.60 54.56 20.9
58.65 22.3
0.78 24.0
49000 2.00 1128 26.0
49000 128
7.30 26 22.56
9.60 11.718 − 28.06
11.64 11.72
14.00 10.912
5859 16.05 26 22.56
5859 25 54.500 − 28.06

R 14 28.42.
R 14 28.48.
14 28.45

172
β Virginis

h m s
12 35 32
° ′
−0 47
0.16056

37 29.62
31.70 33.798
33.80 33.79
35.90
16899 37.97
1899
42.00
44.07
46.10
48.20 50.239
50.28 50.24 38 0.2
52.30 50.28 1.5
54.30 3.1
56.40 4.3
45215 58.50 151 6.0
45215 151
2.70 38 3.02 503
4.78 6.772 − 13.76
6.80 6.77
8.78 10056
3386 10.80 38 3.02
3386 37 50.260 − 12.76

12 85 84.79

R 16 34.50.
R 16 34.38.
16 34.44
0 47 27.9

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176

ε Virginis

h m s
12 56 9
° ′
+11 37

0.16056

587

α Virginis

h m s
13 18 47
° ′
−10 82

0.16056

182

γ Bootis

0.14056

h m s
18 48 55
° ′
+39 2

1.17609
9.97567
1.15176

58	6.60		58	0.9			20	—		21	4.4		50	57.85			50	41.0	
	8.80	10.820		2.7				—			6.2			58.75	56096			42.3	
	10.80	10.82		4.3				—			8.0			56.05	56.09			43.8	
	12.90			5.9	+14.70	7.30	14.79	5.260			9.8			58.25				45.6	
5410	15.00		215	7.7	12.54	7.99	7.992	5.490		397	11.3		28048	0.40			2196	46.9	
	5410			215							39.7			28048				196	
	19.20		58	4.30	6.39	7.27	65.93	58.88		21	7.94			4.78			50	43.92	
	21.30		+	28.88	6.30	7.30	7.325	1.00		−	0.62			7.00			+	29.58	
	23.50				4.19	7.37		3.18						9.15					
	25.70	27.714			2.88	7.99		5.15	7.330					11.35	13523				
	27.80	27.71	58	35.0	2.80	7.30		7.30	7.33	21	40.0			13.50	13.52		51	45.2	
	29.80	29.66		0.0	−2.04	7.46		9.55			42.2			15.70	13.49			46.8	
	32.00			1.9	4.20	7.37		11.57			43.7			17.90				48.5	
	34.05			3.3	6.38	7.29		13.59			45.5			20.05				50.3	
24943	36.08		3089	5.7	8.41	7.346	597	15.75		2182	46.8		12171	22.28			2428	52.0	
	249.43			89				6597			182			12171				2428	
	40.30		59	1.78	12.54	7.21	8	17.80		21	43.64			26.53			51	48.56	
	42.30	44.510	−	34.10	14.69	7.31	36.47	22.00	24.096	−	36.32			28.70	30906		−	35.06	
	44.50	44.51			16.79	7.44	7.284	24.23	24.09					30.90	30.90				
	46.65	55.33			18.89	7.27		26.10						33.10	14699				
22255	48.80		58	4.30	21.03	7.382	048	28.35		21	7.94		15453	35.30			50	43.92	
	2265	58 27.685	+	23.35				2048		21	43.64			453	51 13.505		51	48.56	
																	+	29.58	
					7.300												−	35.06	
					7.324													6464	
						13	18	32.0					13	48	57.73			1.81050	
																		1.15176	
																		2.96226	
																		1.95066	
																		8.98840	
																		5 33 40	

M	52	22.22				M	0	23.78					M	28	41.58				
M	53	43.35				M	1	16.58					M	30	10.88				
R	53	43.28				R	1	16.20					R	30	11.10				
						R	1	16.12					R	30	10.85				
						M	1	16.00					M	30	10.52				
	53	43.32					1	16.22						30	10.84				
		81.10													89.26				
							10	32	24				18	59	54.7				

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183

I Virginis

h m s
13 33 29
° '
+2 8

0.16056

1879
Nov. 25

57 26.80		57 23.1
28.90	30.920	24.7
30.70	30.92	26.5
33.50		25.0
15460 35.00		1317 29.4
460		317
39.20		57 26.74
41.16		
43.30		
45.35		
47.35		58 12.6
49.40	47.39	14.0
51.50		15.8
53.56		17.4
55.57		787 18.9
		287
59.70		58 15.74
1.80	3.866	
3.93	3.87	
5.90	9479	
31933 8.0		57 26.34
1933	57 47.385	58 15.74

M 20 48.40		
M 21 59.72		
R 21 2 0.05		
R 21 2 0.22		
M 21 59.90		
21 59.87		

d

ε Bootis

h m s
14 39 42
° '
+27 35

1.17609
9.94760
1.12369

0.16056

41 36.75		41 25.9
38.95	41.3816	27.2
41.28	41.31	29.4
43.60		31.5
20658 41.10		1470 83.0
658		1470
50.60		41 2.40
52.95		+ 30.53
55.30		
57.60	59.919	
59.90	59.92	42 27.8
2.20	59.94	29.5
4.57		31.2
6.90		33.1
53927 9.25		1568 35.2
53927		68
13.95		42 31.36
16.30	18.566	− 31.43
18.40	18.57	
20.90	11988	
9283 23.28		41 29.40
9283	41 59.930	42 31.36
		+ 30.53
		− 31.43
		61.96
		1.79211
		1.12369
		2.91580
		1.89916
		8.98336
		5 29 50

M 54 2.00	
M 55 21.22	
R 55 21.25	
R 55 21.12	
M 55 21.52	
55 21.28	
79.28	

212

ζ Serpentis

0.16056

h m s
15 38 18
° '
+6 48

1.17609
9.99693
1.17302

Nov. 25

40 15.50		40 10.8
1740	19356	12.3
19.55	19.56	14.1
2163		15.8
9778 22.70		699 16.9
9778		199
27.80		40 13.98
30.05		+ 22.16
32.50		
34.08	36117	
36.12	36.12	41 5.4
38.20	36.17	7.4
40.25		8.6
42.30		10.3
32505 44.30		437 12.0
32505		437
48.63		41 8.74
50.90	52782	− 32.60
52.60	52.78	
54.80	7234	
26391 56.98		40 13.98
1391	40 36.1145	41 8.74
		+ 22.16
		− 32.60
		54.76
		1.73846
		1.17302
		2.91148
		1.89790
		8.98642
		5.329

15 38 20.77

M 40 13.15	
M 41 32.20	
R 41 32.22	
R 41 32.35	
M 41 32.05	
41 32.20	
79.05	

6 48 14.8

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S

Sun ☉ = 46.710

h m s
16 8 30
° '
−20 59

0.16056

Nov. 25 – 26

521

24 Cephei

h m s
22 7 28
° '
+71 45

0.16056

Nov. 26

9 6.05		10 23.9	11 25.88	10 52.2	+26.36 27.11	10 0.15	10 27.9
8.25	10500	25.9	28.06	54.3	19.77 27.32	245113 7.55	31.4
10.50	10.50	27.9	30.28	55.5	13.17 27.23	27.237 14.06	37.2
12.72		29.2	32.50	56.5	+6.52 26.60	20.08	1403 42.8
5250 14.98		1379 31.0	34.50	2758 57.3	−0.00 27.50	27.50	
5250		379		258	6.57 27.43	34.00	10 3508
17.20		10 2758	38.90	10 55.16	13.18 27.42	4060	− 784
21.40		− 59.51	41.25		19.77 27.23	4700	
23.60			43.60		26.39 27.39	5378	
25.83	28.034		45.60 47.833			24532	
28.00	28.03		47.75 47.83			27.258	11 10.4
30.18	28.11		50.05				15.0
32.40			52.20				19.3
34.70			54.38				25.6
25231 37.00			43050 56.77		27.248		1030 32.7
25231			43050				10 30
41.30			1.00				11 2060
43.40	45.730		3.30 5.490				− 5386
45.95	45.73		5.55 5.49				
47.90	5623		7.75				
22865 50.10		10 27.58	2745 9.85	10 55.16			11 50.7
2865	9 28.070	− 59.51	2745				52.4
							54.3
							56.0
							2714 58.0
							214
							11 5428
							−1 2704

M 10 7.52

M 43 18.48

M 45 13.30
M 45 34.22
M 45 48.22

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30

424

38 Urs. Maj. Lc. C.

h m s
10 15 23
+113 ° ' 0.16056
1879 Nov. 26

16 49.80 / 55.18 0.20 5.18 / 30.65 35.60 30.78 36.05 40.80 / 46.35 51.40 56.28 / 11.37 16.75 21.80 27.00 / 10887 31.25 / 10887 170.995

16 38.8 / 42.8 47.6 57.3 / 2360 55.5 / 2360 / 16 47.20 / 17 36.4 / 39.2 43.4 47.6 / 2200 52.0 / 2200 / 17 44.00 / 18 25.0 / 28.7 33.4 37.3 / 1663 41.9 / 1663 / 18 33.26 / 18 47.5 50.0 51.2 52.8 / 2555 54.0 / 55 / 18 51.10

0152 0.15 / 41034 41.03 / 4096 / 21774 21.77 81.02

M 43 18.32.
M 42 15.50.
M 42 5.65.

150

9 H. Draco.

h m s
10 24 46
+103 ° ' 0.16056
40

25 35.15 / 44.20 52.80 1.65 / 26430 10.50 / 26430 / 27.70 36.20 45.30 54.35 2.80 / 11.30 20.28 28.90 / 56448 37.65 / 2448 / 55.80 2.70 12.28 21.30 / 36193 29.65 / 6193 27 2.670

52860 52.86 / 2720 2.72 / 2.62 / 12.386 12.39 24525

24 42.2 / 48.7 53.5 2.0 / 2771 8.7 / 2771 / 24 55.42 / +2 7.25 / 26 52.3 / 57.2 3.8 10.0 / 2717 18.4 / 217 / 27 4.34 / − 1.67 / 27 5.43 / +2 7.25 / − 2.76 / 130,01

25 29.9 / 36.0 40.7 46.9 / 2077 57.2 / 2077 / 25 41.54 / +1 21.13 / 25 52.8 / 58.2 / 1633 46.6 / 1633 / 28 32.66 / −1 29.99 / 28 32.66 / +1 21.13 / − 29.99 / 11 1.12

+28.26 / 21.20 14.11 6.44 −.021 / 7.05 14.13 21.20 28.30 / 42.38 49.44 56.52 63.59 70.67 / 6.670 6.666

6.32 6.83 6.91 6.59 6.39 / 7.15 6.97 6.46 6.70 / 6.85 6.64 6.74 6.61 6.31 / 1609

38.06 45.65 52.30 59.60 6.60 / 14.20 20.90 27.65 35.00 / 60.46 / 42.23 56.18 2.30 10.20 17.18 / 1609

60.33 6.703 6.718 6.72 / 33.19 / 6.63 8.218 3.22

84 — / — — — — / 3083 15.3 / 1.83 / 35 31.5 / 35 3.66 + 3.01 / 36.6 40.5 45.1 / 2070 53.3 / 2070 / 35 41.40 − 34.73 / 35 1.66 / 35 41.40

M 51 49.43.
M 51 32.32.
M 51 2.80.
M 51 33.38.

525

21 Cephei

h m s
22 32 47
+73 ° ' 0.16056
1

84 53.4 / 55.0 2.4 9.2 / 3083 15.3 / 1.83 / 35 3.66 + 3.01 / 35 31.5 / 36.6 40.5 45.1 / 2070 53.3 / 2070 / 35 41.40 − 34.73 / 35 1.66 / 35 41.40

M 28 42.30.
M 28 57.75.

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322

γ Pegasi

h m s
22 37 20
+29 35 1.17609 9.93934 1.11543

39 14.80 19.546 19.55 21.95 9773 24.10 9773 28.30 31.35 33.70 36.07 38.40 38.469 38.47 40.85 38.51 43.20 45.75 34622 48.00 34622 52.70 55.10 57.50 57.48 59.90 77.03 28740 2.20 28740

39 5.1 6.8 8.4 10.0 428 12.5 428 39 8.56 + 29.93 40 8.1 10.2 12.0 14.0 603 16.0 103 40 12.06 − 33.57 39 8.56 40 12.06 + 29.93 − 33.57 63.50 1.80277 1.11543 2.91820 1.90108 8.98288 5 29 28

39 38.490

M 52 56.65
M 54 16.32
R 54 16.40
R 54 16.28
M 54 16.10
54 16.28
7963

325

i Cephei

h m s
22 45 22
+65 34

0.16056 0.16036

46 52.46 57.50 2.48 7.30 31189 12.16 1189 22.30 27.35 32.40 37.35 42.50 42.262 42.26 47.12 52.39 57.80 38036 2.05 38036 11.80 17.13 21.846 22.18 21.85 26.17 8423 10923 31.95 10923 47 42.185

46 44.0 48.7 51.6 53.1 2588 57.4 88 46 51.76 + 50.42 47 27.5 31.5 35.6 39.2 1779 43.7 1779 47 35.58 4 6.60 48 22.6 26.9 30.0 34.0 1514 37.9 14 48 30.28 − 48.10

M 55 5.88
M 55 32.45
M 56 4.58

619

α Piscis Aust.

h m s
22 50 38
−30 16 1.17609 9.93636 1.11245

0.16056

52 52.10 54.45 56.80 59.30 28430 1.65 28430 6.53 8.77 11.20 13.60 16.00 15.963 15.96 18.35 15.94 20.80 22.00 14367 25.42 14367 30.25 32.70 35.10 35.026 35.03 37.38 15189 175.13 39.80 2513 53 15.950

52 52.9 1.9 3.7 5.6 3184 7.3 184 53 3.68 + 12.27 53 49.4 52.2 53.9 55.4 2681 57.2 181 53 53.62 − 3.767 53 3.68 53 53.62 + 12.27 − 37.67 49.94 1.69845 1.11245 2.81090 1.78937 8.97847 5 26.10

22 51 1.99

M 41 46.32
M 42 48.78
R 42 47.00
42 47.89
61.57

90 15 31.9

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154

α Ors. Maj. L. C.

h m s
10 56 15

° ′
+117 36

0.16056

1879 Nov. 26

57 47.50
57.38 55816
55.77 55581
0.15
27908 4.78
27908
13.80
15.05
22.60
27.20 31531
31.60 31.53
36.00 31.43
40.60
44.80
28378 49.13
28378
55.35
2.48 7046
7.00 7.05
11.40 78286
33523 16.00
3523 58 31.480

57 28.3
22.0
24.2
37.5
1735 41.5
1735
57 34.70
+ 56.78
58 8.1
7.9
11.8
15.8
574 18.8
574
58 11.48
+ 2000
58 11.48
+ 56.78
+ 20.00
7678

M 57 45.72.
M 57 20.45.

329

α Pegasi

h m s
22 58 44

° ′
+14 33

0 41.40
43.60 45.680
45.85 45.68
47.75
50.00
22840
54.20
56.40
58.58
0.70 2.771
2.80 2.77
4.88 2.73
7.00
9.10
56494 11.28
2494
13.65
17.65 19.784
19.65 19.78
21.97 12546
9892 24.00
9892 1 2750

22 58 4784

1.17609
9.98584
1.16193

0 31.0
32.7
34.5
35.8
1715 37.5
215
0 34.30
+ 28.45
1 33.6
35.1
37.3
37.2
1860 40.8
1860
1 37.20
+ 28.45
- 34.45
62.90
1.79865
1.16193
2.96058
1.95260
8.99202
5 36 26

M 54 42.12.
M 56 11.78.
R 56 11.93.
R 56 11.78.
M 56 11.65.
56 11.78
89.66

14 38 49.1

3

γ Pegasi

0.15056

h m s
0 7 0

° ′
+14 31

1.17609
9.98591
1.16200

8 55.08
0.20 2.360
2.35 2.36
4.47
31180 6.70
1180
10.50
13.70
15.10
17.20 19.382
19.34 19.38
21.50 19.40
23.65
25.85
17444 28.05
17444
32.28
34.36 36436
36.44 36.441
38.50 3880
18218 40.70
18218 9 19.390

0 7 4.70

8 48.7
50.2
51.5
53.0
2580 54.6
80
8 51.60
+ 27.79
9 44.4
46.3
48.0
49.6
2395 51.2
395
9 47.90
- 28.51
9 47.90
4 27.79
- 28.51
5 46.30
1.66558 1.75051
1.16200
2.82758
1.89409
9.06681 8.98158
6.38 82 5 28 30

M 57 21.55.
M 58 39.98.
M 58 39.85.

58 39.91
78.36

14 31 14

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S

Sun.

h m s
16 12 46
° ′
−21 10

1879

Nov. 27

0.16056

1

L Androm.

h m s
0 2 8
° ′
+28 25

1.17609
9.94424
1.12033

Nov. 29

0.15056

14	—		—	16 39.33		—	
	—		—	41.38	43.644	—	
	—		—	43.53	43.64	—	
	—		—	46.00		—	
	—		—	21822 48.06		—	
				1822			
	33.00	377.03 +4.65	41.68	52.50			
	35.35	41.892 6.65	42.00	54.75			
	37.30	4.42	41.72	57.00			
	39.60	4 1.8774 2.14	41.74	59.20	1.394		
	41.97	41.884 −0.90	41.97	1.40	1.39		
	44.19	2.21	41.93	3.60	1.36		
	46.27	4.43	41.84	5.80			
	48.50	6.65	41.85	8.00			
37687	50.74	8.86	41.88	55255 10.30			
	37687	209.05		1255			
	54.98	41.81	41.61	14.65			
	57.30	59.546 15.44	41.81	16.80	19.080		
	59.70	59.55 17.70	42.00	19.00	19.08		
	1.70	14.92	41.75	21.41	12.272		
29773	4.05	22.20	41.85	9540 23.53			
	29773			9540	17 1.375		

41.851
41.863

				3 56.38		3 52.1	
				58.78	1.120	52.7	
				1.15	1.12	54.2	
				3.47		56.0	
				30560 5.82		2730 58.0	
				560		230	
				10.50		3 5460	
				13.00		+ 25.28	
				15.15			
				17.50	19.889		
				19.90	19.89	4 46.0	
				22.12	19.86	48.0	
				24.35		49.7	
				26.98		51.8	
				17900 29.30		2480 53.0	
				17900		2480	
				32.90		4 49.60	
				36.20	38600	− 29.72	
				38.65	3860		
				40.95	3972		
				19300 43.30		3 5460	
				19300	4 19.875	4 49.60	
						+ 25.28	
						− 29.72	
						55.00	
				0 2 12.31		1.74036	
						1.12033	
						2.86069	
						1.82606	
						8.96537	
						5 16.32	

AR only

M	2	59.72
M	4	6.75
R	4	6.90
R	4	6.82
M	4	6.78
	4	6.81
		67.09

28 25 57.5

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3

γ Pegasi

h m s
0 7 0
+14 31

1879 Nov. 29

8 50.54
52.78
54.75
56.25
57.00
3.30
5.40
7.75
9.80 11,841
11.90 11.84
13.97
16.05
18.20
10657 20.20
10.657
24.50
26.80 28866
28.80 28.87
30.75
14433 32.28
14433 9 11.838

9 6.8
8.1
10.0
12.1
311 14.1
511
9 10.22
9 42.4
45.0
47.0
48.2
2334 49.8
334
9 46.68
9 10.22
9 46.68

0.16056

0 7 4.68

M 57 56.22.
M 58 46.90.
R 58 46.88.
R 58 46.92.
M 58 46.70.
58 46.85

14 31 11.8

582

ε Corvi

h m s
12 2 54

−21° 47' 1.17609
9.96732
1.14341

5 40.20
42.28 44568
44.56 4457
46.80
22284 49.00
22284
53.57
55.70
58.00
0.17 2430
2.20 243
4.70 2.38
7.00
9.15
56187 11.28
21.87
15.85
17.75 20194
20.07 20.19
22.40 12476
10097 24.70
97

5 30.6
32.4
34.2
36.8
1722 38.2
222
5 3444
+ 2796
6 23.7
25.5
27.0
29.0
1860 40.8
1860
6 3720
− 3480
5 34.40
6 37.20
+ 28.00
− 34.80
62.80
1.79796
1.14341
2.94137
1.91908
8.97771
5 25.36

6 2.405

M 23 59.55.
M 25 22.30.
R 25 22.82.
R 25 22.75.
M 25 22.35.
25 22.55
83.00

585

β Corvi

0.16056

h m s
12 28 2

0.16056 −22 44 1.17609
9.96488
1.14097

29 48.25
50.05 52.350
52.20 52.35
54.35
26175 56.70
1176
1.17
3.30
5.55
7.80 10.982
10.17 10.08
12.30 10.18
14.65
16.80
9074 19.00
9074
23.58
25.72 28.012
28.02 28.01
30.27 140.36
14006 32.48
14006
28.012

29 37.8
39.6
41.2
43.0
2064 44.8
64
29 4128
+ 2885
30 46.0
42.5
44.4
46.0
2206 47.7
206
30 4412
− 33.99
29 41.28
30 10.130
30 44.12
+ 28.85
− 33.99
62.84
1.79824
1.14097
2.93921
1.91572
8.97651
5 24.42

M 10 46.38.
M 12 8.90.
R 12 8.80.
R 12 8.70.
M 12 8.55.
12 8.74
82.36

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0556

172 χ^2 Virginis

h m s
12 35 32

		1.17609
−0	47	9.99996
		1.17605

37	19.75		37	15.0	
	21.64	23.784		16.5	
	23.78	23.78		18.3	
	25.85			20.0	
11892	27.80		911	21.3	
	1892			911	
	32.06		37	18.22	
	34.06		+	2.204	
	36.20				
	38.20	40.258	38	9.9	
	40.20	40.26			
	42.32	40.25		11.2	
	44.28			12.6	
	46.50			14.5	
36232	48.50		648	16.6	
	36232			648	
	52.55		38	12.96	
	54.72	56734	−	32.70	
	56.70	56.73			
	58.80	8051			
28367	0.90		37	18.22	
	28367	37 40.255	38	12.96	
			+	22.04	
			−	32.70	
				54.74	
12	85	34.91	1.738	30	
			1.17605		
			2.911435		
			1.89900		
			8.98465		
			5	30 49	

M 15 44.62.
M 17 3.88.
R 17 3.80.
R 17 3.72.
M 17 4.10.
17 3.84
79.25

0 47 28.8

174 λ Virginis

h m s
12 49 30

		1.17609
+4	3	9.99891
		1.17500

51	18.20		51	13.5	
	20.35	22346		15.4	
	22.30	22.35		17.2	
	24.38			18.7	
11173	26.30		855	20.7	
	1173			855	
	30.60		51	17.10	
	32.70		+	2.182	
	34.80				
	36.80	38922			
	39.00	3892	52	11.0	
	41.00	38.91		12.7	
	43.00			14.0	
	45.20			15.5	
35030	47.20		702	17.0	
	35030			202	
	51.30		52	14.04	
	53.40		−	35.12	
	55.45	55.47			
	57.60	7782			
27735	57.60		51	17.10	
		51 38.915	52	14.04	
			+	21.82	
			−	35.12	
				56.94	
			1.755	42	
			1.17500		
			2.978042		
			1.85491		
			8.92449		
			4	48.14	

M 25 35.32.
M 26 47.20.
R 26 46.92.
R 26 46.60.
M 26 46.98.
26 46.92
71.60

176 ξ Virginis

0.16056

h m s
12 56 9

		1.17609
+11	37	9.99101
		1.16710

57	56.70		57	53.0	
	58.85	0.900		54.6	
	0.95	0.90		56.3	
	3.01			58.0	
30450	5.00		2816	57.7	
	450			316	
	9.33		57	56.32	
	11.50		+	21.38	
	13.47				
	15.50	17699			
	17.68	17.70	58	46.7	
	19.73	17.70		48.3	
	21.90			49.9	
	24.00			51.8	
15929	26.18		2505	53.8	
	15929			05	
	30.30		58	50.10	
	32.40	34510	−	32.40	
	34.55	34.51			
	36.60	3541			
17255	38.70		57	36.32	
	2255	58 17.700	58	50.10	
			+	21.38	
			−	32.40	
				53.78	
			1.730	62	
			1.16710		
			2.89772		
			1.85127		
			8.98355		
			5	29.59	

M 52 24.20.
M 53 40.28.

53 40.28
76.08

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587.

2 Virginis

h m s
13 18 49
° ′
−10 32

0.16056

1879 Nov. 29.

20	36.12		20	37.3	26	3.80			—	28	24.16			—	
	37.38	40450		39.0		6.00	8.190		—		26.15	28576		—	
	40.60	40.45		40.8		8.10	8.19		—		28.57	28.58		—	
	42.60			42.2		10.40			—		31.50			—	
20225	44.53		2041	44.8	4095	12.55			—	14288	32.00			—	21
	225			41		4095					14288				
	48.00		20	40.82		17.10					37.65				
	51.50		+	16.44		14.25					39.70				
	53.13					21.50					42.05				
	55.27	57314				23.57	26021				44.28	46513			
	57.18	57.31	21	30.5		26.07	26.02				46.47	46.51			
	59.45	57.22		31.8		28.25	25.98				48.50	46.41			
	1.50			33.2		30.65					51.00				
	3.60			34.7		32.70					53.17				
58583	5.70		1671	36.9	23419	34.80				41862	55.40				36
	51583			171		23419					41862				
	7.85		21	33.42		37.38					0.00				
	11.85	13990	−	36.16		41.38	43772				2.00	4.250			
	14.00	13.99				43.50	43.77				4.20	4.25			
	16.03	11444				46.10	51.96				6.37	9283			
6995	18.22			20 40.82	21886	48.20				2125	8.68				19
	6995	20 57.265		21 33.42		1886	26 26.000				2125	28 46.460			
				+ 16.44											
				− 36.16											
				52.60											

13 18 82.12

59

M 2 59.72 .
M 1 14.18 .
R 1 14.28 .
R 1 14.38 .
M 1 14.12 .
1 14.24 .

Nov. 29 — 30

Sun -

0.16056

A Rouly

10 82 29

M
M
M
M

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1879phae.proj.11506

421

Gl. 1586 Sc. C.

h m s
9 47 32
+106° 33'

0.16056

Nov. 30

48 28.05		47 18.2	48 4.0	
35.20	42490	20.6	8.9	
42.50	42.49	26.6	15.4	
49.70		32.7	20.4	
21245 57.00		1357 37.6	747 26.0	
21245		1357	747	
11.20		47 27.14	48 14.94	
18.38		+2 13.37	+1 25.57	
26.22				
33.75	40517			
40.75	40.52	49 24.0	51 12.1	
47.50	40.50	38.4	16.7	
55.00		44.7	23.2	
2.20		49.9	29.6	
36465 9.65		2210 54.0	1172 35.6	
36465		2210	1172	
24.03		49 44.20	51 23.44	
31.47	38520	− 3.69	−1 42.93	
37.20	3852			
45.90	20101			
19260 52.00		47 27.14	48 14.94	
19260	49 40.510	49 44.20	51 23.44	
		+2 13.37	+1 25.57	
		− 3.69	−1 42.93	
		13706	1885.0	

M 59 28.92.
M 59 7.20.
M 58 29.42.
M 58 7 50.82.

520

20 Cephei

h m s
22 1 20
+62° 12'

0.16056

2 42.18			2 38.8	
47.70	52056		42.0	
52.00	52.06		45.8	
56.50			49.7	
26028 0.40			2291 52.8	
26028			291	
9.65			2 45.82	
14.08			+ 41.54	
18.55				
22.80	27356			
27.40	2736		3 22.4	
31.75	2736		26.1	
36.30			29.7	
40.67			32.4	
24620 45.80			1474 36.8	
24620			1474	
53.76			3 29.48	
58.25	2662		− 2.12	
2.70	2.66			
7.00	17472			
31331 11.60			4 25.8	
1331	3 27.360		29.2	
			32.5	
			36.0	
			1635 40.0	
			1635	
			4 32.70	
			−1 5.34	

M 17 22.02.
M 17 47.25.
M 18 28.72.

521

24 Cephei

h m s
22 7 28
+71° 45'

0.16056

8 30.40		8 11.0	8 46.6
37.20	43740	14.5	52.1
43.80	43.74	18.2	57.0
50.50		24.0	2.2
21870 56.80		968 28.1	2852 7.0
21870		968	2852
10.05		8 19.36	8 57.04
16.50		+1 17.22	+39.54
22.80			
30.00	36446		
36.58	36.79	9 41.8	10 58.7
43.00	36.37	47.0	3.6
49.50		52.5	10.0
56.84		57.3	14.8
321101 2.67		2621 2.4	3476 20.5
32801		2621	476
16.03		9 52.42	11 9.52
22.30	29010	− 15.84	−1 32.94
29.00	29.01		
35.50	19275		
14505 42.26		8 19.36	8 57.04
14505	9 36.580	9 52,42	11 9.29
		+1 17.22	+39.54
		− 15.84	−132.71
		93.06	1322.5

M 44 21.85.
M 44 39.00.
M 45 5.50.
M 45 39.25.

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424 — 38 Urs. Maj. L. C. — h m s 10 15 23 — ° ′ +113 49 — 1879 Nov. 30

150 — 9 H. Draco L. C. — h m s 10 24 46 — ° ′ +103 40 — 0.16056

525 — 31 Cephei — h m s 22 32 47 — ° ′ +73 1 — 0.16056 — 0.16056

16 39.95		16 9.3		25 26.06		24 49.2	26 12.0		33 44.90		33 36.0	34 44.7
45.00	50.114	13.4		34.57	43.304	56.5	17.4		51.70	58.840	41.5	50.0
50.12	50.11	17.2		43.10	4330	2.5	25.7		58.80	58.84	45.8	54.4
55.23		22.2		52.06		7.8	32.0		5.90		52.0	0.4
0.27		868 24.7		21652 0.83		3099 13.9	1251 38.0		29420 12.90		2344 59.1	2761 6.6
25057 25057		868		21652		99	1251		29420		2344	2761
10.60		16 17.36		18.60		25 1.98	26 25.02		27.00		33 46.88	34 55.22
15.68		+1 13.60		27.00		+1 51.06	+ 28.02		34.17		+1 8.42	+ 0.08
20.80				35.80					41.27			
26.05	30.950			44.17	53.092				48.08	55.284		
30.75	3095	17 26.7		52.50	53.09	27 26.0	28 33.9		53.13	55.28	35 33.9	36 44.4
36.20	30.96	30.5		1.78	52.98	33.2	40.2		2.32	55.33	39.5	50.3
41.20		34.2		10.60		40.0	46.7		9.46		45.3	56.3
46.07		39.1		19.50		48.8	54.5		16.55		52.7	2.0
51.20		1728 42.3		47783 27.88		2020 54.0	2371 1.8		49756 23.58		2295 58.1	2820 9.0
27855 27855		1728		47783		2020	2371		49756		2295	2820
1.60		17 34.56		45.20		27 40.40	28 47.42		37.60		35 45.90	36 56.40
6.60	11.824	− 3.60		53.65	2.668	− 47.36	−1 54.38		44.88	51.832	− 50.60	−2 1.10
11.95	1182			2.87	267				52.05	5183		
17.05	18193			11.32	10597				58.73	22067		
21.92		18 32.7		31334 20.30		25 1.98	26 25.02		25916 5.90		33 46.88	34 55.22
5912	17 30.955	36.2		1334	2653.035	27 40.40	28 47.42		25916	34 55.305	35 45.90	36 56.40
5912		39.8				+1 51.06	+ 28.02				+1 8.42	+ .08
		44.0				− 47.34	−1 54.38				− 50.60	−2 1.10
		2011 48.4				158.40	142.40				119.02	121.18
		11										
		18 40.22										
		−1 9.26										

M 43 36.00.
M 42 49.35.
M 42 12.02.

M 51 47.80.
M 51 18.12.
M 50 52.42.
M 50 30.62.

M 28 16.88.
M 28 45.72.
M 29 6.80.
M 29 34.22.
29 8.91

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322

ν Pegasi

h m s
22 37 20
+29° 35'

0.16056

39	4.00		39	13.6
	6.30	8.660		15.2
	8.70	8.66		17.4
	11.00			19.9
4330	13.30		878	21.7
	4330			878
	18.30		39	1.756
	20.60		+	10.08
	22.95			
	25.30	27.639		
	27.70	27.64	39	38.0
	30.00	27.64		0.0
	32.30			1.5
	34.70			3.2
24875	37.00		3082	5.5
	24875			82
	41.90		40	1.64
	44.22	4.6630	−	34.00
	46.65	46.63		
	49.10	5.529		
23315	51.38		39	17.56
	23315	39 27.643	40	1.64
			+	10.08
			−	34.00
				44.08

M 53 23.18.
M 54 18.22.
R 54 18.40.
R 54 18.33.
M 54 17.82.
54 18.20

325

i Cephei

h m s
22 45 22
+65° 34'

0.16056

46	41.40		46	27.1
	46.20	5.1170		30.7
	51.20	51.17		34.6
	56.05			38.4
25585	1.00		1725	41.7
	25585			1725
	10.92		46	34.50
	16.23		+	56.54
	21.10			
	26.10	31.017		
	31.10	31.02	47	19.7
	36.00	31.07		23.7
	41.00			27.5
	45.80			31.5
27915	50.50		1387	36.3
	27915			1384
	1.00		47	27.74
	6.05	1.0970	+	3.30
	11.00	1.097		
	16.00	1.8214		
5485	20.80		48	44.5
	5485	47 31.045		46.3
				52.0
				55.7
			2607	0.2
				2607
			48	52.14
			→	2.110

M 55 4.50.
M 55 37.60.
M 56 25.92.

619

ζ Piscis Aust. 0.16056

h m s
22 50 58
−30° 16'

1.17609
9.93636
1.11245

52	4.45		52	31.8
	7.367	4.6180		34.2
	46.28	46.18		35.7
	49.50			37.4
23090	51.80		1785	39.4
	23090			285
	53.80		52	35.70
	58.18		+	29.58
	0.55			
	2.98	5.312		
	5.35	5.31	53	35.7
	7.60	5.26		38.0
	10.05			41.0
	12.53			42.3
58781	14.77		2013	44.3
	47.81			13
	19.55		53	40.26
	22.00	2.4336	−	34.98
	24.28	24.34		
	26.60	13.052		
12168	29.25		52	35.70
	2168	53 5.285	53	40.26
			+	29.58
			−	34.98
				64.56
22	51 1.96			1.80996
				1.11245
				2.92241
				1.90687
				8.68946
				5 30 40

M 41 22.20..
M 42 42.78.
R 42 43.02.
R 42 42.93.

42 42.91
80.71

30 15 32.1

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154

α Ursæ Maj. L.C.

h m s
10 56 15

° ′
+117 36

1879

Nov. 30

1,17609 0,16056
9.66586
0.84195

57 37.00
41.30 45830
45.83 45.83
50.20
22915 54.80
22915
3.66
8.10
12.50
17.05 21.422
21.30 21.42
25.96 21.46
30.35
34.70
19280 39.18
19280
48.07
52.70 57.088
57.10 57.09
1.57 16292
28544 6.00
28544 58 21.4440

57 2.3
7.0
10.8
14.2
540 19.7
540
57 10.80
+1 10.64
58 0.1
2.8
6.7
10.0
331 13.5
3.91
58 6.62
+ 14.82
57 10.80
58 6.62
+1 10.64
+ 14.82
8546
1.93176
0.84195
2,77371
2.14100
9.36729
13 6 50

M 58 0.92
M 57 22.50

57 22.50
141.58

329

α Pegasi

h m s
22 58 44

° ′
+14 33

1,17609 0.16056
9.98584
1.16193

0 30.72
32.76 34880
34.92 34.88
37.00
39.00
2440
43.40
45.55
47.67
49.90 51966
52.00 51.97
54.07 51.92
56.20
58.45
46769 0.45
46769
4.65
6.38 8.970
8.58 8.97
11.10 10385
14485 13.24
4485 0 51.945

M 44 49.00
M 56 12.90
R 56 13.10
R 56 13.15
56 13.05
684.05

14 58 49.9

0 23.6
25.2
26.8
28.4
1340 30.0
1340
0 26.80
+ 25.14
1 23.1
25.0
27.0
28.8
1346 30.7
1346
1 26.92
− 34.98
60.12
1.77902
1.16193
2.94095

3

γ Pegasi

h m s
0 7 0

° ′
+14 31

1.17609 0.16056
9.98591
1.16200

8 47.32
49.43 51524
57.67 51.52
53.35
25762 55.65
762
0.18
2.28
4.40
6.45 8.600
8.70 8.60
10.70 8.57
12.80
14.95
7740 17.00
7740
21.40
23.42 25.634
25.50 25.63
27.60 13715
12817 30.05
12817 9 8.585

M 57 35.25
M 58 41.18
R 58 41.38
R 58 41.40
M 58 41.18
58 41.36
66.11

14 81 1.3

8 48.8
49.7
50.9
52.0
2547 53.8
2547
8 50.94
+ 17.64
9 25.3
31.0
38.7
40.3
1935 42.2
435
9 38.70
− 30.12
9 38.70
+ 17.64
− 30.12
4776
1.67906
1.16200
2.84106
1.82027
8.97921
5 26 43

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421

Gr. 1586

h m s
9 47 32
+73 27

0.16056

48 34.38		48 11.5	49 47.8	
41.68	48.886	32.5	52.6	
49.00	48.89	26.0	58.2	
56.27		30.9	5.3	
24443 2.10		1273 36.4	2936 11.7	
24443		1273	2956	
18.30		48 25.46	49 59.12	
25.60		+1 21.20	− 12.46	
32.10				
39.28	46.872			
47.22	46.87	50 58.2	51 57.3	
54.40	46.45	2.0	53.9	
1.35		11.6	0.2	
7.35		15.3	4.8	
42185 16.05		3497 22.6	3040 11.8	
42185		497	40	
23.00		51 9.94	52 0.80	
37.18	44.022	−1 23.28	−2 14.14	
44.25	4402			
51.50	21.291			
22011 57.38		48 25.46	49 59.12	
22011	49 46.660	51 9.94	52 0.80	
		+1 21.20	− 12.46	
		−1 23.28	−2 14.14	
		144.48	146.60	

M 3 11.68
M 3 55.70
M 4 19.62
M 4 39.98

4 5.10

520

20 Cephei Le. 6.

h m s
22 1 20
+117 48

0.16056

2 31.28		2 25.4	
41.80	45.996	27.7	
46.10	45.99	32.7	
51.35		37.5	
22998 53.30		1618 38.5	
22998		118	
4.30		2 32.36	
8.28		+ 49.36	
13.00			
16.73	21.781		
21.87	21.78	3 34.5	
26.40	21.66	57.9	
30.60		1.0	
35.30		5.2	
19603 39.55		3089 10.3	
19603		89	
44.45		4 1.78	
51.25	57.340	− 4.06	
57.40	57.34		
1.87	16333		
28670 6.80		4 29.5	
28670	3 21.720	30.3	
		31.3	
		32.0	
		1559 32.8	
		59	
		4 31.18	
		−1 9.46	

M 46 41.80.
M 45 39.75.
M 45 21.90.

521

24 Cephei Le. 6.

h m s
22 7 28
+108 15

0.16056

8 22.28		7 30.2	
29.10	35.680	34.4	
35.62	35.68	38.7	
42.22		46.2	
17840 49.18		1988 49.3	
17840		1988	
2.80		7 39.76	
8.80		+1 48.70	
15.45			
21.75	28.409		
28.00	28.41	9 16.5	
35.70	28.50	21.0	
41.50		27.0	
48.38		32.2	
25568 54.60		1332 36.5	
25568		1332	
8.20		9 26.64	
14.70	21.320	+ 1.82	
21.30	21.32		
28.10	17.700		
10660 34.30		10 44.8	
10660	9 28.455	48.7	
		53.8	
		58.5	
		2710 5.2	
		2710	
		10 54.20	
		−1 25.74	

M 16 20.52.
M 17 30.22.
M 17 1.75.

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30 H 38 Urs. Maj. (424) — 9 H. Draco. (150) — 31 Cephei Le. C. (525)

38 Urs. Maj. (424)

	10	15	23
		+66	11

1879 Nov. 30

16 42.30		16 28.6	0.16056	25 32.30
48.18	53336	33.0	50506	41.58
53.00	5334	35.0	50.50	50.50
58.25		38.6		59.40
3.95		1776 42.4		25253 8.15
26668 26668		1776		25253
14.20		16 3552		24.73
18.85		+ 5864		34.70
23.85				43.30
28.50	33969		0542	52.04
34.05	3397	17 25.4	0.54	0.96
38.57	3434	30.5	0.35	9.00
44.00		33.2		17.67
49.20		36.4		27.48
54.10		1761 40.6		54488 35.00
30572 30572		1661		488
5.00		17 3322		52.75
10.18	15336	+ 094	10208	1.10
15.00	1534		10.20	9.90
20.40	18868		12070	19.48
26.10		18 43.5		35103 27.80
7668 7668	17 34.155	46.7	27 0.495	5104
		53.5		
		58.2		
		2634 1.5		
		2634		
		18 5268		
		−1 1852		

9 H. Draco. (150)

10	24	46
	+76	20

25 11.4	26 1.8
16.0	5.3
20.7	12.8
27.5	17.4
1091 32.5	605 23.2
1091	605
25 2182	26 1210
+1 3868	+ 4840
27 59.1	29 12.1
6.3	17.7
10.8	28.1
15.4	35.4
3573 25.7	1394 45.1
573	1394
28 1146	29 27.88
−1 1096	−2 2738
25 2182	26 12.10
28 11.46	29 27.88
+1 38.68	+ 48.40
−1 10.96	−2 27.38
169.64	195.78

31 Cephei Le. C. (525)

22	32	47
	+106	59

0.16056	33 36.70		32 52.1	33 38.2
	43.60	50396	58.4	42.4
	50.00	5039	5.7	48.6
	57.38		9.3	54.7
	25198 4.30		3199 14.4	2436 59.7
	25198		199	2436
	18.57		33 398	33 48.72
	26.00		+1 4306	+ 5832
	33.30			
	40.20	47136		
	46.55	47.13	35 43.9	36 12.1
	54.50	46.96	50.3	16.2
	1.70		53.2	24.1
	8.30		57.7	29.2
	42422 15.10		2688 3.7	1140 32.4
	42422		2688	1140
	30.05		35 5376	36 2280
	35.90	43530	−1 672	−1 3576
	43.45	4353		
	50.60	21392		
	21765 57.65		33 398	33 48.72
	21765	34 47.045	35 53.76	36 22.80
			+1 43.06	+ 38.32
			−1 6.72	−1 35.76
			169.78	154.08

×

M 19 35.88 ·	M 10 25.70 ·	— 34 21.78 ·
M 20 11.70 ·	M 10 42.70 ·	M 34 1.00 ·
M 21 57.20 ·	M 11 24.28 ·	M 33 33.85 ·
	M 11 48.18 ·	M 33 58.45 ·

21 9.20
93.32

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