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KG
11366
v.620

Polar Catalogue
Observations and Reductions

From

List of stars observed for
Dr. Auwers
Dr. Elkins
Prof. Holden

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h m s
22 3 17
+80° 0′ 20″

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+88 16

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Dm. +83 287
h m s
22 9 46
+96° 37'

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29 H Camelop.
h m s
22 12 44
+95° 10

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Dm. +88° 60
h m s
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+91° 33'

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DM. +83° 630
h m s
22 21 30
+83° 54′

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32 H Camelop.
h m s
22 22 18
+85° 31'

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Dm. +85° 384

h m s
22 22 37
+85° 38'.

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Dm. +81° 775

h m s
22 23 46
+81° 10'

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Dm. +88° 131
h m s
22 24 0
+88° 50'

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Dm +81° 343
h m s
22 24 13
+98° 33'

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D M. +81° 349
h m s
22 31 40
+81° 54'

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Dm. +80° 731
h m s
22 39 0
+80° 44'

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Dm. +79° 750
h m s
22 40 30
+79° 49'

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DM. +82° 703
h m s
22 47 42
+82° 32'

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Dm +84° 577
h m s
22 53 50
+84 4 46

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36 H Cephei.
h = 9
22 53 17
+83° 44'

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Rod. 2894
4 2 3
23 0 46
+91° 44'

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4 m s
23 1 1
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D 1782
h m s
23 23 41
+98° 15'

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Dm. +86° - 170
h m s
23 26 54.
+93° 45'

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397 H. Cephei
h m s
23 27 30,
+66° 40'

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Dm. +89° 18

h m s
23 30 44
+91° 23'

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Dm +82° 743
h m s
23 50 49.
+82° 33'

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Dm +87° 389
α 23 54 18
δ +88° 31'

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Dm. +82° 748
h m s
23 54 18
+82° 20'

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G 1877
L = 9
23 58 57
+93° 14'

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Holden — log cos δ 9.90676 — DM +36° 3539

h m s log 15 cos δ time i 0.01899n

19 19 58

+36° 13' tang = +.73

1885 Z +36° 10 Sin z = +.11

July 21 m = −.15

C = .00

July 22 m = −12 — July 23 −17 — July 28 −14

20	31.5	+2.40	20	39.7	20	15.0	24.4	20	39.8	20	22.1	24.5	20	40.0	20	19.5	25.0	20	40.1
	33.7	26.6		42.0		16.9	26.9		42.5		24.2	27.2		42.5		21.2	27.4		42.8
	36.1	29.3		44.6		19.4	29.4		44.9		26.0	29.9		44.9		23.3	29.9		45.3
	38.3	32.0		47.2		21.6	32.3		47.4		27.5	32.3		47.4		25.3	32.5		47.9
	40.0	34.4 2926		49.7		23.6	34.8 2956		50.0		30.1	34.8 2974		50.0		26.8	35.0 2996		50.5
				52.3					52.5					52.7					53.0
		5.0		54.9		—	5.2		55.0		23.3	5.5		55.1	21	20.0	5.8		55.5
		7.5		57.4		—	7.8		57.7		25.2	8.0		57.6		22.2	8.2		58.2
		10.3		59.8		—	10.3		0.2		27.0	10.6		0.3		24.2	10.8		0.6
		12.7				—	12.8				28.6	13.0				26.4	13.3		
		15.3 10.16				—	15.5 10.32				31.2	15.8 10.58				28.2	15.9 10.80		
		9942					9988		4500			10032		4505			10076		4539
20	35.92	20 49710	20	49.733	20	1930	49.940		50.000	20	25.98	20 50.160	20	50.056	20	23.22	20 50.380	20	50.433
										21	27.06				21	24.20			

T'm			20 49.722					20 49.970					20 50.108					20 50.406	
K			−.019					−.019					−.019					−.019	
Tm+K			20 49.70					20 49.95					20 50.09					20 50.39	
NP-my			−48.17					−48.38					−48.48					−48.83	
n Tan δ			− .11					− .09					− .12					− .10	
a sec δ			.00					.00					.00					.00	
Red to App Place			−3.02					−3.02					−3.02					−3.02	
Sum			−51.30					−51.49					−51.62					−51.95	
M S T			19 58.40					19 58.46					19 58.47					19 58.41	
Red to 1875.0			− 21.519																
α 1875.0			19 36.881					36.941					36.951					36.921	

GR	51 50.33	+13.80	1.13988	52	8.55	+30.67	1.48671	52	1.25	+24.13	1.38256	52	3.56	+27.19	1.43441				
Ri	− 14.42		1.15887n		−32.04		1.50570n		−25.21	−36.95	1.56761n		−28.41	−33.79	1.52879n				
Com GR	51 35.91			51	36.51			51	36.04		1.40155	51	35.15		1.45340n				
											1.58660n				1.54778				
GR								50	56.96			51	0.23						
Ri									+ 38.60				+35.30						
Com GR								51	35.56			51	35.53						
δ 36°	31 12.44			31	11.84			31	12.31	31	12.81	31	13.20	31	12.82				
Z	+6 9 11			6	9 22			6	9 15	6	8 11	6	9 17	6	8 14				
n tang Z	0.79280				0.79310				0.79310		0.79180		0.79310		0.79180				
B-Z	− 21.71				− 9.54				− 8.90		− 8.90		− 20.44		− 20.44				
log Rf	0.77109				0.78356				0.78420		0.78290		0.77266		0.77136				
Rf	− 5.90				− 6.08				− 6.08		− 6.07		− 5.92		− 5.77				
Rmd	− .05				− .24				− .15		− .36		− .19		− .30				
Rs	+ .05				+ .06				+ .06		+ .03		+ .06		+ .03				
Sum	− 5.90				− 6.26				− 6.17		− 6.40		− 6.05		− 6.04				
Corrd								31	6.14	31	6.41	31	7.15	31	6.78				
Corrd 36°	31 6.54			31	5.58			31	6.28	31	6.41	31	6.96	31	6.78				
Rfy	− 17 18.00			−17	17.27			−17	17.70			−17	17.90						
Rd	− .11			−	.11			−	.11			−	.11						
R.S	− 17.55			−	17.84			−	16.12			−	18.68						
Sum	−17 35.66			−17	35.22			−17	35.93			−17	36.69						
36°	13 30.88			13	30.36			13	30.35			13	30.27						
	− .42				+.19				+.25				+.20						
13'	30.26				30.55				30.60				30.47						
Red 1875.0	68.43																		
δ 1875.0	12 21.83				22.12				22.17				22.04						

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9.90676

July 27 −.17 | July 28 −.16 | Aug. 4 −.10 | Aug. 6 −.19

July 27

20 (10.5 10.9 11.4 11.8) 25.2 27.8 30.2 32.8 35.4 30.280 +20.451 | 20 40.4 43.2 45.8 48.2 50.8 53.2 56.0 58.6 1.0

21 20.0 23.0 25.3 28.0 30.0

20 11.15 21 25.26 | 20 50.431 | 457.2 20 50.800

20 50.777
−.019
20 50.76
−49.12
− .12
.00
−3.02
−52.26
19 58.50

36.781

52 17.76 +39.63 1.59802
−41.40 −34.48 1.53757m
51 36.36 1.61701m
1.55656

50 59.70
+36.02
51 35.72

31 11.99 31 12.63

6 9 32 | 6 8 14
0.79330 | 0.79180
−563 | −563
0.78767 | 0.78617

−6.13 | −6.11
− .41 | − .31
+ .07 | + .03
−6.47 | −6.39
31 5.52 | 31 6.24
31 5.88

−17 17.65
− .11
− 19.23
−17 36.99

13 28.89
+.65
29.54

21.11

July 28

21 22.4 24.0 25.8 27.1 28.5 | 25.4 28.1 30.7 33.2 35.8 30.64 | 20 41.0 43.2 45.8 48.4 51.0 53.5 56.0 58.6 1.0

20 9.6 | 6.4 9.0 11.5 14.0 16.6 11.50

20 9.60 21 25.56 | 10214 20 51.070 | 4585 20 50.944

20 51.007
− .019
20 50.99
−49.47
− .12
.00
−3.01
−52.60
19 58.39

36.871

52 21.01 +41.41 1.61711
−43.29 −34.55 1.53845m
51 37.72 1.63610m
1.55744

50 59.52
+36.10
51 35.62

31 10.63 31 12.73

6 9 35 | 6 8 13
0.79340 | 0.79180
−1024 | −1024
0.78316 | 0.78156

−6.07 | −6.05
− .45 | − .31
+ .07 | + .03
−6.45 | −6.33
31 4.78 | 31 6.40
31 5.29

−17 15.92
− .11
− 19.50
−17 35.53

13 29.76
−29
29.47

21.04

Aug. 4

284

20 12.7 14.2 16.5 18.1 19.5 | 31.0 33.4 36.0 38.4 33.44 | 20 4.35 46.0 48.9 51.4 54.0 56.4 59.0 1.5 4.0

21 28.6 31.2 33.1 35.0 36.9 | 9.2 11.9 14.2 16.8 19.3 14.28

20 16.20 21 32.96 | 10772 20 53.860 | 484.7 20 53.856

20 53.858
−.019
20 53.84
−52.34
− .07
.00
−2.98
55.39
19 58.45

36.931

52 15.21 +37.66 1.57588
−39.35 −39.10 1.59218m
51 35.86 1.59487m
1.61117m

50 52.03
+40.85
51 32.88

31 12.49 31 15.47

6 9 29 | 6 8 6
0.79330 | 0.79170
−1799 | −1799
0.77531 | 0.77371

−5.96 | −5.94
− .37 | − .40
+ .02 | + .01
−6.31 | −6.33
31 6.18 | 31 9.14
31 7.66
9.11

−17 16.87
− .11
− 21.36
−17 38.34

13 30.77
29.7
−19
30.58

22.15

Aug. 6

20 14.0 15.0 16.0 17.0 18.3 | 29.8 32.2 34.5 36.8 39.3 34.52 | 20 44.6 47.0 49.3 52.2 55.0 57.3 59.7 2.4 5.2

21 25.3 27.2 30.0 32.0 33.9 | 10.0 12.8 15.3 18.0 20.6 15.34

20 16.06 21 29.68 | 10986 20 54.930 | 4957 20 55.078

20 55.009
−.019
20 54.99
−53.03
− .14
.00
−2.97
−56.14
19 [58.85]

[37.331]

52 12.58 +38.94 1.59040
−40.68 −34.68 1.54008m
51 31.90 1.60939m
1.55907

50 57.63
+36.23
51 33.86

31 16.45 31 14.49

6 9 26 | 6 8 12
0.79320 | 0.79180
−526 | −526
0.78794 | 0.78654

−6.14 | −6.12
− .40 | − .31
+.02 | + .01
−6.52 | −6.42
31 9.93 | 31 8.07
31 9.93

−17 17.80
− .11
− 21.86
−17 39.77

13 29.93
30.16
−.42
29.74

21.31

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Holden-

h m s
19 19 58
+ 86° 13'

1885 Aug. 8 −.11 Aug. 9 −.15 Aug. 11 −.07 Aug. 16 −.20

20	35.5	30.0	20	45.6	20	22.2	30.5	20	46.0	20	25.3	30.7	20	46.7	20	23.7	32.6	20	47.9
	36.9	32.8		48.2		24.3	33.2		48.6		28.0	33.8		49.2		25.2	35.0		50.4
	39.1	35.2		50.7		27.2	35.8		51.0		29.9	36.3		51.8		27.5	37.9		52.9
	40.9	37.7		53.2		29.2	38.5		53.6		30.7	38.9		54.2		30.0	40.2		55.5
	42.7	40.5 3524		55.8		30.9	41.0 3580		56.0		33.8	41.4 3622		56.8		31.6	42.8 3770		58.0
				58.2					58.7					59.3					0.7
21	22.8	11.0		0.7	21	27.4	11.4		1.4			12.0		1.8	21	29.1	18.2		3.2
	24.9	13.6		3.3		28.8	13.8		3.8			14.7		4.4		31.1	15.8		5.7
	27.5	16.2		5.9		30.4	16.4		6.5			17.1		7.0		33.2	18.5		8.2
	29.7	19.0				32.0	19.0					19.6				35.3	20.8		
	31.4	21.3 1622					21.5 1642					22.1 1710				37.5	23.8 1842		
		11146		5016			11222		5056	20	29.54	18332		5112			11612		5225
20	39.02	20 55.730	20	55.733	20	26.76	20 56.110	20	56.178			20 56660	20	56800	20	27.60	20 58060	20	58056
21	27.26				21	29.65									21	33.24			

T_m			20	55.732				20	56144					20	56730				20	58056
K				−.019					−.019						−.019					−.019
$T_m + K$			20	55.72				20	56.12					20	56.71				20	58.04
ΔT_{4m}				−5411					−5453						−5530					−5662
Mean				−.08					−.11						−.05					−.15
Sec				.00					.00						.00					.00
Red to 1885 Plan				−2.95					−2.94						−2.92					−2.88
Sum				−57.14					−57.58						−58.27					−59.65
α 1885.0			19	58.58				19	58.54					19	58.44				19	58.39
Red to 1875				−21.519																
α 1875.0			19	37.061					37.021						36.921					36.871

GR	51	5045	+16.71	1.22298	52	422	+29.38	1.46805	52	57.10 (0.60)	+27.19	1.43441	52	1.72	+30.46	1.48378			
Ri		−1746	−31.53	1.49872m		−3069	−33.51	1.52517m		−28.41		1.45340m		−3182	−35.18	1.54630m			
	51	3299		1.24197m	51	33.53		1.48704m	51	2849			51	29.90		1.50272m			
				1.51771				1.54416m		31.19						1.56529m			
GR	50	5945			50	5771							50	5265					
Ri		+3294				+3501								+3675					
	51	3239			51	3272							51	2940					
S	31	15.36	31	15.96	31	14.82	31	15.63	31	19.66			31	18.45		18.95			
Z	6° 9' 4"		6° 8' 13"		6° 9' 18"		6° 8' 12"		6° 9' 11"				6° 9' 16"		6° 8' 7"				
	0.79280		0.79180		0.79310		0.79180		0.79290				0.79310		0.79170				
	−491		−491		−642		−642		−1462				−510		−510				
	0.78789		0.78689		0.78668		0.78538		0.77818				0.78790		0.78660				
	−6.14		−6.12		−6.12		−6.10		−6.00				−6.14		−6.12				
	−.07		−.26		−.22		−.29		−.19				−.24		−.32				
	.00		.00		.00		.00		.00				−.02		−.01				
	−6.21		−6.38		−6.34		−6.39		−6.19				−6.40		−6.45				
	31 9.15	31 9.58			31 8.48	31 9.24			31 13.47				31 12.05	31 12.40					
	31 9.36				31 8.86								31 12.22						
	−17 17.37				−17 16.27				−17 16.60				−17 19.02						
	− .11				− .11				− .11				− .11						
	− 22.36				− 22.60				− 23.08				− 24.00						
	−17 39.84				−17 38.98				−17 39.79				−17 43.13						
	13 29.52				13 29.88				13 33.68	−3.50			13 29.09						
	− .19				− .33				30.18				+ .54						
	29.33				29.55				− .21				29.63						
Red 1875	−6.43								29.97										
S 1875.0	20.90				21.12				21.54				21.20						

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Aug. 16 – 18

20	51.0	33.0	20	48.2	20	26.7	34.3	20	49.4
	52.5	35.4		50.7		30.0	36.8		52.0
	54.4	38.0		53.3		32.2	39.3		54.5
	56.7	40.4		55.6		34.6	42.0		57.0
	58.8	43.0 3796		58.4		36.0 3190	44.6 3940		59.6
				0.8					2.0
21	27.7	13.7		3.4	20	41.0	15.0		4.8
	30.0	16.2		6.0		43.8	18.0		7.7
	32.0	18.8		8.5		46.2	20.0		10.0
	34.6	21.3				47.3	22.6		
	36.0	23.718 74				49.7 4560	25.320 18		
		11 670		5249	21	26.5	1958		5370
20	54.68	20 58.350	20	58.322		28.3	20 59.790	20	59.667
21	32.06					30.3			
						32.1			
						34.5 3034			

Aug. 20 – 14

Holden's Star 1885.0

	h	m	s		°	′	″		″
July 21	19	19	58.40	–.062	+36	13	30.3	+.31
22			58.46	–.032			30.6	+.61
23			58.47	+.008			30.6	+.61
25			58.44	–.022			30.5	+.51
27			58.50	+.038			29.5	–.49
28			58.39	–.072			29.5	–.49
Aug 4			58.45	–.012			30.6	+.61
6							29.7	–.29
8			58.58	+.118			29.3	–.69
9			58.54	+.078			29.6	–.39
11			58.44	–.022			30.0	+.01
15			58.39	–.072			29.6	–.39
16			58.46	–.002			30.3	+.31
20			58.48	+.018			29.7	–.29
Mean	19	19	58.462		+36	13	29.99	
			$2\sigma = \pm .035$				$2\sigma = \pm .38''$	

	h	m	s		°	′	″
Mean 1875.0	19	19	36.943		+36	12	21.56

20	58.336				20	59.728		
	–.019					–.019		
20	58.32				20	59.71		
	–56.86					–58.31		
	–.13					–.10		
	–2.87					–2.82		
	–59.86					61.23		
19	58.46				19	58.48		
	7							
	36941					36961		

Approximate place for 1880 =

	h	m	s		°	′	″
	19	19	48.46		+36	13	14.49

$m = 3.07224^{s}$ $\log m = 0.12611^{s} = 1.30220''$

51	32.28	+3.66	0.56348	52	0.42	+.2783	1.44451	
	–3.82	–33.72	1.52789n		–29.07	+.1413	1.15014	
51	28.46		0.58247	51	31.35	–.3061	1.48586n	
			1.54688n				1.46380n	
							1.16913n	
50	53.19			51	44.52		1.50485	
	+35.23				–14.76			
51	28.42			51	29.76			
	31 1989	31 19.93		50	54.92	31 17.00	31 18.59	31 21.45
					+31.98			
	6 8 46	6 8 7		51	26.90	6 9 14	6 8 58	6 8 9
	0.79250	0.79170				0.79290	0.79260	0.79170
	–215	–215				–496	–496	–496
	0.79035	0.78955				0.78794	0.78764	0.78674
	–6.17	–6.16				–6.14	–6.13	–6.12
	–.01	–.30				–.20	–.05	–.24
	–.07	–.01				–.04	–.02	–.02
	–6.20	–6.47				–6.38	–6.20	–6.38
31	13.69	31 13.46				31 10.42	31 12.39	31 15.07
31	13.58					31 ~~12.69~~ 13.73		
–17	19.00					–17 18.36		
	–.11					–.11		
	–24.22					–25.09		
17	43.33					–17 43.56		
13	30.25					13 29.13		
	+.08					30.17		
	30.33					–.44		
						29.73		
	21.90					21.30		

h	m	s		°	′	″		
19	19	48.46		+36	13	14.49		
289° 57′ 7″								
sin α							cos α	
tan δ							n cos α	
n tan δ sin α								
9.97309n							9.53305	
9.86476							0.83526	
9.96396n							+6.843	
–.92036								
+2.15188								

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Elkin log cos δ 9.95994 Weiss III 6 15

h m s 15 constants 5.07040m

3 30 29

+24° 14' Long δ +45 +1.10

+18 9

Jan 10 Sun 2 +.31 Jan 14 Jan 17 Jan 18

Er

30	(23.5 27.4)		30	24	(23.5 27.4)	30	19.5	13.2	30	26.9	30	13.3	14.7	30	28.0	30	5.9	15.0	30	28.4
	28.5				28.9		22.7	15.7		29.0		16.2	16.9		30.4		7.7	17.1		30.7
	30.4				31.0		24.2	17.9		31.3		18.3	19.0		32.5		9.4	19.5		32.9
					33.4		25.7	20.1		34.0		20.2	21.2		35.1		10.8	21.7		35.0
					35.7		27.5	22.2	17.82	36.2		21.4	23.5	19.06	37.3		13.0	23.9	19.44	37.4
					38.0					38.3					39.5					40.0
31	5.3	49.3			40.9			49.2		40.4			50.5		41.7			50.9		42.4
	6.3	51.5			42.6			51.5		42.6			52.8		44.3			53.0		44.3
	9.4	53.7			44.7			53.9		45.0			55.1		46.7			55.4		46.4
	11.8	56.0						56.0					57.4					58.0		
	14.0	58.4	53.78					58.6	63.84				59.9	55.74				0.2	55.50	
		[0.4]	18094																	
30	27.95				3207			7166		32.37			7420		3355			7494		3375
31	9.36	30	35.686	30	35.633	30	23.92	30	35.830	30	35.967	30	17.88	30	37.107	30	37.278	30	9.36	30	37.470	30	37.500

Sub. 1s

R.A			30	35.651					30	35.898					30	37.189					30	37.485
K				− .017						− .017						− .17						− .019
RA+K			30	35.63					30	35.88					30	37.17					30	37.47
ΔT+m				− 4.15						− 5.48						− 6.65						− 7.06
m Sun				+ .24						+ .29						+ .26						+ .25
c sec δ				− .02																		
2'-α				− 1.34						− 1.31						− 1.27						− 1.25
Sum				− 5.27						− 6.50						− 7.66						− 8.06
R.A			30	30.36					30	29.38					30	29.51					30	29.41
				29.																		

+7.7

GR	51	2208	− 33.71	1.52776	51	1.36	+ 11.98	1.07846	51	11.46	+19.31	1.28578	51	20.47	+ 28.12	1.44902					
Rin	+	89.64		1.59816		− 14.09		1.14886		− 22.71		1.35618		− 33.07		1.51942					
	52	1.72			50	47.27			50	48.75			50	47.40							
	+24																				
	30	49.63			+24	32 1.08			31	59.60			32	0.95							
		7.18																			
Z	+18	9 32			+18	9 11			+18	9 21			+18	9 30							
Log Z	1.27610				1.27600				1.27600				1.27610								
Sin Z	+	3.76			+	3602			+	2117			+	3510							
Log R	1.30786				1.31202				1.29717				1.31120								
Ref	−	20.82			−	20.51			−	19.82			−	20.47							
Rad	−	.23			−	.03			−	.07			−	.16							
Rns		00				00				00				00							
Sun	−	20.55			−	20.54			−	19.89			−	20.64							
S	+24	30	20.08			31 40.54				31 39.71				31 40.31							
		0																			
R	−	18	9.85		−	18	8.95		−	18	9.60		−	18	9.92						
Ref 2	−		.43		−		.42		−		.42		−		.42						
Sun	+		2.11		+		2.14		+		2.20		+		2.23						
Sun	−	18	8.17		−	18	7.23		−	18	7.82		−	18	8.11						
+24	12	17.91			13	33.31			13	31.89			13	32.20							

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Jan 19 | Jan 21 | Jan 26 | Jan 29

Jan 19	Jan 21	Jan 26	Jan 29
30 52.8	30 34.7	30 29.3	30 26.0
55.6	37.6	383	27.7
57.5	39.5	38.3	29.4
59.0	41.6	~~44.9~~ ~~37.4~~	31.0
	43.8	38.6 36.3	32.4
		38.2 38.3	
		38.5 40.8	
		~~38.9~~ ~~43.4~~	
30 57.6			
53.9			
50.4			
52.4			
0.7 56.20			
−18.094			
30 56.22	30 38.106	30 37.70 .98	30 39.44
		30 38.054	30 38.206
		− .017	
		30 38.04	
		− 7.30	
		+ .33	
		− 1.23	
		− 8.20	
		30 29.84 .49	
		57.70	
		30 38.054	
		− .017	
		30 38.04	
		− 7.30	
		+ .33	
		− 1.23	
		− 8.20	
		30 29.84 .49	

Jan 19	Jan 21	Jan 26	Jan 29
30 16.4	30 30.0	30 9.2	30 30.9
18.7	32.2	11.0	33.3
20.9	34.3	13.4	35.3
23.2	36.7	15.4	37.5
25.7 20.98	38.9	17.2	39.6
	41.5		41.9
52.4	43.6	53.8	44.1
54.9	45.9	55.5	46.1
57.0	48.2	58.0	48.9
59.4		0.3	
1.6 57.06		2.2 57.96	
30 29.30	30 39.020	30 39.033	30 13.24
	30 39.026		30 39.849
	− .017		− .017
	30 39.01		30 39.83
	− 8.93		− 9.50
	+ .37		+ .24
	+ .03		+ .11
	− 1.12		− 1.08
	− 9.65		− 10.23
	30 29.36		30 29.60
	30 39.026		30 39.849
	− .017		− .017
	30 39.01		30 39.83
	− 8.93		− 9.50
	+ .37		+ .24
	+ .03		+ .11
	− 1.12		− 1.08
	− 9.65		− 10.23
	30 29.36		30 29.60

Jan 19	Jan 21	Jan 26	Jan 29
50 27.25 −18.17	1.259352 51 24.05 − 1.01	0.804322 51 29.30 + 9.73	0.98811 51 51.02 +26.61
+ 21.37	1.32976 + 1.19	0.07472 − 11.44	1.05851 − 31.29
50 43.62	51 25.24	57 17.86	51 19.73
32 2.73	31 23.11	31 30.49	31 28.62
+18 8 34	+18 8 58	+18 9 3	+18 9 25
1.27570	1.27590	1.27590	1.27610
+ 3784	+ 2786	+ 2814	+ 4701
1.31354	1.30826	1.30404	1.32311
−20.58	−20.10	−20.14	−21.04
− .07	− .80	− .02	− .15
− .00	− 01	− 01	− 02
−20.65	−20.11	−20.17	−21.21
31 42.08	31 3.00	31 10.32	31 7.41
−18 10.48	−17 38.48	−17 37.87	−17 35.72
− .42	− .41	− 10	− 39
+ 2.26	+ 2.32	+ 2.45	+ 2.46
−18 8.64	−17 36.57	−17 35.82	−17 33.65
13 32.44	13 26.43	13 34.50	13 33.76

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1885 Elkin

h m s
3 30 29
+24° 14'

Jan 31

30	18.6	16.7	30	30.6	
	20.6	19.2		32.7	
	22.4	21.3		35.0	
	25.1	23.8		37.2	
		26.0	21.40	39.6	
				41.8	
		53.0		44.0	
		55.3		46.2	
		57.8		48.6	
		0.1			
		2.1	57.66		
		7906		3557	
30	21.68	30 39.530		30 39.522	

	30	39.526
	−	.017
	30	39.51
	−	9.49
	+	.34
	−	1.06
	−	10.21
	30	29.30

h	m	s
3	30	29.36
		29.38
		29.51
		29.41
		29.49
		29.54
		29.36
		29.61
		29.30
		396
3	30	29.440

.51	42.96	+17.85	1.25164
	− 20.99		1.32204 m
	51 21.97		
+24	31 26.38		
+8	9 17		
	1.27610		
	+ 3016		
	1.30626		

	−20.24		
	− .07		
	− .02		
	−20.33		
	31 6.05		
−17	35.07		
	− .34		
	+ 2.47		
−17	32.99		
	13 33.06		

	°	'	"
+24	13	33.31	
		31.89	
		32.20	
		32.44	
		33.50	
		33.76	
		33.06	
		2016	
+24	13	32.88	

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1885phae.proj.1624.

1885 Elkin 9.95279 9.95279 Wurm III 881

h m s
3 41 22
+26° 14'
+ 16 9

0.06325n
+ .49 +h11
+ .28

Jan 8 Jan 19 Jan 21 Jan 29

Jan 8			Jan 19			Jan 21			Jan 29		
41 44.7			41 18.3	41 31.2		41 24.7	41 43.7		41 48.4	10.2	41 23.6
49.2			20.6	33.5		24.0	46.3		50.8	12.2	25.9
53.4			22.7	34.4		26.0	47.7		53.3	14.5	28.3
			25.1	36.0		28.3	49.3		55.5	17.0	30.6
			27.7	37.3		30.6	51.0		57.3	19.0 14.58	33.0
			29.7			33.2				+18.395	35.3
	41.0		32.2			35.6		45.3		46.3	37.5
	43.7		34.4	44.4		37.8		47.4			40.0
	46.1		36.7	47.0		40.0		49.7	41 31.2 40.4		42.2
	48.5			49.4				52.0			
	50.8	46.020		52.0		49.360		54.3	49.440		
		-18395		54.0		-18395			-18395		
		2474				2772					2964
41 49.10	41 27.625		41 27.489	41 34.48	41 30.965	41 30.800	41 47.60	41 31.345	41 31.200	41 53.06	41 32.975	41 32.933

41 27.541	41 30.855	41 31.321	41 32.967
− .017	− .017	− .017	− .017
41 27.52	41 30.84	41 31.30	41 32.95
− 4.03	− 7.30	− 7.79	− 9.50
+ .39	+ .36	+ .27	+ .26
			+ .11
− 1.44	− 1.32	− 1.29	− 1.17
− 5.08	− 8.26	− 8.81	− 10.30
41 22.41	41 22.58	41 22.49	41 22.65

h	m	
3	41	22.44
		22.58
		22.49
		22.65
		216
3	41	22.54

49 5805	−2156	1.38365	50 20.83 2.08	−362	0.55871	50 3645	−1628	1.21165	50 3569	−2009	1.30298
+ 24.94		1.39690	+ 4.19		0.62196	+ 1883		1.27490	+ 23.24		1.36623
50 22.99			50 26.27			50 5528			50 58.93		
+26° 32 25.36			32 22.08			31 53.07			31 49.42		
+16 8 8			+16 8 32			+16 8 10			+16 8 10		
1.22160			1.22180			1.22170			1.22170		
+ 3184			+ 3832			+ 2786			+ 4705		
1.25344			1.26012			1.24956			1.26875		
−17.92			−18.20			−17.76			−18.57		
− .10			− .01			− .06			− .09		
− .00			− .00			− .01			− .01		
− 18.02			− 18.21			− 17.83			− 18.67		
+26° 32 7.34			32 3.87 5.12			31 35.24			31 30.75		+26 13 57.61
											57.44
											58.61
											56.95
−18 11.48			−18 10.48			−17 38.48			−17 35.72		2.961
− .39			− .37			− .37			− .36		
+ 2.14			+ 2.14			+ 2.22			+ 2.28		
−18 9.73			−18 8.68			−17 36.63			−17 33.80		+26 13 57.40
+26 13 57.61			+26 13 55.19 56.44			13 58.61			13 56.95		

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1885phae.proj.1624.

1885 Elkin 9.96848 DM +21° 530

h m s
3 41 55
+21° 34'
+20 49
Jan 22

+.40 +1.08
+.36

Jan 29

42 33.8
34.7
22.0

42 19.6
21,3
22.0

A.

8.4
8.4
10.8
13.4

41 55.2 4.1
57.4 4.1
59.6 4.0
2.4 4.6
=
8.4 4.0
10.8 4.1
13.4 4.5

18.8
42 21.0
23.3
25.3
27.7 23.220
−17.742

42 34.25 42 4.208 42 2.097 42 5.478

h m s
3 41 55.39
55.17
56
3 41 55.28

42 4.208
− .017
42 4.18
− 7.86
+ .26
− 1.19
− 8.79
41 55.39

42 5.478
− 017
42 5.46
− 9.50
+ .22
+ 11
− 1.12
− 10.29
41 55.17

30 0.08 − 30.05 1.47784n 30 18.48 − 15.49 1.19005n
+ 36.04 1.55678 + 18.58 1.26899
30 36.12 30 37.06

+21 52 12.23 52 17.29

+20 47 34 +20 47 52
1.33970 1.33990
+ 5467 + 4705
1.39437 1.38695

−24.80 −24.38
− .17 − .04
− .00 − .00
−24.97 −24.42

+21 51 47.26 51 46.87

°
+21 34 13.26
14.56
782
+21 34 13.91

−17 37.25 −17 35.72
− 48 − 46
+ 3.73 + 3.87
−17 34.00 −17 32.31
+21 34 13.26 34 14.56

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1885phae.proj.1624.

1885 Elkéw 9.96305 Weiss III 1090

h m s
3 52 13
+23° 18'
+19 5
Jan 8

5.37351
+.43 +1.09
+.33

Jan 10
No. Obs.

Jan 14

Jan 17

51	49.0		55.7	52	9.2	51	51.8		57.0	52	10.6	52	54.5		58.3	52	11.7
	50.6		57.9		11.3		53.7		59.3		12.9		56.2		0.7		14.0
	51.8		0.2		13.5		55.2		1.7		15.2		57.8		3.0		16.3
	53.3		2.5		15.9		56.7		3.8		17.3		59.4		5.0		18.5
	54.9		4.6	018	18.2				6.0	1.56	19.5		1.1		7.3	2.86	20.7
					20.2						21.8						22.9
			31.7		22.7				33.0		24.1				34.2		25.3
			33.8		25.0				35.2		26.3				36.4		27.6
			36.0		27.3				37.5		28.4				38.6		29.7
			38.2						39.8						41.0		
			40.4	3602					42.0	37.50					43.3	38.70	
			3620		1633				3906		1761				4156		1867
51	51.92	52	18.100	52	18.15 44	51	54.35	52	19.530	52	19.567	51	57.80	52	20.780	52	20.744

52 18.122
− .017
52 18.10

− 4.04
+ .34

− 1.43
− 5.13
52 12.97

52 19.548
− .017
52 19.53

− 5.49
+ .28

− 1.39
− 6.60
52 12.93

52 20.762
− .017
52 20.74

− 6.65
+ .25

− 1.36
− 7.76
52 12.98

47 2.15 +26.20 1.41830
− 31.03 1.49181m
46 31.12

+23 36 17.23

+19 5 12
1.29940
+ 3229
1.33169

− 2146
− .13
− 00
− 21.59

+23 35 55.64

− 18 11.48
− .46
+ 3.49
− 18 8.45
+23 17 47.19

47 3.36 +25.20 1.40140 no δ mad. +22.96 1.36097
− 29.85 1.47491m 1.43448m
46 33.51

36 14.84

+19 5 13
1.29940
+ 36 52
1.33592

− 21.67
− .12
− .00
− 21.79

35 53.05

− 18 8.95
− .45
+ 3.51
− 18 5.89
+23 17 47.16

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1885phae.proj:1624.

1885 Elkin 9.96305

h m s
3 52 13
+23° 18'

Jan 18 | Jan 19 | Jan 21 | Jan 22 No Obs.

58.8	52 21.2 12.2	51 52.8	58.8	52 12.4	51 54.5	59.4	52 12.9				
0.8	21.3 14.6	55.0	1.3	14.6	56.8	1.6	15.2				
3.3	21.3 —	56.7	3.4	17.0	58.8	4.0	17.3				
5.5	19.1	58.3	5.6	19.2	0.3	6.1	19.6				
7.8	324 21.2 21.2	0.6	7.9	3.40 21.2	1.8	8.4	3.90 21.8				
				23.4			24.1				
34.7			34.8	25.6		35.5	26.3				
36.8			37.0	28.1		37.5	28.5				
39.1			39.4	30.3		39.9	30.8				
41.4			41.5			42.0					
44.0	39.20		44.0	39.34		44.3	39.84				
4244	10		4274	1918		4374	1965				
52 21.220	52 21.250	51 56.68	52 21.370	52 21.311	51 58.44	52 21.870	52 21.833				

52 21.229	52 21.341		52 21.852
— .017	— .017		— .017
52 21.21	52 21.32		52 21.83
— 7.09	— 7.30		— 7.80
+ .24	+ .31		+ .24
— 1.34	— 1.33		— 1.29
— 8.19	— 8.32		— 8.85
52 13.02	52 13.00		52 12.98

Sun's

41 41.18		46 59.52	+ 24.66	1.39199	47 26.25	+ 23.41	1.36940	
		— 29.21		1.46550n	— 27.73		1.44291n	
		46 30.31			46 58.52			
+23°		36 18.04			35 49.83			
		+19 5 9			+19 5 0			
		1.29940			1.29930			
		+ 3880			+ 2835			
		1.33820			1.32765			
		—21.79			—21.26			
		— .12			— .10			
		— 02			— 02			
		— 21.93			— 21.38			
		+23° 35 56.11			35 28.45			
		—18 10.48			—17 38.48			
		— 44			— 44			
		+ 3.63			+ 3.68			
		—18 7.29			—17 35.24			
		17 48.82			17 53.21 48.			

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Jan 26 — Jan 29 — Jan 31

51 55.0	0.4	52 13.9	52 16.3	1.3	52 14.8	51 59.3	1.0	52 14.2	
56.6	2.6	16.0	18.0	3.5	17.0	1.2	3.4	16.5	
58.4	4.9	18.2	20.1	5.7	19.1	2.8	5.3	18.7	
0.1	7.3	20.4	22.0	8.4	21.1	4.7	7.4	20.9	
1.8	9.2 4880	22.9	23.3	10.1 574	22.6	6.5	9.8 538	23.0	
	+17965	25.2			25.3			25.4	
		27.5			27.0		36.5	27.8	
		29.4		39.3 41.1	30.3		39.0	29.7	
		31.8			32.7		41.1	32.0	
				43.8 41.6			43.6		
				46.0 41.5			45.7 41.18		
				41.40					
		2053		474	2099		4656	2082	
51 58.38	52 22.845	52 22.811	52 19.94	52 23.370	52 23.322	52 2.90	52 23.280	52 23.133	

			l	m	s
52 22.822	52 23.446 (322)	52 23.207	3	52	12.97
− .017	− .017	− .017			12.93
52 22.80	52 23.431	52 23.19			12.98
					13.02
− 8.98	− 9.50	− 9.49			13.00
+ .36	+ .23	+ .32			12.98
+ .03	+ .11				12.99
− 1.22	− 1.18	− 1.16			12.97
− 9.81	− 10.34	− 10.33			12.86
52 12.99	52 13.10 12.99	52 12.86			870
			3	52	12.97

47 32.62	+24.44	1.38810	47 11.30	+3.51	0.54531	47 30.80	+20.31	1.30771	
− 28.95		1.46161n	− 4.16		0.61882n	− 24.06		1.38122n	
47 3.67			47 7.14			47 6.74			
+23 35 44.68			35 41.21			35 41.61			
+19 5 7			+194 45			+19 5 5			
1.29930			1.29920			1.29930			
+ 2869			+ 4708			+ 3095			
1.32799			1.34628			1.33025			
− 21.28			− 22.20			− 21.39			
− .11			− .00			− .08			
− .02			− .02			− .02			
− 21.41			− 22.22			− 21.49			
35 23.27			35 18.99			35 20.12			
−17 37.87			−17 35.72			−17 35.07			
− .43			− .42			− .42			
+ 3.75			+ 3.73			+ 3.73			
−17 34.55			−17 32.41			−17 31.76			
17 48.72			17 46.58			17 48.36			

°	′	″
+23	17	47.19
		47.16
		48.82
		48.21
		48.72
		46.58
		48.36
		5504
+23	17	47.86

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1885phae.proj.1624.

1885 Anwers. log as δ 9.96157 17 Tauri

h m s log 15 cos δ sin 1 0.07203n
3 37 56
+23° 45' tan δ Sec δ +.44 +1.09
Σ = +18 37
Jan. 10 n = +53 Sin 2 = +32 Jan. 14 +64 Jan. 18 +56 Jan. 19 +73
c = -.02

37	54.2	45.6	37	59.1	37	49.6	46.7	38	0.5	37	43.8	46.4	38	1.6	37	44.6	48.7	38	2.0
	56.5	48.0		1.3		52.2	49.3		2.6		46.4	50.7		4.2		46.8	51.0		4.4
	58.0	50.3		3.6		54.4	51.5		4.9		47.9	52.9		6.4		49.1	53.2		6.6
	59.7	52.3		6.0		56.2	53.6		7.0		49.6	55.1		8.7		51.4	55.3		8.8
	1.7	54.8	50	20	8.2		57.8	55.9	51	40	9.3		51.6	57.4	52	50	11.0		53.5	57.9	53	22	11.2
					10.3						11.6						13.2						13.4
		21.7			12.7			22.8			13.8			24.4			15.6			24.6			15.5
		24.0			14.9			25.0			16.0			26.7			17.6			26.8			17.8
		26.1			17.2			27.3			18.4			29.0			20.0			29.0			20.2
		28.4						29.5						31.2						31.3			
		30.7	26	18				31.8	27	28				33.5	28	96				33.6	29	06	
		1638			73.3			1868			84.1			21.46			98.3			2228			99.9
37	58.02	38	8.190	38	8.144	37	5404	38	9.340	38	9.344	37	4786	38	10.730	38	10.922	37	4908	38	11.140	38	11.100

T			38	8.167					38	9342					38	10.826			38	11.120	
K				-.017						-.017						-.017				-.017	
			38	8.15					38	9.32					38	10.81			38	11.10	
ΔT + m				-4.13	3					-5.48	7					-7.07	6			-7.30	
η tan δ				+.23						+.28						+.25				+.32	
c sec δ				-.02																	
ε' sin				-1.36						-1.32						-1.28				-1.26	
Sum				-5.30	28					-6.52	1					-8.09	272			-8.24	
R.A.			38	2.85	7				38	2.80	1									2.86	

19	27.80	+10.15	1.00647	19	34.64	+15.30	1.18469	19	45.28	+22.94	1.36116	19	44.32	+22.04	1.34321				
	11.98		1.07850n		18.06		1.25672n		27.11		1.43319n		26.02		1.41524n				
19	15.82			19	16.58			19	18.17			19	18.30						
+24	3	32.53			3	31.77			3	30.18			3	30.05					
+18	37	38		+18	37	45		+18	37	55		+18	37	54					
	1.28790				1.28800				1.28810				1.28810						
	+3176				+3615				+3518				+3808						
	1.31966				1.32415				1.32328				1.32618						
	-20.88				-21.09				-21.05				-21.19						
	-.02				-.05				-.10				-.09						
	+.00				+.00				-.05				-.05						
	-20.90				-21.14				-21.10				-21.33						
+24	3	11.63			3	10.63			3	9.08			3	8.72					
	-18	10.10			-18	9.52			-18	9.50			-18	10.74					
	-	.44			-	.44			-	.43			-	.43					
	+	27.47			+	27.69			+	27.4			+	27.5					
	-18	7.82	7		-18	7.87			-18	7.14			-18	8.42					
+23	45	3.81			45	3.76			45	1.84			45	0.30					
		3.76																	

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Jan. 21 +.56 | Jan. 22 +.66 | Jan. 26 +.53 −.03 +.03 | Feb. 5 +.95

37	42.9	49.1	38	2.7	37	46.4	49.5	38	2.8	37	44.2	50.1	38	3.6	37	52.5	51.4	38	4.7
	44.9	51.4		4.9		48.3	51.6		5.0		46.0	52.2		5.8		54.1	53.6		7.0
	46.9	53.7		7.1		49.8	53.8		7.4		48.2	54.6		8.0		57.0	55.9		9.2
	48.7	56.0		9.5		50.7	56.3		9.8		49.7	56.7		10.3		58.5	58.0		11.5
	50.3	58.2		11.6		51.8	58.4		12.0		51.6	59.2		12.5		0.0	0.4		13.8
				13.9					14.1					14.9					16.0
		25.0	38	16.0	38	6.0	25.5		16.3			26.0		17.2			27.2		18.2
		27.4		18.4		8.2	27.5		18.6			28.3		19.3			29.5		20.3
		29.6		20.6		10.0	29.8		20.8			30.5		21.5			31.7		22.8
		31.8				11.4	32.0					32.8					34.0		
		34.2				13.0	34.4					35.2					36.3		

		23.28		104.7			23.76		106.8			25.12		113.1			27.60		123.5
37	46.74	38	11.640	38	11.633	37	4940	38	14.880	38	11.867	37	47.94	38	12.560	38	12.564	37	56.42	38	13.800	38	13.722
						38	9.72																

38 11.636
− .017
38 11.62
− 7.79
+ .25
− 12.4
− 8.78
2.84

38 11.874
− .017
38 11.86
− 7.82
+ .29
− 1.22
− 8.79
3.07

38 12.564
− .017
38 12.55
− 8.98 7 +.04
+ .36 −.01
+ .03
− 1.17
− 9.75
2.80 +.03
2.83

38 13.761
− .017
38 13.74
− 10.19
+ .33
− 1.03
− 10.89
2.85

26	1838	+2490	1.39620	19	52.00	+2247	1.35160	20	17.84	+2462	1.39129	20	14.60	+1734	1.23905				
−	29.39		1.46823	−	2.54	+	2.15		0.33244			−	29.06			−	20.47		1.31108
19	48.99			19	49.46			19	48.78		1.46332	19	54.13						
2	59.36			2	58.89			2	59.57			2	54.22						
+18	37.52			+18	37.26			+18	37.82			+18	37.49						
	1.28810				1.28790				1.28810				1.28800						
	+ 27.61				+ 54.68				+ 28.28				+ 14.93						
	1.31571				1.34258				1.31638				1.30293						
	− 20.69				− 22.01				− 20.72				− 20.79						
	− .13				− .50				− .13				− .06						
	− .00				− .05				− .50				− .00						
	− 20.82				− 22.06				− 20.85				− 20.15						
2	38.54			2	36.83			2	38.72			2	34.04						
−17	38.0			−17	37.40			−17	38.28			−17	33.25						
−	.43			−	.42			−	.42			−	.39						
+	2.79			+	2.81			+	2.90			+	3.19						
−17	35.64			−17	35.01			−17	35.80			−17	30.45						
45	2.90			45	1.82				2.92			45	3.62						

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1885 Anwers. 9.96157 25 Jauri

h m s
3 40 32
0.07203

+23° 45'
+18 37
+53
−02

+44 +1.09
+.32

Jan. 10 Jan. 14 +64 Jan. 17 +58 Jan. 18 +56

40	32.8		2.2	40	35.3	40	33.6			40	36.6	40	14.6	24.0	40	37.6	40	19.5	24.6	40	38.0		
	35.8		4.5		37.4		35.8				38.8		16.3	26.3		39.8		21.2	26.9		40.2		
	37.8		6.7		39.7		37.0				40.9		17.6	28.6		42.2		22.3	29.0		42.5		
	38.7		9.0		42.0		38.3				43.0		19.2	30.8		44.3		23.6	31.2		44.9		
	40.7		11.3		44.3		40.2				45.5		21.4	33.0	28 54	46.5		24.9	33.6	29.06	47.0		
					46.5						47.7				18.026	48.8					49.3		
			57.8		48.8	41	14.2		59.0		50.0					51.2			0.5		51.7		
			0.1		51.0		16.2		1.3		52.2					53.4			2.7		53.9		
			2.3		53.3		17.6		3.7		54.5					55.8			5.1		56.2		
			4.9				19.5		5.9										7.4				
			7.0	2.42			21.3		8.0	3.58									9.6	5.06			
				18.026						18.026													
	16				39 83	40	36 98				40 92					41 96			94 12		42 37		
40	37.76	40	44.394	40	44.256	41	17.76	40	45.554	40	45.467	40	1.782	40	46.566	40	46.622	40	2.230	40	47.060	40	47.078

40 44.302
−.017
40 44.29
−4.153
+.23
−.02
−1.338
−.530
40 38.98

40 45.496
−.017
40 45.48
−5.498
+.28
−1.384
−.654
38.94

40 46.603
−.017
40 46.59
−6.654
+.26
−1.30
−7.68
38.91

40 47.069
−.017
40 47.05
−7.07
+.25
−.129
−8.11
38.94

19 33.10 +7.14 0.85370
− 8.43 0.92573
19 24.67

+24 3 23.68

+18 3743
1.28800
+3176
1.31976

−20.88
−.01
+.00
−20.89

+24 3 2.79

−18 10.10
−.44
+2.861
−18 [illegible]73
+23 44 5511
5506

19 34.62 +8.42
−32.26

18 47.52

−18 9.52
−.44
+2.83
18 [illegible].13
44 55.39

20 2.38

24 3 56.52

−18 10.53
−.43
+2.86

19 56.18 +24.77 1.39393
− 29.24 1.46596
19 26.94

+24 3 21.41

+18 38 6
1.28810
+3526
1.32336

−21.06
−.13
−.05
−21.24

3 0.17

−18 9.50
−.43
+2.887
−18 7.13 06
44 53.87
5311

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Jan. 19 +.73 | Jan. 21 +.56 | Jan. 22 +.66 | Jan. 26 +.83 -.03

40	27.6		—	40	38.1	40	26.6	25.3	40	38.7	40	48.8	25.6	40	39.3
	29.8	29.4	27.2		40.5		28.6	27.6		41.0		51.0	27.8		41.2
	31.3	29.4	29.4		42.7		30.3	29.8		43.3		53.7	30.0		43.4
	33.3	29.4	31.6		45.0		31.4	31.8		45.4		55.4	32.2		45.6
	(35.3	29.4	33.9	29.40	47.4		33.2	34.2	29.74	47.7		56.4	34.4	30.00	47.9
				18.026	49.5					50.0					50.6
					51.7			1.2		52.3			1.5		52.7
					54.1			3.4		54.4			3.8		54.7
					56.3			5.7		56.7			6.1		57.0
								7.9					8.6		
								10.3	5.70				10.8	6.16	
					65.3			95.44		429.5			9.616		432.4
40	31.46	40	47426	40	47.256	40	30.02	40 47.720	40	47.722	40	53.06	40 48.080	40	48.044

40	45.4		40	39.6
	46.6			42.0
	47.5			44.2
	49.0			46.3
	50.0			48.7
				51.0
				53.2
				55.5
				57.7
				438.2
40	4770		40	48689

Jan. 19	Jan. 21	Jan. 22	Jan. 26
40 47.312	40 47.721	40 48.062	40 48689
−017	−017	−017	−017
40 47.30	40 47.70	40 48.05	40 48.67
−7.30	−7.79	−7.86	−8.98 +.04
+.32	+.25	+.29	+.36 −.01
−1.28	−1.25	−1.24	−1.18
−8.26	−8.79	−8.81	−9.80 80
39.04	38.91	39.24	38.77 .87 +.03
			38.90

19 4408	+1585	1.20003	20 1830	+17.70	1.24797	19 5200	−5.00	0.69897	20 057	+0.99 9.99564
−1871		1.27206n	−20.89		1.32000n	+5.90		0.77100	−1.17	0.06767n
19 25.37			19 57.41			19 57.90			19 59.40	
+24 3 22.98			2 50.94			2 50.45			2 48.95	
+18 37 54			+18 37 52			+18 37 26			+18 37 35	
1.28810			1.28810			1.28790			1.28790	
+3832			+2784			+5468			+2842	
1.32642			1.31594			1.34258			1.31632	
−21.20			−20.70			−22.01			−20.72	
−.05			−.07			−.01			−.00	
−.05			−.00			−.05			−.00	
−21.30			−20.77			−22.07			−20.72	
3 1.68			2 30.17			2 28.38			2 28.23	
−18 10.74			−17 38.00			−17 37.40			−17 38.28	
−.43			−.43			−.42			−.42	
+2.88			+2.91			+2.93			+3.01	
−18 8.29			17 35.52			−17 34.89			−17 35.69	
44 53.39			44 54.65			44 53.49			52.54	

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1885 Auwers. 996157

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3 40 32
+ 23° 45'

+.44 +1.09

Feb. 5 Feb. 8 +.89

40	36.6		27.5	40	40.9	40	56.4		40	41.4	
	38.2		29.7		43.0		58.0			43.6	
	39.8		31.9		45.3		59.9			45.7	
	41.2		34.0		47.7		1.0			47.9	
	42.6		36.4	3.90	49.9		2.2			50.1	
					52.0		3.6			52.3	
			3.3		54.4					55.0	
			5.6		56.5					57.3	
			7.9		58.9					59.5	
			10.1								
			12.4	7.86							
				9976	448.6					452.8	
40	39.68	40	49.880	40	49.844	40	0.18		40	50.311	

40 49.862
− .017
40 49.845

− 10.19
+ .33
− 1.03
− 10.89

38.96

40 50.311
− .017
40 50.294

− 10.74
+ .39
− 0.97
− 11.32

38.97

20 14.40 + 10.18 1.00775 19 5098 − 9.87 0.99432
− 12.02 1.07978 + 1165 1.06635
20 2.38 20 263
2 4572

+18 37 25
1.28790
+ 3193
1.31983

− 20.88
− .02
− .05
− 20.95

2 24.77

−17 .3410
− .38
+ 3.41
−17 31.07
44 53.76

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Auwers 9.96174 27 Tauri

h m
3 42 12 s0.07220m
+23° 42′ +.44 +1.09
+18 40
Jan. 14 +.64 +.32 | Jan. 17 +58 | Jan. 18 +56 | Feb. 5

42 34.4		42 16.9	41 59.3	4.7	42 18.2	42 1.3	5.1	42 18.6	42 3.0	8.0	42 21.5
36.5		19.3	0.9	6.8	20.4	3.3	7.3	20.8	4.6	10.3	23.7
38.0	8.5 8.5	21.5	2.7	9.3	22.6	4.7	9.5	23.0	6.3	12.5	26.0
40.0	8.3 10.5	23.7	4.2	11.4	24.9	6.3	11.8	25.5	7.6	14.7	28.3
41.4	8.1 12.6 8.30	26.0	6.0	13.7 9.18	27.1	7.8	14.0 9.54	27.6	9.0	17.0 12.50	30.5
		28.5			29.4			29.9			32.7
	39.6	30.6		40.6	31.7		41.0	31.9		44.0	35.0
	41.8	32.8		43.0	33.9		43.1	34.2		46.2	37.4
	44.1	35.0		45.2	36.2		45.5	36.6		48.4	39.5
	46.2			47.4			48.0			50.8	
	48.6 44 06			49.7 45 18			50.2 45.56			53.04 48.48	
	52 36	234.3		54 36	244.4		55.10	248.1		60.98	274.6
42 38.06	42 26.180	42 26.033	42 262	42 27180	42 27.156	42 4.68	42 27550	42 27.567	42 6.10	42 30490	42 30.511

Jan. 14	Jan. 17	Jan. 18	Feb. 5
42 26.106	42 27.168	42 27.558	42 30.500
− .017	− .017	− .017	− .017
42 26.09	42 27.15	42 27.54	42 30.48
− 5.498	− 6.654	− 7.07	− 10.19
+ .28	+ .26	+ .25	+ .33
− 1.325	− 1.2831	− 1.30	− 1.08
− 6.535	− 7.679	− 8.12	− 10.89
42 19.564	19.486	19.42	19.59

22 5.24	− 11.95	1.07737m	22 49.08 (47.58)	+ 24.57	1.39041	22 45.32	+ 22.88	1.35946	23 23.28	+ 24.40	1.38739
+ 14.11		1.14957	− 29.01		1.46261m	− 27.02		1.43166m	− 28.81		1.45959m
22 19.35			22 20.07			22 18.30			22 54.47		
+24 0 29.00			0 28.28			0 30.05			0 6.12		
+18 40 15			+18 40 59			+18 40 55			+18 40 57		
1.28910			1.28940			1.28940			1.28940		
+ 3628			+ 2161			+ 3526			+ 1493		
1.32538			1.31101			1.32466			1.30433		
− 21.15			− 20.46			− 21.12			− 20.15		
− .03			− .12			− .11			− .12		
+ .00			− .03			− .03			− .07		
− 21.18			− 20.61			− 21.26			− 20.34		
+24 0 7.82			0 7.67			0 8.79			59 45.78		
− 18 9.52			− 18 10.53			− 18 9.50			− 17 33.25		
− .44			− .43			− .43			− .39		
+ 2.932			+ 2.985			+ 2.96			+ 3.38		
− 18 7.034			− 18 8.081			− 18 6.977			− 17 30.26		
+23 42 0.788			41 59.6 24			1.80 1.82			42 15.52		
			+2.56								
			42 2.16								

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1885 — Answers. 996174

L n s
3 42 12
+23° 42'
Feb. 8.

+.44 +.09
+.89

42 37.3 8.3 42 22.0
39.2 10.6 24.1
41.6 13.0 26.5
43.0 15.2 28.8
44.6 17.7 12.96 31.0
33.2
44.3 35.8
46.8 38.0
49.0 40.0
51.0
53.5 48.92

6188 279.4
42 4114 42 30.940 42 31.044

42 30.992
−.017
42 30.98

−10.74
+ 39
− 0.98
−11.33
17.65

−25°
22 45.18 − 10.15 1.00647
+ 11.99 1.07867
22 57.17

59 51.18

+18 40 19
1.28910
+3193
1.32103

−20.94
− .02
− .03
−20.99

59 30.19

−17 34.10
− .38
+ .348
−17 34.00
41 59.19 ✓
+2.10
42 1.69

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1885 Anvers 9.95470 (d)

0.065162

3 41 44

−25° 43′ 5″

+68 3

Feb. 3 +.717.02

−.48 + 1.11

+.93 Feb. 12 +.77

42 18.8
21.3
22.6
23.6
26.0

42 23.6
24.7
26.0

42 13.9
16.2
18.5
20.9
23.1 18520
− 18.314

42 226 40
203 24.0 18.850
194 − 18.314

42 22.46 42 0.206 42 24.77 42 1.536
09

42 0.206
−.017
42 0.19

42 1.536
09
−.017
42 107

−9.56 94 +.01
−.34 −.01

−1133 2
−.37

−.057
−10.47 85
41 49.42 +.02
34

−.040
−12.1009
41 49.42
43
48.98

45 29.10 −2225 1.34783 45 29.55 −23.23 1.36605
+ 2585 1.41249 + 26.99 1431.21
45 54.95 45 56.54

−25 23 6.60 23 8.19

+68 3 3
2.15198
+ 3729
2.18927

+68 3 3
2.15198
+ 3796
2.18994

−154.62
+ .10
− .01
−2 34.53

−154.86
+ .11
− .01
−2 34.77

−25 25 41.13 25 42.96

−17 33.80
− 1.14
+ 19.1529
−17 15.80 65
−25 42 56.93
78

−17 33.72
− 1.04
+ 1968.76
−17 15.080
42 58.04
57.96

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1885phae.proj.1624.

1885 Annex 9.95651 (C)

0.06697

$\lambda \sim 45$
3 41 56
−25° 13'
+67 36
Jan. 10 +53 −02

−.47 +1.10
+.92

Feb. 2 +78 −03 +10

41	56.0	2.2	42	15.7	42	29.4				
	58.5	4.5		18.0		31.3				
	1.0	6.7		20.2		32.8				
	2.5	9.0		22.5		34.3				
	3.3	11.3	6.74	24.8		36.5				
				27.0						
		38.3		29.2			42	15.4		
		40.5		31.4				17.6		
		42.7		33.8				20.0		
		45.0						22.3		
		47.2	42	74				24.5	19.960	
									−18.237	
		4948		2226						
42	0.26	42	24.748	42	24.723	42	32.86	42	1.723	C4

42 24.736
−.017
42 24.72
−4.28
−.25
−.02
−0.96
−5.46
42 ~~18.26~~ 19.26

42 1.723
−.017
42 1.71
−.98 −.02 +.01
−.37
+.11
−.060
−10.67
41 51.05 −.01
51.04

22 4695 + 24.48 1.38881 1.45578$_n$
− 28.56
22 18.39

59 5860

+67 40 56
2.144 05
+ 3176
2.175 81

−149.90

15
14 7.15 − 31.14 1.49332$_n$
+ 36.33 1.56029
14 43.48
13
52 55.13

+67 37 41
2.141 13
+ 4552
2.18665

−15369
+ 20
− 02
−2 3349

55 28.62

−18 1103
− 1.28
+ 16.38

−17 3533
− 1.75
+ 1901
−17 17.47
12 460.9

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1885 Auwers 9.96207 (a)

h m s 0.07233m
3 41 49
−23° 36′ — 44 + 1.09
+65 59 +.91
Jan. 31 +75 −.12

Feb. 2 +.78 −.03 +.10

Feb. 3 +.71 +.02

Feb. 7 +.89

41	39.0	41	42.0			41	30.2	41	42.1			41	33.8	41	42.3			41	38.1	41	43.3		
	40.4		44.2				32.3		44.5				35.6		44.7				39.7		45.4		
	41.5		46.6				34.5		46.9				37.4		46.9				41.3		47.3		
	43.0		48.6				36.3		49.0				39.0		49.2				42.8		49.7		
	44.8		51.0	46480			38.2		51.3	46760			40.3		51.5	46920			44.6		52.0	47540	
				+18.006						18.006						+18.006						+18.006	

41	41.74	42	44.86			41	34.30	42	47.66			41	37.22	42	49.26			41	41.30	42	55.46		

				42	4.486					42	4.766					42	4.926					42	5.546
					−.017						−.017						−.017						−.017
				42	4.47					42	4.75					42	4.91					42	5.53
					−9.49	54					−9.82	1	−.02				−9.86	94	+.01				−10.58	5
					−.33						−.34		+.01				−.31		−.01				−.39	
					−.0685						+.11						−.0579						−.052	
					−10.4652						−.061						−10.4784						−11.46	
				41	53.995						−10.65					41	54.17		+.02			41	54.07	
										41	54.10		−.01				0.7							
											54.09													

39	438	+2275	1.35698	m C.R.	+3047	1.48387	39	929	+2771	1.44264	39	726	+2425	1.38471									
	−28.88		1.42951m			1.55640m		−32.75		1.51517m		−28.66		1.45724m									
38	37.50						38	36.54			38	38.60											
−23	15 48.15						15	48.19			15	50.25											
+65	56 38						+65	56 43			+65	56 41											
	2.10808							2.10810				2.10812											
	+3060							+3729				+3554											
	2.13868							2.14539				2.14366											
	−137.62							−139.76				−139.21											
	+.11							+.16				+.12											
	−.04							−.08				−.08											
	−2 17.56						−2	19.68			−2	19.17											
−23	18 5.70						18	7.87			18	9.42											
	−17 35.18							−17 33.80				−17 32.65											
	−1.16							−1.14				−1.08											
	+18.27 44							+18.70 66				+18.90											
−17	17.90						−17	16.28			−17	14.13											
−23	35 23.60						35	24.15				3459											
												24.23											

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1885 Anwers 996207

h m s
3 41 49
−23° 36'

−.44 +1.09

Feb. 12 +77 | Feb. 17 +72 | Feb. 18 +72 +02 | Feb. 19 +79

41 36.3	41 43.6		41 32.4	41 44.0		41 39.0	41 43.9		41 41.2	44.0	42 57.5
38.2	45.9		34.7	46.3		40.5	46.0		43.0	46.2	59.7
40.3	48.0		36.6	48.4		41.7	48.3		45.2	48.5	1.9
42.2	50.2		38.7	50.6		43.3	50.7		47.2	50.8	4.2
44.0	52.5	48.040	41.8	52.8	48420	44.6	53.1	48.400	48.8	52.7	48.440 6.4
		+18.006	43.2		+18.006			+18.006			+18.006 8.7
											11.0
											13.1
											15.6

41 4020 42 6.046 | 41 3790 42 6.426 | 41 4182 42 6406 | 41 45.08 42 6.446 42 58.1 6.456

Feb. 12	Feb. 17	Feb. 18	Feb. 19
42 6.046	42 6.426	42 6.406	42 6.451
−.017	−017	−017	−.017
42 6.03	42 6.41	42 6.39	42 6.43
−11.332	−11.4x6	−11.54 69 +01	−11.7x9
− .34	− .32	− .32 −.01	− 35
− 042	− 0.32	− 0.30	− 0.28
− 1208	−12.10	− 12.31	− 12.42
41 5395	41 54.31	41 5408 +00	41 54.01

39 805 +2.585 1.41246 1.48499m | 39 10.06 +28.53 1.45530 1.52783m | 39 9.01 +24.58 1.39058 1.46311m | 39 484 + 21.37 1.33980 1.41233m

Feb. 12	Feb. 17	Feb. 18	Feb. 19
− 3055	− 33.72	− 2905	− 2584
38 3750	38 3634	38 3996	38 39.00
15 49.15	15 47.99	15 51.61	15 50.65
+65 56 42	+65 56 44	+65 56 43	+65 56 39
2.10812	2.10812	2.10812	2.10812
+ 3796	+ 3915	+ 3200	+ 3326
2.14608	2.14727	2.14012	2.14138
− 139.98	− 140.37	− 138.68	− 138.48
+ .14	+ .16	+ .13	+ .09
− .08	− .08	− .08	− .08
−2 19.92	−2 2029	−2 1803	−2 18.47
18 9.07	18 8.28	18 9.64 −2.50	18 9.12
−17 3372	−17 3352	−17 3503	−17 3360
− 1.04	− .97	− 95	− .94
+ 19.13	+ 1924	+ 1926	+ 1927
−17 15.63	−17 1525	17 16.72	17 15.27
35 2470	35 2353	2636 E4	2439
		−2.50	
		23.86	

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Feb. 21 +66

41	40.0	44.4	41	58.0	41	40.6	41	44.8
	41.5	46.6		0.1		42.9	49.3 49.2	47.0
	43.2	48.8		2.5		44.2	49.3	49.3
	45.0	51.0		4.6		46.0		
	46.0	53.4	4884	6.8		48.0		
				9.1				
		20.0		11.2				
		22.5		13.6				
		24.7		15.8				
		27.2						
		29.4	24.76					
		1360		61.7				
41	43.14	42 6.800	42	6.856	41	44.34	42	7.273

Feb. 23 +59 +.05

49.267
+ 18.006

42	6.828
	− .017
42	6.81
	−12.78 20
	− .29
	− .024
	− 12.73
41	54.08

42	7.273
	− .017
42	7.26
	−12.39 48 −.01
	− .26 −.02
	− .020
	− 1320
41	54.03 −.03
	54.03

39	1040	+ 2369	1.37457	37	881	+ 2793	1.44607
	− 28.00		1.44710		− 33.01	+577	1.51860
38	4240			38	3580		
	15 5405				15 4645		
	+65 56 44				+65 56 43		
	2.10812				2.10812		
	+ 2453				+ 3252		
	2.13265				2.14064		
	−135.72				−138.24		
	+ .13				+ .16		
	− .08				− .08		
	−2 1.567				−2 18.16		
	18 9.72				18 4.61		
	−17 3208				−17 3056		
	− 92				− 89		
	+ 19.27				+ 19.27		
	−17 13.23				17 12.88		
	35 2345				1679		
					+577		
					2256		

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1885 Auwers 9.95994 (b)

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3 42 38.
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−.45 + 1.10
+.92

Feb. 18 +72 +02

43	29.8				42	35.3	32.6	42 55.2	46.2
	32.0					36.6	35.0	55.2	48.4
	33.7					37.9	37.3	55.3	50.8
	35.2					38.9	39.5	55.7	53.4
	37.1					40.3	41.6 37.2	55.4	55.4
			42 54.3	56.6			+18.094		
		7.8	54.3	58.8					
		10.0	54.4	1.2					
		12.3	54.5	3.5					
		14.7							
		16.9	12.340						
			−18.094						

43 33.56 42 54.246 54.375 42 37.804 42 55.294 42 55.360

42 54.310
−.017
42 54.29

−10.585
− .37

−0.582
−11.3944
42 42.90
85

42 55.327
−.017
42 55.31

−11.5469 +.01
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42 43.13 +.00
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17
h 18.30 −39.25 1.59384 no δ +17.53 1.24378
− 46.16 1.66424 − 2061 1.31418
h 17 44.46
−28 54 16.11

+66 33 52
2.12072
+ 3554
2.15626

+ 3220

−143.30
+ .20
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−2 23.13

−23 56 39.24

−17 32.52
− 1.11
+ 19.18
−17 14.4551
−24 13 53.75

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1883 Answer. 9.95110 (e)

h m s 0.06156n
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−26° 41′ −50 +1.12
+69 4 +.93
Jan. 31 +75 +.97

Feb. 2 +.78 −.03 +.10

Feb. 3 +.71 +.02

Feb. 12 +.77

43	25.2	57.0	43	10.9	43	53.2			43	32.0		43	11.4	43	30.7				
	26.5	57.3		13.4		54.3				33.9			13.9		32.1				
	28.2	1.6		15.4		55.3				36.1			16.0		33.5				
	30.7	4.0		17.9		56.0				38.2			18.3		34.7				
	33.1	6.2	1.62	20.0		56.7							20.6		37.0		43	19.5	
				22.4			43	20.4 22.7					23.0				19.5	21.8	
		33.9		24.8				20.4 25.0			34.5		25.2			33.2	19.5	24.1	
		36.4		27.2			34.3	20.4 27.3			26.8		27.6			35.6	19.5	26.4	
		38.6		29.5			36.6	20.6 29.8			39.4		30.0			38.0	19.4	28.6	
		41.0					38.8				41.5					40.2			
		43.2	3862				41.1				43.8	39200				42.5	37.90		
			4024		1.5		43.6	38880			−18.467					(44.8)			
							−18.467						186.0						
43	28.74	43	20.120	43	30.167	43	55.10	43	20.413	43	20.450	43	35.05	43	20.733	43	20.667	43	33.60	43	19.433	43	19.480	+2.33

			43	20.144				43	20.431			43	20.689				43	19.456	
				−.017					−.017				−.017					−.017	
			43	20.13				43	20.41			43	20.67				43	19.44	+2.33
				−9.4954					−9.881	−.02			−28694	+.01				−11.382	
				−.38					−.39	+.02			−.36	−.01				−.38	
				−0.643					+.11				−0.57					−0.40	
				−10.585					−0.6059				−10.84					−12.10	
			43	962					−10.7068				9.80	+.02				9.67	
				9.58				43	9.73	+.02									

43	4068	−8.60	0.93452	43	6.18	−34.67	1.53995	43	3220	−14.36	1.15715	43	3720	−13.14	1.11860				
	+9.91		0.99606		+39.95		1.60151		+16.55		1.21871		+15.14		1.18016				
	43 50.59				43 46.13				43 48.75				43 52.34						
−26	21 2.24				20 57.78				21 0.40				21 3.99						
	+69 1 15				+69 0 40				+69 1 6				+69 1 1						
	2.17325				2.17303				2.17318				2.17277						
	+3060				+4552				+3728				+3797						
	2.20385				2.21855				2.21046				2.21074						
	−159.90				−165.40				−162.35				−162.46						
	+.02				+.27				+.04				+.04						
	−.04				−.06				−.07				−.07						
−2	39.92			−2	45.19			−2	42.38			−2	42.49						
−26	23 42.16				23 42.97				23 42.78				23 46.48						
	−17 3518				−17 3533				−17 3380				−17 3372						
	−1.18				−1.16				−1.14				−1.06						
	+19.207				+19.542				+19.50				+19.95						
−17	17.809			−17	17.407			−17	15.48			−17	14.83						
−26	40 59.32				40 60.04				40 58.22				40 61.31						
	25																		

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1885 Auwers 9.99959 (f)

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19	25.0	30.7	19	51.5	48.3	19	24.4	19	31.3	19		19	24.3	19	32.4		
	27.0	32.8		51.4	45.2		26.3		33.1				25.7		34.5		
	28.5	35.0		51.4	47.3		28.0		35.2				26.8		36.4		
	30.0	37.0		51.5	49.4		29.7		37.3				28.3		38.5		
	31.7	38.9		51.5	51.5		31.7		39.2	35.260			29.7		40.6	36.480	
		+16.515								+16.515						+16.515	

19	28.44	19	51.395	19	51.460	19	28.02	19	51.775				19	26.96	19	52.995	

19 51.428
−.015
19 51.41

19 51.775
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19 51.76

19 52.995
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19 52.98

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3736 +01
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−12.684
+ .03
− 1.74
− 14.375
19 ~~37.39~~
37.41

−1291
+ .03
+ .02
− 1.7069
− 15.565
19 37.423

36	38.35	+22.99	1.36154	36	38.15	+23.76	1.37585					36	42.00	+26.04	1.41564		
−	29.62		1.47159	−	30.61		1.48590					−	33.55		1.52569		
36	8.73			36	7.54							36	8.45				
+2	46 39.62				46 40.81								46 39.90				
+39	54 12			+39	54 12							+39	54 16				
	1.68230				1.68230								1.68230				
	+ 3086				+ 3127								+ 2282				
	1.71316				1.71357								1.70512				
	−5166				−51.71								−50.71				
	− .01				− .01								− .01				
	− .04				− .03								− .03				
	− 51.71				− 51.75								− 50.75				
+2	45 47.91				45 49.06								45 49.15				
−17	32.58			−17	31.30							−17	33.44				
−	.64			−	.61							−	.56				
+	16620			+	16.83							+	17.0710				
−17	16.202			−17	15.08							−17	16.730				
+2	28 31.31				~~44.4~~ 33.98							28	~~72.22~~ 32.25				
	29																

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19	27.0	19	32.5			19	25.6	19	32.8			19	27.0	19	33.0			19	27.5	19	33.5		
	29.2		34.7				27.0		34.8				28.8		35.1				29.2		35.7		
	31.3		36.8				28.4		36.7				30.5		37.2				30.5		37.6		
	32.7		38.7				29.8		39.0	36.90			32.2		39.3				32.2		39.7		
	33.5		41.0	36.740			31.0		41.2	37.00			33.4		41.4	37.200			34.3		41.8	37.660	
				+ 16.515						+ 16.515						+ 16.515						+ 16.515	

19	30.74	19	53.255			19	28.36	19	54.015			19	30.38	19	53.715			19	30.74	19	54.175		

			19	53.255					19	54.015					19	53.715			19	54.175		
				− .015						− .015						− .015				− .015		
			19	53.24					19	53.40					19	53.70			19	54.16		
				− 14.24						− 14.38						− 14.786				− 15.246		
				+ .02						+ .02						+ .02				+ .02		
				+ .03						+ .02						+ .02				− 1.61		
				− 1.68						− 1.66						− 1.64				− 16.85		
				− 15.87						− 16.00						− 16.36				37.31		
				37.37						37.40						39.34						

36	39.56	+22.52	1.35257	36	40.92	+25.66	1.40926	36	38.71	+23.34	1.36810	36	39.76	+23.44	1.36996				
−	29.01		1.46262	−	33.06		1.51931	−	30.07		1.47815	−	30.20		1.48001				
36	10.55			36	7.86			36	8.64			36	9.56						
46	37.80			46	40.49			46	39.71			46	38.79						
+39	54 14			+39	54 15			+39	54 13			+39	54 14						
	1.68230				1.68230				1.68230				1.68230						
+	1526			+	1943			+	33.51			+	3078						
	1.69756				1.70173				1.71581				1.71308						
−	49.84			−	50.32			−	51.98			−	51.65						
−	.01			−	.01			−	.01			−	.01						
−	.03			−	.03			−	.03			−	.03						
−	49.88			−	50.36			−	52.02			−	51.69						
45	47.92			45	50.13			45	47.69			45	47.10						
−17	33.50			−17	35.15			−17	32.12			−17	33.44						
−	.55			−	.53			−	.52			−	.57						
+	17.13			+	17.20			+	17.26			+	17.31						
17	16.92			−17	16.48			17	15.38			17	13.64						
28	31.00			28	31.65			28	32.31			28	33.46						
					.77														
					30.88														

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							Delta	a + 1
19	30.0	19 34.2	19 27.2	19 34.3	19 29.0	19 34.6	19 32.0	19 34.7
	32.2	36.3	29.0	36.2	31.5	36.5	34.0	36.8
	34.5	38.1	31.0	38.2	33.4	38.7	35.6	38.9
	35.9	40.2	33.0	40.2	35.0	40.7	37.2	40.7
	37.7	42.3 38.220	34.8	42.3 38.240	36.8	42.7 38.640	38.4	43.0 38.820
		+16.515		+16.515		+16.515		+16.515
19	34.06	19 54.735	19 31.00	19 54.755	19 33.14	19 53.155	19 35.44	19 55.335

			19 54.735			19 54.755			19 53.155			19 55.335
			−.015			−.015			−.015			−.015
			19 54.72			19 54.74			19 53.14			19 55.32
			−15.459			−15.786			−16.382			−16.546
			+.01			+.02			+.02			+.02
			−.05			−.05			+.03			
			−1.59			−1.56			−1.52			−1.51
			−17.12			−17.35			−17.79			−18.03
			37.60			37.38			37.935			37.79
												33
36	36.81	+20.67 1.31534	36	41.10	+23.76 1.37585	36	38.84	+22.02 1.34282	36	37.91	+19.90 1.29885	
	26.63	1.42539		30.61	1.48590		28.37	1.45287		25.64	1.40890	
36	10.18		36	8.49		36	10.47		36	12.27		
46	38.17		46	39.86		46	37.88		46	36.08		
+39	54.11		+39	54.15		+39	54.13		+39	54.12		
	1.68230			1.68230			1.68230			1.68230		
	+.4643			+.2486			+.3832			+.3285		
	1.72873			1.70716			1.72062			1.71515		
	−.5355			−.5095			−.5256			−.5190		
	−.01			−.01			−.01			−.01		
	−.03			−.02			−.02			−.02		
	−.5359			−.5098			−.5259			−.5193		
45	44.58		45	48.88		45	45.19		45	44.15		
−17	28.94		−17	31.65		−17	29.36		−17	28.88		
	−.49			−.48			−.47			−.46		
	+17.36			+17.41			+17.47			+17.48		
−17	12.07		−17	14.72		−17	12.36		−17	11.86		
28	32.51		28	34.16		28	32.83		28	32.29		

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19	35.6	19	35.2	19	36.0	19	35.7	19	35.2
	36.7		37.1		37.6		38.0		36.7
	37.9		39.2		38.5		40.0		38.2
	39.4		41.3		39.5		42.0		40.3
	40.6		43.3 39.220		40.7		44.0 39.940		42.3
			+16.515				16.515		

19	35.8									Ch f
	37.7									
	37.9									
	42.0									
	44.0	39.880								
		+16.515								

19	38.04	19	55.735	19	38.66	19	56.455	19	38.54	19 56.395

			19 55.735				19 56.455				19 56.395
			−.015				−.015				−.015
			19 55.72				19 56.44				19 56.38
			−16.83				−17.43				−17.87
			+.02				+.02				+.02
			−1.49				−1.46				−1.43
			−18.30				−18.87				−18.88
			37.42				37.57				37.50

36	3625	+1770	1.24797	36	3720	+1780	1.25042	36	3609	+1786	1.25188
	22.80		1.35802n		22.93		1.36047n		23.01		1.36193n
36	13.45			36	14.27			36	13.08		
46	34.90			46	34.08			46	35.27		
+39	54 10			+39	54 11			+39	54 10		
	1.68230				1.68230				1.68230		
	+1636				+3863				+3102		
	1.69866				1.72093				1.71332		
	−49.96				−52.59				−51.68		
	−.00				−.00				−.00		
	−.02				−.02				−.02		
	−49.99				−52.62				−51.71		
45	44.91			45	41.46			45	43.56		
−17	27.78			−17	25.65			−17	26.88		
	.46				.45				.45		
	+17.49				+17.51				+17.52		
−17	10.75			17	8.59			17	9.11		
28	34.16			28	32.87				33.75		

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19	43.0	19	35.7			20	17.0					20	8.3					19	43.5	19	36.8		
	44.8		38.0				18.4						9.9						45.4		38.8		
	46.3		40.0				19.6						11.2						46.7		40.9		
	48.2		42.0				22.8						13.2						48.0		43.1		
	50.5		44.2	39980			24.6						14.7						50.0		45.1	4094	
			+	16515																		+	16.515

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						20	13.0	13.00				20	9.5										
						17	15.2	18.14					11.7										
						19	~~17.0~~	~~17.14~~					13.7										
								13.020					15.7										
						17	21.2	~~17.125~~					17.7	13660									
								− 16.515					− 16.515										
19	46.56	19	56495			20	20.48	20	0.610	Et		20	11.46	19	54.145			19	46.72	19	57.455		

			19	56495				19	56.555				19	57145					19	57455		
				− 015					− 15					− 015						− 015		
			19	5648					56.54				19	57.13					19	57.44		
				−17.95					−17.93	2				−18.60	59					−18.95		
				+ .02					+ ~~.77~~ .03					+ ~~.16~~ .02						+ ~~.20~~ .02		
				− 1.34					− 1.32					− 1.21						− 1.16		
				−19.27					−~~19.52~~ 19.21					−19.78						20.09		
				37.21					37.33					37.35						~~37.38~~		

36	41.08	+ 9.94	0.99739	35	8.660	− 23.93	1.37894	36	11.95	− 14.32	1.15594	36	44.10	+ 10.74	1.03180								
	− 12.81		1.10744		+ 30.96		1.49076		+ 18.53		1.26776		− 13.89		1.14282	m							
36	28.27			36	27.56			36	30.48			36	30.21										
+2	46 20.08			46	20.79			46	17.87			46	18.14										
+39	53 55			+39	53 11			+39	53 26			+39	53 58										
	1.68220				1.68200				1.68210				1.68220										
	+ 2770				+ 2746				+ 1282				+ 2001										
	1.70990				1.70946				1.69492				1.70221										
	− 5127				− 51.22				− 49.54				− 50.37										
	− .00				− 01				− .00				− .00										
	+ .02				+ .02				+ .02				+ .02										
	− 51.27				− 51.23				− 49.54				− 50.37										
	45 28.81			45	29.56			45	28.33			45	27.77										
−17	12.80			−17	12.32			−17	12.02			−17	11.80										
	− 44				− 44				− 43				− 42										
	+ 17.51				+ 17.50				+ 17.41				+ 17.35										
−16	55.73			−16	55.26			16	55.04			16	54.87										
28	33.08			28	34.30			28	33.29			28	32.90										

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Apr. 16 +30

19	43.0	19	37.4	19	49.8
	44.8		39.5		51.7
	46.2		41.5		53.9
	47.8		43.6		56.0
	49.3		45.7	4.54	58.0
					0.1
			10.3		2.2
			12.4		4.2
			14.5		6.3
			16.6		
			18.7	14.50	
			11604		522.2
19	4622	19	58.020	19	58.022

19 58.021
−.015
19 58.01

−19685
+ ~~.52~~
— 1.04
−20.67
37.34

36 4602 +1180 1.07188
— 1527 1.18370m
36 3075

46 1760

+39 54 0
1.68220
+ 719
1.68939

−48.91
— .00
+ .00
— 48.91

45 2869

−17 1218
— 42
+17.17
16 58.49
28 3326

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1885 Anvers 9.99975 (e)

h m s
8 19 45
+1.57
+40 26
Feb. 23 +59 +0.24

0.11021m
+03 +1.00
+.65 Feb. 25 +.71

Mar. 3 +74 +02

Mar. 4 +54 +.03

A

20	34.7			20	0.4		19	57.4	20	3.2		19	58.6	20	3.5		19	59.0	
	35.7				3.0			57.5		5.0			0.6		5.6			1.3	
	37.3				4.5			1.7		6.3			2.9		6.7			3.0	
	38.4				6.3			3.6		7.8			4.8		7.9			5.3	
	39.5				8.3	49.1 53.2		49100 5.6		8.7			6.9		9.5			7.2	
	40.7							+16 510 8.0			Q-1		9.0					9.2	
		Q-1				18.1		5.610 9.8			19.0		11.0					11.5	
						20.3		11.9			21.2		13.2					13.5	
						22.3		13.5			23.3		15.1					15.6	
		20 24.3				24.5					25.4								
		22.2 26.4	2225			26.4	22320				27.5	23280							
		22.3	-16.510				-16.510	51.2				-16.510							
							5.810						62.1					6.5.6	
20	37.72	20 5.740		20	4.50	20 5.777	20	5.689	20	6.20	20	6.770	20 6.900	20	6.64		20	7.289	

		20 5.740					20 5.718					20 6.857					20 7.289		
		-.015					-.015					-.015					-.045		
		20 5.72					20 5.70					20 6.84					20 7.24		
		-12.7452	-.01				-12.684					-13.91					-14.24		
		+.02	+.00				+.02					+.02					+.02		
		-1.72					-1.701					+.02					+.03		
		-14.1422					-14.343					-1.66					-1.65		
		19 51.58	-.01				19 51.36					-15.53					-15.84		
		50					37					51.31					57.44		
		51.49															43		

7	1.02	-31.98	1.50488	7	42.68	+1.22	0.08636	7	41.50	+0.66	9.81954	7	42.33	+0.65	9.81291				
	+41.22		1.61509		-1.25		0.09657		-0.85		9.92975		-0.84		9.92312				
7	42.24			7	41.43			7	40.65			7	41.49						
+2	15 6.11			+2	15 6.92				15 7.70				15 6.86						
+40	24 35			+40	25 17			+40	25 15			+40	25 16						
	1.69010				1.69030				1.69830				1.69030						
	+3922				+3127				+2283				+1526						
	1.72932				1.72157				1.71313				1.70556						
	-53.62				-52.67				-51.66				-50.76						
	-.02				-.00				-.00				-.00						
	-.04				-.05				-.05				-.05						
	-53.68				-52.72				-51.71				-50.81						
+2	14 12.43			+	2 14 14.20				14 15.99				14 16.05						
-17	30.72			-17	31.30			-17	33.44			-17	33.50						
	-.69				-.62				-.57				-.56						
	+16.76				+16.95	-.88			+17.21				+17.25						
-17	14.60			-17	15.04			-17	16.80			-17	16.81						
+1	56 57.83			+1	56 59.16				56 59.19				56 59.24						

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Mar. 6 +.51 +.02

20 2.2 3.8 4.8 6.2 7.6

19 59.0 1.1 3.2 5.4 7.1 9.3 11.5 13.5 15.5 — 65.6

20 4.92

20 7.289

19 56.7 57.9 59.0 0.5 2.3 — 19 57.28

Mar. 8 +.61 +.02

19 59.5 1.4 3.5 5.5 7.6 9.7 11.7 13.8 16.1 — 68.8

20 20.8 22.0 23.7 25.0 26.2

20 7.644

20 23.54

Mar. 10 +.54

20 20.6 22.8 24.6 26.7 28.7 — 24.680 − 16.510 = 8.170

20 8.170

Mar. 12 +.35 −.05

20 6.8 8.1 9.6 11.2 13.0

21.3 23.1 25.0 27.0 29.3 — 25.140 − 16.510 = 8.630

20 9.74

20 0.2 2.6 4.5 6.5 8.8 10.8 12.7 15.0 16.8 — 77.9

20 8.795 − .015 = 20 8.78

20 8.778

---

20 7.289 − .015 = 20 7.27

−14.389

+.02 +.02 −1.63 −1598 = 51.29

20 7.644 − .015 = 20 7.63

−14.786

+.02 +.02 −1.61 1633 = 51.30

20 8.170 − .015 = 20 8.16

−15.246

+.02 −1.59 1683 = 51.33

20 8.795 − .015 = 20 8.78

−15.459

+.01 −.05 −1.57 −1710 = 51.34

---

7 44.90 − 3.06 = 7 41.84 + 2.37 = 15 6.57

0.37475 − 0.48496 =

+40 25 19 + 1.69030 + 1943 = 1.70973

−51.25 − .00 − .05 − 51.30 = 14 15.21

−17 35.15 − .54 + 17.32 = 17 16.93 = 56 56.84

7 51.85 − 10.73 = 7 41.12 + 8.36 = 15 7.23

0.92221 − 1.03042 =

+40 25 26 + 1.69030 + 3351 = 1.72381

−52.94 − .00 − .06 − 53.00 = 14 14.23

−17 32.12 − .53 + 17.39 = 17 15.26 = 56 58.97

7 24.50 − 19.81 = 7 44.31 − 15.37 = 15 4.04

1.18667 − 1.29688 =

+40 24 58 + 1.69020 + 3078 = 1.72098

−52.60 − .00 − .05 − 52.65 = 14 11.39

−17 30.44 − .51 + 17.44 = 17 16.51 = 56 57.88

7 40.50 − 1.21 = 7 41.71 − 0.94 = 15 6.64

9.97313 − 0.08334 =

+40 25 14 + 1.69020 + 4643 = 1.73663

−54.53 − .00 − .05 − 54.58 = 14 12.06

−17 28.94 − .50 + 17.49 = 17 17.93 = 56 60.11

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1885 Answers 9.99975

h m s
8 19 45
+1° 57'

+.03 +1.00

Mar. 14 +54 −.05

20	5.4			20	0.5	20	9.6			20	0.8	20	19.0			20	1.0	20	27.2				—
	7.0				2.3		11.5				2.8		20.6				3.0		28.5				—
	8.2				4.8		13.0				5.0		22.3				5.0		29.9				—
	9.5				6.7		15.1				7.0		24.3				7.3		31.4				—
	11.1				9.0		16.2				9.1		26.2				9.3		33.4				—
					10.8						11.2						11.4					20	9.2 11.3
		21.0			12.9						13.4			21.9			13.4			22.2			9.5 13.6
		23.2			15.1						15.5			24.0			15.4			24.2			9.9 16.1
		25.0			17.2						17.4			25.8			17.4			26.3			9.8 18.0
		27.2												28.0						28.2			
		29.3	25.140											29.7	25.880					30.5	26.280		
			−16.510												−16.510						−16.510		
					79.6						82.2						83.2						
20	8.24	20	8.630	20	8.844	20	13.08			20	9.133	20	22.48	20	9.370	20	9.222	20	30.08	20	9.770	20	9.600

Mar. 17 +60 +.03

Mar. 18 +45

Mar. 19 +45

63

				20	8.778					20	9.133					20	9.271					20	9.685
					−.015						−.015						−.015						−.015
				20	8.761					20	9.12					20	9.26					20	9.67
					−15.786						−16.312						−16.524						−16.83
					+ .02						+ .02						+ .01						+ .01
					− .05						+ .03												
					− 1.54						− 1.50						− 1.49						− 1.48
					−17.23						−17.77						−17.02						−17.30
				19	51.53 .38						51.35						51.24						51.37

7	44.07	+0.53	9.72428	7	38.02	−3.95	0.59660	7	29.12	−13.21	1.12090	7	21.18	−20.40	1.30963								
−	0.68		9.83449	+	5.09		0.70681	+	17.03		1.23111	+	26.29		1.41984								
7	43.39			7	43.11			7	46.15			7	47.47										
15	4.96			15	5.24			15	2.20			15	0.88										
+40	25 18			+40	25 12			+40	25 3			+40	24 55										
	1.69030				1.69020				1.69020				1.69020										
	+ 2486				+ 3832				+ 3285				+ 1636										
	1.71516				1.72852				1.72305				1.70656										
−	51.90			−	53.52			−	52.85			−	50.88										
−	.00			−	.00			−	.00			−	.01										
−	.03			−	.03			−	.03			−	.02										
−	51.93			−	53.55			−	52.88			−	50.91										
14	13.03			14	11.69			14	9.32			14	9.97										
−17	3165			−17	2936			−17	2888			−17	2778										
−	49			−	47			−	47			−	47										
	+17.54				+17.60				+17.61				+17.63										
−17	11.60			−17	12.23			−17	11.74			−17	10.62										
56	58.43			56	59.46			56	57.58			56	57.35										

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1 Mar. 21 +50 | Mar. 23 +46 | Mar. 25 | Mar. 29 +50

20 7.2		20 1.8	20 1.3		20 2.0	Ch. f.		20 36.2		
9.0		3.9	3.3		4.1			37.5		
11.3		6.0	4.7		6.0			39.8		
12.3		8.2	6.6		8.1			40.7		
14.2		10.3	8.6		10.2			42.3		
		12.6			12.3				a-1	
	22.6	14.0			14.4					
	24.7	16.5			16.6					
	26.7	18.6			18.6				27.0 27.0	
	28.9								26.8 28.9	
	31.0 26.78								26.9 31.0 26900+20	
	−16.570								−16.570	
		91.9			92.3					
20 10.80	20 10270	20 10.231	20 4.90		20 10.256			20 39.20	20 10390	
		20 10.231			20 10.256					20 10890
		−.015			−.015					−.015
		20 10.22			20 10.24					20 10.58
		−17.43			−17.4887					−17.95
		+.02			+.01					+.02
		−1.45			−1.42					−1.33
		18.86			18.88					19.26
		51.36			51.36					51.32
7 45.78	−0.57	9.75587n	7 5402	+5.36	0.72916			7 2292	−2881	1.45954n
+0.73		9.86608	−6.91		0.83937n			+3713		1.56975
7 46.51			7 47.11					8 0.05		
15 1.84			15 1.24					14 48.30		
+40 25 20			+40 25 28					+40 24 37		
1.69030			1.69030					1.69010		
+3863			+3102					+2770		
1.72893			1.72132					1.71780		
−53.57			−5264					−5222		
−.00			−.00					−.02		
−.03			−.03					+.00		
−53.60			−5267					−52.24		
14 8.24			14 8.57					13 56.06		
−17 2565			−17 2688					−17 1280		
−.46			−46					−44		
+17.65			+17.66					+1767		
17 8.46			17 9.68					16 5557		
56 ~~24~~ 5978			56 ~~28~~ 5889					56 ~~21~~ 60.49		

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1885-

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0.11198m

h m s
8 19 45-
+1° 57'

+.03 +1.00

Apr. 9. +40

20 26.2 —
28.4 —
30.3 20 11.4 7.3
32.3 11.5 9.4
34.0 11.6 11.6
11.4 13.5
23.7 11.4 15.5
25.9 11.4 17.6
28.0 11.4 19.6
30.0
32.0 27920
−16510

20 30.24 20 11.410 20 11.433

20 11.425
−.015
20 11.41

−18.95
+.01
−1.15
−20.09
51.32

7 38.98 − 1882 1.27462m
+ 24.36 1.38660
8 3.34

14 45.01

+40 24 53
1.69020
+ 2001
1.71021

− 51.31
− .01
+ .03
− 51.29

13 53.72

−17 11.80
− .43
+ 17.53
−16 54.70
56 59.02

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1885

Answers 99990 (d)

h ~ s 0.11036 m Before Mar 30
8 21 29 011213 After " "

+1° 13' +02 +1.00
+41 10 +.66
Feb 21 +66 -.02

Q+1

Feb 23 +59 +.04

Feb 25 +71

Mar 2 +76 -.08

Ex

21	30.4	28.7	21	49.3	41.1	22	15.0			21	52.0	29.2	21	41.5	22	21.3	10.3	22	22.6
	32.0	30.9		49.7	43.5		16.4				53.9	31.2		43.4		23.0	12.6		25.0
	34.0	33.0		49.6	45.5		17.7				55.2	33.3		45.6		24.5	14.4		26.9
	35.4	35.0		49.4	47.3		19.1				57.4	35.3		47.4		26.0	16.3		29.0
	37.2	36.9	32	900	49.4	49.4	20.7				59.2	38.0	33	40		27.2	18.5	14	420	31.0
		+16.504			—			Q-1									+16.504			32.8
		49.404			—			—				2.0			49.5					34.9
					—			22 4.0				4.3			51.7					37.0
					—			6.1 6.0 8.0				6.2			53.5					39.2
								6.1 8.2				8.3			56.0					
								6.5 10.6	6.175			10.7	6.30		58.2					
								— 16.504												
												99.70			86.8					27.84
21	33.80	21	49.404	21	49.480	22	17.78	21	49.651	21	55.54	21	49.850	21	49.644	22	24.40	22	30.924	22	30.933

21 49.442
— .015
21 4948

−12.29 30 +01
+ .01
−1.77
−14.85 6
21 35.38 +01
35
35.36

21 49651
— .015
21 4964

−12.44 52 −01
+ .01 +.00
−1.76
−14.27
35.37 −01
35.36

21 49747
— .015
21 4973

−12.68 4
+ .01
−1.78 5
−14.39 8
21 35.39 5

22 30930
— .015
22 30.92

−13.74
+ .01
— .08
−1.71
−15.52
35.40 16.40 84

52 4218 + 15.64
— 20.17
52 22.01
+1 30 26.34

+41 9 16
1.70150
+ 3086
1.73236

−54.00
— .00
— .05
−54.05
+1 29 32.29

−17 32.58
— .67
+ 16.60 76
−17 16.49
+1 12 15.85
80

1.19424
1.30460 m

51 4632 − 28.13
+ 3627
52 2259
30 25.76

+41 9 20
1.70150
+3922
1.74072

−55.04
— .01
— .04
−55.09
29 30.67

−17 30.72
— .65
+16.89
−17 14.48
12 16.19

1.44917
1.55953

52 15.97 − 5.79
+ 7.46
52 23.93
30 24.92

+41 9 50
1.70160
+ 3127
1.73287

−54.06
— .00
— .05
−54.11
29 30.81

−17 31.30
— .63
+ 17.01 2
−17 14.92 1
12 15.89
90

0.76268 m
0.87304

523
47 6.780 + 6.53 0.81491

+1709

— .06

−17 34.24
— .58
+17.30
−17 17.52 54

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h m s
8 21 29
+1° 13'

+02 +1.00

Mar. 3 Mar. 4 +54 +03 Mc Mar. 6 +51 +02 Mar. 8 +61 +02

Chf.

21 45.2 46.8 47.8 49.5 50.6 30.6 32.8 34.7 36.7 38.7 34700 +16.504 21 42.8 45.0 47.2 49.2 51.6 53.2 55.4 57.4 59.6 11.4 21 47.98 21 51.204 21 51.267

21 21.7 23.4 25.0 26.7 28.4 30.8 32.8 34.6 36.9 39.0 34820 +16.504 21 25.02 21 51.324

21 43.0 45.1 47.0 49.2 51.2 53.3 55.4 57.4 59.5 11.1 21 51.233

21 36.3 38.2 39.7 42.2 21 39.10

21 31.0 33.0 35.2 37.4 39.435700 +16.504 21 51.704

21 43.5 45.6 47.5 49.7 51.6 53.7 55.7 57.8 0.0 46 5.1 21 51.678

21 51246
−.015
21 51.23
−1424 5
+.01
+.03
−1.69
15.90
8 21 35.33

21 51.263
−.015
21 51.25
−1439
+.01
+.02
−1.67
−16.03
35.22

21 51.687
−.015
21 51.67
−1478 6
+.01
+.02
−1.64
16.37
34.30

52 2580 + 3.27 0.51455 52 5410 +26.24 1.41896 52 3602 +12.59 1.10003
− 4.22 0.62491n − 33.83 1.52932n − 16.23 1.21039n
52 21.58 52 20.27 52 19.79
+1 30 26.77 30 28.08 30 28.56

+41 10 0
1.70160
+1531
1.71691

+41 10 28
1.70170
+1955
1.72125

+41 10 10
1.70170
+3380
1.73550

−.5211
−.80
−.05
−52.16

−52.63
−.01
−.06
−52.70

−54.39
−.80
−.05
−54.44

+1 29 34.61 29 35.38 29 34.12

−17 33.50
− .57
+17.39
−17 16.68
12 17.93

−17 35.15
− .55
+17.48
17 18.22
12 17.16

−17 32.12
− .53
+17.55
17 15.10
12 19.02

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Mar. 10 +54

21	36.6		31.5	21	43.8	21	32.6	21	32.2	21	44.7	21	31.6		32.7	21	45.0	21	31.2		33.6	21	45.8
	38.1		33.5		45.9		33.7		34.4		47.1		33.2		34.8		47.1		32.2		35.6		48.0
	40.1		35.6		48.0		34.7		36.6		49.0		35.5		36.8		49.0		33.0		37.6		50.0
	41.5		37.7		49.9		35.9		38.6		51.0		37.2		39.4		51.0		34.0		39.7		52.0
	42.8		39.73560		52.1		37.1		40.73650		53.0		38.4		41.0	36.940	53.0		35.0		41.8	37.66	54.2
					54.1						55.1						55.2						56.5
			4.5		56.1				5.2		57.0				9.7	7.6	57.2				6.4		58.7
			6.5		58.3				7.5		59.2				9.9	9.9	59.2				8.7		0.5
			8.5		0.3				9.4		1.2				9.9	12.0	1.5				10.7		2.6
			10.7						11.7												12.6		
			12.8 8 60						13.79 50						9.8	13.9 9825					14.8	10.64	
			10420		468.5				10600		477.3					10676 5	478.2				10830		488.3
21	39.82	21	52.100	21	52.056	21	3480	21	53.000	21	52.023	21	35.18	21	53.382		53.133	21	33.08	21	54.150	21	54.256

Mar. 17 +60 +.03

Mar. 18 +45

Mar. 21 +50

21	52.078			21	53016			21	53258			21	54203										
	−.015				−.015				−.015				−.015										
21	52.06			21	53.00			21	53.24			21	5419										
	−15.22	×6			−16.38	×2			−16.54				−174	×3									
	+ .01				+ .01				+ .01				+ .01										
					+ .03																		
	−1.62				−1.53				−1.52				−1.47										
	−16.87				−17.41				−18.05				−1884										
	35.19				35.19				35.19				35.30										

52	38.95	+ 12.26	1.08849	52	48.57	+18.22	1.26055	52	48.45	+18.08	1.25720	52	53.62	+21.12	1.32469								
	− 15.81		1.19885½		− 23.49		1.37091½		− 23.31		1.36756		− 27.23		1.43505½								
52	23.14			52	25.08			52	25.14			52	25.39										
30	25.21			30	23.27			30	23.21			30	22.96										
+41	10 13			+41	10 23			+41	10 22			+41	10 28										
	1.70170				1.70170				1.70170				1.70170										
	+3114				+3869				+3290				+3872										
	1.73284				1.74039				1.73460				1.74042										
	−54.05				−55.60				−54.27				−55.01										
	− .80				− .60				− .60				− .60										
	− .05				− .03				− .03				− .03										
	− 54.10				− 55.03				− 54.30				− 55.04										
29	31.11			29	28.24			29	28.91			29	27.92										
−17	30.44			−17	29.36			−17	28.88			−17	25.65										
	− .52				− .48				− .48				− .47										
	+1762				+1780				+1781				+1785										
17	13.34			17	12.14			17	11.55			17	8.27										
17	17.97			17	16.20			17	17.36			17	14.65										
12				12				12				12											

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h m s
8 21 29
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+02 +1.00

Mar. 23 +46 | Mar. 25 | Apr. 1 +45 EX | Apr. 6 +33

21	47.2	21	33.6	46.0				21	40.0	34.5	21 55.0 46.8
	49.1		35.7	47.8	Ch. f.				41.7	36.5	55.2 49.0
	51.3		37.7	50.2					43.2	38.6	55.1 51.0
	53.4		39.6	52.2					44.4	40.8	55.1 53.0
	55.0		41.7	37660 54.5					46.0	42.8	38.640 55.2
			+16.504	56.3						+16.504	—
				58.5							—
				0.4							—
				2.4							—
						21	12.0				
							15.5				
							19.4				
							22.8				
							26.7	19.280			
								16.504			
				488.3							
21	51.20	21	54.164	21 54.256					21 43.06	21 55.144	21 55.120

21 54.225
−.015
21 54.21
−1.748
+.01
−1.44
−18.91
21 35.30

−.015
−1.793
+.01
−1.30
−19.22

21 55.132
−.015
21 55.12
−18.60
+.01
−1.22
−19.87
36.31

52 31.07 + 3.02 0.48031
− 3.89 0.59037m
52 27.18

30 21.17

52 59.92 S +12.07 1.08171
− 15.63 1.19384m
52 44.29

30 4.06

+41 10 5
1.70160
+3113
1.73273

−5404
− .00
− .02
5406

29 27.11

−17 26.88
− .47
+17.87
−17 9.48
H 17.63
12

+41 10 14
1.70170
+1299
1.71469

−51.84
− .00
+ .00
−51.84

29 12.22

−17 12.02
− .44
+17.84
16 54.62
H 17.60
12

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Apr. 9 +40

22 0.2 34.6 21 47.0
1.3 36.7 49.2
3.0 38.8 51.3
4.3 40.9 53.5
6.9 43.0 38800 55.7
+ 16504 57.5
59.8
1.7
4.0

499.7
22 3.14 21 55.304 21 55.522

21 55449
−.015
21 55.43
−18.85
+.01
−1.17
−2011
35.32

52 3295 − 769 0.88593
+ 9.96 0.99806
52 42.91

30 5.44

+41 9 47
1.70160
+20 12
1.72172

−5269
−.00
+.02
−5267

29 1.277

−17 1180
− .44
+ 1578
16 54.42
H 12 18.91

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1885 Auwers 9.9999 (c)

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8 22 14
+0° 38'
+41 45
Mar. 12 +35 −.05

0.11043m Before Mar. 30
0.11220m after " "
+01 +1.00
+.67

Mar. 14 +54 −.05

Mar. 19 +45

Mar. 30 +.64

22	29.7			22	29.2	22	11.3	22	17.3	22	17.5		18.2	22	30.5	22	53.6	22	
	32.0	19.0	16.9		31.0		13.8		19.1		19.5		20.3		32.8		55.5		
	35.0	19.5	17.5		33.0		15.8		21.2		21.6		22.2		35.0		57.2		
	39.1	19.6	21.7		35.8		17.7		23.1		23.5		24.6		37.4		59.1		
		20.1	24.2	19.550	38.0		18.6		25.42	21.220	25.3		26.52	22.36			0.7		
					40.0					+16.501									
			50.2		42.4								51.2	38.1	42.7			22	52.1
			52.3		44.2								53.2	38.8	45.0				54.0
			54.2		46.5								55.4	38.8	47.0				56.0
			56.5										57.4						58.2
			58.7	54380									59.53	5334					0.35612
				−16.501															−16501
					340.1								7770						
22	33.95	22	37879	22	37789	22	15.44	22	37721		22	2148	22	38.850	22	38.857	22	57.22	22	39.619

			22	37.819			22	37721					22	38.854				22	39619
				−.015				−.015						−.015					−.015
			22	37.80			22	37.71					22	38.84				22	39.60
				−15.459				−15.786						−16.83					−17.982
				+ .00				+ .01						.00					+ .01
				− .05				− .05											
				− 1.60				− 1.58						− 1.50					−1.34
				− 17184				− 17.4038						− 1833					19.25
			22	20.70			22	20.31						20.51					20.35
				66				33											

27	1382	+ 3.87	0.58771	27	4002	+ 2228	1.34792	27	3798	+17.37	1.23980	27	935	−17.60	1.24551m				
	− 4.99		0.69814m		− 2873		1.45835m		− 2240		1.35023m		+ 2279		1.35771				
27	8.83			27	11.29			27	15.58			27	32.14						
+0	55 39.52				55 37.06				55 32.77				55 16.21						
+41	44 48			+41	45 14			+41	45 12			+41	44 23						
	1.71 050				1.71060				1.71060				1.71040						
	+ 4667				+ 2494				+ 1682				+ 2757						
	1.75717				1.73554				1.72742				1.73797						
	− 57.17				− 54.39				− 53.38				− 54.70						
	− .80				− .60				− .60				− .60						
	− .04				− .03				− .03				+ .60						
	− 57.21				− 54.42				− 53.41				− 54.70						
+0	54 42.31				54 42.64				54 39.36				54 21.51						
−17	28.94			−17	31.65			−17	27.78			−17	12.32						
	.52				.50				.48				.46						
	+ 17.80				+ 17.85				+ 17.98				+ 18.04						
−17	11.66			−17	14.30			−17	10.28			−16	54.74						
+0	37 30.65				37 28.34				37 29.08				37 26.77						
					35														

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Apr. 1 +45 EX

22	15.8	22	9.4	22	50.3	—		—	
	17.7		12.9		51.4	—		—	
	20.8		16.6		52.2	—		—	
	22.5		19.7		53.2	—	22	40.3	38.2
	25.8		23.1		54.0	—		40.1	40.1
			26.7					40.1	42.2
			29.7			52.5		40.4	44.6
			33.3			57.7		40.2	46.4
			36.7			58.5		40.2	48.4
						58.7			
						0.756620			
						−16.501			
			208.1						
22	20.52	22	23.122	22	52.22	22 40.119		22	40.217

Apr. 6 +33

22 23.122
−.015
22 23.11
−17.93
+ .00
−1.30
−19.23

22 40.168
−.013
22 40.15
−18.60
+ .00
−1.22
−19.82
20.33

S.
25 3192

27 1880 − 12.05 1.08099
+ 15.60 1.19319
27 3440
55 1395

+41 42 46
1.71000
+ 1072
1.72072
− 52.57
+ .00

+41 44 33
1.71040
+ 1299
1.72339
− 52.89
− .00
+ .00
− 52.89
54 21.06

−17 1268
− 46
+18.04
16 55.10 C4

−17 1202
− .45
+18.02
16 54.45
37 26.6 84

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1885 Answers 0.00000 (b)

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0.11046 m Before Mar 30
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Mar. 6 +51 +02 +0 +1.00 +.67 Mar. 17 +60 +03 Mar. 21 +50 Mar 23 +46

A+1

23	7.4	23	10.5			23	29.7	23	—	23	24.5	23	20.4		13.6	23	25.7	23	23.8			23	25.7
	8.9		12.5				31.3		163 14.2		26.8		22.3		15.4		27.8		26.0				27.8
	10.8		14.5				32.4		165 16.5		28.7		23.9		17.6		29.7		27.4				29.9
	12.8		16.6				34.0		162 18.3		30.8		25.2		19.6		32.2		29.0				31.7
	14.2		18.8	14.580			35.4		161 20.2	16.275	33.0		26.4		21.8	1760	34.0		30.2				34.0
			+ 16.500								35.0						36.0						36.0
								45.0			36.9				46.4		38.0				46.3		38.0
								47.2			39.0				48.5		40.3				48.3		40.0
								49.5			41.0				50.7		42.2				50.6		42.1
								51.4							52.8						52.4		
								53.649340							54.6 5060						54.450 400		
																					— 16.500		
								65.615			295.7				6820		305.9						305.2
23	10.82	23	~~58.080~~			23	32.56	23	32.808	23	32.856	28	23.64	23	34100	23	33.989	23	27.28	23	33.900	23	33.911

		23	31080					23	32.832					23	34044							23	33906
			— 015						— 015						— 015								— 0.15
		23	31.06					23	3282					23	34.03							23	3389
			—1439						—163 x2						—1749 x3								—1748
			+ .00						+ .00						+ .00								+ .00
			+ .02						+ .03														
			— 1.67						— 1.54						— 1.48								— 1.45
			— 1604						—1783						—1891								—1893
		28	15.02					23	~~15.68~~						15.12								1496
									14.99														

0	1070	+20.26	1.30664	59	4630	+0.27	9.43136	0	238	+10.40	1.01703	59	5870	+6.63	0.82151								
	— 2613		1.41710		— 0.35		9.54182		— 13.41		1.12749		— 835		0.93197								
	59 4387			59	4595			59	4897			59	50.15										
+0	23 4.48			23	2.40			22	5938			22	5820										
+42	17 44			+42	17 20			+42	17 36			+42	17 33										
	1.71880				1.71870				1.71880				1.71880										
	+ 1955				+ 3869				+ 3872				+ 3111										
	1.73835				1.75739				1.75752				1.74991										
	—54.75				— 57.20				—57.22				—56.22										
	— .00				— .00				— .00				— .00										
	— .03				— .05				— .00				— .05										
	—54.75				— 57.25				— 57.22				— 56.27										
+0	22 9.73				22 5.15				22 2.16				22 1.93										
	—17 35.15				—17 29.30				—17 25.65				—17 26.88										
	— .56				— .49				— .48				— .48										
	+ 17.70				+ 18.10 .06				+ 18.15				+ 18.18										
—17	18.01			—17	11.79 .9			—17	7.98			17	9.18										
+0	4 51.72				4 53.40 .36				4 5418				4 5275										

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Mar 25 Apr. 9 +40

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23	40.5	14.5	23	26.9	
	42.6	16.3		29.0	
	43.7	18.4		31.2	
	44.7	20.5		33.2	
	46.3	23.0 18.54		35.0	
				37.2	
		47.5		39.3	
		49.7		41.6	
		51.8		43.5	
		53.7			
		55.8 57.70			
		7024		31 6.9	
23	43.56	23 35.120	23	35.211	

23 35.165
−.015
23 35.15
−18.95
+ .00
−1.18
−2.013
23 15.02

59 56.78 − 8.40 0.924 28
+ 1088 1.036 51
0 7.63
22 40.72

+42 17 11
1.71870
+ 20.12
1.73882

− 5480
− .02
+ .05
− 5485

21 45.87

−17 11.80
− .44
+ 18.11
−16 54.13
4 51.74

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1885 Anvers 9.99998 (a)

h m s
8 23 33.
−0° 34'
+47 57

0.11044 n Before Mar 30
0.11221 n after " "
−.01 + 1.00

Feb. 21 +66 −.02 +.68 +.04 Feb. 23 +59 Feb. 25 +71 Mar. 2 +76 −.08 Mar. 3

23	30.6	32.2	23	44.9	23	27.3	32.7	23	45.0	23	51.8	—	23	44.8	23	41.3	33.8	23	46.2				
	31.8	34.5		47.0		28.9	34.7		47.0		53.6	367 34.6		47.9		43.2	35.8		48.3				
	33.3	36.5		49.2		30.6	36.7		49.1		54.7	368 36.8		49.2		44.8	38.0		50.2				
	35.7	38.5		51.3		32.0	38.7		51.1		56.5	369 39.0		51.5		46.5	40.2		52.3				
	37.0	40.6	36	46 53.2		33.8	40.8	36	72 53.3		58.5	367 40.8	36	475 53.3		478	42.2	38	00 54.5				
				55.2					55.2					55.4					56.4				
		5.6		57.0			5.4		57.3			5.5		57.3			6.7		58.4				
		7.6		59.3			7.5		59.3			7.5		59.4			8.7		0.6				
		9.6		1.3			10.0		1.4			9.9		1.6			10.9		2.5				
		11.5					12.0					11.9					12.9						
		13.7	9	60			14.0	9	78			14.0	9	76			15.0	10	84				
		106.06		478.4			106.50		478.7			106.51		479.4			108.84		489.4				
23	32.68	23	53.030	23	53.156	23	30.52	23	53.250	23	53.189	23	55.02	23	53.256	23	53.267	23	44.72	23	64.420	23	54.378

23 53.093
−.015
23 58.08
−12.29 30 +01
− .01 −.00
−1.78
−14089
23 39.99 +.01
38.99 +.01

23 53.219
−.015
23 53.20
−12.44 52 −.01
− .01 +.00
−1.76
14289
23 38.99 −.01
.91
38.90

23 53.261
−.015
23 53.25
−12.68 4
− .01
−1.76
−1441
38.84

23 54.378
−.015
23 54.36
−13.7 x 4
− .01
− .08
−1.71
−1554
38.82

39	3988	+1941	1.28803	39	4375	+2270	1.35603	39	1282	−1.76	0.24551	39	2697	+9.66	0.98498								
	−2503		1.39847		−2927		1.96647		+2.27		0.35595		−12.46		1.09542								
	39 1485				39 1448				39 1509				39 1451										
−0	16 2650				16 2613				16 2674				16 2616										
	+42 57 14				+42 57 18				+42 56 44				+42 57 1										
	1.72880				1.72890				1.72870				1.72880										
	+3098				+3931				+3141				+1709										
	1.75978				1.76821				1.76011				1.74589										
	−57.51				−58.64				−57.56				−55.70										
	− .00				− .00				+ .00				+ .62										
	− .09				− .09				− .08				− .09										
	−57.60				−58.73				−57.64				−55.79										
−0	17 24.10				17 24.86				17 29.38				17 21.95										
	−17 32.58				−17 30.72				−17 31.30				−17 34.24										
	− .69				− .67				− .65				− .60										
	+ 17.25	02			+ 17.33	16			+ 17.30				+ 17.61										
	−17 16.01	25			−17 14.06	23			−17 14.65				−17 17.23										
−0	34 40.11				34 38.92				34 39.03				34 39.18										
		35				39.09																		

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Mar. 3

Mar. 4 +54 +03

23 58.2	34.6	23	46.6
0.0	36.4		48.6
2.3	38.5		50.7
3.7	40.4		52.8
4.9	42.7 38.52		54.9
			56.9
	7.2		59.0
	9.4		1.0
	11.5		3.2
	13.4		
	15.6 11.42		
	109.94		493.7
24 1.82	23 54.970	23	54.856

23 54.913
− .015
23 54.90

−14.24 (−14.25)
− .01
+ .03
− 1.70
−15.93
38.97

Mar. 8 +61 +02

23 38.1	34.6	23	47.0
40.1	36.7		49.1
42.2	39.0		51.3
43.9	41.0		53.2
45.1	43.2 38.90		55.3
			57.4
	7.6		59.5
	9.7		1.7
	12.0		3.6
	14.0		
	16.2 11.90		
	110.80		498.1
23 41.88	23 55.400	23	55.344

23 55.372
− .015
23 55.36

−14.78 (−14.76)
− .01
+ .02
− 1.65
−16.40
38.96

Mar. 10 +54

24 4.7		—	23	47.6
6.3	39.3	37.2		49.6
7.8	39.2	39.2		51.7
9.7	39.2	41.3		53.7
11.4	39.3	43.4	39.25	55.6
				57.9
		8.4		59.9
		10.3		2.0
		12.2		4.3
		14.3		
		16.4 12.32		
		111.57		501.3
24 7.98		23 55.785	23	55.700

23 55.742
− .015
23 55.73

−15.24 (−15.26)
− .01
− 1.63
−16.90
38.83

Mar. 12 +35 −05

24 23.7			—
25.2			—
26.6			—
28.0			—
29.8		23 54.7	54.7
		54.9	57.0
	8.7		—
	10.7	56.0	2.2
	12.8	56.2	4.4
	14.7		
	17.0 12.780		
	16.801		
24 26.66	23 56.279	23	56.280

23 56.28 (10)
− .015
23 56.08

−15.45 (−15.49)
− .00
− .05
− 1.61
−17.15
38.93

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39 7.07	−6.91	0.83948n	39 32.62	+13.49	1.13001	39 1.29	−12.24	1.08778n	38 35.00	−30.44	1.48344n
+ 8.91		0.94992	− 17.40		1.24045n	+ 15.78		1.19822	+ 39.25		1.59388
39 15.98			39 15.22			39 17.07			39 14.25		
16 27.63			16 26.87			16 28.72			16 25.90		
+42 56 41			+42 57 4			+42 56 35			+42 56 9		
1.72870			1.72880			1.72870			1.72860		
+ 1531			+ 3379			+ 3114			+ 4666		
1.74401			1.76259			1.75984			1.77526		
− 55.46			− 57.89			− 57.52			− 59.60		
+ .00			+ .00			+ .00			+ .01		
− .08			− .09			− .08			− .07		
− 55.54			− 57.98			− 57.60			− 59.66		
17 23.17			17 24.85			17 26.32			17 25.56		
−17 33.50			−17 32.12			−17 30.44			−17 28.94		
− .58			− .55			− .54			− .52		
+17.71			+17.92			+18.01			+18.08		
−17 16.37			17 14.75			−17 12.97			−17 11.38		
34 39.54			34 39.60			34 39.29			34 36.94		

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1885 Arcturus 999998

h m s
8 23 83
−0° 34′

−.01 +1.00

Mar. 14 +54 −.05 | Mar. 29 +50 | Mar. 30 +64 | Apr. 6 +33

24	11.3	36.0	23	48.1	23	57.3		23	50.0	24	11.4			24	8.1			—	
	12.5	37.7		50.2		58.7			52.0		12.9				9.8			—	
	14.3	40.0		52.3		59.7			54.1		14.2				11.5			—	
	17.2	42.0		54.4		1.6			56.2		16.0				12.8			—	
	19.0	44.0	39.94	56.7					58.4		17.8				14.8			—	
				58.3					0.2									—	
		9.0		0.5			10.3		2.5			24	10.5			11.2	24 58.7	2.8	
		10.9		2.6			13.6		4.5				12.5			13.3	58.6	4.8	
		13.0		4.6			14.5		6.6				14.5			15.2	58.8	7.0	
		15.2					16.5						16.7			17.3			
		16.9	13.00				18.9	14.760					18.7	14.580		19.3	15.260		
								− 16.501						− 16.501			− 16.501		
		11.294		50.7.7					52.45										
24	14.86	23 56.470	23	56.411	23	59.32	23	58.257	23	58.278	24	14.46	23	58.079	24	11.40	23	58.759	23 58.700

			23	56.440				23	58.272				23	58.079				23	58.730
				−.015					−.015					−.015					−.015
			23	56.42				23	58.26				23	58.06				23	58.71
				−15.786					−17.95					−17.982					−18.60
				− .01					.00					− .01					.00
				− .05															
				−1.58					−1.36					−1.35					−1.23
				−17.40					−19.31					−19.28					−19.83
			23	39.02					38.95					38.78					38.88

38	52.12	− 18.42	1.26529$_2$	39	33.48	− 1.05	0.02119$_2$	39	15.40	− 16.38	1.21431$_2$	39	20.98	−12.67	1.10278$_2$				
+	23.75		1.37573	+	1.35		0.13163	+	21.20		1.32652	+	16.41		1.21499				
39	16.87			39	34.83			39	36.60			39	37.39						
16	28.52			16	46.48			16	48.25			16	49.04						
+42	56.28			+42	56.47			+42	56.29			+42	56.35						
1.	72860			1.	72870			1.	72860			1.	72870						
+	2494			+	2785			+	2757			+	1299						
1.	75354			1.	75655			1.	75617			1.	74169						
−	56.69			−	57.09			−	57.04			−	55.17						
+	.00			+	.00			+	.00			+	.00						
−	.04			+	.00			+	.00			+	.04						
−	56.73			−	57.09			−	57.04			−	55.13						
17	25.25			17	43.57			17	45.29			17	44.17						
−17	31.65			−17	12.80			−17	12.32			−17	12.02						
−	.57			−	.46			−	.46			−	.46						
	+18.15				+18.41				+18.41				+18.41						
−17	14.01			−16	54.85			−16	54.37			−16	54.07						
34	39.26			34	38.42			34	39.66			34	38.24						

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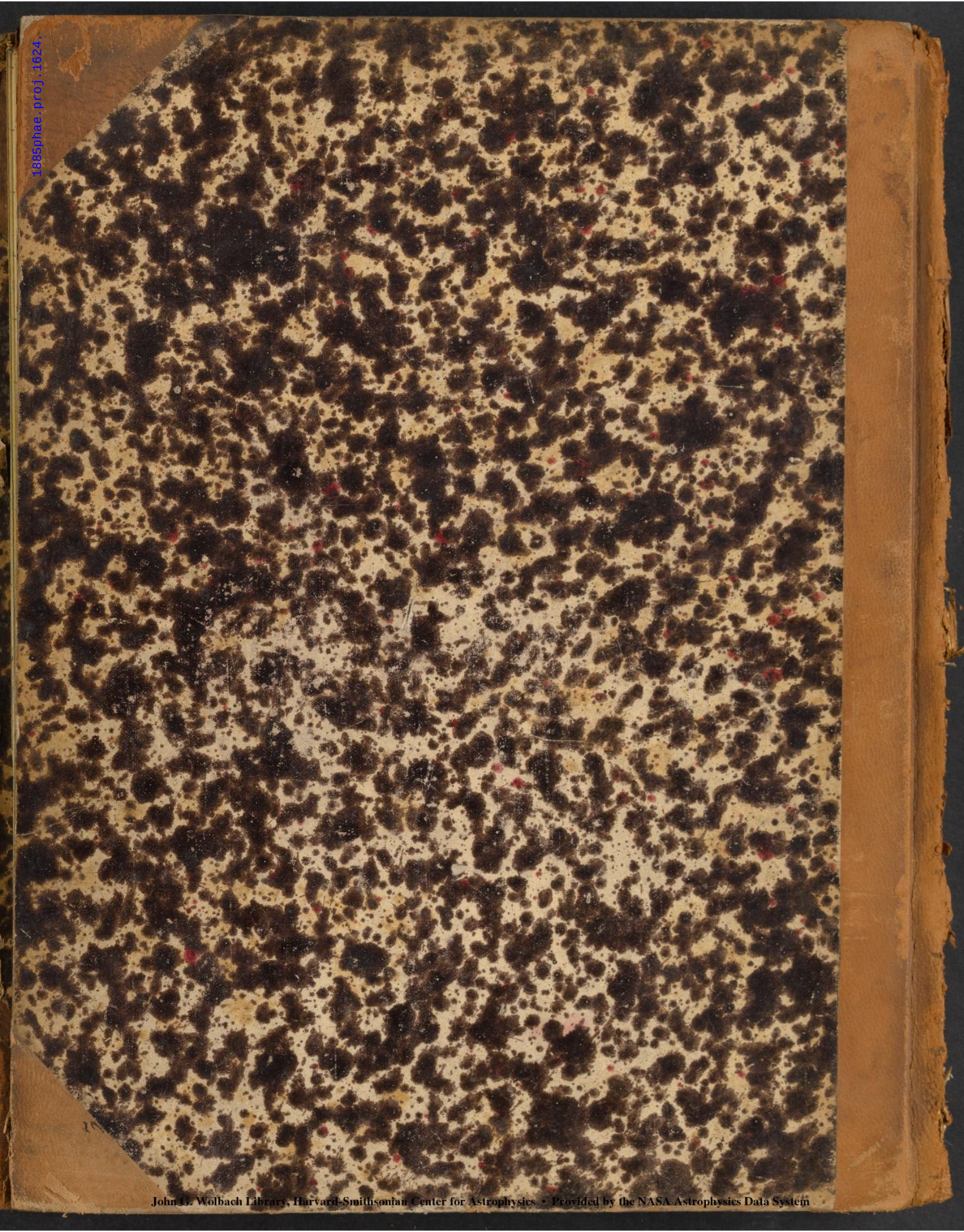
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