

von den drei auf den Platten sichtbaren Corona-Strahlenbündeln die beiden grössten in ungefähr derselben Richtung verlaufen und dass in derselben Richtung sich eine Protuberanz mit sehr grosser Basis erhebt. Ausserdem ergibt sich noch aus den in Odessa erlangten Sonnenphotographien, dass zur Zeit der Finsterniss in derselben Richtung am Sonnenrande ein Fleck mit einem Hof lag.

Sternwarte in Charkow, 1896 December.

Es ist natürlich anzunehmen, dass das Zusammenfallen aller dieser Erscheinungen, der Fleck, die Protuberanz und die Coronastrahlen, die Sonne gleichsam in dieser Richtung auseinander gezogen hat, und auf keine andere Weise, glaube ich, lässt sich eine so bedeutende Vergrösserung des Durchmessers der Sonne in einer Richtung erklären.

J. Sykora.

On the Companion to Procyon.

By *J. M. Schaeberle.*

As the companion to Procyon, which I discovered in November last, has, at this writing, apparently not yet been seen at any other observatory, and as it is doubtless within the reach of some of the larger telescopes in use at the present time, a few remarks as to the conditions under which it is most easily seen may be useful.

On account of its close proximity to Procyon the companion can only be seen when the atmospheric conditions are good. It is essential that the focal area, over which the light-rays of the main star are ordinarily spread, be reduced; this is readily accomplished by means of a cap over the eye piece reducing the aperture of the opening between the eye and the ocular.

In good seeing the full aperture of a good objective should never be reduced as the focal image when formed by the whole lens is evidently more free from the effects of diffraction than it is for any reduced aperture. All methods for reducing the light furnished by such a lens should — in the opinion of the writer — deal only with those rays which are beyond the focal plane; for evidently the actual form of the focal image is in no way affected by any treatment which the portions of the rays beyond the focus may be subjected to.

There is, therefore, a great difference between the definition obtained, by reducing the aperture of the objective, and that found by means of a cap over the eye-piece. In both cases the light is reduced but the latter case has the great advantage that the definition of the focal image is that resulting from the interference of light-rays coming from the whole objective.

For micrometric measures of the companion of Procyon (and of Sirius) I use an eye-piece magnifying 500 diameters, the aperture in the cap over the eye-piece being about one-sixteenth of an inch (1.6 millimetres).

Recent measures compared with those made in November at the time of discovery indicate that the companion has increased its position angle in the neighborhood of 2°. When the seeing is best I am inclined to call the magnitude of the companion as fully equal to that of a twelfth magnitude star; at such times it is as easily and accurately measured as the satellite Phobos when Mars is in opposition.

The companion to Sirius, which I estimate to be about two or three magnitudes brighter than Procyon's companion, is also being regularly observed here with the same power and cap over the eye-piece.

Lick Observatory, University of California, 1897 Febr. 3.

J. M. Schaeberle.

On the period of the variable Star V Puppis.

(1900): RA. = 7^h 55^m 22^s, Decl. = -48° 58' 4".

By *A. Stanley Williams.*

In Astr. Nachr. Nr. 3391 Prof. E. C. Pickering has announced that the star Lacaille 3105 is a spectroscopic binary having a period of 3.115 days. This is also V Puppis, No. 2852 of Chandler's »Third Catalogue of Variable Stars«. The period of variation of this star has never been satisfactorily determined, but is evidently short, and after the important announcement of Pickering it is natural to conclude that the period of variation has some relationship to

the period of the spectroscopic double. And since both components of the latter give a visible spectrum, it is probable that each component alternately eclipses and is eclipsed by the other, so that the most probable period of variation would be half 3.115 days, that is 1.5575 days. In order to test this conclusion if possible, I have examined a few observations of the brightness of the star which I made in the years 1885–86. These observations are given below.*

* The magnitudes differ slightly from those published in »Monthly Notices«, XLVII.91, owing to the latter not having been corrected for differential atmospheric absorption, rendered necessary by the comparison stars being distant. The times are only approximate, but are none of them likely to be in error by as much as half an hour.

| Date | Gr. M. T. | Mag. | Dist. from minimum | Nr. | Date | Mag. |
|---------------|---------------------------------|--------|----------------------------------|-------------------|----------|--------|
| 1885 Nov. 14 | 16 ^h 26 ^m | 5.3 † | — 16 ^h 4 ^m | 30 ^{1/2} | Febr. 17 | 4.5 |
| » 21 | 16 5 | 4.35 | — 4 25 | 41 | Mar. 22 | 4.55 |
| 1886 Febr. 12 | 0 37 | 4.55 | — 0 40 | 39 | » 16 | 4.8 † |
| » 17 | 0 45 | 4.5 | 0 0 | 0 | Nov. 14 | 5.3 † |
| » 21 | 2 16 | 4.75 † | + 0 46 | 43 ^{1/2} | Mar. 30 | 4.95 † |
| Mar. 16 | 3 40 | 4.8 † | + 6 41 | 31 ^{1/2} | Febr. 21 | 4.75 † |
| » 21 | 6 20 | 5.1 † | + 9 51 | 40 ^{1/2} | Mar. 21 | 5.1 † |
| » 22 | 5 27 | 4.55 | + 13 20 | 28 ^{1/2} | Febr. 12 | 4.55 |
| » 30 | 5 33 | 4.95 † | + 18 7 | 2 | Nov. 21 | 4.35 |

It will be noticed that 5 of the observations, marked with a †, make the star faint, whilst the remaining 4 make it bright. Now if it is assumed that the star was at a minimum at the time of the first observation and that the period is 1.5575 days, all five observations marked with a † fall into a group near the computed times of minimum. This is well shown by the following table, in which the observations are arranged according to the interval by which they precede or follow the nearest computed minimum. The column headed »Nr.« contains the number of periods of 3.115 days from Nov. 14, 16^h 26^m, a half period of course signifying that the other component of the binary star was the eclipsing body.

The observations agree so remarkably well with the hypothesis, that V Puppis must certainly be a variable of the Algol type having a period of 1.5575 days; or perhaps it would be more correct to say having a period of 3.115 days with two minima. Incidentally the circumstance that the period of variability corresponds with the period of the duplication of lines in the spectrum of the star, is an important independent confirmation of the correctness of the accepted explanation of the latter phenomenon, though it has yet to be proved that the duplications take place at the times required by theory. It is to be hoped that this star will be attentively studied by some southern observer, so that the exact form of the light curve may be determined.

West Brighton 1897 Febr. 20.

A. Stanley Williams.

Comete e pianeti osservati a Teramo.

Refrattore 15.5 inch di Cooke. Micrometro filare di Grubb.

| 1896 | T. m. Ter. | $\Delta\alpha$ | $\Delta\delta$ | Cf. | α app. | $\log p.A$ | δ app. | $\log p.A$ | Red. ad l. app. | * |
|------|------------|----------------|----------------|-----|---------------|------------|---------------|------------|-----------------|---|
|------|------------|----------------|----------------|-----|---------------|------------|---------------|------------|-----------------|---|

Cometa 1895 IV.

| | | | | | | | | | | |
|---------|-------------------------------------------------|------------------------------------|----------|-----|---------------------------------------------------|--------------------|-----------------|-------|---------------|---|
| Mag. 29 | 10 ^h 19 ^m 23 ^s | — 0 ^m 6 ^s 50 | 0' 0" 0 | 1.1 | 18 ^h 3 ^m 17 ^s 98 | 9.548 _n | + 23° 37' 44" 0 | 0.570 | + 2.80 — 12.7 | 1 |
| Giug. 1 | 10 41 13 | — 0 6.50 | — 4 20.4 | 1.2 | 17 56 47.00 | 9.466 _n | + 23 49 19.8 | 0.529 | + 2.87 — 12.1 | 2 |
| 2 | 10 7 23 | — 0 6.51 | + 2 22.7 | 1.3 | 17 54 41.38 | 9.526 _n | + 23 52 23.1 | 0.555 | + 2.89 — 11.9 | 3 |
| 13 | 10 10 42 | — 0 19.41 | + 2 16.0 | 1.3 | 17 31 52.00 | 9.343 _n | + 23 59 32.2 | 0.492 | + 3.07 — 9.4 | 4 |

Cometa 1896 III.

| | | | | | | | | | | |
|---------|--------|-----------|----------|-----|------------|-------|--------------|-------|--------------|---|
| Mag. 12 | 9 55 4 | + 0 42.95 | — 0 21.7 | 3.3 | 1 45 28.95 | 9.085 | + 66 12 58.3 | 0.921 | — 1.66 + 1.9 | 5 |
|---------|--------|-----------|----------|-----|------------|-------|--------------|-------|--------------|---|

Cometa 1896 IV.

| | | | | | | | | | | |
|----------|---------|----------|----------|-----|-------------|-------|--------------|-------|--------------|---|
| Sett. 10 | 8 37 3 | + 0 6.82 | — 2 51.7 | 1.2 | 14 16 8.39 | 9.877 | + 54 52 37.5 | 0.480 | + 0.93 — 3.9 | 6 |
| 12 | 8 17 13 | + 0 5.10 | + 0 49.0 | 1.2 | 14 29 56.52 | 9.866 | + 54 27 10.0 | 0.392 | + 0.88 — 5.2 | 7 |

Cometa 1896 V (Giacobini).

| | | | | | | | | | | |
|---------|---------|--------|----------|-----|-------------|-------|--------------|-------|--------------|---|
| Ott. 28 | 7 8 19 | — | — 18 2.1 | 1 | — | — | — 13 42 12.7 | 0.852 | — + 3.3 | 8 |
| 30 | 6 45 11 | 0 0.00 | — 1 31.0 | 1.2 | 19 38 51.18 | 9.294 | — 13 44 31.6 | 0.856 | + 3.12 + 3.8 | 9 |

Cometa 1897... (Perrine 1896 Nov. 2).

| | | | | | | | | | | |
|---------|---------|-----------|----------|-----|------------|-------|--------------|-------|---------------|----|
| Nov. 12 | 8 18 18 | + 0 10.48 | — 3 43.0 | 2.2 | 20 7 18.78 | 9.573 | + 17 41 33.6 | 0.658 | + 2.28 + 15.8 | 10 |
|---------|---------|-----------|----------|-----|------------|-------|--------------|-------|---------------|----|

(225) Henrietta.

| | | | | | | | | | | |
|----------|---------|----------|----------|-----|-------------|--------------------|------------|-------|---------------|----|
| Sett. 28 | 8 51 31 | + 0 3.12 | + 4 19.5 | 4.1 | 23 58 37.75 | 9.441 _n | + 9 57 5.8 | 0.699 | + 4.07 + 27.2 | 11 |
|----------|---------|----------|----------|-----|-------------|--------------------|------------|-------|---------------|----|