

1879phae.proj.1305W

KG  
11366  
v. 303



u Cass.

$\alpha$   $1^h 0^m 10^s$

$\delta$   $+54^\circ 20'$

Mag 5.4

Companion A  $p$   $133^\circ 20'$   $s$   $149''.8$

A is brighter than B.

B  $p$   $255^\circ 0'$   $s$   $281''.3$

1. Please draw the stars in the field & be certain of the identity of A & B.
2. Express on the same scale of magnitudes what are the magnitudes of the companions

f

$\alpha$  Ursa Minoris.

$\alpha$  Lyrae.

$\alpha$  Canis Majoris.

R. 57.Corrected.

by F. Thiele.

Page. Hour.

.. 7.	8 22	Zero Phot. K.
.. 10	8 58	S Canceri
.. 13	9 31	f (S Canceri)
.. 15	9 58	no correction
.. 20		Zero Phot. K.
.. 28	8 38	c (R Andri.)
.. 28	8 41	c (— " —)
.. 30	9 07	Zero Phot. K.
.. 37	9 00	Magn.
.. 54	7 27	S Ceti
.. 62	8 30	μ Andri.
.. 71	8 53	t (R Andri.)
.. 86	7 07	Magn.
.. 87		— " —
.. 88	7 36	— " —
.. 88	7 36	— " —
.. 88	7 44	— " —
.. 91		Focus setting
.. 99	9 36	2 Leon. D.
.. 111	9 52	β Persei.
.. 113	7 04	— " —
.. 124	9 14	— " —
.. 127	9 42	— " —
.. 139	7 39	Focus setting.
.. 148	10 19	S Canceri
.. 150	9 53	t (R Linnis).
.. 151	10 30	r (— " —)
.. 160	8 49	g (— " —)
.. 164	9 07	g (— " —)
.. 182	9 22	Zero Phot. K.
.. 191	7 47	d (R Linnis).
.. 193	8 02	R Linnis
.. 205	9 42	n (R Linnis).
.. 205	9 48	Zero Phot. K.







- 5 S Canis cub Stars 33, 142  
 6 Ande brightness bright stars.  
 20 Estimates Prof. Rogers may. & Urachia. by Phil R  
 27 R Andromeda, 48, 62, 68 [36, 41, 86.  
 54 o Ceti  
 58 Helix I  
 59 " I  
 186 " K, 197, 207  
 61 Photometer Q <sup>64, tried</sup> 82, tried; 104 Feb. Orion; 137 Oct.  
 Orion; 152, IV, 27; 176 Ma hel = Hydrus; 212, G.C. 1861.
- 96 R Leonis, 149, 160, 168, 190, 199  
 110 B Rucii, 182,  
 132  $\alpha$  Leonis, Companion;  
 172 Phot. M. 179 54 Leonis. P.E. alt, 174-5; 56 Aug. 179  
 184 Diam. Fish, R1.  
 185 Photometer P  
 203 R Virginis  
 209 Jupiter III  
 216 1 Dis. forming below = .0298 cond.



Jan. 31, 1879

Occultations of stars in Pleiades.  
First minute on chronograph sheet  $2^h 53^m$

P. obs. immersion of faint star about  $2^h 54^m$ .

$3^h 0^m$  by chron. 73451

$24^s.8$  between dark limb and nearest star, S. obs.

Moon	$3^h 0^m 15.0$	Decl.		P. obs.	2	54	14.15	+3.5
Star a	38.0	$8\frac{1}{2}$			3	17	12.2	13.8
" b	41.6	$1\frac{1}{2}$						
" c	$1^m 1.8$	4			3	3	24	40.5
" d	7.0	$5\frac{1}{2}$			4		34	48.0
" e	14.0	$6\frac{1}{2}$			5		38	1.8
					6		42	43.15
					7		43	16.7

Disappearance of Star a

$3^h 16^m$  73451

$13^s$  by S. Clock S. obs. eye & ear, finder

P. obs. E. Equat. Two taps, first for obs. by S. with finder

P. sees disappearance of this star much more sudden than of a previous one observed with finder before  $3^h$  L. id. time

P. obs. disappearance of a fainter star (b) about  $3^h 20^m$ ; star not visible in finder.

S. obs. disappearance of star c with E. Equatorial.



3

Jan. 31, 1879.  
 U. obs. with E. Equat. disappearance  
 of faint star to the south of  
 the last about  $3^h 36^m 50^s$  by  
 7.3451.

P. obs. disappearance of principal  
 component of a double star  
 about  $3^h 38^m 20^s$  by 7.3451.

This double star is No. 21 of Engelmann's chart, See p. 16.  
 faint comp dis about 30 hrs.

3 42 5.5 - 3451 time of disappearance  
 of star also recorded on chronograph S. obs.

Jupiter S. obs.

7 11

1.06	
1.04	
1.21	
1.09	
1.09	49
<u>1.098</u>	1.098

7 16 Star (11 mag.) a out of field S. obs.

1.06	
.89	
.90	
.93	
1.03	481
<u>.962</u>	.962



7 24 Star (11 mag.) Uds

.60  
.84  
.76  
.66  
.81  
.654 2.7  
6.54

Jupiter Uds

7 28 1.23  
1.06  
1.24  
1.40

1.13 10.6  
1.212 1.212

Jupiter Prob.

7 29 1.15  
1.32  
1.18  
1.03  
1.11  
1.158

7.9  
1.158

7 31 .97 Star (11 mag.) Prob.

.82  
.91  
.92  
.98  
.920

1.0  
#.920



Jan. 31, 1879.

Transits of comparison stars of S. Canis  
Large finder.

					Sec,	P. obs.
750	4	38	1.0	= d	14	From chart, 33 54
			34.5	f	6	34 28 34
			23.5	g	25	50 22
	39	0.0	39.5	e	0	35 31 41
			49.0	h	22	39 8
			93.0	i	3	37 14 95
	41	22.0	18.0	a		30 16

F. P. Canis. U. obs

8-02

33.6		
26.3	2.7	
216.7		
218.7	2.0	
5053		2.4
25265		2.0
126.33		47
		235
		1.18

P. obs.

8 6

34.3		
37.9	3.6	
215.6		
219.4	3.8	
5072		3.6
2536		3.8
126.8		14
		37
		1.85

S. obs.

8 12

34.1		
37.9	3.8	
216.1		
219.4	3.3	
5075		3.8
25375		3.3
126.87		11
		355
		1.78



Jan. 31, 1879

		Order of Brightness	of Stars	P. obs.
		$\alpha$	$\beta$	
8	8	1 $\alpha$ Canis Majoris	1	1
		2 $\alpha$ Auriga	2	2
		3 $\beta$ Orionis	3	3
		4 $\alpha$ Orionis	5	5
		5 $\alpha$ Canis Minoris	4	4
		6 $\beta$ Gemminorum	7	7
		7 $\alpha$ Tauri	6	6
		8 $\alpha$ Gemminorum	8	8
		9 <del><math>\beta</math> Tauri</del>		
		9 $\beta$ Orionis	10	12
		10 $\beta$ "	10	11
		11 $\beta$ Tauri	9	10
		12 $\gamma$ Orionis	12	9
		13 $\delta$ "	13	14
		14 $\delta$ "	14	13



Jan 31, 1879

C

8 22 32.8 8.5 stars too near  
 41.3  
 209.3  
 219.9 10.6  
 50 3 3 19 1  
 9.55  
 4.78  
 251.65  
 125.82 ~~256.65~~  
~~128.32~~

8 26 30.6  
 43.5 12.9  
 210.0  
 221.2 11.2  
 50 5 3 4 1  
 25 265 12.05  
 126.32 6.03  
 50 53  
 25 265 12.05  
 126.32 6.02

8 29 31.1 11.7  
 42.8  
 210.6 10.4  
 221.0  
 50 55 2 1  
 25 275 11.05  
 126.38 5.53  
 50 55  
 25 275 11.05  
 126.38 5.52

8

a Jan. 31, 1879

28.8 16.8

45.6

207.8

225.5

50 7 7

25 3 85

126.92

17.7

14 5

17 25

8.62

u. obs.

16.8

17.7

34.5

17.25

8.62

50 7 7  
25 3 85  
126.92

27.5 19.6

47.1

206.2

225.0

50 5 8

25 2 9

126.45

18.8

9 4

19.2

9.60

P. obs.

19.6

18.8

18.20

9.10

50 5 8  
25 2 9  
126.45

24.2

45.2

207.6

225.1

50 2 1

25 1 05

125.52

21.0

17.5

38.5

19.25

9.62

L. obs.

21.0

17.5

38.5

19.25

9.62

50 2 1  
25 1 05  
125.52



Jan. 31, 1879.

g

u. ls.

8 46

23.9 26.9  
50.18

202.3 28.0

230.3

50 73

25 3.65

126.82

149

27.45

13.703

26.9

28.0

14.9

27.45

50 73

25 3.65

126.82

13.72

8 48

21.2 33.7  
54.9198.9 36.9  
235.8

5108 106

2554 353

127.70 17.65

Proto

33.7

36.9

706

353

1765

5108

2554

127.70

8 57

19.4 37.9  
57.3

200.3 36.3

236.6

5136

256.80

128.40

2

37.1

18.55

Sub-

37.9

36.3

742

37.1

18.55

513.6

2568

128.40

Jan. 31, 1879.

26.3 dome interferes; reject,

18.7 too bright; reject. U. obs.

8 58

24.3	18.9	U. obs.
43.2		18.9
208.1	17.5	17.5
225.6		501.2 0.4
		2506 18.7
5012	4	125.30 9.3510
2506	17.2 18.2	
125.30	8.60 9.10	

9 0

22.2	24.4	P. obs.
46.6		24.4
203.3		22.3
225.6	22.3	7
4977	67	2335
24885		11.68
124.42	11.68	

9 3

21.7	23.2	S. obs.
44.6		23.2
201.9	24.2	24.2
226.1		494.6 74
4946	74	2473 23.70
2473	23.7	123.65 11.85
123.65	12.85	



Jan. 31, 1879,

U. obs.

9	10	14.5	39.4		39.4
		53.9			38.8
		197.2	38.8	501.6	39.7
		286.0		2508	19.55
		501.6	2	125.40	
		2508	39.1		
		125.4	19.55		

Prob

9	12	14.0	42.3		42.3
		56.3			44.9
		195.8	44.9	5068	7.2
		240.7		2534	43.6
		5068	7.2	126.7	21.8
		2534	43.6		
		126.70	21.8		

S obs

9	15	13.9	44.9		44.9
		58.8			43.8
		193.1	43.8	502.9	7
		236.9		25135	44.35
		502.7	7	125.68	22.18
		251.35	44.35		
		125.68	22.17		

12

Jan. 31, 1879.

U. obs.

9 20

15.0  
61.2 46.2  
190.2 50.6  
240.8  
507.2 96.8  
253.6 48.4  
126.8 24.2

46.2  
50.6  
507.2 96.8  
253.6 48.4  
126.8 24.2

9 22

10.6  
67.3 56.7  
191.3 53.3  
244.6  
513.8 10.6  
256.90 55.0  
128.45 27.50

Prob.

513.8 56.7  
256.9 53.3  
128.45 55.0  
27.50

9 25

12.8  
60.5 47.7  
195.0 54.7  
249.7  
518.0 2.4  
259.0 51.2  
129.50 25.60 + 4

Prob.

47.7  
54.7  
518.0 2.4  
259.0 51.2  
129.50 25.60



Jan. 31, 1879,

9 31

3158.1  
75.0  
160.7  
256.8

76.9

96.1  
~~86.1~~

850.6 30

425.3 86.5

212.65 ~~40.75~~  
43.25

335.4 117.4

92.8  
262.8 114.9  
147.9

838.9 12.3

419.45 116.15

209.72 58.08

U. obs.

76.9

96.1

850.6 173.0

425.3 86.5

212.65 43.25

P. obs.

117.4

114.9

12.3

838.9 116.15

419.45 58.08

209.72

9 37

319.2

110.9

169.0

266.2

865.3

432.65

216.33

151.7

97.2

248.9

124.45

62.22

Sch.

151.7

97.2

865.3 248.9

432.65 124.45

216.33 62.22

14

d Jan. 31, 1879.

U. obs.

9 42

27.1	19.2	19.2
46.3		
206.9	19.5	5067 19.5
226.4		25335 7
5067	7	126.68 19.35
		9.68
25335	19.35	

126.67 9.68

25.6

21.7

P. obs.

9 43

47.3

206.4	20.1	21.7
226.5		20.1
5058	1.8	5058 1.8
		2529 20.9
25290	20.9	126.45 10.45
126.45	10.45	

25 290 20.9

126.45 10.45

26.0

21.2

S. obs.

9 47

47.2

203.2	26.0	21.2
229.2		26.0
5056	7.2	505.6 7.2
		2528 23.6
2528	23.6	126.40 11.8
126.40	11.8	

229.2

5056 7.2

2528 23.6

126.40 11.8



Jan 31, 1879  
 S. Canine.

9 53

34.2  
 37.9  
 214.4  
 218.4

3.7

4.0

5049  
 25245  
 126.23

77

3.85

1.92

5049  
 25245  
 126.22

3.7

4.0

3.85

1.92

9 55

33.0  
 37.2  
 214.2  
 218.2

4.2

4.0

5026

2513

125.65

4.1

2.05

502.6  
 2513  
 125.65

4.2

4.0

4.1

2.05

P. obs.

9 58

33.5  
 37.5  
 213.6  
 218.9  
 214.9  
 218.8

4.0

5.3

3.9

mean 4.6

decidedly  
 looks too bright

35.5  
 216.55  
 252.05  
 126.02

4.4  
 4.6  
 8.6  
 4.3  
 2.15

2.15 2.20

Sun 777 (P)  
 6,7,8 (S)  
 6,7,6 (U)

4.0  
 5.3  
 4.65  
 2.52  
 3.8  
 13.2  
 6.6  
 2.2

16

Feb L 1879.  
S. 15" ch.

8 19 <sup>C</sup>  
1.10  
1.09  
1.10  
—  
29  
1.097

Sung 5.3.4 5.4

2.9  
1.097

Setting heavy together too large set are separated a little later, when the ring had increased.

8 31 <sup>C</sup>  
.60  
.57  
.70  
7  
.623

18.7  
.623

8 33 <sup>d</sup>  
.93  
.93  
1.24  
310  
1.033

310  
1.033

8 4 <sup>L</sup>  
41 edge of field right  
moved to center

8 54  
0.45  
.46  
.43  
1.4  
.447

1.4  
.447

leaves.

Looked at Pleiades Double star of last night is 21 of Engelmann's chart.



6 23

Feb. 3, 1879

Jupiter. Sols.

1.36

1.27

1.19

1.13

1.23

11 6

11 6  
1.232

1.232

Photometer I,

6 25

1.22

1.37

1.07

1.17

1.07

9 0

1.180

P. obs.

clouds coming.

9 0

1.180

Feb. 4, 1879

Photometer I

6 5

~~Star~~ Japetus

1.01

1.11

.92

1.01

1.14

---

1.9

1.038

1.9  
1.038

P. obs.

Prism to the left  
& below.

6 12

Star  $\epsilon$  (11 magn.)

0.64

.68

.61

.57

.62

---

.6241.2  
.524

P. obs.

Prism to the left  
& below.

6 24

.68

.76

.62

.70

.66

---

.6844.2  
.684

S. obs.

a symmetrically placed  
with regard to other images.  
Prism above telescope.

6 34

Japetus

0.44

.50

.58

.56

.55

---

.5261.3  
.526

S. obs.

In this set the prism  
was below the telescope  
and Saturn behind the prism.



Feb. 4, 1879.

Jupiter repeated.

6 42

.90

.86

1.26

.90

.84

476

.952

476  
952

S. obs.

In this set the prism  
was about the telescope, and  
Saturn out of the field.

6 48

1.28

1.12

1.14

1.18

1.32

104

1.208

104

1.208

U. obs.

Prism above telescope;  
Saturn out of the field.

6 55

1.02

1.11

.96

.91

.82

482

.964

482

.964

U. obs.

Prism below telescope; Saturn  
behind prism.

7 4

.85

.82

.81

.86

.90

424

.848

24

.848

U. obs.

Prism above telescope;  
a out of field.

Star b (11 magn.)

Feb. 4, 1879

Estimates of Magnitude with Phot. K

Polaris

W. & R. obs -

4.6 = magnitude when brightest (Setting 140)

6.0 mag.

8.2

67.4 59.2

184.7 63.6

266.0

248.3

5086

2543

127.15

7.5 mag.

21.8

51.0

204.1

237.2

5141

~~5141~~

25705

128.52

~~575~~

~~128.75~~

9.0 mag.

32.8

42.1

212.1

219.8

5078

2539

126.95

8.3

7.7

8.0

4.0

5086 59.2

2543 63.6

127.15 67.4

30.7

too read wrong. Observer

~~248.3~~

says it is too bright and repeats

2.8

61.4

30.70

5141 29.8

25705 33.1

128.52 28

31.45

~~15.42~~  
15.58

8.3

5078

2539

126.95

7.7

8.0

4.0



Feb. 4, 1879

7 40

7.0 mag.

18.8 32.5

51.3

32.5

190.4 46.5

4974

46.5

236.9

2487

790

4974 790

124.35

395

2487 395

19.75

124.35 19.75

9.5 mag.

34.7

38.7 4.0

4.0

214.5 3.5

5059 3.5

218.0

25295 75

5059 7.5

126.48 3.75

25295 3.75

1.88

126.48 1.88

5.5 mag.

355.6 80.4

76.0

80.4

163.3

105.2

268.5 105.2

8634

1556

8634 1856

4317

928

4317 92.8

215.85

46.40

215.85 46.40

6.5 mag.

66.3 54.7

5150

4.3

11.6

2575

547

190.0 57.1

128.75

57.1

247.1

118

5150 111.8

559

2575 55.9

27.95

128.75 27.95

Feb. 4, 1879

744

8.5  
 28.3 13.1  
 41.4  
 210.4 11.3  
 221.7  
 5018 244  
 2509 12.2  
 125.45 6.1

5.0 mag.

332.7  
 103.0 { 100.4 130.3  
 105.6

158.8 116.0

274.8

8693 2463

43465 123.15

217.33 61.57

8.0 mag.

21.4

47.2

204.0

223.1

4957  
 24785  
 123.92

49  
 22.45  
 11.23

Altered focus.

5018

2509

12545

13.1

11.3

44

122

6.1

130.3

116.0

463

8693 123.15

40965 61.58

20482

43465

217.32

25.8

4957 19.7

24785 44.9

123.92 11.22

8-9

8 & 9 identify region near R Androm.  
 R is not visible in finder and scarcely  
 seen in large telescope with photometer K.  
 Comparison stars found.



Feb. 4, 1879

89 35

Pole Star

Phot. I 5 inch. aperture

9 49

2.09

1.55

S. obs

1.72

236

536

1.787

1.787

1

1.36

1.19

among star 21 not 1

1.09

9 57

89 1

0.99

S. obs.

1.01

282

.940

1.82

282

.94

89 26

1.19

S. obs.

1.87

295

.983

1.89

295

.983

10 0

Seeing 5, 6, 6 (P.)  
6, 7, 7 (U.)

24

Feb. 7. 1879  
Capitula S. obs. Photometer I.

6 20  
98  
82  
82  
73  
80  
416  
832

Prism to the left & below.

416  
832

6 22  
1.14  
1.04  
189  
1.01  
1.10  
18  
1.036

P. obs.  
Prism to the left & below.

18  
1.036

6 37  
54  
151  
50  
47  
417  
249  
498

Star b; a out of field on the right.  
S. obs.

49  
498

6 42  
86  
73  
82  
82  
76  
399  
798

U. obs. Prism to left; a out of field on the right.

49  
798



Feb. 7, 1879.  
Japetus U. obs.

6 47

.92  
.81  
1.07  
1.09  
~~0.90~~  
479  
958

479  
958

Star b

6 53

0.89  
.79  
.78  
~~.72~~  
.84

401  
.802

401

.802

S. obs.

Prism above; images placed symmetrically; a in field.

6 59

.88  
.70  
.68  
.62  
.68  
356  
712

356

712

U. obs.

(probably)  
Prism above

7 2

.88  
.80  
.80  
.82  
.70  
0  
.800

80

.80

P. obs.

Feb. 7, 1879.

Star 6 Prob. Prism at left; a out of  
field

7 6

155

158

158

158

154

33

.566

33  
.566

284.7 Zero

Sub at 239.7  
Transit Sep 6 Salter

-0-

7 16

40.0

Sub 5.2 1.0.4

Sep. 9.0 Sub 5.8

1.0 1.0

Sep Sub

44 31

5.2

9.0

0.4

5.8

15.2 3.8

5.4

3

8.0

2.2

8.6

4.7

20.6 4.3

6.1

1.3

4.9

1.2

7.7

29.9 3.6

5.5

1.0

3.7

1.0

35.6

21.2 4.1

5.6

.8

12.1

3.00

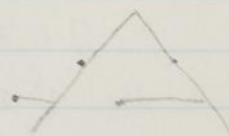
35.6

21.2 4.1

5.6



$$t_u^e - t_1 + \frac{1}{2}$$





Feb. 7, 1879.

7 46 Begun R Andromeda at alt 7 36  
Indurpil

7 47 Y - Y Androm. Constant K P. ob

35.3  
38.8 35 3.5  
213.4 3.7 50 46 3.7  
217.1 25 23 12 36  
50 4 6 126.15 1.80  
25 23 3.6  
126.15 1.8

36.4 2.4 Udo.  
38.8 2.4

7 50 214.6 4.9 50 63 1.9  
216.5 25 315 3  
506 3 4.3 126.58 2.15  
25 315 2.15 1.08  
126.57 1.08

8 25 d - u Androm. P. ob.  
11.5 49.7  
61.2 49.7

193.3 52.3 52.3  
245.6 51 16 102 0  
51 1 6 10 20 25 58 51 0  
25 58 51 0 20.5  
127.90 2.55 127.90 2.55  
10.8

8 27 56.7 45.9 Udo.  
194.2 49.9 45.9  
244.1 50 58 15 8  
50 58 9 58 25 79 47 90  
25 290 47 90 25 29 23.95  
126.45 23.95 126.45

28

Feb. 7, 1879

P. obs.

8 30

336.0

82.4

106.4

168.7

100.5

269.2

8563

2069

42815

103.45

214.08

51.72

106.4

100.5

8563 ~~106.4~~42815 ~~534.5~~214.08 ~~26.72~~

103.45

51.72

8 34

353.7

66.7

186.4

252.9

8597

42985

214.92

73.0

66.5

1395

6975

34.88

u

73.0

8597 66.5

42985 1395

21492 6975

34.88

8 38

353.1

81.8

74.9

181.8

248.2

8580

4290

214.50

1382

691

34.55

81.8

66.4

1482

741

37.05

8580

4290

214.50

8 41

11.8

61.6

190.1

238.8

5023

25115

125.58

49.8

48.7

48.25

24.12

u

49.8

48.7

0.5

4925

24.62

5023

25115

125.58



Feb. 7, 1879,

8 48  
43

24.4  
50.3

25.9

201.7  
229.3

27.6

50 57 13.5  
25 285 26.75  
1 26.43 13.38

P. obs -

25.9  
27.6  
13.5  
5057 26.75  
25285 13.38  
126.42

8 45

22.9  
226.5

27.1

50.0  
201.8

24.7

50 1 2 11.8  
2 506 25.90  
1 25.30 12.95 h

U. obs -

27.1  
5012 24.7  
2506 11.8  
125.30 25.9  
12.95

8 52

24.3  
46.8

22.5

204.7  
229.3

24.6

50 51 47.1  
25 255 23.55  
1 26.27 12.78

P. obs -

22.5  
24.6  
5051 7.1  
25255 23.55  
126.28 11.78

8 54

26.1  
45.8

19.5

205.9  
224.6

18.7

50 2 2 2  
25 11 19.1  
1 25.55 9.55

U. obs -

19.5  
18.7  
.2  
5022 19.1  
2511 9.55  
125.55

30

Feb. 7, 1879,

Alford W. Edging h.

9 05  
9 717.6 35.7  
53.3P. obs.  
35.7200.2  
233.1 32.9

32.9

5042 86

5042 86  
2521 343  
126.05 17.15

2521 34.3

126.05 17.15

9 09

19.0 33.6  
52.6U. obs.  
33.6

202.9 29.1

5065 29.1  
25325 2.9  
8 31.35  
126.62 15.68232.0  
5065 2.7  
25325 31.35  
126.62 15.68

9 12

f  
8.6 51.6  
60.2

P. obs.

193.2 48.1

5033 51.6  
25165 48.1  
125.82 99.7  
49.85  
24.92241.3  
5033 99.7  
251.65 49.85  
125.83 24.92

9 15

13.5 42.0  
55.5

U. obs.

194.3 42.9  
2187.25005 42.0  
25025 42.9  
125.12 42.45  
21.22

5005 9

25025 42.45

125.12 21.22



Feb. 7, 1879

 $\mu$  Androm, constant  $\rightarrow$  K

9 22

33.2

P. obs

37.4 4.2

212.9

217.8 4.9

5013 11

25065 4.55

125.32 2.28

4.2

4.9

5013

25065

125.32

11

4.55

2.28

9 26

35.0

u

37.8 2.8

215.1

218.0 2.9

5059

25295 2.85

126.47 1.43

2.8

2.9

5059

25295

126.48

2.85

1.42

32

6 40

Jupiter Feb 8, 1879.

82

85

78

84

95

42 4

.848

42 4

.848

92

89

79

78

87

.425

.850

11 Aug. Pobs.

puck Co lfr  
A unit of field

42 5

.848

.850



6 54



7 30 S Centuri  
 37 Telescope on S.  
 40 Chart prob  
 47 Phot K on Clock started to  
 S-S Centuri

7 52  
 34.2 3.1  
 37.3  
 214.9 3.4  
 218.3  
 50 47 5  
 25 235 3.25  
 126.17 1.62  
 C

P. obs.

3.1  
 3.4  
 5  
 3.25  
 1.62

578  
 29.9 13.5  
 40.4  
 207.2 14.9  
 222.1  
 50 46 28.4  
 25 13 14.2  
 125.65 + 7.10  
 C much flushed  
 exposed by mother head  
 13.5  
 14.9  
 4  
 14.2  
 7.1

2  
 251  
 50.2 25.1  
 803 203.3 24.6  
 227.9  
 50 65 9.7  
 25 325 24.85  
 126.62 12.42  
 25.1  
 24.6  
 9.7  
 24.85  
 12.42

34

AL 8.1819

807

14.4  
 55.8  
 195.2  
 236.5  
 5019  
 25095  
 125.42  
 23.8  
 45.8  
 205.6  
 229.2  
 5046  
 2523  
 126.15

9  
 41.4  
 41.3  
 7  
 41.35  
 20.67  
 220  
 234  
 54  
 22.7  
 11.85

814

816

352.3  
 78.2  
 175.7  
 255.3  
 8615  
 43075  
 215.33

85.9  
 79.6  
 55  
 82.75  
 41.38

821

8.6  
 603  
 185.5  
 244.3  
 4989  
 24945  
 124.73

51.5  
 58.8  
 110.3  
 55.15  
 27.58



At 8, 1879

8-25

347.0	105.4	+
92.4		105.4
165.4	98.4	98.4
263.8		3.8
868.6	203.8	4343 1019
4343	101.9	217.5 50.95
217.15	50.95	
	<del>5.45</del>	

8-29

19.8	26.4	
462		
204.4	24.5	
228.9		
499.3	9	
2496.5	25.45	
124.83	12.73	

4993 26.4 26.4  
 24965 21.5 24.5  
 124.82 7.9 9  
 23.95 25.45  
 11.98 12.72

8-35

33.7	3.9	3.9
37.6		
215.2	4.0	5057 4.0
219.2		25285 395
5057	3.95	126.42 1.98
25285		
126.43	1.98	

At 8. 1879

full brightness 4.0 to 4.5 but 4.5

6.0  
7.2  
9.0  
7.0  
9.5  
5.5  
6.5  
8.5  
5.0  
8.0

L<sub>nm</sub>  
8 54

6.0  
10.9 10.9 54.4  
65.3  
179.1  
255.6  
510.9  
255.45  
127.72  
76.5  
130.9  
65.45  
32.72

54.4  
76.5  
130.9  
65.45  
32.72  
510.9  
255.45  
127.72

8 56

7.5  
12.2 38.7  
50.9  
199.0  
240.2  
50.23  
251.15  
125.57  
41.2  
79.9  
399.5  
19.98

38.7  
41.2  
79.9  
399.5  
19.98  
50.23  
251.15  
125.58



At 8.1879

Increased illumination

8 57

32.1 9.0  
38.7 6.6212.4 6.7  
219.1

5023

25115 6.65

125.58 3.33

5023

25115

125.58

3.7

5.6

6.7

3

6.15

3.108

6.6

6.7

6.65

3.32

8 58

14.7 7.0  
55.8 41.1

188.2 55.0

243.2

5019 76.1

25095 48.05

125.48 24.03

41.1

55.0

5099

25095

125.48

96.1

4805

24.02

9 0

34.2 9.5

33.3 3.9

37.2

215.0 4.3

219.3

5048

\* 2524

12.6.20

8.9

44.5

2.28

8.2

4.1

2.05

(Clock stopped)

3.9

5048

25240

126.20

4.3

4.1

2.05

9 2

274.2 5.5

332.3 147.9

120.2

156.4 1121.2

277.6

8865 2691

44325 13455

22162 67.27

8865

44325

22162

147.9

121.2

2691

43455

67.28

38

9<sup>h</sup> 4<sup>m</sup>349.0  
67.0

78.0

6.5

Moved telescope to bring \* to focus

199.3 38.8

238.1

8 53 4 116.8

4 26 70 58.4

21 3.35 29.20

78.0

3 8.8

8 53 4 116.8

4 26 7 58.4

21 3.35 29.20

9 7

27.3

14.9

8.5

42.2

14.9

209.7 13.3

223.0

50 2 2 2

25 1.1 14.1

1 25.55 7.05

13.3

2

50 2 2 14.1

25 1.1 7.05

1 25.55

9 8

328.3 5.0

105.6 137.3

154.2 112.4

266.6

8 54 7 249.7

4 27 35 124.85

21 3.68 62.43

137.3

112.4

8 54 7 249.7

4 27 35 124.85

21 3.68 62.42

9 9

16.0 8.0

51.2

189.7 50.6

240.3

497.2 85.8

2486 42.90

124.30 21.45

35.2

35.2

60.6

50.6

95.8

85.8

47.9

42.9

23.95

21.45

U. A. R. looks for (22)  
Abundant away to moonlight



Feb. 9, 1879. Photometer S.  
P. obs.

6 12

Jupiter

0.90

.90

.81

.85

.98

444

.888

444  
.888

Clouds

6 48

.86

.89

.95

.89

.91

450

.900

450  
.900

Sols

Prism to left.

6 55

.56

.60

.54

.60

.57

287

.574

287  
.574

Hazy Sols

Prism to left; a out of field  
on the right

6 58

.87

.75

.86

.92

.75

415

1030

.830

415  
.830

P. obs.

40

Feb. 9, 1879

Star 6

P. obs.

Prism above;  
a in field

7 0

1.05

1.00

1.20

1.03

1.16

1.088

44  
1.088P. obs.  
a out of field

7 1

1.11

0.95

0.95

0.98

0.94

493

.986

493  
.986

7 7

1.06

1.06

99

94

1.02

07

1.014

07  
1.014Obs a in field

7 10

.96

.90

.82

.88

.90

.90

446

.892

446  
.892Obs, a out of field



Feb 9 1879.  
Looked at Roberts

in light the 2

5. d  
f. n c  
g

Estimate of line of a linear line. by R.

6.0  
7.5  
9.0  
7.0  
9.5  
5.5  
6.5  
8.5  
5.0  
8.0

6.0

7 58

59  
85.2  
174.6  
2289  
5446  
2723  
136.15  
79.3  
104.3  
183.6  
918  
45.90

79.3  
104.3  
183.6  
918  
45.90  
5446  
2723  
136.15

42

Feb. 9 1979

801

$\begin{array}{r} 7.5 \\ 13.8 \\ \hline 50.2 \end{array}$ 
 $\begin{array}{r} 40.4 \\ 37.5 \\ 77.9 \\ 38.95 \\ 19.48 \end{array}$

$\begin{array}{r} 40.4 \\ 37.5 \\ 77.9 \\ 38.95 \\ 19.48 \\ 126.02 \end{array}$

802

$\begin{array}{r} 90 \\ 33.8 \\ \hline 37.6 \\ 213.8 \\ \hline 218.2 \end{array}$ 
 $\begin{array}{r} 3.8 \\ 4.4 \\ 8.2 \\ 3.6 \\ 1.80 \end{array}$

$\begin{array}{r} 3.8 \\ 4.4 \\ 2.05 \end{array}$

803

$\begin{array}{r} 70 \\ 6.9 \\ \hline 54.1 \end{array}$ 
 $\begin{array}{r} 47.2 \\ 60.0 \\ 107.2 \\ 53.60 \\ 26.80 \end{array}$

$\begin{array}{r} 4956 \\ 2478 \\ 12390 \end{array}$

$\begin{array}{r} 47.2 \\ 60.0 \\ 107.2 \\ 53.6 \\ 26.8 \end{array}$



Feb. 9, 1879.

809

9.5

339

38.1

4.2

214.8

2.4

217.2

5040

2520

126.00

6.6

33

1.65

5.5

340.8

110.6

129.8

156.0

288.4

132.4

8958

2622

44790

1311

223.95

65.55

8.5

4.0

68.9

64.9

177.2

259.8

82.6

5099

1475

25495

73.75

127.48

36.88

8.5

28.6

41.9

13.3

208.7

222.2

13.5

5014

2507

125.35

13.4

6.70

5040

2520

126.00

4.2

2.4

6.6

3.30

1.65

8958

4479

223.95

139.8 1298

132.4 1324

122 22

1361 1311

68105 6555

5099

25495

127.48

108.3 649

82.6 826

1909 1475

9545 7375

147.42 36.88

13.3

13.5

5014

2507

125.35

8

134

6.70

44

Feb. 9, 1879.

$\begin{array}{r} 5.0 \\ \hline 341.1 \\ 109.7 \\ \hline 106.4 \\ 143.6 \\ 287.0 \end{array}$ 
 $\begin{array}{r} 128.6 \\ 143.4 \\ 123.4 \\ 120 \\ 1260 \\ 63.00 \end{array}$ 
 $\begin{array}{r} 8814 \\ 4207 \\ 220.35 \end{array}$ 
 $\begin{array}{r} 2720 \\ 1360 \\ 68.0 \end{array}$

taken by mistake

$\begin{array}{r} 8.0 \\ \hline 18.6 \\ 53.2 \\ 199.7 \\ 234.0 \\ 5055 \\ 25275 \\ 126.38 \end{array}$ 
 $\begin{array}{r} 346 \\ 34.3 \\ 34.6 \\ 34.3 \\ 9 \\ 3445 \\ 17.22 \end{array}$ 
 $\begin{array}{r} 5055 \\ 25275 \\ 126.38 \end{array}$ 
 $\begin{array}{r} 34.6 \\ 34.3 \\ 9 \\ 3445 \\ 17.22 \end{array}$

P. & S. identified regions  
of R Andromedae & Ceti.

Sing. 5.56 S  
4.57 P



Feb 10 1879  
*Lapetus* *P. ab.*

6 28

.79

.77

.81

82

81

40 0

.80 0

40 0

.800

6 34

58

60

.57

61

62

299

.598

29 9

.598

11 my. A = field



6 37

.60

.63

78

65

62

328

.656

328

.656

A out of field  
 from from

46

Feb. 10, 1879.

8-8 beti  
 7 27 32.8 4.9 Prob.  
 37.7 4.9  
 214.7 4.6  
 219.3  
 5045 504.5499 4.9  
 25225 2495 4.6  
 126.12 124.95 15  
 4.75  
 2.38  
 126.12 2.38

7 34 ~~33.2~~ 33.2 3.6  
 36.8  
 215.4 3.4  
 218.8  
 5042 504.2 3.5  
 2521 2521 1.72  
 126.05 126.05 1.75

Clouds prevented further work.



Feb. 12, 1879.

6 45      Iapetus      Phot I. S. obs.  
                  0.90      Prism above.

.78

1.15

1.09

1.08

1.000

0 0

1.000

Star b

S. obs.

6 51

.69

.62

.77

.67

.69

.688

A in field - Images  
 symmetrically placed -  
 Prism above.

34 4

.688

7 0

.91

.63

.89

.97

.83

.846

U. obs.

Images as above

Stars flickering and variable.

42 3

.846

7 10

Iapetus

U. obs.

.74

Prism above

1.07

.93

.92

1.04

.940

47 0

.940

Feb. 12, 1879

Phot. K

 $\mu - \mu$  Androm

U. obs.

7 30

33.4  
36.6 3.2  
214.6  
218.9 4.3  
503.5 7.5  
251.5 3.75  
125.88 1.88

503.5  
251.5  
125.88

3.2  
4.3  
7.5  
3.75  
1.88

7 57

d  
351.8 85.2  
77.0  
176.7 79.6  
256.3  
861.8 164.8  
430.9 82.4  
215.45 41.2

861.8  
430.9  
215.45

U. obs.  
85.2  
79.6  
4.8  
82.4  
41.20

~~8~~ h  
335.2  
95.5 120.3  
159.1 126.2  
285.3  
875.1 6.5  
437.55 123.25  
218.77 61.63

875.1  
437.55  
218.78

U. obs.  
120.3  
126.2  
6.5  
123.25  
61.62x

8 8

~~8~~ C  
4.5 68.3  
72.8  
187.6 59.2  
246.8  
511.7 127.5  
255.85 63.75  
127.92 31.88

U. obs.  
68.3  
59.2  
7.5  
63.75  
31.88



Feb. 12 1879

g'

U. obs.

8 15  
 22.1  
 49.2 27.1  
 204.4 24.4  
 228.8  
 50 45 11.5  
 25 225 25.75  
 126.12 12.88

27.1  
 50 45 24.4  
 25 225 11.5  
 126.12 25.75  
 12.88

h

U. obs.

8 20  
 24.6  
 47.4 22.8  
 204.8 23.7  
 228.5  
 50 53 6.5  
 25 265 23.25  
 126.32 11.63

8  
 22.8  
 23.7  
 6.5  
 23.25  
 11.62

g

U. obs.

8 28  
 16.5 37.2  
 53.7  
 196.9 39.3  
 236.2  
 50 33 16.5  
 25 165 38.25  
 125.82 19.12

37.2  
 39.3  
 16.5  
 38.25  
 19.12

f

U. obs.

8 35  
 4.9  
 71.6 66.7  
 185.2 60.8  
 246.0  
 50 77 7.5  
 25 385 63.75  
 126.93 31.88

66.7  
 60.8  
 7.5  
 63.75  
 31.88

R too faint to measure

Feb. 12, 1879

 $\mu - \mu$ 

32.4

38.3 5.9

213.2 4.7

217.9

50 1.8 6

25 0.9 5.3

125.45 2.65

 $\mu - \mu$ 

34.6

39.2 4.6

212.2 4.6

216.8

50 2.8

25 1.4 4.6

125.70 2.3

U. obs.

5.9

50 1.8 4.7

250.9 6

125.45 5.3 2.65

S. obs.

50 2.8 4.6

25 1.4 4.6

125.70 2.3

Clouds.

Seeing

7.5 4

7.3 3

(8)

re.

Seeing improved  
during the series  
so that at end the  
images were <sup>better</sup> nearer 11  
points than at begin-  
ning.



Feb. 14, 1879.

Transit of Saturn & faint following object (Jupiter?)

Jupiter, Photometer I.  
Probs. (291)

6 20

16.0

.96

.83

.77

.916

.85

43 7

.874

43 7

.874

Prism to left.

6 26

.47

.52

.53

.51

.50

3

.506

Sch. (292)

Prism to left.

6 34

.61

.65

.78

.68

.74

.34 6

.692

1.04

.91

.83

.87

1.04

Jupiter appeared (293)

Prism above.

34 6

.692

6 38

Probs. (294)

Prism above.

469

.938

469

.938

52

Star 6 Feb. 14, 1879.

6 42

.94

.54

.57

.61

.82

.696

S. obs.

Prism above (192)

A in field and symmetric

34 8

.69 6

6 45

.91

.80

.89

.75

.76

.822

P. obs. (193)

As above

41 1

.822

6 48

.55

.49

.71

.73

.66

.628

P. obs. Prism at left (194)

A out of field

31 4

.628

6 51

.39

.40

.38

.39

.44

.398

.400

S. obs.

As above

195

20 0

.400



Feb. 14, 1879.

Star 6

(196) S. obs.

6 55

.42

Prism at left, but images  
brought nearer, & being in  
field.

.46

.42

.43

.47

.440

20

.440

6 58

.65

U. obs. (197)

.69

Prism at left.  
It out of field.

.71

.74

.62

.682

341

.682

7 6

.66

U. obs. (198)

.63

Prism above -

.66

Images symmetrical with  
it in field -

.60

.74

.65829  
.658

7 14

.82

Jupiter with above (295)

.84

U. obs.

.80

.82

.82

.82010  
.820

54

7 16

Feb. 14, 1879.  
Capitula U. obs

91  
94  
88  
80  
85  
1876

296  
P. sim at left.

38  
876

7 27

Phot. K  
8-8 betti

P. obs

32.8  
37.2 4.4

214.2

218.4

5026

2513

125.65

6.2  
4.2

106 4.3

5.3 2.15

265

5026

2513

125.65

4.4

4.2

7.6 4.3

3.8 2.15

1.90

7 30

32.7 4.5

37.2

213.0

217.7

5006

2503

125.15

4.7

2

4.6

2.3

5006

2503

125.15

4.5

4.9

4.6

2.3

u

some foll



Feb. 14, 1879.

Revised astro. diff. table.

7 36

32.5  
36.8 4.3  
214.3  
218.3 4.0  
5019  
25095 4.15  
125.43 2.08

8 Lyman at Lyman  
two wings

4.3  
4.0  
4.15  
2.08  
5019  
25095  
125.48

7 48

e  
0.0  
77.2 77.2  
168.1  
254.8 86.7  
5001 3.9  
250.05 81.95  
125.02 40.98

P. obs -

77.2  
86.7  
3.9  
5001 81.95  
250.05 40.98  
125.02

7 52

c  
0.5  
71.3 70.8  
180.0 62.3  
242.3  
4941 133.1  
247.05 66.55  
123.52 33.27

U. obs

70.8  
62.3  
133.1  
4941 66.55  
247.05 33.28  
123.52

8 1

n  
20.8  
51.9 31.1  
197.8 32.1  
229.9 63.2  
5004 31.6  
250.2  
125.10 15.80

P. obs -

31.1  
5004 32.1  
250.2 3.2  
125.10 31.6  
15.80

56

Feb. 14, 1879.

8 7

14.8	44.8
59.6	
190.7	51.1
241.8	

Robn.

Thong  
star

8 9

10.0	55.6
65.6	
183.8	60.8
244.6	

U. obs.

8 39

16.0	43.2
59.2	
190.4	50.9
241.3	
5069	941
25345	47.05
126.73	23.52

Robn.

43.2

50.9

941

5069 47.05

25345 23.52

126.72

8 42

12.2	47.1
59.3	
192.3	47.3
239.6	
5034	14.4
2517	47.2
125.85	23.6

U. obs.

47.1

47.3

47.2

23.60

5034

2517

125.85

Feb. 14, 1879.

m

P. obs.

8 47	27.9	16.7		16.7
	44.6			
	206.3	16.5	5016	16.5
	222.8		2508	16.6
			125.40	8.3
	5016			
	250.8	16.6		
	125.40	8.3		

29.1

18.2

U. obs.

8 51	47.3			18.2
	205.4	18.4	5056	18.4
	223.8		2528	18.3
			126.40	8.65
	5056			9.15
	2528	18.3		
	126.4	9.15		

Comparison star lost,  
and region too low to  
continue.

D Ceti - D Ceti

P. obs.

8 58	31.8	4.9		4.9
	36.7			
	211.6	4.6	496.3	4.6
	216.2		248.15	15
			124.08	4.95
	496.3			2.38
	248.15	4.95		
	124.08	2.38		

31.7

6.4

6.4

9 2	38.1			5.9
	210.9			
	216.8	5.9	497.5	5.9
			248.75	3
			124.37	6.15
	497.5	3		3.08
	248.75	6.15		
	124.37	3.07		



58

Feb. 14, 1879.

98 05

18.4 27.6  
46.0  
200.2 27.9  
228.1  
4927 15  
246.35 27.75  
123.17 13.88

n like a long line

7 great.

23.6  
4927 27.9  
24635 27.75  
123.47 13.88  
12.88

Pole Star

Phot J. S. obs.

9 14

194  
210  
2.77  
8.1<sup>h</sup>  
2.270<sup>h</sup>

8.1  
2.27

Magn. = 14.22  
Second look makes it a little  
too bright

S. obs.

9 18

3.05  
3.41  
3.41  
8.7<sup>h</sup>  
3.290<sup>h</sup>

8.7  
3.29

Magn. = 13.41

9 28

1.31  
1.39  
1.29  
3.99<sup>h</sup>  
1.330<sup>h</sup>

1.33

P. obs.

Magn. = 15.38

9 40

1.16  
1.20  
1.01  
3.7<sup>h</sup>

3.7

Magn. = 15.75

U. obs.

1.123<sup>h</sup>

Feb. 14, 1879.

9 45

$$\begin{array}{r}
 9 \\
 1.34 \\
 17.8 \\
 1.47 \\
 \hline
 1591 \\
 1.530 \checkmark
 \end{array}$$

S. obs.

$$\begin{array}{r}
 159 \\
 1.53
 \end{array}
 \text{Magn.} = 15.08$$

9 58

$$\begin{array}{r}
 9 \text{ Phot. I} \\
 .28 \\
 .27 \\
 .27 \\
 \hline
 22 \wedge \\
 .273 \checkmark
 \end{array}$$

U. obs.

$$\begin{array}{r}
 22 \\
 .273
 \end{array}
 \text{Magn.} = 15.92$$

Stars near Pol. seen by P. school in  
 $\alpha$ .

8:

10 4

$$\begin{array}{r}
 9 \text{ Phot. I} \\
 .30 \\
 .34 \\
 .32 \\
 \hline
 6 \wedge \\
 .320 \checkmark
 \end{array}$$

P. obs.

$$\begin{array}{r}
 6 \\
 .32
 \end{array}
 \text{Magn.} = 15.57$$

10 8

$$\begin{array}{r}
 .35 \\
 .34 \\
 .38 \\
 .19 \wedge \\
 .357 \checkmark
 \end{array}$$

S. obs.

$$\begin{array}{r}
 19 \\
 .357
 \end{array}
 \text{Magn.} = 15.34$$

Seeing 8, 6, 7 P.  
 8, 3, 5 S.  
 8, 7, 7. U.

60

Feb. 15, 1879  
 Photometer J

6 30

Star b.

P. obs.

Prism to left;  
a in field.

.65

.67

.84

.68

.78

36 2

.72 4

36 2

1207

.72 4

6 35

.51

S obs.

Prism to left  
a in field

.50

.48

.49

.46

24 4

.48 8

.44 8

6 42

Paper lens

Transits of Aldebaran & Jupiter 20<sup>h</sup>  
Prism to left

.51

.52

.49

.54

.53

26 0

.52 0

.91

.89

.79

.93

.83

43 5

.87 0

P. obs.

Prism to left

43 5

.87 0

6 47



Feb. 15, 1879  
S. obs. J. A. L. L.

0 52

.88

.86

.76

.85

.91

426

.852

2.6

.852

Prism above

6 54

1.01

1.03

1.10

1.02

1.11

27

1.054

27

1.054

P. obs.

Prism above.

Examined pencils  
for coincidence; found  
to be well centred.

8 0

Tried Photometer Q (nebula  
photometer) on nebula in Andromeda

62

Feb. 15, 1899  
 Photometer K.I. Region of  
 R Andromedae.

8 23 34.8  $\mu$  Androm. -  $\mu$  Androm.  
 P. obs.

Stopped to readjust focus.

$\mu$  Androm. -  $\mu$  Androm.  
 P. obs.

8 27 34.2 3.4  
 37.6 4.0  
 211.0 4.0  
 215.0 4.0

4978 7.4 4978 7.4  
 2489 3.7 2489 3.7  
 124.45 1.85 124.45 1.85

8 30 33.6 4.7 3.7  
 37.3 4.1 4.1  
 210.2 4.1 4.1  
 214.3 4.1 4.1  
 4954 8.8 4954 8.8  
 2477 4.4 2477 4.4  
 123.85 2.2 123.85 2.2

Set on the lowest star of  
 the triangle some distance below  
 the Andromeda nebula. The  
 region wanted follows this star.

Identified region but stars got too low.  
 Stars near pole,  
 Phot. I d. S. obs.

9 38 0.70  
 .62  
 .72  
 .204  
 .747  
 .68

24  
 .68

Feb. 15, 1879.

9 42

2  
.40  
.40  
1.55  
13 5  
.45

S. obs.

15  
.45

9 47

35  
33  
27  
5  
.317

g. Obs.

5  
.317

9 52

.31  
.29  
.30  
0  
.300

S. obs.

0  
.30

Seeing 8, 6, 7, P.  
7, 6, 6, S.



Feb. 23, 1879.

Hazy at first. Tried Photometer Q (nebula photometer) on nebula in Andromeda about 7<sup>h</sup>. Sixth magnitude star too bright to be sufficiently reduced by focussing large telescope.

Photometer I. Tests of instrument.

$\alpha$  Leonis. B from A  $310^\circ 180''$   $320^\circ 100''$   
 " " "  $250^\circ 200''$  " "  $260^\circ 120''$   
 " " "  $140^\circ 360''$  " "  $150^\circ 200''$

D A out of field Prism to left.

8 45

1.00

P. obs.

0.83

0.87

0.92

0.86

4 4 8

.896

448

896

8 50

1.22

P. obs. Prism above.  
A. out of field

1.02

1.21

1.28

1.27

100

1.200

100

1.200

Feb. 23, 1879

D

8 53

1.28

1.21

1.19

1.15

1.137

12.0

P. obs. Prism to right  
A out of field

12.0

1.240

1.240

8 57

0.83

.77

.82

1.85

1.77

40.4

.808

P. obs. Prism below.  
A out of field

40.4

.808

Focus prism

75.0

81.4

87.8

84.0

13.2

84.4

P. obs.

First reading 75.0 is  
that used in the  
observations.

13.2

84.4

9 02

Astr. <sup>telescope</sup> ~~prism~~ Sols. 2

82.9

82.2

84.0

9.1

30

9.1

83.03

9 05

66

10

Prism below Sols

1, 3, 5 dms &amp; other sets

12  
 154  
 64  
 69  
 60  
 309  
 618

9  
 618

15

Prism to right

104  
 113  
 99  
 94  
 125  
 39  
 1078

39  
 1078

23

Prism to right left.

102  
 68  
 84  
 78  
 133  
 465  
 930

465  
 930

30

Prism below above

248 ? ~~Prism below~~  
 200  
 154  
 163  
 176  
 951  
 1902

451  
 1902



with to 6.1.07 approx all's to be registered  
 below 0.62  
 night 1.5.9 at at 80 to faint

9 47

Scung 6.75 P  
 5.6.7 S

Feb. 24, 1879

Comp Stars for R. Androm.

Phot. K

 $\mu$ - $\mu$  Androm.

P. obs.

~~34.5~~

34.4

37.9 3.5

3.5

215.2 3.4

3.4

218.6

5061

3.45

5061

25305

1.72

25305 3.45

126.52

126.52 1.73

 $h$ - $\mu$ 

22.2

P. obs.

48.3 26.1

26.1

206.2 22.0

5049

22.0

228.2

25245

48.1

5049 8.1

126.22

24.05

25245 24.05

120.02

126.23 12.03

 $g$ - $\mu$ 

P. obs.

20.2

58.4

38.2

196.7 40.7

40.7

237.4

5127

48.9

5127 78.9

25635

39.45

25635 39.45

128.17

19.72

128.17 19.43

 $f$ - $\mu$ 

P. obs.

5.6

64.6

64.6

70.2

188.2

50.5

238.7 50.5

5027

165.1

5027 115.1

25135

57.55

25135 57.55

125.68

28.78

125.67 28.78

Feb. 24, 1879

7 47  $\mu - \mu$  Androm. S. obs.  
 32.6 6.2  
 38.8 6.2  
 213.1 4.6 5022 4.6  
 217.7 2511 10.8  
 5022 125.55 2.70  
 2511 5.4  
 125.55 2.70

8 15  $h_1 - \mu$   
 20.0 29.3  
 49.3 29.3  
 299.3 32.7 5006 32.7  
 232.0 2503 620  
 5006 125.15 31.0  
 2503 15.5  
 125.15 15.50

8 20  $f - \mu$   
 17.4 42.8  
 60.2 42.8  
 198.3 5081 37.9  
 234.2 25405 0.7  
 5081 127.02 40.35  
 25405 20.17  
 127.03 20.18

8 23  $g - \mu$   
 14.8 44.8  
 59.6 44.8  
 187.8 5041 54.1  
 241.9 25205 98.9  
 5041 126.02 49.45  
 25205 24.72  
 126.03 24.72



70

Feb. 24, 1879

8 34  $\begin{matrix} 21.8 \\ 52.6 \end{matrix}$  30.8 P. obs.  
 8 35  $\begin{matrix} 199.3 \\ 230.3 \end{matrix}$  31.0  $\begin{matrix} 5040 \\ 2520 \\ 126.00 \end{matrix}$   $\begin{matrix} 30.8 \\ 31.0 \\ 15.45 \end{matrix}$   
 $\begin{matrix} 5040 \\ 2520 \\ 126.0 \end{matrix}$  30.9 15.45

8 36  $\begin{matrix} 24.0 \\ 48.7 \\ 202.0 \\ 226.7 \end{matrix}$  24.7 S obs.  
 $\begin{matrix} 5014 \\ 2507 \\ 125.35 \end{matrix}$   $\begin{matrix} 24.7 \\ 24.7 \\ 12.35 \end{matrix}$   
 $\begin{matrix} 5014 \\ 2507 \\ 125.35 \end{matrix}$  12.35

8 42  $\begin{matrix} 347.2 \\ 74.4 \\ 179.0 \\ 264.0 \end{matrix}$  87.2 P. obs.  
 $\begin{matrix} 864.6 \\ 432.3 \\ 216.15 \end{matrix}$   $\begin{matrix} 87.2 \\ 85.0 \\ 12.2 \\ 86.1 \\ 43.05 \end{matrix}$   
 $\begin{matrix} 864.6 \\ 432.3 \\ 216.15 \end{matrix}$  12.2 86.1 43.05

8 46  $\begin{matrix} 354.5 \\ 69.0 \\ 182.7 \\ 248.0 \end{matrix}$  74.5 S obs.  
 $\begin{matrix} 854.2 \\ 427.1 \\ 213.55 \end{matrix}$   $\begin{matrix} 74.5 \\ 65.3 \\ 139.8 \\ 69.9 \\ 34.95 \end{matrix}$   
 $\begin{matrix} 854.2 \\ 427.1 \\ 213.55 \end{matrix}$  13.98 69.9 34.95

Feb. 21, 1879.  
 be not measurable owing to absorption  
 but max. very nearly as high as at first obs.

C  
 8 53 77.0 92.7 P. obs.  
 344.3 121.6  
 164.9 ~~81.8~~  
 286.7 ~~21.45~~  
 872.9 53.62  
 436.45 174.5  
 218.23 88.25  
 101.3 48.62  
 354.8 106.5

8 55 181.3 73.4 S. obs. Star near  
 254.7 edge of field  
 892.1 179.9 at first setting, had  
 446.05 89.95 to be moved before second.  
 223.02 44.98

$\mu - \mu$   
 9 3 214.8 3.8 P. obs.  
 218.6 3.3  
 34.6 11  
 37.9 3.55  
 505.9 1.78  
 252.95 1.78  
 126.47 1.78

9 6 34.4 3.9 S. obs.  
 38.3 3.9  
 214.4 5.2  
 219.6 9.1  
 506.7 4.55  
 253.35 2.28  
 126.68 2.28

72

Feb. 24, 1879.  
 Test of Phot. I  
 Focus Pinion

Sols.

9 33

47.4

47.0

48.3

47.6

Ref,

= setting

Comparison Star not  
in field, hence  
repeated

Repeated

9 43

60.3

65.0

60.3

~~60.3~~

64.2

69.8

63.0

63.8

= Setting -

Sols

D - 2 Loris (v. p. 64)

Sols.

9 48

1.89

1.60

1.59

1.13

0.97

2.18

1.436

+ out of field

Prim above

: U reads

218

1.436

9 55

0.57

.59

.63

.67

.95

341

.682

Prim at left Sols,

341

.682



Feb. 24, 1878

9 58

$$\begin{array}{r}
 0.57 \\
 1.52 \\
 1.58 \\
 1.70 \\
 1.57 \\
 \hline
 29.4 \\
 .588
 \end{array}$$
S. obs. -  
Prism below,
$$\begin{array}{r}
 29.4 \\
 .588
 \end{array}$$

10 8

$$\begin{array}{r}
 .89 \\
 .86 \\
 1.75 \\
 1.82 \\
 .95 \\
 \hline
 42.7 \\
 .854
 \end{array}$$
S. obs.  
Prism at right
$$\begin{array}{r}
 42.7 \\
 .854
 \end{array}$$

10 15

U. obs.

Focus readings on 2 lenses

$$\begin{array}{r}
 71.8 \\
 79.1 \\
 73.3 \\
 \hline
 14.2
 \end{array}$$

$$\begin{array}{r}
 14.2 \\
 73.3
 \end{array}$$

74.7

Setting

D

U. obs. ~~Prism to right~~  
Focus readings on D

10 18

$$\begin{array}{r}
 66.4 \\
 68.2 \\
 66.2 \\
 \hline
 20.8 \\
 66.9
 \end{array}$$

$$\begin{array}{r}
 20.8 \\
 66.9
 \end{array}$$

74

Feb. 24, 1879

10 20

D  
 0.74  
 .74  
 .97  
 1.04  
 .96  
 445

U. obs. Prism to right

445  
 .890

10 28

0.83  
 .88  
 .73  
 .84  
 .81  
 409  
 .818

U. obs. Prism below

409  
 .818

10 32

0.93  
 .80  
 .78  
 .75  
 .78  
 404  
 .808

U. obs. Prism to left

404  
 .808

10 38

1.23  
 1.43  
 1.13  
 1.04  
 1.01  
 54  
 1.108

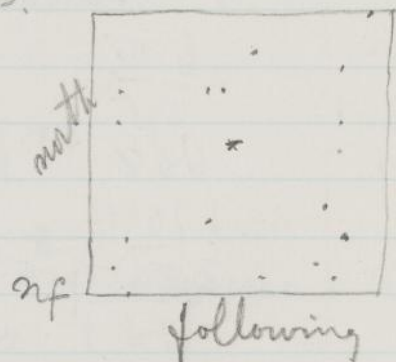
U. obs. Prism above

54  
 1.108

seeing (U.) 8, 6, 6,  
 " (S.) 7, 6, 6,

6 30 Feb. 27, 1879  
Opened dome & set on  $\mu$  Cassiopeiae.  
Stars near  $\mu$  Cass. Sols.

mag	x	y
$\mu$	5	5
12 A	7.58	<del>2.5</del> 2.5
10	9.8	2
11	8	1
12	8.5	0.5
12.5	6	0.5
12	4	2.5
12	1	1
9.5	0	1
12.5	1	2
12	0.5	6
12.5	1	7
11.5	4	7
12.5	4.5	7
12 B	5.5	8.5
11	9	10
11	8.5	8
11	8	6
10	8	5



This field examined  
at the request of  
L. Waldo. Stars  
marked A & B  
supposed to be two  
for which he wanted  
photometric measures.  
The field was that  
included in the square  
for micrometer;  
diameter of square  
about 40'.

Above estimates in tenths of the diameter  
of the field; x measured to the right from the  
north following corner (that is, southwards); y  
upwards from the same corner (that is, towards  
the preceding side). Hence  $x = -\Delta\delta$ ;  $y = -\Delta\alpha \cos\delta$ .



76

Feb. 27, 1879

Photometer K

7 47

6.0  
 5.1  
 63.8 58.7  
 170.1 8 2.8  
 252.9  
 4919 1415  
 24595 70.75  
 122.98 35.38

R. obs.

4919 58.7  
 24595 82.8  
 122.98 1415  
 70.75  
 35.38

Interrupted by clouds.

8 15 Region of  $\mu$  Cassiopeiae carefully  
 examined by L. Waldo, W. Upton,  
 and A. Searle. L. W. did not  
 feel sure that the stars near  
 $\mu$  Cassiopeiae were those for  
 which he wanted magnitudes.  
 Some stars near  $\theta$  Cassiopeiae  
 more likely to be those he meant,  
 but no measures need be made  
 until he has an opportunity to  
 examine the region again with  
 Mr. Seagrave's telescope.

Feb. 27, 1879. Photometer J.

Focus readings on Companion D of  $\alpha$  Leonis.

8 53

57.5

46.4

53.0

69

52.3

1569

52.3

8 55

59.8

58.8

61.0

1796

59.9

Focus readings on Companion B of  $\alpha$  Leonis.

U. obs.

296

59.9

Setting adopted.

9 0

D

1.11

1.02

0.80

0.83

0.96

472

.944

Prism above  
U. obs. A out of field.

472

.944

9 3

0.79

.91

.96

.78

.99

443

.886

U. obs. Prism to left  
A out of field

443

.886



78

Feb. 27, 1879

9 8

D

0.64

0.65

0.63

0.77

0.74

343

.686

U. obs. Prism below  
A out of field343  
.686

...

9 12

0.65

0.71

0.74

0.64

0.73

347

.694

U. obs. Prism to right  
A out of field347  
.694

9 17

C

0.62

0.58

0.57

0.50

0.61

316

.632

Prism to right A &amp; B out of field

316  
.632

9 21

0.55

0.59

0.57

0.49

0.52

272

.544

U. obs. Prism below A out  
of field  
B in field, symmetrical272  
.544



Feb. 27, 1879.

U. obs. Prism to left,  
B in field, in line with  
~~other~~ other images,  
A out of field.

9 25  
0.66  
0.53  
0.56  
0.59  
0.60  
29 4  
600  
58 8

29 4  
.58 8

9 29  
0.69  
0.67  
0.64  
0.56  
0.59  
30 9  
618

U. obs. Prism above, A & B out of  
field

30 9  
.618

9 36

Focus readings on B  
5. obs.

51.6  
63.8  
56.4  
171 8  
~~348 6~~  
57.27

21 8  
5 + 7.27

9 41

Focus readings on 2 Becons

47.2  
47.8  
54.5  
149.5  
49.8

29 5  
4 + 9.83

Setting adopted

80

Feb. 27, 1879.

9 46

C  
 1.04  
 .81  
 .76  
 .77  
 .91  
 ———  
 .862

431  
 .862

1. obs. Prism Above.

A &amp; B out of field.

Great care taken to get the whole of the reflected pencil.

9 50

.91  
 .98  
 .81  
 .80  
 .84  
 ———  
 .868

434  
 .868

Prism above

B in field &amp; symmetrical

9 55

.57  
 .52  
 .61  
 .63  
 .62  
 ———  
 .395  
 .590

295  
 .590

Prism at left

A &amp; B out of field

10 0

.59  
 .55  
 .45  
 .50  
 .58  
 ———  
 .267  
 .534

267  
 .534

Prism below

A &amp; B out of field

Feb. 27, 1879

10 4

.58

.52

.51

.52

.48

.261

.522

261  
.522

Prism below

Bin field, symmetrical

10 9

.98

.97

1.04

.82

.94

.475

.950

475  
.950

Prism at right

A &amp; B out of field.

Reflected image somewhat  
the higher at first, but brought  
to level of the other after first  
or second setting.Seeing (S.) 7, 5, 6.  
(U.) 6, 4, 5.



Feb. 28, 1879.

Experiments with Photometer Q  
(nebula photometer) on  $\alpha$  Leonis  
early in the evening.

Photometer I  
 $\alpha$  Leonis

8 20

55.8  
52.0  
51.0  
8.8  
52.9

Focus readings  
P. obs.

88  
52.93

D

Dist of field

P. obs. Prism to right

8 23

1.64

1.57

2.11

2.10

2.114

986

1.972

486

1.972

8 24

0.73

0.50

0.72

0.68

0.73

366

732

P. obs. Prism below

366

732

Feb 28, 1879

8 33

1.00  
0.80  
0.74  
0.77  
0.80  

---

411

P. obs. Prism to right

This undoubtedly should  
be Prism to left.

411  
.822

8 36

.822  
0.89  
0.91  
0.90  
0.94  
0.94  

---

408

P. obs. Prism above

458  
916

8 47

.916  
1.23  
1.25  
1.45  
1.28  
2.11  
732  
1.464

P. obs. Prism to right.

(In ~~setback~~ at 8:25, the rope  
or some other obstruction  
was thought to have  
hindered view through prism.

732  
1.464

9.2

C.  
1.12  
0.80  
0.99  
0.98  
0.78  

---

467  
934

S. obs. Prism to right.  
A + B out of field.Focus retained at  
52.9

467  
934



84

Feb. 28, 1879.

Prism to right A &amp; B both in field symmetrical

9.16

C  
1.27

S. obs.

Acad as before at 52.9

x A

1.02

1.20

.98

.96

537

1.074

37  
1.074C B  
1.

- Reflected image

9.21

A in field B out of field symmetrical  
prism below.

0.95

.89

.96

1.03

1.01

484

968

484  
968

9.24

A out of field B out of field prism below

0.66

.61

.59

.65

.58

309

.618

309  
.618

9.31

0.44

.52

.55

.67

.62

270

.540

270  
.540Prism to left  
A, B out of field



Feb. 28, 1879.

935 Prism above. A &amp; B out of field.

0.77

81

.87

71

62

40 8

.816

40 8

.816

Seeing 5, 5, 2. (P.)  
6, 4, 4. (S.)

March 3, 1879.

Photometer K.  
R. obs.

7 7

6.0  
~~0.6~~  
68.2 67.6  
163.3 94.3  
257.6  
48.9 7 16.9  
24.485 80.95  
122.42 40.48

4951 62.2  
24755 94.3  
123.78 156.5  
7825  
39.12

7.5  
21.5  
485 27.0

204.1 24.5  
228.6  
50.27 51.5  
25.135 25.75  
125.68 12.88

50.27 24.5  
25.135 25.75  
125.68 12.88

9.0  
33.8 7.5  
41.3  
212.7 7.8  
220.5  
50.83 13  
25.415 7.65  
127.08 3.82

7.5  
50.83 7.8  
25.415 13  
127.08 7.65  
3.82

7.0  
13.3 43.9  
57.2  
190.9 48.0  
238.9  
50.03 119  
250.15 45.95  
125.08 22.98

48.9  
48.0  
11.9  
46.45  
50.03 23.22  
250.15 45.95  
125.08 22.98

March 3, 1879.

9.5

35.3

38.7 (38.2 3.4

39.2

213.9 3.9

217.8

50.57 1.3

25.285 3.65

126.42 1.82

5.5

344.8

94.4 109.86

151.6

284.0 ~~132.4~~8748 ~~132.4~~4374 ~~132.4~~218.7 ~~132.4~~6.5 ~~132.4~~

13.2

59.9 46.7

193.8

235.5 41.7

502.4 88.4

2512 44.2

125.60 22.1

5057 3.4

25285 3.9

126.42 1.3

3.65

1.82

109.6

132.4

242.0

121.0

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

60.50

46.7

41.7

84

442

22.10

7 18

8.5

29.4

43.3 13.9

209.4

222.5 13.1

504.6

252.3 13.5

126.15 6.75

5046

2523

126.15

13.9

13.1

1.0

13.5

6.75



March 3, 1879.

5.0

271.3

957

184.4

184.4

154.7

131.0

285.7

131.0

8074

1354

8074

3154

4037

1577

4037

1577

204.85

78.85

201.85

78.85

8.6

24.3

50.4 26.1

26.1

202.8

23.8

226.6 23.8

5041

99

5041 9.9

25205

2495

25205 24.95

126.02

12.48

126.02 12.48

7 36

5.0

184.4

5.5

6.0

6.5

7.0

293.2

120.0

311.2

335.8

356.2

10.3

117.6

184.4

81.1

129.9

67.2

91.4

56.7

60.5

48.3

38.0

152.5

167.5

188.2

194.2

199.1

272.5

120.0

263.2

95.7

247.9

59.7

235.2

41.0

230.8

31.7

8358

104.4

23

0.25

391

151.1

8423

101.5

488.5

9.7

4179

152.2

4115

147.7

41955

7555

4215

50.75

244.5

34.85

20895

76.1

205.7

58.7

209.7

3778

210.58

25.38

122.0

17.42

7.5

8.0

8.5

9.0

9.5

20.0

24.6

30.2

34.2

35.7

45.5

25.5

43.3

18.7

41.1

10.9

39.4

5.2

39.1

3.4

204.3

206.3

211.6

214.5

215.8

225.2

20.9

223.5

17.2

220.6

7.0

219.1

4.6

218.7

2.9

45950

64

4977

15.9

5035

19.9

5072

9.8

5093

0.3

2875

23.2

24885

17.95

25175

7.95

2536

4.70

25465

2.15

14875

11.60

124.42

8.98

125.88

4.98

126.80

2.45

127.32

1.58

7 44

March 3, 1879  
Photometer

8 20 Focus readings on Companion B of  $\alpha$  Leonis  
U. obs.

66.3  
67.3  
66.2  
198  
66.6

198 198  
66.6 6990  
3495

Adopted setting

Companion C

~~Obs~~

Prism above, A & B out  
U. obs. of field,

8 22 0.77  
0.74  
0.73  
0.59  
0.61  
.688

344  
.688

8 27 0.69  
0.65  
0.62  
0.72  
0.70  
338

338  
.676

U. obs. Prism to left.  
A & B out of field.

8 32 0.78  
0.77  
0.71  
0.70  
0.77  
0.748

U. obs. Prism below  
A & B in field, A  
nearly symmetrical  
B symmetrical

23  
777  
746



90

8 35

0.69  
0.53  
0.52  
0.65  
0.64  
30 3  
.606

March 3, 1879  
U. obs. Prism below, A out  
of field, B in field,  
symmetrical.

3  
1606

8 40

0.52  
0.49  
0.54  
0.61  
0.70  
28 6

U. obs. Prism to right  
A & B out of field

286  
.572

0.572

8 45

0.73  
0.75  
0.66  
0.67  
0.57  
33 8  
.876

U. obs. Prism to right.  
A in field, symmetrical  
B out of field.

338  
.876



March 3, 1879

8 55 Scale in Cent. of focus pinion P. obs.  
Focus Pinion 100.0 Distance 20.6 cent.

$$\begin{array}{r}
 400.6 \\
 15.9 \overline{) 300.} \\
 \underline{189} \\
 1110 \\
 \underline{945} \\
 1650
 \end{array}
 \qquad
 \begin{array}{r}
 1.7 \\
 \underline{18.9}
 \end{array}$$

Focus on  $\alpha$  Loris

$$\begin{array}{r}
 334.7 \\
 338.2 \\
 336.7 \\
 \hline
 336.5
 \end{array}
 \qquad
 \begin{array}{r}
 196 \\
 336.5 \\
 336.5
 \end{array}
 \qquad
 \begin{array}{r}
 336.5 \\
 \pm 31.8 \\
 \hline
 304.7 \\
 368.3
 \end{array}$$

2

340.6

340.1

342.8

$$\begin{array}{r}
 341.5 \\
 \hline
 2
 \end{array}$$

$$\begin{array}{r}
 35 \\
 341.2
 \end{array}$$
 $\alpha$  Loris

349.7

349.2

351.7

350.2

31.8

382.0

318.4

Tube turned about  
and eyepiece changed. P. obs.

306

3103

350.2

92

Mar. 3, 1879.

Focus pinion at 382

~~2~~ ~~Linnis D~~

P. obs -

9 5

~~.57~~

too small

~~.56~~~~.55~~

Focus pinion at 363.1

P. obs -

~~.73~~~~.71~~~~.70~~Rej. on acc. of erroneous  
setting -

Focus at 366.1

Began again to take 5 settings -

Focus at 382.0

9 12

.61

P. obs.

.59

.54

.50

.53

.57

.554

27  
.554

12 12

Focus at 366.1

.69

.65

.62

.68

.70

.70

.70

.70

.70

34  
.668

9  
7 18Mar. 3, 1879  
Setting at 350.2 P. 10.
$$\begin{array}{r}
 .79 \\
 .93 \\
 .94 \\
 .93 \\
 .83 \\
 \hline
 442 \\
 .884
 \end{array}$$

$$\begin{array}{r}
 442 \\
 .884
 \end{array}$$

Setting at 334.3

$$\begin{array}{r}
 .77 \\
 .80 \\
 .71 \\
 .86 \\
 .90 \\
 \hline
 404 \\
 .808
 \end{array}$$

$$\begin{array}{r}
 404 \\
 .808
 \end{array}$$

9 24

Setting at 318.4

$$\begin{array}{r}
 .69 \\
 .75 \\
 .70 \\
 .71 \\
 .59 \\
 \hline
 344 \\
 .688
 \end{array}$$

$$\begin{array}{r}
 344 \\
 .688
 \end{array}$$

Setting P 68.9



9[32] 3.52.4  
55.1  
55.3  
12.8

March 3, 1879.  
true S.H.  
& Securis A

354.3  
15.9  
370.2

386.1

338.4

222.5

322.5

338.4

354.3

12.8

354.3

322.5

338.4 2

354.3 3

370.2

386.1 1

63.6

15.9

true - & Securis D  
S.H.

9 35

353.0

58.6

65.2

178.8

356.27

359.60

28.8

396.0

28.8

359.60

9 37

386.1 true

0.28 .42

.39 .41

.40

.40

.53

1.6

.432

21.6

.432

S.H.

q 41

$$\begin{array}{r}
 338.4 \\
 .70 \\
 .67 \\
 .71 \\
 .65 \\
 .64 \\
 \hline
 337 \\
 .674
 \end{array}$$

$$\begin{array}{r}
 337 \\
 .674
 \end{array}$$

q 44

$$\begin{array}{r}
 354.3 \\
 0.62 \\
 .60 \\
 .62 \\
 .65 \\
 .64 \\
 \hline
 13 \\
 .626
 \end{array}$$

$$\begin{array}{r}
 13 \\
 .626
 \end{array}$$

q 48

$$\begin{array}{r}
 322.5 \\
 0.47 \\
 .58 \\
 .54 \\
 .56 \\
 .67 \\
 \hline
 32 \\
 .564
 \end{array}$$

$$\begin{array}{r}
 282 \\
 .564
 \end{array}$$

q 51

$$\begin{array}{r}
 370.2 \\
 0.60. \\
 .52 \\
 .55 \\
 .58 \\
 .50 \\
 \hline
 25 \\
 .550
 \end{array}$$

$$\begin{array}{r}
 25 \\
 .550
 \end{array}$$

$$\begin{array}{r}
 6.89 \\
 7.77
 \end{array}$$

96

March 5 1879.

6 30

Opened dome &amp; identified region of R Leonis.

 $\gamma$ - $\gamma$  Leonis

U. obs

Photometer K.

7 40

33.3

37.2

3.9

213.5

5014

3.9

2507

3.9

217.4

3.9

125.35

1.95

5014

2507

125.35

1.95

h

U. obs.

8 2

8.6

69.6

61.0

61.0

191.0

5104

50.2

241.2

50.2

2552

111.2

5104

111.2

2552

55.6

127.60

27.80

127.60

55.6

27.80

g

U. obs.

8 6

0.6

72.3

71.7

71.7

185.8

5081

63.6

249.4

63.6

25405

135.3

5081

135.3

25405

67.65

127.02

33.82

127.02

67.65

33.82

h

U. obs.

8 12

27.3

44.2

16.9

16.9

206.0

5006

17.1

223.1

17.1

2503

14.0

5006

34.0

25030

17.0

125.15

8.50

125.15

17.0

8.50



March 5, 1879.

C

21.8

51.9

130.1

199.7

231.7

32.0

505.1

2.1

31.05

252.55

15.52

126.28

U. obs.

5051 30.1

25255 32.0

126.28 62.1

3105

15.52

8 23

C

26.9

45.6

18.7

205.5

225.5

20.0

503.5

38.7

251.75

19.35

125.88

9.68

U. obs.

5035

25175

125.88

18.7

20.0

38.7

19.35

9.675

8 28

7-7

U. obs.

34.2

37.6

3.4

214.7

217.5

2.8

504.0

2

252.0

31

126.00

1.55

8 48

3.4

2.8

2

31

1.55

U. Could not identify other comparison stars; probably too much moonlight to see them well, as the moon was close to the region.

Photometer I. Eye-piece prism missing. Found & replaced. Coincidence of pencils not quite satisfactory, but images well seen.

98

March 5, 1879.

Focus readings on companion B

9 10

55.8  
60.3  
60.2  
176.3  
158.8

358.8

15.9

31.8

374.7

390.6

8 342.9

8 327.0

U. obs. of 2 Leonis  
Photometer J.  
176.3  
58.77

Setting 374.7

9 25

0.55

.55

.52

.48

.51

.522

Companion D.  
U. obs

11  
522

Setting 390.6

9 29

0.42

.40

.45

138

35

.400

U. obs.

200  
400

March 5, 1879.

Setting 342.9

9 32

0.49  
.45

1.53

1.47

1.48

1.484

U. obs.

24 2

28 4

9 36

Setting 358.8

0.52

1.60

.60

1.59

1.57

1.576

U. obs.

28 8

57 6

Setting 327.0

9 38

0.52

.46

.40

.43

.48

1.458

U. obs.

29

458



100

March 5, 1879 -  
Focus Readings & Sum's

9 43

43.7

49.0

43.6

45.4

15.9

31.8

16.3

45.4

29.5

13.6

61.3

77.2

S. obs.

Setting 361.3

0.48

.46

.37

.43

.44

.436

21.8

.436

S. obs.

9 48

313.6

.48

.53

.49

.57

.47

.508

25.4

.508

S. obs.

9 53

345.4

.58

.59

.48

[1.05]

.50

.47

.524

ny.

too high second look

26.2

.524

S. obs.

9 57

Mar. 5, 1879

10 1

$$\begin{array}{r}
 377.2 \\
 .39 \\
 .36 \\
 .33 \\
 .34 \\
 - 41 \\
 \hline
 .366
 \end{array}$$

S. obs.

$$\begin{array}{r}
 183 \\
 .366
 \end{array}$$

10 4

$$\begin{array}{r}
 329.5 \\
 142 \\
 .52 \\
 .46 \\
 .46 \\
 .50 \\
 \hline
 .472
 \end{array}$$

S. obs.

$$\begin{array}{r}
 236 \\
 .472
 \end{array}$$

Following measures requested by L. Waldo.

Companions to  $\theta$  Cass.compared with  $\alpha$  Cass.

A

10 28

$$\begin{array}{r}
 1.35 \\
 1.43 \\
 1.54 \\
 1.29 \\
 1.42 \\
 \hline
 1.406
 \end{array}$$

$$\begin{array}{r}
 203 \\
 1.406
 \end{array}$$

 Seeing 6, 5, 5 (S.)  
 6, 5, 5 (alt)

Phot. I

S. obs. <sup>to right of</sup>  
 Prism above telescope.  
 $\theta$  Cass. on edge of  
 field. (Prism ~~above~~ above telescope  
 at first, before taking  
 $\alpha$  Cass. for the comparison star).

$\theta$  Cassiope. not bright  
 enough for a comparison star.

March 5, 1879

10 32

$$\begin{array}{r}
 B \\
 1.18 \\
 1.06 \\
 1.06 \\
 1.18 \\
 \hline
 1.106 \\
 \hline
 1.108
 \end{array}$$

$$\begin{array}{r}
 54 \\
 1.108
 \end{array}$$

S. obs.  
 to right of  
 Prism above telescope  
 & Cass. out of field.  
 See note previous page.

10 39

$$\begin{array}{r}
 B. \\
 1.45 \\
 1.40 \\
 0.93 \\
 0.82 \\
 \hline
 0.78 \\
 \hline
 1.076
 \end{array}$$

$$\begin{array}{r}
 538 \\
 1.076
 \end{array}$$

to right of  
 Prism above telescope  
 U. obs. & Cass. out of field  
 Want of coincidence  
 of pencils troublesome

10 42

$$\begin{array}{r}
 A \\
 1.39 \\
 1.70 \\
 1.69 \\
 1.59 \\
 1.43 \\
 \hline
 1.480
 \end{array}$$

$$\begin{array}{r}
 240 \\
 1.480
 \end{array}$$

U. obs. to right of  
 Prism above telescope  
 & Cass. out of field.



March 7 1879  
 Photometric obs.  
 of *Canis Majoris*.  
 Comp not done.  
 Zero  $h = 109.5$   
 $109.4$

1 270.6 middle per. to image  
 271.6  
 272.2  
 271.0  


---

 54 271.35

Zero of scale at 58.  
 91.8  
 91.7  
 91.7  


---

 91.7

March 7, 1879.

Phot. of

Mikado Area

Focus Area tel

= Orion's

7 24

$$\begin{array}{r} 5.6 \\ 5.6 \\ \hline 6.2 \end{array}$$

24

24  
5.80

580

a

0

Int.

a

11

ok

9.4

10.2

10.1

29.7

29.7  
9.9

9.90

580

4.10

10.1

580

430

to darken the sky

Focus large telescope 74.7

Compare this

B

18.7

11.6

18.6

48.9

18.9  
16.3

16.3

74.7

16.3

58.4

reduct. this

7 23

Focus 19.8

referred

19.3

5.2

Focus area tel

5.3

5.6

11

5.37

11  
5.37

March 7, 1879.

Lune a a in neb.

$$\begin{array}{r} 1.3 \\ 2.2 \\ \hline 1.6 \\ 21 \end{array}$$

1.70

51  
1.70

$$\begin{array}{r} 1.70 \\ 5.37 \\ \hline 10.03 \end{array}$$

3.67

4.67

$$\begin{array}{r} 9.7 \\ 10.0 \\ \hline 10.4 \\ 1 \\ \hline 10.03 \end{array}$$

0 1  
10.03

$$\begin{array}{r} 10.0 \\ 5.37 \\ \hline 4.63 \end{array}$$

Ret at 10.0

\* at

36.0

36.0

36.4

36.63

4  
36.63

$$\begin{array}{r} 74.7 \\ 36.63 \\ \hline 38.07 \end{array}$$

Sitar full and S  
Results

$$\left. \begin{array}{l} \text{2. } \Sigma \text{ Orion red. } 4.10 = \text{neb.} \\ \text{" " } 4.30 = * \text{ red. } 58.4 \\ \text{" " } 3.67 = \text{neb} \\ \text{" " } 4.67 = \text{neb} \\ \text{" " } 4.63 = * \text{ red } 38.1 \end{array} \right\}$$



March 7, 1879.  
Photometer

Focus readings on  $\alpha$  Leonis.

8 19

73.8 P. obs.  
78.5  
75.6  
17.9 179  
75.9 76.63  
75.93  
Setting adopted

Focus readings on B

8 20

84.0  
84.4  
80.2 86  
82.87 82.87

Prism to right. A, B out of field  
P. obs.

8 21

1.23  
1.25  
1.18  
1.04  
1.02 72  
1.14 4 1.14 4

Prism below. A. out of field  
B. asymmetrical  
P. obs.

8 25

0.66  
0.80  
0.63  
0.70  
0.66  
34 5  
69 0  
69 0

March 7 1879

8 27

0.66

0.68

0.68

0.52

0.71

32 5

.650

P. obs.

Prism below

A in field symmetrical  
B " " not "32 5  
.650

8 30

0.64

0.70

0.74

0.59

0.58

32 5

.650

P. obs.

Prism to ~~right~~ left. {This correction made  
March 8, and  
Kilmer to be required.  
A & B out of field32 5  
.650

8 34

0.63

0.69

0.72

0.70

0.73

34 7

.694

P. obs.

Prism to ~~right~~ left.  
A in field symmetrical  
B " " not "34 7  
.694

8 39

0.94

0.89

1.03

0.821

1.10

48 0

.960

P. obs.

Prism above  
A & B out of field.48 0  
.960



March 7, 1879.

Four readings in 2 hours

8 50

77.3

71.2

73.0

11.5

73.8

15.9

31.8

89.7

105.6

57.9

42.0

11.5  
73.8

8 52

D.  
Setting 89.7~~4.5~~ C by mistake

P. obs.

D

0.57

0.50

0.44

0.47

0.44

25.2

.504

5.2  
.504

8 57

Setting 42.0

P. obs.

0.410

0.42

0.43

0.44

0.42

21.1

.422

1.1  
.422



March 7 1879  
 Setting 73.18  
 P. obs.

9 2

0.52

0.56

0.61

0.52

0.48

269

.538

269  
.538

Setting 105.6  
 P. obs.

9 4

0.41

0.40

0.42

0.39

0.415

207

.414

207  
.414

Setting 57.9  
 P. obs.

9 7

0.50

0.49

0.49

0.51

0.56

5

0.510

255  
.510

March 7, 1879.  
 B-B Planet Chart K.

9 40

332	2.1	S obs.
353		2.1
214.2	2.6	4995
216.8		24975
4995	47	124.88
9990	2.65	
24975	1.18	
124.88		

9 43

32.7		P. obs.
35.9	3.2	
213.4		3.2
217.2	3.8	3.8
4992	70	4992
24960	3.50	24960
124.80	1.75	124.80

9 47

B-92		S
358.4		
67.9	69.5	69.5
180.2	65.2	8519
245.4		42595
8519	1347	21298
42595	6735	
212.98	33.68	

9 48

2.6	63.5	S obs.
66.1		63.5
173.4	69.9	4854
243.3		2427
4854	134	12135
2427	66.7	
121.35	33.35	

March 7 1879

9 50

353.6	P. obs.	80.8	80.8
74.4			
174.7	81.7	8591	81.7
256.14	<u>25</u>	42955	25
8591	81.25	214.78	81.25
42955	40.62		40.62
214.78			

9 52

347.4	P. obs.	86.2	86.2
73.6			
168.7	116.5		116.5
285.2	<u>76.5</u>		202.7
874.9	162.4		101.35
437.45	81.35		50.68
218.72	40.68		
	50.68		

9 55

<del>355.1</del>	Sch.		
33.1	2.8		2.8
35.9			
211.8	2.7	4953	2.7
214.5	<u>7</u>	24765	1.5
4953	55	12382	2.75
24765	275		1.38
123.82	1.38		

9 58

32.5	P. obs.		
36.1	3.6	4943	3.6
211.2		24715	3.3
214.5	3.3	123.58	1.72
4943	9		
24715	3.45		
123.58	1.72		

Reading of  
decl. circle 39.3

being (P) 4, 5, 7.



March 8 1879  
 $\beta$  Pers. Ther. K.

92 -  $\beta$

12.7

54.0

41.3

198.6

33.8

232.4

4977

751

24885

3755

214.42

1878

P. obs.

41.3

33.8

4977

751

24885

3755

124.42

18.78

6 40

16.7

35.1

51.8

194.6

37.6

232.2

4953

727

24765

3635

123.82

18.18

P. obs.

35.1

37.6

4953

727

24765

3635

123.82

18.18

6 42

7.8

46.1

53.9

194.1

39.1

233.2

4890

852

2445

426

122.25

21.3

S. obs.

46.1

39.1

4890

852

2445

426

122.25

21.30

6 45

16.2

36.0

52.2

186.3

44.0

230.3

4850

800

2425

400

121.25

2000

4850

36.0

2425

44.0

121.25

80

40

2000

6 48

The star with which  
 $\beta$  Persi is compared  
 on this page is ~~that~~  
 perhaps that used yesterday, but not  
 that used last year.

March 8, 1879

 $\beta$  Persei -  $\beta$  Persei

P. obs.

Focus altered.

6  
51

32.2  
35.4 3.2  
213.0  
216.1 3.1  

---

4967  
24835 3.15  
124.18 1.58

3.2  
3.1  
4967 63  
24835 3.15  
124.18 1.58

6  
55

32.1  
35.5 3.4  
212.8  
215.6 2.8  

---

4960 62  
2480 3.1  
124.00 1.55

P. obs.

3.4  
2.8  
4960 62  
2480 3.1  
124.00 1.55

7 0

~~3~~  
14.2  
52.4 38.2  
200.1  
234.9 34.8  

---

5016 130  
2508 365  
125.40 18.25

P. obs.

38.2  
34.8  
5016 130  
2508 365  
125.40 18.25

This star is  
the same  
used on p. 112.

7 4

19.6  
49.0  
200.2  
230.4 30.2  

---

4992  
24960  
124.80  
~~89.6~~  
~~3480~~  
47.40  
14.90

P. obs.

29.4  
30.2  
4992 596  
24960 2480  
124.80 14.90



March 8, 1879,

P. obs.

B

13.2

53.0

192.9

235.4

4945

24725

123.62

39.8

42.5

823

4115

20.58

39.8

42.5

123

4115

20.58

7 10

10.0

55.7

191.8

235.5

4930

2465

123.25

45.7

43.7

94

44.70

22.35

P. obs.

45.7

4930 43.7

2465 94

123.25 449

22.35

7 13

35.1

32.2

213.7

216.5

4975

24875

124.38

29

2.8

2.85

1.42

 $\beta - \beta$  Sch

2.9

2.8

4975 17

24875 285

124.38 1.42

7 19

32.0

35.2

213.6

216.3

4971

24855

124.28

3.2

2.7

59

2.95

1.48

P. obs.

3.2

4971 27

24855 59

124.28 295

1.48

7 21



March 8, 1879

7 24

T <sub>B</sub>	
7.4	58.5
65.9	
180.8	70.4
251.2	
505.3	128.9
252.65	64.45
126.32	32.22

Probs,

58.5	
70.4	
128.9	
64.45	
32.22	

7 25

B	
7.5	57.6
65.1	
183.2	66.0
249.2	
505.0	123.6
252.5	6.18
126.25	3.09

Probs,

57.6	
66.0	
123.6	
6.18	
3.09	

7 28

B	
5.3	60.7
66.0	
184.8	70.4
255.2	
511.3	131.1
255.65	65.55
127.82	32.78

Sche

60.7	
70.4	
131.1	
65.55	
32.78	

7 31

B	
17.7	48.1
60.8	
181.4	64.0
245.4	
500.3	112.1
250.15	56.05
125.08	28.02

Sche

48.1	
64.0	
112.1	
56.05	
28.02	

March 9, 1879  
B-B S. L.

7 34

32.0	2.5
34.5	
213.7	2.4
216.1	
4963	4.9
24815	2.45
124.08	1.22

4963 2.5  
24815 2.4  
124.08 2.45  
1.22

7 37

32.7	3.1
34.8	
213.3	3.0
216.3	
4961	3.05
24805	1.52
124.02	

4961 3.1  
24805 3.0  
124.02 3.05  
1.52

7 37

5.3	55.5
60.8	
1902	52.9
243.1	
4994	8.4
2497	54.2
124.85	27.10

4994 55.5  
24970 52.9  
124.85 8.4  
54.2  
27.10

7 41

10.0	49.0
59.0	
189.7	51.3
241.0	
4997	100.3
24985	50.15
124.92	25.08

499.7 49.0  
24985 51.3  
124.92 50.3  
25.08

Moved shutter and turned prism

March 8. 1879  
S. L. S.

B 340.8 92.7

73.5  
175.2  
250.5  
840.0  
420.0  
210.00  
168.0  
84.0  
42.00

6.0 64.1

70.1  
175.7  
255.0  
506.8  
253.4  
126.70  
79.3  
143.4  
71.7  
35.85

Then the brighter  
840.0 92.7  
420.0 75.3  
210.00  
168.0  
84.0  
42.00  
4.78  
42.00

S. L. S.

64.1  
79.3  
506.8  
253.4  
126.70  
143.4  
71.70  
35.85

B -

32.3 4.1

36.3  
210.4  
215.7  
494.6  
247.3  
123.65  
9.4  
4.70  
2.35

S. L. S.

4.1  
5.3  
9.4  
494.6  
247.3  
123.65  
4.70  
2.35

32.3 4.0

36.3  
211.2  
215.2  
495.0  
247.5  
123.75  
4.0  
4.0  
2.00

P. L. S.

4.0  
4.0  
495.0  
247.5  
123.75  
2.00



March 8 1879

804

348.1  
64.9  
183.9  
247.9  
8448  
4224  
211.20

B  
76.8  
64.0  
1408  
70.40  
35.20

8448  
4224  
211.20

P<sub>h</sub>  
76.8  
64.0  
1408  
704  
35.20

806

7

352.3  
77.3  
182.9  
251.8  
8642  
4321  
216.05

B  
84.9  
68.9  
1538  
769  
38.45

8642  
4321  
216.05

P<sub>h</sub>  
84.9  
68.9  
1538  
769  
38.45

808

34.4  
34.7  
212.3  
215.3  
4936  
2468  
123.40

B  
3.2  
3.1  
64  
32  
1.60

4936  
24680  
123.40  
3.3  
3.1  
3.2  
1.60

P<sub>h</sub>

810

358.2  
67.8  
175.3  
251.4  
8531  
42655  
213.28

B  
89.6  
76.5  
1461  
7305  
36.52

8531  
42655  
213.28  
69.6  
76.5  
1461  
7305  
36.52

P<sub>h</sub>

~~B~~ March 8 1879 do

8 13

2.8	67.6	67.6
70.4		4996
183.4	59.6	24980
2,43.0		12490
4996	7.2	636
2498	63.60	31.80
124.96	31.80	

8 16

351.9	80.1 B	S do	
72.0		80.1	
174.0	70.6	70.6	left eye
244.6		8425	1507
8425	1507	42125	7535
42125	7535	210.62	37.68
210.62	37.68		

8 19

7.0	53.2 B	S do.	
60.2		53.2	
179.1	69.1	4945	69.1
2482		24725	1223
4945	1223	123.62	6115
24725	61.15		30.58
123.62	30.58		

right eye

8 25

31.6	3.3	S do	
35.2		3.3	
211.8	4.0	4947	4.0
215.8		24725	7.3
4947	7.3	123.68	3.65
24735	3.65		1.82
123.67	1.82		

March 8, 1879

 $\beta - \beta$ 

8 26

31.3	4.3
35.6	
211.7	3.7
215.4	
<hr/> 4940	<hr/> 0
2470	4000
123.50	2000

P. obs.

4940	4.3
2470	3.7
<hr/> 123.50	<hr/> 0
	2000

 $\beta$ 

8 28

2.3	66.9
69.2	
175.8	80.5
256.3	
<hr/> 5036	<hr/> 1474
2518	73.70
125.90	36.85

P. obs.

	66.9
5036	80.5
2518	1474
<hr/> 125.90	<hr/> 737
	3685

350.7

88.3

P. obs.

8 31

79.0	
166.4	93.0
259.4	
<hr/> 8555	<hr/> 1813
427.75	9065
213.88	45.32

	88.3
8555	93.0
427.75	1813
<hr/> 213.88	<hr/> 9065
	45.32

 $\beta - \beta$ 

8 33

359.2	66.3
65.5	
185.0	63.8
248.8	
<hr/> 8585	<hr/> 101
429.25	65.05
214.62	32.52

Scha

left eye

8585	66.3
429.25	63.8
<hr/> 214.62	<hr/> 1301
	6505
	32.52



Mar 8 1879

S obs

8 36

2.6	63.7
66.3	
185.3	
247.6	62.3
<u>5018</u>	<u>63.00</u>
2509	31.50
125.45	

63.7 right eye  
62.3

5018  
2509  
125.45 31.50

S obs

8 38

31.6	3.0
34.6	
211.2	4.1
215.3	
<u>4927</u>	<u>7.1</u>
24635	3.85
123.17	1.78

3.0  
4.1  
4927  
24635  
123.18  
3.55  
1.78

P. obs.

8 40

31.0	3.8
34.8	
215.2	3.9
211.3	
<u>4923</u>	<u>3.85</u>
24615	1.92
123.08	

3.8  
3.9  
4923  
24615  
123.08  
3.8  
6.1  
9.9  
4.95  
2.48

B

P obs

8 43

357.8	66.3
64.1	
179.4	70.6
250.0	
<u>8513</u>	<u>136.9</u>
425.65	68.45
212.82	34.22

66.3  
8513  
425.65  
212.82  
136.9  
68.45  
34.22

B March 8, 1879.

8 44

353.8	78.9	P. obs.	78.9
72.7			
178.13	83.7	8668	83.7
262.0		4334	2.6
8668	1626	21670	8.13
4334	813		40.65
216.70	40.65		

8 47

355.3	78.6	Sch.	left eye
73.9			
166.3	88.7	78.6	
255.0		bright in second limb	
8505	1673	8505	88.7
42525	8365	42525	73
212.62	41.82	212.62	8365
			41.82

8 49

1.0	63.0 B	Sch.	
64.0			
1763	65.3	right eye	
241.6		42.3	
4829	83	63.0	
24145	64.15	4829	65.3
120.72	32.08	24145	83
		120.72	64.15
			32.08

8 52

31.6	3.2 B	Sch.	
34.8			
211.8	3.3		
215.1			
4933	3.25	4933	3.2
246.65	1.62	24665	3.3
123.32		123.32	325
			1.62



March 8, 1879

8 53

B	P. obs.
30.8	
357.1	4.3
211.6	4.6
<u>216.2</u>	
4937	
24685	4.3
12342	4.6
	<u>9</u>
	445
	2.22

8 55

B	P. obs.
359.6	
70.9	71.3
175.9	
253.7	77.8
<u>8601</u>	
43005	91
215.02	74.55
	37.28

8 57

B	P. obs.
352.8	
75.7	80.9
168.5	
263.0	94.5
<u>8620</u>	
431.0	175.4
215.50	89.4
	44.6
	43.85

8 59

B	S obs	right eye
50.0		
62.7	62.7	
177.0		
249.0	72.0	
<u>4887</u>		
24435	1347	
122.17	6735	
	33.68	



Mar. 8. 1879.

B

347.0

87.0

74.0

167.6

87.8

255.4

844.0

174.8

422.0

874.0

211.00

43.70

31.3

3.5

34.8

[209.0]

210.3

4.0

214.2

490.5

7.5

245.25

3.75

122.62

1.88

h<sub>p</sub> eye

87.0

844.0

87.8

422.0

874

211.0

43.70

3.5

4.0

as high.

rept.

490.5

3.75

245.25

1.88

122.62

7

31.0

4.2

35.2

210.3

4.3

214.6

491.1

4.25

245.55

2.12

122.78

P. obs.

4.2

491.1

4.3

245.55

4.25

122.98

2.12

B

339.1

106.1

85.2

116.1

159.2

109.6

268.8

852.3

426.15

213.08

25.7

112.85

56.42

53.92

P. obs.

106.1

852.3

109.6

426.15

213.08

15.7

107.85

53.92

March 8 1879

13

340.0

105.2 P. obs.

85.2

163.9

277.1

816.6

433.1

216.55

113.2

18.4

109.2

54.60

105.2

113.2

866.2

433.1

216.55

109.2

54.60

9 16

3218.3

74.2

166.3

253.6

842.4

421.2

210.60

85.9

87.3

173.2

86.60

43.30

S. obs. right eye

85.9

87.3

842.4

421.2

210.60

173.2

86.6

43.30

9 18

346.2

69.4

174.1

248.2

837.9

418.95

209.48

83.2

74.1

154.3

78.65

39.32

S. obs. left eye

83.2

74.1

837.9

418.95

209.48

154.3

78.65

39.32

9 23

29.4

34.0

211.8

214.6

489.8

2449.0

122.45

4.6

2.8

7.4

3.70

1.85

S. obs.

4.6

2.8

489.8

2449.0

122.45

7.4

3.70

1.85

9 26



March 8, 1879

9 28

$\beta$			
30.3	3.9	P. tr.	
34.2			3.9
211.0	3.7	4902	3.7
214.7		2451	3.8
490.2		122.55	1.90
245.10	3.80		
122.55	1.90		

9 30

$\beta$			
332.1	114.9	P. ob.	
87.0			114.9
167.2	88.1	8416	88.1
255.3		4208	2030
8416	2030		1015
4208	1015	210.40	50.75
210.40	50.75		

9 32

348.8	87.2	P. tr.	
76.0			87.2
169.6	99.7	5637	99.7
269.3		43185	69
8637	1869	215.92	93.45
43185	93.45		46.72
215.92	46.72		

9 34

356.5	74.5	S. ob.	l. eye
71.0			74.5
185.2	66.2	8641	66.2
251.4		43205	140.7
8641	140.7	216.02	70.35
43205	70.35		35.18
216.02	35.18		



March 8, 1879

357.0

85.0 S. obs.

myth eye

760

85.0

9 37

169.7

83.3

253.0

829.7

83.3

424.85

83

207.42

84.5

420.85

849.7

83

424.85

84.15

212.42

42.08

29.9

4.5

Scho.

34.4

4.5

9 40

211.1

2.8

213.9

489.3

2.8

244.65

7.3

122.32

3.65

489.3

7.3

244.65

3.65

122.32

1.82

30.4

3.9

Prob.

34.3

3.9

9 41.2

210.1

4.0

214.1

488.9

4.0

244.45

3.95

122.22

1.98

488.9

8

244.45

39.5

122.48

1.98

13

324.0

118.6

Prob.

82.6

118.6

9 46

132.3

154.9

287.2

826.1

154.9

4130.5

273.5

206.52

136.75

826.1

273.5

4130.5

136.75

206.52

68.37

68.38

B March 8, 1879

9 47

92.1	121.4	P. obs.
330.7		12 1.48
145.0	114.7	11 4.7
259.7		8 295
		41375
8 275	236 1	206.88
4 13.75	118.05	59.02
206.87	59.02	

9 50

342.8	86.2	S. obs.	right eye
69.0			8 6.2
162.3	90.1	8 265	9 6.1
252.4		41325	1763
8 265	176 3	206.62	8815
4 13.25	88.15		44.08
206.62	44.08		

9 52

351.4	83.5	S. obs.	left eye
74.9			8 3.5
169.8	84.2	8 501	8 4.2
254.0		42505	17 7
8 501	7 7	212.52	8 3.85
425.05	8 3.85		41.92
212.52	41.92		

9 55

30.2	4.0	B	S. obs.	Observations of
34.2			B by S. generally partly	
209.8	3.4		with right, partly with left eye	
213.2				
4874	7.4	4874	4.0	
243.7	3.70	2437	3.4	Swing P. 5, 6, 8
121.85	1.85	121.85	3.7	S 54.4
			1.85	

eye rubbing



Mar 28, 1879

P. obs.

9 58

 $\beta$   
30.2

33.7

209.9

213.1

---

4869

24345

121.72

3.5

3.2

7

3.35

1.68

3.5

3.2

4869

24345

121.72

3.35

1.675

Transits of stars

M. +40° 671

Star B

0.0

8' n. of  $\beta$ 

8.8 mag.

 $\beta$  Persei

23.2

220

Star B

2<sup>d</sup> wire

48.0

 $\beta$  Persei2<sup>d</sup> wire

69.8 early

M. +40° 676

Star C

84.0 2<sup>d</sup> late7' s. of  $\beta$ 

Star C

2<sup>d</sup> wire

125.0

8.6 mag.

Star C is that observed M. 112 & 113  
 Star B observed most of the evening.

0	23.2	84.0
480	69.8	125.0
480	46.6	41

200 sec. 1 min full.



March 10, 1879.

2 Leonis D.

Term

Uds

A. #

7 03

50.2

51.8

50.7

50.9

24  
50.9

-19.1

35.0

50.7

-66.8

82.7

63.6

15.9

Leonis B

A out of field

50.4

51.1

50.2

1.7

50.57

1.7  
50.57

66.8

u

7 09

58

54

begin again 66.8

7 38

60

73

70

73

69

35.1

70.2

70.2

March 10, 1879.

7 42

19.1 = 700

$$\begin{array}{r}
 .58 \\
 .81 \\
 .74 \\
 .67 \\
 .74 \\
 \hline
 354 \\
 708
 \end{array}$$

$$\begin{array}{r}
 354 \\
 708
 \end{array}$$

45

$$\begin{array}{r}
 .64 \\
 .60 \\
 \hline
 .75 \\
 .89 \\
 .85 \\
 .75 \\
 .89 \\
 \hline
 413 \\
 .826
 \end{array}$$
509  
neglect )
$$\begin{array}{r}
 13 \\
 .826
 \end{array}$$

750

$$\begin{array}{r}
 350 \\
 75 \\
 .85 \\
 .94 \\
 .78 \\
 .76 \\
 \hline
 408 \\
 .816
 \end{array}$$

$$\begin{array}{r}
 8 \\
 .816
 \end{array}$$

82.7

55

$$\begin{array}{r}
 .57 \\
 .56 \\
 .60 \\
 .66 \\
 .62 \\
 \hline
 306
 \end{array}$$

$$\begin{array}{r}
 6 \\
 .612
 \end{array}$$

Mar. 10, 1879

Prism

I expect a faint companion to  $\alpha$  Linné  
 whose pos. angle is  $30^\circ$  greater than  $\alpha$  and  
 " distance is less than  $\frac{1}{10}$  that of  $\alpha$ .  
 Not confirmed by U.

Seen in this position in  
 other nights by P.

8 7

from  $\alpha$ 

30.6

35.3

35.2

33.7

11 1

33.70

P. obs

prism at right

8 9

from  $\alpha$ 

34.6

38.7

37.6

37.0

20 9

36.97

33.7 adopted

8 14

 $\alpha$ 

1.45

1.46

1.11

1.35

1.44

1.362

P. obs. prism to right  
 A & B out of field.

18 1

1.362



March 10, 1879.

P. obs.

8 17

$$\begin{array}{r}
 1.27 \\
 1.20 \\
 1.16 \\
 1.23 \\
 1.26 \\
 \hline
 7.224
 \end{array}$$

$$\begin{array}{r}
 112 \\
 1.224
 \end{array}$$

Priem below.  
 A & B in field  
 Symmetrical with A

8 20

$$\begin{array}{r}
 0.85 \\
 .85 \\
 .85 \\
 .96 \\
 .99 \\
 \hline
 .900
 \end{array}$$

$$\begin{array}{r}
 00 \\
 .900
 \end{array}$$

P. obs.  
 Priem below  
 A & B out of field.

8 23

$$\begin{array}{r}
 0.60 \\
 .65 \\
 .60 \\
 .71 \\
 .67 \\
 \hline
 .646
 \end{array}$$

$$\begin{array}{r}
 23 \\
 .646
 \end{array}$$

P. obs.  
 Priem at left.  
 A & B out of field.

8 27

$$\begin{array}{r}
 1.00 \\
 0.98 \\
 1.13 \\
 .96 \\
 .79 \\
 \hline
 0.972
 \end{array}$$

$$\begin{array}{r}
 486 \\
 972
 \end{array}$$

P. obs.  
 Priem at left.  
 A & B in field.  
 Symmetrical with A

March 10, 1879.

8 29

C  
 0.90  
 1.09  
 1.03  
 1.36  
 1.15  
1.106

P. obs  
 Prism above  
 ALB out of field

5 3  
 1.10 6

8 55

A Coll.  
 Comp A Bright star at edge of field  
 Alder

1.67  
~~1.66~~  
 1.92  
 1.58  
2.10  
 1.774

38 7  
 1.77 4

8 57

2.37  
 2.91  
 3.42  
 3.24  
 3.13  
3.014

P. obs.

0 0 7  
 3.0 14

While making one or large disk two others  
 were made by hand zone 270 and 286

March 10, 1879  
Uds. B <sup>250°</sup>  
~~280°~~

9 07

1.89  
2.04  
2.04  
1.74  
2.27  
7.996

498  
1.996

9 10

2.55  
1.90  
2.65  
2.59  
2.24  
2.386

P. obs.

193  
2.386

9 17

1.90 A repeated  
2.40 Uds.  
2.25  
2.25  
2.44  
2.248

124  
2.248

9 22

2.98  
2.33  
2.54  
2.65  
2.78  
2.656

P. obs.

328  
2.656



March 10, 1879.

U Leonis. identification of cap star

a	14.8	41	44.8
b	23.2	41	53.2
c	34.0	42	40

b to a 15.3 prob. 16 sec

a = 42 9.2

a to U Leonis.

$$\begin{array}{r} 17.2 \\ 52.8 \\ \hline 35.6 \end{array}$$

March 11, 1879

I measured diam field obtained with  
rack and pinion ~~eye~~ adapter. Result 20'

Nebula Photometer.

Nebula Orion

Focus of small telescope.

P. obs.

7 23

8.7

E Orionis

8.2

7.9

<sup>8</sup>  
8.278.3

Focus of large telescope

P. obs.

359.6

O Orionis

59.9

<sup>25 8</sup>  
358.6

56.3

358.6<sup>50</sup>  
308.6

Star n.f. nebula

7 26

Set at 308.6

P. obs.

4.6

4.8

4.8

<sup>22</sup>  
4.734.73

16.00

8.00

7 30

11.2

11.5

11.1

<sup>8</sup>  
11.2711.27

March 11, 1879.

Setting 258.6

P. obs.

7 32

13.3

13.2

14.1

13.531.6  
13.53

7 33

0.6

1.6

2.0

1.4014.93  
7.46

P. obs.

1.2  
1.40

Setting 208.6

P. obs.

19.2

18.4

18.6

18.732.2  
18.73

7 35

Setting 158.6

P. obs.

20.4

21.6

20.8

20.932.8  
20.93

7 37

Setting 108.6

P. obs.

24.2

25.0

26.5

25.237  
25.23



March 11, 1879.  
Selling 83.6

78 39

29.1  
28.6  
30.3  
29.33

880  
29.33

P. obs.

$F_a$  from large tel. obs

367.8  
68.1  
75.2

311  
370.4 mean  $F_a$

$F_c$  = from of large tel.  
 $F_d$  = " " small "

311  
370.37

7  
8 51

$F_b$  6.5  
6.5

6.2  
6.40 = mean  $F_b$

12  
6.40

7  
8 52

Set at 3.20.

9.9  
9.7  
9.5  
9.70

21  
9.70

7  
8 55

4.1  
4.0  
4.2  
4.10

13.8  
6.9

3  
4.10

140

7  
8 56

$$\begin{array}{r}
 4.270 \\
 12.3 \\
 11.3 \\
 \hline
 12.1 \\
 35.7 \\
 \hline
 11.90
 \end{array}$$

$$\begin{array}{r}
 5.7 \\
 \hline
 11.9
 \end{array}$$

7  
8 58

$$\begin{array}{r}
 0.2 \\
 1.2 \\
 \hline
 1.0 \\
 2.4 \\
 \hline
 0.80
 \end{array}$$

$$\begin{array}{r}
 12.70 \\
 6.35
 \end{array}$$

$$\begin{array}{r}
 2.4 \\
 \hline
 0.80
 \end{array}$$

7  
8 59

$$\begin{array}{r}
 17.0 \\
 16.6 \\
 \hline
 17.6 \\
 1.2 \\
 \hline
 17.07
 \end{array}$$

$$2.20$$

$$\begin{array}{r}
 2 \\
 \hline
 17.07
 \end{array}$$

8 01

$$\begin{array}{r}
 17.0 \\
 \hline
 19.0 \\
 23.0 \\
 \hline
 20.6 \\
 62.6 \\
 \hline
 20.87
 \end{array}$$

$$\begin{array}{r}
 2.6 \\
 \hline
 20.87
 \end{array}$$

8 05

$$\begin{array}{r}
 120. \\
 \hline
 26.5 \\
 27.3 \\
 \hline
 26.6 \\
 \hline
 24 \\
 \hline
 26.80
 \end{array}$$

$$\begin{array}{r}
 2.4 \\
 \hline
 26.80
 \end{array}$$

8 06

$$\begin{array}{r}
 95 \\
 27.5 \\
 27.8 \\
 29.7 \\
 \hline
 25 \quad 0 \\
 28.33
 \end{array}$$

$$\begin{array}{r}
 25 \quad 0 \\
 28.33
 \end{array}$$

8 22

Cen. A.  $\theta$  Cen. S. obs. Compared with d. Cass.

$$1.78$$

$$1.97$$

$$1.88$$

$$1.53$$

$$1.63$$

$$1.758$$

$$\begin{array}{r}
 379 \\
 1.758
 \end{array}$$

$\theta$  out of field  
Prism to right.  
It reads

8 32

B

S. obs.

Prism to right.

$$1.35$$

$$1.60$$

$$1.53$$

$$1.75$$

$$1.58$$

$$1.562$$

$$\begin{array}{r}
 281 \\
 1.562
 \end{array}$$

8 37

B

S. obs.

Prism bright.

$$2.14$$

$$2.08$$

$$2.00$$

$$2.13$$

$$2.17$$

$$2.104$$

$$\begin{array}{r}
 5 \quad 2 \\
 2.104
 \end{array}$$

It reads



March 11, 1879

P. obs.

8 39

3.58

too bright

2.68

Prism to right.

2.86

(Unread)

2.87

487

2.88

2.974

2.974

End of Vol. XI.

Stars near  $\theta$  Cass. Soho

A 133° 150°

130° 90°

160° 140°

350° 140°

130° 160°

145° 160°

~~March 11, 1879~~S. Cancri - ~~S. Cancri~~  $\delta$  Cancri ( $\epsilon$  Cancri is Praesepe)

Soho

9 18

31.0

50.3 19.3

19.3

202.7 20.3

20.3

223.0

50.70 39.6

2535 19.80

126.75 9.90

50.70 39.6

2535 19.80

126.75 9.90

March 11, 1879

9 25

S - S

22.2 23.0  
45.2

204.0 17.9

221.9

4933 409

24665 2045

12332 10.22

4933

24665

12332

23.0

17.9

409

2045

10.22

Sob

9 29

Sm 2089, e ~~lauri~~ Plauri Sob.

357.8 68.0

65.8

174.0 79.0

253.0

8506

42530

21265

1470

735

3675

68.0

850.6

42530

21265

79.0

1470

735

3675

9 36

4.8

60.2

187.3

243.3

4956

24780

123.90

55.4

56.0

1114

557

2785

U. obs.

55.4

4956

24780

12390

56.0

114

5570

2785

9

S - S

19.6

42.9

198.2

226.8

4875

24375

121.88

23.3

28.6

519

2595

12.98

U. obs.

23.3

4875

24375

121.88

28.6

119

2595

12.98

9 40



March 11, 1879.

S. &amp; S.

18.5  
45.3

26.8

U. S.

26.8

9 42

201.0  
223.6

22.6

488.4

49.4

244.2

24.70

122.10

12.35

4884  
2442  
1221022.6  
9.4  
247  
12.35

9 45

19.8

23.4

43.2

23.4

201.7

23.3

225.0

4897

467

24485

23.35

122.42

11.68

4897  
24485  
1224223.3  
2335  
11.68

9 47

17.2

26.9

44.1

Proto

26.9

201.3

23.8

225.1

4877

507

24385

2535

121.92

12.68

4877  
24385  
121.9223.8  
107  
2535  
12.68

9 50

2.1

52.6

54.7

Proto

52.6

192.2

43.2

235.4

4844

9.58

2422

47.90

121.10

23.95

4844  
2424  
121.4043.2  
958  
4790  
23.95

Seeing

8 6, 6 (P.)  
8 8, 7 (S.)  
8 7, 7 (W.)



March 12, 1879 Cloudy at first.  
S - ~~8~~ Canari Photometer 1K  
U. obs.

8 53

14.5  
49.2 34.7  
195.9  
229.5 33.6  
4891 3  
24455 34.15  
122.28 17.08

34.7  
33.6  
3  
3415  
16.58  
17.08  
4891  
24455  
12228

15.4

51.5

clouds

U. obs.

8 59

13.2  
49.2 36.0  
195.7  
227.16 31.9  
48157 79  
24285 33.95  
121.42 16.98

U. obs.

36.0 36.0  
31.9 31.9  
669 679  
3345 3395  
16.72 16.98

4787  
23935  
4857  
24285  
12142

9 7

2089 - 88  
8.2  
61.3 53.1

U. obs.

53.1

9 15

185.0  
242.5 57.5  
4970 106  
24850 55.30  
124.25 27.65

4970  
2485  
124.25  
57.5  
106  
553  
27.65

March 12, 1879

9 16

2089 - 8

355.6 69.5

65.1

176.2

247.5

8 4 4 4

4 2 2 2

211.10

71.3

8

70.4

35.2

Sols

69.5

8 4 4 4

4 2 2 2

211.10

71.3

0 8

70.40

35.20

5 - 8

clouds.

16.3

52.7 36.4

194.1

832.3

49 5 4

24770

123.85

14.6

37.3

18.65

14.0

51.0

194.0

224.4

48 3 4

24 17

120.85

87.0

30.4

74

33.70

16.85

Sols

Reversed telescope

Image furthest

from prism in this

by next set

495 4

2477

123.85

87.4 36.4

38.2 38.2

10.6 7.46

37.80 37.30

18.90 18.65

Sols.

37.0

30.4

7 4

3370

16.85

9 44



March 12, 1879.

f - d

9 50

150	30.2
45.2	
188.2	49.8
238.0	
<u>48 6 4</u>	800
24 32	400
12 1.60	20.00

U. obs Image farthest  
from from the two  
settings.

48 6 4	30.2
24 32	49.8
12 1.60	80 0
	400
	20.0

9 53

4.3	48.9
53.2	
188.0	49.9
237.9	
<u>48 3 4</u>	8
24 17	49.4
120.85	24.70

U. obs.

48 3 4	48.9
24 17	49.9
120.85	8
	49.4
	24.70

clouds.

10 1

2089 - d	
5.3	50.7
56.0	
180.5	59.9
240.4	
<u>48 2 2</u>	10 6
24 11	55.3
120.55	27.65

U. obs. Rather cloudy

48 2 2	50.7
24 11	59.9
120.55	10 6
	55.30
	27.65

10 3

358.8	62.7
61.5	
185.3	56.6
241.9	
<u>8475</u>	1193
423.75	5965
211.88	29.82

S. obs.

8475	62.7
42375	56.6
21188	1193
	5965
	29.82

More clouds



March 12, 1879

10 19

$$\begin{array}{r} 8-8 \\ 358.2 \\ 60.5 \\ 181.8 \\ 241.3 \\ \hline 8418 \\ 4209 \\ 210.45 \end{array}$$

8418  
4209  
21045

Sob

$$\begin{array}{r} 62.3 \\ 59.5 \\ \hline 18 \\ 609 \\ 30.45 \end{array}$$

10 22

$$\begin{array}{r} 357.6 \\ 63.8 \\ \hline 127.5 \\ 241.5 \\ \hline 8404 \end{array} \quad \begin{array}{r} 662 \\ 640 \\ 102 \\ 65.1 \\ 32.55 \end{array}$$

8404  
4202  
21010

$$\begin{array}{r} 3.8 \\ 66.2 \\ 64.0 \\ \hline 102 \\ 6510 \\ 3255 \end{array}$$

Seeing 5, 3, 5 - (S.)  
4, 7, 7. (W)

March 13, 1879.

Cloudy at first, clear about 8<sup>1</sup>.

Photometer M. Sirius. Companion suspected, not certainly seen.

Phot K

9 34

$\eta - \eta$  Leonis

30.4 3.6

34.0

210.3 3.6

213.9

4886

2443

122.15 1.8

S. obs.

3.6

3.6

4886

2443

122.15

1.80

9 48

$\lambda - \eta$

359.0 62.8

61.8

185.6 56.8

242.4

8488

4244

212.20

1196

5980

29.90

S. obs.

62.8

8488

4244

212.20

56.8

19.6

59.80

29.90

9 51

$\gamma - \eta$

342.9 91.4

74.3

176.6 73.6

250.2

8440

4220

211.00

91.4

73.6

1650

825

41.25

S. obs.

91.4

73.6

1650

825

41.25

March 13, 1879

9 53

2-7

~~24.9~~ 25.9 16.1

42.0

204.8

224.6

4973

24865

124.32

19.8

~~19.7~~

358

~~17.90~~

8.95

8.98

S.oh.

16.1

19.8

15.9

17.95

8.98

9 55

c-7

20.9

42.4

199.8

224.6

4877

24385

121.92

21.5

24.8

463

2315

11.58

S.oh

21.5

24.8

63

2315

11.58

10 0

21-7

21.7

44.0

203.1

222.0

4908

24540

122.70

22.3

18.9

412

2060

10.30

S.oh

22.3

18.9

12

2060

10.30

10 8

E-7

30.3

36.1

210.4

215.2

4920

2460

123.00

5.8

4.8

10.6

5.3

2.65

S.oh.

5.8

4.8

6

530

2.65



March 13, 1879

10 21

18 - 7

$$\begin{array}{r} 39.7 \\ 25.2 \\ \hline 214.5 \end{array}$$

$$\begin{array}{r} 205.0 \\ 214.5 \\ \hline 4844 \end{array}$$

$$\begin{array}{r} 2422 \\ 121.10 \\ \hline 240 \\ 12.0 \\ \hline 6.0 \end{array}$$

Sob -

14.5

9.5

240

120

bro

4844

2422

12110

10 30

11 - 7

$$\begin{array}{r} 36.2 \\ 29.0 \\ \hline 209.1 \end{array}$$

$$\begin{array}{r} 209.1 \\ 215.2 \\ \hline 4895 \end{array}$$

$$\begin{array}{r} 24475 \\ 122.38 \\ \hline 24475 \\ 122.38 \\ \hline 3.32 \end{array}$$

Sob -

7.2

6.1

133

665

332

4895

24475

12238

10 44

31 - 7

$$\begin{array}{r} 27.5 \\ 36.0 \\ \hline 209.9 \end{array}$$

$$\begin{array}{r} 209.9 \\ 215.4 \\ \hline 4888 \end{array}$$

$$\begin{array}{r} 2444 \\ 12220 \\ \hline 2444 \\ 12220 \\ \hline 3.00 \end{array}$$

Sob -

8.5

5.5

14

70

3.00

4888

2444

12220

10 49

7 - 7

$$\begin{array}{r} 31.1 \\ 34.8 \\ \hline 212.1 \end{array}$$

$$\begin{array}{r} 215.0 \\ 212.1 \\ \hline 4930 \end{array}$$

$$\begin{array}{r} 24650 \\ 123.25 \\ \hline 24650 \\ 123.25 \\ \hline 1.65 \end{array}$$

4930

2465

12335

3.7

2.9

6

330

1.65

Sob.

Seeing 5, 6, 4.

March 15, 1879.

7 50 Phot P. adjusted by R. D. G. B. Clark  
+ 2° 50'

clat Cir Dec.  
7 20.7 23.4 - 10° 7.6 + 8.532  $\beta$  C. Min  
27 0 297 + 12.9 32.107  $\alpha$  Gem

$\alpha$  Gem. lum. piece fell and broke corner

	RA	Dec.	line	Circle
$\alpha$ C. Min.		+ 25.5		30.5
$\beta$ Gem.		28.3		53.3

I compared M.S. chart of stars near pole with the sky. Pretty correct, except that components of triple stars are not nearly enough in line.

Photometer Q 9 star following G.C. 2102  
Nebula # IV 27 P. obs. (see Hydrae is in the neighborhood)

9 27  
6.3 10.4  
6.2  
6.3  
6.27

Nebula greener than star

9 30  
5.8 P. obs. star  
5.9  
5.4  
2.1  
5.7

March 15 1879

P. obs

Principal star.

9 34

60.3

47.8

45.1

153.2

51.07

~~23.2~~~~4.73~~

153.2

51.07

9 45

4.5

7.4

6.4

183

6.1

Nebula and star. Solus

18.3

6.10

O

9 52

92.8

93.1

92.9

8.18

[3]92.93

8.8

92.93

9 53

1.5

6.1

9.0

16.6

[4]05.53

16.6

5.52

Nebula much too high

S. 576



March 18, 1872.

Stars near  $\mu$  Cass. by request of L. Waldo.

Comp.  $187^{\circ} 2'$   $\mu$  Cass. &  $\alpha$  bars. Phot. I.  
P. obs.

7 17

1.91  
2.65  
2.65  
2.15  
2.57

19 3  
2.38 6

19 3  
~~2.32~~  
2.38 6

7 20

2.03

U obs.

2.02

2.01

2.26

1.95

27  
2.054

27  
2.054

Partial Compar. to  $\theta$  Cass

7 40

1.05

$\theta$  behind  $\alpha$  bars.

1.95

P. obs.

1.03

1.98

00 4

1.03

1.008

0 4

1.01

March 18, 1879

Tr. comp. to  $\alpha$  Com. Prob-

7 43

2.74

3.07

2.65

2.93

2.72

411

2.822

411

2.822

Same

Uds

7 46

3.22

3.37

3.04

2.77

3.44

84

3.168

84

3.168

7 47

.91

.73

.78

.83

.177

402

.804

2

8804

March 18, 1879  
P obs

8 0

34  
33  
31  
8  
327

<sup>8</sup>  
327

These observations  
are of star g, near the  
pole.

27 lin vis

U obs

8 08

32  
33  
31  
6  
32

<sup>6</sup>  
32

limit 29

S obs

8 15

31  
33  
29  
3  
31

<sup>3</sup>  
31

Several other points  
suspected by U. & P.  
but located g  
nearly in line from  
j to f, .6 from j  
g. (u)

Limit of visibility taken here  
seems not to have been recorded.

By memory March 26 it was .25

Following estimates assume  $\phi$  to be  
the centre, and the position of j  
from f  $180^\circ$ , distance 1.0



March 18, 1879.

Dist. from f	Angle from f	
.2	150	Br. than g
.4	185	g
.1	270	f
.3	250	

S. obs.

.2	140°	15 magn.	P. obs.
.4	220°		
.4	175°	g	
.3	250°		
.1	260°		

.2	160		U. obs.
.3	175		
.4	185		
.1	260	g	
.4	160		
.4	140	as bright as f	
.7	250	ε	
.4	240		
.5	260		
.6	250		

March 18 1879

Uranus, was near another object of nearly equal brightness, and the two probably appeared as one star to the naked eye.

Looked Uranus easily seen by naked eye  
Star near rect. Altair. ang  $5^{\circ}$  U. obs  
 $10^{\circ}$  N. obs  
dist.  $30'' \pm$   $10^{\circ}$  S. obs

$11^h = H. \text{ day}$ ,  $13.6 = \delta$  circle Reading of a Linn.

Comp. of  $\alpha$  Leonis seen  $A+$

by D. at  $70^{\circ}$  zenith angle  $B$   
than B distance about  $10'' \pm$

Smith right it has been seen in this position.  
Obs confirmed by U.

$\epsilon$  Hydrae  $\delta + 7^{\circ}.9$   $h + 42^m$   
 $12.7$   
 $20.6$

$19.32$   
 $6.52$   
 $12.80$

Feb on Mch, 1879

1 m 10



March 19, 1879

W. A. Rogers observed an asteroid  
early in the evening,  
Photometer R. Region of R Leonis

 $\eta$  Leonis

U. obs.

8 23

31.0  
33.7 2.7  
211.1 2.4  
213.5  
4893 11  
24465 2.55  
122.32 1.28

4893  
24465  
122.32  
2.4  
2.55  
1.28

Sol.

8 27

30.0 3.8  
33.8 2.6  
210.9  
213.5  
4882 4  
244.10 3.20  
122.05 1.60

4882  
2441  
122.05  
3.8  
2.6  
4  
3.2  
1.60

 $\zeta$ 

U. obs.

8 47

51.6 51.8  
57.4  
185.5 53.1  
238.6  
4871 49  
24355 52.45  
121.78 26.22

4871  
24355  
121.78  
56.8  
43.1  
99.9  
49.95  
24.98  
51.8  
53.8  
104.9  
52.45  
26.22

U. obs.

8 49

35.1 73.9  
69.0  
177.2 68.9  
246.1  
8484  
4237  
21.85  
71.9  
35.75 35.70

847.4  
4237  
211.85  
73.9  
68.9  
12.8  
71.4  
35.70

March 19, 1879

$$\begin{array}{r}
 8 \quad 52 \\
 \begin{array}{r}
 356.9 \\
 63.0 \\
 174.6 \\
 240.0 \\
 \hline
 834.5 \\
 417.25 \\
 208.62 \\
 \hline
 1460.37
 \end{array}
 \end{array}$$

L

$$\begin{array}{r}
 8 \quad 54 \\
 \begin{array}{r}
 5.0 \\
 63.9 \\
 189.3 \\
 243.7 \\
 \hline
 501.9 \\
 250.95 \\
 125.48 \\
 \hline
 878.33
 \end{array}
 \end{array}$$

b

$$\begin{array}{r}
 8 \quad 57 \\
 \begin{array}{r}
 22.7 \\
 39.6 \\
 205.6 \\
 220.6 \\
 \hline
 488.5 \\
 244.25 \\
 122.12 \\
 \hline
 854.87
 \end{array}
 \end{array}$$

h

$$\begin{array}{r}
 9 \quad 2 \\
 \begin{array}{r}
 26.2 \\
 38.7 \\
 205.18 \\
 219.2 \\
 \hline
 489.28 \\
 244.95 \\
 122.48 \\
 \hline
 856.71
 \end{array}
 \end{array}$$

S. obs.

$$\begin{array}{r}
 66.1 \\
 65.4 \\
 11.5 \\
 65.75 \\
 32.88
 \end{array}$$

S. obs.

$$\begin{array}{r}
 58.9 \\
 54.4 \\
 113.3 \\
 56.65 \\
 28.32
 \end{array}$$

S. obs.

$$\begin{array}{r}
 16.9 \\
 15.0 \\
 11.9 \\
 15.45 \\
 7.98
 \end{array}$$

U. obs.

$$\begin{array}{r}
 12.5 \\
 13.4 \\
 5.9 \\
 12.95 \\
 6.48
 \end{array}$$



March 19, 1879

c

17.8

24.4

u. obs.

42.2

195.3

29.0

224.3

4796

534

2398

2670

179.90

13.35

17.2

33.1

50.3

198.1

25.5

223.6

4892

586

24460

293

122.30

14.65

e

20.0

21.2

41.2

202.5

22.5

225.0

4887

43.7

24435

21.85

122.18

10.92

24.8

14.1

38.9

205.2

217.6

4865

12.4

24325

26.5

121.62

13.25

6.62

u. obs.

34.4

24.4

28.0

29.0

34

134

312

2670

1560

13.35

s. obs.

33.1

4892

255

2446

586

122.30

2930

14.650

s. obs.

21.2

4887

22.5

24435

437

122.18

2185

10.92



March 19, 1879

V

Sob

9 22

28.4	6.4
34.8	
208.9	7.3
216.2	
488.3	13.7
244.15	6.85
122.08	3.42

	6.4
488.3	7.3
244.15	13.7
122.08	6.85
	3.42

9 25

28.4	6.8
35.2	
210.4	5.6
216.0	
490.0	12.4
245.0	6.2
122.50	3.10

U. obs.

	6.8
490.0	5.6
245.0	4
122.50	6.20
	3.10

9 36

30.2	6.0
36.2	
209.5	4.7
214.2	
490.1	10.7
245.05	5.35
122.52	2.68

U. obs.

	6.0
490.1	4.7
245.05	10.7
122.52	5.35
	2.68

9 38

30.9	5.0
35.9	
207.8	6.5
214.3	
488.9	11.5
244.45	5.75
122.22	2.88

Sob.

488.9	5.0
244.45	6.5
122.22	11.5
	17.5
	2.88

March 19, 1879

$$\begin{array}{r} 28.8 \\ 36.5 \end{array} \quad 7.7 \quad \text{u. obs.}$$

9 47 [206.3] reject; too bright

$$\begin{array}{r} 209.1 \\ 218.9 \\ \hline 4933 \\ 24665 \\ 12332 \end{array} \quad \begin{array}{r} 9.8 \\ 175 \\ \hline 875 \\ 4.38 \end{array} \quad \begin{array}{r} 4933 \\ 24665 \\ 12332 \end{array} \quad \begin{array}{r} 7.7 \\ 9.8 \\ 175 \\ 875 \\ 4.38 \end{array}$$

$$\begin{array}{r} 28.8 \\ 37.7 \end{array} \quad 8.9 \quad \text{S. obs.}$$

9 48

$$\begin{array}{r} 210.5 \\ 216.9 \\ \hline 4939 \\ 24695 \\ 12348 \end{array} \quad \begin{array}{r} 6.4 \\ 15.3 \\ \hline 765 \\ 3.82 \end{array} \quad \begin{array}{r} 4939 \\ 24695 \\ 12348 \end{array} \quad \begin{array}{r} 8.9 \\ 6.4 \\ 15.3 \\ 765 \\ 3.82 \end{array}$$

$$\begin{array}{r} 18 \\ 26.4 \\ 36.5 \end{array} \quad 10.1 \quad \text{u. obs.}$$

9 56

$$\begin{array}{r} 207.14 \\ 217.3 \\ \hline 4876 \\ 24380 \\ 121.90 \end{array} \quad \begin{array}{r} 9.9 \\ 0 \\ 5.00 \end{array} \quad \begin{array}{r} 4876 \\ 2438 \\ 121.90 \end{array} \quad \begin{array}{r} 10.1 \\ 9.9 \\ 0 \\ 5.00 \end{array}$$

9 57

$$\begin{array}{r} 25.5 \\ 36.0 \\ 207.0 \\ 236.2 \\ \hline 4847 \\ 24235 \\ 121.18 \end{array} \quad \begin{array}{r} 10.5 \\ 9.2 \\ 19.7 \\ 9.85 \\ 4.92 \end{array} \quad \begin{array}{r} 4847 \\ 24235 \\ 121.18 \end{array} \quad \begin{array}{r} 10.5 \\ 9.2 \\ 19.7 \\ 9.85 \\ 4.92 \end{array}$$

March 19, 1879.

$\eta - \eta$   
 $29.91$   
 $33.13$  3.4  
 10 3  
 $210.5$  3.2  
 $213.7$   


---

 $4894$  3.3  
 $24370$   
 $121.85$  1.65

30.1  
 33.2 3.1  
 10 5  
 $210.0$   
 $212.9$  2.9  


---

 $4862$  3.0  
 $2431$   
 $121.55$  1.50

U. obs.  
 3.4  
 $4874$  3.2  
 $2437$  3.3  
 $121.85$  1.65

Obs.  
 3.1  
 $29$   


---

 $4862$   
 $2431$  1.50  
 $121.55$

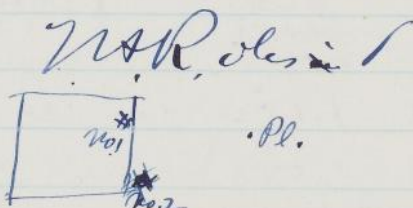


Mar 19 1879

NAR. obs. (123) Brunched with the E. Equatorial.  
Comparison stars.

My. 9.3  $\mu\alpha = \text{unknown}$   $\text{h m s } 10^{\circ} 41' 16'' + 12.2$  for 1879  
" 8.7  $\mu\delta = 1.2543$  D.M. =  $10^{\circ} 47' 19'' + 1' 15''$  for 1879  
 $P = 139^{\circ} 24'$

In R.A. Series I  
Appearance in field



Order of obs.

#  
#  
pl.  
pl.  
#  
#  
pl.  
pl.

Series  
Obs. ends  $10^{\text{h}} 36^{\text{m}}$

Series A. In R.A. Comp # = No. 2 NAR. obs.  
Order of obs.

#  
#  
pl.  
pl.  
#  
#  
pl.  
pl.

Series ends at  $10^{\text{h}} 46^{\text{m}}$

Series B In R.A. Comp with Nos. 1 and 2 NAR. obs.

Order of obs.

#2  
#2  
#1  
#1  
pl.  
pl.  
#2  
#2  
#1  
#1  
pl.  
pl.

Perhaps lost the pl. over the  
second bar in the first 3 obs of  
this series.

Series ends at  $10^{\text{h}} 58^{\text{m}}$



Series IV Q.C. N. obs. in R.A.

Comparison of #1 with pl. Order same as above with #1  
4<sup>th</sup> set in this series useless - incomplete. 2 sets follow.

Series V Q.C. N. obs. in R.A.

Comp. # = no. 2

Series begins with long rattle,  
1<sup>st</sup> set - incomplete. Rj. Followed by 5 sets.  
Series ends 11<sup>h</sup> 24<sup>m</sup>

Series VI W.R. obs. in R.A.

Order same as in Series III

Comp. # = nos. 1 & 2

Series VII W.R. obs. for sec.

Comp # = no. 1.

Appearance in field



Pl  
P = 184 24

Order of obs. #1

#1

pl

pl

#1

pl

Series VIII W.R. obs. for sec.

Comp # = no. 2

Appearance in field



Order of obs. #2 #2 #2 pl #2 pl. pl. pl.

In the last 3 series of this set. The order is # # pl. # # pl. pl. pl.

Series IX W.R. obs. in R.A. Comp # = nos. 1 & 2

Order. #1 #1 #2 #2 pl pl #1 #1 #2 #2 pl. pl.

168

March 21 1879  
 Cloudy early. Photography P. obs. K. Region of R Leonis.

g 35  
 30.6  
 34.2 3.6  
 210.4  
 213.6 3.2  
 4888  
 2444 3.4  
 122.20 1.70

b  
 24.8  
 40.4 15.6  
 204.1  
 220.6 16.5  
 4899  
 24495 1  
 122.48 16.05  
 8.02

h  
 1.2  
 64.7 63.5  
 181.41  
 244.8 63.4  
 4921  
 24605 63.45  
 123.02 31.72

g  
 356.3  
 69.4 73.1  
 179.8  
 243.9 64.7  
 8494  
 4247 1372  
 212.35 686  
 34.3



March 21, 1879.

C

P. obs.

8 49

12.4	43.4
55.8	
190.8	39.9
<u>230.7</u>	
489.7	33
244.85	41.65
122.42	20.82

489.7	43.4
244.85	39.9
	83.3
	41.65
122.42	20.82

e

P. obs.

9 0

201.2	17.8
219.0	
23.1	18.1
<u>41.2</u>	
484.5	35.9
242.25	17.95
121.12	8.98

	17.8
484.5	18.1
242.25	35.9
121.12	17.95
	8.98

v

P. obs.

9 7

27.2	10.9
38.1	
205.4	13.2
218.6	
<u>489.3</u>	4.1 1205
244.65	705
122.32	3.52 6.02

	10.9
489.3	13.2
244.65	24.1
122.32	4.1
	1205
	6.02

A

P. obs.

9 15

25.8	10.8
36.6	
206.3	10.2
216.5	
<u>485.2</u>	105
24.26	5.25
121.3	

	10.8
485.2	10.2
24.26	105
121.30	5.25

170

March 21, 1879.

Σ

24.2 16.0

40.2

Prob.

16.0

21.1

37.1

18.55

9.28

9 24

204.1 21.1

225.2

49 37

24 685

123.42

37 1

18.55

9.28

49 37

24 685

123.42

a

204.3

20.1

224.4

19.6

22.1

41.7

49 00

24 50

122.50

21.1

10.55

Prob. Image large

20.1

22.1

22

21.1

10.55

9 30

49 00

24 50

122.50

η Leonis

30.5

5.7

36.2

211.0

6.2

217.2

49 49

24 745

123.72

11.9

5.95

2.98

Prob.

5.7

6.2

11.9

5.95

2.98

9 36

49 49

24 745

123.72

Dew on object-glass,

March 21, 1879  
 Meridian Circle  
 W IX<sup>h</sup> 896

U. obs.

22' 3".0

~~23~~ 5

Observed over first 3 wires  
 Set at end of inclined line

903

48' 18".4

Observed over last 3 wires  
 of central group; set near  
 7th wire

914

47' 15".3

Observed over first 3  
 wires of central group.  
 Set at 1<sup>st</sup> wire of central  
 group.

937

49' 24".6

50' 31".3

39.8

48.8

41.9

Observed completely, ex-  
 cept 1<sup>st</sup> two wires.  
 Microscope read  
 for disc. observation  
 after R.A. wires  
 had been taken



172

Mar. 26, 1879  
Phot. R.

P. obs.

Eyepiece set at 88.0

Moon and Polaris

7 12

72.3

65.6

57.8

Both object in a thick haze. Measures for experiment.

Phot. M. 54 lenses  
 Alt dis.  $197^{\circ} \frac{14}{5}$  Set at  $152^{\circ}$

7 55

Focus

346.4

345.8

344.3

345.5 = Setting

P. obs.

16.5  
 345.5

PD 155, 5.29

 $91.4 = F$ , middle point images

4.0

E 85.0

A 97, 7.30

Transit

29.2

40.0

10.8

59.0

9.2

10.12

March 26, 1879.

8.15

B 95.0

35.7

54.0

218.3 Edge of tube

17.0

35.7

18.7

52.8

11.7

18.9

8 39

Focus 348.7

B 297°, 12° 9'

12 8

302, 2 37

2 53

N 265.0

PD 65, 5.64

63, 3.22

8 46

280° 11° 8'

64, 4.58

4.29

320 5 53

4.26

4.11

8 56

-286 1.54

56 6.53

March 26, 1879.

Udo ~~54~~ 54 Secans Center  
 286, 1° 38' 55", 5.08  
 2° 13'

9 16

Consecutive readings of light Udo  
 to determine

57.24	+06	
.716	-02	
.738	+20	
7.06	-12	
6.89	-29	
7.28	+10	
7.31	+13	
7.11	-07	
7.30	+12	
7.12	-06	
57.185	+61	.117
	-56	
	117	

9 25

P. obs

57.38	-9	
.58	+11	
.67	+20	
.47	0	
.61	+14	
.37	-10	
.57	+10	
.50	+3	
.46	-1	
.12	-35	.115
47.3	+60	
5	-55	
	115	



9 35

~~286~~<sup>0</sup> 1 20

1° 32'

+ 9

uob.

1 30'

+ 7

0 57'

- 26

1 18

- 15

1 42

+ 19

0 23

- 60

1 40

+ 17

2 12

+ 44

0 48

- 35

2 0

+ 37

1 23.2

+ 138

- 136

24

P.ob

9 40

286

2 11

+ 4

2 14

+ 7

1 40

- 27

2 7

00

1 43

- 24

2 42

+ 35

2 7

00

0 36.56

- 71

2 19

+ 12

3 12

+ 65

2 7.1

+ 123

- 122

245

March 30, 1879

Photometer Q  
Planetary nebula in Hydra (Gl. 2102?)  
& Locomis in small telescope

9 0

Focus 7.4

7.8

7.6

72.8

7.6<sup>+</sup>

P. obs.

Passing clouds

Shutting down to c

to make 2 Locomis  
accessible to prism

2 Locomis = nebula

9 3

4.2

4.9

41.1

13.2

4.40<sup>+</sup>

1.2  
4.40

P. obs.  
Inside focus

9 4

11.3

12.0

12.4

35.7

11.90<sup>+</sup>

5.7  
11.90

P. obs. Outside focus

Hydrae reduced to nebula  
Focus readings

15.7

15.8

11.0

12.5

14.2<sup>+</sup>

12.5  
14.2

Projection of tailpiece  
10.3

March 30, 1879

Pinion  
0.82

4.6 scale

360

2.1 Reg. tailpiece


$\therefore$  Tube = 2 beams out of focus by  $\frac{11.90 - 4.40}{2} = 3.75$   
 in small telescope.  
 = <sup>Hydrazine</sup> beams out of focus by 17.8 cms in large  
 telescope

10.3 + 14.2

2.1	4.6	
8.2	9.6	17.8

Result Tube =  $\mu$  Hydrazine 17.8 cms out of  
 focus in large telescope

at W 2	2.1 m *
W 5	12.6



Adjusted Photometer P.



April 1, 1879.

Adjusted Photometer R.

45.7

5  
6

7  
37

30  
45

2 Aurigae  
56 Aurigae

Photometer M. 56 Aurigae.

April 1, 1879. Photometer M.  
56 Aurigae

8 50

$$F = 357.7$$

Reject,  
Cross lines  
not in focus  
Reject

8 53

$$B = 97^{\circ}, 7' 30''$$

Zero of position.  $N = 152^{\circ}$ 

$$E = 85^{\circ}.2$$

+

$$13.1$$

$$25.7$$

$$E = 95^{\circ}.2$$

+

8 56

$$F = 356.6$$

P. obs.

$$B = 97^{\circ}, 7' 30''$$

Zero of position

$$N = 152^{\circ}$$

8 57

$$E = 85^{\circ}.2$$

+

$$11.4$$

$$23.1$$

$$E = 105^{\circ}.2$$

+

$$17.5$$

$$34.1$$

$$\frac{300 \times 11.0}{57.2} = \frac{57.7}{57.2}$$

Wind shakes telescope

9 3

$$RD = 92, 2.50$$

Angle of position

$$B \quad 28^{\circ}, 13' 25''$$

$$N 120.4$$

A

$$13 \quad 2$$

$$85, 5.56$$

$$13 \quad 21$$

$$12 \quad 37$$

$$2/5$$

$$28^{\circ} 6'$$

9 9

$$B \quad 20, 5 \quad 55$$

Distance

$$RD \quad 87, 8.52$$

$$8.96$$

$$9.16$$

$$9.39$$

$$4.03$$

$$89.01$$

$$\begin{matrix} 0.3 \\ 9.07 \end{matrix}$$

April 1, 1879,  
56 Aurigae continued.

$$B = 277^{\circ}, 7' 30''$$

Angle of position.

9 19 RD 29, 9.81  $B = 207^{\circ}, 12' 21''$   
 36, 6.33

$$\begin{array}{r} 12\ 27 \\ 12\ 18 \\ \hline 11\ 48 \\ 54 \\ \hline 207^{\circ}\ 14' \end{array}$$

9 24 B 200, 5 47 Distance RD 30,  $\begin{bmatrix} 3.18 \\ 2.18 \\ 3.02 \end{bmatrix}$  prob. 3.18  
 213, 3 56

$$\begin{array}{r} 2.64 \\ 3.47 \\ \hline 3\ 1 \\ \hline 33.07 \end{array}$$

Set at 2.18.  
 decidedly wrong.  
 approx setting  
 3.24

9 33 B 277^{\circ}, 7' 30'' Zero of position  $N.O. = 152^{\circ}$   
 $E = 90^{\circ}$   $t = 9^{\circ}.3$   
 100^{\circ}

$$\begin{array}{r} 19.0 \\ 17.2 \\ \hline 35.8 \end{array}$$

$$\frac{16.8}{54.8} 5040 = 92'$$



April 1, 1879.

Zero of position

$$B = 277^{\circ} 7' 0''$$

$$E = 90^{\circ}$$

$$E = 100^{\circ}$$

$$N = 152^{\circ}$$

$$t = 11.6$$

$$24.1$$

$$17.2$$

$$35.2$$

$$\frac{5.6}{59.3}$$

$$16.8$$

$$28.3$$

$$28'$$

9 40

$$B = 278^{\circ} 8' 0''$$

$$E = 90^{\circ}$$

$$E = 100^{\circ}$$

t

$$7.0$$

$$16.1$$

$$19.6$$

$$40.0$$

$$N = 152^{\circ}$$

$$\frac{23.9}{56.1}$$

$$7.7$$

$$128'$$

Zero Pos.

$$97 \quad 30 \quad \frac{116.}{58}$$

$$277 \quad 30 \quad 92$$

$$277 \quad 0 \quad 28$$

$$278 \quad 0 \quad 128$$

$$95^{\circ} 34' \quad 28 \quad 6 \quad 67^{\circ} 28'$$

$$275 \quad 58 \quad 207 \quad 14 \quad 68^{\circ} 44'$$

$$276 \quad 32 \quad 68 \quad 6$$

$$275 \quad 52$$

$$\text{Mean Zero } 95^{\circ} 46' \quad 68^{\circ} 6'$$

$$89.01$$

$$3307$$

$$122.08 \quad 61.04$$

$$55.94 \quad 27.97$$

April 2, 1879  
 Photometer K  
 $\beta$  Persei P. obs.

9 18  
 29.9  
 33.6 3.7<sup>c</sup>  
 209.7  
 213.8 4.1<sup>c</sup>  
 487.0 7.8<sup>c</sup>  
 243.5 3.9<sup>c</sup>  
 121.75 1.95<sup>c</sup>

3.7  
 4.1  
 7.8  
 39.0  
 121.75 1.95

P. obs.

9 20  
 29.9  
 33.9 4.0<sup>c</sup>  
 209.5  
 213.8 4.3<sup>c</sup>  
 487.1 4.15<sup>c</sup>  
 243.55 2.08<sup>c</sup>  
 121.78

4.0  
 4.3  
 4.15  
 20.8  
 487.1  
 243.55  
 121.78

DM. 40° 671,  $\beta$  Persei P. obs.

9 22  
 333.7  
 97.2  
 146.6  
 264.4  
 841.9  
 420.95  
 210.48  
 123.5  
 117.8  
 41.3  
 120.65  
 60.32

123.5  
 117.8  
 41.3  
 120.65  
 60.32  
 841.9  
 420.95  
 210.48

P. obs.

9 24  
 339.8  
 78.3 98.5  
 163.8  
 262.8 99.0  
 844.7 197.5  
 422.35 98.75  
 211.18 49.38

98.5 98.5  
 99.0 99.0  
 197.5 197.5  
 98.75 98.75  
 49.38 49.38  
 844.7  
 422.35  
 211.18



April 2, 1879  
 M. 40° 676, B Persei. Prob.

9 26

357.4  
 67.4  
 175.0  
 259.2  
 859.0  
 4295  
 214.75  
~~107.38~~  
 354.1

70.0  
 84.2  
 14.2  
 77.1  
 38.55

70.0  
 84.2  
 154.2  
 771  
 3855

9 27

79.2  
 176.1  
 251.1  
 860.5  
 430.25  
 215.12

85.1  
 75.0  
 0.1  
 80.05  
 40.02

Prob.  
 46.9  
 85.1  
 75.0  
 80.1  
 80.05  
 40.02

B Persei

30.0  
 34.8

4.8

Prob.

9 28

208.4  
 213.0  
 486.2  
 2431  
 121.55

4.6  
 4.7  
 2.35

4.8  
 4.6  
 4.7  
 2.35

9 30

30.2  
 35.7  
 208.1  
 213.8  
 487.8  
 2439  
 121.95

5.5  
 5.7  
 5.6  
 2.8

Prob.  
 5.5  
 5.7  
 5.6  
 2.8



21 48 *Ass 2.1875*  
 Diameter of Hole R.1  
 C.S. Micron. P. ds.  
 90.7 94.0  
 90.5 93.9  
 90.6 93.9  
 Lower  
 Upper Sem 90.63 93.93 = 3.30 div.

22 03 Upper Sem. 2.6  
 2.5 5.9  
 2.4 5.8  
 2.6 5.9  
 2.5 5.87 3.37

3.33 = mean diam  
 Hole practically elliptical

Assumed diameter = .00354 cms.

$$1 \text{ div} = \frac{25.4}{2400} = .0106 \text{ cms.}$$

$$\begin{array}{r}
 .00350 \\
 .00357 \\
 \hline
 .00354
 \end{array}$$

$$\begin{array}{r}
 254 \overline{) 24} \\
 \underline{24} \phantom{00} \\
 14 \phantom{00} .0106 \\
 \hline
 318 \phantom{00} \\
 \underline{318} \phantom{00} \\
 3498 \phantom{00} \\
 \underline{3498} \phantom{00} \\
 74 \phantom{00} \\
 \underline{74} \phantom{00} \\
 3572
 \end{array}$$

$\frac{1.878}{24}$  of an inch to 1' in E. Equatorial

Hence .003312 cms. to 1"

"  $1.069 = .00354 \text{ cms.} = \text{assumed diameter of R1}$

Mon. April 6 1879.

Index error =  $+1^{\circ}$

Star 1.7 m. later

Trouble from motion of emergent pencil.

Double image prism removed direct vision.  
Prism still gives trouble. Glass ruler  
cemented onto hub not tried April 7. Images  
are now excellent. Stars 7.5 and 8.0 mag. near  
Aolaris easily seen.

April 6, 1879  
Photometer K

2 Un. Min.

31.0

3.7<sup>^</sup>

P. obs.

34.7

210.3

3.2<sup>^</sup>

213.5

489.5<sup>^</sup>

244.75<sup>^</sup>

122.38<sup>^</sup>

9<sup>^</sup>

3.45<sup>^</sup>

1.72<sup>^</sup>

489.5

244.75

122.38

3.7

3.2

3.45

1.72

8 20

Same

7 Sols

Focus changed. Considerable difference of focus between observers. Concluded to begin again, ~~and~~ each observer to take a complete series.

31.8

3.0

P. obs.

34.8

Began again

Eye-piece 2.34<sup>cm</sup>

31.5

2.6<sup>^</sup>

34.1

210.2

2.9<sup>^</sup>

213.1

488.9<sup>^</sup>

244.45<sup>^</sup>

122.22<sup>^</sup>

15<sup>^</sup>

2.75<sup>^</sup>

1.38<sup>^</sup>

488.9

244.45

122.22

2.6

2.9

15

275

1.38

Eye-piece

8 35

DM

88° 4

19.1

29.2<sup>^</sup>

48.3

196.2

29.1<sup>^</sup>

225.3

488.9<sup>^</sup>

244.45<sup>^</sup>

122.22<sup>^</sup>

29.15<sup>^</sup>

14.58<sup>^</sup>

P. obs.

29.2

29.1

29.15

14.58

8 38



April 6, 1879

DM 88° 9

354.0

63.1

175.2

244.1

8 36.4<sup>^</sup>4 18.2<sup>^</sup>2 09.10<sup>^</sup>69.1<sup>^</sup>68.9<sup>^</sup>69.0<sup>^</sup>34.50<sup>^</sup>

P. obs.

8 36.4

4 18.2

209.10

69.1

68.9

69

34.50

8 43

DM 89° 3

[348.3] reject; dome interferes.

337.2

85.9

168.2

267.2

8 58.5<sup>^</sup>4 29.25<sup>^</sup>2 14.62<sup>^</sup>108.7<sup>^</sup>99.0<sup>^</sup>20 77<sup>^</sup>10 385<sup>^</sup>5 1.92<sup>^</sup>

P. obs.

8 58.5

4 29.25

2 14.62

10 8.7

99.0

20 77

10 385

5 1.92

8 48

S Mrs. Main

25.2

38.3

207.0

21 8.24

4 8 8 9<sup>^</sup>2 4 4 45<sup>^</sup>1 2 2.22<sup>^</sup>13.1<sup>^</sup>11.4<sup>^</sup>24 5<sup>^</sup>1 2 2.5<sup>^</sup>6.12<sup>^</sup>

P. obs.

488.9

244.45

122.22

13.1

11.4

4 5

12.25

6.12

8 55

Eye-piece thought  
to have been moved.

51 Caphei

27.5

37.5

207.2

21 5.9

4 8 8 1<sup>^</sup>2 4 4 05<sup>^</sup>1 2 2.22<sup>^</sup>10.0<sup>^</sup>8.7<sup>^</sup>18.7<sup>^</sup>9.35<sup>^</sup>4.68<sup>^</sup>

P. obs.

488.9

244.05

122.02

10.0

8.7

18.7

9.35

4.68

9 5

Eye-piece 2.25  
Reset to 2.34

April 6, 1879.

51 Cephei (repeated on account of displacement  
208.3 8.5 of eye-piece).  
216.8 P. obs.

Reject; wrong star

51 Cephei

207.9

9.1

P. obs.

217.0

26.7

9.9

Reject this set; wrong star

36.6

4882

9.5

2441

122.05

4.75

X Urs. Min.

19.2

24.2

P. obs.

43.41

197.0

228.9

4885

24425

122.12

31.9

561

2805

14.02

24.2

31.9

4885

24425

122.12

561

2805

14.02

51 Cephei

205.6

12.8

P. obs.

218.41

25.0

13.7

38.7

4877

26.5

24385

13.25

121.92

6.62

12.8

13.7

4877

24385

121.92

26.5

13.25

6.62

Looked at DM stars near  
hole; too faint to measure

April 6 1879

2 Ur. Bin

28.0

33.7

5.7<sup>^</sup>

208.7

213.3

4.6<sup>^</sup>

4837<sup>^</sup>

74185<sup>^</sup>

120.92<sup>^</sup>

3

5.15<sup>^</sup>

2.58<sup>^</sup>

29.2

32.3

209.2

212.3

3.1<sup>^</sup>

3.1<sup>^</sup>

4830<sup>^</sup>

2415<sup>^</sup>

120.75<sup>^</sup>

3.1<sup>^</sup>

1.55<sup>^</sup>

Probs.

5.7

4.6

3

5.15

2.58

4837

74185

120.92

Eye-piece 1.28<sup>cm.</sup>  
reset at 2.34

Probs.

4830

2415

120.75

8.1

3.1

1.55



April 8, 1879.

7 25

γ-γ Lewis

Phot. K

P. obs.

34.8 3.0

37.8

216.3

219.6

508.5

254.25 3.15

127.12 1.58

508.5 3.0  
 254.25 3.3  
 127.12 3.15  
 1.58

7 27

35.2 2.3

37.5

215.9

219.1

507.7 5.5

253.85 2.75

126.92 1.38

U obs.

507.7 2.3  
 253.85 3.2  
 126.92 5.5  
 2.75  
 1.38

7 32

342.8 96.9

79.7

170.3 93.7

264.0

856.8

428.4

214.20

190.6

95.3

47.65

P. obs.

856.8 96.9  
 428.4 93.7  
 214.20 10.6  
 95.3  
 47.65

7 36

L

P. obs.

2.3 73.0

75.3

174.3

257.3

509.2 156.0

254.6 78.0

127.30 39.00

509.2 73.0  
 254.6 83.0  
 127.30 156.0  
 78.0  
 39.00

April 8, 1879.

7 38

2  
27.4 17.8  
45.2  
209.1 17.9  
227.0  
5087 17  
25435 17.85  
127.18 8.92

Prob.

17.8  
17.9  
5087  
25435  
127.18  
17  
17.85  
8.92

7 40

C  
17.2 32.1  
49.3  
201.2  
230.8 29.6  
4985 17  
24925 30.85  
124.62 15.42

Prob.

32.1  
29.6  
4985  
24925  
124.62  
617  
3085  
15.42

7 43

21 Leonis  
26.0 23.8  
49.8  
203.0 29.1  
232.1  
5109 12.9  
25545 26.45  
127.72 13.22

Prob.

23.8  
29.1  
5109  
25545  
127.72  
12.9  
26.45  
13.22

7 47

d  
24.6 25.6  
50.2  
203.3 27.5  
230.8  
5089 13.2  
25445 26.6  
127.22 13.28

Prob.

25.6  
27.5  
13.1  
6655  
331  
2655  
13.28

Apr. 8. 1879

d

Uds.

7 50 25.6 21.6  
 47.2  
 202.4 25.6  
 228.0  
 5032 72  
 2516 236  
 125.80 16.80  
 11.8

21.6  
 25.6  
 5032  
 2516  
 125.80  
 72  
 236  
 11.80

7 53 f  
 18.3 38.9  
 57.2  
 195.0 42.6  
 237.6  
 5081 815  
 25405 4075  
 127.02 20.38

P. obs.

38.9  
 42.6  
 5081  
 25405  
 127.02  
 15  
 4075  
 20.38

7 55 f  
 18.3 38.9  
 57.2  
 194.3 40.1  
 234.4  
 5042 790  
 2521 395  
 126.05 19.75

Uds.

38.9  
 40.1  
 5042  
 2521  
 126.05  
 790  
 395  
 19.75

8 0 k  
 12.6 49.1  
 61.7  
 190.3 49.3  
 239.6  
 5042 4  
 2521 49.2  
 126.05 24.6

P. obs.

49.1  
 49.3  
 5042  
 2521  
 126.05  
 4  
 49.2  
 24.60

from collection 2 m. after



Apr. 8. 1879.  
U. chs.

8 02

R.

15.6	42.6
58.2	
191.9	43.9
235.8	
501.5	<del>42.25</del>
250.75	<del>21.12</del>
125.38	21.62

501.5  
250.75  
125.38

<del>42.6</del>	42.6
<del>44.9</del>	43.9
<del>7.5</del>	6.5
43.75	43.25
21.88	21.62

8 8

L

P. ob.

26.3	22.8
49.1	
205.6	20.6
226.2	
507.2	34
253.6	21.7
126.80	10.85

507.2  
253.6  
126.80

22.8  
20.6  
~~21.7~~  
10.85

8 11

29.3

14.6

U. chs

43.9	
206.7	19.9
226.8	
506.5	14.5
253.25	17.25
126.62	8.62

506.5  
253.25  
126.62

14.6  
19.9  
~~34.5~~  
17.25  
8.62

April 8, 1879

A

8 19

34.3	5.9
40.2	
212.3	5.6
217.9	
5047	1.5
25235	5.75
126.17	2.88

P. obs.

5047	5.9
25235	5.6
	1.5
126.18	5.75
	2.88

35.2

39.1 3.9

8 21

213.5 3.6

217.1

5049

25245 3.75

126.22 1.88

U. obs.

5049	3.9
25245	3.6
	1.5
126.22	3.75
	1.88

V

32.4

42.1

8 29

209.8

219.6

5039

25195 9.75

125.98 4.88

P. obs.

5039	9.7
25195	9.8
	9.75
125.98	4.88

32.8

41.2

8 31

210.3

218.8

5031

25155 8.45

125.78 4.22

U. obs.

5031	8.4
25155	8.5
	9
125.78	8.45
	4.22



April 8, 1879

P. obs.

$$\begin{array}{r} 32.8 \\ 40.0 \end{array} \quad 7.2$$

8 36

$$\begin{array}{r} 212.7 \\ 220.6 \\ 5061 \\ 25305 \\ 126.52 \end{array} \quad \begin{array}{r} 7.9 \\ 11 \\ 7.55 \\ 3.78 \end{array}$$

$$\begin{array}{r} 5061 \\ 25305 \\ 126.52 \end{array} \quad \begin{array}{r} 7.2 \\ 7.9 \\ 7.55 \\ 3.78 \end{array}$$

Circle readings

$$12^{\circ} 0' \\ 22^m W$$

8 38

$$\begin{array}{r} 33.1 \\ 38.8 \\ 213.9 \\ 219.5 \\ 5053 \\ 25265 \\ 126.32 \end{array} \quad \begin{array}{r} 5.7 \\ 5.6 \\ 5.65 \\ 2.82 \end{array}$$

$$\begin{array}{r} 5053 \\ 25265 \\ 126.32 \end{array} \quad \begin{array}{r} 5.7 \\ 5.6 \\ 5.65 \\ 2.82 \end{array}$$

$$\begin{array}{r} 159 \\ 179 \end{array}$$

8 48

$$\begin{array}{r} 18 (2) \\ 30.6 \\ 41.2 \\ 212.7 \\ 223.9 \\ 5084 \\ 2542 \\ 127.10 \end{array} \quad \begin{array}{r} 10.6 \\ 11.2 \\ 1.8 \\ 10.96 \\ 5.45 \end{array}$$

P. obs.

$$\begin{array}{r} 5084 \\ 2542 \\ 127.10 \end{array} \quad \begin{array}{r} 10.6 \\ 11.2 \\ 1.8 \\ 10.96 \\ 5.45 \end{array}$$

U. obs.

8 50

$$\begin{array}{r} 32.0 \\ 40.0 \\ 212.9 \\ 222.0 \\ 5069 \\ 25345 \\ 126.72 \end{array} \quad \begin{array}{r} 8.0 \\ 9.1 \\ 9.1 \\ 171 \\ 855 \\ 4.28 \end{array}$$

$$\begin{array}{r} 506.9 \\ 25345 \\ 126.72 \end{array} \quad \begin{array}{r} 8.0 \\ 9.1 \\ 171 \\ 855 \\ 4.28 \end{array}$$



196

April 8, 1879

 $\eta$  Leonis

P. obs.

8 53

35.7	3.6
39.3	
212.6	6.3
218.9	
506.5	9.9
253.25	4.95
126.62	2.48

506.5	3.6
253.25	6.3
126.62	9.9
	4.95
	2.48

8 55

35.3	4.3
39.6	
214.1	3.2
217.3	7.5
506.3	3.75
253.15	1.88
126.58	

U. obs.

506.3	4.3
253.15	3.2
126.58	7.5
	3.75
	1.88

April 8 1879  
 2 Urs. Min.

35.0  
 38.2 3.2<sup>^</sup>

P. sh.

Eye-piece <sup>cm.</sup> 2.05 —

9 14 214.3 2.9<sup>^</sup>  
 217.2  
 5047<sup>^</sup> 1  
 25235<sup>^</sup> 3.05<sup>^</sup>  
 126.18<sup>^</sup> 1.52<sup>^</sup>

3.2  
 2.9  
 5047 1  
 25235 3.05  
 126.18 1.52

DM 88° 4

27.6 20.6<sup>^</sup> P. sh.  
 48.2

5050 20.6  
 2525 18.8  
 126.25 4  
 20.2  
 19.70  
 9.85

9 16 205.2 18.8<sup>^</sup>  
 214.0 [should be 2240, as shown by approx. setting 229].  
 5050<sup>^</sup> 39.4<sup>^</sup>  
 2525<sup>^</sup> 19.70<sup>^</sup>  
 126.25<sup>^</sup> 9.85<sup>^</sup>

DM 88° 9

15.8  
 62.8 47.0<sup>^</sup> P. sh.

9 18 188.3 56.6<sup>^</sup>  
 244.9  
 5118<sup>^</sup> 36<sup>^</sup>  
 2559<sup>^</sup> 518<sup>^</sup>  
 127.95<sup>^</sup> 25.90<sup>^</sup>

47.0  
 56.6  
 5118 1036  
 2559 518  
 127.95 25.90

DM 89° 3

353.3  
 86.0 92.7<sup>^</sup>

P. sh.

9 26 165.1 98.7<sup>^</sup>  
 263.8  
 8682<sup>^</sup> 114<sup>^</sup>  
 4341<sup>^</sup> 957<sup>^</sup>  
 217.05<sup>^</sup> 47.85<sup>^</sup>

8682  
 4341  
 217.05

92.7  
 98.7  
 114  
 9570  
 47.85

Eye-piece <sup>cm.</sup> 2.02  
 Set at 2.05



S. W. Min.

April 8, 1879

Prob.

212.2 10.4<sup>^</sup>  
222.6

9 30

29.7 9.5<sup>^</sup>  
39.2  
50.3 7<sup>^</sup> 19.9<sup>^</sup>  
25.1 8.5<sup>^</sup> 9.95<sup>^</sup>  
12.5 9.2<sup>^</sup> 4.98<sup>^</sup>

5037 10.4  
25185 9.5  
12592 19.9  
495  
4.98

S. W. Min.

Prob.

198.4 36.4<sup>^</sup>  
2341.8

9 38

19.1 33.6<sup>^</sup>  
52.7  
50.5 10<sup>^</sup> 10.0<sup>^</sup>  
2.5 2.5<sup>^</sup> 3.5<sup>^</sup>  
126.25<sup>^</sup> 17.50<sup>^</sup>

5050 36.4  
2525 33.6  
126.25 10.0  
350  
17.50

51 Cephæi

Prob.

217.6 10.2<sup>^</sup>  
221.8

9 45

28.2 13.0<sup>^</sup>  
41.2  
50.2 8<sup>^</sup> 3.2<sup>^</sup>  
25.1 1.16<sup>^</sup>  
12.5 7.0<sup>^</sup> 5.8<sup>^</sup>

5028 10.2  
2514 13.0  
125.70 23.2  
1160  
5.80

S. W. Min.

Prob.

341.0 3.4<sup>^</sup>  
37.4

9 51

214.8 4.2<sup>^</sup>  
219.0 7.6<sup>^</sup>  
50.5 2<sup>^</sup> 3.8<sup>^</sup>  
25.26<sup>^</sup> 1.9<sup>^</sup>  
126.30<sup>^</sup>

5052 3.4  
2526 4.2  
126.30 7.6  
3.80  
190

Eye-piece 2.04<sup>cm</sup>



April 12, 1879.  
 Photometer R. Comparison star  $\eta$  Leonis throughout.

$\eta$  Leonis.

35.3 2.9 1 obs.

38.2 2.9

8 33

214.4 2.8

217.2

5051

25255 2.85

126.28 1.42

5051 2.9  
 25255 2.85  
 126.28 1.42

$\alpha$  Leonis.

33.3

8 obs.

39.1 5.8

8 55

211.3

219.9 8.6

5036 14.4

2518 7.2

125.90 3.6

5036

2518

125.90

5.8  
 8.6  
 14.4  
 7.2  
 3.60

$\gamma$  Leonis.

31.2

8 obs.

42.0 10.8

9 5

210.2

221.8 11.6

5052 2.4

2526 11.2

126.30 5.6

Dec. circle reads +12.8

10.8  
 11.6  
 4  
 11.2  
 + 5.60

$\eta$  937

13.0

8 obs.

61.2 48.2

9 22

194.1

232.4 39.3

5003 16.5  
 2503 38.25  
 125.18 19.12

wrong star.

200

Apr. 12, 1879.  
W. 937(?)

S. Obs.

22,4  
 57.3 34.9  
 9 34 202.0  
 226.9 24.9  
 5086 598  
 2543 2990  
 127.15 14.95

Dec. circ. n. ab +13.8  
Probably wrong star

5086 34.9  
 2543 24.9  
 127.15 59.8  
 2990  
 14.95

21 Leonis

S. Obs.

22,7  
 41.9 19.2  
 10 0 205.5  
 225.0 19.5  
 4951  
 24755 19.35  
 123.78 9.68

3.6  
 4951 19.2  
 24755 19.5  
 123.78 7  
 19.35  
 9.68

W. 937

S. Obs.

28.7  
 10 8 40.0 11.3  
 206.6  
 224.3 17.7  
 4996 290  
 2498 145  
 12490 7.25

Northern star brighter of  
 the two; that is, star presumed  
 to be W. 937 brighter to the eye, as  
 well as by measure, than the star  
 presumed to be 21 Leonis. The relative  
 position of the two stars seemed correct.

W. 914.

S. Obs.

339.0  
 10 50 120.1 14.1  
 241.6



Apr. 12, 1879.

W. 914(?)

S. obs.

Probably wrong star.

10 54

307.4  
130.3

146.9

290.5 143.6

8751 3265

43755 81.62

218.78

182.9 182.9

8751

144.6 143.6

43755

127.5 126.5

218.78

163.75 163.25

81.88 81.62

W. 903.

S. obs.

11 0

16.6  
49.0 324198.0  
24.3.1 451

5067 775

25335 3875

126.68 19.38

32.4

506.7

45.1

25335

775

126.68

3875

19.38

W. 896.

S. obs.

11 8

17.3  
48.4 31.1199.0  
233.4 34.4

4981 55

24905 32.75

124.52 16.38

31.1

4981

34.4

24905

5.5

124.52

32.75

16.38

11 15

2.5  
61.0 58.5175.3  
257.3 82.0

4961 1405

24805 70.25

124.02 35.12

W. 914.

S. obs.

4961  
24805  
124.02

58.5

82.0

1405

70.25

35.12

Dec. circled + 11.5



202

Apr. 12, 1879,

y Lewis,

St. Alb.

33,3

37,3 4.0

212,2

216,4 4.2

4992

2496 4.1

12480 2.05

4.0

4.2

4.1

2.05

4992

2496

12480

Apr. 14. 1879,  
~~E - E Virginis.~~

R Virginis Stars.

Photometer R.

E - E Virginis.

U. Obs.

U. Obs.

8 47

30.8

36.5 5.7

212.6

217.8 5.2

Ref.

could not get companion stars and  $\epsilon$   
 in the opening.

S - S Virginis

U. Obs.

9 8

32.3

35.4 3.1

214.5

217.1 2.6

499.3 5.7

249.65 2.85

124.82 1.42

499.3

249.65

124.82

3.1

2.6

5.7

2.85

1.42

f

U. Obs.

9 20

28.9

38.9 10.0

210.7

219.5 8.8

498.0 18.8

249.0 9.4

124.50 4.7

498.0

249.0

124.50

10.0

8.8

18.8

9.4

4.70

204

April 14, 1879  
K

~~29.1~~  
 29.1  
 42.0 12.9  
 9 25 205.9  
 221.0 15.1  
 4980 28.0  
 2490 14.0  
 124.50 7.00

U. Obs.

12.9  
 4980 15.1  
 2490 8.0  
 124.50 1.40  
 7.0

i

23.8  
 43.0 19.2  
 9 27 204.1  
 226.8 22.7  
 4977 41.9  
 24885 20.95  
 124.42 10.48

U. Obs.

19.2  
 4977 22.7  
 24885 41.9  
 124.42 20.95  
 10.48

e

27.8  
 40.4 12.6  
 9 31 207.2  
 219.2 12.0  
 4946  
 2473 12.30  
 123.65 6.15

U. Obs.

4946 12.6  
 2473 12.0  
 123.65 12.3  
 6.15

h

15.5  
 54.2 38.7  
 9 40 192.6  
 236.1 43.5  
 4984 82.2  
 2492 41.1  
 124.60 20.55

U. Obs.

4984 38.7  
 2492 43.5  
 124.60 5.2  
 41.1  
 20.55



April 14, 1879  
U

9 42  
315.0  
80.6 125.6  
136.8  
233.8 97.0  
7662 2266  
3831 1133  
19.155 56.65  
55.65

U. obs.  
125.6  
7662 97.0  
3831 2226  
1113  
19.155 55.65

9 45  
12.6  
59.2 46.6  
187.2 56.8  
244.6  
5042 1034  
2521 517  
126.05 28.85

U. obs.  
5042 46.6  
2521 56.8  
12605 1034  
5170  
25.85

9 48  
356.1  
76.8 80.7  
168.8 88.9  
257.7 169.6  
8594 4248  
4248 848  
214.88 42.4  
214.85

U. obs.  
80.7  
8594 88.9  
4297 96  
21485 848  
4240

9 51  
25.2  
47.2 22.0  
202.7 24.8  
227.5 46.8  
5020 284  
2513 1170  
125.65

U. obs.  
22.0  
5026 24.8  
2513 68  
234  
125.65 11.70

206

April 14, 1879  
d

9 55 32.9  
39.4 6.5  
213.2  
219.9 6.7  
5054 12  
2527 6.60  
126.35 3.30

U. Obs.

6.5  
5054 6.7  
2527 6.6  
126.35 3.30

c

9 59 17.4  
51.3 33.9  
197.7  
230.0 32.3  
4964 2  
2482 33.1  
124.10 16.55

U. Obs.

33.9  
4964 32.3  
2482 2  
124.10 33.1  
16.55

f

10 2 22.2  
45.3 23.1  
201.3  
224.1 22.8  
4929 45.9  
24645 22.95  
123.22 11.48

U. Obs.

23.1  
4929 22.8  
24645 5.9  
123.22 22.95  
11.48

S-S Virginis.

10 6 34.2  
37.6 3.4  
212.4  
216.2 3.8  
5004  
2502 3.60  
125.10 1.80

U. Obs.

5004 3.14  
2502 3.8  
125.10 3.6  
1.80

Seeing 8 -- (u)



Apr. 16, 1879

Pole Star Phot. K Comparison star &amp; Uranian.

 $\alpha - \alpha$  Ursa Mini.

7 57

35.4 3.5<sup>^</sup>  
 38.9  
 214.2 3.2<sup>^</sup>  
 217.4  
 5059<sup>^</sup>  
 25295<sup>^</sup> 3.35<sup>^</sup>  
 126.48<sup>^</sup> 1.68<sup>^</sup>

Urb.

3.5  
 3.2  
 3.35  
 1.68  
 5059  
 25295  
 126.48

51 Cygni

8 13

25.6  
 47.0 21.4<sup>^</sup>  
 207.4 13.6<sup>^</sup>  
 221.0  
 5010<sup>^</sup> 350<sup>^</sup>  
 2505<sup>^</sup> 17.50<sup>^</sup>  
 125.25<sup>^</sup> 8.75<sup>^</sup>

Urb.

21.4  
 13.6  
 35.0  
 17.5  
 8.75  
 5010  
 25050  
 125.25

8 16

27.7  
 43.5 15.8<sup>^</sup>  
 207.2 13.2<sup>^</sup>  
 220.4  
 4988<sup>^</sup> 9.0<sup>^</sup>  
 2494<sup>^</sup> 14.5<sup>^</sup>  
 124.70<sup>^</sup> 7.25<sup>^</sup>

S. obs.

15.8  
 13.2  
 9.0  
 14.5  
 7.25  
 4988  
 24940  
 124.70

8 23

$\alpha - \alpha$   
 33.9 2.3<sup>^</sup>  
 36.2  
 214.2 2.6<sup>^</sup>  
 216.8  
 5011<sup>^</sup>  
 25055<sup>^</sup> 2.45<sup>^</sup>  
 125.28<sup>^</sup> 1.22<sup>^</sup>

S. obs.

2.3  
 2.6  
 9  
 245  
 1.22  
 5011  
 25055  
 125.28



208

Apr. 16, 1879

8-2

8 32

Clouded over,

S. obs.

52.4	303.4
<u>26.20</u>	<u>151.70</u>
48.5	31.01
<u>24.25</u>	<u>155.05</u>
44.4	
<u>22.20</u>	303.8
	<u>151.90</u>

50.8	31.46
<u>25.40</u>	<u>157.30</u>
98.05	159.5
24.51	<u>153.99</u>

89.9	315.8
86.7	<u>157.65</u>
<u>176.6</u>	2220
883	3110
44.15	<u>155.50</u>

April 20, 1879

Reappearance of Jupiter III by ephemeris 16 1 35 Washington

$$\begin{array}{r} 23 \ 42 \\ 16 \ 25 \ 17 \text{ Cambridge} \end{array}$$

Chron. B. 236 17 46 53½

Clock B. 394 15 50 0

$$\begin{array}{r} 1 \ 56 \ 53\frac{1}{2} \\ 18 \ 22 \ 10\frac{1}{2} \end{array}$$

B 236

Jupiter I Limit of visibility. Photometer H  
I. obs.

18 11

125.5

177.9

3034

524

15170

26.20

18 12

130.8

179.3

3108

485

155.05

24.25

18 14

129.7

174.1

3038

444

151.90

22.20

18 19

131.9

182.7

3146

408

157.30

25.40

1595

1808

Sum  
Mean

153.99

24.51

The limit of visibility was ~~increasing~~ receding as the planet rose, so that finally the satellite could be seen at reading 135. It was however, somewhat further from the limb than it should have been.

h m s  
18 22 47½

135.0

Satellite first seen; it was then a little brighter than Jupiter I. The circle had been set at 135.

23 50

131.7

24 20

193.1

25 25

113.3

27 25

196.8

28 30

185.5

Clock stopped.

31 35

200.8

32 35

112.7

33 20

202.6

89.9

37 40

110.0

40 50

196.7

$$\begin{array}{r} 8 \ 6.7 \\ 17 \ 6 \ 6 \\ 8 \ 8 \ 3 \\ 44.15 \end{array}$$

$$\begin{array}{r} 6 \ 2 \ 2 \\ 1 \ 5 \ 5 \ 5 \ 0 \end{array}$$

Definition so bad that neither satellite was visible except at long intervals.



210

April 20, 1879

B 236

18	4210	106.6
	4530	197.8
	470	115.0
	4835	205.0
		<u>6244</u>
		156.10

91.2

90.0

1812

90.6

45.8

624.4
3122
<u>156.10</u>

91.2
90.0
<u>1812</u>
906
45.30

Looked at object-glass, but found no dew on it. The definition was in fact tolerable at instants, but they were far apart.

Seeing about 4, 4, 2.

B 236

19 2 5½

B 394

17 5 0

1	57	5½
---	----	----

18 15

17 47

15 28

16 18

394

236

394

=

236

15 50 00

17 46 53.5

17 5 0 = 19

2 5.5

15.5

15.5

15 49 44.5

17 4 44.5

12

17 46 53.5

19 2 5.5

19 2 5

1 57 09.0

1 57 21.0

17 46 53

1 15 12

C.M.J. 16<sup>h</sup> 18<sup>m</sup> = mean time of limit of visibility.

disappearance 16 25 32.5

" 26 35.0

" 27 05.0

" 28 10

" 30 9

" 31 14

" 34 19

16 39

C.M.J.  
= mean time of ending

16 49



April 21. 1879

Adjustment of Phot T  
B&C 3312 in center of field at 9 39  
3331 " " " " "

April 21 1879  
 Place of nebula Gen. Cat. 1861  
 $9^h 25^m + 22^{\circ} 10'$   
 Photometer Q.

$\epsilon$  Leonis in small telescope made equal  
 to central part of nebula

9 12

14.8  
 16.3  
16.2  
 17.3  
 15.8<sup>+</sup>

P. obs.

17.3  
 15.77

$\epsilon$  Leonis made equal to brightest part  
 of nebula outside of nucleus.

9 14

29.3  
 30.5  
31.2  
 1.0  
 30.3<sup>+</sup>

P. obs.

1.0  
 30.3

~~$\epsilon$  Leonis made equal to~~  
 Focus in large telescope of a 10 magn.  
 star south of nebula. P. obs.

9 16

400.6  
 394.9  
 398.9  
24.4  
 398.1<sup>+</sup>

1194.4  
 398.1

April 21, 1879

9 18 This star made equal to  $\epsilon$  Leonis at setting 30.3.  
P. obs.

$$\begin{array}{r} 293.2 \\ 295.3 \\ \hline 293.6 \\ 294.0^+ \end{array}$$

$$\begin{array}{r} 1.21 \\ 294.0.3 \end{array}$$

9 20 Star equal to  $\epsilon$  Leonis at setting 15.8  
P. obs.

$$\begin{array}{r} 334.8 \\ 334.7 \\ \hline 340.8 \\ 20.3 \\ \hline 336.8^+ \end{array}$$

$$\begin{array}{r} 20.3 \\ 336.8 \end{array}$$

$$\begin{array}{r} 398.1 \\ 336.8 \\ \hline 61.3 \end{array}$$

$$\begin{array}{r} 398.1 \\ 294.0 \\ \hline 104.1 \end{array}$$

$\therefore$  nucleus = \* at 61.3  
= \* at 104.1

U obs nucleus.

9 26

$$\begin{array}{r} 11.5 \\ 11.7 \\ \hline 12.0 \\ 5.2 \\ \hline 11.7^+ = \text{mean} \end{array}$$

$$\begin{array}{r} 2.2 \\ 11.73 \end{array}$$

9 28

$$\begin{array}{r} 27.1 \\ 26.3 \\ \hline 30.4 \\ 23.4 \\ \hline 27.9 \end{array}$$

$$\begin{array}{r} -8 \\ -16 \\ +25 \end{array}$$

$$\begin{array}{r} 23.8 \\ 27.9 \end{array}$$

Set of angles above nucleus  
Same as that obs. by P.



Apr 21 1879.  
Uds. trans on class.

9 30

$$\begin{array}{r}
 409.8 \\
 - 5.9 \\
 \hline
 410.3 \\
 414.1 \\
 411.3 \\
 \hline
 411.9^+
 \end{array}$$

56  
411.87

9 34

Star made equal to  $\alpha$  Leonis at 29.17  
Uds.

$$\begin{array}{r}
 285.0 \\
 270.8 \\
 252.5 \\
 \hline
 208.3 \\
 269.4^+
 \end{array}$$

208.3  
269.4

9 36

Star made equal to  $\alpha$  Leonis at 11.7  
Uds.

$$\begin{array}{r}
 334.0 \\
 342.6 \\
 343.4 \\
 \hline
 340.0^+
 \end{array}$$

0.0  
340.0

9 40

Focus on Star

S. obs.

$$\begin{array}{r}
 410.8 \\
 395.5 \\
 391.0 \\
 \hline
 399.1^+
 \end{array}$$

1197.3  
299.1

$$\begin{array}{r}
 399.1 \\
 340.0 \\
 \hline
 59.1
 \end{array}$$

$$\begin{array}{r}
 399.1 \\
 269.4 \\
 \hline
 129.7
 \end{array}$$

$$\begin{array}{r}
 411.9 \\
 340.0 \\
 \hline
 71.9
 \end{array}$$

$$\begin{array}{r}
 411.9 \\
 269.4 \\
 \hline
 142.5
 \end{array}$$

Apr. 21, 1879.

 $\epsilon$  Leonis - nucleus of nebula

9 43

13.0

S. obs.

12.7

13.8

13.2<sup>+</sup>5  
13.2 $\epsilon$  Leonis - part of nebula above nucleus.

9 45

22.6

S. obs.

28.6

27.3

26.2<sup>+</sup>18.5  
26.2Star made equal to  $\epsilon$  Leonis at 26.2

9 48

259.2

S. obs.

261.3

242.3

254.3<sup>+</sup>162.8  
254.3Star made equal to  $\epsilon$  Leonis at 13.2

9 50

321.5

S. obs.

343.2

343.5

336.1<sup>+</sup>108.2  
336.1

399.1

399.1

336.1

254.3

63.0

144.8

D.

61.3

104.1

1.788

2.017

8.94

10.08

S

63.0

144.8

1.799

2.161

9.00

10.80

u

71.9

142.5

1.857

2.154

9.28

10.77



~~April 21~~  
 0<sup>h</sup> April 22, 1879 ~~civil time~~  
 Number of centimeters to 1 turn of the  
 pinion of the focussing screw of the  
 East Equatorial.

1.49	1.16 cms.	at	4.00 of the scale
	2.65		3.50
1.49	4.16		3.00
1.47	5.63		2.50
1.48	7.11		2.00
1.50	8.61		1.50
1.48	10.09		1.00
	<hr/> 8.93		

Reversed motion.

10.15	1.00
1.21	4.00
<hr/> 8.94 cms. to	<hr/> 3.00 turns of pinion
2.98 cms. to 1 turn of pinion	
0.0298 cms to 1 division of pinion.	

Calc.  $M = 10.00$











1979phase, Dec 11, 1980W