1979phot.prog..1607

KG
11366
v.503

Fundamental Stars.
Observations and Reductions.
B 8

From Nov. 30. 1879. to Jan. 1. 1880.

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1879phnae.proj.1597

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1879phae.proj.1507

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1879phae.proj.1507

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1879pnac.proj..1307

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1879phae.proj.1507

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1979pnac.proj..43007

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1879phae.proj.1507

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1879phae.proj.1007

156

S Sosmis

S

Sun c = 46.696

h m s
11 7 40
+21° 11 9.96962
1.14571

h m s
16 29 37
−21° 37

0.16056

0.16056

1879 Nov. 30

Nov. 30 – Dec. 1

9	24.72		9	15.3	30	19.60		31	33.5	32	37.40		31	51.5	
	27.00	29178		17.0		21.63	23866		35.1		41.60	43854		53.7	
	29.30	29.18		18.6		23.90	23.87		36.7		43.70	43.85		53.7	
	31.37			20.0		26.10			38.2		46.17			57.9	
14589	33.60		932	22.3	11933	28.10		1837	40.3	21927	49.40		2781	57.3	
	14589			932		1933			1837		21927			281	
	3340		9	18.64		32.58		31	3674		52.88		31	5562	
	4038					34.50					53.20				
	42.58					37.10					57.47				
	44.75	46978				39.30	41588				59.60	1828			
	47.00	46.98		10 16.6		41.75	41.59				1.90	1.83			
	49.27	46.91		18.8		43.88	41.67				4.00	1.78			
	51.37			20.6		46.08					6.10				
	53.30			22.5		48.38					8.40				
42280	55.35		1031	24.6	37429	50.50				55645	10.90				
	42280			31		37429					1645				
	0.20		10	20.62		54.90					15.28				
	2.45	4636				57.25	59480				17.60	19726			
	4.63	4.64				59.65	59.48				19.70	19.72			
	6.90	9382				1.60	8335				21.98	12357			
2318	9.10			9 18.64	29740	4.00		31	36.74	9863	24.07		31	5562	
	2318	9 46.945		10 20.62		29740	30 41.630	−	55.11		9863	33 1.805	+	1 6.18	
				+ 28.30											
				− 33.68											
				61.98											
11	7	44.24		1.79225											
				1.14571											
				2.93796											
				2.15649											
				9.21853											
				9 23 30											

M 16 57.28
M 19 20.18
R 19 20.12
R 19 20.38
M 19 19.98
9 20.66
143.38

M 1 28.118
M

M 34 28.32

21 10 43.7

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30 353 358

β Arietis 9.97238 67 Ceti 9.99676 47 H. Cephei 9.28319

h m s 1 47 57 0.16056 h m 2 10 0.16056 h m s 2 30 4 0.26056

+20 13 ° ′ -7 0 ° ′ +78 56

1879 Dec-1

12 — 13 7.9 — 52 40.0
— 9.5 — 48.1
— 11.0 10.98 — 56.0
+14.56 1.91 3.88 47.35 12.5 — 4.6
12.47 1.97 1.94 49.50 549 14.0 — 2840 15.3
49 2840
8.32 1.92 17.74 53.60 13 10.98 — 52 56.80
6.24 1.97 1.971 53.73 —
4.15 1.95 57.80 —
2.06 1.91 57.85 1.968 —
50 22.2 -0.00 1.90 1.90 1.97 13 27.4 -0.02 24.98 52 25.00 53 43.1
24.2 2.07 2.08 4.15 29.2 10.72 25.28 125.92 36.01 46696 52.2
26.1 4.16 1.98 6.18 30.6 21.37 30.66 25.59 25.184 47.10 46.69 55.0
-6.60 3.40 50 10.00 27.5 6.24 2.06 8.30 32.2 32.25 24.75 57.00 10.7
8.81 3.39 6.76 12.20 1298 29.8 8.33 1.97 5771 10.30 1533 33.9 43.06 25.32 23348 8.38 3053 21.3
3.395 298 1771 33 23348 3053
13.19 3.31 16.36 16.30 50 25.96 12.47 1.93 9.55 14.40 13 30.66 64.50 25.00 125.61 29.50 54 1.06
15.39 3.31 3.272 18.70 20.876 14.53 1.92 1.91 16.45 18.550 75.24 25.18 25.122 40.42 51.144
17.59 3.29 20.88 20.87 16.63 1.87 18.50 18.55 86.01 25.04 51.10 51.14
19.74 3.21 23.00 18.71 1.94 20.70 96.76 25.44 2.20
22.06 3.24 10438 25.30 20.86 1.84 9275 22.70 13 10.980 107.80 24.90 5572 12.50 54 36.0
10438 50 25.96 9275 13 30.66 25572 45.1
53.6
3.333 1.940 25.153 3.3
3.307 1.948 25.153 2728 14.8
2728
54 54.56

R 15 21.62 M 27 11.48 M 33 50.38
R 15 21.68 M 27 39.62 M 34 6.95
R 15 21.75 R 27 40.05 M 34 20.52
R 27 39.85
M 27 39.75
27 39.82

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1879phae.proj.1507

47

δ Celi

585

β Corvi

172

γ Virginis

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1879phae.proj.1507

174

S Virginis

12 49 30

+4° 3'

1.17609 0.16056
9.99891
1.17500

1879 Dec 1

57 12.80			57 15.9			57 50.70			57 43.3		
14.05	16140		17.2			52.45	54610		45.2		
16.18	16.14		18.5			54.60	54.61		46.7		
18.20			20.6			56.60			48.1		
8070 20.27			947 22.5			27305 58.70			2332 49.9		
8070			947			2.305			332		
2442			57 18.94			2.76			57 46.64		
26.53						3.00					
28.50						7.10					
30.60	32636					9.30	11.370				
3260	32.63		52 1.9			11.33	11.37		58 38.7		
3465	32.63		3.2			13.50	11.39		40.7		
36.70			4.5			15.60			42.5		
38.80			6.2			17.77			44.0		
29372 40.90			244 8.6			10233 19.27			2119 46.0		
29372			244			10233			119		
4495			52 4.88			24.00			58 42.38		
47.00	49124					26.15	28166				
49.12	49.12					28.08	28.17				
51.25	6526					30.30	142 58				
24562 53.30			51 18.94			14083 32.40			57 46.64		
4562	51 32.630		52 4.08			14083	58 11.380		58 42.38		
			+ 13.69						+ 24.74		
			− 31.45						− 31.00		
			45.14						55.74		
			1.654456						1.746617		
			1.17500						1.16710		
			2.829956						2.91327		
			1.82328						1.90075		
			8.99372						8.98748		
			428 36	5 37 45					5 32 58		

M	25 38.42					M	52 20.80				
M	26 44.85					M	53 40.12				
R	26 45.15					R	53 40.32				
R	26 45.00										
M	26 44.95										
	26 44.99						53 40.37				
	66.57						79.57				

176

E Virginis

h m s

12 56 9

+11 37

1.17609 0.16056
9.99101
1.16710

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1879phae.proj.15107

8

Sun ☉ = 46,696

h m s
16 34 16
° '
-22 0

0,16056

Dec. 1 – 2

34	35.75			35	54.2	36	—			36	15.1			
	37.97	40198			55.8		—				18.2			
	40.18	40.19			57.6		—				17.6			
	42.39				59.0	36,23	2.60	15.58	18.18		20.8			
20099	44.70			2876	1.0	18.115	4.70	13.35	18.06	959	22.2			
	099				2876						9.59			
	48.01			25	57.52	165.55	2.50	8.40	18.40	36	19.18			
	51.20					18.394	11.70	6.67	18.37					
	53.30						13.25	4.41	18.30					
	55.85	57.992					16.05	2.28	18.25					
	58.17	57.99					18.63	0.98	18.39					
	0.20	58.02					20.67	2.22	18.45					
	2.48						22.88	4.43	18.43					
	4.78						25.00	6.67	18.33					
52193	6.85					16558	27.30	6.91	18.39					
	52193						16558							
	11.45					9246	31.80	13.35	18.46					
	13.70	15.850				18.492	34.10	15.58	18.52					
	15.90	15.85					36.20	17.88	18.38					
	17.90	11604					38.58	20.03	18.55					
7925	20.30			35	57.52	18156	40.85	22.32	18.56	36	19.18			
	7925	34	58.005	–	59.52		18156							

18.337
18.340

37	10.50			37	6.6									
	12.40	14540			8.0									
	14.60	14.54			9.6									
	16.55				11.0									
7270	18.65			480	12.8									
	22.70				480									
	22.75				37 9.60									
	24.78													
	26.85													
	29.00	30.976												
	31.00	30.98		38	2.2									
	33.00	30.97			3.9									
	35.10				5.8									
	37.10				7.7									
27878	39.20			290	9.4									
	27878				290									
	43.30				38 5.80									
	45.30	47.410												
	47.45	47.41												
	49.40	6195												
23705	51.60				37 9.60									
	23705	37	30.975		38 5.80									
					+ 21.38									
					– 3482									
					56.20									

12 35 35.0

1.749 74
1.176 05
2.925 79
1.909 98
8.984 19
5.30 28

M 10 39.10

M 10 44.60

M	15	48.10	
M	17	9.35	
R	17	9.32	
R	17	9.30	
M	17	9.55	
	17	9.38	
		81.28	

0 47 29.4

172

γ Virginis

h m s
12 35 32
° '
-0 47 1.17609 0,16056
9.99996
1.17605

Dec 2

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1879phae.proj.1507

174 δ Virginis
12h 49m 30s
+4° 3′
0.16056

176 ε Virginis
12h 56m 9s
+11° 37′
0.16056

587 α Virginis
13h 18m 49s
−10° 32′
0.16056
EK.

1879 Dec. 2

δ Virginis

51 —
—
—
—
—
—
—
—
—
—
—
—

−6.20	29.70	59.37	35.90
8.28	29.67	29.685	37.95
12.41	29.59	148.11	42.00
14.48	29.60	29.622	44.08
16.55	29.75		46.30
18.66	29.64		48.30
−20.75	29.58	3106	50.38
			23106

29.653
29.640

46212
46.21

57 46.5
47.9
49.4
50.9
2472 52.5
472
51 49.44
52 10.8
51 49.444

ε Virginis

57 47.30
49.40 51470
51.30 51.47
53.60
25735 55.75
735
0.00
2.08
4.10
6.17 8346
8.36 8.34
10.45 8.31
12.60
14.65
7511 16.70
7511
20.95
23.00 25164
25.20 25.16
27.30 13663
12582 29.37
2582
58 8.325

57 51.5
52.8
54.5
56.3
2729 57.8
229
57 5458
58 36.0
38.1
40.1
41.5
1992 43.5
1992
58 39.84

57 54.58
58 39.84
+ 13.74
− 31.52
45.26

α Virginis

20 26.45
29.00 31150
31.20 31.15
33.60
15575 35.50
575
39.68
41.75
43.78
45.97 47993
48.03 47.99
50.10
52.06
54.20
43194 56.37
43194
0.60
2.60
4.75
6.38
9.00
20 47.948

20 32.4
34.0
35.7
37.7
1798 40.0
1798
20 35.96
21 20.3
21.6
25.0
26.4
20 35.96

13 18 22.20

M 26 26.80
M 26 58.02
R 26 57.75
R 26 57.98
M 26 58.02
26 57.94

M 52 37.25
M 53 41.80

M 0 10.05
M 1 17.80
R 1 17.65
1 17.72
67.67

10 32 34

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1879phae.proj.15107

S

Sun c=46,696

h m s
16 38 37
−22° 8

0,16056

Dec 2-3

38	52.60		—	41	12.25		—
	55.10	57.200	—		15.48	17.740	—
	57.30	57.20	—		17.90	17.74	—
	59.45		—		20.00		—
28600	1.65		—	8870	22.07		—
	28600				8870		
	6.06				24.46		
	8.24				26.68		
	10.40				31.90		
	12.30	14967			33.37	35.529	
	15.50	14.97			35.60	35.53	
	17.25	15.62			37.30	35.55	
	19.40				40.00		
	21.60				42.25		
13470	23.75			31976	44.40		
	13470				31976		
	25.50				46.75		
	30.65	32.850			51.20	53.374	
	32.80	32.85			53.32	53.37	
	35.00	15005			55.60	7111	
16425	37.20			26687	57.80		
	1425	39 14.995			1687	41 35.5410	

Shell not 110.

174 Sbrginis

h m s
12 49 30
+4° 1

0,16056

Dec 3

	6.30				0.4		
	8.25	10420			1.9		
	10.45	10.42			3.1		
	12.50				4.4		
5210	14.57			164	6.6		
	5210				164		
	18.77				3.28		
	20.92						
	22.50						
	25.10	27096					
	27.00	27.09			58.5		
	29.10	27.05			0.1		
	31.20				1.9		
	33.35				3.4		
24386	35.48			3094	5.5		
	24386				94		
	37.50				1.88		
	41.68	43676					
	43.70	43.68					
	45.70	5410					
21838	47.80				3.28		
	1838	27.070			1.88		

Ar only

M	25	26.30	.
M	26	50.10	.
R	26	50.12	.
R	26	50.20	.
M	26	50.18	.
		~~23.88~~	
	26	50,15	
		83.85	

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1879phae.proj.1507

176

ε Virginis

h m s
12 56 9
+11° 37'

0.16056

1879 Dec. 3.

	44.78			42.3			24.30		18.2
	46.90	49068		44.0			26.40	28510	19.5
	49.10	49.07		45.0	45.118		28.55	28.51	20.8
	51.23			47.2			30.65		22.0
245341	53.33		22741	48.9		114255	32.65		10.50 24.5
	48534			274			4255		50
	57.50			45.48			36.90		21.00
	59.55						39.15		
	1.60						41.18		
	3.68	5834					43.28	45373	
	5.88	5.83		22.8			45.30	45.37	13.2
	7.93			23.8			47.45	45.33	14.9
	10.11			24.8	25.418		49.60		17.0
	12.05			26.7			51.70		18.8
59251	14.27		12744	27.0		40836	53.80		8 44 20.5
	52251			274			40836		3144
	18.40			25.48			57.97		16.88
	20.65						0.10	2156	
	22.66						2.22	2.16	
	24.69						4.21	9067	
	26.83					31078	6.28		21.00
		×2	5846				1078	2 45350	16.88

13 18 52.23

587

α Virginis

h m s
13 18 49
−10° 32'

0.16056

	24.30			18.2					
	26.40	28510		19.5					
	28.55	28.51		20.8					
	30.65			22.0					
114255	32.65		1050	24.5					
	4255			50					
	36.90			21.00					
	39.15								
	41.18								
	43.28	45373							
	45.30	45.37		13.2					
	47.45	45.33		14.9					
	49.60			17.0					
	51.70			18.8					
40836	53.80		844	20.5					
	40836			3144					
	57.97			16.88					
	0.10	2156							
	2.22	2.16							
	4.21	9067							
31078	6.28			21.00					
	1078	2 45350		16.88					

M	52	29.55	
M	53	26.25	
R	53	26.30	
	53	26.27	

M	59	52.18	
M	1	11.65	
R	1	11.90	
R	1	11.92	
M	1	12.12	
	1	11.90	
		79.72	

10 32 8.6

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1879phae.proj.15007

S

Sun. C = 46,715

h m s
16 42 37.
−22° 16'

0.16056

1879 Dec 3-4

43 11.00		— 45 21.60			
12.90	15.116	— 33.87	36.110		
15.40	15.28	— 36.10	36.11		
17.18		— 38.38			
7638 19.50		— 18055 40.60			
2558		18055			
24.08		45.00			
26.10		47.40			
28.48		49.65			
30.48	32.888	51.52	54.031		
32.92	32.89	54.07	54.03		
33.00	33.06	54.20	53.99		
37.38		58.40			
38.65		0.60			
29599 41.90		48628 3.04			
29599		48628			
46.26		7.27			
47.62	50.836	9.63	11.880		
50.90	50.84	12.85	11.88		
5303	6612	14.05	10799		
25418 55.37		5940 16.40			
418	43 32.975	5940	45 54.010		

30

β Arietis

h m s
1 47 57.
+20° 13'

0.16056

Dec. 4

		— 49 —			49 54.8
		— —			57.0
		— —			58.2
		— —			59.6
		— —			2910 1.4
					2910
+8.79	54.39	490.91	45.60		49 58.20
6.39	54.35	54.345	47.96		
4.26	54.35		50.09		
2.11	54.41		52.30	54.523	
−0.00	54.57		54.57	54.52	50 2.6
2.16	54.57		56.73		27.3
4.26	54.72		58.98		29.5
6.39	54.79		1.18		30.7
8.29	54.76	49071	3.30		1449 32.4
			49071		1449
12.74	55.11	275.43	7.85		50 28.98
14.92	55.08	55.086	10.00	12.140	
17.05	55.00		12.05	12.114	
19.18	55.12		14.30		
21.35	55.12	6070	16.50		49 58.20
			6070		50 28.98

54.816
54.667

AR only

M	16	3.18
M	16	45.18
R	16	45.25
R	16	45.28
M	16	45.00
	16	45.18

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33 — α Arietis — h m s 2 0 21; ° ′ +22 53; 1.17609, 9.96440, 1.14049

1879 Dec. 4

1 56.05		1 45.7		
58.48	0.652	47.6	49.180	
0.60	0.65	49.1	49.18	
2.95		50.8		
30326 5.18		2459 52.7		
326		459		
9.70				
11.92				
14.06				
16.25	18.564			
18.53	18.56	2 45.6		
20.72	18.60	46.8	4.888	
22.00		49.0	48.88	
25.80		50.6		
16708 27.60		2444 52.4		
16708		444		
32.05				
34.40	36.550			
36.50	36.55			
38.80	37.20			
18275 41.00		1 49.18		
18275	2 18.580	2 48.88		
		+ 29.40		
		− 30.30		
		59.70		
		1.77597		
		1.14049		
		2.91646		
		1.90331		
		8.98685		
		5 32.29		

56 — ε Eridani — h m s 3 27 14; ° ′ −9 52; 1.17609, 9.99353, 1.16962; 0.16056

28 49.00		28 42.2	
51.10	53.194	42.5	
53.20	53.19	44.7	
55.22		45.8	
26597 57.45		2234 47.2	
1597		234	
1.70		28 44.68	
3.75			
5.75			
7.95	9.977		
9.95	9.98	29 37.8	
12.10	9.96	40.4	
14.07		42.0	
16.22		43.8	
8979 18.40		2094 45.4	
8979		94	
22.50		29 41.88	
24.60	26.730		
26.80	26.73		
28.80	13992		
13365 30.95		28 44.68	
3365	29 9.970	29 41.88	
		+ 25.29	
		− 31.91	
		57.20	
		~~1.91450~~ 1.75740	
		~~1.16962~~	
		2.92702	
		1.91450	
		8.98748	
		5 32.58	

550 — δ Eridani — h m s 3 37 30 (27³); ° ′ −10 11; 1.17609, 9.99310, 1.16919; 0.16056

39 2.35		38 54.0	
4.40	6550	56.0	
6.50	6.55	57.7	
8.70		59.8	
3275 10.80		2883 1.8	
3275		383	
15.00		38 57.66	
17.00			
19.10			
21.35	23370		
23.25	23.37	39 56.8	
25.40	23.31	58.5	
27.60		59.9	
29.80		1.4	
21033 31.80		3003 3.7	
21033		3003	
35.50		40 0.06	
37.90	40.060		
40.10	40.08		
42.22	4663		
20040 44.18		38 57.66	
20030	39 23.340	39 40 0.06	
		+ 25.68	
		− 36.72	
		62.40	
		1.79518	
		1.16919	
		2.96437	
		1.94260	
		8.97823	
		5 25.59	

α Arietis	ε Eridani	δ Eridani
M 34 57.20	M 19 43.88	M 38 1.65
M 36 17.18	M 21 5.98	M 39 29.22
R 36 17.30	R 21 6.10	R 39 29.32
R 36 17.32	R 21 6.00	
M 36 17.18	M 21 5.95	
36 17.24	21 6.01	39 29.27
80.04	82.13	87.62

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61 η Tauri

h m s: 3 40 18

° ′: +23 44

0.16056

				42 15.5
				18.5
				20.0
				21.2
				981 22.9
				981
+9.02	15.30	42 6.28		42 19.62
6.76	15.31	136.13 8.55		
4.50	15.20	15.125 10.70		
2.23	15.27	12.04	1513.0	
−0.00	15.18	15.18	1513	42 53.8
2.24	15.13	17.37		56.0
4.51	14.24	18.75		57.6
6.76	15.24	22.00		59.0
9.04	15.26	3617 24.30		2871 0.7
		13617		2871
13.52	15.28	77.70 28.80		42 57.42
15.78	15.37	15.54 31.15	33386	
17.03	16.33	33.36	33.39	
20.29	15.33	35.62		
−22.61	15.36	6693 38.10		42 19.62
		1693		42 57.42

15.333
15.243

M 45 26.98
M 46 17.75
R 46 17.75
R 46 17.67
M 46 17.58
46 17.69

63 ζ Persei

h m s: 3 46 32

° ′: +31 31

1.17609
9.93069
1.10678

0.16056

48 5.80		47 53.8	
8.06	10.640	55.4	
10.60	10.64	57.6	
13.19		59.7	
5320 15.55		2874 0.9	
5320		2874	
20.25		47 57.48	
22.64			
25.30			
27.65	30.063		
30.06	30.06	48 52.7	
32.27	29.92	55.3	
34.90		57.2	
37.50		58.6	
27057 40.00		2850 1.2	
27057		2850	
44.50		48 57.00	
46.80	49.214		
49.00	49.21		
51.60	5985		
24607 54.17		47 57.48	
24607	48 29.990	48 57.00	
		+ 32.51	
		− 27.01	
		59.52	

1.77466
1.10678
2.88144
1.86528
8.98384
5 30 12

M 57 15.18
M 58 28.42
R 58 28.58
R 58 28.68
M 58 28.38
58 28.51
73.33

582 ε Corvi

h m s: 12 3 54

° ′: −21 57

0.16056

5 25.50		5 18.1
27.70	29.930	20.5
30.00	29.93	22.6
32.05		24.0
14965 34.40		1126 26.8
14965		126
38.75		5 22.52
41.00		
43.20		
45.65	47.742	
47.90	47.74	
50.00	47.69	
52.18		
54.40		
42968 56.60		
42968		
1.00		
3.25	5446	
5.50	545	
7.60	9538	
2723 9.88		5 22.52
2723	5 47.715	+ 25.20

R 24 9.95
R 24 10.08

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584

S Corvi

h m s
12 23 37
° ′
−15 50

1.17609 0.16056
9.98320
1.15929

1879 Dec. 4

25 8.30		25 0.6	
10.53	12.626	2.0	
12.60	12.63	3.8	40
14.80		5.8	
63.13 16.90		201 7.5	
6.313		201	
21.27		25 4.02	
23.60			
25.48			
27.60	29.797		
28.70	29.79	26 1.0	
31.95	29.79	2.4	
33.57		4.4	
36.30		6.3	
26817 38.30		233 5.2	
26817		233	
42.65		26 4.66	
44.90	4.6950		
47.00	46.95		
48.00	59.58		
23475 50.20		25 4.02	
3475	25 29.790	26 4.66	
		+ 25.77	
		− 34.87	
		60.64	
		1.78276	
		1.15929	
		2.94205	
		1.92583	
		8.98378	
		5 30 9	

M 18 19.95
M 19 111.28
R 19 111.22

19 44.25
84.30

172

γ Virginis

h m s
12 35 32
° ′
−0 47

1.17609 0.16056
9.99996
1.17605

37 4.67		37 0.4	
6.90	8.886	2.1	
8.86	8.89	3.3	
11.00		4.9	
4443 13.08		177 7.0	
4443		177	
17.20		37 3.54	
18.40			
21.50			
23.50	25.461		
25.45	25.82 46	38 0.0	
27.35	24.93	1.7	
29.50	5.43	3.6	
31.60		5.1	
22915 33.65		171 6.7	
22915		171	
37.80		38 3.42	
40.07	41.976		
41.52	41.98		
44.08	5087		
20988 46.08		37 3.541	
988	37 25.563	38 3.42	
		+ 22.02	
		− 3.786	
		59.88	
		1.77728	
		1.17605	
		2.95333	
		1.94586	
		8.99253	
		5 36 50	

12 35 34.06

M 15 45.82
M 17 14.05
R 17 14.28
R 17 14.25
M 17 13.82
17 14.10
88.28

0 47 29.8

174

S Virginis

h m s
12 49 30
° ′
+4 3

1.17609 0.16056
9.99891
1.17500

57 2.60		52 55.1	
5.60	7.720	58.7	
7.63	7.72	53.3	
9.87		0.1	
3860 11.90		2924 2.2	
3860		2924	
16.05		50 58.48	
18.00			
20.15			
22.03	24.200		
24.20	24.20	51 54.6	
26.28	24.19	56.3	
28.32		52.6	
30.40		59.4	
21780 32.40		2889 1.0	
21780		2889	
36.50		51 57.78	
38.68	40.656		
40.72	40.66		
42.70	48 38		
20328 44.68		50 58.48	
328	51 24.195	51 57.78	
		+ 25.72	
		− 33.58	
		59.30	
		1.77305	
		1.17500	
		2.94805	
		1.93515	
		8.98710	
		5 32 40	

M 25 26.60
M 26 52.78
R 26 52.60
R 26 52.95
M 26 52.58
26 52.73
86.13

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587

δ Virginis

h	m	s
13	18	49

°	′	
−10	32	1.17609
		9.99262
		1.16871

0.16056

Dec. 4

20	21.68	
	23.68	25.742
	25.60	25.741
	27.60	
12871	29.85	
	2871	
	34.00	
	36.18	
	38.30	
	40.50	4 2493
	42.50	42.38
	44.60	42.46
	46.58	
	48.58	
38244	50.90	
	38244	
	53.10	
	55.10	59186
	57.18	59.19
	1.30	8493
29593	8.45	
	29593	20 42.420

20	15.4	
	17.4	
	18.5	
	20.6	
933	22.0	
	933	
20	18.66	
21	21.8	
	23.6	
	25.0	
	21.4	
1246	27.8	
	246	
21	2492	
20	18.66	
21	24.92	
+	23.76	
−	42.50	
	66.26	

15 18 52.26

1.	82125
1.	16871
2.	98996
1.	99092
9.	00096
5	42 42

5 43 23

M 59 55.62
M 1 33.55

1 33.55
97.93

10 32 87

δ

Sum − C = 46.723

h	m	s
16	47	18

°	′	
−22	24	

0.16056

Dec. − 4 − 5

47	28.55	
	31.15	33376
	33.40	33.38
	35.50	
16688	37.88	
	1688	
	4240	
	44.60	
	46.80	
	49.10	51.352
	51.30	51.35
	53.50	51.30
	55.80	
	58.25	
46217	0.42	
	46217	
	4.78	
	7.00	9.218
	9.28	922
	11.38	10260
4609	13.65	
	4609	47 51.325

48	45.6	
	49.9	
	51.8	
	53.8	
2601	56.0	
	101	
48	52.02	

− 1 0.70

35

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587

α Virginis

h	m	s
13	18	49
	°	′
	−10	32

1879 Dec. 6.

20	15.55		20	9.5	
	17.78	19.870		10.9	
	19.90	19.87		12.3	
	22.06			13.9	
9935	24.06		625	15.9	
	9935			625	
	28.36		20	12.50	
	31.40				
	32.40				
	34.65	36642			
	36.60	36.64	21	10.1	
	38.70	36.68		12.0	
	40.75			14.0	
	42.98			15.6	
32978	45.00		690	17.3	
	32978			19.0	
	49.28		21	13.80	
	51.40	53476			
	53.50	53.48			
	55.53	7335			
26738	57.65		20	12.50	
	1738	20 36.660	21	13.80	
			+	24.16	
			−	37.14	
				61.30	

13 18 52.32

M	0	2.78
M	0	30.05

10 32 9.1

182

η Bootis

h	m	s
13	48	55
	°	′
	+19	0

0.16056

1.17609
9.97567
1.15176

0.16056

50	21.20		50	10.7	
	23.27	25484		12.4	
	25.45	25.48		13.7	
	27.70			15.6	
12742	29.80		700	17.6	
	2742			200	
	34.18		50	14.00	
	36.32				
	38.50				
	40.67	42894			
	42.90	42.89	51	12.6	
	45.08	42.87		15.0	
	47.28			17.0	
	49.50			18.6	
38605	51.70		848	20.6	
	38605			348	
	53.80		51	16.96	
	57.80	0260			
	0.20	026			
	2.50	8574			
30130	4.70		50	14.00	
	130	50 42.880	51	16.96	
			+	28.88	
			−	34.08	
				62.96	

1.79966
1.15176
2.95682
1.93237
8.98155
528 28

M	28	54.42
M	30	20.30
R	30	19.82
R	30	20.08
M	30	19.82
	30	20.00
		85.58

18 59 51.8

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S

Sun c = 46.723

h m s
16 56 3
° ′
−22 30

0.16056

Dec. 6–7

		59			0	13.6
						15.4
						17.0
						18.9
					855	20.6
						855
+8.93	29.73	266.65	20.80		0	17.10
6.70	29.65	29.628	22.95			
4.46	29.71		25.25			
2.20	29.55		27.35	29.633		
−0.00	29.50		29.50	29.63		
2.22	29.73		31.95			
4.47	29.58		34.05			
6.70	29.65		36.35			
−8.95	29.55	26670	38.50			
			26670			

2	4.38		−13.40	50.92	25.89
	6.62	8870	15.63	50.94	50.978
	8.83	8.87	17.87	50.96	
	11.20		20.10	51.10	
0 17.10 4435	13.32		22.40	50.92	
	4435				

M 28 5.78

525

31 Cephei

h m s
22 32 47
° ′
+73 1

0.16056

Dec. 7

35	23.60		35	16.7	36	2.3
	30.78	37.744		21.4		7.8
	37.66	37.74		26.3		14.0
	44.68			32.0		19.0
18872	52.00		1332	36.8	683	25.2
	18872			1332		683
	5.85		35	2664	36	1366
	13.15					
	20.20					
	26.97	34210				
	34.07	34.21	36	43.4	37	53.4
	41.40	34.08		48.8		1.0
	48.20			54.1		8.2
	55.50			57.9		13.8
30789	2.55		2687	4.5	3356	19.2
	30789			2687		356
	16.50		36	5374	38	712
	23.30	30430				
	30.60	3043				
	37.75	18817				
15215	44.00		35	26.64	36	13.66
	15215	36 34.145	36	53.74	37	7.12
			+1	750	+	2048
			−	19.60	−	32.98
				87.10		53.46

M 28 17.98

M 28 38.78

M 28 55.22

M 29 24.60

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322

η Pegasi

h m s
22 87 20
+29° 35′ 1.17609
9.99393 4
1.11543

1879 Dec. 7

40 43.30		40 34.6
45.70	48.042	36.2
47.75	48.04	38.7
50.37		40.4
24021 52.77		1920 42.1
24021		1920
57.50		40 38.40
0.04		
2.21		
4.65	7.006	
7.00	7.00	41 31.1
9.30	7.01	33.0
11.70		34.6
14.15		36.3
60305 16.50		1735 38.5
6305		235
21.27		41 34.70
23.60	25.990	
25.88	25.99	
28.40	134.63	
12995 30.80		40 38.40
12995	41 7.005	41 34.70
		+ 28.60
		− 27.70
		56.30
		1.75051
		1.11543
		2.86594
		1.84442
		8.97848
		5 26 10

M 53 6.12
M 54 15.90
R 54 16.12

54 16.01
69.89

325

i Cephei

h m s
22 45 22
+65° 34′

0.16856

48 20.62		48 1.4
25.30	30560	4.2
30.40	30.56	9.0
35.88		13.2
15280 40.40		445 16.7
15280		445
50.50		48 8.90
55.60		
0.40		
5.28	10383	
10.35	10.38	48 52.5
15.40	10.36	1.0
20.40		5.6
25.30		8.1
63345 30.22		3269 13.3
9345		269
40.07		49 5.38
45.10	50170	
50.25	50.17	
55.25	140.73	
25085 0.28		50 0.7
25085	49 10370	5.0
		8.4
		12.6
		457 17.0
		457
		50 9.14

M 55 3.25
M 55 38.30
M 56 15.25

619

α Piscis Aust.

h m s
22 50 58
−30° 16′ 1.17609
9.99363 6
1.11245

0.16856

57 20.76		34 9.3
22.17	25448	12.4
23.45	25.45	14.0
27.80		15.7
12724 30.06		688 17.4
12724		688
34.90		54 13.76
37.40		
39.78		
42.22	44536	
44.53	44.53	55 21.2
46.50	44.57	22.8
49.35		24.5
51.68		26.5
40082 54.06		1234 28.4
40082		234
58.50		55 24.66
1.40	3.700	
3.80	3.70	
6.05	8915	
31850 8.45		54 13.76
1850	54 44.550	55 24.68
		+ 30.79
		− 40.13
		40.92
		1.85077
		1.11245
		2.96322
		1.94817
		8.98495
		5 31 2

22 51 18.5

M 41 39.60
M 43 8.22
R 43 8.118

43 8.35
88.75

80 15 32.5

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154

α Ursæ Maj. Lo. 6.

h m s
10 46 15
+ 117 36 1.17609 9.66586 0.84195

59 16.70 — 58 50.4
21.17 25500 — 52.7
23.70 25.50 — 57.2
30.00 — 0.7
12750 34.40 — 2860 5.0
12750 — 2860
43.28 — 58 57.20
47.60
52.38
58.70 4107
1.00 1.71 — 0 8.9
5.70 1.03 — 12.6
10.00 — 15.5
14.30 — 17.5
54996 18.80 — 765 22.0
996 — 765
22.55 — 0 15.30
32.10 36576
36.30 36.57
41.20 122.67
18288 45.33 — 58 57.20
18288 0 1.070 — 0 15.30
+1 3.87
− 14.23
78.10
1.89265
0.84195
2.73460
1.83187
9.09727
71.51

M 57 43.95
M 56 51.85

56 51.85
67.90

329

δ Pegasi

h m s
22 58 44
+ 14 33

0.16056

2 9.85 — 2 0.4
1205 14146 — 2.3
14.15 14.15 — 4.0
16.28 — 5.6
7073 18.30 — 196 7.3
7073 — 196
22.73 — 2 3.92
24.78
26.95
29.18 31228
31.30 31.23 — 3 3.2
32.36 31.20 — 5.2
35.40 — 6.9
37.60 — 8.7
28105 39.75 — 345 10.5
28105 — 345
44.80 — 3 6.90
46.18 48260
48.32 48.26
50.38 6241
24130 52.42 — 2 3.92
4130 2 31.215 — 3 6.90
+ 27.30
− 35.68
62.98

32 58 47.71

M 54 52.90
M 55 21.82
R 55 21.88
R 55 22.15

55 21.95

14 38 48.6

529

π Cephei

h m s
23 4 3
+ 74 44

0.16056

6 34.06 — 6 26.0 7 30.7
4206 49.694 — 30.2 38.5
47.68 49.69 — 34.4 42.8
57.37 — 42.4 47.2
248.47 5.30 — 1850 50.0 2145 53.3
248.47 — 1850 2145
21.00 — 6 37.00 7 42.90
29.00
36.81
44.76 52.443
52.20 52.44 — 8 38.3 9 43.1
0.35 52.38 — 44.8 51.9
8.10 — 51.0 58.7
15.80 — 57.3 2.6
47199 24.07 — 2554 4.0 2889 12.0
47199 — 2554 28.89
37.30 — 8 51.08 9 57.78
47.30 55080
53.20 55.08
2.96 22477
27540 10.70 7 — 6 37.00 7 42.90
27540 X 52.410 — 8 51.08 9 57.78
+ 1541 − 50.49
− 1 58.67 − 3 5.37
134.08 235.86

M 45 13.70
M 45 39.18
M 45 41.35
M 46 28.55

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436

Gr. 1771 L.C.

h m s
11 15 39
+ 115 0

0.16056

1879 Dec. 7

18	36.05		18	11.2	22	33.00		22	13.3	26	37.00		26	42.2	
	41.10	45856		15.0		37.38	41742		16.1		3.25	8.974		46.7	
	45.70	45.86		18.7		41.75	41.74		19.8		8.75	8.97		53.4	
	50.68			22.9		46.18			23.2		14.87			57.6	
22928	55.65		943	27.2	20871	50.40		979	25.3	34487	21.00		2635	3.6	
	22928			943		20871			979		34487			2635	
	5.20		18	18.86		55.17		22	19.58		33.50		26	52.70	
	10.05					3.62					37.20				
	15.00					8.80					44.80				
	19.78	24803				12.00	16503				51.16	57156			
	25.15	24.80	18	43.6		16.50	16.50	22	55.7		57.15	57.15	27	37.7	
	29.65	24.89		48.4		20.90	16.47		1.8		3.18	57.15		44.3	
	34.65			53.0		25.23			5.6		9.18			51.5	
	39.40			58.5		29.47			8.5		15.10			58.2	
22323	44.35		2608	59.3	68853	33.64		3264	11.8	51440	21.14		2504	0.7	
	22323			108		14853			264		51440			2504	
	54.30		18	52.16		42.37		23	5.28		33.35		27	50.08	
	59.00	3.924				46.90	51200				39.20	45.33			
	4.05	3.92				51.28	5120				45.30	45.33			
	8.80	16978				55.65	15294				51.30	11430			
31962	13.47		30	2.5	25600	57.80		24	12.8	22665	57.30		29	2.0	
	1962	19 24.845		6.0		600	23 16.485		15.2		22665	27 57.150		8.8	
				10.7					18.3					10.0	
				14.4					22.3					15.2	
			520	18.4				961	26.5				550	22.0	
				52.0										550	
			20	10.40				24	19.22				29	11.00	

M	32	27.48	M	51	40.32	M	31	56.42	
M	32	5.85	M	52	11.98	M	31	27.72	
M	31	19.05	M	52[3]	2.15	M	30	48.35	

533

4 Cass.

h m s
23 19 28
+ 61 37

0.16056

162

λ Draco. L.C.

h m s
11 24 12
+ 110 0

0.16056

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30

β Arietis

h m s
1 47 37
+20° 13' 1.17609 0.16056
9.97238
1.14847

48 23.75		48 13.9		0 47.40		0 42.0		57 24.61		57 15.5	
26.07	28.246	15.4		49.70	51.924	43.7		26.65	28.716	17.4	
28.29	28.15	17.2		51.87	51.92	45.2		28.70	28.71	19.2	
30.45		18.8		54.15		46.9		30.79		20.7	
14123 32.67		857 20.4		25962 56.40		2268 49.0		14358 32.80		953 22.5	
14123		857		962		268		14358		953	
32.80		48 17.14		0.90		0 45.36		37.00		57 19.06	
39.30				3.20				39.10			
41.45				5.30				41.00			
42.66	45857			7.60	9822			43.18	4 5221		
43.83	45.86	47 15.9		9.50	9.82	1 40.3		45.29	45.22		
44.07	45.83	17.4		12.00	9.82	41.9		47.27	45.26		
50.30		18.9		14.25		43.8		49.35			
52.50		20.4		16.50		45.6		51.40			
41271 54.60		949 22.3		8840 18.85		2190 47.4		40699 53.40			
41271		949		8840		190		40699			
52.00		49 18.98		23.30		1 43.80		57.65			
1.25	8424			25.80	27730			55.70	1810		
3.40	3412			27.65	27.73			1.80	1.81		
5.51	81 67			30.60	13965			3.90	9052		
31712 7.50		48 17.111		13865 32.10		0 45.36		30905 6.00		57 19.06	
1712	48 45.845	49 18.98		13865	1 9.820	1 43.80		905	57 45.240	+ 26.18	
		+ 28.70				+ 24.46					
		− 33.14				− 26.07	33.98				
		61.84				50.48	58.144				
		1.79127				+70312					
		1.14847				1.14102					
		2.93974				2.84414					
		1.92319				1.89209					
		8.98345				9.04795	8.98436				
		529.54				62219	5 3036				

M	15	19.92	M	35	4.18	R	56	11.58			
M	16	43.58	M	36	22.22	R	56	11.42			
R	16	43.92	R	36	22.32						
R	16	43.82	R	36	22.38						
M	16	43.52	M	36	22.02			57	11.50		
	16	43.71		36	22.48			3 37.	11.9		
		83.79			7800						

33

ζ Arietis

h m s
2 0 21
+22° 53' 1.17609 0.16056
9.96493
1.14102

47

ζ Ceti

h m
2 55 0.16056
+3° 37'

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550

S Eridani

h m s
3 37 30
−10 °

0,16056

61

2 Tauri

h m s
3 40 18
+23 °

0,16056

63

2 Persei

h m s
3 46 32
+31 °

0,16256

1879 Dec. 7

33	53.61		38	46.2	41	44.08		41	34.9	47	56.70
	53.69	57.850		47.5		46.32	48.590		36.8		59.40
	57.90	57.85		47.4		45.58	48.59		38.7		2.10
	0.00			47.3		50.85			40.2		4.35
28925	2.05		2474	53.0	24295	53.12		1923	41.7	30920	6.75
	28925			2474		24295			1923		920
	6.90			38 49.48		57.70		41	38.46		11.65
	8.30					58.85					14.10
	10.47					2.03					16.38
	12.58	14617				4.38	6.643				18.88
	14.62	14.62				6.60	6.64				21.23
	16.70	14.60				8.90	6.62				23.70
	18.78					11.18					26.08
	20.90					13.35					28.45
13155	23.03				59979	15.70				19119	30.90
	13155					59979					19119
	27.25					20.20					35.75
	29.18	31356				22.34	24666				38.20
	31.30	31.36				24.76	24.66				40.67
	33.45	14921				26.85	13325				42.03
15678	35.60			38 49.48	12333	28.18		41	38.46	20315	45.50
	15678	39 14.610	+	25.13		2333	42 6.630	+	28.17		315

			48 47.7
			45.7
			57.6
			53.8
		2588	56.0
			88
		48	51.76
	40.630		
	4063		
	4247		
48	21.235	48	51.76
		−	30.52

R 38 8.20.

R 44 45.25.

R 58 32.70.

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164

B Lerouis

h m s
11 42 53
+13° 15'
0.16056

1879

Dec. 8

44	14.27			44	5.8										
	16.63	18.700			7.1										
	18.80	18.70			8.9										
	20.86				10.2										
9350	22.94			43	8 11.8										
	9350				438										
	27.23			44	8.76										
	29.37														
	31.58														
	33.65	35.750													
	35.70	35.75		45	2.5										
	37.80	35.77			4.3										
	40.07				6.0										
	42.07				7.5										
32175	44.28			294	9.1										
	32175				294										
	48.60			45	5.88										
	52.68	52.840													
	52.90	52.84													
	53.02	71.54													
26420	57.88			44	8.76										
	1420	114 35.760		45	5.88										
				+	27.00										
				−	30.12										
					57.12										

11 43 3689

R 15 33.78
R 15 33.62

15 33.70
15 14 26.9

582

E Corvi

h m s
12 3 34
−21° 57'
0.16056

5	13.70														
	15.80	17.980													
	18.05	17.98													
	20.05														
8990	22.30														
	8990														
	26.86														
	29.03														
	31.40														
	33.67	35.839													
	35.90	35.84		6	3.4										
	38.10	35.82			5.0										
	40.32				6.3										
	42.64				8.1										
32255	44.70			338	11.0										
	32255				338										
	48.25			6	6.76										
	51.50	53660													
	53.70	53.66													
	55.80	71.64													
26830	58.05														
	1830	5 35.830		6	6.76										
				−	3093										

R 25 25.78
R 25 25.68

25 25.73

684

S Corvi

h m s
12 23 37
−13° 30'

24	56.60			24	50.0										
	58.70	0812			51.3										
	0.78	0.81			52.6										
	2.98				54.2										
30406	5.00			2641	56.0										
	406				141										
	7.30			24	52.82										
	11.75														
	13.80														
	15.85	18.006													
	18.00	18.00													
	20.30	17.92													
	22.20														
	24.45														
16205	26.40														
	16205														
	30.70														
	32.70	35.036													
	35.10	35.04													
	37.30	3585													
17518	39.48			21	52.82										
	17518	25 17.960	+	25.14											

R 18 20.45
R 18 20.38

18 20.42

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585

β Corvi

h m s
12 28 2
−22° 44

0.16056

1879 Dec. 8

99 — — 36 53.10 36 47.1 50 57.68 50 54.0
— — 53.25 57.250 48.5 53.80 55904 53.2
— — 57.25 57.25 49.8 53.90 55.90 56.9
— — 57.30 57.3 58.04 58.4
— — 28625 1.85 2495 52.8 27952 0.10 2848 0.8
28625 2495 27952 2848
5.40 36 49.90 4.00 50 56.96
2.58 6.16
5.88 8.06
11.50 13694 10.38 12337
30 12.7 138.2 13.69 37 40.9 12.38 12.34 51 45.5
15.3 15.10 13.71 42.4 14.40 12.38 47.5
12.7 11.80 42.5 16.00 49.2
12.5 12.87 45.0 18.50 51.0
882 22.0 12325 91.50 2186 46.8 11103 20.75 2460 52.8
882 123.25 186 111.03 460
30 17.654 26.08 37 43.72 24.60 51 49.20
30 1.20 13.42 47.78 143.72 28.30 30178 26.70 28.840
3.50 15.66 47.84 47.906 30.08 30.18 28.50 28.86
6.80 17.90 48.10 32.16 14.743 30.95 14476
15089 34.27 36 49.90 14430 33.15 50 56.96
30 17.611 15089 37 13.700 37 43.72 4430 51 12.360 51 49.20
+ 23.80 + 15.40
47.907 − 30.02 − 36.84
53.82 52.24
12 85 85.17 1.730944 1.71800
1.17605 1.17500
2.90699 2.89300
1.89316 1.87379
8.98611 8.98079
5 31.55 627.54

R 12 15.42.
R 12 15.32.

12 15.37

M 15 48.60.
M 17 6.78.

17 6.78
78.18

M 25 41.50.
M 26 56.15.
R 26 56.115.
R 26 56.110.
M 26 56.12.
26 56.28
7478

0 47 30.6

172

γ Virginis

h m s
12 35 32
−0° 47 9.99996
1.17605

0.16056

174

δ Virginis

h m s
12 49 30
+4° 3 9.99891
1.17500

0.16056

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1879phae.proj.13507

176

E Orionis

h m s
12 56 9
+11° 37' 1.17609 0.16056
9.99101
1.16710

5

Sun c = 46,723

h m s
17 4 49
-22° 37' 0.16056

Dec. 8 – 9

57 30.00		57 22.0		4 47.30		6 1.7		7 8.90		6 3.9	
32.80	34.120	24.6		47.30	51.690	3.5		11.03	13.300	26.3	
34.10	34.12	26.1		51.65	51.69	5.7		13.30	13.33	27.6	
36.20		27.5		54.00		7.2		15.52		29.6	
17060 38.30		1307 29.5		25845 56.20		274 7.3		6665 17.90		1401 31.7	
2060		3.0		845		274		6665		401	
42.30		57 26,14		0.40		6 5.48		22.35		6 28.02	
44.75				2.80				24.55			
46.80				5.00				26.83			
48.75	51.039			7.30	9.611			28.94	31.294		
51.00	51.04	58 20.9		9.70	9.61			31.00	31.29		
53.20	51.04	22.6		12.05	9.64			33.35	31.31		
55.20		24.2		14.25				36.05			
57.40		26.0		16.40				38.11			
45935 59.53		1215 27.8		8650 18.60				28165 40.27			
45935		215		8650				28165			
2.75		58 24,30		20.20				44.80			
5.80	7960			23.50	27660			47.10	49286		
8.08	7.96			27.50	27.66			49.38	49.29		
2.95	102.08			2220	13935			57.50	6262		
3980 12.22		57 26.114		138.30 22.10		6 5.48	24643	53.65		6 28.02	
3980	57 51.040	58 24,30		13830	5 9.640	– 55.84		4643	7 31.300	+1 3.28	
		+ 24.90									
		– 33.26									
		58.16									
		1.76462									
		1.16710									
		2.93172									
		1.91339									
		8.98164									
		5 28.34									

M 52 27.40
M 33 49.32

53 49.32
81.92

M 1 57.25

M 35 8.82

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30

β Arietis

h m s
1 47 57
+20° 13' 1.17609 0.16856
99.72318
1879 Dec. 9 1.14847

49 17.48		49 9.2		1 41.18		1 31.0	
17.62	21866	10.7		43.50	45640	33.3	
21.75	21.87	12.3	12.34	45.70	45.69	35.4	
24.10		13.9		47.87		37.1	
14933 26.38		6.17 15.6		22845 50.20		1760 39.2	
0.33		6.17		22845		2.60	
30.77		49 12.34		54.75		1 35.200	
33.00				56.80			
35.20				58.50			
37.40	39579			1.25	3544		
39.50	39.58	50 10.0		3.50	3.54	2 3.44	
41.75	39.45	11.3		5.85	3.55	35.8	
43.97		12.6	12.58	8.02		37.7	
46.23		13.7		10.23		39.2	
35621 48.39		629 15.3		57190 12.50		1881 41.0	
35621		1.29		3190		1881	
52.56		50 12.58		16.85		2 37.62	
57.80	57038			19.20	21426		
57.10	57.04			21.40	21.42		
57.23	7891			23.60	12711		
28519 1.30		49 12.315		10713 25.98		1 35.20	
28519	49 39.515	50 12.58		713	2 3.545	2 37.62	
		+ 27.18				+ 28.34	
		− 33.06				− 34.68	
		60.24				62.42	
		1.77988				1.79532	
		1.14847				1.14049	
		2.92835				2.93581	
		1.90509				1.92221	
		8.97674				8.98640	
		524.53				532.8	

M	15	20.52.		M	34	56.92.	
M	16	40.78.		M	36	20.32.	
R	16	41.05.		R	36	20.62.	
R	16	40.92.		R	36	20.42.	
M	16	40.80.		M	36	20.72.	
	16	40.89			36	20.52	
		80.37				83.60	

33

α Arietis

h m s
2 0 21
+22° 53' 1.17609 0.16856
99.64440
1.14049

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1879phae.proj.1507

8

Sun - C = 46,723

h m s
17 18 1
− 23 6

0.16056

Dec - 11 - 12

17	57.65			19	8.8	20	12.67			19	31.7		
	57.00	56200			11.0		16.07	18250			32.3		
	56.20	56.20			13.0		18.20	18.25			34.6		
	58.40				14.8		20.61				36.5		
28100	0.75			638	16.2	9125	22.70			1741	38.0		
	28100				138		9125				241		
	5.80			19	12.76		27.28			19	3482		
	7.40						29.65						
	9.70						31.70						
	11.97	14131					34.05	36222					
	14.26	14.13					36.20	36.22					
	16.28	14.18					38.52	36.25					
	18.50						40.50						
	20.78						42.80						
12718	23.28					32606	45.40						
	12718						32600						
	2.784						44.77						
	3.85	32170					52.05	54252					
	32.18	32.17					54.30	54.25					
	34.20	14837					56.38	42.50					
16085	36.74			19	1276	27126	58.76			19	3482		
	1085	18	14.155	−	58.60		2126	20	36.235	+	1.42		

17	23.98					50	34.22			M	4	25.80	−

1

α Androm.

h m s
0 2 8
+ 28 25

0.16056

Dec. 12

	8	18.05				4	14.7						
		20.30	22710				18.2						
22758		22.70	22.71				21.3						
		25.00					24.6						
	N355	27.50				1062	27.4						
		1.355					62						
		3.218				4	21.24						
3455		3.467											
		36.80											
		38.95	41.531										
		41.35	41.53										
		43.76	41.55										
		46.40											
		48.67											
37378		51.00											
		37.378											
		56.10											
		58.05	0.400										
		0.25	0.40										
		2.70	8311										
30200		5.00				4	21.24						
		209	3	41.540	−	34.70							
		0.400		−012									
				41.528									

0 2 12.6

28 25 57.6

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3

γ Pegasi

h m s
0 7 0
+14 31

0.16066

1879 Dec. 12

8 1230
14.50 16590
16.60 16.59
18.75
8295 20.80
3295
23.20
23.85
24.87
31.60 33693
33.55 33.69
36.80 33.65
37.90
40.27
30324 42.20
30324
46.40
48.65 50.722
50.88 5.072
52.78 67.31
25361 57.90
361 8 33.670

0 7 4.54

9 10.4
14.2
16.6

M 59 2.00
M 59 1.88
59 1.94
14 30 70.9

30

β Arietis

h m s
1 47 57
+20 13

0.16066

1.17609
9.97238

Dec. 15

49 0.39
2.60 4748
4.75 4.75
7.00
2374 7.60
2374
13.40
15.76
17.94
20.00 22249
2217 22.25
24.40 22.30
26.67
28.90
20024 31.83
20024
35.25
37.66 37.77 39858
37.90 39.86
42.07 4461
16929 44.20
4929 49 22.275
-.005
22.270

49 0.9
2.9
4.3
5.8
213 7.4
213
49 4.26

49 43.5
45.4
46.8
48.8
2360 50.5
2360
49 47.20

49 4.26
49 47.20
+ 18.02
- 24.92
42.94

M 15 35.82
M 16 31.02
R 16 31.18
R 16 31.15
M 16 30.88
16 31.06

33

α Arietis

h m s
2 0 21
+22 53

0.16066

1.17609
9.96446
1.14049

Dec. 15

1 23.88
26.05 28264
24.19 28.26
30.53
14132 32.67
14132
37.35
39.57
41.80
44.06 46268
46.25 4627
48.40 46.18
50.67
53.00
41640 53.30
41640
57.70
1.70 4.110
4.05 4.11
6.30 9237
37055 8.60
2053 1 46.213

1 20.8
22.2
24.0
25.5
1702 27.7
2.02
1 34.04
2 12.8
19.7
21.3
22.8
1069 25.3
69
2 21.38
1 31.04
2 21.38
+ 12.17
- 35.17
47.34
1.67523
1.14049
2.81572
1.79879
8.98307
5 29 37

M 35 19.70
M 36 22.72
R 36 22.80
R 36 23.18
M 36 22.78
36 22.62 87
62.92

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47

α Ceti

h m s
2 33 34

1.176090 0.16056
+3° 37 999913
1.17522

57 1.00		56 54.8
3.10	5.170	56.5
5.20	5.17	58.5
7.25		0.2
2585 9.30		2915 1.5
2585		2915
13.40		56 58.30
15.50		
17.60		
19.60	21.702	
21.65	21.70	57 52.2
23.77	21.67	52.9
25.80		55.8
27.85		57.0
19532 29.90		2778 30.9
19532		278
31.03		57 55.56
36.07	38180	
38.20	38.18	
40.22	4335	
19090 4238		56 58.30
19090	57 21.685	57 55.56
		+ 23.38
		− 33.88
		57.26
2 56 2.83		1.76785
		1.17522
		2.93307
		1.91640
		8.98333
		5 29 49

M 51 16.02		
M 52 38.35		
R 52 38.78		
R 52 38.55		
M 52 38.35		
52 38.51		
8.249		

3 37 11.3

56

ε Eridani

h m s
3 27 14

1.17609 0.16056
−9° 52 999353
1.16962

28 17.00		28 17.4
19.00	21.040	19.4
21.00	21.04	21.4
23.10		23.4
10520 25.10		1063 24.7
520		63
27.20		28 21.26
31.40		
33.50		
35.50	37.633	
37.70	37.63	29 4.0
39.70	37.68	5.7
41.80		7.3
43.82		8.6
33870 45.78		354 9.8
33870		354
47.05		29 7.08
52.30	54.322	
54.38	54.32	
56.38	7536	
27161 58.50		28 21.26
2161	28 37.655	29 7.08
		+ 16.40
		− 29.42
		45.82
		1.66106
		1.16962
		2.83068
		1.81544
		8.98476
		5 30 54

M 20 0.40	
M 21 5.58	
R 21 5.82	
R 21 5.95	
M 21 5.78	
21 5.78	
65.38	

550

ι Eridani

0.16056

h m s
3 37 30

1.17609
−10 11 999316
1.16919

37 20.05		38 19.7
22.15	34.210	21.0
24.20	34.21	22.3
26.25		24.2
17105 28.40		1134 26.2
2105		134
42.65		38 22.68
44.75		
46.81		
48.85	51.011	
50.90	51.01	39 23.3
52.10	50.96	24.7
55.28		26.3
57.37		27.9
46910 59.40		1321 29.9
910		321
3.50		39 26.42
5.60	7.726	
7.68	7.72	
9.80	10193	
3863 12.05		38 22.68
3863	38 50.988	39 26.42
		+ 28.30
		− 35.44
		63.74
		1.80441
		1.16919
		2.97360
		1.95665
		8.98305
		5 29 36

M 38 2.45	
M 39 32.95	
39 32.95	
90.50	

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61

η Tauri

h m s
3h 40m 18s
+23° 44'

0.16056

1879 Dec. 15

41 20.50		41 10.5
22.70	24976	11.9
24.70	24.98	13.4
27.28		14.9
12488 27.50		669 16.2
2.488		164
34.00		41 13,38
36.22		
38.50		
40.68	42994	
43.00	4299	42 10.7
45.25	43.00	12.9
47.50		14.4
49.80		15.9
38695 52.00		719 18.0
38.695		2.19
52.50		42 14,38
55.30	1020	
1.00	1.02	
3.20	8600	
30510 5.60		41 13,38
510	41 42.995	42 14.38
		+ 29.62
		− 31.38
		51.00

M 111 42.32		
M 456 3.78		
R 456 3.88		
R 456 3.72		
M 456 3.52		
456 3.72		

63

β Persei

h m s
3h 46m 22s
+31° 21' 1.17609 0.16056
9.93069
1.10678

47 32.41		47 24.7
35.70	38.336	26.9
38.26	38.541	29.7
40.75		30.6
19268 43.30		1433 32.4
19.268		14.33
47.65		47 28.66
50.40		
52.75		
55.24	57589	
57.58	57.59	48 27.8
0.01	57.77	29.7
2.28		30.9
4.80		32.5
51830 7.20		1563 33.0
51.830		63
12.20		48 31.26
14.55	17004	
16.97	17.00	
19.40	11554	
8502 21.20		47 28.66
3502		47 57.680
		+ 29.02
		− 33.58
		62.60
		1.79657
		1.10678
		2.90335
		1.88919
		8.985844
		5 31 43

M 57 18.40	
M 58 35.92	
R 58 35.85	
R 58 35.98	
M 58 35.75	
58 35.88	
77.48	

584

ν Ceti

h m s
12h 23m 8?s
−15° 20'

0.16056

Shall not do.

36.05		30.0
38.08	40290	31.3
40.27	40.29	32.7
4240		34.5
20145 44.65		1651 36.4
20.145		1.51
48.90		33,020
51.10		
53.15		
55.30	57.451	
57.45	57.45	25.5
57.50	57.45	26.8
1.70		28.2
3.90		31.0
51706 6.08		1455 33.0
51.706		1.455
10.37		29.10
12.50	14618	
14.53	14.62	
16.75	114.91	
7309 18.92		3302
2309	37.450	29.10

M 18 27.45	
M 19 45.32	
R 19 45.05	
R 19 45.07	
19 45.15	
77.70	

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585

β Corvi

h m s
12 28 2
−22 44

0.16037

0.46		54.0
2.90	5078	55.8
5.00	5.08	55.1
7.28		55.7
2539 9.55		2890 1.4
2539		2890
14.05		57.80
16.18		
18.54		
20.76	23.020	
23.05	23.02	55.5
25.29	22.98	57.5
27.50		57.4
2977		0.3
20718 32.04		2956 2.4
20718		2956
36.46		59.12
38.67	40898	
40.80	4089	
43.23	4597	
20449 45.35		57.80
449	23.000	59.12

M 19 2.58
M 12 21.82
R 12 24.72
R 12 24.72
M 12 24.88
12 24.78
82.20

172

γ Virginis pr.

h m s
12 35 32
0° 47'

0.16056

32.35		22.8
34.40	36478	23.8
36.40	36.48	25.3
38.58		27.0
18239 40.63		1278 28.9
18239		278
44.72		25.56
46.78		
48.80		
50.95	53012	
53.02	53.01	15.2
55.18	52.98	16.6
5720		18.5
59.18		20.4
47711 1.28		929 22.2
47711		92.9
5.35		18.58
7.40	9.486	
9.48	9.49	
11.60	10597	
4743 13.60		25.56
4743	52.995	18.58

12 8 35.41

M 15 43.85
M 17 0.35
M 17 0.25

17 0.30
7645

0 47 81.8

174

α Virginis

h m s
12 49 30
+10° 3'

0.16056

1.17609
.999891
1.17500

50 31.20		50 21.9
33.28	35920	23.4
35.28	35.32	25.1
37.38		27.0
17660 39.46		1258 28.5
2660		258
43.65		50 25.16
45.65		
47.70		
49.81	51.867	
51.88	51.87	51 17.0
53.85	51.80	18.8
56.50		20.4
58.07		21.9
46680 0.20		1015 23.4
46680		16
4.20		51 20.90
6.20	8296	
8.28	829	
10.30	10361	
4148 12.50		50 25.16
4148	50 51.835	51 20.30

+ 26.68
− 28.46
55.14
1.74143
1.17560
2.91647
1.89840
8.98193
5 28.46

M 25 30.07
M 26 49.18
R 26 49.02
R 26 49.28

26 49.16
79.14

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176

ε Virginis

h m s
12 56 9
+ 11° 37'

0.16056

1879. Dec. 15

57 9.55		57 24.0	
11.70		25.8	
13.60		27.5	
15.80		29.6	
18.10		1382 31.3	
		382	
22.05		57 27.64	
24.50			
26.38			
28.48	30.554		
30.56	30.55	58 1.7	
32.51		3.2	
34.70		5.0	
36.80		6.5	
27499 38.75		247 8.3	
27499		247	
42.15		58 4.94	
45.25	47.378		
47.38	47.38		
49.48			
23689 51.63		57 27.64	
23689	57 30.870	58 4.94	

M 53 7.72 .
M 54 55.32 .

54 55.32
182.60

587

α Virginis

h m s
13 18 49
− 10 32

1.176090 0.16056
9.99262
1.16871

19 43.20		19 40.7
57.20	53320	42.4
53.30	5332	44.0
55.40		45.9
26660 57.50		2208 47.8
1660		208
1.75		19 44.16
3.80		
6.00		
8.00	10087	
10.05	1006	20 38.2
12.05	10.50	39.9
14.25		41.4
16.35		43.2
9078 18.50		2077 44.9
9078		77
22.70		20 43.54
24.80	26896	
26.90	26.89	
28.90	14021	
13448 31.18		19 44.16
13448	20 10.095	20 41.54

+ 25.94
− 31.44
57.38

13 18 52.60

1.758776
1.168771
2.927547
1.916114
8.998677
5 33 52

M 59 58.38.
M 1 20.82.

1 20.82
8244

10 32 57.5

198

β Ser. Bor.

h m s
14 37 8

0.16036

+ 14° 40'

M 51	21.68.
M 51	42.15.
M 51	57.38.
M 52	16.68.
M 52	29.20.
M 52	39.60.
M 52	51.70.

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1879phae.proj.15307

200

β Librae

h m s
15 10 30
° ′
−8 36

1.17609 0.16056
9.99470
1.17079

11	22.25		11	22.8	
	31.20	33356		25.4	
	38.28	3336		27.0	
	35.45			23.5	
16678	37.60		1346	29.9	
	16678			346	
	41.66		11	2692	
	43.78				
	45.50				
	47.97	50023			
	50.02	50.02	12	19.4	
	52.12	50.06		20.7	
	54.18			22.5	
	56.25			24.2	
15021	58.35		1130	26.0	
	45021			930	
	2.60		12	22.60	
	4.70	6766			
	6.75	676			
	8.80	10612			
3383	10.88		11	26.92	
	3383	11 50.040	12	22.60	
			+	23.12	
			−	32.56	
				55.68	
			1.744570		
			1.17079		
			2.91649		
			1.90184		
			8.98535		
			5 31 21		

M	21	25.10	
M	25	45.52	
R	25	45.08	
R	25	44.95	
M	25	45.12	
	25	45.17	
		79.77	

212

α Serpentis

h m s
15 38 18
° ′
+6 48

1.17609 0.16056
9.99693
1.17302

39	17.52		39	11.5	
	19.33	21946		13.0	
	21.85	21.95		14.8	
	24.05			16.4	
10973	26.08		739	18.2	
	973			239	
	30.26		39	1478	
	32.30				
	34.35				
	36.55	38.523			
	38.57	38.52	40	13.4	
	40.57	38.55		14.7	
	42.65			16.4	
	44.68			17.7	
34671	46.78		820	19.8	
	34671			320	
	51.00		40	16.40	
	52.10	55154			
	53.20	55.15			
	57.20	7710			
92577	57.27		39	14.78	
	2577		39	38.535	40 16.40
					+ 23.76
					− 37.86
					6.162
					1.78972
					1.17302
					2.96274
					1.94027
					8.97753
					5 25 28

M	40	23.85	
M	41	51.05	
R	41	51.02	
R	41	51.10	
M	41	50.82	
	41	51.00	
		87.15	

15 38 21.15

6 48 10.9

596

α Scorpii

h m s
16 21 39
° ′
−26 10

1.17609 0.16056
9.95304

22	56.45		22	48.8	
	58.66	1000		50.5	
	0.55	1.00		52.6	
	3.30			54.5	
30500	5.64		2731	56.7	
	500			131	
	10.20		22	5162	
	12.55				
	14.76				
	17.00	19318			
	19.30	19.32	23	58.2	
	21.55	19.37		57.8	
	24.05			57.6	
	26.07			1.6	
17386	28.40		2985	3.3	
	17386			2985	
	32.20		23	59.70	
	33.45	33736			
	37.70	3774			
	40.00	3874			
18868	42.33		22	5462	
	18868	23 19.345	23	59.70	
			+	24.72	
			−	40.36	
				65.08	
			1.81345		

16 22 2.86

M	36	35.98	
M	37	2.65	
R	37	2.65	
R	37	2.78	
M	37	2.88	
	37	2.74	

26 9 50.7

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3

Sun ☉ = 46,723

h m s
17 35 44
−23° 20′

1879 Dec-15-16

33

α Aquilæ

h m s
2 0 21
+22° 53′ 9.964440
1.14049

Dec-16

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S

Sun. c = 46.723

$17^h\ 40^m\ 10^s$

$-23°\ 23'$

0.16056

1879 Dec-16-17

		39	—		41	2.9	42	6.05		41	24.8
			—			4.3		8.23	10,536		26.6
			–			5.6		10.58	10,54		27.9
			—			6.7		12.82			29.6
			—		287	9.2	5268	15.00		1399	31.0
						287		5268			399
			—		41	5.74		19.50		41	27.98
			—					21.86			
			—					24.05			
			—					26.30	28,604		
			—					28.60	28.60		
			—					30.90	28.61		
-4.50	6.50	19.25	11.00					33.20			
6.76	6.35	6.416	13.10					35.38			
9.00	6.40		15.40				25744	37.65			
								25744			
13.44	6.51	32.47	20.00					42.05			
15.73	6.57	6.492	22.30	24480				44.27	46680		
17.49	6.57		24.50	2448				46.70	46.68		
20.23	6.47		26.70					49.00	5722		
22.55	6.382	2240	28.90		41	57.40	23340	57.38		41	27.98
			2240					23340	42 28.605	+ 1	0.62
6.455											
6.465											

M 33 47.05

M 6 55.30

30

β Arietis

$1^h\ 47^m\ 57^s$

$+20°\ 13'$

0.16056

Dec. 17

48	53.32		48	45.0
	55.50	57702		46.6
	57.65	57.70		48.2
	59.97			49.7
28851	2.07		2409	51.4
	28851			2409
	6.50		48	48.18
	8.72			
	10.90			
	13.00	15,291		
	15.30	15.29	49	33.3
	17.50	15.30		35.5
	19.70			37.6
	21.90			39.0
13762	24.10		1861	40.7
	13762			1861
	28.40		49	37.22
	30.65	32,900		
	32.90	32.90		
	35.20	15060		
16450	37.35		48	48.18
	1450	49 15.295	49	37.22
			+	27.12
			−	21.92
				49.04

M 15 21.32

M 15 27.50

R 15 27.58

R 15 27.60

M 15 27.15

15 27.143

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33 | 198 | 47

α Arietis

h m s
2 0 21
° '
+22 53

1.17609 0.16056
9.96440
1.14049

1879
Dec. 17

1	16.87		1 7.3
	19.00	21.400	8.7
	21.48	21.40	10.5
	23.70		11.9
10700	25.95		524 14.0
	700		524
	30.40		1 10.48
	32.66		
	34.88		
	37.00	39.350	
	39.28	39.35	2 8.0
	41.66	39.30	9.9
	43.90		11.5
	46.07		13.2
35415	48.30		579 15.3
	35415		579
	52.78		2 11.58
	54.88	57.204	
	57.20	57.20	
	59.48	7860	
28602	1.68		1 10.48
	28602	1 39.325	2 11.58
			+ 28.84
			− 32.26
			61.10

2 0 26.89

1.78604
1.14049
2.92653
1.91403
8.98750
5 32 59

M 34 57.52
M 36 19.48
R 36 19.60
R 36 19.68
M 36 19.50
36 19.56
82.04

22 53 53.1

β Urs. Min. L. C.

h m s
14 51 5
° '
+105 20

0.16056

50	50.75		50 27.5	51 44.5	
	58.62	6.230	31.7	49.6	
	5.63	6.23	37.2	53.6	
	14.27		45.3	1.4	
33115	21.88		1927 51.0	2781 9.0	
	3115		1947	2781	
	37.68		50 38.94	51 55.62	
	46.50				
	53.18				
	0.70	8.877			
	8.65	8.54	52 24.9	53 9.1	
	16.35	8.56	31.2	16.6	
	24.35		37.1	23.4	
	32.52		44.4	30.8	
61689	39.96		1871 49.5	1164 36.5	
	7989		1871	1164	
	55.18		52 37.42	53 23.28	
	3.30	10.902			
	10.85	10.90			
	18.80	17.13			
35451	26.38		53 46.1	51 55.62	
	5451	52 8.550	52.5	53 23.28	
			58.7	+ 12.93	
			5.7	−1 14.73	
			2933 10.3	87.66	
			2933		
			53 58.66		

M 11 53.08
M 10 21.88
M 10 6.38
M 9 49.60
M 9 36.52

α Ceti

h m s
2 55 57
° '
+3 37

0.16056

1.17609
9.99913
1.17522

56	54.18		56 47.1
	56.22	58.270	48.9
	58.30	58.27	50.5
	0.30		52.0
29135	2.35		2521 53.6
	29135		21
	6.60		56 50.42
	8.62		
	10.70		
	12.75	14.824	
	14.75	14.82	57 31.7
	17.00	14.85	33.3
	19.00		34.7
	21.00		36.2
13343	23.00		1745 38.6
	13342		245
	27.30		57 34.90
	29.35	31.440	
	31.40	31.41	
3334	33.65	14971	
15720	35.50		56 50.42
	720	57 14.835	57 34.90
		.055	+ 24.42
		14.780	− 20.06
			44.48

2 56 23.2

~~1.80632~~ 1.64 816
1.17522 ~~82~~ ~~338~~
~~2.98154~~ 2.82 338
1.80632 8.98 294
~~8.82478~~
~~3 49 18~~ ~~5.24~~ 5 29

M 51 13.22
M 52 17.28
R 52 17.48
R 52 17.45
M 52 16.75
52 17.24
64.02

3 37 11.1

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1879phae.proj.0007

56

ε Eridani

h m s
3 27 14
−9° 1.17609 0.16056
82 999353
1.16962

| | | |

1879phae.proj.1507

63

ζ Persei

h m s
3 46 32

° ′
+31 31

1879 Dec. 17

1.17609 0.16057
9.99069
1.10678

47 26.60
33.97 31410
31.40 3141
33.86
15705 36.22
7.05
41.00
42.55
46.03
48.40 50804
50.80 50.80
52.20 50.78
53.70
58.06
45724 0.50
45724
5.30
7.70 10150
10.15 10.15
12.60 10156
15.00
5075
5.075 47 50.790

47 16.2
18.0
19.7
21.1
983 23.3
983
47 19.66
48 11.5
13.0
15.4
16.9
761 17.3
261
48 15.22
47 19.66

48 15.22
+ 31.13
− 24.43
55.56
1.74476
1.10678
2.85154
1.83556
8.98402
5 30.20

582

ε Corvi

h m s
12 3 54

° ′
−21 57

1.17609 0.16057
9.96732
1.14341

4 46.50
48.85 51106
51.18 51.10
53.80
55.70
25553 58.70
583
0.00
2.00
4.30
6.55 8798
8.80 8.79
11.18 8.84
13.80
15.40
7918 17.65
7918
22.05
24.57 26570
26.63 26.59
28.70 13769
13295 31.80
3295 5 8.815

4 36.8
38.6
40.0
41.5
2001 43.2
01
4 40.02
5 34.7
36.2
38.7
40.1
1915 41.8
415
5 38.30
4 40.02

5 38.30
+ 28.80
− 29.48
58.28
1.76552
1.14341
2.90893

584

S Corvi

h m s
12 23 37

° ′
−15 50

1.17609 0.16056
9.98320
1.15929

24 29.57
31.50 33858
33.77 33.85
35.93
16923 38.16
1923
42.38
44.60
46.67
48.95 51.019
50.90 51.02
53.30 50.96
55.17
57.50
45917 59.70
917
3.80
6.50 8.088
8.12 8.08
10.12 10193
4044 12.40
4044 24 50.980

24 20.2
21.7
24.1
25.8
1192 27.4
192
24 23.84
25 21.2
23.7
25.0
27.0
1267 29.8
267
25 25.34
24 23.84
25 25.31
+ 27.14
− 34.36
61.50
1.78888
1.15929
2.94817
1.92716
8.97899
5 26.33

M 57 15.82.
M 58 21.32.
R 58 24.22.
R 58 24.42.
M 58 24.25.
58 24.30
68.48

M 24 3.10.
M 20 21.75.
R 20 21.82.
R 20 21.68.
M 20 21.60.
20 21.71

M 18 17.75.
M 19 42.48.
R 19 42.18.
R 19 42.28.
19 42.31
8.56

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585

β Corvi

h m s
12 28 2
−22° 44′ 1.17609 0.16056
9.99648
1.14097

28 54.03		28 45.0	
56.32	58576	46.5	
57.67	58.58	48.3	
0.86		51.0	
29288 3.00		2418 52.0	
29288		418	
7.60		28 48.36	
9.87			
12.00			
14.30	16486		
16.40	16.48	29 46.8	
18.60	16.43	48.5	
20.50		50.2	
23.20		51.8	
14837 25.30		2509 52.6	
14837		09	
29.80		29 50.18	
32.06	34284		
34.38	3428		
36.40	15286		
17142 38.78		28 48.36	
2142	29 16.455	29 50.18	
		+ 28.10	
		− 33.72	
		61.82	
		1.79113	
		1.14097	
		2.93210	
		1.91413	
		8.98203	
		5 28 50	

M 10 51.72.
M 12 13.72.
R 12 13.78.
R 12 14.00.
M 12 13.62.
12 13.78
82.06

172

γ Virginis

h m s
12 35 32
−0° 47′ 1.17609 0.16056
9.99996
1.17605

36 25.52		36 20.7	
28.10	30104	22.6	
30.00	30.10	24.5	
32.15		25.6	
15052 34.35		1207 27.3	
052		207	
38.30		36 24.14	
40.35			
42.50			
44.60	46617		
46.57	4668	37 11.5	
48.60	46.64	13.4	
50.83		15.5	
53.00		17.0	
42015 55.80		759 18.5	
41955		259	
58.30		37 15.18	
1.00	3176		
3.28	3.18		
5.80	93.28		
31588 7.40		36 24.14	
1588		36 46.660	37 15.18
			+ 22.52
			− 28.52
			51.04
			1.70791
			1.17605
			2.88396
			1.86177
			8.97781
			5 25 40

M 15 47.68.
M 17 0.50.
R 17 0.30.
R 17 0.52.
M 17 0.38.
17 0.42
72.74

174

δ Virginis 0.16054

h m s
12 49 30
+4° 3′ 1.17609
9.99891
1.17500

50 24.72		50 17.5	
26.33	28880	19.1	
28.85	28.88	21.0	208
31.00		22.4	
14440 33.00		1038 23.8	
4440		38	
37.20		50 20.76	
39.27			
41.30			
43.33	45474		
45.45	45.47	51 14.1	
47.17	45.48	16.2	
49.65		18.1	
51.70		19.6	
40927 53.60		892 21.2	
40927		392	
55.75		51 17.84	
0.10	2094		
2.26	2.09		
4.10	9697		
31047 6.26		50 20.76	
1047	50 45.475	51 17.84	
		+ 24.72	
		− 32.36	
		57.08	
		1.75648	
		1.17500	
		2.93148	
		1.91829	
		8.98681	
		5 32 27	

M 25 30.15.
M 26 52.95.
R 26 52.88.
R 26 52.95.
M 26 53.22.
26 53.00
82.85

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176

ε Virginis

h m s
12 56 9
+ 11 ° ' 37

0.16066

1879 Dec. 17

57	2.18		56	53.3
	5.30	7.390		55.6
	7.32	7.39		55.2
	9.50			0.9
3695	11.65		2893	2.0
	3695			2893
	15.87		56	54.86
	17.90			
	20.00			
	22.27	24244		
	24.23	24.24	57	52.4
	26.38	24.20		54.0
	28.40			56.2
	30.50			57.5
21820	32.65		2793	59.2
	21820			293
	36.83		57	55.86
	38.90	41.010		
	40.95	41.01		
	43.00	4840		
20505	45.37		56	57.86
	505	57 24,220	57	55.86
			+	26.36
			−	31.64
				58.08

M 52 29.10.
M 53 49.90.

198

β Ursae Min.

h m s
14 51 8
+ 74 ° ' 40

0.16056

R 51 25.18.
R 51 53.60.
R 51 36.68. Prob. 52
R 51 54.82.

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1879phae.proj.1507

8

Sun e = 46,723

h m s
17 44 36
−23° 24'

0.16056

Dec-17—18

44	6.90			45	30.0	46	22.45			45	51.2			48	42.4
	9.00	11.210			32.0		31.60	33.866			53.0				43.7
	11.00	11.21			33.7		33.98	33.87			54.9				45.3
	13.35				35.1		36.00				56.4				46.8
5605	15.80			1676	36.8	16933	37.30			2737	58.2			2267	48.5
	5605				176		16933				237				267
	20.40			45	36.52		42.70			45	54.7440				48 45.34
	22.55						45.20								
	24.70						47.75								
	26.80	29.290					49.60	51.986							
	29.10	29.29					51.80	51.98							
	31.78	29.26					54.27	51.94							
	34.00						56.68								
	36.00						58.95								
26361	38.28					46787	0.62								
	26361						46787								
	42.60						5.36								
	46.10	47.326					7.90	10.020							
	47.40	4732					9.97	10.02							
	49.68	58 53					12.38	10389							
23663	51.85			45	33.52	5016	14.55			45	54.74				
	23663	41 29.275	− 1 4.24				5010	46 51.960	+ 57.22						

48	49.40			48	42.4										
	51.80	54.074			43.7										
	54.05	54.07			45.3										
	56.25				46.8										
27037	58.37			2267	48.5										
	2037				267										
	2.70				48 45.34										
	5.00														
	7.28														
	9.53	11.678													
	11.75	11.68		49	31.8										
	13.80	11.72			34.0										
	16.05				35.7										
	18.37				37.3										
10510	20.40			1781	38.3										
	10510				281										
	25.00			49	35.62										
	27.20	29380													
	29.35	29.38													
	31.53	143 45													
14690	33.80			48 45.34											
	4690	49 11.700		49 35.62											
				+ 2636											
				− 23.92											
				50.28											
				1.701140											
				1.148447											
				2.849587											
				1.832276											
				8.982891											
				5 29 29											

M 35 37.75

M 8 53.22

M	15	21.30
M	16	29.38
R	16	29.35
R	16	29.35
M	16	29.28
	16	29.34
		68.01

30

B Ariet.

h m s
1 47 37

+20° 13'

1.17609
9.97238
1.14847

0.16056

Dec-18.

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1879phae.proj.1507

33

d Aquilæ

h m s
2 0 21
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+22 53

1.17609
9.96440
1.14049

1879 Dec. 18

1	13.50			1	12.0														
	15.65	17.886			14.4														
	17.40	17.89			16.5														
	20.08				18.3														
8943	22.80			816	20.4														
	3943				316														
	26.67			1	16.32														
	28.80																		
	31.22																		
	33.37	35.655																	
	35.78	35.66		2	2.0														
	38.05	35.75			3.7														
	40.05				5.6														
	42.38				7.7														
32092	44.60			290	10.0														
	32092				290														
	47.20			2	5.80														
	52.45	53.618																	
	52.58	53.62																	
	53.80	7151																	
26809	55.06			1	16.32														
	1809	1 35.705		2	5.80														
				+	19.38														
				−	30.10														
					50,28														
	2 0 26.39				1.70140														
					1.14049														
					2,84189														
					1.82178														
					8.97989														
					5 27 14														

M	35	10.12.																	
M	36	16.65																	
R	36	16.45																	
R	36	16.35																	
M	36	16.38																	
	36	16.46																	
		66.34																	

22 68 53.1

198

N.C

B Ceti. Mir. H.C.

h m s
14 51 5
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+103 20

0.16056

50	47.65					49	52.9	50	34.0	51	8.5								
	55.60	3366					57.8		38.2		12.0								
	3.00	3.37					3.3		40.5		14.8								
	11.38						6.6		45.0		18.7								
31683	17.20					3133	12.7	2115	53.85	812	21.2								
	1683					8266	133		2117		812								
	34.05					50	2.66	50	42.30	51	16.24								
	42.15																		
	49.15																		
	57.65	53.78																	
	5.50	5.38				51	34.5	52	11.4	52	44.0								
	13.30	5.47					38.2		15.7		47.9								
	20.87						42.7		17.2		53.4								
	28.40						48.2		25.1		0.9								
58840	36.70					2168	53.2	1031	31.7	2735	5.3								
	4840					9336	2168		1031		2735								
	52.30					51	43.36	52	20.62	52	54.70								
	59.67	7.684																	
	7.30	7.58																	
	15.50	7.695																	
33792	23.15		25 443			53	16.7	54	6.4	51	16.24								
	3792		5X 5.425				22.0			52	54.70								
			5.053				29.9			−	10.80								
							34.0			−	49.26								
						1463	43.7				60.06								
						2526	1463												
							53 29.26												

M	11	11.50																	
M	H	55.80	Knob 10																
M	H	42.75																	
M	H	32.02																	
		1552																	
		3.68																	
9		50.15																	
		35.62																	

8 37 11.0

47

d Cetæ

h m s
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+3 37

1.17609
9.99913
1.17522

0.16056

0.16056

56	50.60																	56	43.3
	52.56	54706																	44.8
	54.67	54.70																	46.7
	56.80																		48.0
27353	58.90																	2326	49.8
	2353																		326
	2.98																	56	4652
	5.00																		
	7.07																		
	9.22	11.271																	
	11.38	11.27																57	36.2
	13.38	11.20																	38.0
	15.38																		40.1
	17.50																		41.9
10144	19.60																	1999	43.7
	10144																		499
	23.65																	57	3998
	25.70	27710																	
	27.70	27.71																	
	29.70	142.41																	
13855	31.90																	56	416.52
	13855	57 11.235																57	39.58
																		+	24.72
																		−	28.74
																			53.46
2 56 2.82																			1.72503
																			1.17522
																			2.90325
																			1.88610
																			8.98285
																			6 29 27

M	51	11.65																	
M	52	28.35																	
R	52	28.65																	
R	52	28.65																	
M	52	28.68																	
	52	28.58																	
		76.93																	

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56

ε Eridani

h m s
3 27 14
−9° ′ 1.17609 0.16056
52 9.99353
1.16962

28 6.28		27 56.5		38 17.70	
8.30	10.506	57.9		21.78	23.896
10.60	10.50	57.5		24.00	23.89
12.65		1.0		26.00	
52 53 14.70		2971 2.2		11948 28.00	
52 53		2971		19 48	
18.58		27 59.42		32.05	
21.00				34.25	
23.10				36.43	
25.25	27.321			38.60	40.622
27.25	27.32	28 54.8		40.67	40.64
29.48	27.21	56.7		42.78	40.63
31.55		58.0		44.80	
33.55		59.7		46.92	
24589 35.80		2904 1.2		36560 49.00	
24589		2904		36560	
37.78		28 58.080		53.17	
41.78	43.932			55.33	57.380
43.92	43.93			57.40	57.38
46.00	54.43			59.40	81.27
21966 48.18		27 59.42		28690 1.60	
1966	28 27.265	28 58.08		28690	38 40.635
		+ 27.84			
		− 30.82			
		58.66			
		1.76834			
		1.16962			
		2.93796			
		1.92080			
		8.98284			
		5 29 27			

38 9.4		41 10.05	
10.9		12.38	1.4566
12.2		14.56	14.57
13.7		16.80	
614 15.2		7283 19.04	
614		2283	
38 12.28		23.50	
		25.75	
		28.00	
39 8.7		30.24	32.531
10.4		32.57	32.53
11.6		34.77	32.56
13.7		37.00	
599 15.5		39.35	
599		29278 41.60	
39 11.98		29278	
		46.05	
		48.35	50.562
		50.53	50.56
		52.78	6.513
38 12.28		25281 55.10	
39 11.98		281	4 32.545
+ 28.36			
− 31.34			
59.70			

41 5.7			
6.6			
8.4			
10.5			
439 12.7			
439			
41 8.78			
41 57.2			
59.3			
1.2			
2.8			
3047 4.2			
47			
42 0.94			
41 8.78			
42 0.911			
~~36.24~~	+ 23.76		
~~12840~~	− 28.40		
~~12464~~	52.16		
1.71734			
1.13771			
2.85505			
1.84603			
8.99098			
5 35.38			

M 19 39.28
M 21 2.75
R 21 2.45
R 21 2.45
M 21 2.80
21 2.61
8.33

M 38 56.48
M 39 21.58

M 44 48.72
M 45 58.55
R 45 59.08
R 45 58.92
M 45 58.92
45 58.87
70.15

550

δ Eridani

h m s
3 37 30
−10° ′ 11
0.16056

61

η Tauri

h m s
3 40 18
+23° ′ 1.17609 0.16056
44 9.96162
1.13771

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1879phae.proj.1507

63

ζ Persei

3 46 32
+31 31 1.17609 0.16056
1879 9.93069
1.10678
Dec. 18

47	22.45			47	11.6			4	37.18			4	37.5		
	25.40	27.800			12.9				37.50	41.596			39.7		
	27.83	27.80			14.5				41.53	41.59			41.2		
	30.22				16.0				43.70				42.7		
13900	32.60			728	17.8			20798	46.05			2051	44.0		
	39.00				22.8				798				51		
	37.50			47	14.56				50.35			4	41.02		
	40.00								52.50						
	42.30								53.10						
	44.74	47.210							57.20	59.320					
	47.24	47.21		48	14.8				59.28	59.32		5	30.8		
	49.68	47.14			16.8				1.57	59.36			32.7		
	52.05				18.5				2.80				35.1		
	54.48				19.9				5.58				37.0		
42489	56.90			922	22.1			53388	8.20			1740	38.3		
	42489				921				53388				240		
	1.60			48	1.42				13.00			5	34.80		
	4.00	6.484							15.10	17.142					
	6.57	6.48							17.00	17.14					
	8.50	9.428							19.16	11873					
3242	11.85			47	14.56			8571	21.45			4	41.02		
	3242	47 47.175		48	18.441				8571	4 59.340		5	34.80		
				+	32.62							+	18.32		
				−	31.26							−	35.46		
					6388								53.78		
				1.80536								1.73062			
				1.10678								1.14341			
				2.91214								2.87403			
				1.89642								1.87373			
				8.98428								8.99970			
				5 30 32								5 42 24			

M	57	13.85		M	24	15.48		M	18	17.60					
M	58	32.30		M	25	30.12		M	19	37.18					
R	58	32.78		R	25	30.25		R	19	36.95					
R	58	32.45		R	25	30.40		R	19	37.00					
M	58	32.98		M	25	30.25									
	58	32.63			25	30.25			19	37.04					
		78.78				74.77				79.44					

582

ε Corvi

4 m 8
12 03 54 1.17609 0.16056
−21° 57 9.96732
1.14341
Dec. 20

584

δ Corvi

0.16056

h m s
12 23 37 1.17609
−15° 50 9.98320
1.15929

24	20.00			24	12.0										
	22.00	24.190			14.4										
	24.00	24.19			16.7										
	26.45				18.4										
12095	28.50			718	20.3										
	2095				218										
	32.70			24	16.36										
	35.00														
	37.50														
	39.20	41.339													
	41.30	41.34		25	2.4										
	43.50	41.34			4.8										
	45.62				7.7										
	47.90				10.4										
37205	49.83			680	12.7										
	1205				680										
	54.20			25	13.60										
	56.28	58.496													
	58.55	58.49													
	60.65	82.68													
29248	2.80			24	14.36										
	29248	24 41.340		25	13.60										
				+	26.98										
				−	32.26										
					59.24										
				1.77262											
				1.15929											
				2.93191											
				1.90004											
				8.96813											
				5 18 32											

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1879phae..proj..1567

172 γ Virginis

h m s
12 35 32
° ′
−0 47

0.16056

				26 —		36 34.4				
				—		37.0				
				—		39.3				
				—		41.0				
				—		1941 42.4				
						441				
+	8.25	36.87	331.20	28.62		36 38.82				
	6.19	36.87	36.60	30.68						
	4.12	36.92		32.80						
	2.04	36.94		34.90	36806					
−	0.80	36.50		36.50	3680	37 9.0				
	2.06	36.34		38.60		11.4				
	4.13	36.97		40.60		13.5				
	6.19	37.21		42.40		15.5				
	8.27	36.83	125	45.15		673 17.9				
				33125		673				
	12.36	36.92	185.20	49.30		37 13.46				
	14.44	37.16	37.04	51.60	53560					
	16.31	37.09		53.60	5356					
	18.37	37.03		55.60						
	−20.70	37.07	6780	57.70		36 3882				
				1780		37 13.46				

36.920
36.886

12 35 35.51

174 δ Virginis

h m s
12 49 30
° ′
+4 3

1.17609 0.16056
9.99891
1.17500

				50 14.70		50 7.0				
				16.90	1.9030	8.7				
				19.00	19.03	10.8				
				21.30		12.6				
				9515 22.25		535 14.4				
				4515		535				
				27.68		50 1.070				
				29.88						
				31.74						
				33.72	3.5747					
				35.50	35.75	51 2.4				
				37.70	35.66	4.2				
				39.70		6.2				
				41.70		8.0				
				32172 43.80		308 10.0				
				32172		308				
				48.80		51 6.16				
				50.28	52.304					
				52.40	52.30					
				54.36	7133					
				26152 56.48		50 10.70				
				1152	5035,705	51 6.16				
						+ 25.00				
						− 30.46				
						55.46				
						1.74398				
						1.17500				
						2.91898				
						1.91256				
						8.99388				
						5 37 52				

176 ε Virginis

h m s
12 56 9
° ′
+11 37

1.17609 0.16056
9.99101
1.16710

				56 53.65		56 49.5				
				55.30	57.660	51.7				
				57.60	57.66	54.0				
				59.75		54.9				
				28830 1.80		2673 57.2				
				28830		173				
				6.05		56 53.46				
				8.17						
				10.20						
				12.30	14.428					
				14.42	14.43	57 42.7				
				16.52	14.44	45.1				
				18.57		46.9				
				20.72		48.4				
				12985 22.90		2340 50.9				
				12985		340				
				27.00		57 46.80				
				29.15	31.230					
				31.15	31.23					
				33.30	14889					
				15615 35.35		56 53.46				
				615		57 14.435	57 46.80			
							+ 20.98			
							− 32.36			
							53.34			
							1.72706			
							1.16710			
							2.89416			
							1.87760			
							8.98345			
							5 29 54			

M 16 22.62
M 17 13.02
R 17 13.10
R 17 12.90
M 17 12.72
17 12.93

0 47 32.6

M 25 28.18
M 26 49.80
R 26 50.08
R 26 50.10
M 26 50.02
26 50.00
81.82

M 52 34.85
M 53 50.28
R 53 50.30

53 50.29
75.44

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1879phae.proj.1507

182

η Bootis

h m s
13 48 53
° '
+19 00

0,166056

1879 Dec. 20

S

Sun. C = 46,646

h m s
17 57 53
° '
−23 27

0,166056

Dec. 20 - 21

49	—		—			57 16.92			58 41.2	59 39.40			59 33	
	—		—			19.03	2.1210		42.8	41.82	44006		53	
	—		—			21.15	21.21		44.4	43.93	44.00		8.8	
	—		—			23.35			45.8	46.30			10.8	
	—		—			10605 25.50			2220 47.82	22003 48.58			399 11.7	
						605			220	2003			399	
	—					21.53			58 44.40	53.00			59 7.98	
16.55	.40	271	53.85			32.60				55.32				
7.36	.41	338	36.05			34.90				57.38				
2.16	.44		38.21			37.00	39.488			59.75	1.997			
0.00	.35		0.35	50	33.3	32.60	39.49			2.05	1.99			
2.18	.32		2.50		35.6	41.95	39.37			4.07	1.99			
4.37	.31		4.68		37.6	44.15				6.60				
6.55	.22		6.77		39.4	46.00				8.90				
8.74	.26		9.00	18667	40.8	33539 48.64			55797	10.90				
				1867		5539				1797				
.209	.31	1.63	13.40	50	37.34	5285				15.35				
13.27	.33	.326	15.60	17780		5500	57.530			17.58	19.998			
17.46	.19		17.65	1778		57.30	57.53			20.10	19.99			
19.64	.31		17.75			0.00	7874			22.28	12399			
21.89	.49	8890	22.30		37.33	28765 2.00			58 44.40	9999 24.68			59 7.98	
			3.890			28765	57 39.430	−1	4.97	9999	0	1.990	+ 54.01	

.332
.334

13 48 58.61

R 30 24.00.
R 30 24.45.

M 38 18.95

M 11 34.90

30 24.22
18 57 48.2

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30

β Arietis

h m s
1 47 57
+20° 13′

Dec. 21

48 41.25
43.32 45.726
45.90 45.72
48.08
22863 50.08
2863
54.40
56.65
58.80
0.95
3.25 3.28
5.38 3.22
7.60
9.70
58953 12.10
3
16.30
18.57 20730
20.70 20.73
22.80 12645
10365 25.28
365 49 3.250

0.16056

+8.74 59.44 535.83
6.60 59.60 59.536
4.29 59.29
2.17 59.35
−0.00 59.42
2.19 59.36
4.40 59.60
6.60 59.68
8.81 60.04

48 59.516

30

β Arietis

h m s
1 47 57
+20° 13′

Dec 23

48 —
—
—
—
—
50.65
53.07
55.00
57.18 59.531
59.42 59.53
1.55
4.00
6.08
53578 8.90
53578
—
—
—
—
—

49 20.8
22.7
26.2
27.5
1262 29.0
262
49 25.240

49 25.24

0.16056

+8.96 23.46 211.62
6.72 23.62 23.513
4.47 23.47
2.22 23.42
−0.00 23.55
2.21 23.57
4.48 23.52
6.72 23.56
8.97 23.43

1 23.569

2 0 26.35

33

α Arietis

h m s
2 0 21
+22° 53′

Dec. 23

1 —
—
—
—
—
14.50
16.90
19.00
21.20 23.517
23.55 23.52
25.80
28.00
30.30
21165 32.40
21165
—
—
—
—
—

0 56.3
58.3
0.7
2.3
3015 3.9
15
1 0.30

1 0.30

0.16056

A only

M 16 33.75
M 16 33.68

16 33.71

M 35 6.35
M 35 6.58

35 6.46
22 53 53.0

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1879phae.proj.1507

176

E Virginis

h m s
12 56 9
+ 11° 37'

0,16856

1879 Dec. 25

S

Sun C = 46,589

h m s
18 20 7
− 23° 22'

0,16056

Dec. 25 – 26

56 44.05		57 46.3	19 19.92		20 36.9	21 42.60		21 2.0			
46.28	48366		22.22	24428	39.0	45.00	47.100	4.5			
47.50	48.37		24.62	24.28	40.9	47.00	47.10	7.5			
50.48			26.68		43.6	49.00		9.3			
24183 52.52			1214 28.70		2057 45.3	3550 51.90		346 11.3			
4183			2214		57	3550		346			
56.37			33.57		20 41.14	56.08		21 6.92			
57.00			35.85			58.22					
1.00			38.10			0.85					
3.10	5157		40.40	42.552		2.15	5167				
5.22	5.16		42.80	42.55		5.20	517				
7.22	5.16		44.85	42.43		7.40	5.08				
9.50			46.90			9.80					
11.50			48.95			11.85					
58641 1360			38297 51.55			58650 1395					
4641			38297			4650					
17.63			56.08			18.43					
20.00	21954		58.34	0.576		20.67	23074				
22.00	21.95		0.70	0.58		23.20	23.07				
24.07	18032		2.76	82486		25.40	13017				
10977 26.07			362.88 5.80		20 41.14	11537 27.67		21 692			
977	57 5.160		288	19 42.490 − 5865		1537	225.125 + 58.20				

M 54 9.82.

M 33 33.08

M 6 50.18

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3

γ Pegasi

h m s
0 7 0
+14 31

0.16056

Dec. 26

7 34.56
36.75 38.642
33.35 38.64
40.57
19321 42.78
4321
47.20
42.00
37.27
33.29 55.582
33.65 55.58
37.55 55.60
0.06
2.02
50024 4.20
50024
8.40
10.55 14.560
12.20 12.56
14.85 11.20
6280 16.80
6280 7 55.590

0 7 9.39

M 58 49.95.

14 40 0.1

33

α Arietis

h m s
2 0 21
+22 53

0.16056

Dec. 27

0 52.40
53.80 57.170
52.17 57.17
52.56
28585 1.72
3555
6.30
8.50
10.85
13.01 15.234
15.20 15.24
17.35 15.14
19.63
21.98
13715 24.30
13711
26.52
30.80 33.110
33.25 33.11
35.30 15.028
16555 37.68
1555 1 15.190

2 0 26.82

M 35 1.30.

22 58 58.0

0 45.5
47.8
50.1

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1879phae.proj.1507

8

Sun C=46663

h m s
18 33 25
° ′
−23 14

0.16056

1879 Dec. 28-29

33

2 Arietis

h m s
2 0 21
+22 53 9.96440

0.16056
1.17609
1.140419

Dec. 29.

32 30.50			33 40.2	34 —			34 33.7		0 46.24			0 35.2			
32.45	34.684		42.0	—			35.9		48.41	50.670		37.0			
34.72	34.68		43.7	—			38.0		50.70	50.67		38.8			
37.00			45.3	—			39.5		53.00			41.0			
17342 39.25			2191 47.9	14.67 1.20	+13.47	14.67	1886 41.5		25335 55.00			1944 42.4			
2.342			1.91	14.67.			3.86		3.35			4.44			
42.71			23 43.82	133.04 5.70	+8.98	14.68	34 37.72		57.80			0 38.88			
45.74				14.787 8.05	6.74	14.79			1.95						
48.05				10.48	4.49	14.97			4.08						
50.50	52.656			12.50	2.22 14.791	14.72			6.35	8.608					
52.77	52.65			14.60	−5.69 14.79	14.60			8.57	8.61		1 39.6			
55.00	52.641			16.90	−2.24	14.66			10.82	8.57		42.0			
57.00				19.34	4.99	14.85			13.00			44.5			
59.48				21.65	6.74	14.91			15.30			46.5			
47390 1.65			13312 23.90		8.99	14.91			61747 17.60			2210 48.4			
47390			4312						7747			2.10			
6.00				74.58 28.30	13.47	14.83			22.03			1 44.20			
8.45	10.606			14.916 30.80	3.49 16 15.08				24.28	2.6478					
10.68	10.60			32.90	32.88	19.93			26.43	26.48					
12.70	10.528			35.10	20.21	14.79			28.65	1.3715					
5303 15.20			33 4382 16438	37.58	23.53	15.05	34 37.72		13239 31.00			0 38.88			
5303	32 52.645 +	51.18		1.458					3239	1 8.590		1 44.20			
												+ 29.71			
												− 35.61			
												65.32			
												1.81505			
												1.140419			
												2.95554			
												1.94106			
												8.98552			
												6 31 28			

14.791
14.822

20 26.30

M 24 3.95 M 58 55.75

M 34 54.95
M 36 22.28
R 36 22.18
R 36 22.25
M 36 22.35
36 22.26
87.31

22 58 52.9

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1879phae.proj.1507

353

67 Ceti

h m s
2 10 57
−6° 57'

0.160056

198

β Urs. Min L.C.

h m s
14 51 3
+105 22

0.160566

47

α Ceti 0.14056

h m s
2 53 57
+3° 37

1.17609
999913
1.17522

11	22.70		11	21.4	50	21.25		49	18.9	49	54.0	56	23.40			56	14.3
	24.80			22.3		20.00	37.626		24.7		58.3		25.50	27.568			15.8
	26.94			25.6		37.50	37.63		31.2		3.2		27.60	27.57			17.2
	29.08			27.6		45.50			37.2		8.2		29.64				18.8
	31.00		1763	28.4	18813	53.18		1537	41.7	3219	18.2	13784	31.70			866	20.5
				2.63		3813			1537		219		3784				366
	35.25		11	35.26		7.00		49	30.74	50	4.38		35.77			56	17.32
	37.30					16.68							37.88				
	37.25					24.05							39.97				
	41.38	43488				32.20	39.853						42.05	44.080			
	43.63	43.419	12	2.8		39.75	39.85	57	7.2	52	3.8		44.05	44.08		57	14.5
	45.25			5.3		42.70	39.83		13.6		9.0		46.20	44.08			16.2
	47.60			7.0		55.41			17.2		16.7		48.20				17.7
	49.68			8.2		2.95			21.6		20.7		50.30				19.3
39139	51.75		332	9.9	35868	10.87		886	27.0	774	27.0	39672	52.30			889	21.2
	3139			3.32		35868			886		774		3672				389
	55.00		12	6.64		26.50		51	17.72	52	15.48		56.47			57	17.78
	57.73	0.0046				3437	42.030						58.40	0.594			
	0.00	0.05				41.70	42.03						0.70	0.59			
	2.10					49.78	19.966						2.70	8816			
39023	4.40		11	35.26	21015	57.60		53	14.2	50	4.38	30297	4.70			56	17.32
	023	11	43.428	12 6.64		1015	50 39.8410		19.3	52	15.48		297	56	44.080	57	17.78
									34.8	+ 1	35.46					+	26.76
									30.6	−	35.64					−	33.70
								1279	39.0		131.10						6046
												2 56	2.27				1.78147
								53	25.58								1.17522
																	2.95669
																	1.93932
																	8.98263
																	529 17

M	26	57.40			M	11	1.02					M	51	11.75					
M	27	41.18			M	10	17.02					M	52	36.62					
R	27	41.28			M	10	16.90					R	52	38.82					
R	27	41.35			M	9	52.30					R	52	38.75					
M	27	41.98			M	9	26.50					M	52	38.65					
	27	41.55											52	38.71					
														86.96					

3 37 102

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56 — ε Eridani — 3h 27m 14s, −9° 52′ — 1.17609, 9.99353, 1.16962

550 — δ Eridani — 3h 37m 30s, −10° 11′ — 0.16066, 1.17609, 0.16056, 9.99310, 3.44310

61 — η Tauri — 3h 40m 18s, +23° 44′ — 1.17609, 0.16056, 9.96162, 1.13771

1879 Dec. 29

	27 39.15		27 33.4	+20.49 13.46	37 52.97		38 21.9		40 43.00		40 37.5
	41.30	43356	35.3	18.86 13.51	67.78 54.65	56904	23.5		45.15	47.420	39.5
	43.33	4336	36.8	16.78 13.70	13.556 56.92	5690	25.4		47.34	47.42	41.3
	45.40		38.8	14.65 13.53	58.98		27.0		49.61		43.3
21678	47.60		1848 40.5	12.58 13.52	28452 1.00		1267 28.9	23710	52.00		2064 44.8
	1678		348		28452		267		3710		64
	51.70		27 36.96	8.39 14.79	14.79 6.40		38 25.34		56.36		40 41.28
	53.80				14.79				58.68		
	55.95								0.92		
	58.00	0098							3.20	5388	
	0.10	010	28 26.7				38 40.4		5.40	539	41 35.9
	2.18	0.10	29.2				41.8		7.60	5.40	37.6
	4.25		31.0				43.5		9.90		39.3
	6.40		32.5				45.3		12.05		41.4
54088	8.50		1539 34.5				2179 46.9	58849	14.38		1978 43.6
	088		39				179		4849		478
	12.70		28 30.78	−12.58 13.60	67.94 26.18		38 43.58		18.90		41 39.56
	14.75	16.844		14.67 13.71	13.588 28.38	30372			21.00	23380	
	16.87	1684		16.77 13.63	30.40	3037			23.38	23.38	
	18.90	12020		18.87 13.53	32.40				25.70	13080	
8422	21.00		27 36.96	21.03 13.45	186 34.50		38 25.34	11690	27.92		40 41.28
	3422	28 0.100	28 30.78		186		38 43.58		1690	41 5.395	41 39.56
			+ 23.14								+ 24.12
			− 30.68	13.578							− 34.16
			53.82	13.697							58.28
			1.73094								1.76552
			1.16962								1.13771
			2.90056								2.90323
			1.88795								1.89025
			8.98739								8.98702
			5 32 54								5 32 37

M 19 53.00
M 21 10.45
R 21 10.18
R 21 10.12
M 21 10.30
21 10.26
77.26

M 39 1.15
M 39 26.15

M 44 19.15
M 46 6.88
R 46 6.78
R 46 6.82
M 46 6.80
46 6.82
77.67

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63

9 Persei

h m s
3 46 32
+ 31° 31'
Dec. 29

1.17609 0.16056
9.95069
1.12678

46 56.20		46 49.0
58.28	0736	51.0
0.65	0.74	52.6
3.00		54.3
30368 5.55		2628 53.9
368		128
10.37		46 52.56
12.80		
15.15		
17.50	20013	
20.05	20.01	47 38.6
22.38	20.05	51.9
24.82		2.0
27.30		4.2
18012 29.75		3109 6.2
012		109
34.50		48 2.18
36.80	39356	
37.38	39.36	
41.80	40.10	
19678 44.30		46 52.56
4678	47 20.030	48 2.18
		+ 27.47
		− 42.15
		69.62
		1.84273
		1.12678
		2.96951
		1.93131
		8.96180
		~~5 21 13~~ 5 13 57

M 57 19.55
M 58 114.75
R 58 45.28
R 58 114.95
M 58 114.72
58 44.92
85.37

33

2 Arietis

h m s
2 0 21
+ 22° 53'
Dec. 30

0.16056

0 42.35		1 40.6
44.55	4.776	43.7
46.70	46.78	47.4
49.90		
23388 51.38		
2388		
53.82		
55.05		
0.15		
2.27	4634	
4.62	4.63	
6.88	4.68	
9.02		
11.20		
68171 13.70		
4171		
18.23		
20.38	22540	
22.64	22.50	
24.70	12.937	
11295 27.80		
1295	1 4.655	
	2 0 26.29	

M 36 28.92
M 36 28.65
36 28.78
2 2 58 52.9

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582

ε Corvi

h m s
12 3 34
−21 57

1879 Dec. 31

0.16056

8.25		8.5
10.52	12740	10.7
12.73	12.74	12.1
14.90		14.0
6370 17.30		613 16.0
1370		113
21.75		12,26
24.07		
26.05		
28.30	30519	
30.50	30.52	8.0
32.70	30.49	10.0
34.85		11.8
37.15		13.4
27467 39.30		582 15.0
467		82
42.80		11,64
46.05	48246	
48.30	48.25	
50.40	6099	
24123 52.68		12.26
4123	30.505	11.64

584

S Corvi

h m s
12 23 37
° ′
−15 50

1.17609
9.98320
1.15929

0.16057

23 51.25		23 44.4
53.40	55530	46.5
55.60	55.53	48.0
57.60		49.5
27765 59.80		2393 50.9
2765		393
4.00		23 47.86
6.30		
8.45		
10.38	12607	
12.68	12.61	24 42.2
14.78	12.65	44.0
16.75		46.0
18.80		47.5
11346 21.12		2287 49.0
2346		287
25.70		24 45.74
27.60	29.776	
29.70	29.78	
32.10	14531	
14888 34.08		23 47.86
4888	24 12.630	24 45.74
		+ 24.77
		− 33.11
		57.88
		1.76253
		1.15929
		2.92182
		1.90276
		8.98094
		5 28 1

172

γ Virginis

h m s
12 35 32

° ′
−0 47

1.17609
9.99996
1.17605

0.16056

35 47.72		35 42.2
49.72	51818	44.4
51.95	51.82	46.0
53.90		48.0
25909 55.80		2298 49.2
909		298
0.05		35 45.96
2.00		
4.20		
6.25	8267	
8.25	8.27	36 43.2
10.30	8.25	44.7
12.37		46.0
14.48		47.4
7440 16.50		2307 48.4
7440		307
20.60		36 46.14
22.65	24646	
24.60	24.69	
26.80	136.51	
12348 28.80		35 45.96
2348	36 8.260	36 46.14
		+ 22.30
		− 37.88
		60.18
12 85 85.92		1.77945
		1.17605
		2.95550
		1.92012
		8.96462
		5 15 59

M	24 22.90	
M	25 44.38	
R	25 44.35	
R	25 44.55	
M	25 44.60	
	25 44.47	
	81.57	

M	18 26.72	
M	19 46.72	
R	19 46.67	
R	19 46.60	
M	19 46.70	
	19 46.66	
	79.94	

M	16 0.65	
M	17 23.88	
R	17 23.90	
R	17 23.92	
M	17 23.72	
	17 23.85	
	83.20	

0 47 85.3

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174

β Virginis

h m s
12 49 30
° ′
+4 3

1.17609 0.16056
9.99891
1.17500

49 46.30
48.28 50.392
50.40 50.39
52.48
25196 54.50
196
58.73
0.73
3.35
5.00 7.039
7.00 7.04
9.17 6.88
11.15
13.22
60335 15.30
6.335
17.30
21.30 2.3380
23.50 23.38
25.30 13377
11690 27.50
1690 50 6.960

49 38.9
40.8
42.6
44.3
2122 45.8
12.3
49 42.46
37.0
39.0
40.7
1941 42.2
1941
50 38.82
+ 24.52
− 31.86 45.733
56.38 45.738
1.75113
1.17500
2.92613
1.91073
8.98460
5 30 46

+8.43 45.43 411.33 37.00
6.32 45.38 45.703 39.18
9.21 45.71 41.50
2.13 45.83 43.70 45.699
−0.26 45.75 45.75 45.70
2.10 45.80 47.50
4.19 45.77 49.96
6.32 45.68 52.00
8.48 45.80 1129 54.30
5129
12.64 45.83 229.02 58.47
14.76 45.75 45.804 0.50 2.670
16.88 45.85 2.70 2.67
18.96 45.84 4.80
21.13 45.778 313.33 6.88
1335

M 25 34.88.
M 26 56.38.
R 26 56.42.
R 26 56.50.
M 26 55.92.
26 56.30
8142

176

ξ Virginis

h m s
12 56 9
° ′
+11 37

0.16036

56 40.9
42.6
43.4
44.7
2179 46.3
179
56 43.58
22.2
24.0
26.3
1193 27.2
193
57 23.86

56 43.58
57 23.86

M 53 6.20.
M 54 2.32.

587

ζ Virginis

0.16056

h m s
13 18 49
° ′
−10 32

1.17609
9.99262
1.16871

19 4.28
6.30 8.482
8.60 8.48
10.53
4241 12.70
4241
16.77
19.00
21.00
23.00 25.291
25.35 25.29
27.40 25.26
29.55
31.65
22762 33.90
4762
37.87
40.03 42.040
42.00 42.04
4400 5052
21020 46.80
1020 19 25.275

18 58.4
0.4
1.8
3.6
3102 6.0
102
19 2.04
19 56.4
58.3
0.5
2.5
3011 3.4
11
20 0.22
19 204
20 0.22
+ 23.24
− 34.94
58.18
1.76477
1.16871
1.92623 2.93348
1.92023 8.98675
8.98675
5 32 24

13 18 52.11

M 0 1.80.
M 1 24.95.
R 1 24.98.
R 1 25.12.
1 25.02
83.22

10 32 8.5

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33

α Arietis

h m s
2 0 21
+22 53

1880 Jan 1

0 34.37		0 24.5
36.61	38.846	26.2
38.84	38.85	30.7
41.00		
19423 43.34		
4423		
47.52		
50.04		
52.22		
54.57	56.841	
57.00	56.84	
57.00	56.80	
1.40		
3.70		
57157 5.70		
6157		
10.30		
12.48	14.756	
14.74	14.76	
16.96	11.361	
7378 19.30		
2378	0 56.820	

2 0 26.27

M 34 57.72.
M 34 57.62.

34 57.67
22 58 62.9

47

α Coli

h m s
2 53 57
+3 0 37

0.16056

1.17609 a 16056
9.99913
1.17522

56 11.50		56 5.2
13.30	16.852	7.0
15.52	15.85	8.7
17.88		10.2
7926 19.98		431 12.0
2926		431
24.07		56 8.62
26.07		
28.10		
30.10	32.247	
32.20	32.25	57 1.8
34.35	32.33	2.0
36.35		3.8
38.48		5.3
29022 40.50		193 7.4
29022		193
44.66		57 3.86
46.68	48.812	
48.85	48.81	
50.90	6.466	
24406 52.97		56 8.62
4406	56 32.290	57 3.86
		+ 23.67
		− 31.57
		55.24
		1.74225
		1.17522
		2.91747
		1.90304
		8.98557
		5 31 31

2 56 2.25

M 51 14.32.
M 52 34.22.
R 52 34.18.
R 52 34.18.
M 52 34.38.
52 34.31
79.99

3 37 10.0

56a

ε Eridani

0.16056

h m s
3 27 14

1.17609
−9° 52 9.99353
1.16962

27 27.50		27 18.4
29.60	31.700	20.2
31.60	31.70	21.5
33.90		23.3
15850 35.90		1086 24.8
850		86
39.90		27 21.72
42.05		
44.10		
46.20	48.316	
48.30	48.31	28 16.2
50.38	48.37	18.0
52.57		19.5
54.64		21.5
43484 56.70		985 23.3
7484		485
0.75		28 19.70
2.97	5.044	
5.00	5.04	
7.20	9.674	
2522 9.80		27 21.72
2522	27 48.340	28 19.70
		+ 26.62
		− 31.36
		57.98
		1.76328
		1.16962
		2.93290
		1.92210
		8.98920
		5 34 16

M 19 44.78.
M 21 8.35.
R 21 8.28.
R 21 8.35.
M 21 8.45.
21 8.36
83.58

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550

S Eridani

h m s
3 37 30
° ′ 1.17609 0.16056
−10 11 9.99310
1.16919

	37 40.78		37 31.5		40 31.20		40 31.4
	42.82	4.4960	33.0		33.45	3.5676	32.8
	45.50	44.96	35.0		35.68	35.67	34.7
	47.00		36.3		38.00		36.7
22480	49.20		1738 38.0		17838 40.05		1740 38.4
	2480		2.38		2838		240
	53.30		37 34.76		44.70		40 34.80
	53.40				46.90		
	57.35				49.20		
	57.62	1.741			57.40	53.644	
	1.70	1.74	38 27.9		53.68	53.64	41 22.5
	3.70	1.72	29.8		53.72	53.69	24.6
	6.04		31.0		55.05		26.1
	8.17		33.0		1.35		27.9
55569	10.19		1566 34.9		48280 2.60		1310 29.9
	1567		6.6		3280		310
	14.40		38 31.32		7.15		41 26.20
	16.45	18.490			9.48	11.714	
	18.50	18.49			11.70	11.71	
	20.50	12345			1378	10738	
9245	22.60		37 34.76		5857 16.26		40 34.80
	9245	38 1.730	38 31.32		5857	40 53.665	41 26.20
			+ 26.97				+ 18.86
			− 29.59				− 32.54
			5656				51.40
			1.75251				1.71096
			1.16919				1.13771
			2.92170				2.84867
			1.90374				1.83998
			8.98204				8.99131
			5 28.50				5 35.53

M 38 3.33
M 39 23.45

39 23.45
80.12

M 44 55.70
M 46 4.88
R 46 4.85
R 46 4.80
M 46 4.98
46 4.88
69.18

η Tauri

h m s
3 40 18
° ′ 1.17609 0.16056
+23 44 9.96162
1.13771

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S

Sun - C = 46.663

h m s
18 51 6
− 22 ° 56 ′

0,16056

1880

Jan - 1 - 2.

49	53.40			51	11.0	52	17.20		51 31.5
	57.60	59.830			12.0		19.40	21.650	32.9
	57.85	59.83			14.4		21.50	21.65	34.3
	2.00				16.6		23.95		36.3
29915	4.30			739	18.9	10825	26.20		1729 37.9
	29915				239		825		229
	8.75			51	1478		30.65		51 34.58
	11.20						32.85		
	13.30						35.10		
	16.55	17.782					37.35	39.642	
	17.68	17.78					39.60	39.64	
	20.80	17.80					41.95	39.72	
	22.28						44.20		
	24.53						46.30		
16004	26.75					35678	48.78		
	16004						8678		
	31.35						53.25		
	33.42	35.768					55.53	57.790	
	35.72	35.77					57.87	57.79	
	38.05	155.60					60.05	7944	
17884	40.30			51	14,78	28895	62.35		51 34.58
	17884	50 17,790	− 56.99				28895	52 39.680	+ 1 5.10

M 7 25.78 · M 40 32.72 · ÷ 25 38.80 ·

S

Sun C = 46.628

h m s
18 59 54
− 22 ° 44 ′

0,16036

Jan - 3 - 4

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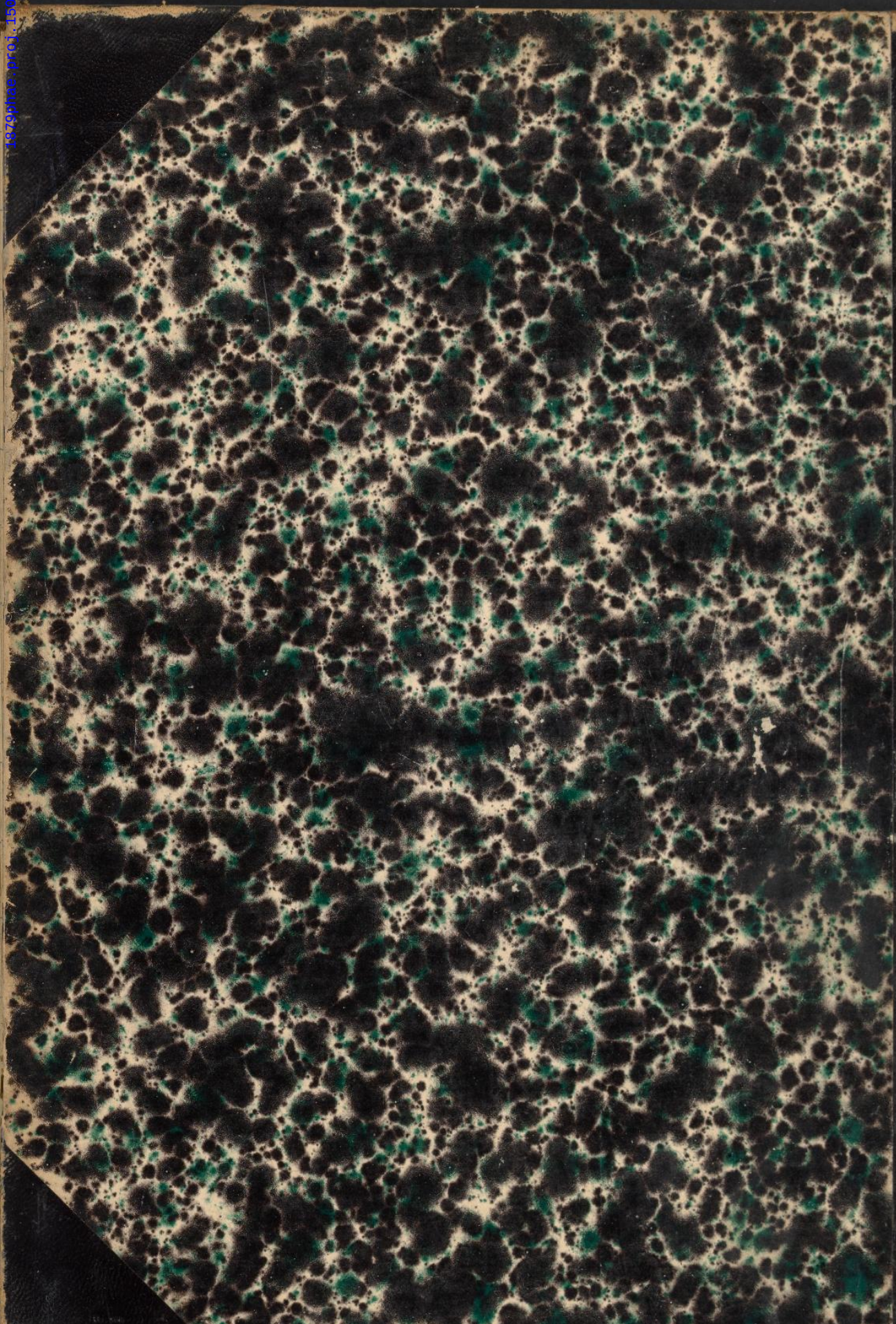
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1979ApJ...230..507



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