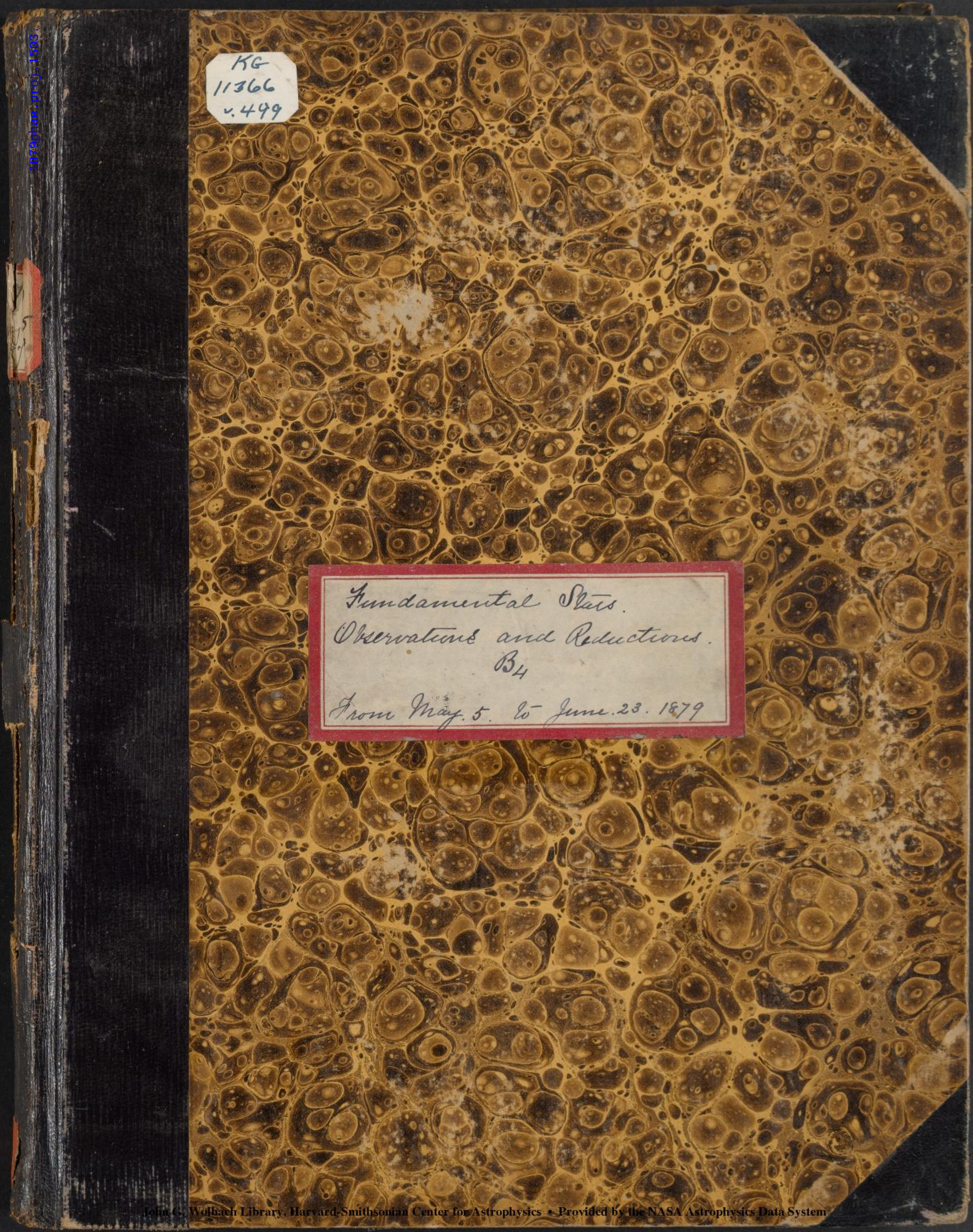

KG
11366
v.499

Fundamental Stars.
Observations and Reductions.
$B_4$
From May. 5. to June. 23. 1879

770

# Values of $i$ and $\log 15 \tan. i$

From

| | | | |
|---|---|---|---|
| ~~May 6 ... May 12~~ | ~~4° 58' 36"~~ | | |
| ~~May 13 ... May 31~~ | ~~4 57.24~~ | | |
| June 1 ... June 8 | 4 56 06 | 8.93624 | 0.11233 |
| June 9 ... June 19 | 4 55 07 | 8.93479 | 0.11088 |
| June 20 ... June 24 | 4 55 44 | 8.93570 | 0.11179 |
| | 4 55 39 | | 0.11167 |

From June 1 to June 24 $\log 15 \tan g\, i = 0.11167$

~~From May 5 to June 8 $i = 4° 57' 40"$ tang $i$ 8.93854 15 tang $i$ = 0.11163~~

~~From June 8 to June 28 $i = 4\ 55\ 41$ tang $i$ 8.93563 15 tang $i$ 0.11172~~

~~$\Delta\delta = 15 \tan g\, i \cos\delta$~~

1879

154
α Urs. Maj.

h m s
10 56 15
° '
+ 62 24
May 5

cos δ 9.66586
1.17609
0.84195
8.53854
9.98045

56 4.00
8.55 12960
12.88 1296
17.47
6480 21.40
6480
30.70
35.20
39.67
44.00 48539
48.55 48.57
53.00 48.56
57.53
1.78
43685 6.42
43685
15.40
19.70 24174
24.10 24.17
28.50 9713
12087 33.17
12087 56 48.565

10 56 18.92

56 9.0
12.2
15.4
19.7
800 23.7
800
56 1600
+ 3256
57 20.2
24.6
27.8
31.0
1389 35.3
1389
57 2778
− 3922
56 16.00
57 27.78
+ 32.56
− 39.22
1.51268
1.55351n
1.25317
1.39400n

0.11559
0.11559
9.66586

155
ψ Urs. Maj.

h m s
11 2 51
° '
+ 45 9

1.17609
9.84834
1.02443

2 53.80
56.70 59640
59.66 59.64
2.50
29820 5.54
29820
11.38
14.22
17.24
20.04 23043
23.00 23.04
25.98 23.04
28.96
31.80
20739 34.77
20739
40.63
43.50 46440
46.45 46.44
49.32 166.08
23220 52.30
23220 3 23.040

9. 84834
.11463
9.96298

2 43.9
46.0
48.0
50.3
2415 53.3
2415
2 4830
+ 3474
3 58.0
0.6
3.6
6.0
3166 8.4
166
4 332
− 4028
2 4830
4 3.32
+ 34.74
− 40.28
1.54083
1.60509
1.50580
1.56806

0.11559
0.11559
9.84835

7502
1.87518
1.02443
289961
1.83620
8.93659
4 56 20

156
δ Leonis

h m s
11 7 40
° '
+21 11

1.17609
9.96962
1.14571

7 48.63
50.90 53084
53.00 53.08
55.32
26542 57.57
26542
1.93
4.18
6.38
8.52 10779
10.79 10.78
13.00 10.76
15.25
17.38
9701 19.58
9701
24.00
26.25 28446
28.45 28.45
30.68 141.53
14223 32.85
14223 8 10.770

11 7 43.24

9.96962
11463
0.08425

7 40.3
42.3
44.4
46.2
2210 47.8
2210
7 4420
+ 2657
8 43.3
45.9
48.0
49.9
2390 51.9
2390
8 4780
− 3703
7 44.20
8 47.80
+ 26.57
− 37.03
1.42439
1.56855
1.50864
1.65280

0.11559

6360
1.80346
1.14571
2.94917
1.88936
8.94019
4 58 47

M 4 5.85 +19.64
M 4 48.52
R 4 48.22
R 4 48.42
4 48.39 −2366

4 25.49 38
4 24.83 38
4 25.11

62 24 16.1

M 18 37.65 +3205
M 19 46.25
R 19 46.27
R 19 46.17
19 46.23 −3658
68.58

19 9.80
9.24
19 9.47

23

M 16 25.32 +3226
M 17 42.90
R 17 42.82
R 17 42.77
17 42.83 − 4456
77.51

37.58 14
37.80
37.92

21 11 22

1559
3.60
346
571
917
936
4019
847

164

β Leonis

h m s
11 42 53
° ′
+15 15

1.17609 0.11559
9.98443
1.16052

43 2.25
4.40
6.55
8.78
10.90
15.15
17.40
19.29
21.52 23652
23.60 2364
25.80
27.88
30.03
21278 32.20
21287
36.40
38.60 40696
40.70 4069
42.88
20348 46.00
20348 43 23.644

43 17.8
19.7
21.8
23.9
1086 25.4
1086
43 21.72
43 51.7
53.5
55.0
57.0
2760 58.8
2760
23 55.20
43 21.72
43 55.20

11 42 56.07

M 13 8.95
M 13 50.32
R 13 50.52
R 13 50.37
13 50.103

15 14 41.4

582

ε Corvi 9.56832
11463
.08195

h m s
12 3 57
° ′
−21 57

1.17609 0.11559
9.96732
1.14341

4 1.43
3.75 5942
5.95 5.94
8.22
2971 10.36
2971
14.74
16.93
19.20
21.43 23644
23.70 2364
25.85 23.71
28.02
30.35
21280 32.58
21280
37.00
39.26 41478
41.48 41.48
43.70 4742
20739 45.95
20739 4 23.675

3 50.4
51.7
52.8
54.2
2648 55.7
2648
3 52.96
+ 30.72
4 51.5
54.1
55.8
58.0
2797 0.3
2797
4 55.94
− 32.26
3 52.96
4 55.94
+ 30.72
− 32.26
1.48742
1.50866
1.56537
1.55061

6298
1.79920
1.14341
2.94261
1.88104
8.93843
4 57 35

M 22 58.05 +3710 23 35.15 .01
M 24 14.02 ~~−3856~~
R 24 14.07
R 24 14.17
24 14.09 −3856 35.13
76.04
35.14

172

γ Virginis foll. 9.99996
11463
11459

h m s
12 35 31
° ′
−0 47

1.17609 0.11559
9.99996
1.17605

35 41.38
43.49 45550
45.52 45.55
47.68
22775 49.68
22775
53.73
55.78
57.84
59.96 1943
2.00 1.94
4.00 1.99
6.00
8.00
55749 10.18
1749
14.30
16.35 18440
18.45 18.44
20.50 12399
9220 22.60
9220 36 1.965

35 34.2
35.9
37.4
38.8
1867 40.4
1867
35 37.34
+ 24.62
36 27.9
29.7
31.8
34.0
1592 35.8
1592
36 31.84
− 29.88
35 37.34
36 31.84
+ 24.62
− 29.88
1.35129
1.47538
1.50588
1.58557

5450
1.73640
1.17605
2.91245
1.84893
8.93648
4 56 16

12 35 34.77

M 14 24.25 +3205 14 56.30
M 15 34.75 .16
R 15 35.05
R 15 34.80
~~15 34.87~~
15 34.87 −3850 55.99
70.62
56.14

0 47 23.4

1879 May 5

## 174

δ Virginis 9.99891
11463
.11354

h m s
12 49 30
° ′ 1.17609 0.11559
+4 3 9.99891
1.17500

| | | | |
|---|---|---|---|
| 49 40.04 | | 49 34.8 | |
| 42.18 | 44220 | 36.5 | |
| 44.26 | 44.22 | 38.1 | |
| 46.35 | | 40.5 | |
| 22110 48.27 | | 1924 42.5 | |
| 22110 | | 1924 | |
| 52.46 | | 49 3848 | |
| 54.60 | | + 2228 | |
| 56.60 | | | |
| 58.70 | 0.758 | | |
| 0.80 | 0.76 | 50 29.5 | |
| 2.85 | 0.76 | 31.2 | |
| 4.95 | | 33.4 | |
| 6.96 | | 34.6 | |
| 54682 9.00 | | 1653 36.6 | |
| 682 | | 1653 | |
| 13.15 | | 50 3306 | |
| 15.20 | 17310 | − 3230 | |
| 17.35 | 17.31 | | |
| 19.35 | 12153 | | |
| 8655 21.50 | | 49 38.48 | |
| 8655 | 50 0.760 | 50 33.06 | |
| | | + 22.28 | |
| | | − 32.30 | 5458 |
| | | 1.34982 | 1.73703 |
| | | 1.50920 | 1.17500 |
| | | 1.46146 | 2.91203 |
| | | 1.62274 | 1.85582 |
| | | | 8.94379 |
| | | | 5 1 16 |

## 176

ε Virginis 9.99101
11463
.10564

h m s
12 56 9
° ′ 1.17609 0.11559
+11 37 9.99101
1.16710

| | | | |
|---|---|---|---|
| 56 18.57 | | 56 9.9 | |
| 20.67 | 22784 | 11.6 | |
| 22.80 | 22.78 | 13.4 | |
| 24.88 | | 15.0 | |
| 11392 27.00 | | 671 17.2 | |
| 11392 | | 671 | |
| 31.18 | | 56 1342 | |
| 33.39 | | + 2624 | |
| 35.40 | | | |
| 37.57 | 39668 | | |
| 39.68 | 39.67 | 57 7.0 | |
| 41.82 | 39.64 | 9.3 | |
| 43.95 | | 11.5 | |
| 45.97 | | 13.2 | |
| 35701 48.05 | | 562 15.2 | |
| 35701 | | 562 | |
| 52.27 | | 57 1124 | |
| 54.48 | 56516 | − 3158 | |
| 56.50 | 5651 | | |
| 58.65 | 7929 | | |
| 28238 0.68 | | 56 13.42 | |
| 28258 | 56 39.655 | 57 11.24 | |
| | | + 26.24 | |
| | | − 31.58 | 5782 |
| | | 1.41856 | 1.76208 |
| | | 1.48841 | 1.16710 |
| | | 1.53250 | 2.92918 |
| | | 1.61285 | 1.87367 |
| | | | 8.94449 |
| | | | 5 1 45 |

## 587

α Virginis 9.99262
.11463
.10925

h m s
13 18 49
° ′ 1.17609 0.11559
−10 32 9.99262
1.16871

| | | | |
|---|---|---|---|
| 18 58.30 | 500 | 18 49.2 | |
| 0.45 | ~~2494~~ | 50.9 | |
| 2.52 | 250 | 52.6 | |
| 4.58 | | 54.4 | |
| 31250 6.65 | | 2639 56.8 | |
| 1250 ~~12.47~~ | | 2639 | |
| 10.84 | | 18 5278 | |
| 12.90 | | + 2647 | |
| 15.00 | | | |
| 17.18 | 19222 | | |
| 19.23 | 19.22 | 19 44.6 | |
| 21.30 | 19.28 | 46.4 | |
| 23.40 | | 48.2 | |
| 25.50 | | 50.0 | |
| 17300 27.65 | | 2419 52.7 | |
| 17300 | | 2419 | |
| 31.90 | | 19 4838 | |
| 33.97 | 36060 | − 29.13 | |
| 35.98 | 36.06 | | |
| 38.18 | 3856 | | |
| 18030 40.27 | | 18 52.78 | |
| 18030 | 19 19.250 | 19 48.38 | |
| | | + 26.47 | |
| | | − 29.13 | 5560 |
| | | 1.42285 | 1.74507 |
| 13 18 | 52.27 | 1.46430 | 1.16871 |
| | | 1.53625 | 2.91378 |
| | | 1.59984 | 1.85266 |
| | | | 8.93888 |
| | | | 4 57 54 |

| | | | | |
|---|---|---|---|---|
| M | 24 4.00 | +28.54 | 2432.54 | .43 |
| M | 25 16.07 | | | |
| R | 25 15.60 | | | |
| R | 25 16.57 | | | |
| | 25 15.75 | −41.95 | 33.80 | |
| | 71.75 | | | |
| | | | 33.37 | |

| | | | | |
|---|---|---|---|---|
| M | 50 53.70 | +34.08 | 51 27.78 | .17 |
| M | 52 8.30 | | | |
| R | 52 8.72 | | | |
| R | 52 8.35 | | | |
| | 52 8.46 | −41.01 | 29.45 | |
| | 74.76 | | | |
| | | | 27.61 | |

| | | | | |
|---|---|---|---|---|
| M | 58 36.25 | +34.38 | 59 9.63 | .44 |
| M | 59 46.40 | | | |
| R | 59 46.65 | | | |
| R | 59 46.40 | | | |
| | 59 46.48 | −39.83 | 8.65 | |
| | 71.23 | | | |
| | | | 9.19 | |

10 32 5.4

0.25

607

α² Capricorni 9.98887

h m s
20 11 20

° '
−12 55

0.11559

11 28.80 11 20.2
30.90 33.000 21.7
33.00 33.00 23.5
35.00 25.1
16500 37.30 1174 26.9
16500 1174
41.47 11 2348
43.65 + 26.44
45.69
47.78 49926.
49.95 49.93
52.00 4990
54.17
56.22
44933 58.40
44933.
2.60
4.75 6.814
6.77 6.81
8.95 99.81
3407 11.00 11 2348
3407 11 49 ~~870~~ 915 + 21.39

20 11 22.88

R 21 30.17·
R 21 30.07·21 30.12

12 55 5.0

---

289

γ Cygni 9.88510

h m s
20 17 53

° '
+39 52

0.11559

17 56.30 17 52.6
58.95 1.588 54.9
1.60 1.58 57.1
4.17 59.9
30794 6.92 2865 2.0
794 2865
12.28 17 5730
14.96 + 25.77
17.71
20.40 23.067
23.00 23.07
25.85 23.07
28.46
31.10
20760 33.84
20760
39.20
41.90 44.556
44.50 44.56
47.18 4614
22278 50.00 17 5730
22278 18 23.070 + 25.77

R 35 53.95·
R 35 53.85·35 53.90

---

294

α Cygni 9.85062

h m s
20 37 18

° '
+44 51

1.17609
9.85062
1.02671

0.11559

37 19.18 37 11.8
22.00 25.006 14.5
24.98 25.00 16.8
27.98 19.4
12503 30.89 840 21.5
12503 840
36.85 37 1680
39.63 + 31.53
42.55
45.47 48.369
48.30 48.37 38 22.4
51.22 48.29 24.4
54.22 26.8
57.10 29.8
43532 59.98 1361 32.6
43532 1361
5.78 38 2722
8.67 11580 − 38.89
11.55 11.58
14.50 9658
5790 17.40 37 1680
5790 37 48.330 38 27.22
+ 31.53
− 38.89
7042
1.84770
1.02671
2.87441
1.80889
8.93448
4 54 64

20 37 19.76

M 37 13.42·
M 38 17.82·
R 38 17.87·
R 38 17.77·

38 17.82
64.40

44 50 41.9

1879

| 298 | | | | | ~~510~~ 303 | | | | | 306 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ε Cygni | | 9.92102 | | | ζ Cygni | | 9.93869 | | | α Cephei | | 9.67066 | | |
| h m s | | | | | h m s | | | | | h m s | | | | |
| 20 41 19 | | | | | 21 7 47 | | | | | 21 15 41 | | | | |
| ° ′ | 1.17609 | | | 0.11559 | ° ′ | ~~1.17609~~ | | | 0.11559 | ° ′ | | | | 0.11559 |
| +33 31 | 9.92102 | | | | +29 44 | | | | | +62 4 | 9.67066 | | | |
| May 5 | 1.09711 | | | | | | | | | | | | | |

| | | | | |
|---|---|---|---|---|
| | 41 24.03 | | | 41 16.0 |
| | 26.40 | 28930 | | 18.0 |
| | 28.92 | 2893 | | 19.9 |
| | 31.40 | | | 22.0 |
| 14465 | 33.90 | | 1003 | 24.4 |
| | 14465 | | | 1003 |
| | 38.72 | | | 41 2006 |
| | 41.27 | | | + 2860 |
| | 43.75 | | | |
| | 46.18 | 48641 | | |
| | 48.65 | 4863 | | 42 23.8 |
| | 51.10 | 48.68 | | 26.0 |
| | 53.60 | | | 28.0 |
| | 56.00 | | | 30.1 |
| 43771 | 58.50 | | 1399 | 32.0 |
| | 43777 | | | 1399 |
| | 3.55 | | | 42 27.98 |
| | 6.00 | 8440 | | − 3932 |
| | 8.40 | 844 | | |
| | 10.87 | 9737 | | |
| 4220 | 13.38 | | | 41 2006 |
| | 4220 | 41 48.655 | | 42 27.98 |
| | | | | + 28.60 |
| | | | | − 39.32 |
| | | | | 6792 |
| | | | | 1.83200 |
| | | | | 1.09711 |
| | | | | 2.92911 |
| | | | | 1.86870 |
| | | | | 893959 |
| | | | | 4 58 23 |

| | | | | |
|---|---|---|---|---|
| | 7 53.00 | | | 8 1.3 |
| | 55.86 | 57812 | | 3.6 |
| | 57.90 | 57.81 | | 5.7 |
| | 0.26 | | | 7.7 |
| 28906 | 2.54 | | 276 | 9.3 |
| | 28906 | | | 276 |
| | 7.28 | | | 8 5.52 |
| | 9.60 | | | + 1124 |
| | 12.00 | | | |
| | 14.37 | 16740 | | |
| | 16.70 | 1674 | | 8 56.7 |
| | 19.00 | 16.77 | | 58.8 |
| | 21.60 | | | 0.7 |
| | 23.84 | | | 2.4 |
| 15066 | 26.27 | | 3033 | 4.7 |
| | 15066 | | | 433 |
| | 30.95 | | | 9 0.66 |
| | 33.38 | 35734 | | − 4390 |
| | 35.80 | 35.73 | | |
| | 38.04 | 15354 | | |
| 17867 | 40.50 | | | 8 5.52 |
| | 17867 | 8 16.755 | | 9 0.66 |
| | | | | + 11.24 |
| | | | | − 43.90 |

| | | | | |
|---|---|---|---|---|
| 15 — | | | 15 19.7 | 15 42.4 |
| — | | | 22.9 | 46.0 |
| — | | | 27.0 | 49.2 |
| — | | | 30.3 | 52.3 |
| — | | | 1341 34.2 | 2471 57.2 |
| | | | 1341 | 2471 |
| 53.95 | +17.63 | 11.58 | 15 26.82 | 15 49.42 |
| 58.35 | 13.22 | 11.57 | + 4460 | + 2200 |
| 2.60 | 8.81 | 11.41 | | |
| — | | 34.56 | | |
| — | | 11.52 | 17 2 3 | 17 28.4 |
| — | | | 5.8 | 30.3 |
| — | | | 9.0 | 32.3 |
| — | | | 12.8 | |
| — | | | 475 17.6 | |
| | | | 475 | |
| — | | | 17 9.50 | |
| — | | | − 58.08 | |
| 46.53 | −35.26 | 11.27 | | |
| 50.98 | −39.67 | 11.31 | | |
| 55.60 | −44.21 | 11.39 | 15 26.82 | 15 49.42 |
| | | 33.97 | 17 9.50 | |
| | | 11.323 | | |
| | 11.421 | | | |
| | 11.421 | | | |
| 31 | 15 41.86 | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| M | 56 | 48.00 | M | 44 | 10.20 | M | 24 | 3.47 |
| M | 58 | 1.87 | M | 44 | 11.82 | M | 24 | 17.47 |
| R | 58 | 1.95 | R | 44 | 11.77 | M | 24 | 3.52 |
| R | 58 | 1.90 | R | 44 | 12.00 | M | 24 | 17.27 |
| | 58 | 1.91 | | 44 | 11.86 | | ~~24~~ | ~~12.75~~ |
| | | 7391 | | | | | | |

62 4 84

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 307 | | | | 309 | | | | 311 | | |
| β Aquarii | | 9.99753 | | ε Pegasi | | 9.99423 | | α Aquarii | | 9.99995 |
| h m s | | | | h m s | | | | h m s | | |
| 21 25 11 | | | 0.11559 | 21 38 14 | | | 0.11559 | 21 59 34 | | 0.11559 |
| − 6° 6′ | | | | + 9° 19′ | | | | − 0° 54′ | | |
| 25 19.75 | | 25 22.9 | | 38 22.83 | | 38 13.3 | | 59 — | | 0 8.9 |
| 21.80 | 23882 | 24.4 | | 24.93 | 27.030 | 16.2 | | — | | 11.7 |
| 23.85 | 23.88 | 26.3 | | 26.98 | 27.03 | 17.4 | | — | | 14.0 |
| 25.98 | | 28.4 | | 29.20 | | 19.3 | | — | | 16.0 |
| 1941 28.03 | | 1318 29.8 | | 13515 31.21 | | 862 21.0 | | — | | 686 18.0 |
| 11941 | | 1318 | | 13515 | | 862 | | | | 686 |
| 32.04 | | 25 2636 | | 35.40 | | 38 1724 | | — | | 0 1372 |
| 3426 | | + 1410 | | 37.50 | | + 2648 | | — | | − 1055 |
| 36.35 | | | | 39.65 | | | 22.06 | 3.12 +412 59.00 | | |
| 38.40 | 40467 | | | 41.65 | 43744 | | 3.151 | 3.04 204 1.00 | | |
| 40.48 | 40.47 | | | 43.75 | 43.74 | 39 16.5 | | 3.20 −000 3.20 | | 0 35.9 |
| 42.54 | 40.45 | | | 45.80 | 43.71 | 18.3 | | 3.19 −206 5.25 | | 37.2 |
| 44.60 | | | | 47.95 | | 20.0 | | 3.17 413 7.30 | | 38.8 |
| 46.73 | | | | 50.00 | | 22.0 | | 3.18 619 9.37 | | 40.3 |
| 36420 48.80 | | | | 39370 52.00 | | 1010 24.2 | | 3.16 827 11.43 | | 1939 41.7 |
| 36420 | | | | 39370 | | 1010 | | | | 1939 |
| 52.80 | | | | 56.20 | | 39 2020 | 15.98 | 3.30 1238 15.68 | | 0 3878 |
| 54.90 | 57026 | | | 58.30 | 0.394 | − 3648 | 3.196 | 3.36 1444 17.80 | 19716 | − 35.61 |
| 57.00 | 57.03 | | | 0.37 | 0.39 | | | 3.09 1651 19.60 | 19.72 | |
| 59.15 | 8091 | | | 2.50 | 8742 | | | 3.13 1857 21.70 | | |
| 28513 1.28 | | 25 26.36 | | 30197 4.60 | | 38 1724 | | 3.10 2070 23.80<br>9858 | | 0 13.72 |
| 28513 | 25 40.460 | + 14.10 | | 197 | 38 43.725 | 39 20.20 | | 9858 | | 0 38.78 |
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| M 33 2.62 · | | | | M 37 54.77 · | | | | M· 22 1.65 · | | |
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| 52 | 7.35 | | |
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| 5863 | 16.00 | | |
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| | 24.45 | | |
| | 26.45 | 28739 | |
| | 28.70 | 28.74 | |
| | 30.90 | 28.96 | |
| | 33.40 | | |
| | 35.35 | | |
| 25865 | 37.45 | | |
| | 25865 | | |
| | 41.87 | | |
| | 44.00 | 46194 | |
| | 46.28 | 46.19 | |
| | 48.32 | 57.92 | |
| 23097 | 50.50 | | |
| | 23097 | 52 | 28.850 |

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|---|---|---|---|---|
| 53 | 18.7 | 57 | 19.92 | 24330 |
| | 20.3 | | 22.03 | ~~23330~~ |
| | 22.2 | | 24.40 | 24.33 |
| | 24.0 | | 26.50 | |
| 1111 | 25.9 | 12165 | 28.80 | |
| | 1111 | | 12165 | |
| 53 | 2222 | | 33.00 | |
| − | 5334 | | 35.20 | |
| | | | 37.45 | |
| | | | 39.55 | 41633 |
| | | | 41.58 | 41.63 |
| | | | 43.70 | 41.58 |
| | | | 46.02 | |
| | | | 48.00 | |
| | | 37470 | 50.20 | |
| | | | 37470 | |
| | | | 54.50 | |
| | | | 56.70 | 59840 |
| | | | 58.87 | 58.84 |
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| 53 | 22.222 | 29420 | 3.20 | |
| + | 53.37 | | 29920 | 54 41.605 |

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| 53 | 39.5 |
| | 42.0 |
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| 2204 | 48.0 |
| | 2204 |
| 53 | 4408 |
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| 25112 | 37.00 | | |
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| | 41.50 | | |
| | 43.70 | 46.022 | |
| | 46.04 | 46.02 | |
| | 48.37 | 56.02 | |
| 23011 | 50.50 | | |
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| 10 | 4.3 | |
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| 10 | 59.36 | |
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| − | 31.41 | 51.46 |
| | 1.30233 | 1.71147 |
| | 1.48907 | 1.13676 |
| | 1.39863 | 2.84823 |
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48.29 4838 1540 3.78 5.918
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3836 −000 38.36 38.34
3835 −277 41.12
3844 556 44.00
3839 834 46.73
3826 34507 1114 49.40
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38.318 38.33 1946 57.79 0570
3840 2220 0.60 0.57
3843 2503 3.46
3810 302 2790 87 6.00
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M 21 59.32.
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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 154 | | | | 155 | | | | 164 | | 9.88445<br>11483 | |
| | α Urs. | Maj | 9.78049 | 9.66586 | ψ Urs. | Maj | 9.86257 | 9.84835 | β Leonis | | 0.08906 | 9.98443 |
| | h m<br>10 56 | s<br>15 | | 0.11559 | h m<br>11 2 | s<br>51 | 1.17609 | 0.11559 | h m<br>11 42 | s<br>53 | | 0.11559 |
| | +62° | 24′ | | | +45° | 9′ | 9.84835 | | +15° | 15′ | | |
| 1879 | May 6 | | | | | | 1.02444 | | | | | |
| | 56 4.25 | | 56 16.1 | | 2 54.00 | | 2 44.0 | | 43 — | | 43 20.9 | |
| | 8.72 | | 19.8 | | 56.95 | 54.850 | 46.5 | | — | | 23.0 | |
| | 13.15 | 13.266 | 24.0 | | 59.80 | 59.85 | 48.8 | 72.23 24.06 | 17.12 6.94 | | 24.8 | |
| | 17.80 | | 27.0 | | 2.80 | | 51.3 | 24.076 24.18 | 14.98 9.20 | | 27.3 | |
| 6633 | 22.40 | | 1183 31.4 | | 29925 5.70 | | 2449 54.3 | 23.99 | 12.83 11.16 | | 1250 29.0 | |
| | | | 1183 | | 29925 | | 2449 | | | | 1250 | |
| | 31.10 | | 56 23.66 | | 11.56 | | 2 4898 | 214.60 23.95 | 8.55 15.40 | | 43 25.00 | |
| | 35.42 | | | | 14.62 | | + 3424 | 23.844 23.81 | 6.42 17.39 | | − 1.10 | |
| | 39.80 | | | | 17.41 | | | 23.82 | 4.27 19.55 | | | |
| | 44.58 | 48926 | | | 20.40 | 23186 | | 23.84 | +2.12 21.72 | 23849 | | |
| | 49.00 | 48.93 | 57 8.0 | | 23.00 | 23.18 | 4 0.2 | 23.80 | −000 23.80 | 23.85 | 43 56.9 | |
| | 53.25 | | 11.1 | | 26.15 | 23.26 | 2.7 | 23.87 | −2.13 26.00 | | 59.1 | |
| | 57.85 | | 14.9 | | 29.00 | | 6.3 | 23.72 | 4.28 28.00 | | 0.9 | |
| | 2.50 | | 18.8 | | 31.89 | | 9.0 | 23.93 | 6.42 30.35 | | 2.8 | |
| 44033 | 6.83 | | 763 22.9 | | 20867 34.64 | | 302 12.0 | 23.862 | 8.57<br>1464 32.43 | | 3051 5.4 | |
| | 44033 | | 763 | | 20867 | | 302 | | 21464 | | 57 | |
| | 15.45 | | 57 15.26 | | 40.90 | | 4 604 | | — | | 44 102 | |
| | 20.03 | 24412 | | | 43.58 | 46656 | − 4282 | | — | | − 37.12 | |
| | 24.44 | 24.41 | | | 46.75 | 46.66 | | 23.960 | — | | | |
| | 28.84 | | | | 49.53 | 46.51 | | 23.902 | — | | | |
| 12206 | 33.30 | | 56 23.66 | | 23331 52.52 | | 2 4898 | | — | | 43 25.00 | |
| | 12206 | 56 48.775 | 57 15.26 | | 23328 | 3 23.220 | 4 6.04 | | | | 44 1.02 | |
| | | | +25.27 | | | | + 34.24 | | | | | |
| | | | −26.33 | | | | − 42.82 | 77.06 | | | | |
| | | | 1.40260 | | | | 1.53453 | 1.88683 | | | | |
| 10 | 56 18.92 | | 1.42045 | | | | 1.63165 | 1.02444 | 11 42 | 56.06 | | |
| | | | 1.18305 | | | | 1.48850 | 2.91127 | | | | |
| | | | 1.20054 | | | | 1.58462 | 1.85248 | | | | |
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| M | 4 11.22 | +15.24 | 4 26.46 | 13 M | 18 38.25 | +31.44 | 19 9.66 | .12 | M 13 12.82 | | | |
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| R | 4 42.05 | | | | | | | | R 13 58.20 | | | |
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| | 4 42.09 | −15.88 | 26.21 | | 19 49.45 | −35.32 | 10.13 | | 13 58.27 | | | |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 582 |  |  |  | 172 |  |  |  | 173 |  |  |  |
| ε Corvi |  | 9.96732 |  | γ Virginis fr | | .11459 | 9.99996 | ε Urs. Maj |  | .11354 | 9.74055 |
| h m s |  |  |  | h m s |  |  |  | h m s |  |  |  |
| 12 3 54 |  |  |  | 12 35 31 |  |  |  | 12 48 42 |  |  |  |
|  |  |  | 0.11559 |  | 1.17609 |  | 0.11559 |  |  |  | 0.11559 |
| −21° 57′ |  |  |  | −0° 47′ | 9.99996 |  |  | +56° 37′ |  |  |  |
|  |  |  |  |  | 1.17605 |  |  |  |  |  |  |
| 4 1.70 |  | 3 53.1 |  | 35 41.40 |  | 35 34.9 |  | 48 37.91 |  | 48 51.9 |  |
| 3.90 | 6100 | 55.1 |  | 43.37 | 45486 | 36.4 |  | 41.65 | 45544 | 56.2 |  |
| 6.02 | 6.10 | 56.7 |  | 45.50 | 45.48 | 38.8 |  | 45.50 | 45.54 | 58.1 |  |
| 8.28 |  | 59.0 |  | 47.56 |  | 40.6 |  | 49.65 |  | 1.9 |  |
| 3050 10.60 |  | 2851 1.2 |  | 22743 49.60 |  | 1931 42.4 |  | 22772 52.95 |  | 2924 5.3 |  |
| 3050 |  | 2851 |  | 22743 |  | 1931 |  | 22772 |  | 2924 |  |
| 14.93 |  | 3 57.02 |  | 53.80 |  | 35 3862 |  | 0.47 |  | 48 5848 |  |
| 17.20 |  |  |  | 55.87 |  | + 2336 |  | 4.40 |  | + 17.09 |  |
| 19.47 |  |  |  | 57.93 |  |  |  | 8.03 |  |  |  |
| 21.70 | 23881 |  |  | 59.98 | 1998 |  |  | 11.84 | 15594 |  |  |
| 23.93 | 23.88 |  |  | 2.02 | 2.00 | 36 32.9 |  | 15.55 | 15.59 | 49 58.4 |  |
| 26.05 |  |  |  | 4.05 | 1.96 | 34.8 |  | 19.36 | 15.55 | 0.7 |  |
| 28.40 |  |  |  | 6.03 |  | 36.5 |  | 23.00 |  | 3.7 |  |
| 30.50 |  |  |  | 8.06 |  | 38.5 |  | 26.90 |  | 6.9 |  |
| 21493 32.75 |  |  |  | 55798 10.24 |  | 1832 40.5 |  | 14035 30.80 |  | 3205 10.8 |  |
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| 37.20 |  |  |  | 14.40 |  | 36 3664 |  | 38.05 |  | 50 410 |  |
| 39.50 |  |  |  | 16.37 | 18432 | − 3466 |  | 41.90 | 45566 | − 48.53 |  |
| 41.65 |  |  |  | 18.39 | 18.43 |  |  | 45.60 | 45.57 |  |  |
| 43.85 |  |  |  | 20.50 | 12391 |  |  | 49.20 | 15111 |  |  |
| 46.10 |  | 3 57.02 |  | 9216 22.60 |  | 35 38.62 |  | 22783 53.18 |  | 48 58.48 |  |
|  | 4 23.880 |  |  | 9216 | 36 1.980 | 36 36.64 |  | 22783 | 49 15.570 | 50 4.10 |  |
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|  |  |  |  |  |  | − 34.66 | 58.02 |  |  | − 48.53 |  |
|  |  |  |  |  |  | 1.36847 | 1.76358 |  |  | 1.23294 |  |
|  |  |  |  | 12 35 34.77 |  | 1.53883 | 1.17605 |  |  | 1.68601 |  |
|  |  |  |  |  |  | 1.48306 | 2.93963 |  |  | 1.34624 |  |
|  |  |  |  |  |  | 1.65442 | 1.87887 |  |  | 1.95555 |  |
|  |  |  |  |  |  |  | 8.93924 |  |  |  |  |
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| M 23 1.02 |  |  |  | M 14 19.92 | +3041 | 14 5033 | 6 | M 51 29.35 | + 2220 | 51 5155 | 63 |
|  |  |  |  | M 15 35.40 |  |  |  | M 52 15.82 |  |  |  |
|  |  |  |  | R 15 35.60 |  |  |  | R 52 15.80 |  |  |  |
|  |  |  |  | R 15 35.75 |  |  |  | R 52 15.90 |  |  |  |
|  |  |  |  | 15 35.58 | −4513 | 5065 |  | 52 15.84 | − 6303 | 5281 |  |
|  |  |  |  | 75.66 |  |  |  |  |  |  |  |
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| | 176 | | | | 587 | | | | 289 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ε Virginis | | 10564 | 9.99101 | α Virginis | | 10825 | 9.99262 | γ Cygni | |
| | h m s<br>12 56 9 | | | | h m s<br>13 18 49 | | | | h m s<br>20 17 ~~33~~ 53 | |
| | +11° 37′ | | | 0.11559 | −10° 32′ | 1.17609<br>9.99262<br>1.16871 | | 0.11559 | +39° 52′ | 0.11559 |
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ε Virginis:

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| | 56 ~~19.03~~ | | 56 45.0 |
| | ~~21.23~~ | | 47.0 |
| | 23.43 | 23.22 | 49.0 |
| 1609 | 25.20 | | 50.6 |
| | 27.20 | 2437 | 52.1 |
| | | | 2437 |
| | 31.50 | | 56 48.74 |
| | 33.50 | | |
| | 35.65 | | |
| | 37.80 | 39.910 | |
| | 39.97 | 39.91 | 57 11.0 |
| | 42.05 | | 12.7 |
| | 44.12 | | 14.9 |
| | 46.26 | | 16.9 |
| 35919 | 48.34 | 741 | 18.6 |
| | 35919 | | 741 |
| | 52.55 | | 57 14.82 |
| | 54.60 | 56728 | |
| | 56.77 | 5672 | |
| | 58.77 | | |
| 28364 | 0.95 | | 56 48.74 |
| | 28364 | 56 39.890 | 57 14.82 |

α Virginis:

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| | 18 58.37 | | | 18 48.0 |
| | 0.50 | 2.664 | | 50.8 |
| | 2.80 | 2.66 | | 52.6 |
| | 4.80 | | | 54.8 |
| 31332 | 6.85 | | 2627 | 56.0 |
| | 13.32 | | | 2627 |
| | 11.00 | | | 18 52.54 |
| | 13.20 | | | + 26.84 |
| | 15.20 | | | |
| | 17.38 | 19450 | | |
| | 19.52 | 19.34 | | 19 52.3 |
| | 21.50 | 19.43 | | 54.1 |
| | 23.70 | | | 56.2 |
| | 25.70 | | | 58.0 |
| 17505 | 27.85 | | 2806 | 0.0 |
| | 17505 | | | 2806 |
| | 32.08 | | | 19 56.12 |
| | 34.07 | 36206 | | − 36.74 |
| | 36.20 | 36.20 | | |
| | 38.30 | 3886 | | |
| 18103 | 40.30 | | | 18 52.54 |
| | 18103 | 19 19.385 | | 19 56.12 |

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| | 63.58 |
| 1.42878 | 1.80332 |
| 1.56514 | 1.16871 |
| 1.53603 | 2.97203 |
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|---|---|---|---|---|---|---|---|---|
| M | 51 39.07 | M | 58 33.87 | +34.36 | 59 8.23 | .02 |
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| R | 52 11.22 | R | 59 55.27 | | | |
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| | 52 11.31 | | 59 55.30 | 47.03 | 8.28 | |
| | | | 81.43 | | 8.25 | |

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| 7 | 53.35 |  | 7 | 44.6 |
|  | 55.78 | 58080 |  | 46.2 |
|  | 58.02 | 58.08 |  | 48.0 |
|  | 0.40 |  |  | 50.0 |
| 29040 | 2.85 |  | 2411 | 52.3 |
|  | 29040 |  |  | 2411 |
|  | 7.55 |  | 7 | 4822 |
|  | 9.90 |  | + | 28.83 |
|  | 12.37 |  |  |  |
|  | 14.70 | 17.059 |  |  |
|  | 17.00 | 17.06 | 8 | 51.0 |
|  | 19.45 | 17.04 |  | 52.5 |
|  | 21.80 |  |  | 54.7 |
|  | 24.20 |  |  | 56.9 |
| 15353 | 26.56 |  | 2743 | 59.2 |
|  | 15353 |  |  | 2743 |
|  | 31.23 |  | 8 | 54.86 |
|  | 33.67 | 36.010 | − | 37.81 |
|  | 36.05 | 36.01 |  |  |
|  | 38.33 | 15408 |  |  |
| 18005 | 40.77 |  | 7 | 48.22 |
|  | 18005 | 8 17.050 | 8 | 54.86 |
|  | 36.010 |  | + | 28.83 |
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| 15 54.3 | 15 39.9 | 16 5.0 |
| 58.8 | 44.6 | 9.8 |
| 3.3 | 48.4 | 13.3 |
| 7.7 | 51.9 | 17.2 |
| 12.2 | 2407 55.9 | 667 21.4 |
| 16.5 | 2407 | 667 |
| 20.9 | 4814 | 16 1334 |
| 25.2 |  |  |
| 29.7 |  |  |
| 648.6 | 16 35.3 | 17 26.5 |
| 12.07 | 38.7 | 29.1 |
|  | 42.2 | 33.3 |
|  | 45.7 | 36.4 |
|  | 2122 50.3 | 1651 39.8 |
|  | 2122 | 1651 |
|  | 4244 | 17 3302 |
| 31 15 41.89 | 15 48.14 | 16 13.34 |
|  | 16 42.44 | 17 33.02 |

308

β Cephei 9.53336

h m s
21 27 5
+70° 2'

0.11559

|  |  |  |
|---|---|---|
| 27 12.7 | 26 12.3 | 26 43.5 |
| 18.6 | 17.2 | 47.1 |
| 24.8 | 21.7 | 52.2 |
| 30.7 | 27.4 | 57.4 |
| 36.8 | 1113 32.7 | 2629 2.7 |
| 42.8 | 1113 | 2629 |
| 49.0 | 26 2226 | 26 5258 |
| 54.9 | + 1453 | + 44.21 |
| 0.8 |  |  |
| 33811 |  |  |
| 27 3679 | 27 50.0 | 28 47.0 |
|  | 55.9 | 52.3 |
|  | 1.6 | 57.6 |
|  | 7.1 | 2.9 |
|  | 3066 12.0 | 2896 9.8 |
|  | 66 | 2896 |
|  | 28 132 | 28 5792 |
|  | − 2453 | −1 21.13 |
|  | 29 37.4 | 26 52.58 |
|  |  | 28 57.92 |

M 43 49.87
M 45 5.75
R 45 5.87
R 45 5.52

45 5.71
75.84

M 24 18.25
M 24 34.10
M 24 50.75
M 25 20.77

24 55.21

M 26 45.37
M 26 59.77
M 26 30.50
M 27 54.12
M 28 10.05
~~27 23.61~~

62 4 8.7

1879 May 6

309
ε Pegasi 9.99423
h m s
21 38 14
+9° 19'
0.11559

38 23.20
25.25 27374
27.32 27.37
29.50
13687 31.60
13687
35.66
37.80
39.90
42.00 44050
44.07 44.05
46.05 44.07
48.20
50.29
39645 52.48
39645
56.65
58.70 0.770
0.84 0.77
2.80 8814
30385 4.96
385 38 44.060

38 15.5
17.1
19.0
20.9
948 22.3
948
38 1896
+ 25.10
39 6.1
7.8
9.8
11.7
489 13.5
489
39 946
− 25.40
38 18.96
39 9.78
+ 25.10
− 25.72

M 7 56.47
M 9 1.32

9 1.32

311
α Aquarii 9.99995
h m s
21 59 34
−0° 54'
1.17609 0.11559
9.99995
1.17604

59 42.70
44.80 46870
46.85 46.87
49.00
23435 51.00
23435
56.00
57.21
59.33
1.33 3.391
3.44 3.39
5.43 3.38
7.45
9.60
57052 11.67
3052
15.77
17.84 19.902
19.90 19.90
21.90 12677
9951 24.10
9951 0 3.385

59 33.2
34.6
35.9
37.8
1813 39.8
1813
59 3626
4 27.12
0 28.4
30.3
32.3
34.0
1609 35.9
1609
0 3218
− 2880
59 36.26
0 32.18
+ 27.12
− 28.80
55.92
1.74757
1.17604
2.92361
1.86326
8.93965
4 58 25

21 59 25.81

M 21 12.40
M 22 25.20
R 22 25.47
R 22 25.50

22 25.39
72.99

0 54 21.6

329
α Pegasi 9.98584
h m s
22 58 44
+14° 33'
0.11559

58 51.79
54.00 56144
56.20 56.14
58.28
28072 0.45
28072
4.65
6.80
8.90
11.00 13197
13.20 13.20
15.43 13.30
17.50
19.62
11877 21.77
11877
25.99
28.07 30246
30.24 30.46
32.35 14660
15123 34.50
15123 59 13.250

59 44.2
46.2
48.3
50.2
2411 52.2
2411
59 48.22
− 34.97
59 48.22
− 34.97

22 58 45.26

R 55 16.25
R 55 16.60

55 ~~16.60~~ 16.42

14 33 18.9

1

α Androm . 9.94424

h m s
0 2 8
° ′
+ 28 25

0.11559

2 12.82
15.05 17.408
17.35 17.41
19.77
8704 22.05
8704
26.78
29.07
31.48
33.83 36.164
36.18 36.16
38.48 36.16
40.86
43.20
32548 45.60
32548
50.20
52.55 54.916
54.90 54.92
57.28 7.233
27458 59.68
27458 2 36.160 + 27.18

2 5.2
6.9
8.9
10.9
449 13.0
449
2 8.98
+ 27.18

2 8.98
+ 27.18

0 2 8.83

R 2 14.77 ·
R 2 14.85 ·

2 14.85 1

28 25 22.1

3

γ Pegasi

h m s
0 7 0
° ′
+ 14 31

0.11559

7 —
—
—
—
—
—
—
—
—
—
—

84.44 28.19 − 4.26 32.45
28.146 27.99 6.59 34.68
28.26 8.54 36.80
141.60 28.08 12.79 40.87
28.32 28.33 14.92 43.25 45.384
28.35 17.05 45.40 45.38
28.40 19.18 47.58
28.44 22.692 21.38 49.82
22692
45384

28.233
28.255

0 7 13.3

7 46.4
48.3
51.0
52.5
2524 54.2
2524
7 50.48
− 22.22
7 50.48

R 57 35.15 ·
R 57 35.12 ·

57 35.12 4

14 30 41.7

33

α Arietis 9.96440

h m s
2 0 21
° ′
+ 22 53

0.11559

1.17609 0.11559
9.96440
1.14049

0 27.60
29.85 32.062
32.03 32.06
34.30
16031 36.53
16031
40.96
43.27
45.40
47.75 49.976
50.00 49.98
52.23 49.96
54.50
56.70
44978 58.97
44978
3.35
5.69 7.864
7.90 7.86
10.05 9992
3932 12.40
3932 0 49.970

0 21.1
23.1
25.0
27.2
1257 29.3
1257
0 25.14
+ 24.83
1 21.0
23.0
25.4
27.4
1262 29.4
1262
1 25.24
− 35.27
0 25.14
1 25.24
+ 24.83
− 35.27
60.10
1.77887
1.14049
2.91936
1.85854
8.93918
4 586

2 0 21.91

M 34 4.15 ·
M 35 16.47 ·
R 35 16.27 ·
R 35 16.32 ·

35 16.35
72.20

22 53 28.1

S    306

Sun c = 46.760    9.98094    α Cephei L. C    9.94620

h m s    h m s
2 57 4    -21 15 41

0.11559    0.11559

+16 51    +11° 56'

1879 May 6-7    May 7

55 59.58    57 7.8    58 12.05    57 41.3    16 3.0    14 51.8    15 33.6
1.85 3896    10.0    14.30 16540    43.3    7.2    54.9    37.8
3.75 3896    12 7    16.60 16.54    45.6    11.5    58.2    41.3
6.05    14.9    18.77    47.7    16.0 18.212    2.1    45.1
31948 8.25    623 16.9    8270 20.90    2272 49.3    20.5    2934 6.4    2061 48.3
19118    623    8270    2272    24.9    2934    2061
12.45    57 1246    25.20    57 4544    29.3    14 58.68    15 41.22
14.65    - 51.35    27.38    + 4844    1457 33.3
16.80    29.50
18.86 21113    31.85 33894
21.00 21.11    33.97 33.89    16 24.3    17 8.2
23.20 21.11    36.08 33.88    29.7    11.0
25.48    38.20    36.0    13.3
27.50    40.37    41.0
19002 29.90    30505 42.50
19002    30505    21 15 41 95
34.04    46.90
36.20 38336    49.00 51234
38.24 38.34    51.30 51.23
40.50 4223    53.47 6777
19168 42.70    57 1246    25617 55.50    57 4544    14 58.68    15 41.22
19168 56 21.110 - 51.35    25617 58 33.885 + 48.44    16

M 20 4.10    M 53 34.82.    M 36 53.52.
M 36 26.82.
M 35 33.42.
M 35 32.12.

~~35 57.45~~

62 4 8.7

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 138 |  |  |  |  | 140 |  |  |  | 148 |  |  |  |
|  | α Hydrae |  | 9.98561 | 9.99561 | θ Urs. Maj |  |  | 9.98907 | 9.78707 | ξ Leonis |  | 9.09530 | 9.96067 |
|  |  |  | 11463 |  |  |  |  | .11463 |  |  |  |  |  |
|  | h m s |  | .11024 |  | h m s |  |  | 9.90170 |  | h m s |  |  |  |
|  | 9 21 38 |  |  |  | 9 24 45 |  |  |  |  | 10 9 57 |  |  |  |
|  |  |  |  | 0.11559 |  |  | 1.17609 |  | 0.11559 |  | 1.17609 |  | 0.11559 |
|  | −8° 8′ |  |  |  | +52° 14′ |  | 9.78707 |  |  | +24° 1′ |  | 9.96067 |  |
|  |  |  |  |  |  |  | ~~1.16316~~ |  |  |  |  | 1.13676 |  |
|  | May 7 |  |  |  |  |  | 0.96316 |  |  |  |  |  |  |
|  | 21 46.87 |  | 21 50.7 |  | 24 43.70 |  | 24 32.1 |  | 10 5.50 |  | 9 57.0 |  |  |
|  | 48.91 | 50990 | 52.5 |  | 47.17 | 50486 | 35.4 |  | 7.85 | 10.118 | 58.8 |  |  |
|  | 50.97 | 50.99 | 54.6 |  | 50.47 | 50.49 | 38.4 |  | 10.16 | 10.12 | 0.4 |  |  |
|  | 53.00 |  | 56.5 |  | 53.80 |  | 41.3 |  | 12.40 |  | 2.8 |  |  |
|  | 25495 55.20 |  | 2723 58.0 |  | 25243 57.29 |  | 1915 44.3 |  | 5059 14.68 |  | 3039 4.9 |  |  |
|  | 26495 |  | 2723 |  | 25243 |  | 1915 |  | 5059 |  | 39 |  |  |
|  | 57.40 |  | 21 54.46 |  | 3.95 |  | 24 38.30 |  | 19.00 |  | 10 0.78 |  |  |
|  | 1.50 |  | + 13.23 |  | 7.35 |  | + 39.15 |  | 21.40 |  | + 27.37 |  |  |
|  | 3.55 |  |  |  | 10.70 |  |  |  | 23.70 |  |  |  |  |
|  | 5.60 | 7.720 |  |  | 14.05 | 17.422 |  |  | 25.90 | 28.141 |  |  |  |
|  | 7.67 | 7.72 | 22 34.7 |  | 17.40 | 17.42 | 25 52.9 |  | 28.07 | 28.14 | 10 56.6 |  |  |
|  | 9.90 | 7.66 | 36.2 |  | 20.80 | 17.48 | 55.7 |  | 30.38 | 28.16 | 58.3 |  |  |
|  | 11.88 |  | 37.8 |  | 24.03 |  | 58.2 |  | 32.70 |  | 0.3 |  |  |
|  | 13.98 |  | 39.7 |  | 27.57 |  | 1.5 |  | 34.94 |  | 2.4 |  |  |
|  | 60948 16.00 |  | 1902 41.8 |  | 15680 30.95 |  | 2927 4.4 |  | 25327 37.18 |  | 3023 4.7 |  |  |
|  | 6948 |  | 1902 |  | 15680 |  | 2927 |  | 25327 |  | 23 |  |  |
|  | 20.10 |  | 22 38.04 |  | 37.68 |  | 25 58.54 |  | 41.75 |  | 11 0.46 |  |  |
|  | 22.25 | 24322 | − 30.35 |  | 41.00 | 44456 | − 41.09 |  | 43.95 | 46.210 | − 32.31 |  |  |
|  | 24.38 | 24.32 |  |  | 44.40 | 44.46 |  |  | 46.15 | 46.21 |  |  |  |
|  | 26.38 | 13531 |  |  | 47.90 | 19495 |  |  | 48.45 | 5633 | 10 |  |  |
|  | 12161 28.50 |  | 21 54.46 |  | 22228 51.30 |  | 24 38.30 |  | 23105 50.75 |  | 9 0.78 |  |  |
|  | 12161 | 22 7.690 | 22 38.04 |  | 22228 | 25 17.450 | 25 58.54 |  | 23105 | 10 28.150 | 11 0.46 |  |  |
|  |  |  | + 13.23 |  |  |  | + 39.15 |  |  |  | +0 27.37 |  |  |
|  |  |  | − 30.35 |  |  |  | − 41.09 | 80.24 |  |  | − 32.31 | 59.68 |  |
|  |  |  | 1.12156 |  |  |  | 1.55293 | 1.90439 |  |  | 1.43827 | 1.77583 |  |
| 9 21 40.35 |  |  | 1.48216 |  |  |  | 1.61374 | ~~1.16316~~ | 0.96316 |  | 1.50534 | 1.13676 |  |
|  |  |  | 1.23180 |  |  |  | 1.49443 | ~~3.06755~~ | 2.86755 |  | 1.51250 | 2.91259 |  |
|  |  |  | 1.55240 |  |  |  | 1.51544 | 1.80182 |  |  | 1.58484 | 1.85181 |  |
|  |  |  |  |  |  |  |  | ~~8.73427~~ | 8.93427 |  |  | 8.93922 |  |
|  |  |  |  |  |  |  |  | ~~3 6 15~~ | 4 54 46 |  |  | 4588 |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 35 16.05 | +1705 | 35 33.10 | .07 | M 14 15.45 | +3122 | 14 46.69 | .32 | M 26 27.12 | +3255 | 26 55.67 | 05 |  |
| M | 36 12.57 |  |  |  | M 15 19.25 |  |  |  | M 27 38.10 |  |  |  |  |
| R | 36 12.52 |  |  |  | R 15 18.62 |  |  |  | R 27 38.37 |  |  |  |  |
|  |  |  |  |  | R 15 18.57 |  |  |  | R 27 38.17 |  |  |  |  |
|  | 54 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 36 12.36 | −3512 | 33.24 |  | 15 18.81 | −3207 | 46.04 |  | 27 38.21 | −3843 | 55.08 |  |  |
|  |  |  |  |  | 63.36 |  |  |  | 71.09 |  |  |  |  |
|  |  |  | 33.17 |  |  |  | 46.35 |  |  |  | 55.92 |  |  |
| 8 8 20.4 |  |  |  |  |  |  |  |  |  |  |  |  |  |

C

γ Leonis 9.99173 9.97173

11463

.08636

h m s

10 13 18

+20° 27'

1.17609

9.97173

1.14782

0.11559

1879 May 7

13 26.50
28.75 30.940
30.95 30.94
33.20
15470 35.30
15470
39.70
41.95
44.15
46.30 48.522
48.50 48.52
50.70 48.53
52.90
55.16
43670 57.34
43670
1.77
4.00 6.130
6.00 613
8.28 97.07
3065 10.60
3065 13.. 48.525

10 13 20.49

13 20.3
22.3
24.1
26.0
1207 28.0
1207
13 2414
+ 2438

14 18.0
20.7
22.3
24.3
1116 26.3
1116
14 2232
− 33.80

13 24.14
14 22.32
+ 24.38
− 33.80
1.38703
1.52852
1.49339
1.61528

58.18
1.76477
1.14782
2.91259
1.85461
8.94202
503

149

u Urs. Maj 9.87059

h m s

10 15 7

+42° 6

15 10.78
13.58
16.05
19.00
21.95

27.40
30.25
33.00
35.80 38.579
38.60 38.58
41.33
44.05
47.00
34721 49.78
34721
55.30
58.05 0.824
0.78 0.82
3.62
30412 6.37
412 15 38.563

15 47.3
49.0
51.7
53.4
2571 55.7
2571
15 5142

16 13.0
15.3
17.4
20.0
880 22.3
880
16 17.60

15 5142
16 17.60

0.11559

154

α Urs. Maj 9.66586 9.78049

h m s

10 56 15

+62° 24'

0.11559

56 57.8
2.4
6.9
11.0 15.72
15.7
20.3
24.6
29.1
33.7
1415

10 56 18.88

57 37.0
40.7
44.2
47.7
2223 52.7
2223
57 4446
− 28.74

57 58.3
2.1
6.2
10.9
3313 13.8
313
58 6.26
− 50.54

57 44.46
58 6.26

M 0 26.50 + 29.94
M 1 38.05

1 38.05 − 41.24
71.55

20 27 3.1

56.24 .28

56.81

56.52

M 22 9.17
M 22 34.10
R 22 33.95
R 22 34.00

22 34.02

M 4 59.50
M 5 12.07
R 5 12.05
R 5 12.00

5 12.07

62 25 5.3

300

21

23

M
M
R
R

155

ψ Urs. Maj 9.56299 9.84835

h m s
11 2 51
+45° 9′ 1.17609 0.11559
9.84835
1.02444

| | | | |
|---|---|---|---|
| 2 54.25 | | 2 44.7 | |
| 57.20 | 0.080 | 47.4 | |
| 0.00 | 0.08 | 50.0 | |
| 3.00 | | 52.9 | |
| 30040 5.95 | | 2500 55.0 | |
| 040 | | 2500 | |
| 11.77 | | 2 5000 | |
| 14.70 | | + 33.48 | |
| 17.58 | | | |
| 20.58 | 23466 | | |
| 23.50 | 23.47 | 4 10.7 | |
| 26.37 | 23.48 | 13.1 | |
| 29.29 | | 15.7 | |
| 32.20 | | 18.2 | |
| 21119 35.20 | | 782 20.5 | |
| 21119 | | 782 | |
| 40.98 | | 4 1564 | |
| 44.00 | 46876 | − 52.16 | |
| 46.80 | 46.87 | | |
| 49.85 | 46.95 | | |
| 23438 52.75 | | 2 50.00 | |
| 23438 | 3 23.475 | 4 15.64 | |
| | | + 33.48 | |
| | | − 52.16 | 8564 |
| | | 1.52478 | 1.93268 |
| | | 1.91734 | 1.02444 |
| | | 1.48995 | 2.95712 |
| | | 1.68031 | 1.89271 |
| | | | 8.93559 |
| | | | 4 55 40 |

156

δ Leonis 0.08425 9.96962

h m s
11 7 40
+21° 11′ 1.17609 0.11559
9.96962
1.14571

| | | | |
|---|---|---|---|
| 7 49.00 | | 7 41.8 | |
| 51.83 | 53488 | 44.0 | |
| 53.48 | 53.49 | 46.0 | |
| 55.65 | | 48.0 | |
| 26744 57.98 | | 2295 49.7 | |
| 26744 | | 2295 | |
| 2.40 | | 7 4590 | |
| 4.50 | | + 25.27 | |
| 6.70 | | | |
| 8.98 | 11.184 | | |
| 11.18 | 11.18 | 8 43.5 | |
| 13.40 | 11.16 | 45.5 | |
| 15.60 | | 47.2 | |
| 17.88 | | 49.0 | |
| 10066 20.02 | | 2364 51.2 | |
| 10066 | | 2364 | |
| 24.40 | | 8 4728 | |
| 26.60 | 28834 | − 36.11 | |
| 28.87 | 28.84 | | |
| 31.00 | 14233 | | |
| 14417 33.30 | | 7 45.90 | |
| 14417 | 8 11.170 | 8 47.28 | |
| | | + 25.27 | |
| | | − 36.11 | 6138 |
| | | 1.~~36680~~ 40260 | 1.78803 |
| | | 1.55763 | 1.14571 |
| | | 1.~~45105~~ 41625 | 2.93374 |
| | | 1.64188 | 1.87227 |
| | | | 8.93853 |
| | | | 4 57 39 |

11 7 43.22

164

β Leonis 0.09806 9.98443

h m s
11 42 53
+15° 15′ 1.17609 0.11559
9.98443
1.16052

| | | | |
|---|---|---|---|
| 43 2.78 | | 42 58.0 | |
| 4.90 | 6980 | 59.9 | |
| 7.00 | 6.98 | 1.7 | 1.84 |
| 9.00 | | 3.8 | |
| 3490 11.22 | | 3092 5.8 | |
| 3490 | | 92 | |
| 15.50 | | 43 184 | |
| 17.66 | | + 2222 | |
| 19.84 | | | |
| 21.95 | 24053 | | |
| 24.05 | 24.05 | 43 55.0 | |
| 26.18 | 24.07 | 57.0 | |
| 28.29 | | 58.5 | 58.58 |
| 30.44 | | 0.4 | |
| 21648 32.57 | | 2929 2.0 | |
| 21648 | | 2929 | |
| 36.90 | | 43 5858 | |
| 39.00 | 41.164 | − 34.52 | |
| 41.20 | 41.16 | | |
| 43.30 | 4814 | | |
| 20582 45.42 | | 43 1.84 | |
| 20582 | 43 24.060 | 43 58.58 | |
| | | + 2222 | |
| | | − 34.52 | 5674 |
| | | 1.34674 | 1.75389 |
| | | 1.53807 | 1.16052 |
| | | 1.44580 | 2.91441 |
| | | 1.63913 | 1.85394 |
| | | | 8.93953 |
| | | | 4 58 20 |

11 42 56.06

| | | | | | |
|---|---|---|---|---|---|
| M 18 39.25 | + 30.74 | 19 59.9 | .27 | | |
| M 19 56.95 | | | | | |
| R 19 57.52 | | | | | |
| R 19 57.62 | | | | | |
| 19 57.36 | − 47.80 | 9.46 | | | |
| 78.11 | | 9.92 | | | |

| | | | |
|---|---|---|---|
| M 16 27.60 | + [illegible] 30.64 | 16 [illegible] 58.24 | ~~121~~ .62 |
| M 17 42.05 | | | |
| R 17 42.10 | | | |
| R 17 42.20 | | | |
| 17 42.12 | − 43.84 | 58.28 | |
| 74.52 | | ~~17.07~~ 58.26 | |

21 11 1.3

| | | | |
|---|---|---|---|
| M 12 42.77 | + 29.51 | 13 10.68 | .08 |
| M 13 54.22 | | | |
| R 13 54.17 | | | |
| R 13 54.25 | | | |
| 13 54.21 | − 43.36 | 10.85 | |
| 71.44 | | 10.76 | |

15 14 41.5

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 582 | | | | 172 | | | | 173 | | | |
| | ε Corvi | | 9.96732 | 9.96732 | γ Virginis foll. | | | ~~1145~~ | ε Urs. Maj | | 9.74055 | 9.74055 |
| | | | 11463 | | | | | 9.99996 | | | 11463 | |
| | h m s | | .08155 | | h m s | | | | h m s | | 9.85518 | |
| | 12 3 | 54 | | | 12 35 | 31 | | | 12 48 | 42 | | |
| | | 1.17609 | | 0.11559 | | | 1.17609 | 0.11559 | | | | 0.11559 |
| | −21° | 57′ 9.96732 | | | −0° | 47′ | 9.99996 | | +56° | 37′ | | |
| 1879 | | 1.14341 | | | | | 1.17605 | | | | | |
| | May 7 | | | | | | | | | | | |
| | 4 1.98 | | 3 54.2 | | 35 41.88 | | 35 33.0 | | — | | 49 47.2 | |
| | 4.17 | 6406 | 56.2 | 57.98 | 43.90 | 45976 | 35.0 | | — | | 50.5 | |
| | 6.40 | 6.40 | 57.5 | 57.98 | 46.00 | 45.98 | 36.5 | | — | | 54.0 | |
| | 8.58 | | 59.7 | | 48.07 | | 37.9 | | — | | 57.0 | |
| | 3203 10.90 | | 2899 2.3 | | 22988 50.03 | | 1822 39.8 | | — | | 2685 59.8 | |
| | 3203 | | 2899 | | 22988 | | 1822 | | | | 2685 | |
| | 15.36 | | 3 57.98 | | 54.28 | | 35 3644 | | — | | 49 5370 | |
| | 17.52 | | + 26.18 | | 56.30 | | + 26.04 | | — | | − 37.81 | |
| | 19.70 | | | | 58.26 | | | | — | | | |
| | 22.00 | 24147 | | | 0.40 | 2459 | | | — | | | |
| | 24.04 | 24.15 | 4 54.4 | | 2.40 | 2.46 | 36 31.00 | | — | | 50 9.8 | |
| | 26.38 | 24.17 | 56.2 | | 4.47 | 2.51 | 32.6 | | — | | 13.0 | |
| | 28.60 | | 58.0 | | 6.52 | | 34.7 | | — | | 15.4 | |
| | 30.70 | | 0.1 | | 8.70 | | 36.4 | 1595 −11.2549 | 27.20 | 31.93 | 18.8 | |
| | 21732 33.02 | | 2907 2.0 | | 56213 10.80 | | 1728 38.1 | 1588 1502 | 31.10 | 15.96 | 800 23.0 | |
| | 21732 | | 2907 | | 2213 | | 1728 | | | | 800 | |
| | 37.49 | | 4 5814 | | 14.90 | | 36 3456 | 1588 2250 | 38.38 | | 50 1600 | |
| | 39.70 | 41942 | − 33.98 | | 16.94 | 19054 | − 32.08 | 1570 2635 | 42.05 | 45.906 | −1 0.11 | |
| | 41.92 | 4194 | | | 19.00 | 19.05 | | 1604 30.01 | 46.05 | 45.91 | | |
| | 44.18 | 4834 | | | 21.20 | 12503 | | 1580 33.75<br>15.88 37.62 | 49.55 | 79.30 | | |
| | 20971 46.42 | | 3 57.98 | | 9527 23.23 | | 35 36.44 | 22953 | 53.50 | 15.86 | 49 53.70 | |
| | 20971 | 4 24.160 | 4 58.14 | | 9527 | 36 2.485 | 36 34.56 | | 22953 | | 50 16.00 | |
| | | | + 26.18 | | | | + 26.04 | | | | | |
| | | | − 33.98 | 60.16 | | | − 32.08 | 58.12 | | 15.91 | | |
| | | | 1.41757 | 1.77931 | | | 1.41564 | 1.76433 | | 15.84 | | |
| | | | 1.53122 | 1.14341 | 12 35 8476 | | 1.50623 | 1.17605 | | | | |
| | | | 1.49992 | 2.92272 | | | 1.53023 | 2.94038 | | | | |
| | | | 7.61310 | 1.86261 | | | 1.62082 | 1.87795 | | | | |
| | | | | 8.93989 | | | | 8.93757 | | | | |
| | | | | 4 58 35 | | | | 4 57 0 | | | | |
| M | 23 0.05 | +31.62 | 23 31.67 | .11 M | 14 21.97 | +3350 | 55.87 | .09 M | 52 8.72 | | | |
| M | 24 12.77 | | | M | 15 37.45 | | | M | 52 24.27 | | | |
| R | 24 13.02 | | | R | 15 37.47 | | | R | 52 24.30 | | | |
| R | 24 13.00 | | | R | 15 37.56 | | | R | 52 24.60 | | | |
| | 24 12.93 | −41.04 | 31.85 | | 15 37.47 | −41.77 | 55.90 | | 52 24.39 | | | |
| | 72.88 | | | | 75.50 | | | | | | | |
| | | | 31.78 | | | | 55.78 | | | | | |
| | | | | | 0 47 26.3 | | | | | | | |

016

176

ε Virginis .10564 9.99101

h m s
12 56 9
+11° 37′
1.17609
9.99101
1.16710
0.11559

56 19.30
21.33
23.50
25.48
11721 27.60
11721
31.87
33.90
36.00
38.05
40.18
42.27
44.37
46.60
36194 48.70
36194
52.90
54.90
56.96
59.17
28517 1.24
28517

23442
2344
40.216
4022
40.23
57.034
57.03
8047
56 40.225

56 16.4
18.0
20.1
22.4
1011 24.2
1011
56 2022
+ 2000
57 6.0
8.0
10.0
12.0
496 13.6
496
57 992
− 29.70
56 20.22
57 9.92
+ 20.00
− 29.70
1.30103
1.49206
1.40608
1.59980

49.70
1.69636
1.16710
2.86346
1.80665
8.94319
5 0 51

587

α Virginis .10825 9.99262

h m s
13 18 49
−10° 32′
1.17609
9.99262
1.16871
0.11559

18 58.70
0.90
2.86
4.88
31334 7.00
1434
11.20
13.27
15.43
17.55
19.68
21.72
23.80
25.87
17657 28.05
17657
32.09
34.27
36.34
38.50
18195 40.75
18195

2868
2.67
19.619
1962
19.53
36390
36.39
3906
19 19.575

18 18 52.27

18 52.3
54.2
56.0
58.0
2804 59.9
2804
18 5608
+ 23.50
19 46.3
48.0
50.3
52.2
2511 54.3
2511
19 5022
− 30.64
18 56.08
19 50.22
+ 23.50
− 30.64
1.37107
1.48629
1.49832
1.55854

54.14
1.73352
1.16871
2.90223
1.84142
8.93919
4 58 6

13

γ Cassiop 9.65869 9.69409

h m s
0 49 25
+60° 4′
11463
9.81282
0.11559

49 13.40
17.53
21.90
25.92
10875 30.00
10875
38.20
42.45
46.50
50.52
54.90
59.10
3.00
7.00
49294 11.27
49294
19.70
23.60
28.05
32.28
13968 36.05
13968

21750
21.75
54.771
5477
54.84
27936
27.94
14969
49 54.805

48 58.0
0.9
3.6
7.9
3221 11.7
221
49 442
+ 50.38
50 40.0
43.3
46.4
50.0
2339 54.2
2339
50 4678
− 51.98
49 4.42
50 46.78
+ 50.38
− 51.98
1.80226
1.91584
1.~~80580~~
1.82305

49 45.4
49.4
52.3
55.6
2624 59.7
2624
49 5248
+ 2.32
51 17.6
49 5248
+ 2.12

M 52 1.97 + 25.47
M 52 6.25
R 52 5.92
R 52 5.95
52 6.04 − 37.83
64.07

51 29.44
28.21
29.83

39

M 58 39.45 + 30.08
M 59 48.82
R 59 48.97
R 59 48.80
59 48.86 − 38.22
69.41

10 82 55

59 9.53
9.64
9.58

.05

M 24 28.47 ~~16.45~~ 32.03
M 24 58.92
M 25 34.30
M 25 53.25
~~25 48.82~~ − ~~66.34~~
33.77

20

δ Cassiop 9.70418

h m s
1 17 55
+59° 36′

1879 May 7

| | | | |
|---|---|---|---|
| 17 43.15 | | 17 41.2 | |
| 48.00 | 51.796 | 44.3 | |
| 51.88 | 51.79 | 48.6 | |
| 55.30 | | 52.2 | |
| 25898 0.05 | | 2422 55.9 | |
| 25898 | | 4844 2422 | |
| 18.38 | | 17 48.44 | |
| 12.30 | | | |
| 16.30 | | | |
| 20.45 | 25.670 | | |
| 24.60 | 25.67 | 18 11.8 | |
| 28.70 | | 15.0 | |
| 32.60 | | 19.8 | |
| 36.90 | | 22.4 | |
| 23103 40.80 | | 965 27.5 | |
| 23103 | | 19.30 965 | |
| 49.00 | | 18 19.30 | |
| 52.95 | | | |
| 57.00 | | | |
| 1.03 | | | |
| 5.00 | 17 25.00 | 18 41.5 | |
| | | 44.5 | |
| | | 48.0 | |
| | | 52.0 | |
| | | 54.6 | |
| | | 2966 56.0 | |

138

α Hydrae .71024 9.99561

0.11559

h m s
9 21 38
−8° 8′

1.17609
9.99561
1.17170

May 8

0.11559

| | | | |
|---|---|---|---|
| 21 47.30 | | 21 39.0 | |
| 49.40 | 51.490 | 40.8 | |
| 51.50 | 51.49 | 42.5 | |
| 53.60 | | 44.6 | |
| 25745 55.65 | | 2129 46.0 | |
| 745 | | 2129 | |
| 59.70 | | 21 42.58 | |
| 1.90 | | + 25.58 | |
| 4.02 | | | |
| 6.04 | 8.134 | | |
| 8.18 | 8.13 | 22 35.5 | |
| 10.25 | 8.18 | 37.0 | |
| 12.25 | | 38.9 | |
| 14.40 | | 40.6 | |
| 61321 16.47 | | 1946 42.6 | |
| 7321 | | 1946 | |
| 20.70 | | 22 38.92 | |
| 22.70 | 24.856 | − 30.76 | |
| 25.00 | 24.86 | | |
| 26.90 | 13635 | | |
| 12428 28.98 | | 21 42.58 | |
| 12428 | 22 8.155 | 22 38.92 | |
| | | + 25.58 | |
| | | − 30.76 | 56.34 |
| 9 21 40.84 | | 1.40790 | 1.75082 |
| | | 1.48799 | |
| | | 1.51814 | 2.92252 |
| | | 159823 | 2.12047 |
| | | | 9.19795 |
| | | | 8 56 51 |

140

θ Urs. Maj 9.90170 9.78707

h m s
9 24 45
+52° 14′

0.11559

May 8

| | | | |
|---|---|---|---|
| 24 44.00 | | 24 42.0 | |
| 47.40 | 50.810 | 46.8 | |
| 50.88 | 50.81 | 50.0 | |
| 54.17 | | 52.4 | |
| 25405 57.60 | | 2468 55.6 | |
| 25405 | | 2468 | |
| 4.30 | | 24 49.36 | |
| 7.80 | | | |
| 10.95 | | | |
| 14.55 | | | |
| 17.80 | 17.817 | 26 12.3 | |
| 21.25 | 17.80 | 15.4 | |
| ~~24.70~~ | | 17.7 | |
| 27.90 | | 20.8 | |
| 160.35 ~~31.10~~ | | 912 25.0 | |
| 17.817 | | 912 | |
| 37.90 | | 26 18.24 | |
| 41.35 | 44.754 | | |
| 44.71 | 44.75 | | |
| 48.20 | | | |
| 22377 51.55 | | 24 49.36 | |
| 22377 | 25 17.80 | 26 18.24 | |

M 51 54.85 ·
M 52 15.67 ·
M 52 54.92 ·

~~52 25.29~~

M 34 59.80 · +32.97 9277 33
M 36 11.77 ·

36 11.77 −39.65 9.212

131.97

9.244

8 8 20.4

M 14 24.37 ·
M 15 33.97 ·

15 33.97

142

ε Leonis 9.95960 9.95960

11463
0.07423

h m s
9 38 59

° ′
+24 30

1.17609
9.95960
1.13569

0.11559

May 8

| | | | |
|---|---|---|---|
| 39 1.15 | | 39 2.5 | |
| 9.55 | 11.770 | 4.6 | |
| 11.75 | 11.77 | 6.5 | |
| 14.08 | | 8.4 | |
| 5885 16.40 | | 325 10.5 | |
| 5885 | | 325 | |
| 20.83 | | 39 6.50 | |
| 23.10 | | + 2334 | |
| 25.36 | | | |
| 27.60 | 29.848 | | |
| 29.87 | 29.85 | 40 1.6 | |
| 32.07 | 29.84 | 2.8 | |
| 34.39 | | 4.8 | |
| 36.61 | | 6.9 | |
| 26863 38.84 | | 257 9.6 | |
| 26863 | | 257 | |
| 43.47 | | 40 5.14 | |
| 45.77 | 47.906 | − 3530 | |
| 47.95 | 47.91 | | |
| 50.05 | 5968 | | |
| 23953 52.29 | | 39 6.50 | |
| 23953 | 39 29.845 | 40 5.14 | |
| | | + 23.34 | |
| | | − 3530 | 58.64 |
| | | 1.36810 | 1.76819 |
| | | 1.54777 | 1.13569 |
| | | 1.44233 | 2.90388 |
| | | 1.62200 | 1.84398 |
| | | | 8.94010 |
| | | | 4 6844 |

M 9 50.90 +27.69 78.59 .13
M 9 0.72

9 0.72 − 41.88 7884

69.82 7872

146

α Leonis 9.98950 9.98950

11463
0.10413

h m s
10 1 56

° ′
+12 33

1.17609
9.98950
1.16569

0.11559

| | | | |
|---|---|---|---|
| 2 5.18 | | 2 2.2 | |
| 7.30 | 9.440 | 3.9 | |
| 9.42 | 9.44 | 5.5 | |
| 11.57 | | 6.5 | |
| 4720 13.73 | | 277 9.6 | |
| 4720 | | 277 | |
| 17.80 | | 2 5.54 | |
| 19.94 | | + 20.78 | |
| 22.06 | | | |
| 24.05 | 26.291 | | |
| 26.29 | 26.29 | 2 53.8 | |
| 28.38 | 26.34 | 55.5 | |
| 30.50 | | 57.2 | |
| 32.70 | | 58.9 | |
| 23662 34.90 | | 2864 1.5 | |
| 23662 | | 2864 | |
| 39.00 | | 2 57.28 | |
| 41.20 | 43.244 | − 3096 | |
| 43.27 | 43.24 | | |
| 45.28 | 5268 | | |
| 21622 47.47 | | 2 5.54 | |
| 21622 | 2 26.315 | 2 57.28 | |
| | | + 20.78 | |
| | | − 30.96 | 5174 |
| | | 1.31764 | 1.71383 |
| | | 1.49080 | 1.16559 |
| | | 1.42177 | 2.87942 |
| | | 1.59493 | 1.80284 |
| | | | 8.92342 |
| | | | 4 4782 |

10 1 58.94

M 54 5.87 +26.41 32.28 1.12
M 55 9.42
R 55 9.32
R 55 9.40

55 9.38 −39.35 30.03
6351

31.16

12 33 16.6

148

ζ Leonis .07530 9.96067

h m s
10 9 57

° ′
+24 1

1.17609
9.96067
1.13676

0.11559

| | | | |
|---|---|---|---|
| 10 6.00 | | 10 0.0 | |
| 8.40 | 10630 | 2.2 | |
| 10.70 | 10.63 | 4.1 | |
| 12.93 | | 6.3 | |
| 5315 15.12 | | 204 7.8 | |
| 5315 | | 204 | |
| 19.78 | | 10 4.08 | |
| 21.96 | | + 2460 | |
| 24.20 | | | |
| 26.36 | 28.688 | | |
| 28.60 | 28.69 | 10 53.5 | |
| 30.92 | 28.68 | 55.8 | |
| 33.15 | | 57.8 | |
| 35.44 | | 59.9 | |
| 25819 37.78 | | 2890 2.0 | |
| 25819 | | 2890 | |
| 42.19 | | 10 57.80 | |
| 44.41 | 46.732 | − 2912 | |
| 46.76 | 46.73 | | |
| 49.00 | 5736 | | |
| 23366 51.30 | | 10 4.08 | |
| 23366 | 10 28.685 | 10 57.80 | |
| | | + 24.60 | |
| | | − 29.12 | 53.72 |
| | | 1.39094 | 1.73014 |
| | | 1.46419 | 1.13676 |
| | | 1.46624 | 2.86690 |
| | | 1.53949 | 1.81331 |
| | | | 8.94641 |
| | | | 5 3 5 |

M 26 29.80 +29.26 59.06 .68
M 27 34.77
R 27 34.97
R 27 34.85

27 34.86 −34.63 60.23
65.06

59.64

C

149

153

γ Leonis .08636 9.97173 u Urs. Maj 9.87039 β Urs. Maj 9.73572

h m s
10 13 18
+20° 27′

1.17609
9.97173
1.14782

0.11559

h m s
10 15 7
+42° 6′

0.11559

h m s
10 54 32
+57° 2′

0.11559

1879
May 8

13 26.75
29.20
31.45
33.65
15702 35.97
15702
40.29
42.50
44.66
46.82
49.00
51.27
53.37
55.70
44161 58.00
44161
2.32
4.55
6.70
8.88
3343 10.98
3343

31404
31.40

49068
49.07
49.13

6.686
6.66
9826

13 49.000

10 13 20.48

13 22.9
24.7
27.0
28.4
1332 30.2
1332
13 2664
+ 2246

14 21.0
23.2
24.9
27.2
1257 29.4
1257
14 2514
− 36.04

13 26.64
14 25.14
+ 22.46
− 36.04
1.35141
1.55678
1.43777
1.64314

58.50
1.76716
1.14782
2.91498
1.84899
8.93401
4 5435

15 11.18
13.92
16.83
19.60
8378 22.25
8378
28.05
30.88
33.60
36.20
38.95
41.82
44.70
47.40
35180 50.20
35180
55.75
58.50
1.37
4.00
30542 6.80
642

16756
16.75

39.089
39.09
38.91

1284
1.08
7783

15 39.000

15 28.6
31.4
33.3
35.5
1670 38.2
1670
15 3340
+ 5.60

16 12.3
14.4
16.3
18.6
829 21.3
829
16 1658
− 37.58

15 3340
16 16.58
+ 5.60
− 37.58

54 27.75
31.43
35.15
38.95
17600 42.72
17600
50.24
54.05
57.91
1.60
5.37
9.20
12.90
17.00
58893 20.65
4893
28.00
32.05
35.83
39.67
17910 43.55
17910

35200
35.20

5437
5.44
5.50

35820
35.82
13102

55 5.475

54 28.7
32.5
34.8
37.9
1756 41.7
1756
54 3512
+ 30.36

55 48.2
51.2
56.4
59.2
2778 2.8
2778
55 55.56
− 50.08

54 3512
55 55.56
+ 30.36
− 50.08

M 0 29.12 +27.40 56.52 .34
M 1 39.80

1 39.80 −43.97 55.83
70.63
56.18

20 27 3.2

M 21 51.62
M 22 32.90
M 22 32.65

22 32.78

M 26 23.57

154

α Urs. Maj 9.78049 9.66586

h m s
10 56 15
+62° 24′
0.11559

56 —
—
—
49.80 3120 18.60 99.40
49.60 2672 22.88 49.700
49.44 1782 31.62 444.90
49.41 1336 36.05 49.433
49.38 890 40.48
49.01 +441 44.60 49.441
49.47 -001 49.48 49.44
49.61 -444 54.05
49.55 891 58.46
49.59 1336 2.95
49.44 4497 7.28
44497 246.99
49.48 2672 16.20 49.398
49.35 3118 20.53 25060
49.33 3564 24.97 25.06
49.51 4009 29.60
49.32 4458 34.00
12530
49.510
49.455
11 56 18.87

56 29.0
33.0
36.5
40.9
1848 45.4
1848
56 3696
+ 1250
57 38.6
42.0
46.2
50.0
2312 54.4
2312
57 4624
− 5678
56 36.96
57 46.24

M 4 19.22
M 5 0.15
R 5 0.25
R 5 0.05
5 0.15

62 24.54

155

ψ Urs. Maj ~~9.96294~~ 9.84835

h m s
11 2 51
+45° 9′
0.11559

1.17609
9.84835
1.02444

2 54.75
57.90 0.664
0.70 0.66
3.60
30332 6.37
332
12.35
15.15
18.05
20.90 23.911
24.00 23.91
26.90 23.96
29.75
32.60
21520 35.50
21520
41.40
44.25 47.250
47.25 47.25
50.15 47.91
23625 53.20
23625 3 23.935

2 45.2
47.2
49.5
51.7
2485 54.9
2485
2 49.70
+ 34.24
4 2.3
4.3
7.1
9.5
361 12.9
360
4 7.20
− 43.26
2 49.70
4 7.22
+ 34.24
− 43.28
1.53453
1.63629
1.49750
1.59926

7752
1.88941
1.02444
2.91385
1.85028
8.93643
4 56 14

M 18 38.65 +31.44 70.09 .17
M 19 49.25
R 19 49.72
R 19 49.50
19 49.49 −39.74 69.75
70.84
69.92

156

δ Leonis .08425 9.96962

h m s
11 7 40
+21° 11′
0.11559

1.17609
9.96962
1.14571

7 49.70
51.80 54020
53.97 54.02
56.15
27011 58.48
27010
2.85
5.00
7.20
9.47 11.637
11.65 11.64
13.84 11.68
16.02
18.30
10473 20.40
10473 ~~5856~~
24.90
27.00 29334
29.37 29.33
31.60 14335
14667 33.80
14667 8 11.660

11 7 48.21

7 42.9
44.8
47.0
49.0
2349 51.2
2349
7 4698
+ 2468
8 41.2
43.3
45.0
47.2
2257 49.0
2257
8 4514
− 3348
7 4698
8 45.14
+ 2468
− 33.48
1.39234
1.52478
1.47659
1.60903

5816
1.76462
1.14571
2.91033
1.84714
8.93681
4 56 29

M 16 28.87 +29.96 58.03 .14
M 17 38.42
R 17 38.37
R 17 38.42
17 38.40 −40.65 57.75
70.33
57.89

21 11 1.41

|  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 164 |  |  |  | 582 |  |  |  |  | 172 |  |  |
|  | β Leonis |  | .09906 | 9.98443 | ε Corvi |  |  | 9.96732 | γ Virginis pr. |  |  | ~~11459~~<br>9.99996 |
|  | h m<br>11 42 | s<br>53 |  |  | h<br>12 | m s<br>3 54 |  |  |  | h m s<br>12 35 32 |  |  |
|  | +15° | 15' | 1.17609<br>9.98443 | 0.11559 | −21° | 57' | 1.17609<br>9.96732 | 0.11559 |  | − 0° 47' | 1.17609<br>9.99996 | 0.11559 |
| 1879 | May 8 |  | 1.16052 |  |  |  | 1.14341 |  |  |  | 1.17605 |  |
|  | 43 3.15 |  | 42 57.2 |  | 4 2.48 |  | 3 55.4 |  | 35 42.00 |  | 35 32.7 |  |
|  | 5.25 | 7386 | 58.9 |  | 4.68 | 6842 | 57.8 |  | 44.19 | 46270 | 34.5 |  |
|  | 7.43 | 7.38 | 1.0 |  | 6.77 | 6.84 | 59.2 |  | 46.34 | 46.27 | 35.8 |  |
|  | 9.50 |  | 2.7 |  | 9.00 |  | 0.7 |  | 48.36 |  | 37.8 |  |
| 3693 | 11.60 |  | 3046 4.8 | 3421 | 11.28 |  | 2958 2.7 | 23135 | 50.46 |  | 1803 39.5 |  |
|  | 3693 |  | 46 |  | 3421 |  | 2958 |  | 23135 |  | 1803 |  |
|  | 15.97 |  | 43 0.92 |  | 15.53 |  | 3 59.16 |  | 54.55 |  | 35 36.06 |  |
|  | 18.20 |  | + 23.58 |  | 17.77 |  | + 25.34 |  | 56.55 |  | + 26.72 |  |
|  | 20.28 |  |  |  | 20.00 |  |  |  | 58.80 |  |  |  |
|  | 22.47 | 24519 |  |  | 22.35 | 24458 |  |  | 0.80 | 2.797 |  |  |
|  | 24.50 | 24.52 | 43 50.9 |  | 24.47 | 2446 | 4 50.4 |  | 2.70 | 2.79 | 36 33.5 |  |
|  | 26.65 | 24.48 | 52.7 |  | 26.70 | 24.54 | 52.4 |  | 4.90 | 2.77 | 35.3 |  |
|  | 28.70 |  | 54.8 |  | 28.90 |  | 53.9 |  | 6.85 |  | 37.0 |  |
|  | 30.90 |  | 56.8 |  | 31.00 |  | 55.5 |  | 8.97 |  | 38.7 |  |
| 22067 | 33.00 |  | 2741 58.9 | 22012 | 33.40 |  | 2702 58.0 | 56517 | 11.05 |  | 1853 40.8 |  |
|  | 22067 |  | 2741 |  | 22012 |  | 2702 |  | 2517 |  | 1853 |  |
|  | 37.37 |  | 43 54.82 |  | 37.70 |  | 4 54.04 |  | 15.18 |  | 36 37.06 |  |
|  | 39.37 | 41568 | − 30.32 |  | 39.90 | 42240 | − 29.54 |  | 17.17 | 19276 | − 34.28 |  |
|  | 41.52 | 41.57 |  |  | 42.27 | 42.24 |  |  | 19.28 | 19.27 |  |  |
|  | 43.70 | 4895 |  |  | 44.48 | 4908 |  |  | 21.28 | 12554 |  |  |
| 20784 | 45.88 |  | 43 0.92 | 21120 | 46.85 |  | 3 59.16 | 9638 | 23.47 |  | 35 36.06 |  |
|  | 20784 | 43 24.500 | 43 54.82 |  | 21120 | 4 24.500 | 4 54.04 |  | 9638 | 36 2.780 | 36 37.06 |  |
|  |  |  | + 23.58 |  |  |  | + 25.34 |  |  |  | + 26.72 |  |
|  |  |  | − 30.32 | 53.90 |  |  | − 29.54 | 54.88 |  |  | − 34.28 | 61.00 |
|  |  |  | 1.37254 | 1.73159 |  |  | 1.40381 | 1.73941 |  |  | 1.42684 | 1.78533 |
| 11 42 | 56.05 |  | 1.48173 | 1.16052 |  |  | 1.47041 | 1.14341 | 12 35 | 84.76 | 1.53504 | 1.17605 |
|  |  |  | 1.47160 | 2.89211 |  |  |  | 2.88282 |  |  | 1.54143 | 2.96138 |
|  |  |  | 1.58079 | 1.82802 |  |  |  | 1.82334 |  |  | 1.64963 | 1.90352 |
|  |  |  |  | 8.93591 |  |  |  | 8.94052 |  |  |  | 8.94214 |
|  |  |  |  | 4 5553 |  |  |  | 4 591 |  |  |  | 5 08 |
| M | 12 41.72 | +29.62 | 71.34 | .20 | M 23 1.40 | +25.34 | 26.74 | 5.85 | M 14 14.82 | +34.79 | 49.61 | .33 |
| M | 13 48.82 |  |  |  | M 24 7.82 |  |  |  | M 15 34.77 |  |  |  |
| R | 13 49.15 |  |  |  | R 24 7.95 |  |  |  | R 15 35.07 |  |  |  |
| R | 13 49.10 |  |  |  | R 24 8.17 |  |  |  | R 15 34.85 |  |  |  |
|  | 13 49.02 | −38.09 | 70.93 |  | 24 7.98 | −29.54 | 38.44 |  | 15 34.90 | −44.63 | 50.27 |  |
|  | 67.30 |  |  |  | 66.58 |  |  |  | 80.08 |  |  |  |
|  |  |  | 71.14 |  |  |  | 32.59 |  |  |  | 49.94 |  |
| 15 | 14 41.6 |  |  |  |  |  |  | 0 | 47 26.8 |  |  |  |

173

ε Urs. Maj 9.85518 9.74055

| h | m | s |  |
|---|---|---|---|
| 12 | 48 | 42 |  |
| +56° | 37′ |  | 0.11559 |

|  |  |  |
|---|---|---|
| 48 38.48 |  | 48 23.7 |
| 42.48 | 46156 | 27.5 |
| 46.22 | 46.16 | 30.2 |
| 50.00 |  | 34.3 |
| 23078 53.60 |  | 1536 37.9 |
| 23078 |  | 1536 |
| 1.20 |  | 48 30.72 |
| 4.90 |  | + 4546 |
| 8.58 |  |  |
| 12.47 | 16232 |  |
| 16.40 | 1623 | 49 18.2 |
| 20.00 | 16.12 | 21.8 |
| 23.80 |  | 24.4 |
| 27.45 |  | 28.7 |
| 14609 31.29 |  | 1255 32.4 |
| 14609 |  | 1255 |
| 38.60 |  | 49 25.10 |
| 42.27 | 46094 | − 8.92 |
| 46.00 | 46.09 |  |
| 49.80 | 15225 |  |
| 23047 53.90 |  | 48 30.72 |
| 23047 | 49 16.175 | 49 25.10 |
|  |  | + 45.46 |
|  |  | − 8.92 |
|  |  | 1.65763 |
|  |  | 0.95036 |
|  |  | 1.51281 |
|  |  | 0.80554 |

176

ε Virginis ~~.10564~~ 9.99101

| h | m | s |  |  |
|---|---|---|---|---|
| 12 | 56 | 9 |  |  |
| + 11° | 37′ |  | 1.17609 | 0.11559 |
|  |  |  | 9.99101 |  |
|  |  |  | 1.16710 |  |

|  |  |  |  |
|---|---|---|---|
| 56 19.48 |  | 56 12.5 |  |
| 21.67 | 23776 | 13.9 |  |
| 23.80 | 23.78 | 15.4 | ~~15~~ |
| 25.88 |  | 17.3 |  |
| 11888 28.05 |  | 789 19.8 |  |
| 11888 |  | 789 |  |
| 32.23 |  | 56 15.78 |  |
| 34.20 |  | + 24.78 |  |
| 36.32 |  |  |  |
| 38.45 | 40539 |  |  |
| 40.55 | 40.54 | 57 10.0 |  |
| 42.60 | 40.59 | 11.7 |  |
| 44.70 |  | 13.4 |  |
| 46.85 |  | 15.0 |  |
| 36485 48.95 |  | 670 16.9 |  |
| 36485 |  | 670 |  |
| 53.20 |  | 57 13.40 |  |
| 55.23 | 57.410 | − 32.84 |  |
| 57.47 | 57.41 |  |  |
| 59.53 | 8119 |  |  |
| 28705 1.62 |  | 56 15.78 |  |
| 28705 | 56 40.565 | 57 13.40 |  |
|  |  | + 24.78 |  |
|  |  | − 32.84 | 57.62 |
|  |  | 1.39410 | 1.76057 |
|  |  | 1.51640 | 1.16710 |
|  |  | 1.49974 | 2.92767 |
|  |  | 1.62204 | 1.86882 |
|  |  |  | 8.94115 |
|  |  |  | 4 59 27 |

20

δ Cassiop L.C. 9.93577

| h | m | s |  |
|---|---|---|---|
| 1 | 17 | 55 |  |
| +120 | 24 |  | 0.11559 |

|  |  |  |
|---|---|---|
| 18 4.0 | 17 14.0 | 17 42.0 |
| 7.9 | 18.0 | 45.1 |
| 12.0 | 22.3 | 50.7 |
| 16.1 | 25.7 | 53.8 |
| 20.0 | 1089 28.9 | 2500 58.4 |
| 24.0 | 1089 | 2500 |
| 28.2 | 17 21.78 | 17 50.00 |
| 32.0 | + 58.29 | + 30.07 |
| 36.4 |  |  |
| 1806 |  |  |
| 18 20.07 | 18 35.9 | 19 14.9 |
|  | 41.6 | 18.5 |
|  | 47.8 | 22.5 |
|  | 50.8 |  |
|  | 2310 54.9 |  |
|  | 2310 |  |
|  | 18 46.20 |  |
|  | − 26.13 |  |
|  | 17 21.78 | 17 50.00 |
|  | 18 46.20 | 19 |

|  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| M 51 9.57 | +32.57 | 42.14 | .01 | M 50 56.30 | +31.60 | 87.90 | .22 | M 9 55.27 |
| M 51 48.72 |  |  |  | M 52 10.37 |  |  |  | M 9 35.50 |
| R 51 48.37 |  |  |  | R 52 10.27 |  |  |  | M 8 57.55 |
| R 51 48.52 |  |  |  | R 52 10.05 |  |  |  | M 8 36.60 |
| 51 48.54 | −63.98 | 42,15 |  | 52 10.23 | −41.88 | 88.35 |  | 9 ~~3.22~~ |
|  |  | 42,15 |  | 73.93 |  | 88.12 |  |  |

1879

289

γ Cygni 9.88510

h m s
20 17 53

° ′
+39 52

0.11559

May 8

17 57.65
0.10
2.76
5.37
31410 8.20
1410
13.48
16.04
18.90
21.48
24.05
26.90
29.55
32.35
21805 35.20
21805
40.30
43.00
45.75
48.40
22870 51.25
22870

2820
2.82
24228
24.23
24.28
45740
45.74
4856
18 24.255

17 48.4
50.9
53.8
55.5
2665 57.9
2665
17 5330
+ 30.96
17 53.30
+ 30.96

R 35 50.37.
R 35 50.47.

35 50.~~47~~ 42

294

α Cygni 9.85062 9.85062
.11463
9.96525

h m s
20 37 18

° ′
+44 51

0.11559

37 20.38
23.55
26.36
29.00
13149 32.20
13149
38.00
40.80
43.70
46.50
49.45
52.30
55.30
58.05
44510 1.00
44510
7.03
9.95
12.70
15.62
6410 18.80
6410

26298
26.39
49456
49.46
49.60
12820
12.82
9921
37 49.530

37 24.0
26.8
28.8
31.0
1440 33.4
1440
37 2880
+ 20.73
39 23.9
27.0
29.7
32.3
1481 35.2
1481
39 2962
−1 40.09
37 2880
39 29.62
+ 20.73

20 37 19.85

M 37 25.57.
M 38 20.57.
R 38 20.60.
R 38 20.27.

38 20.48

44 50 42.3

298

ε Cygni 9.92102 9.92102
11463
0.03565

h m s
20 41 19

° ′
+33 31

0.11559

41 25.20
27.50
30.05
32.52
15015 34.88
15015
39.97
42.53
44.93
47.30
49.81
52.30
54.84
57.50
44909 59.85
44909
4.70
7.16
9.66
12.13
4843 14.78
4843

30030
30.03
49899
49.90
49.85
9.686
9.68
9971
41 49.875

41 16.2
19.0
21.0
23.6
1054 25.6
1054
41 21.08
+ 2880
42 22.0
25.0
27.6
29.8
1365 32.1
1365
42 27.30
− 37.42
41 21.08
42 27.30
+ 28.80
− 37.42
1.45939
1.57310
1.49504
1.60875

M 56 49.27.+31.26
M 57 0.45.
R 57 0.32.
R 57 0.65.

57 0.47−40.62

2~~8~~0.53
19.85
20 19

34

303

ξ Cygni 9.93869 **9.93869**
11463
005332
h m s
21 7 47
1.17609 0.11559
+29° 44′
9.93869
1.11478

7 54.30 | 7 48.4
56.70 59.048 | 50.5
59.00 59.05 | 53.1
1.40 | 54.9
29524 3.84 | 2632 56.3
29524 | 2632
8.48 | 7 52.64
10.82 | + 25.30
13.25
15.48 17.898
17.85 17.89 | 8 52.8
20.16 17.99 | 54.6
22.64 | 56.3
25.00 | 58.5
16108 27.40 | 2824 0.2
16108 | 2824
32.28 | 8 56.48
34.50 36.926 | − 38.54
36.92 36.93
39.23 15598
18463 41.70 | 7 52.64
18463 8 17.940 | 8 56.48
+ 25.30
− 38.54 63.84
1.40312 1.80509
1.58591 1.11478
1.45644 2.91987
1.63923 1.85968
8.93981
4 58 32

M 43 54.07. +28.60: 82.67 .11
M 45 6.52.
R 45 6.47.
R 45 6.40.
45 6.46 −43.57 82.89
72.39
82.78

306

α Cephei 9.67066
h m s
21 15 41
0.11559
+62° 4′

15 55.0 | 15 13.6 | 15 35.0
59.4 | 17.6 | 38.4
3.8 | 21.0 | 41.7
8.4 12.61 | 25.1 | 45.2
12.7 | 1064 29.1 | 2107 50.4
17.0 | 1064 | 2107
21.4 | 15 21.28 | 15 42.14
25.8 | + 51.33 | + 30.47
6535 30.0
1135
×2
16 26.2 | 17 25.2
29.0 | 28.5
33.5 | 31.8
37.2 | 36.5
1677 41.8 | 1619 40.9
21 15 42.0 | 1677 | 1619
16 33.54 | 17 32.38
− 20.93 | −1 19.77
15 21.28 | 15 42.14
16 33.54 | 17 32.98

M 24 1.50.
M 24 15.10.
M 24 46.12.
M 24⁵ 21.05
~~24 27.42~~

62 4 8.6

307

β Aquarii 9.99753 9.99753
11463
0.11216
h m s
21 25 11
1.17609 0.11559
−6° 6′
9.99753
1.17362

25 21.00 | 25 14.5
22.85 25.040 | 16.6
24.90 25.04 | 19.0
27.20 | 21.2
12520 29.25 | 942 22.9
2520 | 942
33.30 | 25 18.80
35.40 | + 22.78
37.50
39.56 41.653
41.80 41.65 | 26 14.4
43.64 41.60 | 15.7
45.83 | 17.3
47.90 | 19.4
37488 49.95 | 886 21.8
37488 | 886
53.90 | 26 17.72
56.05 58.156 | − 36.10
58.23 58.16
0.20 8320
29078 2.40 | 25 18.84
29078 25 41.625 | 26 17.72
+ 22.78
− 36.10 58.88
1.35755 1.76997
1.55751 1.17362
1.46971 2.94359
1.66967 1.88885
8.94526
5 2 17

M 32 48.80 +29.49 78.29 59
M 34 6.15.
R 34 6.30.
R 34 6.22.
34 6.22 −46.74 79.48
77.42
78.88

309 | 329 | 13

ε Pegasi 9.99423 9.99423 | α Pegasi 9.98584 | γ Cassiop 9.69809

11463

0.10886

h m s | h m s | h m s
21 38 14 | 22 58 44 | 0 49 25

1.17609 0.11559 | 0.11359

+9° 19' 9.99423 | +14° 33' | +60° 4'

1,17032

1899

May 8

| | | | | |
|---|---|---|---|---|
| | 38 24.04 | | | 38 18.2 |
| | 26.06 | 28160 | | 20.0 |
| | 28.15 | 28.16 | | 21.6 |
| | 30.22 | | | 23.2 |
| 14080 | 32.33 | | 1085 | 25.5 |
| | 14080 | | | 1085 |
| | 36.50 | | 38 | 21.70 |
| | 38.53 | | + | 23.17 |
| | 40.70 | | − | 32.67 |
| | 42.87 | 44856 | | |
| | 44.85 | 44.86 | 39 | 14.0 |
| | 47.00 | 44.88 | | 15.7 |
| | 49.00 | | | 17.7 |
| | 51.03 | | | 19.3 |
| 40370 | 53.22 | | 877 | 21.0 |
| | 40370 | | | 877 |
| | 57.45 | | 39 | 17.54 |
| | 59.50 | 1.610 | | |
| | 1.55 | 1.61 | | |
| | 3.70 | 8977 | | |
| 38805 | 5.85 | | 38 | 21.70 |
| | 805 | 38 44.870 | 39 | 17.54 |
| | | | + | 23.17 |
| | | | − | 32.64 |

| | |
|---|---|
| | 5584 |
| 1.36493 | 1.74695 |
| 1.51415 | 1.17032 |
| 1.47379 | 2.91727 |
| 1.62301 | 1.85842 |
| | 8.94115 |
| | 4 59 27 |

| | | | |
|---|---|---|---|
| | 58 52.80 | | 58 47.9 |
| | 54.85 | 57010 | 50.0 |
| | 56.92 | 57.01 | 51.9 |
| | 59.20 | | 53.8 |
| 28505 | 1.28 | | 2592 55.6 |
| | 28505 | | 2592 |
| | 5.48 | | 58 5.184 |
| | 7.57 | | + 22.18 |
| | 9.70 | | |
| | 11.96 | 14.003 | |
| | 14.00 | 14.00 | |
| | 16.17 | 14.03 | |
| | 18.23 | | |
| | 20.40 | | |
| 12603 | 22.52 | | |
| | 12603 | | |
| | 26.75 | | |
| | 28.95 | 31.060 | |
| | 31.00 | 31.06 | |
| | 33.20 | 14807 | |
| 15530 | 35.40 | | 58 5184 |
| | 15530 | 59 14.015 | + 22.18 |

22 58 45.32

| | | | | |
|---|---|---|---|---|
| | 49 38.9 | | 49 11.5 | 49 29.1 |
| | 42.9 | | 13.2 | 33.4 |
| | 46.9 | | 15.5 | 35.8 |
| | 51.2 | 55.23 | 18.0 | 39.5 |
| | 55.3 | | 792 21.0 | 1801 42.3 |
| | 59.4 | | 792 | 1801 |
| | 3.4 | | 49 15.84 | 49 36.02 |
| | 7.5 | | + 39.39 | + 19.21 |
| 5271 | 11.6 | | | |
| | 4971 | | | |
| | | | 50 2.7 | 50 58.7 |
| | | | 6.9 | 2.6 |
| | | | 9.4 | 7.3 |
| | | | 13.5 | 10.6 |
| | | | 506 18.1 | 3334 14.2 |
| | | | 506 | 334 |
| | | | 50 10.12 | 51 6.68 |
| | | | − 14.89 | −1 11.45 |
| | | | 49 15.84 | 49 36.02 |
| | | | 50 10.12 | 51 6.68 |

| | | | | |
|---|---|---|---|---|
| M | 7 56.70 | +29.77 | 85.47 | .71 |
| M | 9 8.92 | | | |
| R | 9 8.80 | | | |
| R | 9 8.92 | | | |
| | 9 8.88 | −41.98 | 86.90 | |
| | 72.18 | | 86.18 | |

R 54 4.90

R 54 4.95

54 $4.95^2$

2M 24 34.87

M 24 48.17

M 25 10.45

M 25 48.77

25 ~~18.80~~

14 38 19.1

20

δ Cassiop 9.70418

h m s
1 17 55
+59° 36′

0.11559

18 8.8
12.4
16.2
20.9
24.7
29.3
32.9
37.1
41.0
2233
18 24.81

17 24.3
26.3
28.8
32.2
34.0
37.4
1830
17 ~~3660~~
3050
+ 5431

18 40.5
42.6
46.5
49.9
2327 53.2
2327
18 4654
− 2173

19 35.5
37.9
41.4
44.7
2071 47.6
19 41.42
−1 16.61

17 48.5
51.8
54.2
57.4
2737 1.8
2737
17 64.74
+ 30.07

19 11.8
15.0
18.8
22.0
948 27.2
948
19 18.96
− 5415

17 54.74
19 18.96

M 51 41.75
M 51 58.82
M 52 32.27
M 52 53.37
M 52 6.72
~~52 30.39~~

33

α Arietis 9.96440

h m s
2 0 21
+22° 53′

0.11559

0 28.60
30.90
33.30
35.30
16560 37.50
16560
41.88
44.02
46.40
48.80
50.90
53.00
55.50
57.67
45800 59.83
45800
4.40
6.57
8.94
10.90
~~13.15~~

33120
33.12

50.889
50.89

0 50.77

0 24.9
27.5
29.8
31.7
1481 34.2
1481
0 29.62

1 27.0
29.0
31.0
32.9
1554 35.5
1554
1 31.08

0 29.62
1 31.08

2 0 21.95

M 34 9.20
M 35 21.40
R 35 21.40
R 35 21.22

35 21.34

22 53 28.1

S

Sun c = 46.727 9.97966

B Urs. Maj 9.73572

h m s
3 4 49
+17° 24'

h m s
10 54 32
+57° 2'

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1879 May 8-9

May 10

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 3 45.95 | | 4 55.9 | 5 57.00 | 5 27.2 | 32.00 6.30 37.93 | 54 28.37 | | 54 20.6 |
| | 48.05 | 50.190 | 57.7 | 1.20 | 3.402 29.3 | 6.40 6.51 34.11 | 32.40 | 36060 | 24.6 |
| | 50.25 | 50.19 | 57.4 | 3.40 | 3.40 30.8 | 6.38 80.35 | 36.03 | 36.06 | 26.6 |
| | 52.30 | | 1.2 | 5.60 | 32.3 | 6.46 26.56 | 39.90 | | 29.0 |
| 25095 | 54.40 | | 2982 4.0 | 31701 7.80 | 1534 33.8 | 6.35 22.75 | 18030 43.60 | | 1340 33.2 |
| | 25095 | | 2982 | 1701 | 5 3.068 | | 18030 | | 1340 |
| | 58.86 | | 4 59.64 | 12.00 | + 49.96 | 57.36 6.44 15.17 | 51.27 | | 54 26.80 |
| | 0.88 | | + 52.22 | 14.05 | | 6.373 6.38 11.38 | 55.00 | | + 39.58 |
| | 3.20 | | | 16.23 | | 6.37 7.58 | 58.79 | | |
| | 5.30 | 7.427 | | 18.44 | 20.592 | 6.13 + 3.75 | 2.38 | 6.380 | |
| | 7.40 | 7.43 | | 20.50 | 2059 | 6.20 - 0.00 | 6.20 | 6.39 | |
| | 9.63 | 7.40 | | 22.87 | 20.69 | 6.50 3.78 | 10.28 | | |
| | 11.70 | | | 25.00 | | 6.43 7.59 | 14.02 | | |
| | 13.90 | | | 27.00 | | 6.42 11.38 | 17.80 | | |
| 60684 | 15.97 | | | 18533 29.24 | | 6.49 15.19 | 5748 21.68 | | |
| | 6684 | | | 18533 | | | 5742 | | |
| | 20.00 | | | 33.50 | | | — | | |
| | 22.64 | 24626 | | 35.87 | 37.982 | | — | | |
| | 24.70 | 24.62 | | 38.03 | 37.99 | | — | | |
| | 26.79 | 13481 | | 40.17 | 41.39 | * | — | | |
| 12313 | 29.00 | | 4 59.64 18994 | 42.34 | | 5 30.68 | — | | 54 26.80 |
| | 12313 | 4 7.415 | + 52.22 | 18991 | 6 20.640 | + 49.96 | | | |
| | | | ~~52.22~~ | | | | | | |
| | | | | | | 6.386 | | | |
| | | | | | | 6.383 | | | |

? 48 35.55 ? 21 3.37 M 26 18.05

154 α Urs. Maj 9.78049 9.66586

h m s
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0.11559

1879 May 10

| | | | | | | |
|---|---|---|---|---|---|---|
| | 56 5.80 | | | 55 48.8 | | 56 50.9 |
| | 10.30 | 14.646 | | 54.0 | | 53.9 |
| | 14.65 | 14.64 | | 56.8 | | 57.0 |
| | 18.98 | | | 0.6 | | 1.7 |
| 7323 | 23.50 | | 2841 | 3.9 | 2898 | 6.3 |
| | 7323 | | | 2841 | | 2898 |
| | 32.60 | | 55 | 56.82 | 56 | 54.96 |
| | 36.77 | | + | 53.47 | − | 7.67 |
| | 41.60 | | | | | |
| | 45.90 | 50.322 | | | | |
| | 50.48 | 50.32 | 57 | 35.5 | 58 | 7.6 |
| | 54.75 | 50.26 | | 39.1 | | 11.8 |
| | 59.20 | | | 42.8 | | 16.7 |
| | 3.60 | | | 46.4 | | 20.0 |
| 45290 | 8.00 | | 2156 | 51.8 | 799 | 23.8 |
| | 45290 | | | 2156 | | 799 |
| | 17.00 | | 57 | 43.12 | 58 | 15.98 |
| | 21.20 | 25.870 | − | 52.83 | −1 | 25.69 |
| | 25.80 | 25.87 | | | | |
| | 30.38 | 10.051 | | | | |
| 12935 | 34.97 | | 55 | 56.82 | 56 | 57.96 |
| | 12935 | 56 50.290 | 57 | 43.12 | 58 | 15.98 |
| | | | + | 53.47 | −1 | 1.14 |
| | | | − | 52.83 | −2 | 19.16 |

10 56 18.76

155 ψ Urs. Maj 9.96297 9.84835

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| | | | | |
|---|---|---|---|---|
| | 2 53.60 | | 2 46.1 | |
| | 58.45 | 1.388 | 49.8 | |
| | 1.38 | 1.39 | 52.3 | |
| | 4.29 | | 54.6 | |
| 30694 | 7.22 | | 2609 57.5 | |
| | 694 | | 2609 | |
| | 12.97 | | 2 52.18 | |
| | 15.90 | | + 32.60 | |
| | 18.70 | | | |
| | 21.95 | 24.786 | | |
| | 24.80 | 24.78 | 3 53.3 | |
| | 27.78 | 24.78 | 55.5 | |
| | 30.72 | | 59.0 | |
| | 33.65 | | 1.8 | |
| 22307 | 36.60 | | 2936 4.0 | |
| | 22307 | | 2936 | |
| | 42.39 | | 3 58.72 | |
| | 45.30 | 48.174 | − 33.94 | |
| | 48.20 | 48.17 | | |
| | 50.98 | 49.56 | | |
| 24087 | 54.00 | | 2 52.18 | |
| | 24087 | 3 24.780 | 3 58.72 | |
| | | | + 32.60 | |
| | | | − 33.94 | 6654 |
| | | | 1.51322 | 1.82308 |
| | | | 1.53071 | 1.02444 |
| | | | 1.47619 | 2.84752 |
| | | | 1.49368 | 1.78611 |
| | | | | 8.93859 |
| | | | | 4 5742 |

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|---|---|---|---|---|
| | 7 50.50 | | 7 44.9 | |
| | 52.70 | 54.900 | 46.6 | |
| | 54.88 | 54.90 | 48.3 | |
| | 57.10 | | 50.0 | |
| 27450 | 59.32 | | 2418 52.0 | |
| | 2450 | | 2418 | |
| | 3.70 | | 7 48.36 | |
| | 5.90 | | + 24.22 | |
| | 8.02 | | | |
| | 10.35 | 22.586 | | |
| | 12.80 | 12.58 | 8 42.2 | |
| | 14.78 | 12.58 | 44.0 | |
| | 17.00 | | 46.4 | |
| | 19.20 | | 48.3 | |
| 11293 | 21.48 | | 2314 50.5 | |
| | 11293 | | 2314 | |
| | 25.80 | | 8 46.28 | |
| | 28.00 | 30.256 | − 33.70 | |
| | 30.22 | 30.26 | | |
| | 32.52 | 14.516 | | |
| 15128 | 34.74 | | 7 48.36 | |
| | 15128 | 8 12.580 | 8 46.28 | |
| | | | + 24.22 | |
| | | | − 33.70 | 57.92 |
| | | | 1.38417 | 1.76283 |
| | | | 1.52763 | 1.14571 |
| | | | 1.46842 | 2.90854 |
| | | | 1.61188 | 1.85303 |
| | | | | 8.94449 |
| | | | | 5145 |

11 7 43.18

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 3 | 53.87 · | M | 18 | 41.05 | +29.94 | 70.99 | .00 | M | 16 28.70 | +29.40 | 58.10 .49 |
| M | 4 | 31.87 · | M | 19 | 42.00 · | | | | M | 17 – | 3 read (520) | |
| R | 4 | 58.72 · | R | 19 | 42.20 · | | | | R | 17 40.10 · | | |
| R | ~~4~~ 5 | 18.12 · | R | 19 | 42.27 · | | | | R | 17 39.87 · | | |
| | ~~4 36.17~~ | | | 19 | 42.16 | −31.17 | 70.99 | | | 17 39.98 | −40.91 | 59.08 |
| | | | | | 61.11 | | | | | 71.29 | | 88.59 |

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| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 164 | | | | 172 | | | | | 13 | | |
| | β Leonis | | 0.09906 | 9.98443 | γ Virginis pr | | ~~0.11459~~ | | γ Cassiop L.C. | | | 9.93782 |
| | | | | | | | | 9.99996 | | | | |
| | h m s<br>11 42 53 | | | | h m s<br>12 35 31 | | | | h m s<br>0 49 25 | | | |
| | + 15° 15′ | | | 0.11559 | − 0° 47′ | | 1.17609<br>9.99996 | 0.11559 | +119° 56′ | | | 0.11559 |
| 1879 | May 10 | | | | | | 1,17605 | | | | | |
| | 43 4.05 | | 43 0.9 | | 35 42.00 | | 35 34.8 | | 49 10.00 | | 49 11.7 | 49 45.0 |
| | 6.20 | | 2.7 | | 45.16 | 47.218 | 36.4 | | 14.00 | 18.150 | 15.5 | 48.3 |
| | 8.30 | | 4.4 | | 47.20 | 47.22 | . 38.1 | | 18.00 | 18.15 | 18.9 | 53.0 |
| | 10.45 | | 5.9 | | 49.34 | | 40.1 | | 22.30 | | 22.8 | 55.0 |
| | 12.50 | | 218 7.9 | | 23609 51.39 | | 1918 42.4 | | 9075 26.45 | | 949 26.0 | 2600 58.7 |
| | | | 918 | | 23609 | | 1918 | | 9075 | | 949 | 2600 |
| | 16.84 | | 43 4.36 | | 55.45 | | 35 38.36 | | 34.70 | | 49 18.98 | 49 52.00 |
| | 19.00 | | | | 57.50 | | + 2534 | | 38.90 | | + 32.44 | − 0.58 |
| | 21.00 | | | | 59.68 | | | | 43.45 | | | |
| | 23.28 | 25.441 | | | 1.70 | 3.726 | | | 47.35 | 51.467 | | |
| | 25.48 | 25.44 | 43 52.3 | | 3.70 | 3.72 | 36 26.9 | | 51.50 | 51.47 | 50 34.5 | |
| | 27.70 | | 54.2 | | 5.75 | 3.69 | 28.6 | | 55.75 | 51.38 | 39.3 | |
| | 29.75 | | 55.9 | | 7.90 | | 30.8 | | 59.75 | | 43.3 | |
| | 31.82 | | 58.0 | | 9.85 | | 32.4 | | 3.80 | | 46.3 | |
| | 22897 34.00 | | 2806 0.2 | | 57353 12.00 | | 1530 34.3 | | 46320 8.00 | | 2143 50.9 | |
| | 22897 | | 2806 | | 3353 | | 1530 | | 46320 | | 2143 | |
| | 38.22 | | 43 56.12 | | 16.05 | | 36 30.60 | | 16.30 | | 50 42.86 | |
| | 40.28 | 42.534 | | | 18.05 | 20.170 | . − 2690 | | 20.55 | 24.604 | − 51.44 | |
| | 42.60 | 42.53 | | | 20.22 | 20.17 | | | 24.60 | 24.60 | | |
| | 44.70 | | | | 22.25 | 18.739 | | | 28.57 | 10275 | | |
| | 21267 46.87 | | 43 4.36 | | 10085 24.28 | | 35 38.36 | | 12302 33.00 | | 49 18.98 | 49 52.00 |
| | 21267 | 43 25.43 | 43 56.12 | | 10085 | 36 3.705 | 36 30.60 | | 12302 | 49 51.425 | 50 42.86 | |
| | | | | | | | + 25.34 | | | | + 32.44 | |
| | | | | | | | − 26.90 | 5224 | | | − 51.44 | |
| | | | | | | | 1,40381 | 1.71800 | | | | |
| | 11 42 56.03 | | | | | | 1,42975 | 1.17605 | | | | |
| | | | | | | | 1,51840 | 2,89405 | | | | |
| | | | | | | | 1,54434 | 1,83746 | | | | |
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| | | | | | | | | 5 1 0 | | | | |
| M | 12 45.25 | | | | M 14 18.22 | +32.99 | 51.21 | :39 | M 36 46.37 | | | |
| M | 13 49.70 | | | | M 15 27.10 | | | | M 36 21.27 | | | |
| R | 13 49.85 | | | | R 15 26.82 | | | | M 35 49.32 | | | |
| R | 13 49.82 | | | | R 15 27.07 | | | | M | | | |
| | 13 49.79 | | | | 15 27.00 | −3502 | 51.98 | | ~~36 3.55~~ | | | |
| | | | | | 68.78 | | | | | | | |
| | | | | | | | 51.60 | | | | | |
| | 15 14 41.9 | | | | | | | | | | | |

S Sheet not Numbered

Sum c = 46.727

h m s
3 12 38
+17° 55′

1879
May 10–11

S

Sum c = 9.97779

h m s
3 16 33
+18° 10′

May 11–12

0.11539

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 15 | 30.00 | | 16 | 41.2 | 17 | 43.73 | | 17 | 11.2 |
| | 32.05 | 34380 | | 42.9 | | 45.90 | 48090 | | 12.4 |
| | 34.47 | 34.38 | | 45.6 | | 48.07 | 48.09 | | 13.9 |
| | 36.50 | | | 48.0 | | 50.28 | | | 15.4 |
| 17190 | 38.88 | | 2277 | 50.02 | 24045 | 52.47 | | 707 | 17.8 |
| | 17190 | | | 2277 | | 24045 | | | 707 |
| | 43.00 | | 16 | 45.54 | | 56.67 | | 17 | 14.14 |
| | 45.27 | | − | 53.73 | | 58.80 | | + | 51.36 |
| | 47.42 | 830 | | | | 1.20 | | | |
| | 49.60 | 51.~~836~~ | | | | 3.35 | 5498 | | |
| | 51.98 | 51.83 | | | | 5.50 | 5.49 | | |
| | 54.16 | 51.79 | | | | 7.65 | 5.51 | | |
| | 56.24 | | | | | 9.80 | | | |
| | 58.30 | | | | | 12.06 | | | |
| 46647 | 0.50 | | | | 58948 | 14.25 | | | |
| | 46647 | | | | | 4948 | | | |
| | 4.95 | | | | | 18.48 | | | |
| | 6.95 | 9.210 | | | | 20.75 | 22934 | | |
| | 9.17 | 9.21 | | | | 22.97 | 2293 | | |
| | 11.45 | 10359 | | | | 25.10 | 13102 | | |
| 1705 | 13.53 | 10 | 16 | 45.54 | 11467 | 27.47 | | 47 | 14.14 |
| | 4605 | 15 51.800 | − | 53.68 | | 11467 | 18 5.500 | + | 51.36 |

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γ Urs. Maj 9.76537

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1879
May 12

308 35 4347 27.65
286 31.86 14.67 31.00 34.596
2.95 28.85 2.934 34.60 34.59
2.80 24.80 38.00
2.98 17298 41.73
21.25 17298
2.67 14.17 25.27 48.50
2.81 10.63 2.818 52.18
2.85 7.08 55.77
2.80 +3.50 59.30 2.813
2.80 −0.00 2.80 281
2.84 3.53 6.37
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Sun c = 46.727 9.97717

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1879 May 12-13

B Urs. Maj 9.73572

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May 13

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|---|---|---|---|---|---|---|---|---|---|---|---|
| | 19 ~~25.96~~ | | 20 40.2 | 21 39.10 | | 21 2.4 | +37.43 | 6.70 | 54 28.77 | | 54 12.4 |
| | 27.60 | | 42.6 | 41.33 | 43430 | 4.5 | 34.11 | 6.59 | 33.11 32.48 | 36282 | 15.2 |
| | 29.70 | | 45.4 | 43.47 | 43.43 | 6.6 | 36.33 | 6.61 | 6.622 36.26 | 36.28 | 18.7 |
| | 31.75 | | 47.0 | 45.55 | | 8.3 | 26.56 | 6.61 | 40.05 | | 21.0 |
| | 34.60 | | 2235 48.3 | 21715 47.70 | | 317 9.9 | 22.75 | 6.60 | 18141 43.85 | | 913 24.0 |
| | | | 2235 | 21715 | | 317 | [illegible] | | 18141 | | 913 |
| | 38.20 | | 4470 | 52.20 | | 21 684 | 15.75 | 7.23 | 59.82 57.48 | | 54 18.26 |
| | 40.55 | | | 54.46 | | + 54.54 | 11.56 | 6.68 | 6.658 55.30 | | + 48.38 |
| | 42.65 | | | 56.60 | | | 7.58 | 6.58 | 59.00 | | |
| | 44.88 | 46998 | | 58.77 | 0.877 | | 3.75 | 6.55 | 2.80 | 6.611 | |
| | 47.00 | 46.99 | | 0.80 | 0.88 | | 0.20 | 6.56 | 6.56 | 6.61 | |
| | 49.30 | | | 3.00 | 0.89 | | 3.78 | 6.62 | 10.40 | | |
| | 51.40 | | | 5.26 | | | 7.59 | 6.59 | 14.18 | | |
| | 53.50 | | | 7.30 | | | 11.38 | 6.50 | 17.98 | | |
| 42298 | 55.50 | | | 54789 9.50 | | | 15.19 | 6.61 | 5950 21.80 | | |
| | 41298 | | | 789 | | | | | 5950 | | |
| | 0.05 | | | 14.05 | | | | | — | | |
| | 2.40 | 4.464 | | 16.10 | 18350 | | | | — | | |
| | 4.36 | 4.49 | | 18.37 | 18.35 | | 6.640 | | — | | |
| | 6.70 | | | 20.58 | 12178 | | 6.644 | | — | | |
| 2247 | 8.96 | | 20 44.70 | 9175 22.65 | | 21 634 | | | — | | 54 18.26 |
| | 2247 | | | 9175 | 22 0.885 | + 54.54 | | | | | |

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24205

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2440
2 48.80
+ 36.24

4 6.4
8.2
11.4
13.4
558 16.4
558
4 11.16
− 46.12

2 48.80
4 11.16
+ 36.24
− 46.12
1.55919
1.66389
1.52216
1.62686

82.36
1.91572
1.02444
2.94016
2.12853
9.18837
8.4618

M 18 43.60 +3327
M 20 57.97
R 20 58.12
R

20 58.04 −42.35

134.44

76.87 .58

~~35.69~~ 7

76.28

156

δ Leonis .08425 9.97248

h m s
11 7 40
+21° 11′

1.17609
996962
1.14571

0.11559

7 50.75
52.95
55.00
57.30
27550 59.50
27550
3.00
6.05
8.37
10.60
12.80
14.95
17.00
19.40
11455 21.58
11455
26.00
28.22
30.38
32.50
15195 34.85
15195

55.100
55.10

12.728
12.73
12.74

30.360
30.39
14549

8 12.735

11 7 43.15

7 43.7
45.8
47.5
49.4
2376 51.2
2376
7 47.52
+ 25.22

8 47.7
50.3
51.9
53.7
2590 55.4
2590
8 51.80
− 39.06

7 47.52
8 51.80
+ 25.22
− 39.06
1.38417
1.59173
1.46842
1.67598

6428
1.80808
1.14571
2.95379
1.88857
893478
4557

M 16 35.00 +2940
M 17 52.30
R 17 52.27
R 17 52.55

17 52.37 −47.42
77.37

460 27

4.95

4.17

21 11 1.9

164 166 No wires. 13

B Leonis .09906 9.98443 γ Urs. Maj 9.76537 9.76537 γ Cassiop L.C. 9.93782

1899
May 13

B Leonis
h m s
11 42 53
+15° 15′

0.11559

43 4.39
6.30 8.514
8.48 8.51
10.63
4257 12.77
4257
16.97
19.20
21.24
23.44 25.553
25.62 25.55
27.66 25.60
29.80
32.00
22998 34.05
22998
38.30
40.53 42.700
42.79 42.70
44.88 51.21
21350 47.00
21350 43 25.575

11 42 56.01

42 56.9
57.9
0.5
2.5
3028 4.0
28
43 0.56
+ 25.02
43 57.4
59.0
0.9
3.0
3056 5.3
56
44 1.12
− 35.54
43 0.56
44 0.11
+ 25.02
− 34.53
1.39829
1.53820
1.49735
1.63726

γ Urs. Maj
h m s
11 47 28
+54° 22′

47 26.90
30.45 33.944
33.87 33.94
37.50
16972 41.00
16972
48.05
51.63
55.20
58.62 2.281
2.20 2.28
5.92 2.26
9.40
13.03
56053 16.48
2053
23.50
27.00 30.580
30.55 30.58
34.05 12452
15290 37.80
15290 48 2.270

9.76537
11463
9.88000
1.17609
9.76537
0.94146

47 14.9
18.1
21.4
24.3
1064 27.7
1064
47 21.28
+ 40.99
48 45.7
48.5
51.6
55.5
2596 58.3
2596
48 51.92
− 49.65
47 21.28
48 51.92
+ 40.99
− 49.65
1.61268
1.69592
1.49268
1.57592

0.11559

9.064
1.95732
0.94146
2.89878
1.83423
8.93545
4 55 34

γ Cassiop L.C.
h m s
0 49 25
+119° 56′

0.11559

48 38.0
41.7
44.7
48.5
2239 51.0
2239
48 44.78
50 4.4
8.7
11.8
14.6
575 18.0
575
50 11.50
48 44.78
50 11.50

49 10.0
14.3
16.5
20.2
850 24.0
850
49 17.00
50 49.4
53.8
56.7
49 17.00
50

M 12 47.42 +31.43 18.85 .68
M 17 3.57
R 17 3.75
R 18 3.42

4
12 3.58 −43.38 20.20
19.58

15 14 42.1

M 6 7.90 +31.09 38.58 .24
M 8 16.22
R 8 16.07
R 8 16.22
8 16.17 −37.66 38.51
68.27
38.75

M 37 0.05
M 36 39.20
M 36 3.47
M 35 36.32
~~36 26.33~~

176 No wires.

20.

ε Virginis ,10564 9.99101 δ Cassiop S.C. 9.93577

h m s
12 56 9
+11° 37′ 1.17609 0.11559
9.99101
1.16710

h m s
1 17 55
+ 120° 24′ 0.11559

56 20.70 56 12.0 17 15.6 17 55.0
22.70 13.6 19.3 55.2
24.84 24831 15.3 23.4 0.4
26.92 24.83 16.8 25.5 3.4
12416 29.00 761 18.4 1132 29.4 3048 7.8
2416 761 1132 48
33.25 56 15.22 17 22.64 18 0.96
35.37 + 26.45
37.48
39.55 41681
41.75 41.68 57 11.2 18 24.1 19 1.7
43.85 41.66 13.0 27.8 5.8
45.90 14.9 31.2 10.7
47.93 16.9 33.4 13.3
37513 50.05 744 18.4 1545 37.4 481 16.6
37513 744 1545 481
54.30 57 14.88 18 30.90 19 9.62
56.30 58490 − 33.21
58.52 58.49
0.63 8332
29245 2.70 56 15.22 17 22.64 17 0.96
29245 56 41.670 57 14.88 18 30.90 19 9.62
+ 26.45
− 33.21 59.66
1.42242 1.77568
1.52127 1.16710
1.52906 2.94278
1.62691 1.88281
8.94003
4 5841

M 51 1.62 +33.81 35.43 .09 M 9 46.32
M 52 18.00 M 9 20.80
R 52 17.95 M 9 1.12
R 52 17.95 M 9 36.72

52 17.97 −42.36 3561 9 ~~19.55~~
76.35
3552

S

149

Sun c = 46.775 9.97653

h m s
3 24 25
+18° 40
0.11559

1899
May 13-14

u Urs. Maj 9.87039

h m s
10 15 7
+42° 6
0.11559

May 14

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 23 20.50 | | | 24 35.9 | | 25 34.50 | | | 24 56.3 | | 15 11.86 | |
| | 22.87 | 24930 | | 37.6 | | 36.77 | 38940 | | 56.8 | | 14.68 | 17454 |
| | 24.93 | 24.93 | | 39.8 | | 38.98 | 38.94 | | 0.4 | | 17.50 | 17.45 |
| | 27.05 | | | 42.0 | | 41.20 | | | 1.9 | | 20.20 | |
| 12465 | 29.30 | | 2000 | 44.7 | 19470 | 43.25 | | 3024 | 4.0 | 8727 | 23.03 | |
| | 12465 | | | 2000 | | 19470 | | | 24 | | 8727 | |
| | 33.65 | | 24 | 4000 | | 47.70 | | 25 | 0.26 | | 28.57 | |
| | 35.90 | | − | 57.69 | | 49.80 | | + | 53.88 | 3125 | 31.35 | |
| | 37.90 | | | | | 51.93 | | | | | 34.10 | |
| | 40.18 | 42334 | | | | 54.20 | 56334 | | | | 37.01 | 39.716 |
| | 42.32 | 42.34 | | | | 56.40 | 56.33 | | | | 39.70 | 39.72 |
| | 44.60 | 42,28 | | | | 58.50 | 56.38 | | | | 42.40 | 39.70 |
| | 46.75 | | | | | 0.70 | | | | | 45.30 | |
| | 48.90 | | | | | 2.85 | | | | | 48.05 | |
| 38110 | 51.00 | | | | 50701 | 4.93 | | | | 35744 | 50.97 | |
| | 38110 | | | | | 50701 | | | | | 35744 | |
| | 55.22 | | | | | 9.42 | | | | | 56.36 | |
| | 57.48 | 59640 | | | | 11.58 | 13812 | | | | 59.30 | 1950 |
| | 59.80 | 59.64 | | | | 13.80 | 13.81 | | | | 1.92 | 1.95 |
| | 1.70 | 8457 | | | | 15.95 | 11275 | | | | 4.67 | 7940 |
| 29820 | 4.00 | | 24 | 40.00 | 6906 | 18.28 | | 24 | 0.48 | 30975 | 7.50 | |
| | 29820 | 23 42.310 | − | 57.69 | | 6906 | 25 56.355 | + | 5.88 | | 975 | 15 39.710 |
| | | | | | | | | | | | | −.005 |
| | | | | | | | | | | | | 39.705 |

M 32 44.32·

M 4 56.77·

AR only

153

B Urs. Maj 9.73572

10 54 32
+ 57° 2'

54 57.0
54.8
58 6
2.5
6.2
9.9
13.7
17.6
21.3
556
55 6.18

A R only

[illegible]

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154

α Urs. Maj 9.78049 9.66586

0.11559

h m s
10 56 15
+ 62° 24'

56 5.66
9.97 14446
14.25 14.45
18.87
7223 23.48
7223
32.37
36.80
41.10
45.60 50113
50.07 5011
54.58 50,10
58.95
3.60
45102 7.95
45102
17.00
21.39 25.748
25.70 25.75
30.05 10620
12874 34.60
12874 56 50.105
25748

10 56 18.65

0.11559

55 50.7
54.4
58.3
1.5
2919 7.0
2919
55 5838
+ 51.72

57 39.5
43.4
47.3
50.5
2370 56.3
2370
57 47.40
− 5730

55 58.38
57 47.40
+ 51.72
− 57.30
1,71366
1,75815
1,49415
1,53864

? only 3 micros read.
A 21 / ~~P~~ 103

62 24 16.0

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155

ψ Urs. Maj ~~9.96297~~
9.84835

h m s
11 2 51
+ 45° 9'

2 55.37
58.33 1.190
1.20 1.19
4.05
30595 7.00
595
12.90
15.80
18.70
21.60 24.567
24.55 24.57
27.40 24.57
30.37
33.45
22110 36.33
22110
42.07
45.00 47950
47.90 47.95
50.93 4914
23975 53.85
23975 3 24.570

M. 18 47.42 +29.28 16.90 29
M 19 53.00
R 19 52.77

19 52.88 −35.60 19.28
65.46
16.58

1.17609 0.11557
9.84835
1.02444

2 47.7
50.4
52.5
54.5
2634 57.3
2634
2 5268
+ 31,89

3 58.0
0.1
3.2
6.4
3167 9.0
167
4 334
− 38.77

2 52.68
4 3.34
+ 31.89
− 38.77
1,50365
1,58850
1,46662
1,55147

70.66
1.84917
1.02444
2.87361
1.81598
8.94237
5 0 17

156 δ Leonis 9.96962

h m s
11 7 40
° ′
+21 11

0.11559

1879
May 14

—
—
—
—
—
—
—
—
—

8 41.2
43.5
45.3 4ᶜ
47.0
2261 49.1
2261
8 45.22
+ 33.05

1219-000 8 12.19
1219 -221 60.81 14.40
1213 443 12.165 16.56
1216. 664 18.80
1214 886 21.00
1222 1328 60.90 25.50
1219 1549 1218 27.68 29900
1226 1771 29.97 29.90
1213 1992 32.05
1210 14950 2220 34.30
14950

8 53.6
55.4
57.6

8 45.22
8

12.172
12.171
11 7 45.56

M 17 45.92
M 18 58.32
R 18 58.52
R 18 58.47
18 58.44

21 11 0.2

---

164 β Leonis .09906 9.98443

h m s
11 42 53
° ′
+15 15

1.17609
9.98443
1.16052

0.11559

43 3.70
5.90 7960
8.00 7.96
10.00
3980 12.20
3980
16.50
18.70
20.80
23.00 25094
25.05 25.09
27.23 25.08
29.37
31.50
22585 33.70
22585
37.90
40.05 42190
42.22 42.19
44.33 5015
21095 46.45
21095 43 25085

11 42 56.00

42 53.5
55.0
56.9
58.8
2847 0.5
2847
42 5694
+ 28.14

43 50.8
52.3
54.3
56.0
2716 58.2
2716
43 5432
− 29.24

42 56.94
43 54.32
+ 28.14
− 29.24 5738
1.44932 1.75876
1.46598 1.16052
1.54838 2.91928
1.56504 1.85962
8.94034
4 58 54

M 12 43.72 +35.35 19.09 015
M 13 56.27
R 13 55.97
R 13 56.05
13 56.10 −36.73 19.37
72.38
1522

15 14 42.2

---

166 γ Urs. Maj 9.88000 9.76537

h m s
11 47 28
° ′
+54 22

1.17609
9.76537
0.94146

0.11559

47 26.37
30.00 33564
33.85 33.56
37.00
16782 40.60
16782
47.70
51.34
54.90
58.50 1.969
2.00 1.97
5.55 1.88
9.03
12.65
55772 16.05
1772
23.00
26.70 30216
30.28 30.21
33.80 12377
15108 37.30
15108 48 1.925

47 21.0
24.2
27.2
29.4
1358 34.0
1358
47 2716
+ 34.76

48 50.0
52.8
56.0
59.2
2808 2.8
2808
48 5616
− 54.24

47 27.16
48 56.16
+ 34.76
− 54.24 8900
1.54108 1.94939
1.73432 0.94146
1.42108 2.89085
1.61432 1.82692
8.93613
4 56 2

M 6 13.05 +26.37 39.42 19
M 7 20.00
R 7 20.15
R 7 20.40
7 20.18 −41.14 39.04
67.13
38.23

172

γ Virginis ~~.1140~~ 9.99996

h m s
12 35 31
− 0° 47′

1.17609
9.99986
~~1.17515~~
1.17605

0.11559

35 42.67
44.70 46810
46.88 46.81
48.90
23405 50.90
23405
55.00
57.00
59.00
1.30 3.267
3.30 3.27
5.40 3.31
7.40
9.48
56940 11.52
2940
15.78
17.78 1.9826
19.78 19.82
21.84 12663
9913 23.95
9913 36 3.290

12 35 34.72

35 32.4
33.5
35.0
36.8
1762 38.5
1762
35 35.24
+ 28.05

36 30.9
32.6
34.0
36.2
1717 38.0
1717
36 34.34
− 31.05

35 35.24
.36 34.34
+ 28.05
− 31.05
1.44793 59.10
1.49206 1.77159
1.56252 1.17515
1.60665 2.94674
1.89003
8.94329
5 0 55

M 14 22.80 +36.52 55.32 35
M 15 40.10
R 15 40.47
R 15 40.72

15 40.43 −40.42 60.01
77.63
55.67

0 47 26.0

---

13

γ Cassiop L.C. 9.93782

h m s
0 49 25
+ 119° 56′

0.11559

49 34.5
38.7
42.7
46.7 50.94
50.8
55.0
59.2
3.3
7.6
4585

48 41.6
46.2
48.7
51.8
2442 55.9
2442
48 48.84
+1 2.10

49 13.4
16.4
19.7
23.0
979 25.4
979
49 19.58
+ 31.36

50 17.6
20.3
24.4
27.2
1212 31.7
1212
50 24.24
− 33.30

50 51.5

48 48.84 49 19.58
50 24.24

M 37 59.95
M 36 39.15
M 36 56.60
M 35 40.35

36 25.37

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176

ε Virginis ~~.10561~~ 9.99101

h m s
12 56 9
+ 11° 37′

1.17609
9.99101
1.16710

0.11559

56 20.05
22.00 24230
24.30 24.23
26.40
12115 28.40
12115
32.53
34.84
36.88
38.90 41076
41.00 41.07
43.20 41.08
45.45
47.40
36968 49.48
36968
53.69
55.80 57938
57.97 57.94
0.03 8217
28969 2.20
28969 56 41.075

56 13.2
15.0
16.7
18.4
837 20.4
837
56 16.74
+ 24.34

57 13.0
14.6
16.4
18.6
828 20.2
828
57 16.56
− 35.48

56 16.74
57 16.56
+ 24.34
− 35.48
1.38632 59.82
1.54998 1.77685
1.49196 1.16710
1.65562 2.94395
1.88001
8.93606
4 55 59

M .51 4.20 +31.04 35.24 21
M 52 20.25
R 52 19.92
R 52 20.02

52 20.06 −45.25 34.81
75.86
35.03

20

δ Cassiop L.C.

h m s
1 17 55
+120° 24'

0.51559

1879
May 14

18 4.5
8.5
12.5
16.8
20.8
25.0
1169 28.8

16.7
1h 18m 16.70s

17 18.3
22.4
26.3
29.0
1274 31.4
1274
2548

18 29.2
32.0
35.3
39.3
1780 42.2
1780
18 35.60

19 22.6

17 40.2
44.5
46.7
49.0
2349 54.5
2349
17 4698

19 0.4
3.5
8.2
12.0
396 15.5
396
19 7.92

17 4698
19 7.92

13

γ Cassiop 9.69809

h m s
0 49 25
+60° 4'

0.71559

49 14.97
19.00
23.20
—
—
—
—
—
—
—
—
—
—
—
—
—
—
—

41.36 56.33
37.20 56.20
33.10 56.30
168.83
56.273

49 16.7
20.9
24.4
27.4
1203 30.9
120.3
49 24.06
4 32.21

49 24.06

20

δ Cassiop

h m s
1 17 55
+59° 36'

0.11559

17 45.30
49.30
53.15
57.20
26645 1.50
9.65
13.50
17.80
21.80
25.75
29.87
34.10
38.20
23297 42.30
50.30
54.40
58.37
2.47
28424 6.70
28424

53.29
25.888
25.428
56.848
56.85
1 18 25.43

17 39.7
42.9
45.8
49.5
2308 52.9
2308
17 46.16

18 38.0
40.9
45.0
48.7
2246 52.0
2246
18 44.92

19 41.1
42.4
43.5

18 5.2
9.9
12.9
16.0
636 19.6
636
18 12.72

19 16.6
20.0
23.4
25.8
1143 28.5
1143
19 22.86

18 12.72
19 22.86

M 9 47.90 ?
M 9 32.00 .
M 9 0.15 .
M 8 39.00 .
M 8 31.55 .
~~8 55.68~~

M 24 46.22 .

M 52 58.55 .
M 52 17.37 .
M 52 38.60 .
M 53 2.77 .
M 53 14.17 .
~~52 48.23~~

|  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | S |  |  |  |  |  | S | Ex Sheet for Min - |  |  |  |  |
|  | Sum c = |  |  |  |  |  | Sum c = 46.733 |  |  | 9.96823 |  |  |
|  | h m s<br>3 28 22 |  |  |  |  |  | h m s<br>4 24 33 |  |  |  |  |  |
|  | ° ′<br>+18 54 |  |  |  | 0.11559 |  | ° ′<br>+21 39 |  |  | 0.11559 |  |  |
| 1879 | May 14-15 |  |  |  |  |  | May 28-29 |  |  |  |  |  |
| 27 17.18 |  | 28 28.9 | 29 31.27 |  | 28 43.3 |  | — |  | 43.4 | — |  | 32.6 |
| 19.32 | 21522 | 30.8 | 33.40 | 35610 | 45.0 |  | — |  | 46.5 | — |  | 34.6 |
| 21.50 | 21.52 | 32.5 | 35.55 | 35.61 | 46.7 |  | — |  | 48.9 | — |  | 36.4 |
| 23.68 |  | 34.0 | 37.83 |  | 48.3 |  | — |  | 50.7 | — |  | 37.9 |
| 10761 25.93 |  | 1622 36.0 | 17805 40.00 |  | 2336 50.3 |  | — |  | 2419 52.4 | — |  | 1815 40.0 |
| 10761 |  | 1622 | 17805 |  | 2336 |  |  |  | 2419 |  |  | 1815 |
| 30.03 |  | 28 3244 | 44.20 |  | 28 46.72 |  | — |  | 48.38 | — |  | 36.30 |
| 32.27 |  | – 5348 | 46.40 |  | +1 6.34 | 476.76 59.56 | 666 52.90 |  |  | — |  |  |
| 34.55 |  |  | 48.78 |  |  | 59.595 59.64 | 4.44 55.20 |  | 110.09 15.67 | 4.44 11.23 |  |  |
| 36.80 | 38.909 |  | 50.97 | 53.076 |  | 59.56 | +2.19 57.37 |  | 15.727 15.74 | +2.19 13.55 |  |  |
| 38.85 | 3891 |  | 53.00 | 53.07 |  | 59.63 | -0.00 59.63 |  | 15.67 | -0.00 15.67 |  |  |
| 41.17 | 39.02 |  | 55.35 | 53.06 |  | 59.58 | -2.22 1.80 |  | 15.78 | -2.22 18.00 |  |  |
| 43.35 |  |  | 57.48 |  |  | 59.51 | 4.44 3.95 |  | 15.86 | 4.44 20.30 |  |  |
| 45.38 |  |  | 59.70 |  |  | 59.79 | 6.66 6.46 |  | 15.71 | 6.66 22.37 |  |  |
| 35018 47.78 |  |  | 47768 1.80 |  |  | 59.49 | 8.89 8.38 |  | 15.66 | 8.89 24.55 |  |  |
| 35018 |  |  | 47768 |  |  |  |  |  |  |  |  |  |
| 52.04 |  |  | 6.28 |  |  | 297.52 59.48 | 13.32 12.80 |  | 79.84 15.98 | 13.32 29.30 |  |  |
| 54.35 | 56.528 |  | 8.30 | 10.520 |  | 59.504 59.46 | 15.54 15.00 | 17.278 | 15.968 15.96 | 15.54 31.60 | 33.742 |  |
| 56.55 | 56.53 |  | 10.48 | 10.52 |  | 59.52 | 17.76 17.28 | 18.12 | 16.07 | 17.76 33.83 | 33.64 |  |
| 58.70 | 7805 |  | 12.66 | 10613 |  | 59.46 | 19.98 19.44 |  | 15.90 | 19.98 35.88 |  |  |
| 28264 1.00 |  | 28 3244 | 5260 14.88 |  | 28 4672 | 59.60 | 9057 22.27 21.87 |  | 15.93<br>48.38 16827 | 22.27 38.20 |  | 36.30 |
| 28264 | 27 38.965 | – 53.48 | 5260 | 29 53.065 | + 1 6.34 |  | 8639 |  |  | 16871 |  |  |
|  |  |  |  |  |  | 59.549<br>59.567 |  |  | 15.847<br>15.826 |  |  |  |

M 18 21.58 · M 50 26.32 · M 34 52.75 · M 34 31.00 ·

Ex Sheet for mic -

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 86 | | | | 164 | | | | 166 | | |
| | α Aurigae | | | | β Leonis | | | | γ Urs. Maj | | 9.76537 |
| | h m | s | | | h m | s | | | h m | s | |
| | 5 7 | 45 | | | 11 42 | 53 | | | 11 47 | 28 | |
| | | | | 0.11559 | | | | 0.11559 | | | 0.11559 |
| | +45° | 52′ | | | +15° | 15′ | | | +54° | 22′ | |
| 1879 | May 29 | | | | | | | | | | |
| I | 7 56.30 | | 51.4 | | 43 13.50 | | 43 31.5 | | 47 — | | 48 8.0 |
| | 5940 59.88 | 2566 | 52.9 | | 15.70 | 17,800 | 33.6 | | — | | 10.0 |
| | 2.60 | 2.56 | 55.9 | | 17.85 | 17.80 | 35.3 | | — | | 13.0 |
| | 5.60 | | 59.4 | | 19.90 | | 36.6 | | — | | 15.6 |
| | 31283 8.45 | | 2816 2.0 | | 8900 22.05 | | 1764 39.4 | | — | | 653 18.7 |
| | 1283 | | 2816 | | 8900 | | 1764 | | | | 653 |
| II | 14.35 | | 56,32 | | 26.27 | | 43 35,28 | | — | | 48 13.06 |
| | 17.40 | | | | 28.45 | | − 0.43 | | — | | − 1.82 |
| | 20.40 | | | | 30.60 | | | 79.05 11.13 | 7.08 4.05 | | |
| | 23.43 | 26276 | | | 32.70 | 34,838 | | 11.293 11.50 | +3.50 7.80 | | |
| | 26.32 | 26.27 | 11.0 | | 34.87 | 34.84 | 44 11.0 | 11.30 | −0.00 11.30 | | 48 54.3 |
| | 29.20 | 26.28 | 13.3 | | 36.98 | 34,86 | 13.0 | 11.35 | −3.53 14.88 | | 57.3 |
| | 32.18 | | 16.0 | | 39.00 | | 14.6 | 11.34 | 7.08 18.42 | | 0.5 |
| | 35.16 | | 17.6 | | 41.27 | | 16.4 | 11.17 | 10.63 21.80 | | 4.0 |
| | 23648 38.04 | | 794 21.5 | | 31354 43.40 | | 735 18.5 | 11.26 | 14.19 25.45 | | 3034 7.3 |
| | 23 648 | | 794 | | 31354 | | 735 | | | | 34 |
| | 44.17 | | 15,88 | | 47.60 | | 44 14.70 | 55.87 11.23 | 21.25 32.48 | | 49 0.68 |
| | 47.00 | 50,002 | | | 49.80 | 51930 | − 39.85 | 11.174 11.19 | 24.79 35.98 | 39,532 | − 49.44 |
| | 49.96 | 50.00 | | | 51.95 | 51.93 | | 11.15 | 28.34 39.49 | 39.53 | |
| | 52.98 | 5256 | | | 54.03 | 6973 | | 11.23 | 31.88 43.11 | | |
| | 25001 55.90 | | 56.32 | | 25965 56.27 | | 43 35.28 | 11.07 19766 | 35.53 46.60 | | 48 13.06 |
| | 25001 | 8: 26.275 | 15.88 | | 965 | 43 34.850 | 44 14.70 | | 19766 | | 49 0.68 |
| | | −.024 | | | | | − 0.43 | | | | |
| | | 26.251 | | | | | − 39.85 | 11.233 | | | |
| | | | | | | | | 11.243 | | | |
| 5 | 7 46.27 | | | 11 | 42 56.86 | | | | | | |
| | M 35 58.52 | | | | M 13 38.85 | | | | M 7 0.02 | | |
| | M 37 10.70 | | | | M 14 28.72 | | | | M 7 35.67 | | |
| | M 37 10.67 | | | | R 14 28.97 | | | | R 7 35.67 | | |
| | | | | | R 14 28.60 | | | | R 7 35.62 | | |
| | 37 10.68 | | | | 14 28.76 | | | | 7 35.65 | | |
| 45 | 52 29.2 | | | 15 | 14 53.5 | | | | | | |

174

δ Virginis .11354

h m s
12 49 30
+4° 3'

1.17609
9.99891
1.17500

0.11559

49 57.50
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27846
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10938 20.43
10938
24.50
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14340 32.90
14340

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49 44.0
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49 47.58
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2185
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− 31.54
49 47.58
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+ 24.58
− 31.54
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1.49886
1.50412
1.61240

5612
1.74912
1.17500
2.92412
1.86189
893777
4 57 8

13 18 52.81

587

α Virginis .10725

h m s
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−10° 32'

0.11559

19 9.82
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28.55
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32.69
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36.88
27590 39.00
27590
43.38
45.42
47.50
49.55
23755 51.70
23755

13900
13.54
30656
30.66
30.52
47510
47.51
6105
19 30.590

19 2.2
4.0
6.0
8.0
302 10.0
302
19 604
+ 24.55
20 7.2
8.8
10.8
12.4
536 14.4
536
20 1072
− 40.13
19 6.04
20 10.72
+ 24.55
− 40.13
1.39005
1.60347
1.49730
1.71072

0.11559

181

η Urs. Maj 9.80882
114 63
9.92345

h m s
13 42 46
+49° 55'

1.17609
9.80882
0.98491

0.11559

42 57.93
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4.40
7.73
32210 10.87
2210
17.30
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23.77
26.90
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33.20
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39.70
27055 42.93
27055
49.30
52.45
55.67
58.80
27832 2.20
27842

4420
4.42
30061
30.06
30.04
55684
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6008
43 30.035

42 45.8
48.5
50.9
53.4
2473 56.7
2553
42 5106
+ 38.98
44 7.7
10.9
13.3
15.7
673 19.7
673
44 1346
− 43.42
42 49.46
44 13.46
+ 40.58
− 43.42
1.60831
1.63769
1.53176
1.56114

84.00
1.92428
0.98491
2.90919
1.83683
892764
4 50 19

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M | 24 29.35 | +31.92 | 61.27 | .06 | M | 59 6.60 | +31.43 | 38.03 | .63 | M | 33 24.70 | +34.02 | 58.72 .87 |
| M | 25 41.85 | | | | M | 059 30.45 | | | | M | 34 33.50 | | |
| R | 25 42.12 | | | | M | 059 30.85 | | | | R | 34 33.35 | | |
| R | 25 42.02 | | | | R | 059 30.85 | | | | R | 34 33.22 | | |
| M | 25 42.45 | | | | R | 059 30.75 | −51.37 | 39.38 | | M | 34 33.47 | | |
| | 25 42.11 | −40.96 | 61.15 | | | 059 30.72 | | | | | 34 33.38 | −36.40 | 56.98 |
| | 72.76 | | | | | | | | | | 68.68 | | |
| | | | 61.21 | | | | | 38.70 | | | | | 57.85 |

10 32 5.2

1879

May 29

182

η Boötis 9.97567
11463
h m s 0.09030
13 48 55
° ' 1.17609 0.11559
+19 0 9.97567
1.15176

| | | | | |
|---|---|---|---|---|
| | 49 15.95 | | 49 12.6 | |
| | 18.20 | 20308 | 14.6 | |
| | 20.29 | 2031 | 16.8 | ~~16.80~~ |
| | 22.48 | | 19.0 | |
| 10154 | 24.62 | | 840 21.0 | |
| | 10154 | | 840 | |
| | 29.00 | | 49 1680 | |
| | 31.20 | | + 20.94 | |
| | 33.40 | | | |
| | 35.57 | 37739 | | |
| | 37.77 | 37.74 | 50 4.9 | |
| | 39.90 | 37.73 | 7.4 | |
| | 42.00 | | 9.5 | |
| | 44.34 | | 11.4 | |
| 33965 | 46.47 | | 469 13.7 | |
| | 33965 | | 469 | |
| | 50.85 | | 50 9.38 | |
| | 52.95 | 55150 | −31.64 | |
| | 55.10 | 55.15 | | |
| | 57.35 | 7546 | | |
| 27575 | 59.50 | | 49 1680 | |
| | 27575 | 49 37.735 | 50 9.38 | |
| | | | + 20.94 | |
| | | | −3 31.64 | 5 ~~4~~2.58 |
| | | | 1,32098 | ~~1,62921~~ 1.7 |
| 13 48 58,67 | | | 1,33526 | ~~1.715976~~ |
| | | | 1,41128 | ~~2.78097~~ |
| | | | 1.42556 | 1,811[illegible]7 |
| | | | | ~~903020~~ |
| | | | | ~~6 7 8~~ |
| | | | | 6,93859 |
| | | | | 4 5742 |

183

τ Virginis 9.99970
11463
h m s 0.11433
13 55 29
° ' 1.17609
+2 8 9.99970
1.17579

| | | | | |
|---|---|---|---|---|
| | 55 50.80 | 50.70 | 55 51.8 | |
| | 52.75 | 54840 | 53.9 | |
| | 54.80 | 54.84 | 55.8 | |
| | 56.90 | | 57.5 | |
| 27420 | 58.95 | | 2781 59.1 | |
| | 2420 | | 281 | |
| | 2.97 | | 55 5562 | |
| | 5.00 | | + 15.66 | |
| | 7.03 | | | |
| | 9.27 | 11256 | | |
| | 11.27 | 11.25 | 56 37.7 | |
| | 13.33 | 11.32 | 39.4 | |
| | 15.38 | | 41.2 | |
| | 17.50 | | 42.9 | |
| 10130 | 19.55 | | 2062 45.0 | |
| | 10130 | | 2062 | |
| | 23.67 | | 56 41.24 | |
| | 25.77 | 27.814 | − 29.96 | |
| | 27.82 | 27.81 | | |
| | 29.85 | 14265 | | |
| 13907 | 31.96 | | 55 5562 | |
| | 13907 | 56 11.285 | 56 41.24 | |
| | | −.005 | + 15.66 | |
| | | 11.280 | − 29.96 | 4562 |
| | | | 1,19479 | 1.65916 |
| | | | 1,47654 | 1.17579 |
| | | | 1,30912 | 2.83495 |
| | | | 1,59087 | 1.77887 |
| | | | | 8.94392 |
| | | | | 5 1 21 |

187

α Boötis 9.97349
11463
h m s 0.08812
14 10 8
0.11559 ° ' 0.11559
+19 49

| | | | | |
|---|---|---|---|---|
| | 10 28.87 | | 10 51.3 | |
| | 31.00 | 33286 | 53.4 | |
| | 33.36 | 33.2[illegible] | 55.0 | |
| | 35.50 | | 56.7 | |
| 16643 | 37.70 | | 2754 59.0 | |
| | 16643 | | 254 | |
| | 42.10 | | 10 5508 | |
| | 44.33 | | − 420 | |
| | 46.50 | | | |
| | 48.68 | 50.912 | | |
| 5090 | 51.00 | 50.91 | 11 20.5 | |
| | 53.18 | 50.86 | 22.5 | |
| | 55.35 | | 24.2 | |
| | 57.52 | | 26.3 | |
| 45821 | 59.55 | | 1219 28.4 | |
| | 45821 | | 219 | |
| | 4.00 | | 11 2438 | |
| | 6.25 | 8430 | − 33.50 | |
| | 8.45 | 8.43 | | |
| | 10.60 | 10172 | | |
| 4215 | 12.85 | | 10 5508 | |
| | 4215 | 10 50.885 | 11 24.38 | |
| | | −.005 | * − 4.20 | |
| | | 50.880 | − 33.50 | |

14 10 11,70

| | | | | |
|---|---|---|---|---|
| M | 27 53.52 | +25.78 | 19.30 | |
| M | 28 58.55 | | | |
| R | 28 58.07 | | | |
| R | 28 58.20 | | | |
| M | 28 58.22 | | | |
| | 28 58.26 | −2664 | 31.62 | |
| | 64,74 | | | |

| | | | | |
|---|---|---|---|---|
| M | 20 5.90 | +20.38 | 26.28 | .37 |
| M | 21 6.02 | | | |
| R | 21 5.85 | | | |
| R | 21 6.15 | | | |
| M | 21 6.00 | | | |
| | 21 6.00 | −38.98 | 27.02 | |
| | 60,10 | | | |
| | | | 26.65 | |

| | |
|---|---|
| M | 39 57.10 |
| M | 40 33.27 |
| R | 40 33.30 |
| R | 40 33.15 |
| M | 40 33.50 |
| | 40 33.30 |

18 0 ~~8~~5.0

19 48 35.1

329

α Pegasi

h m s
22 58 44
+14° 30'

59 3.83 | 58 59.1
6.00 8082 | 1.0
7.00 8.08 | 2.6
10.28 | 4.8
4041 12.30 | 3139 6.4
4041 | 139
16.55 | 59 2780
18.75 | + 22.34
20.88
23.00 25144
25.15 25.14
27.27 25.11
29.40
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22630 33.70
22630
37.90
40.05 42150
42.05 42.15
44.30 5023
21075 46.45 | 59 2.78
21075 59 25.125 + 22.34

12 58 45.96

M 54 33.35

14 33 21.3

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0.11559

13

γ Cassiop

h m s
0 49 25
+60° 4'

49 25.35 | 49 17.0
29.67 33710 | 20.0
33.70 33.71 | 23.7
37.88 | 27.4
16855 41.95 | 1185 30.4
16855 | 1185
50.28 | 49 2370
54.30 | + 43.05
58.50
2.65 6.759
6.70 6.76
10.85 6.74
14.90
19.20 19.35
60083 23.30
6083
31.55
35.57 39.764
39.80 39.76
43.90 13347
19882 48.00 | 49 23.70
19882 50 6.750 | + 43.05
-.007
6.743

R 25 0.65 .
R 25 1.45 .
R 25 1.30 .
R 25 1.23 .
25 1.16 33 ✓

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0.11559

20

δ Cassiop

h m s
1 17 55
+59° 36'

9.70418

0.11559

18 —
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927.69 36.66 1631 20.35
36410 36.53 1223 24.30
36.20 8.15 28.05
36.44 404 32.40 36406
36.40 -000 36.40 36.41
36.43 -407 40.60
36.29 816 44.45
36.37 1223 48.60
36373 32763 1633 52.70
32765
181.56 36.39 2446 0.85
36.312 36.41 2854 4.95 8960
36.37 3263 9.00 8.96
36.30 3670 13.00
36.09 4480 4091 17.00
4480

36.361
36.378

17 46.3 | 18 47.0
49.0 | 49.9
53.4 | 53.0
57.5 | 57.0
2668 0.6 | 2679 1.0
2668 | 2679
17 53.36 | 18 53.58
+ 43.02 | − 17.20
19 28.8 | 19 47.5
32.1 | 51.4
35.8 | 53.9
39.3
1792 43.2
1792
19 35.84
− 59.46
17 53.36 | 18 53.58
19 35.84 | 19

M 17 18.80 .
M 17 58.87 .
M 18 25.92 .
M 18 35.27 .
~~18 20.02~~

33

α Arietis

h m s
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+22° 53′

1879

May 29

0 39.00
41.30 ~~4~~3.568
43.67 43.57
45.67
21784 48.20
21784
52.58
54.84
57.00
59.36 1.551
1.50 1.55
3.85 1.49
6.05
8.23
55346 10.55
1396
14.95
17.20 19.422
19.38 19.42
21.65 12.99
9711 23.93
9711 1 1.520

0 42.4
44.4
46.9
1835 49.8
1835
4588 ~~3670~~
+ 1564

1 38.0
40.7
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44.5
2125 46.6
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− 40.98

1 42.50
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2 0 22.41

0.11559

8

Sun c = 46.750

h m s
4 28 38

+21° 48′

May 29-30

27 41.44
43.55 45.812
45.80 45.81
48.00
22906 50.27
22906
54.80
56.95
59.17
1.30 3.649
3.60 3.65
5.85 3.59
8.22
10.35
57284 12.60
3284
16.90
19.00 21.366
21.33 21.37
23.70 12718
10683 25.90
10683 28 3.620

28 47.5
49.8
52.2
53.9
2591 55.7
2591
28 51.82
− 48.20

28 51.82 − 48.20

29 ~~57.92~~
57.92
2.00
4.40
6.43
5
10.90
13.28
15.38
17.76 19.913
19.90 19.91
22.05
24.47
26.60
17922 28.88
17922
33.30
35.55 37.754
37.80 37.75
39.92
18877 42.20
18877

0.11559

29 34.3
36.2
38.3
40.5
1913 42.0
1913
29 38.26

29 38.26

M 34 43.75.
M 35 51.20.
R 35 51.10.
R 35 51.40.
M 35 51.05.
35 51.19

M 24 45.40.

M 57 22.95.

22 53 28.8

86

α Aurigae

h m s
5 7 45
+ 45° 52'

1.17609
9.84282
1.01891

1879 May 30
6

0.11559

|  |  |  |  |
|---|---|---|---|
|  | 7 56.28 |  | 7 47.8 |
|  | 59.17 | 2.120 | 50.2 |
|  | 2.10 | 2.12 | 52.8 |
|  | 5.18 |  | 54.9 |
| 31060 | 7.97 |  | 2634 57.7 |
|  | 1060 |  | 2634 |
|  | 14.04 |  | 7 5268 |
|  | 17.00 |  | + 33.47 |
|  | 19.90 |  |  |
|  | 23.20 | 25949 |  |
|  | 26.00 | 2595 | 9 2.9 |
|  | 28.80 | 26.35 | 4.7 |
|  | 31.78 |  | 7.5 |
| 34.78 | 34.88 |  | 9.6 |
| 23354 | 37.94 |  | 370 12.3 |
|  | 23354 |  | 370 |
|  | 43.75 |  | 9 740 |
|  | 46.75 | 49630 | − 41.25 |
|  | 49.60 | 49.63 |  |
|  | 52.50 | 5270 |  |
| 24815 | 55.65 |  | 7 52.68 |
|  | 24815 | 8 26.150 | 9 7.40 |
|  |  | −.005 | + 33.47 |
|  |  | 26.145 | − 41.25 |

7472
1.87344
1.01891
2.89235
~~1.89070~~ 1.83691
~~8.99835~~ 8.93856
~~5 41 21~~ 4 57 41

5 7 46.29

M 35 55.77
M 37 3.65
R 37 3.42
R 37 3.67
M 37 3.35
37 3.52
6 17.75

45 52 29.1

172

γ Virginis

h m s
12 35 31
− 0° 47'

May 31

0.11559

|  |  |  |  |
|---|---|---|---|
|  | 35 ~~52.21~~ |  | 36 14.3 |
|  | ~~54.28~~ |  | 16.3 |
|  | 56.38 |  | 18.4 |
|  | 58.35 |  | 20.4 |
|  | 0.44 |  | 914 22.0 |
|  |  |  | 914 |
|  | 4.44 |  | 36 18.28 |
|  | 6.58 |  |  |
|  | 8.60 |  |  |
|  | 10.70 | 12697 |  |
|  | 12.85 | 12.70 | 36 38.4 |
|  | 14.83 |  | 40.3 |
|  | 16.85 |  | 42.0 |
|  | 18.92 |  | 44.0 |
| 11427 | 21.00 |  | 2110 46.3 |
|  | 11427 |  | 2110 |
|  | 25.00 |  | 36 42.20 |
|  | 27.40 | 29268 |  |
|  | 29.25 | 29.27 |  |
|  | 31.29 |  |  |
| 14634 | 33.40 |  | 36 18.28 |
|  | 14634 | 36.12.75 | 36 42.20 |

12 35 34.63

M 15 27.57
M 15 59.45
R 15 59.42
R 15 59.95
M 15 59.45
15 59.76

0 47 25.2

13

γ Cassiop. L.C.

h m s
0 49 25
+ 119° 56'

May 31

0.11559

|  |  |  |  |
|---|---|---|---|
| 49 46.4 |  | 49 2.8 | 49 44.2 |
| 50.0 |  | 8.5 | 48.8 |
| 54.4 |  | 11.5 | 52.0 |
| 58.7 | 2.63 | 14.3 | 55.4 |
| 2.7 |  | 554 18.3 | 2597 59.3 |
| 6.8 |  | 554 | 97 |
| 10.8 |  | 49 11.08 | 49 51.94 |
| 14.7 |  | + 57.55 | + 10.69 |
| 2637 19.2 |  |  |  |
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|  |  | 50 22.4 | 50 52.0 |
|  |  | 25.8 | 55.5 |
|  |  | 29.2 | 58.3 |
|  |  | 33.2 | 1.3 |
|  |  | 1474 36.8 | 2909 3.8 |
|  |  | 1474 | 2909 |
|  |  | 50 29.48 | 50 58.18 |
|  |  | − 26.85 | − 55.55 |
|  |  | 49 11.08 | 49 51.94 |
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181

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26503 42.28
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42 57.9
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42 57.20
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44 4.5
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44 9.36
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1.50840
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182

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49 15.60
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19.80 19.89
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33605 46.00
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52.50 54714
54.75 54.71
56.95 7460
27357 59.00
27357 49 37.320

49 17.3
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49 21.08
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50 5.6
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M 10 5.25
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M 33 29.40 +27.03 5643 .03
M 34 29.78
R 34 30.25
R 34 30.02
M 34 29.78
34 ~~29.96~~ −33.47 5649
34 29.71
60.31 5646

M 27 59.82 +19.99 19.81 .41
M 28 59.98
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M 28 59.52
28 59.74 −41.16 18.58
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18 19 0 5.8
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| 183 | | | |
| τ Virginis | .11433 | | |
| h m s<br>13 55 27 | | | |
| ° ′<br>+2 8 | 1.17609<br>9.99970 | | 0.11559 |
| | 1.17579 | | |
| 55 50.22 | | 55 40.0 | |
| 52.30 | 54376 | 42 6 | |
| 54.40 | 54.38 | 44.0 | |
| 56.46 | | 46.4 | |
| 27188 58.50 | | 2210 48.0 | |
| 27188 | | 210 | |
| 2.55 | | 55 4420 | |
| 4.65 | | + 2668 | |
| 6.80 | | | |
| 8.85 | 10.898 | | |
| 10.87 | 10.90 | 56 36.9 | |
| 12.93 | 10.86 | 38.8 | |
| 15.00 | | 40.8 | |
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| 9808 19.25 | | 2029 44.7 | |
| 9808 | | 38 | |
| 23.10 | | 56 4076 | |
| 25.30 | 27.348 | − 2988 | |
| 27.37 | 27.35 | | |
| 29.40 | 14173 | | |
| 13674 31.57 | | 55 44.20 | |
| 13674 | 56 10.880 | 56 40.58 | |
| | | + 26.68 | |
| | | − 29.70 | 5638 |
| | | 1.42618 | 1.75113 |
| | | 1.47276 | 1.17579 |
| | | 1.54651 | 2.92692 |
| | | 1.58709 | 1.86794 |
| | | | 8.94102 |
| | | | 4.5922 |

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| α Boötis | | .08812 | |
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| 10 28.10 | | 10 36.6 | |
| 30.80 | 32972 | 39.1 | |
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| 16486 37.30 | | 2035 44.7 | |
| 16486 | | 35 | |
| 41.75 | | 10 4070 | |
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| 48.34 | 50494 | | |
| 50.47 | 50.49 | 11 20.2 | |
| 52.67 | 50.48 | 22.0 | |
| 54.89 | | 23.6 | |
| 57.00 | | 25.8 | |
| 45445 59.28 | | 1193 27.7 | |
| 45445 | | 193 | |
| 3.65 | | 11 2386 | |
| 5.80 | 7.990 | − 3338 | |
| 7.90 | 7.99 | ~ | |
| 10.20 | 10096 | | |
| 3995 12.40 | | 10 40.70 | |
| 3995 | 10 50.485 | 11 23.86 | |
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| | | 1.52349 | |
| | | 1.07846 | |
| | | 1.61161 | |

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| 193 | | | |
| γ Boötis | | 9.98694<br>11463<br>9.10067 | 9.89152<br>11463<br>0.00615 |
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| 31.20 | 33736 | 41.5 | |
| 33.60 | 3.74<br>~~3774~~ | 43.6 | |
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| 17468 39.00 | | 2194 48.4 | |
| 16868 | | 2194 | |
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| 49.60 | | | |
| 52.28 | 54979 | | |
| 54.90 | 5498 | 28 29.4 | |
| 57.70 | 5494 | 31.6 | |
| 0.33 | | 33.4 | |
| 2.90 | | 35.8 | |
| 49481 5.55 | | 1684 38.2 | |
| 49481 | | 1684 | |
| 10.85 | | 28 3368 | |
| 13.50 | 16142 | − 3872 | |
| 16.18 | 16.14 | | |
| 18.78 | 10988 | | |
| 8071 21.40 | | 27 43.88 | |
| 8071 | 27 54.960 | 28 33.68 | |
| | | + 11.66 | |
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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | M 19 52.60 | +34.71 | 87.31 | .21 | M 39 39.90 | +11.98 | 51.88 | .40 | M 38 25.82 | +11.83 | 37.65 | 32 |
| | M 21 6.47 | | | | M 40 33.42 | | | | M 39 15.85 | | | |
| | R 21 6.35 | | | | R 40 33.55 | | | | R 39 15.68 | | | |
| | R 21 6.25 | | | | R 40 33.67 | | | | R 39 15.65 | | | |
| | M 21 6.47 | | | | M 40 33.62 | | | | M 39 15.58 | | | |
| | 21 6.38 | −38.64 | 87.74 | | 40 33.56 | −40.89 | 52.67 | | 39 15.69 | −38.68 | 37.01 | |
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| 40 1.25 | | 39 59.9 | |
| 3.50 | 5.854 | 2.5 | |
| 5.87 | 5.85 | 3.9 | |
| 8.15 | | 5.5 | |
| 2927 10.50 | | 3197 7.9 | |
| 2927 | | 197 | |
| 15.60 | | 40 394 | |
| 17.47 | | + 20.48 | |
| 19.83 | | | |
| 22.00 | 24.409 | | |
| 24.40 | 24.41 | 40 56.6 | |
| 26.75 | 24.44 | 58.6 | |
| 29.00 | | 0.7 | |
| 31.48 | | 2.4 | |
| 21968 33.75 | | 3025 4.2 | |
| 21968 | | 25 | |
| 38.40 | | 41 050 | |
| 40.67 | 43034 | − 36.08 | |
| 43.07 | 43.03 | | |
| 45.32 | 4888 | | |
| 21517 47.78 | | 40 3.94 | |
| 21517 | 40 24.425 | 41 0.50 | |
| | | + 20.48 | |
| | | − 36.08 | 5656 |
| | | 1.31133 | 1.75251 |
| | | 1.55727 | 1.12369 |
| | | 1.37356 | 2.87620 |
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| 32.80 | | 30.2 | |
| 15002 34.62 | | 1407 32.0 | |
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| 39.40 | | 2 28.14 | |
| 41.80 | | + 2060 | |
| 44.00 | | | |
| 46.38 | 48.769 | | |
| 48.75 | 48.77 | 3 21.8 | |
| 51.17 | 48.72 | 23.9 | |
| 53.42 | | 25.9 | |
| 55.80 | | 27.9 | |
| 43892 58.20 | | 1291 29.6 | |
| 43892 | | 1291 | |
| 2.80 | | 3 2582 | |
| 5.00 | 7.450 | − 37.08 | |
| 7.42 | 7.45 | | |
| 9.83 | 9745 | | |
| 3725 12.20 | | 2 28.14 | |
| 3725 | 2 48.745 | 3 25.82 | |
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| 7 19.45 | | 7 11.4 |
| 21.60 | 23696 | 13.4 |
| 23.76 | 23.69 | 15.3 |
| 25.70 | | 17.3 |
| 11848 27.97 | | 771 19.7 |
| 11848 | | 271 |
| 32.23 | | 7 1542 |
| 34.35 | | + 2532 |
| 36.56 | | |
| 38.60 | 40766 | |
| 40.80 | 40.76 | 8 9.9 |
| 42.90 | 40.71 | 11.9 |
| 44.95 | | 13.8 |
| 47.20 | | 15.6 |
| 36689 49.30 | | 681 16.9 |
| 36689 | | 181 |
| 53.48 | | 8 1362 |
| 55.60 | 57730 | − 32.88 |
| 57.72 | 57.73 | |
| 59.85 | 8142 | |
| 28865 2.00 | | 7 15.42 |
| 28865 | 7 40.735 | 8 13.62 |
| | | + 25.31 |
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|---|---|---|---|---|
| M | 53 | 15.37 | +2364 | 3901 .06 |
| M | 54 | 20.65 | | |
| R | 54 | 20.58 | | |
| R | 54 | 20.82 | | |
| M | 54 | 21.02 | | |
| | 54 | 20.77 | −41.64 | 3913 |
| | | 65.40 | | |
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| M | 2 | 48.87 |
| M | 2 | 55.12 |
| R | 2 | 54.67 |
| R | 2 | 54.72 |
| | 2 | 54.84 |

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|---|---|---|
| M | 57 | 2.60 |
| M | 58 | 15.77 |
| R | 58 | 15.07 |
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35.00 39140
39.20 39.14
43.23 ~~3~~3272
19570 47.47
19570 50 6.120

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479 16.0
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49 9.58
+ 56.54

50 56.3
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3168 10.8
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51 3.36
− 57.24

49 54.0
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50 0.64
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49 9.58 50 0.64
~~51 50 3.36~~ 3.36 + 5.48
+ 56.54
~~+ 2.76~~ − 57.24
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1.73062
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1.82276
9.21796
9 22 46

M 24 50.87
M 25 25.82
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31.82 35817
35.80 35.82
39.88 35.83
44.04
47.96
32235 52.00
32235
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4.50 8470
8.40 8.47
12.50 ~~7~~7166
4235 16.60
4235 18 35.825

17 40.2
43.3
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50.8
2356 54.0
2356
17 47.12
+ 48.70

19 4.8
7.7
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594 19.0
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19 11.88
− 36.06

18 14.2
16.5
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1003 26.9
1003
18 20.06
− 15.76

19 43.1
45.8
50.3
53.8
2510 58.0
10
19 50.20
−1 14.38

17 47.12 18 20.06
19 11.88 19 50.20
+ 48.70 + 15.76
− 36.06 −1 14.38
84.76 90.14
1.92819 1.95492
0.88027 0.88027
2.80846 2.83519
1.83467 1.83467
9.02621 8.99948
6 3 48 5 42 14

M 52 14.35
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M 53 — 2+3 micros (?) A21 p114
M 53 34.25
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May 31 – June 1

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15718 35.95
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55650
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13476
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6105 16.70
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27059 39.00
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43.45
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23948 52.40
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7 52.2
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428
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+ 28.71
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1.85443
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5 7 46.31

M 35 59.65
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48 51.7
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2769 59.2
269
48 55.38
+ 21.22
49 46.0
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2490 53.5
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49 49.80
+ 33.20
48 55.38
49 49.80
+ 21.22
− 33.20
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M 34 44.12
M 35 54.62
R 35 54.50
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7 22 60.5

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β Leonis

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h m s
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9.98443
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| | 35 52.20 | | 35 44.0 |
| | 54.27 | 56.360 | 45.8 |
| | 56.40 | 56.36 | 47.0 |
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| | 9.75 | 11.767 | | |
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| | 56 29.80 | | 56 30.4 | |
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| | 42.20 | | 56 33.76 | |
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| | 48.57 | 50.694 | | |
| | 50.75 | 50.69 | 57 18.8 | |
| | 52.78 | 50.68 | 21.3 | |
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| 45625 | 59.18 | | 1150 27.0 | |
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| | 3.25 | | 57 23.00 | |
| | 5.50 | 7.550 | − 32.36 | |
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| | 9.65 | 10136 | | |
| 3775 | 11.80 | | 56 33.76 | |
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| 34.97 | 37168 | | |
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| | 55 50.05 | | 55 44.3 | | 37 37.30 | | 37 27.9 | | 59 3.50 | | 59 1.0 | 6.55 | 413 |
| | 52.25 | 54.288 | 45.9 | | 39.69 | 42.074 | 30.0 | | 5.70 | 7.830 | 2.5 | 6.49 | 372 |
| | 54.25 | 54.29 | 47.5 | | 42.00 | 42.05 | 31.8 | | 7.95 | 7.83 | 4.5 | 6.55 | 331 |
| | 56.39 | | 49.5 | | 44.48 | | 33.3 | | 10.00 | | 6.4 | 6.64 | 289 |
| 27144 | 58.50 | | 2387 51.5 | 21027 | 46.90 | | 1579 34.9 | 3915 | 12.00 | | 228 8.4 | 6.59 | 248 |
| | 21 44 | | 2387 | | 21037 | | 1579 | | 3915 | | 228 | | |
| | 2.55 | | 55 47.74 | | 51.65 | | 37 31.58 | | 16.30 | | 59 4.56 | 6.34 | 165 |
| | 4.50 | | | | 53.95 | | 4 29.44 | | 18.43 | | + 20.31 | 6.31 | 124 |
| | 6.55 | | | | 56.37 | | | | 20.60 | | | 6.47 | 8.2 |
| | 8.60 | 10.709 | | | 58.63 | 1.028 | | | 22.77 | 24.853 | | 6.25 | + 4.0 |
| | 10.68 | 10.71 | 56 45.0 | | 1.00 | 1.03 | | | 24.87 | 24.85 | | 6.55 | -0.0 |
| | 12.80 | | 46.7 | | 3.40 | 1.01 | | | 27.00 | 24.89 | | 6.65 | -4.1 |
| | 14.78 | | 48.0 | | 5.70 | | | | 29.00 | | | 6.63 | 827 |
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| 9638 | 19.00 | | 2402 50.9 | 54925 | 10.50 | | | 22368 | 33.38 | | | 6.42 | 1656 |
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| | 23.05 | | 56 48.04 | | 15.28 | | | | 37.75 | | | | |
| | 25.20 | | | | 17.58 | 19.972 | | | 39.80 | 41.950 | | | 6.511 |
| | 27.20 | | | | 19.90 | 19.97 | | | 41.90 | 41.95 | | | 6.496 |
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| 55 | 4136 | 49 | 2519 | | 49 | 14.4 | 50 | 7.4 |
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| 55 | 3310 | 6.564 | 33.46 | | | 20.4 | | 15.4 |
| 64 | 2896 | | 37.68 | | | 23.6 | | 17.7 |
| 59 | 2481 | | 41.78 | | 1040 | 28.2 | 728 | 21.3 |
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| 31742 | 11.60 | | 2919 | 5.7 | 1128 | 29.5 |
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| | 15.37 | | | 31.86 | +4.45 | 36.31 | 145.44 |
| | 17.59 | 19.840 | | 34.06 | 2.21 | 36.27 | 36.36 |
| | 19.88 | 19.84 | | 36.38 | -0.00 | 36.38 | |
| | 22.10 | 19.86 | | 38.70 | 2.22 | 36.48 | |
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| | 35.38 | 37.710 | | 52.00 | -15.60 | 36.40 | 145.92 |
| | 37.70 | 37.71 | | 54.37 | 17.83 | 36.54 | 36.48 |
| | 39.97 | 3973 | | 56.53 | 20.06 | 36.47 | |
| 18855 | 42.24 | | | 177 58.87 | -22.36 | 36.51 | 41 13.94 |
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| 52 | 16.22 | | 53 | 23.5 | 54 | 33.18 | | 54 | 0.2 |
| | 18.48 | 20650 | | 25.9 | | 35.36 | 37618 | | 2.8 |
| | 20.70 | 20.65 | | 28.3 | | 37.60 | 37.62 | | 4.9 |
| | 22.85 | | | 30.0 | | 39.93 | | | 6.2 |
| 10325 | 25.00 | | 1399 | 32.2 | 18809 | 42.02 | | 221 | 8.0 |
| | 325 | | | 1.399 | | 18809 | | | 221 |
| | 29.50 | | 53 | 27.98 | | 46.65 | | 54 | 4.42 |
| | 32.00 | | − | 49.46 | | 48.90 | | + | 51.12 |
| | 34.00 | | | | | 51.00 | | | |
| | 36.00 | 38.513 | | | | 53.35 | 55.550 | | |
| | 38.47 | 38.51 | | | | 55.50 | 55.55 | | |
| | 40.87 | 38.53 | | | | 57.87 | 55.52 | | |
| | 43.00 | | | | | 59.96 | | | |
| | 45.28 | | | | | 2.25 | | | |
| 34662 | 47.50 | | | | 49995 | 4.47 | | | |
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| | 54.25 | 56.420 | | | | 11.20 | 13.428 | | |
| | 56.45 | 5642 | | | | 13.45 | 13.43 | | |
| | 58.60 | 7707 | | | | 15.60 | 11105 | | |
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| 35 | 52.48 | | 35 | 50.5 | | |
| | 54.57 | 56616 | | 52.0 | | |
| | 56.65 | 56.62 | | 53.6 | | |
| | 58.70 | | | 55.7 | | |
| 28208 | 0.68 | | 2695 | 57.7 | | |
| | 28308 | | | 195 | | |
| | 4.85 | | 35 | 53.90 | | |
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| | 10.95 | 13.~~260~~ | | | | |
| | 13.00 | 13.04 | 36 | 42.5 | | |
| | 15.00 | 13.09 | | 44.0 | | |
| | 17.03 | | | 46.0 | | |
| | 19.27 | | | 47.4 | | |
| 11734 | 21.29 | | 2293 | 49.4 | | |
| | 11734 | | | 293 | | |
| | 25.47 | | 36 | 45.86 | | |
| | 27.53 | 29.572 | − | 3280 | | |
| | 29.58 | 29.57 | | | | |
| | 31.58 | 14619 | | | | |
| 14786 | 33.70 | | | 35 5390 | | |
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| | | | | 1.28149 | 1.71567 | |
| | 12 35 34.56 | | | 1.51640 | 1.17605 | |
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| 24.18 | 28862 | 54.0 | 51.9 |
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| 32.95 | | 59.8 | 57.2 |
| 14431 37.10 | | 2861 4.5 | 2686 0.5 |
| 14431 | | 2861 | 2686 |
| 45.50 | | 48 57.22 | 49 53.72 |
| 49.60 | | +1 4.75 | + 8.25 |
| 53.78 | | | |
| 57.92 | 1.972 | | |
| 1.85 | 1.98 | 50 52.2 | |
| 6.00 | 1.96 | 55.2 | |
| 10.00 | | 57.7 | |
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| 5786 18.57 | | 2894 3.3 | |
| 1775 | | 2894 | |
| 26.88 | | 50 57.88 | |
| 31.00 | 35058 | − 55.91 | |
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| 39.24 | 12392 | | |
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| 56 29.88 | | 56 22.2 | |
| 32.00 | 34102 | 23.8 | |
| 34.06 | 34.10 | 25.2 | |
| 3612 36.22 | | 26.9 | |
| 17051 38.35 | | 1269 28.8 | |
| 17051 | | 269 | |
| 42.50 | | 56 25.38 | |
| 44.67 | | + 25.48 | |
| 46.70 | | | |
| 48.85 | 50.910 | | |
| 50.90 | 50.91 | 57 19.5 | |
| 53.00 | 50.81 | 21.3 | |
| 55.00 | | 23.3 | |
| 57.20 | | 25.0 | |
| 45819 59.37 | | 1163 27.2 | |
| 45819 | | 1163 | |
| 3.50 | | 57 23.26 | |
| 5.58 | 7.724 | − 32.40 | |
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| 9.92 | 10162 | | |
| 3762 11.97 | | 56 25.38 | |
| 3862 | 56 50.855 | 57 23.26 | |
| | +.005 | + 25.48 | |
| | 50.860 | − 32.40 | 57.88 |
| | | 1.40620 | 1.76253 |
| | | 1.51054 | 1.16710 |
| | | 1.51184 | 2.92963 |
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| 54.75 | 58870 | 28.0 | 18.0 |
| 58.80 | 58.87 | 31.0 | 21.9 |
| 3.00 | | 34.3 | 25.4 |
| 29435 7.00 | | 1559 37.6 | 1085 29.0 |
| 29435 | | 59 | |
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| 19.30 | | +1 0.37 | + 9.85 |
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| 27.48 | 31537 | | |
| 31.40 | 31.54 | 19 6.9 | |
| 35.40 | 31.57 | 10.0 | |
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| 28383 47.92 | | 711 22.0 | |
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| 4.40 | 4.28 | | |
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| 42 57.90 | | 42 45.5 | |
| 1.10 | 4.286 | 48.0 | |
| 4.30 | 4.29 | 50.6 | |
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| 32143 10.73 | | 2524 55.5 | |
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| 17.00 | | 42 5048 | |
| 20.36 | | + 39.45 | |
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| 26.70 | 29.944 | | |
| 30.00 | 29.94 | 44 3.0 | |
| 33.22 | 29.93 | 5.7 | |
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| 8930 39.40 | | 10.2 | |
| 26950 42.80 | | 404 13.8 | |
| 26950 | | 404 | |
| 49.20 | | 44 808 | |
| 52.40 | 55570 | − 38.15 | |
| 55.50 | 55.57 | | |
| 58.80 | 59.86 | | |
| 27785 1.95 | | 42 5048 | |
| 27785 | 43 29.935 | 44 8.08 | |
| | −.005 | + 39.46 | |
| | 29.930 | − 38.14 | 77.60 |
| | | 1.59616 | 1.88986 |
| | | 1.58138 | 0.98491 |
| | | 1.51961 | 2.87477 |
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| 49 15.80 | | 49 10.8 | |
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| 20.25 | 2022 | 15.2 | |
| 22.40 | | 16.9 | |
| 10110 24.60 | | 746 18.7 | |
| 10110 | | 246 | |
| 28.92 | | 49 1492 | |
| 31.80 | | + 22.76 | |
| 33.35 | | | |
| 35.50 | 37.637 | | |
| 37.68 | 37.64 | 50 1.8 | |
| 39.83 | 37.71 | 4.8 | |
| 41.97 | | 6.4 | |
| 44.05 | | 8.6 | |
| 33873 46.43 | | 320 10.4 | |
| 33873 | | 320 | |
| 50.82 | | 50 640 | |
| 53.16 | 55198 | − 28.72 | |
| 55.14 | 55.20 | | |
| 57.37 | 7542 | | |
| 27599 59.50 | | 49 1492 | |
| 2599 | 49 37.675 | 50 6.40 | |
| | | + 22.76 | |
| | | − 28.72 | 51.48 |
| | | 1.35717 | 1.71164 |
| | 13 48 58.62 | 1.45818 | 1.15176 |
| | | 1.44747 | 2.86340 |
| | | 1.54848 | 1.80209 |
| | | | 8.93869 |
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| 55 50.60 | | 55 41.0 | |
| 52.68 | 54.754 | 42.4 | |
| 54.80 | 54.75 | 43.9 | |
| 56.82 | | 45.8 | |
| 27377 58.87 | | 2205 47.4 | |
| 2377 | | 205 | |
| 2.96 | | 55 4410 | |
| 5.00 | | + 27.16 | |
| 7.04 | | | |
| 9.34 | 11.277 | | |
| 11.22 | 11.28 | 56 35.8 | |
| 13.30 | 11.25 | 37.8 | |
| 15.50 | | 39.4 | |
| 17.55 | | 41.7 | |
| 10149 19.58 | | 1983 43.6 | |
| 10149 | | 1983 | |
| 23.60 | | 56 3966 | |
| 25.66 | 27.752 | − 28.40 | |
| 27.75 | 27.75 | | |
| 29.86 | 14250 | | |
| 13876 31.90 | | 5544.10 | |
| 13876 | 56 11.265 | 56 39.66 | |
| | | + 27.16 | |
| | | − 28.40 | 55.56 |
| | | 1.43393 | 1.74476 |
| | | 1.45332 | 1.17579 |
| | | 1.54826 | 2.92055 |
| | | 1.56765 | 1.86034 |
| | | | 8.93979 |
| | | | 45831 |

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|---|---|---|
| M 33 22.30 | +33.08 | 55.38 .05 |
| M 34 27.40 | | |
| R 34 27.22 | | |
| R 34 27.15 | | |
| M 34 27.27 | | |
| 34 27.26 | −31.98 | 55.28 |
| 64.96 | | |
| | | 55.33 |

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| M 27 50.57 | +28.02 | 18.59 .01 |
| M 28 54.32 | | |
| R 28 53.80 | | |
| R 28 53.87 | | |
| M 28 53.88 | | |
| 28 53.97 | −35.36 | 18.61 |
| 63.40 | | |
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19 0 6.5

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| M 19 51.45 | +35.34 | 86.79 .11 |
| M 21 3.85 | | |
| R 21 4.07 | | |
| R 21 3.97 | | |
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| 21 3.95 | −36.95 | 87.00 |
| 72.50 | | |
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| h m s | | | | |
| 14 10 8 | | 1.17609 | 0.11297 | |
| +19° 49' | | 9.97349 | | |
| 1879 June 5 | | 1.14958 | | |
| 10 28.94 | | 10 19.5 | | |
| 31.00 | 33312 | 21.5 | | |
| 33.32 | 33.31 | 23.3 | | |
| 35.50 | | 25.0 | | |
| 16656 37.80 | | 1159 26.6 | | |
| 16656 | | 159 | | |
| 42.02 | | 10 23.18 | | |
| 44.30 | | + 27.69 | | |
| 46.48 | | | | |
| 48.68 | 50857 | | | |
| 50.88 | 50.86 | 11 17.9 | | |
| 53.00 | 50.88 | 19.7 | | |
| 55.35 | | 21.2 | | |
| 57.40 | | 22.9 | | |
| 45771 59.60 | | 1061 24.4 | | |
| 771 | | 1061 | | |
| 3.97 | | 11 2122 | | |
| 6.29 | 8464 | − 3035 | | |
| 8.48 | 8.46 | | | |
| 10.70 | 10177 | | | |
| 4232 12.88 | | 10 23.18 | | |
| 4232 | 10 50.870 | 11 21.22 | | |
| | | + 27.69 | | |
| | | − 30.35 | 58.04 | |
| | | 1.44232 | 1.76373 | |
| 14 10 11.67 | | 1.48216 | 1.14958 | |
| | | 1.53044 | 2.91331 | |
| | | 1.57028 | 1.85297 | |
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| M 39 17.82 | +33.92 | 51.74 : .09 | |
| M 40 29.35 | | | |
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| 40 29.10 | −37.18 | 51.92 | |
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| 19 48.361 | | | |

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| h m s | | | |
| 1 17 55 | 1.17609 0.11297 | | |
| +59° 36' | 9.70418 | | |
| June 7 | 0.88027 | | |
| 17 57.00 | | 17 46.1 | 18 42.4 |
| 1.30 | 5264 | 49.3 | 45.3 |
| 5.30 | 5.26 | 53.0 | 48.8 |
| 9.27 | | 55.8 | 52.3 |
| 32632 13.45 | | 2638 59.6 | 2452 56.4 |
| 2632 | | 2638 | 2452 |
| 21.70 | | 17 5276 | 18 4904 |
| 25.60 | | + 4508 | − 1120 |
| 29.60 | | | |
| 33.85 | 37847 | | |
| 37.80 | 37.85 | 19 34.4 | |
| 41.97 | 37.84 | 38.3 | |
| 46.00 | | 42.0 | |
| 50.05 | | 45.8 | |
| 34062 54.05 | | 2099 49.4 | |
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| 2.30 | | 19 4198 | |
| 6.20 | 10420 | −1 414 | |
| 10.50 | 10.42 | | |
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| 5210 18.60 | | 17 52.76 | 18 49.04 |
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| M 52 19.05 |
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| h m s | | | |
| 1 56 28 | | 1.17609 | 0.11297 |
| +41° 45' | | 9.87277 | |
| June 7 | | 1.04886 | |
| 56 43.20 | | | 56 34.7 |
| 46.00 | 48770 | | 37.7 |
| 48.80 | 48.77 | | 40.3 |
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| 24385 54.30 | | | 2001 44.9 |
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| 59.82 | | | 56 4002 |
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| 8.00 | 10.889 | | |
| 10.95 | 10.89 | | 57 36.9 |
| 13.65 | 10.90 | | 39.6 |
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| 63800 21.93 | | | 2084 46.5 |
| 9800 | | | 84 |
| 27.48 | | | 57 4168 |
| 30.25 | 33032 | | − 3078 |
| 32.95 | 33.03 | | |
| 35.88 | 14180 | | |
| 16516 38.60 | | | 56 40.02 |
| 16516 | 58 10.895 | | 57 41.68 |
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| M 43 24.62 |
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|---|---|---|---|---|
| 0 | 40.53 |  | 0 | 46.4 |
|  | 42.77 | 45060 |  | 48.3 |
|  | 44.95 | 45.06 |  | 49.9 |
|  | 47.35 |  |  | 52.3 |
| 22530 | 49.70 |  | 2512 | 54.3 |
|  | 2530 |  |  | 2512 |
|  | 54.05 |  | 0 | 5024 |
|  | 56.25 |  | + | 12.72 |
|  | 58.45 |  |  |  |
|  | 0.73 | 2.967 |  |  |
|  | 2.98 | 296 | 1 | 30.3 |
|  | 5.20 | 2.96 |  | 32.4 |
|  | 7.44 |  |  | 34.3 |
|  | 9.70 |  |  | 36.3 |
| 56660 | 11.90 |  | 1720 | 38.7 |
|  | 2670 |  |  | 220 |
|  | 16.45 |  | 1 | 3440 |
|  | 18.60 | 20.864 | − | 31.44 |
|  | 20.82 | 20.86 |  |  |
|  | 23.00 | 12592 |  |  |
| 10432 | 25.45 |  | 0 | 50.24 |
|  | 432 | 1 2.960 | 1 | 34.40 |
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|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 37.35 |  | 5 | 43.1 | 6 | 56.60 |  | 6 | 11.0 |
|  | 41.57 | 43850 |  | 45.4 |  | 58.80 | 1016 |  | 13.0 |
|  | 43.90 | 43.85 |  | 48.2 |  | 0.93 | 102 |  | 14.9 |
|  | 46.05 |  |  | 50.4 |  | 3.20 |  |  | 16.4 |
| 21925 | 48.38 |  | 2390 | 51.9 | 30508 | 5.55 |  |  | 17.7 |
|  | 1925 |  |  | 2390 |  | 508 |  | 925 | 19.5 |
|  | 52.83 |  | 5 | 4780 |  | 9.98 |  |  | 325 |
|  | 55.00 |  | − | 46.01 |  | 12.26 |  | 6 | 1650 |
|  | 57.29 |  |  |  |  | 14.44 |  | +1 | 2.49 |
|  | 59.57 | 1.790 |  |  |  | 16.70 | 18.978 |  |  |
|  | 1.84 | 1.79 |  |  |  | 18.90 | 18.98 |  |  |
|  | 4.05 | 1.79 |  |  |  | 21.22 | 19.00 |  |  |
|  | 6.27 |  |  |  |  | 23.50 |  |  |  |
|  | 8.50 |  |  |  |  | 25.80 |  |  |  |
| 55611 | 10.76 |  |  |  | 17080 | 28.00 |  |  |  |
|  | 1611 |  |  |  |  | 17080 |  |  |  |
|  | 15.28 |  |  |  |  | 32.47 |  |  |  |
|  | 17.60 | 19.742 |  |  |  | 34.70 | 36984 |  |  |
|  | 19.80 | 19.74 |  |  |  | 36.95 | 36.98 |  |  |
|  | 21.98 | 12359 |  |  |  | 39.25 | 38.00 |  |  |
| 9871 | 24.05 |  | 5 | 47.80 | 18492 | 41.65 |  | 6 | [illegible] |
|  | 9871 | 5 1.790 | − | 46.01 |  | 18492 | 7 18.993 |  |  |

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8 32.3
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-17.78 26.87 135.15 44.65
20.74 27.16 27.03 47.90 80.770
23.71 27.09 50.80 50.77
26.68 27.12 53.80
20.74 26.91 385 56.70
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59.90 1.904
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10.22 10.32
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16.50 18.476
18.40 18.47
20.50 18.48
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16628 26.70
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37.18 36.95
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49 50.7
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35 53.75
55.80 57.850
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12.27 14.296
14.33 14.29
16.35 14.31
18.43
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12866 22.50
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26.60
28.68 30.776
30.80 30.78
32.85 14863
15388 34.95
388 36 14.300
37.60

35 50.4
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2679 56.7
179
35 53.58
+ 20.72
36 45.2
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2424 52.3
2430
36 48.60
− 34.30
35 53.58
36 48.48
+ 20.72
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1.31639
1.53377
1.42807
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54.90
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M 36 39.70.
M 38 8.30.
R 38 8.12.
R 38 8.05.
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M 5 53.07
R 5 53.00
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M 5 52.90
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7 28 1.1

M 14 54.22 +26.80 81.02 .19
M 16 5.72.
R 16 5.62.
R 16 5.60.
M 16 5.45.
16 5.60 −44.20 81.40
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| h m s |  |  |  |
| 0 49 25 |  |  | 0.11297 |
| + 119° 56′ |  |  |  |
| 49 22.50 |  | 49 8.6 | 49 40.8 |
| 26.50 | 30520 | 13.4 | 45.0 |
| 30.30 | 30.52 | 17.0 | 47.7 |
| 34.50 |  | 19.7 | 50.3 |
| 15260 38.80 |  | 816 22.9 | 2370 53.2 |
| 260 |  | 816 | 2370 |
| 47.27 |  | 49 16.32 | 49 47.40 |
| 51.27 |  | + 47.18 | + 16.10 |
| 55.33 |  |  |  |
| 59.28 | 3.486 |  |  |
| 3.27 | 3.48 | 50 27.2 | 51 3.3 |
| 7.47 | 3.53 | 30.0 | 6.2 |
| 11.78 |  | 33.0 | 9.4 |
| 15.70 |  | 35.0 | 18.9 |
| 57137 20.10 |  | 1645 39.3 | 6.3 |
| 3137 |  | 1645 |  |
| 28.18 |  | 50 32.90 |  |
| 32.40 | 36540 | − 29.40 |  |
| 36.52 | 36.54 |  |  |
| 40.70 | 12706 |  |  |
| 18270 44.90 |  | 49 16.32 | 49 47.40 |
| 18270 | 50 3.505 | 50 32.90 |  |
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M 37 12.07.
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|  |  | 9.99101 |  |
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| h m s |  |  |  |
| 12 56 9 | 1.17609 | 0.11297 |  |
| + 11 37 | 9.99101 |  |  |
|  | 1.16710 |  |  |
| 56 31.25 |  | 56 21.8 |  |
| 33.40 | 35456 | 23.4 |  |
| 35.45 | 35.46 | 25.5 | 25.32 |
| 37.50 |  | 27.1 |  |
| 17728 39.68 |  | 1266 28.8 |  |
| 17728 |  | 1266 |  |
| 43.90 |  | 56 25.32 |  |
| 46.00 |  | + 26.92 |  |
| 48.00 |  |  |  |
| 50.00 | 52233 |  |  |
| 52.22 | 52.23 | 57 18.7 |  |
| 54.30 | 52.26 | 20.4 | 22.32 |
| 56.40 |  | 22.5 | 22.32 |
| 58.58 |  | 24.0 |  |
| 47010 0.70 |  | 1116 26.0 |  |
| 47010 |  | 1116 |  |
| 4.95 |  | 57 22.32 |  |
| 7.00 | 9.070 | − 30.08 |  |
| 9.00 | 9.07 |  |  |
| 11.10 | 10453 |  |  |
| 4535 13.30 |  | 56 25.32 |  |
| 4535 | 56 52.245 | 57 22.32 |  |
|  |  | + 26.92 | 57.00 |
|  |  | − 30.08 | 1.75587 |
|  |  | 1.43008 | 1.16710 |
|  |  | 1.47828 | 2.92297 |
|  |  | 1.53281 | 1.85842 |
|  |  | 1.58101 | 8.93545 |
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| M 51 21.45 | + 34.10 | 5555 | , d |
| M 52 33.87. |  |  |  |
| R 52 33.57. |  |  |  |
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| 52 33.63 | − 38.11 | 5552 |  |
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| 1 17 55 |  |  | 0.11297 |
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| 17 52.78 |  |  | 17 41.9 |
| 56.50 | 0.700 |  | 44.8 |
| 0.68 | 0.70 |  | 47.5 |
| 4.84 |  |  | 50.7 |
| 30350 8.70 |  |  | 2399 55.0 |
| 350 |  |  | 2399 |
| 16.80 |  |  | 17 47.98 |
| 20.85 |  |  | + 45.18 |
| 25.00 |  |  |  |
| 29.00 | 33.102 |  |  |
| 32.90 | 33.10 |  | 18 47.1 |
| 36.97 | 33.22 |  | 51.4 |
| 41.35 |  |  | 53.5 |
| 45.43 |  |  | 56.9 |
| 29792 49.62 |  |  | 2694 0.5 |
| 29792 |  |  | 2694 |
| 51.53 |  |  | 18 53.88 |
| 1.72 | 5.750 |  | − 20.72 |
| 5.70 | 5.75 |  |  |
| 9.80 | 6645 |  |  |
| 32875 14.00 |  |  | 17 47.98 |
| 2875 | 18 33.160 |  | 18 53.88 |
|  |  |  | + 45.18 |
|  |  |  | − 20.72 65.90 |
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| h m s |  | 992054 |  |
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| ° ′ |  | 1.17609 | 0.11297 |
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|---|---|---|---|
| 42 55.00 |  | 42 50.4 |  |
| 2.42 | 5.530 | 52.8 |  |
| 5.52 | 5.53 | 55.4 |  |
| 8.78 |  | 57.6 |  |
| 32765 11.93 |  | 2773 1.1 |  |
| 2765 |  | 2773 |  |
| 18.28 |  | 42 5546 |  |
| 21.65 |  | + 3572 |  |
| 24.77 |  |  |  |
| 27.99 | 31186 |  |  |
| 31.24 | 31.18 | 44 14.7 |  |
| 34.28 | 31.18 | 16.9 |  |
| 37.68 |  | 19.2 |  |
| 40.78 |  | 21.6 |  |
| 28067 44.00 |  | 968 24.4 |  |
| 28067 |  | 968 |  |
| 50.45 |  | 44 1936 |  |
| 53.60 | 56842 | − 4818 |  |
| 56.96 | 5684 |  |  |
| 0.00 | 6237 |  |  |
| 28421 3.20 |  | 42 5546 |  |
| 28421 | 43 31.180 | 44 19.36 |  |
|  |  | + 35.72 |  |
|  |  | − 48.18 | 83.90 |
|  |  | 1.55291 | 1.92376 |
|  |  | 1.68287 | 0.98491 |
|  |  | 1.47345 | 2.90867 |
|  |  | 1.60341 | 1.84466 |
|  |  |  | 8.93599 |
|  |  |  | 4 5556 |

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|---|---|---|---|
| M 33 27.60 | +29.75 | 57.35 | .03 |
| M 34 37.67 |  |  |  |
| R 34 37.72 |  |  |  |
| R 34 37.45 |  |  |  |
| M 34 37.30 |  |  |  |
| 34 37.53 | −40.12 | 57.41 |  |
| 69.93 |  |  |  |
|  |  | 57.38 |  |

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|---|---|---|---|
| η Bootis |  | 9.97567 |  |
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| h m s |  | 0.08739 |  |
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| ° ′ |  | 1.17609 | 0.11297 |
| +19 0 |  | 9.97567 |  |
|  |  | 1.15176 |  |

|  |  |  |  |
|---|---|---|---|
| 49 17.00 |  | 49 11.7 |  |
| 19.40 | 21470 | 13.4 |  |
| 21.45 | 21.47 | 15.4 |  |
| 23.68 |  | 17.4 |  |
| 10735 25.82 |  | 764 18.5 |  |
| 10735 |  | 264 |  |
| 30.30 |  | 49 1528 |  |
| 32.40 |  | + 2368 |  |
| 34.67 |  |  |  |
| 36.78 | 38.968 |  |  |
| 38.90 | 38.97 | 50 9.1 |  |
| 41.16 | 38.94 | 10.6 |  |
| 43.30 |  | 12.9 |  |
| 45.50 |  | 14.5 |  |
| 35071 47.70 |  | 634 16.3 |  |
| 35071 |  | 634 |  |
| 52.05 |  | 50 1268 |  |
| 54.28 | 56416 | − 3372 |  |
| 56.40 | 56.42 |  |  |
| 58.60 | 7789 |  |  |
| 28208 0.75 |  | 49 15.28 |  |
| 28208 | 49 38.955 | 50 12.68 |  |
|  |  | + 23.68 |  |
|  |  | − 33.72 | 57.40 |
|  |  | 1.37438 | 1.75891 |
| 13 48 58.61 |  | 1.52789 | 1.15176 |
|  |  | 1.46177 | 2.91067 |
|  |  | 1.61528 | 1.84757 |
|  |  |  | 8.93690 |
|  |  |  | 4 5633 |

|  |  |  |  |
|---|---|---|---|
| M 27 51.50 | +28.96 | 80.46 | .10 |
| M 29 2.10 |  |  |  |
| R 29 1.72 |  |  |  |
| R 29 1.87 |  |  |  |
| M 29 1.90 |  |  |  |
| 29 1.90 | −41.24 | 80.66 |  |
| 70.40 |  |  |  |
|  |  | 80.56 |  |

19 0 7.0

183

|  |  |  |  |
|---|---|---|---|
| τ Virginis |  | 9.99970 |  |
|  |  | 11172 |  |
| h m s |  | 0.11142 |  |
| 13 55 29 |  |  |  |
| ° ′ |  | 9.99970 | 0.11297 |
| +2 8 |  | 1.17609 |  |
|  |  | 1.17579 |  |

|  |  |  |  |
|---|---|---|---|
| 55 51.91 |  | 55 46.4 |  |
| 53.88 | 55996 | 48.3 |  |
| 56.00 | 55.99 | 49.9 |  |
| 58.00 |  | 51.5 |  |
| 27999 0.20 |  | 2495 53.4 |  |
| 27999 |  | 2495 |  |
| 4.30 |  | 55 4990 |  |
| 6.30 |  | + 2255 |  |
| 8.37 |  |  |  |
| 10.37 | 12466 |  |  |
| 12.40 | 12.47 | 56 40.7 |  |
| 14.50 | 12.43 | 42.6 |  |
| 16.60 |  | 44.2 |  |
| 18.65 |  | 46.1 |  |
| 11219 20.70 |  | 2215 47.9 |  |
| 11219 |  | 2215 |  |
| 24.80 |  | 56 4430 |  |
| 26.80 | 28886 | − 3185 |  |
| 28.87 | 28.88 |  |  |
| 30.96 | 14487 |  |  |
| 14443 33.00 |  | 55 49.90 |  |
| 14443 | 56 12.450 | 56 44.30 |  |
|  |  | + 22.55 |  |
|  |  | − 31.85 | 54.40 |
|  |  | 1.35315 | 1.73560 |
|  |  | 1.50311 | 1.17579 |
|  |  | 1.46457 | 2.91139 |
|  |  | 1.61453 | 1.85022 |
|  |  |  | 8.93883 |
|  |  |  | 4 5752 |

|  |  |  |  |
|---|---|---|---|
| M 19 57.32 | +29.15 | 86.47 | .25 |
| M 21 8.25 |  |  |  |
| R 21 8.07 |  |  |  |
| R 21 8.17 |  |  |  |
| M 21 8.12 |  |  |  |
| 21 8.15 | −41.17 | 86.98 |  |
| 70.83 |  |  |  |
|  |  | 86.72 |  |

187

α Boötis

| | | | |
|---|---|---|---|
| h m s | | 9.97349<br>11172<br>0.08521 | |
| 14 10 8 | | | |
| ° ' | | 1.17609 | 0.11297 |
| +19 49 | | 9.97349 | |
| | | 1.14958 | |
| 10 30.18 | | 10 22.8 | |
| 32.35 | | 24.7 | |
| 34.65 | 34.58 | 26.4 | |
| 36.78 | | 28.2 | |
| 17294 38.98 | | 1328 30.7 | |
| | | 1328 | |
| 43.34 | | 10 26.56 | |
| 45.50 | | + 25.56 | |
| 47.72 | | | |
| 49.92 | | | |
| 52.18 | 52.14 | 11 24.0 | |
| 54.40 | 52.11 | 26.1 | |
| 56.50 56.60 | | 28.0 | |
| 58.68 | | 29.7 | |
| 46926 0.92 | | 1393 31.5 | |
| | | 1393 | |
| 5.32 | | 11 27.86 | |
| 7.50 | | − 35.74 | |
| 9.60 | 9.65 | | |
| 11.85 | 10423 | | |
| 4877 14.00 | | 10 26.56 | |
| | 10 52.125 | 11 27.86 | |
| | +.005 | + 25.56 | |
| | 52.120 | − 35.74 | 61.30 |
| | | 1.40756 | 1.78746 |
| 11 10 11.65 | | 1.55315 | 1.14958 |
| | | 1.49277 | 2.93704 |
| | | 1.63836 | 1.86788 |
| | | | 8.93084 |
| | | | 4 5227 |

| | | |
|---|---|---|
| M 39 21.35 | +31.10 | 5245 .41 |
| M 40 35.12 | | |
| R 40 35.35 | | |
| R 40 35.00 | | |
| M 40 35.00 | | |
| 40 35.12 | −43.49 | 51.63 |
| 73.77 | | 5204 |

19 48 36.6

193

γ Boötis

| | | | |
|---|---|---|---|
| h m s | | 9.89152<br>11172<br>000324 | |
| 14 27 12 | | | |
| ° ' | | 1.17609 | 0.11297 |
| +38 50 | | 9.89152 | |
| | | 1.06761 | |
| 27 30.17 | | 27 30.6 | |
| 32.83 | 35446 | 32.4 | |
| 35.50 | 35.45 | 35.0 | |
| 38.05 | | 37.2 | |
| 17723 40.68 | | 1744 39.2 | |
| 17723 | | 1744 | |
| 46.06 | | 27 34.88 | |
| 48.68 | | + 21.76 | |
| 51.30 | | | |
| 53.98 | 56619 | | |
| 56.55 | 56.62 | 28 31.0 | |
| 59.25 | 56.65 | 32.7 | |
| 1.90 | | 34.9 | |
| 4.57 | | 37.6 | |
| 50957 7.28 | | 1769 40.7 | |
| 50957 | | 1769 | |
| 12.47 | | 28 35.38 | |
| 15.20 | 17.854 | − 38.74 | |
| 17.90 | 17.85 | | |
| 20.45 | 11330 | | |
| 8927 23.25 | | 27 34.88 | |
| 8927 | 27 56.635 | 28 35.38 | |
| | | + 21.76 | |
| | | − 38.74 | 60.50 |
| | | 1.33766 | 1.78176 |
| | | 1.58816 | 1.06761 |
| | | 1.34090 | 2.84937 |
| | | 1.59140 | 1.78519 |
| | | | 8.93582 |
| | | | 4 5549 |

| | | |
|---|---|---|
| M 38 15.52 | +21.92 | 3744 .02 |
| M 39 16.72 | | |
| R 39 16.67 | | |
| R 39 16.40 | | |
| M 39 16.22 | | |
| 39 16.50 | −39.03 | 3747 |
| 60.98 | | 3646 |

d

ε Boötis

| | | | |
|---|---|---|---|
| h m s | | 9.94760<br>11172<br>005932 | |
| 14 39 42 | | | |
| ° ' | | 1.17609 | 0.11297 |
| +27 35 | | 9.94760 | |
| | | 1.12349 | |
| 40 2.90 | | 39 58.1 | |
| 5.19 | 7.550 | 0.6 | |
| 7.53 | 7.55 | 3.9 | |
| 9.93 | | 5.8 | |
| 33775 12.20 | | | |
| 33775 | | | |
| 16.80 | | | |
| 19.18 | | | |
| 21.52 | | | |
| 23.79 | 26128 | | |
| 26.16 | 26.13 | 40 56.4 | |
| 28.37 | 26.10 | 58.2 | |
| 30.83 | | 59.7 | |
| 33.00 | | 1.6 | |
| 23515 35.50 | | 2984 3.5 | |
| 23515 | | 2994 | |
| 39.90 | | 40 59.88 | |
| 42.39 | 44.664 | − 33.76 | |
| 44.60 | 44.66 | | |
| 47.00 | 5221 | | |
| 22332 49.43 | | 49 | |
| 22332 | 40 26.115 | 40 59.68 | |
| | | + 33.56 | |
| | | − 33.56 | |

| |
|---|
| M 53 11.22 |
| M 54 16.72 |
| R 54 16.70 |
| R 54 16.60 |
| M 54 16.27 |
| 54 16.57 |
| 65.35 |

1879

198

β Urs. Min.

h m s
14 51 4
° ′
+ 74 39

June 8

0.11297

| | | | | | | |
|---|---|---|---|---|---|---|
| | | — | | 50 12.0 | 51 8.9 | |
| | | — | | 15.8 | 14.9 | |
| | | — | | 22.3 | 24.0 | |
| | | — | | 27.4 | 28.6 | |
| | | — | | 1139 36.4 | 1110 34.6 | |
| | | | | 1139 | 1110 | |
| +31.18 | 53.98 | 51 22.8 | | 50 2278 | 51 2220 | |
| 23.34 | 54.34 | 486.98 31.0 | | +1 3132 | + 3190 | |
| 15.57 | 54.27 | 54.164 38.7 | | | | |
| 7.71 | 53.91 | 46.2 | 54.122 | | | |
| -0.01 | 53.84 | 53.9 | 54.12 | 52 39.5 | 53 49.0 | |
| 7.77 | 54.03 | 1.8 | | 45.7 | 58.0 | |
| 15.59 | 54.41 | 10.0 | | 53.6 | 55.4 | |
| 23.38 | 54.02 | 17.4 | | 0.3 | 12.7 | |
| 31.22 | 54.08 | 4871 25.3 | | 2670 7.9 | 8149 21.8 | |
| | | 4871 | | 2670 | ~~2139~~ | |
| 46.77 | 54.03 | 270.44 40.8 | | 52 5340 | 54 298 | |
| 54.56 | 54.44 | 54.088 49.0 | 56500 | − 5930 | −2 888 | |
| 62.37 | 54.23 | 56.6 | 5650 | | | |
| 70.16 | 53.44 | 4.1 | | | | |
| 78.20 | 53.80 | 2825 12.0 | | 50 2278 | 51 2220 | |
| | | 2825 | | 52 53.40 | 54 2.98 | |

54.098
54.101

199

β Bootis

h m s
14 57 23
° ′
+40 52

9.87866
11172
9.99038

1.17609 0.11297
9.87866
1.05475

| | | | |
|---|---|---|---|
| 57 40.38 | | 57 32.5 | |
| 43.20 | 45.912 | 34.7 | |
| 45.90 | 45.91 | 37.8 | |
| 48.68 | | 39.8 | |
| 22956 51.40 | | 1872 42.4 | |
| 22956 | | 1872 | |
| 56.70 | | 57 3744 | |
| 59.48 | | + 3022 | |
| 2.03 | | | |
| 4.82 | 7.627 | | |
| 7.70 | 7.63 | 58 46.4 | |
| 10.40 | 7.69 | 47.9 | |
| 13.00 | | 50.0 | |
| 15.82 | | 53.2 | |
| 60864 18.69 | | 2536 56.1 | |
| 6864 | | 2536 | |
| 24.03 | | 58 5072 | |
| 26.68 | 29.466 | − 4306 | |
| 29.45 | 29.47 | | |
| 32.20 | 13538 | | |
| 14733 34.97 | | 57 3744 | |
| 14733 | 58 7.660 | 58 50.72 | |
| | | + 30.22 | |
| | | − 43.06 | 73.28 |
| | | 1.48029 | 1.86499 |
| | | 1.63407 | 1.05475 |
| | | 1.47067 | 2.91974 |
| | | 1.46045 | 1.85788 |
| | | | 8.93814 |
| | | | 4 5724 |

200

β Librae

h m s
15 10 30
° ′
− 8 56 0.11297

9.99470
11172
0.10642

1.17609
9.99470
1.17079

| | | | | |
|---|---|---|---|---|
| 10 52.30 | | 10 49.7 | | |
| 54.50 | 56520 | 51.3 | | |
| 56.55 | 56.52 | 52.8 | | |
| 58.55 | | 54.1 | | |
| 28260 0.70 | | 2639 56.0 | | |
| 28260 | | 2639 | | |
| 4.80 | | 10 5278 | | |
| 6.90 | | + 2038 | | |
| 8.90 | | | | |
| 11.00 | 13.144 | | | |
| 13.16 | 13.14 | 11 38.0 | | |
| 15.30 | 13.17 | 40.5 | | |
| 17.25 | | 42.6 | | |
| 19.45 | | 44.3 | | |
| 11830 21.55 | | 2111 45.7 | | |
| 11830 | | 2111 | | |
| 25.60 | | 11 4222 | | −12.79 |
| 27.60 | 29.826 | − 29.06 | | 14.92 |
| 29.88 | 29.82 | | | 17.66 |
| 32.00 | 146 34 | | | 19.19 |
| 14913 34.05 | | 10 52.78 | | 21.18 |
| 14913 | 11 13.155 | 11 42.22 | | |
| | | + 20.38 | | |
| | | − 29.06 | 49.44 | |
| | | 1.30920 | 1.69408 | |
| | | 1.46330 | 1.17079 | |
| | | 1.41562 | 2.86487 | |
| | | 1.56972 | 1.80223 | |
| | | | 8.93736 | |
| | | | 4 56 52 | |

| | | | |
|---|---|---|---|
| M 49 46.62. | | | |
| M 49 57.87. | | | |
| M 50 18.97. | | | |
| M 50 50.27. | | | |
| M 52 13.12. | | | |
| R 52 13.10. | | | |
| R 52 13.17. | | | |
| 52 ~~16.20~~ 13.13 | | | |
| 99.58 | | | |

| | | |
|---|---|---|
| M 36 20.87. | +29.56 | 50.43 |
| M 37 33.17. | | |
| R 37 32.90. | | |
| R 37 32.90. | | |
| M 37 32.87. | | |
| 37 32.96 | −28.87 | 64.09 |
| 72.09 | | |

| | | | |
|---|---|---|---|
| M 23 34.95 | +26.04 | 0.99 | .13 |
| M 24 38.45. | | | |
| R 24 38.30. | | | |
| R 24 38.27. | | | |
| M 24 38.45. | | | |
| 24 38.37 | −37.13 | 1.24 | |
| 63.42 | | | |
| | | 1.12 | |

329 EX

α Peg.

h m s
22 58 44
+14° 33'
1.17609 0.11297

59

~12.79 26.71 39.50 134.47
14.92 27.13 42.05 26.89
17.06 26.90 43.96 43.96
19.19 26.88 46.07
21.16 26.85 21981 48.23

0 1.0
3.0
4.9
6.5
239 8.5
239
0 4.78

0 4.78

26.894

49.44
69408
17079
.86,86 7
1.8022 3
9 37.3 6
,56 52

3

γ Pegasi C=46,723

h m s
0 7 0
+14° 31'
1.17609 0.11297
9.98591
1.16200

7 21.94
23.80
25.97
28.05
12996 30.20
12996
34.42
36.48
38.70
40.70
42.88
45.00
47.20
49.32
38620 51.50
38620
55.60
57.75
59.92
2.00
29940 4.13
29940

25.992
25.99

42.911
4291
42.93

59.880
59.88
8587

7 42.920

8 7 2.28

7 22.4
23.3
24.9
26.2
1253 28.5
1253
7 2506
+ 17.86
8 16.5
18.0
20.3
21.6
998 23.4
998
8 1996
− 37.04
7 25.06
8 19.96
+ 17.86
− 37.04

54.90
1.73957
1.16200
2.90157
28.10054
9.19897
8 59 6

20

δ Cassiop. C=46,735

h m s
1 17 55
+59° 36'
1.17609 0.11297
9.70418
0.88027

17 57.77
1.80
6.05
10.00
32972 14.00
2972
22.28
26.38
30.45
34.50
38.58
42.80
46.68
50.83
34740 54.90
34740
2.95
7.20
11.00
15.30
5585 19.40
5585

5.944
5.94

38.600
38.60
38.55

11.170
11.17
7711

18 38.575

17 37.5
38.0
39.0
1145
3817
18 36.9
40.5
44.4
48.0
2198 50.0
2198
18 4396
− 5.38
19 30.0
33.9
37.7
40.0
1846 43.0
1846
19 36.92

17 51.9
55.3
58.4
1.0
2919 5.3
2919
17 58.88
+ 40.20
19 8.6
11.4
15.6
18.9
768 22.3
768
19 15.36
− 36.78
17 58.38
19 15.36
+ 40.20
− 36.78

76.98
1.88638
0.88027
2.76665

R 55 45.25.
R 55 45.30.
R 55 45.57.
R 55 45.67.
55 45.45

M 56 13.55.
M 58 19.47.
R 58 19.70.
R 58 19.75.
M 58 19.47.
58 19.60
126.05

14 30 47.2

M 52 9.00.
M 52 24.15.
M 52 53.85.
M 52 14.75.
M 52 28.02.
~~52 30.19~~

1879

32

γ Androm.

h m s
1 56 28
° ′
41 45
June 8

1.17609 0.11297
9.87277
1.04886

56 42.97
46.70
49.30
52.10
24707 55.00
24707
0.68
3.18
5.95
8.80
11.50
14.20
17.00
19.90
10388 22.67
10388
28.18
30.95
33.70
36.46
16853 39.24
16853

49.414
49.41
11.542
11.54
11.56
33.706
33.71
143.12
57 11.560

56 30.4
32.4
34.2
37.1
1737 39.6
1737
56 34.74
+ 3682
57 47.5
49.3
51.2
53.5
2574 55.9
74
57 51.48
− 39.92
56 34.74
57 51.48
+ 36.82
− 39.92

76.74
1.88502
1.04886
2.93388
1.86870
8.93482
4558

M 43 19.50
M 44 33.42
R 44 33.40

44 33.41
73.91

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33

α Arietis

h m s
2 0 21
° ′
+22 53
June 8

1.17609 0.11297
9.96440
1.14049

0 41.40
43.59
45.80
47.95
22892 50.18
22892
54.70
56.87
59.00
1.37
3.65
6.00
8.06
10.30
57250 12.55
3250
17.24
19.38
21.57
23.76
10795 26.00
10795

45.784
45.78
3.611
3.61
3.68
21.590
21.59
127.37
1 3.645

20 22.69

0 34.4
36.7
38.5
40.6
1929 42.7
1929
0 38.58
+ 25.06
1 35.4
37.7
39.7
41.4
1985 44.3
1985
1 39.70
− 36.06
0 38.58
1 39.70
+ 25.06
− 36.06

| | |
|---|---|
| 431.18 | 44.58 |
| 23.39 | 44.04 |
| 15.57 | 44.97 |
| 7.71 | 44.21 |
| −0.01 | 44.41 |
| 7.77 | 44.33 |
| 15.54 | 44.41 |
| 23.38 | 43.92 |
| 31.22 | 44.28 |
| 46.77 | 44.23 |
| 54.56 | 43.84 |
| 62.37 | 44.03 |

44.190
44.275
61.12
1.78618
1.14049
2.92667
1.86829
8.94162
45946

57 13.4
399.20 20.7
44.355 29.4
36.5
44.4
52.0
0.00
7.3
3992 15.5
3992
132.10 31.0
44.025 38.4
46.4

44.36
44.36

M 34 32.07
M 35 45.80
R 35 45.85
R 35 45.97
M 35 46.02
35 45.91
73.84

22 53 29.6

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198

β Urs. Min. L.C.

h m s
14 51 4
° ′
+ 105 21
June 8

1.17609 0.11297
9.42278
0.59887

49 43.6
49.9
54.7
59.4
2733 5.7
2733
49 54.66
+1 49.62
51 21.2
24.9
30.8
39.0
1614 45.5
1614
51 32.28
+ 1200
53 26.4
34.7
41.0
45.7
2007 52.9
2007
40.14

50 34.0
40.9
47.1
52.0
2355 1.5
2355
50 47.10
+ 57.18
52 19.3
23.3
28.4
37.0
1554 47.4
1554
52 31.08
− 46.80
50 47.10
52 31.08

M 10 21.42
M 10 2.50
M 9 45.70
M 9 25.65
M 9 3.62
~~9 34.37~~
~~72.95~~

198

β Urs. Min. C = 46.735

| | | | |
|---|---|---|---|
| h m s | | | |
| 14 57 4 | | | |
| ° ′ | 1.17609 | 0.11297 | |
| +74 39 | 9.42278 | | |
| June 9 | 0.59887 | | |

| | | | |
|---|---|---|---|
| 57 23.6 | | 50 41.7 | 51 58.2 |
| 31.2 | | 46.5 | 6.0 |
| 38.9 | | 53.8 | 11.8 |
| 47.5 | 54.76 | 0.5 | 19.8 |
| 54.7 | | 2714 8.9 | 3622 26.4 |
| 2.5 | | 2714 | 622 |
| 10.4 | | 50 54.28 | 52 1244 |
| 18.2 | | +1 0.48 | − 1768 |
| 4928 25.8 | | | |
| 49 28 | | | |
| | | 52 39.2 | 53 29.9 |
| | | 45.5 | 36.1 |
| | | 55.2 | 42.4 |
| | | 0.5 | 49.7 |
| | | 2682 7.8 | 2162 58.1 |
| | | 2682 | 2162 |
| | | 52 5364 | 53 4324 |
| | | − 5888 | −1 4848 |
| | | 50 54.28 | 52 12.44 |
| | | 52 53.64 | 53 43.24 |

M 50 7.57
M 50 35.15
M 50 48.50
M 51 4.25

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199

β Bootis 9.99038

| | | | |
|---|---|---|---|
| h m s | | | |
| 14 57 23 | | | |
| ° ′ | 1.17609 | 0.11297 | |
| +40 52 | 9.87866 | | |
| | 1.05475 | | |

| | | | |
|---|---|---|---|
| 57 40.98 | | 57 30.0 | |
| 43.65 | 46454 | 32.9 | |
| 46.49 | 4645 | 35.6 | |
| 49.18 | | 37.4 | |
| 23227 51.97 | | 1752 39.3 | |
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| 51.40 | | 57 3504 | |
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| 2.87 | | | |
| 5.53 | 8291 | | |
| 8.29 | 829 | 58 46.4 | |
| 11.00 | 8.25 | 48.9 | |
| 13.75 | | 51.2 | |
| 16.43 | | 53.4 | |
| 61462 19.25 | | 2554 55.5 | |
| 7462 | | 54 | |
| 24.56 | | 58 51.08 | |
| 27.40 | 30046 | − 42.81 | |
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| 32.72 | 13650 | | |
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| | | − 42.81 | 7604 |
| | | 1,52153 | 1.88104 |
| | | 1,63154 | 1.05475 |
| | | 1,51191 | 2.93579 |
| | | 1,62192 | 1.87344 |
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| M 36 16.15 | +32.50 | 48.65 | .17 |
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| | | 1.44248 | 1.77188 |
| | | 1.49748 | 1.17079 |
| | | 1.54890 | 2.94267 |
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| 1879 | June 9 | | 1.12552 | | | | 1.17202 | |
| | 29 55.29 | | 29 55.0 | | 38 41.92 | | 38 36.6 | |
| | 57.70 | 59.938 | 59.4 | | 44.00 | 46.060 | 38.3 | |
| | 59.90 | 59.94 | 1.7 | | 46.06 | 46.06 | 40.4 | |
| | 2.25 | | 3.5 | | 48.05 | | 42.4 | |
| | 29969 4.55 | | 3077 5.1 | | 23030 50.27 | | 2020 44.3 | |
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| | 9.18 | | 30 1.54 | | 54.44 | | 38 40.40 | |
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| | 13.85 | | | | 58.50 | | | |
| | 16.00 | 18.467 | | | 0.52 | 2.688 | | |
| | 18.45 | 18.47 | 30 48.6 | | 2.79 | 2.69 | 39 29.6 | |
| | 20.75 | 18.47 | 50.5 | | 4.84 | 2.64 | 31.1 | |
| | 23.20 | | 52.4 | | 6.85 | | 32.6 | |
| | 25.44 | | 54.3 | | 8.85 | | 34.1 | |
| | 16620 27.78 | | 2622 56.4 | | 56419 10.92 | | 1634 36.0 | |
| | 16620 | | 2622 | | 2419 | | 1634 | |
| | 32.57 | | 30 52.44 | | 15.00 | | 39 32.68 | |
| | 34.70 | 37.004 | − 33.97 | | 17.15 | 19.224 | − 30.02 | |
| | 36.95 | 37.00 | | | 19.30 | 19.22 | | |
| | 39.30 | 15694 | | | 21.30 | 12528 | | |
| | 18502 41.50 | | 30 1.54 | | 9612 23.37 | | 38 40.40 | |
| | 18502 | 30 18.470 | 30 52.44 | | 9612 | 39 2.665 | 39 32.68 | |
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| | | | 1.22866 | 1.70672 | | | 1.34752 | 1.71834 |
| 15 | 29 | 37.24 | 1.53110 | 1.12552 | | | 1.47741 | 1.17302 |
| | | | 1.28981 | 2.89224 | | | 1.45617 | 2.89136 |
| | | | 1.59225 | 2.07591 | | | 1.58606 | 1.82672 |
| | | | | 9.18367 | | | | 8.93536 |
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| | M 22 2.87 | | | | M 40 33.65 | | | |
| | R 22 2.42 | | | | R 40 33.67 | | | |
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| | M 22 1.95 | | | | M 40 33.65 | | | |
| | 22 2.36 | −39.11 | 23.25 | | 40 33.67 | −38.55 | 55.12 | |
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| | 12 56.80 | | 14 | 6.4 | 15 | 14.20 | | 14 | 34.8 |
| | 59.27 | 1460 | | 8.3 | | 16.45 | 18.746 | | 37.0 |
| | 1.48 | 1.46 | | 10.4 | | 18.78 | 18.75 | | 39.2 |
| | 3.70 | | | 12.0 | | 21.00 | | | 42.0 |
| 30730 | 6.05 | | 517 | 14.6 | 9373 | 23.30 | | | 44.0 |
| | 730 | | | 517 | | 9373 | | 2431 | 46.1 |
| | 10.50 | | 14 | 1034 | | 27.80 | | | 2431 |
| | 12.70 | | − | 5086 | | 30.05 | | 14 | 4862 |
| | 14.90 | | | | | 32.30 | | + | 4818 |
| | 17.45 | 19.532 | | | | 34.62 | 36.832 | | |
| | 19.57 | 19.53 | | | | 36.75 | 36.83 | | |
| | 21.82 | 19.42 | | | | 39.00 | 36.76 | | |
| | 24.00 | | | | | 41.33 | | | |
| | 26.37 | | | | | 43.67 | | | |
| 17579 | 28.48 | | | | 33149 | 45.97 | | | |
| | 17579 | | | | | 33149 | | | |
| | 32.66 | | | | | 50.25 | | | |
| | 35.15 | 37.370 | | | | 52.45 | 54.782 | | |
| | 37.47 | 37.37 | | | | 54.75 | 54.78 | | |
| | 39.70 | 38.83 | | | | 56.98 | 7353 | | |
| 18685 | 41.87 | | 14 | 10.34 | 27391 | 59.48 | | | |
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| | 49 30.20 | | 49 | 22.7 | 50 | 2.4 |
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| 19262 | 46.80 | | 1472 | 36.0 | 459 | 16.1 |
| | 19262 | | | 1472 | | 459 |
| | 55.05 | | 49 | 29.44 | 50 | 9.18 |
| | 59.20 | | + | 42.12 | + | 2.38 |
| | 3.40 | | | | | |
| | 7.57 | 11.584 | | | | |
| | 11.64 | 11.58 | 50 | 59.4 | | |
| | 15.70 | 11.55 | | 2.8 | | |
| | 19.90 | | | 7.5 | | |
| | 23.85 | | | 11.2 | | |
| 64426 | 28.05 | | 3360 | 15.1 | | |
| | 10426 | | | 360 | | |
| | 36.29 | | 51 | 7.20 | | |
| | 40.50 | 44.590 | − | 55.64 | | |
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| | 48.70 | 14311 | | | | |
| 22295 | 52.86 | | 49 | 29.44 | 50 | 9.10 |
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| 2 | 34.48 | | 2 | 25.0 |
| | 36.62 | 39.070 | | 27.4 |
| | 39.00 | 39.07 | | 29.4 |
| | 41.45 | | | 31.2 |
| 19535 | 43.80 | | 1460 | 33.0 |
| | 19535 | | | 1460 |
| | 48.50 | | 2 | 29.20 |
| | 50.90 | | + | 28.62 |
| | 53.00 | | | |
| | 55.55 | 57.842 | | |
| | 57.80 | 57.84 | 3 | 37.0 |
| | 0.10 | 57.80 | | 38.6 |
| | 2.55 | | | 40.0 |
| | 4.88 | | | 42.0 |
| 52058 | 7.30 | | 2026 | 45.0 |
| | 52058 | | | 26 |
| | 12.10 | | 3 | 40.52 |
| | 14.00 | 16.530 | − | 42.70 |
| | 16.50 | 16.53 | | |
| | 18.87 | 115.60 | | |
| 8265 | 21.28 | | 2 | 29.20 |
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| | | | + | 28.62 |
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| 49 | 34.48 | | 49 | 18.4 | 50 | 21.8 |
| | 38.48 | 42.692 | | 21.2 | | 25.5 |
| | 42.65 | 42.69 | | 24.0 | | 28.5 |
| | 46.90 | | | 26.6 | | 31.7 |
| 21346 | 50.95 | | 1216 | 31.4 | 1435 | 36.0 |
| | 21346 | | | 1216 | | 1435 |
| | 59.10 | | 49 | 24.32 | 50 | 28.70 |
| | 3.33 | | + | 51.38 | − | 13.00 |
| | 7.50 | | | | | |
| | 11.60 | 15.687 | | | | |
| | 15.80 | 15.68 | 51 | 3.4 | | |
| | 19.80 | 15.71 | | 5.8 | | |
| | 23.95 | | | 10.4 | | |
| | 28.00 | | | 14.4 | | |
| 68118 | 32.20 | | 528 | 18.8 | | |
| | 14118 | | | 528 | | |
| | 40.50 | | 51 | 10.56 | | |
| | 44.55 | 48.740 | − | 54.86 | | |
| | 48.85 | 48.74 | | | | |
| | 52.80 | 15143 | | | | |
| 24370 | 57.00 | | 49 | 24.32 | 50 | 28.70 |
| | 24370 | 50 15.695 | 51 | 10.56 | − | 13.00 |
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| 18 | 4.52 | | 18 | (7.7) | 18 | 52.7 |
| | 8.70 | 12.818 | | 10.3 | | 55.2 |
| | 12.81 | 12.82 | | 13.9 | | 58.6 |
| | 17.00 | | | 16.7 | | 2.4 |
| 6409 | 21.00 | | | 19.8 | 2956 | 6.7 |
| | 6409 | | | 23.4 | | 2956 |
| | 29.28 | | 97.8 | 920 | 18 | 59.12 |
| | 33.20 | | | 16.30 | − | 13.87 |
| | 37.30 | | | | | |
| | 41.27 | 45.483 | | | | |
| | 45.40 | 45.48 | 19 | 41.8 | | |
| | 49.65 | 44.92 | | 44.8 | | |
| | 53.60 | | | 48.8 | | |
| | 57.90 | | | 51.6 | | |
| 40935 | 1.75 | | 2430 | 56.0 | | |
| | 40935 | | | 2430 | | |
| | 9.96 | | 19 | 48.60 | | |
| | 13.90 | 18.022 | −1 | 3.35 | | |
| | 18.00 | 17.02 | | | | |
| | 22.05 | 8984 | | | | |
| 8511 | 26.20 | | | | 18 | 59.12 |
| | 9011 | 18 45.250 | | | − | 13.87 |
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| M | 2 | 37.77 |
| M | 3 | 59.87 |
| R | 3 | 59.80 |
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| M | 24 | 58.12 |
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| M | 52 | 31.40 |
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14150 32.78 0 43.52
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27.48 +1 5338 + 4754
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45723 22.05 1812 51.2 2218 58.4
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37.58 51 3624 52 4436
45.30 53020 + 1448 − 5364
52.82 53.02
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26510 8.60 53 2.0 53 34.0
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18.65 15 5310
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28.19 31347
31.38 31.40 17 11.8
34.55 31.46 14.6
37.85 17.2
41.00 20.5
28257 44.05 871 23.0
28257 871
50.60 17 1742
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28437 3.00 15 53.30
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1879 June 17

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5564 15.65 841 20.5 —
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22.30 − 47.74 —
24.55 —
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29.20 29.08 —
31.37 29.07 —
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26170 38.05 —
26170
42.50 45 0.30 −13.44 46.81 233.83
44.72 47014 2.50 4790 15.74 46.76 46.766
47.00 47.01 4.75 4.79 17.94 46.76
49.25 5814 7.00 20.34 46.66
23507 51.60 43 1682 2395 9.40 −22.56 46.84
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25.10 25.18 30 53.2
27.50 2516 55.8
29.85 57.7
32.17 59.8
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22659 2883
39.00 30 5766
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1879 June 17

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| +6° 48′ | 1.17609<br>9.99693<br>1.17302 | 0.11297 | +60° 4′ | | 0.11297 | +59° 36′ | 0.11297 |

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| 38 48.70 | | 38 44.5 | |
| 50.85 | 52890 | 46.0 | |
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| 54.97 | | 49.5 | |
| 26445 57.00 | | 2393 51.4 | |
| 26445 | | 2393 | |
| 1.20 | | 38 4786 | |
| 3.20 | | + 21.61 | |
| 5.37 | | | |
| 7.30 | 9.463 | | |
| 9.52 | 9.46 | 39 40.0 | |
| 11.50 | 9.48 | 42.0 | |
| 13.60 | | 43.8 | |
| 15.70 | | 45.7 | |
| 8517 17.78 | | 2194 47.9 | |
| 8517 | | 194 | |
| 21.95 | | 39 4388 | |
| 23.95 | 26080 | − 3441 | |
| 26.08 | 26.08 | | |
| 28.22 | 13897 | | |
| 13040 30.28 | | 38 47.86 | |
| 13040 | 39 9.470 | 39 43.88 | |
| | | + 21.61 | |
| | | − 34.41 | 56.02 |
| | | 1.33465 | 1.74834 |
| 15 38 21.96 | | 1.53668 | 1.17302 |
| | | 1.44330 | 2.92136 |
| | | 1.64533 | 1.85685 |
| | | | 8.93549 |
| | | | 4 5536 |

| | | | |
|---|---|---|---|
| 49 35.20 | | 49 18.0 | 50 10.9 |
| 39.20 | 43380 | 21.7 | 13.9 |
| 43.33 | 43.38 | 25.2 | 17.7 |
| 47.47 | | 28.3 | 21.1 |
| 21690 51.70 | | 1247 31.5 | 886 25.0 |
| 21690 | | 1247 | 886 |
| 0.00 | | 49 2494 | 50 1772 |
| 4.07 | | + 5156 | − 1.22 |
| 8.33 | | | |
| 12.37 | 16551 | | |
| 16.50 | 16.55 | 51 24.0 | |
| 20.80 | 16.46 | 28.3 | |
| 24.84 | | 31.3 | |
| 28.90 | | 35.3 | |
| 14896 33.15 | | 1578 38.9 | |
| 14896 | | 1578 | |
| 41.40 | | 51 3156 | |
| 45.35 | 49540 | − 15.06 | |
| 49.55 | 49.54 | | |
| 53.55 | 15292 | | |
| 24770 57.85 | | 49 24.94 | 50 17.72 |
| 24770 | 5018.505 | 51 31.56 | + 0.78 |
| | | + 53.56 | |
| | | −1 13.06 | |

| | | |
|---|---|---|
| 18 5.38 | | 17 56.3 |
| 9.65 | 13532 | 59.6 |
| 13.46 | 13.53 | 3.0 |
| 17.50 | | 6.4 |
| 6766 21.67 | | 3153 10.0 |
| 6766 | | 153 |
| 29.80 | | 18 306 |
| 33.93 | | + 43.10 |
| 38.07 | | |
| 42.07 | 46193 | |
| 46.07 | 46.19 | 18 53.5 |
| 50.34 | 46.13 | 56.9 |
| 54.48 | | 1.0 |
| 58.48 | | 4.0 |
| 41574 2.50 | | 3028 7.4 |
| 41574 | | 28 |
| 10.54 | | 19 056 |
| 14.60 | 18728 | − 1440 |
| 18.80 | 18.73 | |
| 22.75 | 9226 | |
| 9364 26.95 | | 19 43.4 |
| 9364 | 18 46.160 | 46.6 |
| | | 57.1 |
| | | 54.4 |
| | | 2541 55.6 |
| | | 19 5082 |
| | | − 4.66 |

| | | |
|---|---|---|
| M 39 25.60 | +27.75 | 53.35 ,01 |
| M 40 37.62 | | |
| R 40 37.32 | | |
| R 40 37.50 | | |
| M 40 37.65 | | |
| 40 37.52 | −44.19 | 53.33 |
| 71.92 | | 5334 |

6 48 16.4

M 24 58.20
M 25 32.63? 1st read (?) this is mean of 3
M 18.70
R 18.75
R 18.80
M 18.97
25 18.80

M 52 21.27
M 52 59.57
M 53 31.67

33

α Arietis

h m s
2 0 21
+22° 53
June 17

0.11297

|  |  |  |
|---|---|---|
| 0 48.85 |  | 0 44.5 |
| 50.95 | 53250 | 47.0 |
| 53.30 | 53.25 | 49.3 |
| 55.45 |  | 51.3 |
| 26625 57.70 |  | 2450 52.9 |
| 26625 |  | 2450 |
| 2.20 |  | 0 4900 |
| 4.45 |  | + 22.11 |
| 6.55 |  |  |
| 8.88 | 11113 |  |
| 11.20 | 1111 |  |
| 13.36 | 11.11 |  |
| 15.58 |  |  |
| 17.80 |  |  |
| 10002 20.00 |  |  |
| 10002 |  |  |
| 24.46 |  |  |
| 26.76 | 28.978 |  |
| 28.90 | 2898 |  |
| 31.17 | 14223 |  |
| 14489 33.60 |  | 0 49.00 |
| 14489 | 1 11.110 | + 22.11 |

2 0 22.92

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13

γ Cassiop. L.C.

h m s
0 49 25
+11°9 56
June 18

0.11297

|  |  |  |  |
|---|---|---|---|
| 49 30.70 |  | 49 9.0 | 49 50.4 |
| 34.90 | 38860 | 13.0 | 54.2 |
| 38.80 | 38.86 | 15.2 | 57.2 |
| 42.90 |  | 19.0 | 0.8 |
| 19430 47.00 |  | 784 22.2 | 2865 3.9 |
| 19430 |  | 784 | 2965 |
| 55.47 |  | 49 1568 | 49 57.30 |
| 59.55 |  | + 56.22 | + 14.60 |
| 3.53 |  |  |  |
| 7.95 | 11920 |  |  |
| 12.00 | 11.92 | 50 59.2 |  |
| 15.90 | 11.89 | 3.0 |  |
| 20.20 |  | 6.3 |  |
| 24.28 |  | 11.3 |  |
| 64728 28.40 |  | 3371 17.3 |  |
| 10728 |  | 371 |  |
| 36.65 |  | 51 7.42 |  |
| 40.80 | 44.916 | − 5552 |  |
| 44.88 | 44.92 |  |  |
| 49.10 | 14378 |  |  |
| 22458 53.15 |  | 49 15.68 | 49 57.30 |
| 22458 | 50 11.905 | 51 7.42 | + 14.60 |
|  |  | + 56.22 |  |
|  |  | − 55.52 |  |

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176

ε Virginis. 10273

h m s
12 56 9
+ 11° 37
June 18

1.17609 0.11297
9.99101
1.16710

|  |  |  |  |
|---|---|---|---|
| 56 39.00 |  | 56 32.6 |  |
| 41.00 | 43194 | 34.4 |  |
| 43.20 | 43.19 | 36.0 |  |
| 45.30 |  | 37.8 |  |
| 21597 47.47 |  | 1807 39.9 |  |
| 21597 |  | 1807 |  |
| 51.60 |  | 56 3614 |  |
| 53.70 |  | + 2390 |  |
| 55.85 |  |  |  |
| 58.05 | 0.082 |  |  |
| 0.05 | 008 | 57 32.8 |  |
| 2.18 | 0.01 | 34.3 |  |
| 4.27 |  | 36.0 |  |
| 6.44 |  | 38.4 |  |
| 54074 8.60 |  | 1817 40.2 |  |
| 074 |  | 1817 |  |
| 12.70 |  | 57 3634 |  |
| 14.67 | 16.834 | − 3630 |  |
| 16.90 | 16.83 |  |  |
| 18.90 | 12002 |  |  |
| 8417 21.00 |  | 56 36.14 |  |
| 8417 | 57 0.045 | 57 36.34 |  |
|  |  | + 23.90 |  |
|  |  | − 36.30 | 6020 |
|  |  | 1.37840 | 1.77960 |
|  |  | 1.55991 | 1.16710 |
|  |  | 1.48113 | 2.94670 |
|  |  | 1.66264 | 1.88230 |
|  |  |  | 8.93560 |
|  |  |  | 4 5540 |

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R 34 35.22
R 34 34.77
R 34 34.80

34 34.93
22 53 30.4

M 37 22.00
M 36 54.10
M 36 8.70
R 36 8.12
R 36 8.17
~~M 36~~

M 51 22.50 +30.28 52.78 00
M 52 38.82
R 52 38.72
R 52 38.55
M 52 38.95
52 38.76 −45.99 52.77
76.26
52.78

20

δ Cassiop Lt. C.

h m s
1 17 35
° '
+120 24
1.17609
9.70418n
0.11297

1879
June 18

18 1.00
4.90
9.00
13.23
4538 17.25
4538
25.50
29.55
33.55
37.88
41.66
45.80
49.60
53.90
37529 57.85
37529
6.05
10.20
1443
18.30
7130 22.32
7130

9.076
907

41699
4169
41.66

14260
14.26
8333

18 41.675

17 34.0
36.3
39.9
44.0
2016 47.4
2016
17 4033
+1 1.35

19 28.5
32.8
34.6
38.6
1785 44.0
1785
19 35.70
− 5402

17 4032
19 35.70
+ 1 1.36
− 54.02

18 24.8
30.0
34.7
38.9
1694 41.0
1694
18 3388
+ 780

18 3388
+ 7.80

13 42 49.48

M 10 17.42.
M 9 39.75.
~~M 9~~ rej last δ

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181

η Urs. Maj. 9.92054

h m s
13 42 46
° '
+49 55
1.17609
9.80882
0.98491
0.11297

43 6.70
10.00
13.36
16.40
6636 19.90
6636
25.93
29.20
32.50
35.60
38.80
41.95
45.25
48.47
34936 51.66
34936
55 00
1.00
4.40
7.50
32178 10.88
2178
4356

13272
1327

38818
38.82
38.81

4.356
436
7763

43 38.815

43 3.8
5.9
8.1
10.3
398 11.7
398
43 796
+ 3086

44 29.7
32.7
35.4
37.5
1755 40.2
1755
44 3510
− 5628

43 7.96
44 35.10
+ ~~31.06~~
− 56.28
1,49220
1,75035
1,41274
1,67089

30.86
5628
8714
1.94022
0.98491
2.92513
1.85467
8.92954
4 ~~50 56~~
51 36

M 33 29.55.+25.87
M 34 42.87.
R 34 41.92.
R 34 41.80.
M 34 41.85.
34 ~~41.41~~ 46.87
42.11
71.56

55.42.62
5.4234
5480

49 55 1.9

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182

η Bootis .08739

h m s
13 48 55
° '
+19 0
1 17609
9.97567
1.15176
0.11297

49 24.90
27.10
29.40
31.45
14655 33.70
14655
37.97
40.15
42.30 30
44.38
46.70
48.82
51.00
53.30
41997 55.35
41997
57.60
1.97
4.05
6.38
32047 8.47
2047

29310
29.31

46663
4666
46.70

4.094
4.09
9340

49 46.680

13 48 58.53

49 23.9
25.4
26.7
28.5
1345 30.0
1345
49 2690
+ 19.78

12.5
14.9
17.3
19.0
850 21.3
850
50 1700
− 3032

49 2690
17.00
+ 19.78
− 30.32
1,29623
1,48173
1,38362
1,56912

50.10
1.69
1.15
2.85
1.78
8.93
4.55
55

984
176
160
633
473
5

M 27. 53.87.+2419
M 28 54.62.
R 28 54.37.
R 28 54.55.
28 54.51 −37.08
61.14

1756 .06
1743
1750

19 0 8.2

| | | | |
|---|---|---|---|
| 183 | | | |
| T Virginis | .11142 | | |
| h m s | | | |
| 13 55 29 | 0.11297 | | |
| + 2° 8' | | | |
| 55 59.60 | | 55 51.9 | |
| 1.70 | 3800 | 53.5 | |
| 3.80 | 3.80 | 55.4 | |
| 5.90 | | 56.8 | |
| 31900 8.00 | | 2762 58.6 | |
| 1900 | | 262 | |
| 12.50 | | 55 5524 | |
| 14.00 | | + 2503 | |
| 16.18 | | | |
| 18.20 | 20.256 | | |
| 20.25 | 20.26 | 56 46.6 | |
| 22.30 | 20.28 | 48.3 | |
| 24.42 | | 50.3 | |
| 26.45 | | 52.0 | |
| 18230 28.50 | | 2512 54.0 | |
| 18230 | | 12 | |
| 32.65 | | 56 5024 | |
| 34.68 | 3.6756 | − 29.97 | |
| 36.75 | 36.76 | | |
| 38.80 | 4056 | | |
| 18378 40.90 | | 55 55.24 | |
| 18378 | 56 20.270 | 56 50.24 | |
| | | + 25.03 | |
| | | − 29.97 | 55.00 |
| | | 1.39846 | 1.74036 |
| | | 1.47669 | |
| | | 1.50988 | |
| | | 1.58811 | |

| | |
|---|---|
| 50.10 | |
| .69 | 984 |
| .15 | 176 |
| .85 | 160 |
| 1.76 | 633 |
| .93 | 473 |
| 55 | 5 |
| 55 | |

| | | | |
|---|---|---|---|
| 187 | | | |
| α Bootis | ~~.08521~~ | | |
| h m s | | | |
| 14 10 8 | | | |
| +19° 49' | 1.17609 | 0.11297 | |
| | 9.97349 | | |
| | 1.14958 | | |
| 10 37.90 | | 10 34.0 | |
| 40.22 | 42392 | 36.0 | |
| 42.44 | 42.39 | 38.3 | |
| 44.68 | | 40.7 | |
| 21196 46.72 | | 1917 42.7 | |
| 1196 | | 1917 | |
| 51.23 | | 10 3834 | |
| 53.45 | | + 21.59 | |
| 55.50 | | | |
| 57.75 | 59.920 | | |
| 59.90 | 59.92 | 11 30.5 | |
| 2.00 | 59.94 | 33.0 | |
| 4.20 | | 35.0 | |
| 6.45 | | 37.0 | |
| 53928 8.80 | | 1745 39.0 | |
| 53928 | | 245 | |
| 13.00 | | 11 3490 | |
| 16.25 | 1.7494 | − 34.97 | |
| 17.50 | 17.49 | | |
| 19.82 | 11988 | | |
| 8747 21.90 | | 10 3834 | |
| 8747 | 10 59.930 | 11 34.90 | |
| | | + 21.59 | |
| | | − 34.97 | 56.56 |
| | | 1.33425 | 1.75251 |
| 14 18 11.58 | | 1.54370 | 1.14958 |
| | | 1.41946 | 2.90209 |
| | | 1.62891 | 1.83607 |
| | | | 8.93398 |
| | | | 45434 |

| | | | |
|---|---|---|---|
| 193 | | | |
| γ Bootis | .00324 | | |
| h m s | | | |
| 14 27 12 | | | |
| +38° 50' | 1.17609 | 0.11297 | |
| | 9.89152 | | |
| | 1.06761 | | |
| 27 38.60 | | 27 25.0 | |
| 40.85 | 43.390 | 27.1 | |
| 43.50 | 43.39 | 28.5 | |
| 45.90 | | 30.6 | |
| 21695 48.70 | | 1438 32.6 | |
| 21695 | | 1438 | |
| 53.90 | | 27 2876 | |
| 56.50 | | + 35.72 | |
| 59.20 | | | |
| 1.80 | 4.456 | | |
| 4.48 | 4.46 | 28 38.3 | |
| 7.22 | 4.57 | 40.6 | |
| 9.70 | | 42.3 | |
| 12.30 | | 45.8 | |
| 58010 15.00 | | 2146 47.6 | |
| 4010 | | 2146 | |
| 20.37 | | 28 4292 | |
| 22.97 | 25.648 | − 38.44 | |
| 25.70 | 25.64 | | |
| 28.30 | 12903 | | |
| 12824 30.90 | | 27 2876 | |
| 12824 | 28 4.485 | 28 42.92 | |
| | | + 35.72 | |
| | | − 38.44 | 74.16 |
| | | 1.55291 | 1.87017 |
| | | 1.58478 | 1.06761 |
| | | 1.55615 | 2.93778 |
| | | 1.58802 | 1.87743 |
| | | | 8.93965 |
| | | | 45825 |

M 19 52.92 +32.35 2528 16
M 20 4.45
R 20 4.12
R 20 4.12
M 20 4.62
~~20 4.33~~ −38.74 2559
25.43

M 39 23.85 +26.27 50.12 .16
M 40 32.70
R 40 32.25
R 40 32.27
M 40 32.42
40 32.41 −42.55 4980
68.56
4996

19 48 38.0

M 37 57.47 +35.99 9346 .34
M 39 12.92
R 39 12.95
R 39 12.70
M 39 12.95
39 12.88 −38.73 94.15
75.41
9380

d

ε Bootis .05932

h m s
14 39 42
+27° 35' 1.17609 9.11297
9.94760
1.12369

1879 June 18

40 10.50
12.87 15230
15.23 1523
17.65
7615 19.90
2615
24.65
26.85
29.19
31.49 33.793
33.88 33.79
36.00 33.81
38.40
40.78
30414 43.00
30414
47.80
49.95 52406
52.38 5240
54.70 6763
26203 57.20
26203 40 33.800

39 59.1 +79.97
0.8 70.13
2.0 62.40
4.0 54.59
3126 6.7
126
40 252
+ 31.28
41 4.9
6.4
8.2
10.2
417 12.0
417
41 8.34
− 34.54
40 2.52
41 8.34
+ 31.28
− 34.54 65.82
1.49527 1.81836
1.53832 1.12369
1.55459 2.94205
1.59764 1.87146
8.92941
4 51 30

M 53 0.17 +35.86 3603 503
M 54 15.02
R 54 14.32
R 54 14.42
M 54 14.45
54 14.55 −39.59 3496
74.38
3540

198

β Urs. Min.

h m s
14 51 4
+74° 39' 1.17609 0.11297
9.42278

51 30.5
38.3
46.2
54.3 1.72
1.9
9.1
17.6
24.8
5555 32.8
55

50 3.6 50 34.7
6.8 39.1
14.6 47.3
20.0 55.5
717 26.7 1783 1.7
717 2383
50 1434 50 47.66
+1 47.38 +1 14.06

51 56.5 52 53.7
3.5 2.7
7.8 7.7
18.0 12.0
3494 23.6 3361 20.0
494 361
52 988 53 722
− 8.16 −1 5.50

53 40.6 50 35.66
48.7 52 7.22
54.5
3.4
2799 12.7
2799
53 5598
−1 54.26

M 49 49.67
M 50 2.45
M 50 31.07
M 50 50.27
M 50 6.45
~~50 22.56~~
2.89

199

β Bootis 9.99038

h m s
14 57 23
+40° 52' 1.17609 0.11297
9.87866
1.05475

57 48.28
57.00 53806
53.85 53.80
56.60
26903 59.30
1903
4.70
7.40
10.00
12.75 15529
15.57 15.53
18.25 15.62
20.90
23.70
13976 26.49
13976
32.05
34.78 37442
37.46 37.44
40.02 15124
18721 42.90
18721 58 15.575

57 38.3
40.5
43.1
45.0
2842 47.3
2142
57 4284
+ 32.74
58 49.9
52.5
55.1
57.6
2747 59.6
247
58 5494
− 39.36
57 42.84
58 54.94
+ 32.74
− 39.36
1.51508
1.59506
1.50546
1.58544

M 36 15.15 +32.02 47.17 .17
M 37 26.17
R 37 26.10
R 37 25.90
M 37 25.87
37 26.01 −38.50 47.51
70.86
47.34

201

δ Boötis 9.91976
11172
003148

h m s
15 10 37

° '
+33 46

1.17609 0.11297
9.91976
1.09585

11 4.78
7.00
9.67
12.18
4821 14.58
4821
19.70
22.04
24.50
26.95
29.50
32.00
34.40
36.95
26544 39.40
26544
44.27
46.90
49.40
51.79
24664 54.28
24664

9.642
9.64
29.493
29.49
29.48
49.328
49.33
5897
11 29.485

10 56.2
58.0
0.1
2.0
3013 5.0
13
11 026
+ 2922
11 59.9
1.6
3.4
6.2
3198 8.7
198
12 3.96
− 34.48
11 026
12 3.96
+ 29.22
− 34.48
1.46568
1.53757
1.49716
7.56905

6370
1.80414
1.09585
2.89999
1.83213
8.93214
4 5320

72.10
1.85794
1.05475
2.91269
1.84040
8.92771
4 50 22

M 42 15.92 +31.42 4734 -28
M 43 24.20.
R 43 24.10.
R 43 23.65.
M 43 23.48.
43 23.86 -37.07 4679
67.94
4706

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209

α Cor. Bor. .06115

h m s
15 29 34

° '
+27 7

1.17609 0.11297
9.94943
1.12552

30 2.70
5.20
7.40
9.65
3688 11.93
3688
16.47
18.77
21.00
23.43
25.80
28.20
30.35
32.80
23182 35.00
23182
39.63
42.05
44.18
46.60
22141 48.95
22141

7.376
7.37
25.758
25.76
25.82
44.282
4428
5165
30 25.790

29 52.0
53.8
56.8
58.5
2821 1.0
2821
29 5642
+ 2937
30 58.8
0.7
2.7
4.6
3138 7.0
138
31 2.76
− 3697
29 56.42
31 2.76
+ 29.37
− 36.97
1.46790
1.56785
1.52905
1.62900

66.34
1.82178
1.12552
2.94730
1.88406
8.93676
4 56 27

15 29 37.21

M 20 45.70 +33.81 19.87 5
M 22 2.37.
R 22 2.10.
R 22 2.30.
M 22 2.32.
22 2.27 -42.56 1971
76.57
19.90

27 7 6.7

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212

α Serpentis .10865

h m s
15 38 18

° '
+6 48

1.17609 0.11297
9.99693
1.17302

38 49.45
51.40
53.55
55.65
26775 57.70
1775
1.87
3.87
5.96
7.90
9.95
12.03
14.20
16.28
9034 18.28
9034
22.47
24.55
26.60
28.70
13307 30.75
13307

53550
53.55
10038
10.04
10.08
26614
26.61
14016
39 10.060

38 40.9
42.7
44.0
46.0
2212 47.6
212
38 4424
+ 25.82
39 39.9
42.0
43.7
45.3
2179 47.0
179
39 4358
− 3352
38 44.24
39 43.58
+ 25.82
− 33.52
1.41196
1.52530
1.52061
1.63395

59.34
1.77335
1.17302
2.94637
1.88383
8.93746
4 56 56

15 38 21.96

M 39 18.47 +33.16 5163 .16
M 40 35.02.
R 40 34.65.
R 40 35.00.
M 40 35.35.
40 35.00 -43.05 5195
76.53
5179

6 48 16.7

1879

1

α Androm

h m s
0 2 8
° ′
+28 25
1.17609
9.94424
1.12033
0.11297

June 18

2 35.50
38.00 40344
40.47 40.34
42.80
20172 44.95
172
49.70
52.05
54.27
56.60 59002
58.50 59.00
1.40 59.06
3.70
6.60
53102 8.40
53~~28~~102
13.20
15.40 17786
17.88 17.79
20.00 17813
8893 22.45
8893 2 59.030

2 31.9
34.1
36.9
39.0
1826 40.7
1826
2 3652
+ 2251
3 35.6
37.4
39.0
41.0
1956 42.6
1956
3 3912
− 4009
2 3652
3 39.12
+ 22.51
− 40.09

62.60
1.79657
1.12033
2.91690
1.85576
8.93886
45753

0 2 10.24

M 2 44.22
M 3 56.17
R 3 55.70
R 3 56.02
3 55.96
71.74

28 25 26.9

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3

γ Pegasi

h m s
0 7 0
° ′
+14 31
1.17609
9.98591
0.11297

7 29.70
31.80 33900
34.00 33.90
36.00
16950 38.00
16950
42.46
44.50
46.68
48.95 50953
50.95 50.95
53.10 50.95
55.15
57.30
45858 59.50
45858
3.89
5.88 8.008
8.02 8.01
10.05 10191
4004 12.20
4004 7 50.950
8.008

7 27.1
29.0
30.6
32.5
1536 34.4
1536
7 30.72
+ 2023
8 27.5
28.8
30.0
7 3072
+ 20.23

0 7 2.63

M 57 5.62
M 58 18.82
R 58 18.67
R 58 18.37
M 58 18.57
58 18.61
7299

14 30 49.2

---

33

α Arietis

h m s
2 0 21
° ′
+22 53
1.17609
9.96440
0.11297

June 18

0 49.28
51.42 53734
53.67 53.73
55.95
26867 58.35
1867
2.70
4.90
7.00
9.35 11.602
11.60 11.60
13.85 11.62
16.05
18.37
10442 20.60
10442
25.00
27.25 29.510
29.50 29.51
31.80 14324
14755 34.00
14755 1 11.610

0 41.3
42.5
45.0
47.0
2246 48.8
2246
0 4492
+ 2669
0 4492
+ 26.69

2 0 22.97

R 34 28.50
R 34 28.32
R 34 28.40
342841

22 53 30.7

52

α Persei

h m s
3 15 41
° ′ 1.17609 0.11297
+49 26 9.81314

June 18

| | | | | |
|---|---|---|---|---|
| 16 | 1.00 | | 16 | 12.0 |
| | 3.90 | 7.080 | | 15.3 |
| | 7.00 | 7.08 | | 18.3 |
| | 10.00 | | | 21.2 |
| 3540 | 13.50 | | 910 | 24.2 |
| | 3540 | | | 910 |
| | 19.90 | | 16 | 1820 |
| | 23.30 | | + | 1440 |
| | 26.30 | | | |
| | 29.50 | 32.670 | | |
| | 32.78 | 32.67 | 17 | 14.7 |
| | 35.80 | 32.52 | | 17.5 |
| | 38.90 | | | 20.4 |
| | 42.25 | | | 22.5 |
| 29403 | 46.30 | | 1008 | 25.7 |
| | 29403 | | | 1008 |
| | 51.70 | | 17 | 2016 |
| | 54.80 | 57.956 | − | 47.56 |
| | 57.88 | 57.96 | | |
| | 1.00 | 6504 | | |
| 28978 | 4.30 | | 16 | 18.20 |
| | 28978 | 16 32.595 | 17 | 20.16 |
| | | | + | 1440 |
| | | | − | 47.56 |

8 15 42.96

M 2 58.20
M 3 49.80
R 3 49.52
R 3 49.27
M 3 49.67
~~3 49.56~~
~~1.36~~

49 25 46.4

☉

Sun C = 46.702

h m s
5 57 14
° ′
+23 26

0.11297

June 19

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 50 | 26.68 | | 51 | 38.0 | 52 | 44.50 | | 52 | 20.7 |
| | 28.85 | 31.226 | | 39.8 | | 46.80 | 49.000 | | 22.3 |
| | 31.30 | 31.23 | | 41.8 | | 48.90 | 49.00 | | 23.8 |
| | 33.50 | | | 43.8 | | 51.27 | | | 26.0 |
| 15613 | 35.80 | | 2094 | 46.0 | 24500 | 53.63 | | 1211 | 28.3 |
| | 15613 | | | 2094 | | 24500 | | | 211 |
| | 40.05 | | 51 | 4188 | | 58.00 | | 52 | 2422 |
| | 42.20 | | − | 5269 | | 0.25 | | + | 4263 |
| | 44.65 | | | | | 2.50 | | | |
| | 46.98 | 49.128 | | | | 4.70 | 7.011 | | |
| | 49.24 | 49.13 | | | | 7.00 | 6.70 | | |
| | 51.46 | 49.25 | | | | 9.30 | 7.00 | | |
| | 53.67 | | | | | 11.55 | | | |
| | 55.90 | | | | | 13.80 | | | |
| 44215 | 58.00 | | | | 60310 | 16.00 | | | |
| | 44215 | | | | | 6310 | | | |
| | 2.80 | | | | | 20.50 | | | |
| | 4.98 | 7.274 | | | | 22.80 | 25.000 | | |
| | 7.25 | 7.27 | | | | 25.00 | 25.00 | | |
| | 9.47 | 9850 | | | | 27.25 | 13400 | | |
| 3637 | 11.87 | | 51 | 41.88 | 12500 | 29.45 | | 52 | 24.22 |
| | 3637 | 50 49.190 | − | 5269 | | 2500 | 53 6.850 | + | 42.63 |

M 46 0.10

M 18 27.67

1879phae.proj.1503.

1879

13

y Cassiop. L.C.

h m s
0 49 25
° '
+ 119 56

June 19

49 31.22
35.18 3.9340
39.30 39.34
43.30
19670 47.70
19670
56.00
0.40
4.10
8.40 12480
12.50 1248
16.60 12.41
20.70
24.75
65232 28.87
11232
37.00
41.47 45480
45.55 45.48
49.50 14482
22740 53.88
22740 50 12.445

0.11297

49 3.8
7.2
10.0
13.0
3515 17.5
515
49 10.30
+1 2.14
50 6.9
11.2
14.4
18.6
733 22.2
733
50 14.66
− 2.22
49 10.30
50 14.66
+ 1 2.14
− 2.22

M 37 25.92
M 36 43.32.

---

20

δ Cassiop. L.C

h m s
1 17 55
° '
+120 24

18 1.75
5.38 9.540
9.57 9.54
13.43
4770 17.67
4770
25.68
29.80
33.90
38.05 42116
41.93 42.12
46.30 42.10
50.40
54.48
37904 58.50
37904
6.30
10.60 14.670
14.68 14.67
18.87 8421
7335 22.90
7335 18 42.110

0.11297

17 30.0
34.2 3738
37.3 37.38
41.4
1869 44.0
1869
17 37.38
+1 4.73
18 47.7
50.9
52.5
55.3
2654 59.0
154
18 53.08
− 10.97
17 37.38
18 53.08
+ 1 4.73
− 10.97

M 10 20.15.
M 9 28.52? 4 read (269) included.
M 9 58.42.

---

187

α Bootis .08521
0.11297

h m s
14 10 8
° '
+ 19 49

1.17609
9.97349
1.14958

10 38.40
4060 40.70 42.806
42.70 42.81
45.00
21403 47.23
21403
51.60
53.80
55.85
58.05 0.290
0.40 0.29
2.45 0.31
4.66
6.80
54261 9.00
261
13.50
15.70 17.810
17.85 17.81
19.95 12062
8905 22.05
8905 11 0.300
−.005
0.295

14 10 11.57

10 32.8
34.6
36.4
38.7
1829 40.4
1829
10 3658
+ 2372
11 34.9
37.1
38.7
19 41.0
~~21~~47 43.0
1947
11 3894
− 3864
103658
11 ~~42~~.94 38.94
+ 23.72 62.36
− 3864 ~~4264~~ ~~66.36~~
1.37511 ~~1.82191~~
1.62982 1.14958
1.46032 ~~2.97149~~
1.71503 ~~1.77321~~
~~8.91172~~
~~4 39 55~~
45747

1.7
11
2.9
18
8.9
4

M 39 20.50 + 28.86 49.36
M 40 36.87.
R 40 37.22.
R 40 36.78.
M 40 36.82.
40 36.92 − 51.88 45.04
76.42

19 48 38.1

193

γ Bootis .00324

h m s
14 27 12
° ′
+38 50

1.17609
9.89152
1.06761

0.11297

27 38.12
40.85
43.60
46.18
21745 48.70
21745
54.05
56.77
59.38
2.03
4.74
7.50
10.00
12.68
58253 15.38
4253
20.57
23.28
25.88
28.50
12953 31.30
12953

43.490
43.49
4.726
4.72
4.70
25.906
25.91
12940
28 4.710

27 29.5
31.8
33.6
36.5
1700 38.6
1700
27 3400
+ 30.71
28 36.2
38.8
41.0
43.3
2053 46.0
53
28 4106
− 3685
27 3400
28 41.06
+ 30.71
− 36.35
1,48728
1.56050
149052
1,56374

67.06
1.82646
1.06761
2.89407
1.83046
8.93639
4 5612

1.79491
1.14958
2.94449
1.88321
8.93872
4 5747

d

ε Bootis .05932

h m s
14 39 42
° ′
+27 35

1.17609
9.94760
1.12369

0.11297

40 11.00
13.25
15.60
17.98
7810 20.27
7810
24.90
27.17
29.46
31.95
34.25
36.39
38.77
41.30
30769 43.50
30769
48.05
50.50
52.85
55.10
16395 57.45
1395

15.620
15.62
34.188
3419
34.20
52790
5279
6841
40 34.195

40 3.4
5.9
8.0
10.0
395 12.2
395
40 790
+ 2630
41 4.2
8.4
10.3
12.0
484 13.5
484
41 9.68
− 3548
40 790
41 9.68
+ 26.30
− 3548
1,41996
1,54998
1,47928
1,60930

61.78
1.79085
1.12369
2.91454
1.84856
8.93402
4 5436

198

β Urs. Min.

h m s
14 51 4
° ′
+74 39

1.17609
9.42278

0.11297

50 43.40
51.90
59.00
7.17
29627 14.80
29627
30.10
37.95
45.80
53.95
1.50
9.00
16.83
25.60
55365 32.92
1365
48.40
56.40
3.70
11.47
31917 19.20
1917

59.254
59.25
1.517
1.52
1.54
3.834
383
308
52 1.530

50 41.4
46.9
53.5
56.7
2617 3.2
2617
50 52.34
+1 9.19
52 41.1
52.0
56.9
1.3
2806 9.3
2806
52 56.12
− 54.59
54 19.7
29.9
35.8
85.4
285

51 50.5
57.3
7.3
12.7
3277 19.9
277
52 5.54
− 401
53 19.8
27.7
35.5
41.5
1245
31.1
52 6.56
53
− 1 5.03

M 38 3.67 +30.94 34.61 .06
M 39 11.52
R 39 11.27
R 39 11.30
M 39 11.32
39 11.35 −36.62 3473
67.68
3467

M 53 6.15 +30.15 36.30 .13
M 54 16.87
R 54 16.70
R 54 16.78
M 54 16.50
54 16.71 −40.67 3604
70.56
36.17

M 50 4.38
M 50 30.37
M 50 46.48
M 50 59.12
M 50 15.95

199

β Bootis 9.99038

h m s
14 57 23
° ′
+ 40 52
1.17609 0.11297
9.87866
1.05475

1879
June 19

57 48.60 57 40.0
51.30 54.056 43.4
54.50 54.06 45.3
56.88 47.0
27028 59.50 2252 49.5
2028 2252
4.95 57 4504
7.65 + 30.80
10.40
13.00 15.806
15.75 1580 58 52.7
18.50 15.89 56.3
21.25 58.4
23.95 1.2
14225 26.80 2921 3.5
14225 2921
32.35 58 5842
35.00 37.728 − 42.58
37.70 37.73
40.40 151 79
18864 43.19 57 45.04
18864 58 15.845 58 58.42
+ 30.80
− 42.58 73.38
1.48855 1.86558
1.62920 1.05475
1.47893 2.92033
1.61958 1.85364
8.93331
4547

200

β Librae .10642

h m s
15 10 30
° ′
− 8 56
1.17609 0.11297
9.99470
1.17079

Ex m
10 0.50 10 55.4
2.65 4680 57.8
4.60 4.61 59.6
6.78 1.6
2340 8.87 2975 3.1
2340 2975
12.90 10 59.50
15.00 + 38.24
17.10
19.25 21.272
21.35 21.27 11 45.5
23.35 21.25 47.5
26.40 49.2
27.50 51.2
19145 29.60 2466 53.2
19145 2466
33.80 11 49.32
35.85 37.900 − 28.06
37.90 3790
39.95 4251
18950 42.00 10 59.50
18950 10 21.260 11 49.32
+ 38.24
− 28.06 66.30
1.58252 1.82151
1.44809 1.17079
1.68894 2.99230
1.55451 1.81558
~~8.82328~~

209

α Cor. Bor. .06115

h m s
15 29 34
° ′
+27 7
1.17609 0.11297
9.94943
1.12552

30 3.00 30 3.5
5.30 7.640 5.0
7.70 7.64 7.2
10.00 9.5
3820 12.20 370 11.8
3820 370
16.80 30 740
19.20 + 18.68
21.40
23.70 26.063
26.00 26.06 31 1.5
28.37 26.10 3.3
30.60 5.2
33.00 7.3
23457 35.50 275 9.2
23457 265
40.05 31 5.30
42.20 44.574 − 39.22
44.50 44.57
46.85 5221
22287 49.27 30 7.40
22287 30 26.080 31 5.50
+ 18.68
− 39.42 58.10
1.27138 1.76418
15 29 27.21 1.59572 1.12552
1.33253 2.88970
1.65687 1.82426
8.93456
4 5458

M 36 16.78 +31.12 4790 .69
M 37 28.37.
R 37 28.30.
R 37 28.05.
M 37 27.95.
37 28.17 −41.65 4652
71.39
4721

M 23 31.95 +48.86 ~~20.8~~ 1204
M 24 37.62. 24
R 24 37.40.
R 24 37.20.
M 24 37.20.
24 37.35 −35.85 150
65.40

M 20 58.72 +21.50 8022 .08
M 22 5.60.
R 22 5.40.
R 22 5.40.
M 22 5.38.
22 5.44 −45.38 8006
66.72
80.14

27 7 15.0

7

212 α Serpentis .10865

h m s
15 38 18
° ′
+6 48

1,17609
9.99693
1.17302

0,11297

38 49.60
51.60 53754
53.70 5375
55.90
26877 57.97
1877
2.00
4.20
6.26
8.30 10.327
10.30 10.32
12.37 10.32
14.40
16.53
9288 18.58
9294
22.70
24.85 26900
26.95 2690
29.00 14065
13450 31.00
13450 39 10.320

38 44.8
46.3
48.3
51.1
2433 52.8
2433
38 4866
+ 2166
39 37.3
40.5
42.5
44.3
2105 45.9
2105
39 4210
− 3178
38 48.66
39 42.10
+ 2166
− 31.78
1,33566
1.50215
1,44431
1,61080

53.44
1,72787
1.17302
2.90089
1.83550
8.93461
4550

15 38 21.96

M 39 25.12 +27.82 52.94 .08
M 40 33.65
R 40 33.38
R 40 33.67
M 40 33.67
40 33.59 −4881 52.78
68.47
52.86

6 48 16.9

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3 γ Pegasi

h m s
0 7 0
° ′
+14 31

1,17609
9.98591
1.16200

0.11297

7 30.20
32.32 34458
34.50 34.46
36.67
17229 38.60
17229
42.90
45.00
47.10
49.30 51.476
51.48 51.47
53.65 51.46
55.85
58.00
46328 0.00
46328
4.27
6.30 8460
8.48 846
10.55 10292
4230 12.70
4230 7 51.465

7 25.9
27.6
29.4
31.1
1470 33.0
1470
7 2940
+ 2206
8 26.7
28.5
30.5
32.7
1535 35.1
1535
8 3070
− 3924
7 29.40
8 30.70
+ 22.06
− 39.24
61.30

61.30
1.78746
1.16200
2.94946
2.06707
9.11761
~~9.18437~~
7 288
84355

0 7 269

M 56 3.70
M 58 20.52
R 58 20.42
R 58 20.45
M 58 20.30
58.20.42
136 ~~17~~76.72

14 30 49.5

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13 γ Cassiop.

h m s
0 49 25
° ′
+60 4

0.11297

49 36.16
40.30 44388
44.28 44.38
48.50
22194 52.70
22194
0.90
5.20
9.60
13.35 17.477
17.49 17.48
21.65 17.46
25.80
29.90
15729 34.00
15729
42.20
46.40 50.526
50.55 5053
54.70 15491
25263 58.78
25263 50 17.470

0.11297

49 16.5
19.0
21.8
25.0
1113 29.0
1113
49 2226
+ 5521
50 21.9
25.3
29.3
33.2
1475 37.8
1475
51 29.50
−1 12.03
49 22.26
51 29.50
+ 55.21
−1 12.03

50 57.1
55.7
58.4
1.7
2929 6.0
2929
50 5858
− 4111
50 5858
− 41.11
127.24

M 24 54.78
M 25 58.85
M 26 17.52
R 26 17.55 17.39
R 26 17.10
~~25 27.75~~

20

S Cassiop-

h m s
1 17 55
° '
+59 86

0.11297

1879 June 19

18 6.40
10.38 14502
14.58 14.50
18.50
7251 22.65
7251
30.65
34.78
38.90
42.95 47061
47.00 47.06
51.27 47.12
55.30
59.38
42355 3.32
42355
11.70
15.65 19.740
19.70 19.74
23.80 9424
9870 27.85
9870 18 47.090

18 1.8
6.7
9.4
12.5
468 16.4
468
18 936
+ 3773
19 55.3
58.7
2.7
6.6
3038 10.5
138
20 276
- 1 15.67
18 9.36
20 2.76
+ 37.73
-+ 73.67

19 6.0
9.6
13.5
16.6
662 20.5
662
19 1324
- 2615
19 13.24
111.40

M 52 24.97
M 53 7.78
M 53 39.32

~~53 23.55~~

33

α Arietis

h m s
2 0 21
° '
+22 53

0.11297

0 49.65
57.88 54110
54.12 54.11
56.30
27055 58.60
2055
3.00
5.30
7.50
9.72 11956
11.93 11.96
14.20 11.99
16.55
18.70
10760 20.70
10760
25.40
27.60 29870
29.90 29.87
32.05 14398
14935 34.40
14935 1 11.975

0 39.7
41.1
43.2
45.2
2165 47.3
2165
0 4330
+ 2868
0 43.30
+ 28.68

2 0 28.03

R 52 27.35 }
R 52 27.52 } ?
R 52 27.27 }

52 27.38

82 53 30.8

198

β Urs. Min. L.C.

h m s
14 51 4
° '
+105 21

0.11297

50 34.00
41.45 49590
49.70 49.59
57.80
24795 5.00
24795
20.85
28.50
35.90
44.00 51.828
52.10 51.83
59.60 51.77
7.30
14.80
46645 23.10
46645
37.40 38.00
46.30 53946
53.80 5395
1.98 22354
26973 9.65
26973 51 51.800

49 34.0
38.4
44.0
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2263 56.9
2263
49 4526
+2 654
50 51.7
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1.6
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3101 15.2
101
51 202
+ 49.78
52 46.7
52.0
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3060 17.4
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53 1.20

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M 10 31.67
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M 9 7.70

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h m s
3 15 41
+ 49° 26′

1.17609
9.81314
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June 19

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Sun C = 46,702

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June 20

50 13.8
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+ 1 2818
51 37.0
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2511 3.8
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5022
+ 158
53 24.4
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34.0
39.5
43.8
2182 46.2
2182
52 364
− 1 5184

16 1.18
4.50 7616
7.80 7.61
10.70
3808 13.90
3808
20.28
23.50
26.70
29.90 33.014
33.00 33.01
36.28 32.98
39.42
42.45
29713 45.60
29713
52.00
55.25 58.364
58.50 58.36
1.47 6597
29182 4.60
29182 16 32.995

3 15 48.01

15 45.4
46.7
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2412 57.0
2412
15 4824
+ 4476
17 17.9
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1078 25.6
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17 21.56
− 4856
15 48.24
17 21.56
+ 44.76
− 4856

9332
1.96997
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2.95920
1.89575
8.93655
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54 36.60
39.01 41.230
41.35 41.33
43.50
20665 45.70
20615
50.36
52.70
54.80
56.85 59.314
59.37 59.31
1.55 59.30
3.84
6.00
53383 8.36
53383
12.88
15.15 17.266
17.00 17.27
19.45 11860
8633 21.85
8633 54 59.305

55 51.7
53.7
56.0
58.1
2794 59.9
294
55 5588
− 56.58
55 55.88
− 56.58

56 54.60
56.70 58970
58.90 58.97
1.20
29485 3.45
29485
7.90
10.15
12.47
14.88 16.962
17.00 16.96
19.00 17.00
21.46
23.80
15266 26.00
15266
30.55
32.80 35040
35.00 35.04
37.35 15401
17520 39.50
17520 57 16.980

56 22.5
23.8
25.1
27.0
1279 29.5
279
56 25.580
+ 51.40
56 25.58
+ 51.40

M 2 33.27
M 3 52.02
R 3 51.90
R 3 52.07
M 3 51.72
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49 25 46.03

M 45 23.90

le 17 39.78

172

γ Virginis .11168

| h | m | s | | |
|---|---|---|---|---|
| 12 | 35 | 31 | | |
| ° | ′ | | 1.17609 | 0.11297 |
| − 0 | 47 | | 9.99996 | |

1879 June 20 1.17605

| | | | | |
|---|---|---|---|---|
| 36 | 2.37 | | 35 | 57 5 |
| | 4.50 | 6.558 | | 59 2 |
| | 6.57 | 6.56 | | 1. 0 |
| | 8.60 | | | 2. 7 |
| 3279 | 10.75 | 10.65 | 3052 | 4. 8 |
| | 3279 | | | 52 |
| | 14.79 | | 36 | 104 |
| | 16.89 | | + | 21.96 |
| | 18.95 | | | |
| | 20.95 | 23001 | | |
| | 22.95 | 23.00 | 36 | 53.4 |
| | 25.00 | 23 01 | | 54.9 |
| | 27.00 | | | 56.7 |
| | 29.28 | | | 58.5 |
| 20701 | 31.20 | | 2839 | 0.4 |
| | 20701 | | 6 | 2839 |
| | 35.40 | | 3x | 56.78 |
| | 37.35 | 39470 | − | 33.78 |
| | 39.50 | 39.47 | | |
| | 41.50 | 46 03 | 36 | |
| 19735 | 43.60 | | ~~35~~ | 104 |
| | 19735 | 36 23.005 | 36 | 56.78 |
| | | −.005 | + | 21.96 |
| | | 23.000 | − | 33.78 |

55.74
~~115.74~~

| | | |
|---|---|---|
| 1.74617 | 1.91360 | ~~2.06333~~ |
| 1.17605 | 1.52866 | 1.17605 |
| ~~2.92222~~ | 2.02528 | 3.23938 |
| 1.85631 | 1.64034 | 1.85631 |
| 8.93409 | | ~~8.61693~~ |
| 4 54 39 | | 8.4953439 |

12 35 34.45

| | | | |
|---|---|---|---|
| M | 14 | 57.02 | +106.00 |
| M | 16 | 8.95 | |
| R | 16 | 9.07 | |
| R | 16 | 8.72 | |
| M | 16 | 8.67 | |
| | 16 | 8.85 | −43.69 |
| | | 71.83 | |

0 47 23.8

176

ε Virginis .10273

| h | m | s | | |
|---|---|---|---|---|
| 12 | 56 | 9 | | |
| | ° | ′ | 1.17609 | 0.11297 |
| + | 11 | 37 | 9.99101 | |

June 20 1.16710

| | | | | |
|---|---|---|---|---|
| 56 | 39.77 | | 56 | 30.0 |
| | 41.87 | 43.958 | | 31.6 |
| | 43.95 | 43.96 | | 33.0 |
| | 46.00 | | | 35.3 |
| 21979 | 48.20 | | 1669 | 37.0 |
| | 21979 | | | 169 |
| | 52.40 | | 56 | 3338 |
| | 54.47 | | + | 27.40 |
| | 56.50 | | | |
| | 58.63 | 0.750 | | |
| | 0.80 | 0.75 | 57 | 30.0 |
| | 2.85 | 0.80 | | 32 0 |
| | 4.90 | | | 33.8 |
| | 7.00 | | | 35.5 |
| 54675 | 9.20 | | 1683 | 37.0 |
| | 675 | | | 183 |
| | 13.40 | | 57 | 3366 |
| | 15.55 | 17.646 | − | 32.88 |
| | 17.60 | 17.65 | | |
| | 19.80 | 121.61 | | |
| 8823 | 21.88 | | 56 | 3338 |
| | 8823 | 57 0.775 | 57 | 33.66 |
| | | | + | 27.40 |
| | | | − | 32.88 |

| | |
|---|---|
| | 60.28 |
| 1.43775 | 1.78017 |
| 1.51693 | 1.16710 |
| 1.54048 | 2.94727 |
| 1.61966 | 1.88466 |
| | 8.93679 |
| | 11 56 28 |

| | | | | |
|---|---|---|---|---|
| M | 51 | 19.15 | +34.71 | 53.86 .10 |
| M | 52 | 36.02 | | |
| R | 52 | 35.78 | | |
| R | 52 | 35.22 | | |
| M | 52 | 35.85 | | |
| | 52 | 35.72 | −4165 | 5407 |
| | | 76.57 | | |
| | | | | 5396 |

181

η Urs. Maj. C = 46.702

| | | | | | |
|---|---|---|---|---|---|
| h m s | | | | | |
| 13 42 46 | | 9.92054 | 0.11297 | | |
| ° ′ | | 1.17609 | | | |
| +49 55 | | 9.80882 | | | |
| 1879 June 21 | | 0.98491 | | | |
| 43 | 7.96 | | 42 | 52.4 | |
| | 11.28 | 14.452 | | 54.0 | |
| | 14.50 | 14.45 | | 56.2 | |
| | 17.62 | | | 59.3 | |
| 7226 | 20.90 | | 2846 | 2.7 | |
| | 7226 | | | 2846 | |
| | 27.00 | | 42 | 5692 | |
| | 30.30 | | + | 4313 | |
| | 33.60 | | | | |
| | 36.80 | 40.034 | | | |
| | 40.00 | 40.03 | 44 | 19.5 | |
| | 43.38 | 40.07 | | 23.2 | |
| | 46.48 | | | 26.2 | |
| | 49.85 | | | 29.2 | |
| 36031 | 52.90 | | 1302 | 32.1 | |
| | 36031 | | | 1302 | |
| | 59.30 | | 44 | 2604 | |
| | 2.47 | 5694 | − | 45.99 | |
| | 5.75 | 5693 | | | |
| | 8.90 | 8014 | | | |
| 32847 | 12.05 | | 42 | 5692 | |
| | 2847 | 43 40.050 | 44 | 26.04 | |
| | | | + | 43.13 | |
| | | | − | 45.99 | 89.12 |
| | | | | 1,63478 | 1.94998 |
| 18 42 39.387 | | | | 1,66266 | 0.98491 |
| | | | | 1,55532 | 2.93489 |
| | | | | 1,58320 | 1.87105 |
| | | | | | 8.93616 |
| | | | | | 4 56 3 |

182

η Boötis .08739

| | | | | | |
|---|---|---|---|---|---|
| h m s | | | | | |
| 13 48 55 | | 1.17609 | 0.11297 | | |
| ° ′ | | | | | |
| +19 0 | | 9.97567 | | | |
| | | 1.15176 | | | |
| 49 | 26.00 | | 49 | 17.2 | |
| | 28.25 | 30450 | | 19.0 | |
| | 30.50 | 3045 | | 21.0 | |
| | 32.60 | | | 23.0 | |
| 15225 | 34.90 | | 1047 | 24.5 | |
| | 15225 | | | 1047 | |
| | 39.16 | | 49 | 2094 | |
| | 41.37 | | + | 2696 | |
| | 43.55 | | | | |
| | 45.70 | 47.933 | | | |
| | 48.00 | 47.93 | 50 | 19.3 | |
| | 50.02 | 47.88 | | 21.7 | |
| 52.30 | 52.40 | | | 23.4 | |
| | 54.50 | | | 25.4 | |
| 43140 | 56.70 | | 1173 | 27.5 | |
| | 43140 | | | 1173 | |
| | 1.00 | | 50 | 2346 | |
| | 3.16 | 5316 | − | 3556 | |
| | 5.30 | 5.31 | | | |
| | 7.47 | 9576 | | | |
| 2658 | 9.65 | | 49 | 2094 | |
| | 2658 | 49 47.905 | 50 | 23.46 | |
| | | −.005 | + | 26.96 | |
| | | 47.900 | − | 35.56 | 62.52 |
| | | | | 1,43072 | 1.79602 |
| 18 48 58.50 | | | | 1,55096 | 1.15176 |
| | | | | 1,51811 | 2.94778 |
| | | | | 1,63835 | 1.88564 |
| | | | | | 8.93786 |
| | | | | | 4 57 12 |

183

τ Virginis .11142

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|---|---|---|---|---|---|
| h m s | | | | | |
| 13 55 29 | | | | | |
| ° ″ | | 1.17609 | 0.11297 | | |
| + 2 8 | | 9.99970 | | | |
| | | 1.17579 | | | |
| 56 | 1.00 | | 55 | 54.9 | |
| | 3.00 | 5.036 | | 57.6 | |
| | 5.00 | 5.03 | | 59.6 | |
| | 7.00 | | | 1.4 | |
| 2518 | 9.18 | | 2963 | 2.8 | |
| | 2518 | | | 2963 | |
| | 13.30 | | 55 | 59.26 | |
| | 15.40 | | + | 2229 | |
| | 17.45 | | | | |
| | 19.50 | 21.596 | | | |
| | 21.58 | 21.59 | 56 | 53.5 | |
| | 23.65 | 21.52 | | 55.3 | |
| 25.70 | 25.80 | | | 56.9 | |
| | 27.88 | | | 58.4 | |
| 19436 | 29.80 | | 2846 | 0.6 | |
| | 19436 | | | 2846 | |
| | 33.96 | | 56 | 5692 | |
| | 35.98 | 38.008 | − | 35.37 | |
| | 38.00 | 38.01 | | | |
| | 40.05 | 4304 | | | |
| 19004 | 42.05 | | 55 | 59.26 | |
| | 19004 | 56 21.555 | 56 | 56.92 | |
| | | −.005 | + | 22.30 | |
| | | 21.550 | − | 35.36 | 57.66 |
| | | | | 1,34830 | 1.76087 |
| | | | | 1.54851 | 1.17579 |
| | | | | 1,45972 | 2.93666 |
| | | | | 1,65993 | 1.86964 |
| | | | | | 8.93298 |
| | | | | | 4 53 54 |

| | | | | |
|---|---|---|---|---|
| M 33 19.75 | +35.92 | 55.67 .05 | | |
| M 34 34.40 | | | | |
| R 34 34.02 | | | | |
| R 34 33.72 | | | | |
| M 34 34.12 | | | | |
| 34 34.06 | −38.30 | 55.76 | | |
| 74.31 | | | | |
| | | 5572 | | |
| 49 55 2.2 | | | | |

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|---|---|---|---|---|
| M 27 45.05 | +32.97 | 78.02 .20 | | |
| M 29 1.90 | | | | |
| R 29 1.92 | | | | |
| R 29 1.87 | | | | |
| M 29 1.90 | | | | |
| 29 1.90 | −43.49 | 78.41 | | |
| 76.85 | | | | |
| | | 78.22 | | |
| 19 0 8.5 | | | | |

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|---|---|---|---|---|
| M 19 58.05 | +28.82 | 86.87 .23 | | |
| M 16 ~~21~~ 12.55 | | | | |
| R 16 ~~21~~ 12.67 | | | | |
| R 16 ~~21~~ 11.82 | | | | |
| M 16 ~~21~~ 12.05 | | | | |
| 16 ~~21~~ 12.12 | −45.70 | 86.42 | | |
| 74.07 | | | | |
| | | 8664 | | |

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|---|---|---|---|
| 187 | | | |
| α Bootis | | .08521 | |
| h m s | | | |
| 14 10 8 | | 1.17609 | 0.11297 |
| +19 49 | | 9.97349 | |
| 1879 June 21 | | 1.14958 | |
| 10 39.39 | | 10 32.9 | |
| 41.48 | 43658 | 34.6 | |
| 43.55 | 43.66 | 36.4 | |
| 45.87 | | 38.1 | |
| 21829 48.00 | | 1822 40.2 | |
| 21829 | | 1822 | |
| 52.40 | | 10 3644 | |
| 54.60 | | + 24.74 | |
| 56.80 | | | |
| 58.90 | 1.156 | | |
| 1.15 | 1.16 | 11 41.9 | |
| 3.30 | 1.19 | 44.0 | |
| 5.60 | | 45.4 | |
| 7.70 | | 47.0 | |
| 55040 9.95 | | 2267 48.4 | |
| 1040 | | 2267 | |
| 14.43 | | 11 4534 | |
| 16.60 | 18726 | − 4416 | |
| 18.70 | 18.73 | | |
| 20.90 | 12239 | | |
| 9363 23.00 | | 10 36.44 | |
| 9363 | 11 1.175 | 11 45.34 | |
| | | + 24.74 | |
| | | − 44.16 | 68.90 |
| | | 1.39340 | 1.83822 |
| 14 10 11.56 | | 1.64503 | 1.14958 |
| | | 1.47861 | 2.98780 |
| | | 1.73024 | 1.92865 |
| | | | 8.94085 |
| | | | 4 59 15 |
| M 39 20.92 | +30.10 | 51.02 .51 | |
| M 40 45.90 | | | |
| R 40 45.67 | | | |
| R 40 45.60 | | | |
| M 40 45.90 | | | |
| 40 45.77 | −53.73 | 52.04 | |
| 84.85 | | | |
| | | 51.53 | |
| 19 48 38.2 | | | |

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|---|---|---|---|
| 193 | | | |
| γ Bootis | | .00324 | |
| h m s | | | |
| 14 27 12 | | | |
| +38° 50′ | | 1.17609 | 0.11297 |
| | | 9.89152 | |
| | | 1.06761 | |
| 27 39.10 | | 27 32.5 | |
| 41.80 | 44420 | 34.8 | |
| 44.40 | 44.42 | 37.0 | 37.04 |
| 47.00 | | 39.5 | |
| 22210 49.80 | | 1852 41.4 | |
| 22210 | | 1852 | |
| 55.00 | | 27 37040 | |
| 57.50 | | + 28.52 | |
| 0.20 | | | |
| 2.95 | 5.543 | | |
| 5.55 | 5.54 | 28 40.0 | |
| 8.10 | 5.58 | 43.1 | |
| 10.90 | | 45.3 | |
| 13.50 | | 47.9 | |
| 58989 16.19 | | 2263 50.0 | |
| 4989 | | 2263 | |
| 21.50 | | 28 4526 | |
| 24.00 | 26740 | − 39.70 | |
| 26.80 | 26.74 | | |
| 29.40 | 13116 | | |
| 13370 32.00 | | 27 37.04 | |
| 13370 | 28 5.560 | 28 45.26 | |
| | | + 28.52 | |
| | | − 39.70 | 68.22 |
| | | 1.45515 | 1.83391 |
| | | 1.59879 | 1.06761 |
| | | 1.45839 | 2.90152 |
| | | 1.60263 | 1.83658 |
| | | | 8.93506 |
| | | | 4 55 18 |
| M 38 5.50 | +28.73 | 34.23 .05 | |
| M 39 14.37 | | | |
| R 39 14.15 | | | |
| R 39 13.92 | | | |
| M 39 14.12 | | | |
| 39 14.14 | −40.06 | 34.14 | |
| 68.64 | | | |
| | | 34.18 | |

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| d | | | |
| ε Bootis | | .05932 | |
| h m s | | | |
| 14 39 42 | | | |
| +27° 35′ | | 1.17609 | 0.11297 |
| | | 9.94760 | |
| | | 1.12369 | |
| 40 11.85 | | 40 0.4 | |
| 14.15 | 16536 | 1.8 | |
| 16.50 | 16.54 | 3.6 | |
| 18.90 | | 5.0 | |
| 8268 21.28 | | 182 7.4 | |
| 8268 | | 182 | |
| 25.92 | | 40 364 | |
| 28.10 | | + 31.51 | |
| 30.50 | | | |
| 32.88 | 35151 | | |
| 35.20 | 35.15 | 41 5.9 | |
| 37.40 | 35.15 | 8.1 | |
| 39.76 | | 10.4 | |
| 42.05 | | 12.3 | |
| 31636 44.55 | | 514 14.7 | |
| 31636 | | 514 | |
| 49.10 | | 41 1028 | |
| 51.50 | 53760 | − 35.13 | |
| 53.80 | 5376 | | |
| 56.00 | 7630 | | |
| 26880 58.40 | | 40 364 | |
| 26880 | 40 35.150 | 41 10.28 | |
| | | + 31.51 | |
| | | − 35.13 | 66.64 |
| | | 1.49845 | 1.82373 |
| | | 1.54568 | 1.12369 |
| | | 1.55777 | 2.94742 |
| | | 1.60500 | 1.88383 |
| | | | 8.93641 |
| | | | 4 56 13 |
| M 53 0.15 | +36.12 | 36.27 .27 | |
| M 54 17.05 | | | |
| R 54 16.97 | | | |
| R 54 16.27 | | | |
| M 54 16.45 | | | |
| 54 16.68 | −39.86 | 36.82 | |
| 7653 | | | |
| | | 36.54 | |

198

β Urs. Min.

h m s
14 51 4
° '
+ 74 39   1.17609   0.11297
9.42278

50 ~~44.72~~
52.50
0.50
7.95
15.68
31.30
39.10
47.10
54.65   28.33
2.60   2.61
10.00
18.40
26.35
56350 34.00
56550
49.60
57.63   51.88
5.50   5.18
12.96
32594 20.45
25594   52 2.673

50 33.9
35.9
42.0
47.9
53.3
2718 58.8
2718
50 54.36
52 38.8
45.3
51.8
59.4
2610 5.7
2610
52 52.20
53 56.9
4.3
13.2
20.6
3631 28.1
631
54 12.62

51 39.7
45.3
51.2
58.3
5.9
2604
51 52.08
53 17.6
23.4
32.0
37.1
46.4
1565
53 31.30
54 31.9
34.0
36.1
51 52.08
53 31.30

M 50 ~~8~~1.55.
M 50 22.92.
M 50 44.05.
M 50 56.27.
M 51 9.00.
M 51 15.25.
73.70

199

β Bootis   9.99038

h m s
14 57 23
° '
+ 40 52   1.17609   0.11297
9.87866
1.05475

57 49.40
52.27   54.944
54.95   54.94
57.70
27472 0.40
27472
6.92
8.67
11.39
13.98   16.804
16.70   16.80
19.46   16.77
22.32
25.00
15124 27.80
15124
33.18
35.90   38.602
38.60   38.60
41.28   15354
19301 44.05
19301   58 16.785

57 38.3
41.7
43.2
46.0
2180 48.8
180
57 43.60
+ 33.18
58 58.2
1.0
3.4
5.3
3159 8.0
159
59 3.18
− 46.40
57 43.60
59 3.18
+ 33.18
− 46.40   79.58
1,52088   1.90080
1,66652   1.05475
1,51126   2.95555
1,65690   1.88897
8.93342
4 54 12

M 36 13.90 +32.45   46.35 .19
M 37 31.55.
R 37 31.37.
R 37 31.30.
M 37 31.20.
37 31.35 −45.39   45.96
77.45
46.16

201

δ Bootis   .03148

h m s
15 10 37
° '
+ 33 46   1.17609   0.11297
9.91976
1.09585

11 5.85
8.40   10910
10.95   10.91
13.45
5455 15.90
5455
20.87
23.35
25.90
28.40   30784
30.70   30.78
33.28   30.76
35.68
38.10
27706 40.80
27706
45.65
48.20
50.60   50.60
53.00   61.51
25300 55.55
300   11 30.770
50600

10 52.4
58.5
0.5
2.7
3027 4.6
27
11 0.54
+ 30.23
12 10.7
13.2
15.4
17.3
758 19.2
758
12 15.16
− 44.39
11 0.54
12 15.16
+ 30.23
− 44.39   74.62
1,48044   1.87286
1,64728   1.09585
1,51192   2.96871
1,67876   1.90069
8.93198
4 53 14

M 42 15.00 +32.50   47.50 .34
M 43 34.62.
R 43 34.60.
R 43 34.40.
M 43 34.62.
43 34.56 −47.73   46.83
79.56
47.16

209

α Cor. Bor. .06115

h m s
15 29 34 1.17609 0.11297
° '
+27 7 9.94943
1.12552

1879 June 21

30 3.95
6.20 8530
8.55 8.53
10.85
4265 13.10
4265
17.74
20.00
22.46
24.73 27043
27.00 27.04
29.28 27.05
31.70
34.08
24339 36.40
24339
40.95
43.27 45566
45.54 45.57
47.97 5410
22783 50.10
22783 30 27.045

29 57.3
58.4
0.3
2.3
3020 4.7
20
30 0 40
+ 26.64
31 0.0
2.1
4.0
5.7
197 7.9
197
31 3 94
− 36.90
30 0.40
31 3.94
+ 26.64
− 36.90
1.42553
1.56703
1.48668
7.62818

63.54
1.80305
1.12552
2.92857
1.85992
8.93135
45248

19 39 27.26

M 20 49.10 +30.67 79.77 .36
M 22 1.82
R 22 1.50
R 22 1.45
M 22 1.35
22 1.53 −42.48 79.65
7243
7941

27 7 17.8

---

212

α Serpentis .10865

h m s
15 38 18 1.17609 0.11297
° '
+6 48 9.99693

38 50.68
52.80 54796
54.80 54.79
56.84
27398 58.86
2398
3.00
5.16
7.10
9.20 11.251
11.33 11.35
13.50 11.34
15.57
17.60
10216 19.70
10216
23.70
25.80 27.886
28.00 27.89
30.00 14268
13943 31.93
139413 39 11.345

38 —
49.6
51.0
53.1
56.0
39 43.6
46.4
—
49.9
52.0

15 38 21.96

M 39 26.37
M 40 39.78
R 40 39.85
R 40 39.72
M 40 40.05
40 39.85
7348

6 48 17.2

---

13

γ Cassiop.

h m s
0 49 25
° '
+60 4 0.11297

49 37.30
41.50 45580
45.60 45.58
49.60
22790 53.90
22790
2.08
6.28
10.40
14.45 18646
18.60 18.65
22.80 18.69
26.90
31.00
16781 35.30
16781
43.60
47.75 51802
51.86 51.80
55.90 15738
25901 59.90
901 50 18.670

49 22.3
24.4
28.2
30.7
1389 33.3
1389
49 2778
+ 50.89
50 45.0
49.1
53.0
57.0
2651 1.0
2651
50 53.02
− 34.35
49 27.78
50 53.02
+ 50.89
− 34.35 85.24

M 24 56.47
M 25 52.78
R 25 52.52
R 25 52.65
M 25 52.82
25 52.69

20

δ Cassiop

h m s
1 17 55
° '
+ 59 36

1.17609 0.11297
9.70418
0.88027

| | | | |
|---|---|---|---|
| 18 7.60 | | 17 42.0 | 19 13.7 |
| 11.60 | 15720 | 50.1 | 18.0 |
| 15.70 | 15.72 | 53.8 | 21.5 |
| 19.80 | | 56.7 | 25.5 |
| 7860 23.90 | | 2684 0.8 | 1082 29.5 |
| 7860 | | 2684 | 82 |
| 32.05 | | 17 53.68 | 19 21.64 |
| 36.05 | | + 5468 | − 3328 |
| 40.08 | | | |
| 44.20 | 4 4318 | | |
| 48.28 | 48.32 | 19 43.9 | |
| 52.37 | 48.40 | 49.0 | |
| 56.48 | | 52.0 | |
| 0.65 | | 54.8 | |
| 43486 4.70 | | 2586 58.9 | |
| 43486 | | 2586 | |
| 12.98 | | 19 51.72 | |
| 17.00 | 21.076 | − 336 | |
| 21.00 | 21.08 | | |
| 25.20 | 9680 | | |
| 10538 29.20 | | 17 53.68 | 19 21.64 |
| 10538 | 18 48.360 | 19 51.72 | |
| 21.076 | | + 5468 | |
| | | − + 63.36 | 118.04 |
| | | | 2.07188 |
| | | | 0.88027 |
| | | | 2.95215 |
| | | | 1.85902 |
| | | | 8.90687 |
| | | | 4 3649 |

32

γ Androm.

h m s
1 56 28
° '
+ 41 45

1.17609 0.11297
9.87277
1.04886

| | | | |
|---|---|---|---|
| 56 53.48 | | 56 39.5 | |
| 56.28 | 59062 | 41.4 | |
| 59.12 | 59.06 | 43.5 | |
| 1.80 | | 46.2 | |
| 29531 4.63 | | 2193 48.7 | |
| 29531 | | 2193 | |
| 10.00 | | 56 43.86 | |
| 12.85 | | + 37.32 | |
| 15.70 | | | |
| 18.30 | 21.169 | | |
| 21.15 | 21.17 | 57 55.8 | |
| 23.80 | 21.18 | 59.3 | |
| 26.70 | | 1.6 | |
| 29.62 | | 3.6 | |
| 19052 32.40 | | 3070 6.7 | |
| 19052 | | 70 | |
| 37.80 | | 58 1.40 | |
| 40.58 | 43306 | − 40.22 | |
| 43.27 | 43.31 | | |
| 45.93 | 16237 | | |
| 21653 48.95 | | 56 43.86 | |
| 21653 | 57 21.175 | 58 1.40 | |
| | | + 37.32 | |
| | | − 40.22 | 77.54 |
| | | | 1.88953 |
| | | | 1.04886 |
| | | | 2.93839 |
| | | | 1.87099 |
| | | | 8.93260 |
| | | | 4.5335 |

33

α Arietis

h m s
2 0 21
° '
+ 22 53

1.17609 0.11297
9.96440
1.14049

| | | | |
|---|---|---|---|
| 0 50.90 | | 0 47.2 | |
| 53.20 | 55370 | 49.8 | |
| 5530 55.40 | 55.37 | 51.6 | 5th |
| 57.55 | | 53.6 | |
| 27685 59.80 | | 2572 56.0 | |
| 27685 | | 72 | |
| 4.35 | | 0 51.44 | |
| 6.49 | | + 21.78 | |
| 8.70 | | | |
| 10.90 | 13232 | | |
| 13.19 | 13.23 | 1 40.8 | |
| 15.48 | 13.22 | 42.6 | |
| 17.74 | | 44.3 | |
| 20.00 | | 45.9 | |
| 11905 22.20 | | 2211 47.5 | |
| 11905 | | 2211 | |
| 26.57 | | 1 44.22 | |
| 28.85 | 31.060 | − 31.00 | |
| 31.10 | 31.06 | | |
| 33.28 | 14643 | | |
| 15530 35.50 | | 0 51.44 | |
| 530 | 1 13225 | 1 44.22 | |
| 31.060 | −.005 | + 21.78 | |
| | 13.220 | − 31.00 | 52.78 |
| | | | 1.72247 |
| | | | 1.14049 |
| | | | 2.86296 |
| | | | 1.80113 |
| | | | 8.93817 |
| | | | 4 5725 |

2 0 28.08

M 52 12.62
M 53 10.57
M 53 29.92
R 53 29.65
R 53 29.45
~~53 24.90~~
72.28
53 29.67

M 43 17.62
M 44 31.87
R 44 31.97

44 31.92
74.30

M 34 33.80
M 35 37.20
R 35 36.82
R 35 37.02
M 35 37.20
35 37.06
83.26

2 2 58 36.0

1879

S

Sun - C = 46,702

h m s
6 3 43
° ′
+23 27

1879. June 22

2 57.30
59.60
1.90
4.00
30917 6.37
917
10.90
13.00
15.36
17.60
19.80
22.00
24.28
26.60
17839 28.85
17839
33.40
35.75
37.98
40.25
18978 42.40
18978

1,834
1,83
19,821
19,82
19.89
37,956
37,96
39,79
3 19,855

4 12,4
14.0
15.9
17.5
795 19.7
295
4 1590
- 56,04

4 1590
- 56.04

5 ~~15.20~~
17.40
19.37
21.65
24.00
28.50
30.70
33.00
35.20
37.40
39.70
42.00
44.30
33740 46.60
33740
50.95
53.27
55.48
57.70
27750 0.10
27750

37,489
37,49
55500
55,50

0.11297

4 51.4
52.9
54.9
56.8
2749 58.9
249
4 54,98

4 54,98

M 45 20,42.

M 17 43,78.

587

α Virginis

h m s
13 18 49
° ′
-10 32

19 20.60
22.68
24.80
26.95
12403 29.00
2403
33.10
35.20
37.30
39.48
41.50
43.65
45.75
47.83
37368 49.87
1368
54.00
56.25
58.30
0.40
2.50

24,806
24,81
41,520
41,52
19 41.535

1.17609
9.99262

19 18.4
20.0
22.1
23.9
1102 25.8
1102
19 22,04
20 13.6
15.2
16.9
18.8
847 20.2
847
20 16,94

22,04
16,94

0.11297

13 18 52,06

15.95
M 59 ~~12.38~~
M 0 25.92
R 0 25.82
R 0 25.78
M 0 25.78
0 25.82
7344

10 32 4.3

181

η Urs. Maj.

h m s
13 42 46
° ′
+49 55

0.11297

43

40.47 59.70
40.52 2.95 6150
40.41 6.05 6.15
40.54 9.38
~~40.75~~ 3075 12.67
3075

-19.23
22.43
25.64
28.84
32.05
20246
40,492

13 42 49.84

44 15.2
17.9
20.3
23.7
1036 26.5
36
44 2072

44 2072

182

η Bootis .08739

h m s
13 48 55
° ′
+19 0

1.17609 0,11297
9.97867
1.15476

49 21.70
28.88 31056
31.00 31.06
33.22
15528 35.48
528
39.80
42.10
44.20
46.40 48536
48.50 48.53
50.70 48.49
52.90
55.10
43682 57.32
43682
1.60
3.70 5920
5.97 5.92
8.00 9698
2960 10.33
2960 49 48.510

49 18.0
19.9
21.5
23.7
1085 25.4
85
49 21.70
+ 26.81

50 18.0
20.0
21.4
23.6
1088 25.8
1088
50 2176
− 3325

49 21.70
50 21.96
+ 26.81
− 33.25 60.06
1,42830 1.77859
1.52179 1.15476
1.51569 2.93335
1.60918 1.86576
8.93241
4 5331

187

α Bootis .08521

h m s
14 10 8
° ′
+19 49

1.17609 0.11297
9.97349
1.14958

10 39.90
42.10 44.274
44.27 44.27
46.50
22137 48.60
2137
53.00
55.20
57.40
59.60 ~~1.789~~
1.80 1.79
4.00 1.78
6.10
8.40
55610 10.60
1610
14.97
17.10 19300
19.30 19.30
21.53 12357
9650 23.60
9650 11 1.785

10 32.5
33.9
35.7
37.4
1790 39.5
290
10 35.800
+ 25.98

11 30.3
32.3
34.0
36.3
1712 38.3
17 212
11 3424
− 3246

10 3580
11 ~~26.24~~ 34.24
+ 25.98
− ~~3226~~.46
1,41464
1,42259
1.49985
1.50780

58.
~~64~~
52.44
~~1.71966~~
1.14958
~~2.86924~~
1.85479
~~8.98555~~
~~5 31 30~~

1.76671
1 14958
~~1.62892~~
2.91629
~~2.97850~~
185479
~~8.87629~~
~~4 18 5~~
8.93850
4 5738

14 10 11.55

M 34 28.97
R 34 28.52
R 34 28.27
M 34 28.38
34 28.53

49 55 2.3

M 27 45.72 +32.79 18.51 .03
M 28 59.40
R 28 59.38 ✓
R 28 58.78 ✓
M 28 59.22 ✓
28 59.13 −4066 18.47
73.41
1848

M 39 19.10 +31.61 50.71
M 40 31.02
R 40 30.65
R 40 30.42
M 40 30.72
40 30.68 −3220 5848
71.58

19 48 38.1

193

γ Bootis .00324

h m s
14 27 12
+38° 50′

0,11297

1879 June 22

27 39.77
42.38
45.00
47.62
22515 50.38
22515
55.70
58.30
0.90
3.60
6.20
8.95
11.60
14.18
59635 16.92
5635
22.00
24.60
27.45
30.00
13675 32.70
13675

27
45030
45.03
6.261
6.26
6.19
27350
27.35
13238
28 6.225

27 26.7
28.2
30.5
33.1
1539 35.4
39
27 3078
+ 3544
28 45.0
47.2
49.0
51.7
2469 54.0
2469
28 4938
− 43.16
27 30.78
28 49.38
+ 35.44
− 43.16
1.54949
1.63508
1.55273
1.63832

78.60
1.89542

198

β Urs. Min

h m s
14 57 4
+74° 39′

0.11297

50 45.00
53.50
1.00
8.70
30498 16.78
[illegible]498
32.12
39.90
47.90
55.90
3.30
11.00
18.90
26.60
57022 34.60
57022
50.10
58.00
5.60
13.70
32868 21.28
2868

0.996
0.99
3.358
3.36
3.36
5.736
5.73
6.72
52 3.360

50 5.0
10.0
15.7
23.0
823 28.6
823
50 1646
+1 4690
52 27.7
33.0
41.3
48.8
2066 55.8
2066
52 4132
− 3796
54 27.1
29.2
31.7

50 53.8
1.3
7.7
13.3
3355 19.4
355
51 7.10
+ 5626
53 29.3
34.7
41.0
48.8
2111 57.3
2111
53 4222
−1 3886
51 7.10
53 42.22
− 3.74

199

β Bootis 9.99038

h m s
14 57 23
+40° 52′

1.17609
9.87866
1.05475

0.11297

57 50.20
53.00
55.77
58.50
27864 1.17
27864
6.58
9.35
12.00
14.70
17.53
20.20
22.90
25.70
15744 28.48
15744
33.90
36.60
39.32
42.00
19670 44.88
19670

55728
55.73
17493
17.49
17.53
39340
39.34
15507
58 17.510

57 38.0
39.7
42.3
44.5
2111 46.6
2111
57 4222
+ 3529
58 49.9
52.2
55.1
57.9
2756 0.5
2756
58 5512
− 37.61
57 42.22
58 55.12
+ 35.29
− 37.61
1.54765
1.57530
1.53803
1.56568

72.90
1.86273
1.05475
2.91748
1.85242
893494
4 5513

M 37 58.30 ✓
M 39 17.52
R 39 17.20
R 39 17.15
M 39 17.15
39 17.25 −4348

M 49 47.42
M 50 6.07
M 50 39.15
M 50 58.80
M 51 12.92
~~50 44.23~~

M 36 11.95 +3452 46.47 .05
M 37 23.52
R 37 22.95
R 37 22.92
M 37 23.18
37 23.14 −3678 4636
71.19
4642

201

δ Boötis .03148

h m s
15 10 37
° '
+33 46

1.17609 0.11297
9.91976
1.09585

11 6.55 10 54.5
8.90 11.480 56.5
11.50 11.48 58.2
13.95 0.6
5740 16.50 2923 2.5
5740 2923
21.40 10 5846
2395 + 3289
26.30.
28.95 31.347
31.33 31.35 12 0.5
33.85 31.35 3.2
36.28 5.2
38.80 7.4
28212 41.26 258 9.5
28212 258
46.28 12 5.16
48.78 51.228 − 3381
51.30 51.23
53.78 6271
25614 56.00 10 58.46
614 11 31.350 12 ~~51.60~~ 5.16
+ 32.89 66.70
= ~~33.81~~ ~~+13.14~~
1.51706 ~~2.05346~~ 1.82413
1.90444 ~~1.09585~~ 109585
1.54854 ~~3.14931~~ 2.91998
1.93592 ~~1.85388~~ 185388
~~8.70457~~ 8.93390
4 54 31

M 42 11.30 +35.36 46.66
M 43 22.95
R 43 22.77
R 43 22.55
M 43 22.65
43 22.73 −8628 ~~645~~
71.43

13

γ Cassiop.

h m s
0 49 25
° '
+60 4

0.11297

Chf.

20

δ Cassiop.

h m s
1 17 55
° '
+59 36

0.11297

18 8.30 17 48.3
12.35 16440 50.3
16.37 16.44 54.0 54.26
20.48 57.7
8220 24.70 2713 1.0
8220 2713
32.70 17 54.26
36.80 + 54.82
40.90
45.50 49.074
49.50 49.07 19 26.3
53.20 49.69 30.3
57.20 33.6 3386
1.37 37.5
44167 5.50 1693 41.6
44167 1693
13.50 19 3386
17.70 21.754 − 44.78
21.70 21.75
25.92 9819
10877 29.95 17 54.26
877 18 49.080 19 33.86
+ 54.82
− 44.78

M 52 12.05
M 52 18.07

32

ζ Androm.

h m s
1 56 28
+41° 45′ 0.11297

1879 June 22

| | | | | |
|---|---|---|---|---|
| | 56 54.40 | | 56 | 57.4 |
| | 57.10 | 59.894 | | 59.3 |
| | 59.80 | 59.89 | | 1.8 |
| | 2.70 | | | 4.3 |
| 29947 | 5.47 | | 3092 | 6.4 |
| | 29947 | | | 792 |
| | 10.80 | | 57 | 1.84 |
| | 13.50 | | + | 20.06 |
| | 16.28 | | | |
| | 19.00 | 21.860 | | |
| | 21.88 | 21.86 | | |
| | 24.55 | 21.94 | | |
| | 27.50 | | | |
| | 30.28 | | | |
| 19674 | 32.95 | | | |
| | 19674 | | | |
| | 38.50 | | | |
| | 41.20 | 44.000 | | |
| | 43.92 | 44.00 | | |
| | 46.75 | 16389 | | |
| 22002 | 49.65 | | 57 | 1.84 |
| | 22002 | 57 21.900 | + | 20.06 |

R 43 34.22
R 43 34.35

43 34.28

33

α Arietis

h m s
2 0 21
+22° 53′ 0.11297

| | | | | |
|---|---|---|---|---|
| | 0 51.40 | | 1 | 16.7 |
| | 53.70 | 55.970 | | 18.9 |
| | 55.97 | 55.97 | | 21.0 |
| | 58.28 | | | 23.0 |
| 27985 | 0.50 | | 1043 | 24.7 |
| | 27985 | | | 43 |
| | 4.97 | | 1 | 2086 |
| | 7.10 | | − | 6.94 |
| | 9.45 | | | |
| | 11.70 | 13.936 | | |
| | 13.95 | 13.94 | | |
| | 16.20 | 13.90 | | |
| | 18.40 | | | |
| 2070 | 20.80 | | | |
| 12542 | 22.85 | | | |
| | 12542 | | | |
| | 27.40 | | | |
| | 29.60 | 31.832 | | |
| | 31.88 | 31.83 | | |
| | 34.00 | 14780 | | |
| 15916 | 36.28 | | 1 | 2086 |
| | 916 | 1 13.920 | − | 6.94 |
| | | −.005 | | |
| | | 13.915 | | |

R 35 9.10
R 35 9.48
R 35 9.20

35 9.26
~~35 9.34~~

198

β Urs. Min. L.C.

h m s
14 51 4
+105° 21′ 0.11297

E.H.

| | | | | | | |
|---|---|---|---|---|---|---|
| 54 | 22.70 | | 53 | 0.5 | 53 | 58.0 |
| | 30.20 | | | 5.5 | | 2.7 |
| | 37.25 | | | 10.9 | | 10.0 |
| | 45.40 | 53.283 | | 18.3 | | 14.5 |
| | 53.20 | | 604 | 25.2 | 3491 | 23.9 |
| | 1.40 | | | 604 | | 491 |
| | 8.50 | | 53 | 12.08 | 54 | 9.82 |
| | 16.40 | | | | | |
| | 24.50 | | | | | |
| | 47955 | | | | | |
| | 40.00 | | 54 | 47.0 | 55 | 58.3 |
| | 47.70 | | | 52.7 | | 5.7 |
| | 55.60 | 55.560 | | 2.9 | | 15.5 |
| | 3.40 | | | 17.2 | | 20.0 |
| | 10.10 | | 3076 | 16.8 | 3665 | 27.0 |
| | 27780 | | | 76 | | 665 |
| | | | 55 | 4.52 | 56 | 13.30 |
| | | | | | | |
| | | | 56 | 34.3 | 54 | 9.82 |
| | | | | 40.3 | 56 | 13.30 |
| | | | | 46.5 | | |
| | | | | 52.0 | | |
| | | | 2321 | 59.0 | | |
| | | | | 2321 | | |
| | | | 56 | 46.42 | | |

M 10 18.22
M 9 58.40 ✓
M 9 39.25
M 9 15.52
M 9 4.75
~~9 29.48~~

α Persei

h m s
3 15 41
° ′
+49 26

0.11297

June 22

EX

S

Sun. C = 46.719

h m s
6 7 52
° ′
+23 27

0.11297

June 23

| | | | | |
|---|---|---|---|---|
| 19 | 3.12 | | 18 | 49.6 |
| | 6.28 | 9.510 | | 51.0 |
| | 9.50 | 951 | | 54.0 |
| | 12.75 | | | 57.2 |
| 4755 | 15.90 | | 2716 | 59.8 |
| | 4755 | | | 216 |
| | 22.15 | | 18 | 5432 |
| | 25.30 | | + | 40.52 |
| | 28.55 | | | |
| | 31.48 | 34.618 | | |
| | 34.78 | 3462 | 19 | 42.0 |
| | 38.00 | 34.85 | | 44.5 |
| | 41.25 | | | 47.5 |
| | 43.70 | −44.50 | | 49.2 |
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| 6015 | 16.35 | | 1637 | 24.8 | 14856 | 34.25 | | 2409 | 51.5 |
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| | 27.90 | 30067 | | | | 45.50 | 47.759 | | |
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+45 52
1.17609
9.84282
1.01891
0.11297

June 23

8 9.64
12.60 15542
15.47 15.54
18.60
7771 21.40
7771
27.60
30.50
33.30
36.30 39.283
39.00 39.28
42.45 39.26
45.00
48.25
35355 51.15
35355
57.20
59.92 2.984
3.00 2.98
5.90 7852
31492 8.90
1492 8 39.270

7 55.4
57.3
0.6
2.2
2998 4.3
2998
7 59.96
+ 39.31
9 18.0
19.8
22.4
26.2
1157 29.3
1157
9 23.14
− 43.87
7 59.96
9 23.14
+ 39.31
− 43.87
~~83.18~~

83.18
1.92002
1.01891
2.93893
1.87495
8.93602
4 5557

5 7 46.72

M 35 54.10
M 37 9.28
R 37 9.12
R 37 8.98
M 37 8.95
37 9.08
74.98

45 52 25.7

3.18
9200 2
0189 1
9389 3
8749 5
360 2
557

2.25
2.15
4.40

Residuals $^{2}$ in δ between M and R.

| | $^{2}$ |
|---|---|
| May 5 | .25" |
| May 6 | .24 |
| " 7 | .16 |
| " 8 | .25 |
| " 11 | .19 |
| " 13 | .30 |
| " 14 | .24 |
| " 29 | .23 |
| " 31 | .24 |
| Jun 1 | .27 |
| " 2d | .20 |
| " 5 | 9 |
| " 8 | .14 |
| " 9 | .19 |
| " 17 | 4 |
| " 18 | 23 |
| " 19 | .24 |
| " 20 | .15 |
| " 21 | .29 |
| " 22 | 4 |
| 23 | 28 |
| | .194 |

$\frac{194}{39}$

$.233 = $ PE

$x = \sqrt{(.233)^2 - .10^2} = .210''$

$x = \sqrt{(.233)^2 - (.101)^2 - (.031)^2} =$

$\varepsilon_3 = .27$

$\varepsilon_1 = .10$

$x = \varepsilon_2$

$.27 = \sqrt{\varepsilon_1^2 + \varepsilon_2^2} = \sqrt{\varepsilon_1^2 + x^2}$

$.0729 = \varepsilon_1^2 + x^2$

$x^2 = .0729 - \varepsilon_1^2$

$x = \sqrt{.0729 - \varepsilon_1^2}$

$x = \sqrt{(.24)^2 - (.10)^2}$

$= 0.22''$