

## Nahe Konjunktionen Jupiters mit AG.-Sternen.

Durch die kürzlich von Dr. Graff in A. N. 4143 mitgeteilte Beobachtung einer wahrscheinlich stattgehabten Bedeckung eines Fixsterns durch einen Jupitermond wurde ich veranlaßt, zu untersuchen, ob vielleicht in der nächsten Zeit

ähnliche Phänomene, die ja für die Positionsbestimmung der Trabanten auch an den einschließenden Tagen von großer Bedeutung sind, zu erwarten seien. Besonders bemerkenswert erscheinen mir die nachstehenden drei Konjunktionen.

Konj. in RA. in M. Z. Gr.	* AG. Berl. B	Gr.	$\alpha$ app.	$\delta$ app.	$\delta_* - \delta_{21}$
1907 Febr. 9 <sup>d</sup> 6 <sup>h</sup> 23 <sup>m</sup>	2236	8.7	6 <sup>h</sup> 6 <sup>m</sup> 14 <sup>s</sup> 52	+ 23° 27' 22".6	+ 36".6
April 3 8 59	2301	7.3	6 13 39.19	+ 23 30 20.5	- 37.5
» 14 22 1	2366	7.8	6 19 52.45	+ 23 29 34.4	+ 2.8

Bei den beiden ersten Sternen ist die kleinste Distanz des Sterns vom Jupiterrande 15"9 resp. 20"0, während bei dem dritten eine fast zentrale Bedeckung stattfindet, die jedoch nur in Australien beobachtet werden kann. Für die Sternwarten von New South Wales (Länge ca. 10<sup>h</sup> östl. von Gr., südl. Breite 30°) geht die Sonne um 5<sup>h</sup>7 unter; der Eintritt erfolgt um etwa 7<sup>h</sup>1, der Austritt um 8<sup>h</sup>9 Ortszeit,

etwa 0<sup>h</sup>9 vor dem Untergange Jupiters. Perth kann nur den Austritt, Wellington auf Neu-Seeland nur den Eintritt beobachten. Vielleicht gelingt es, trotz der verhältnismäßig großen Lichtschwäche des Sterns den Eintritt, dessen Beobachtung durch die schwache Phase Jupiters etwas erleichtert wird, zu fixieren.

Berlin, 1907 Jan. 16.

H. H. Kritzinger.

## Thirty-six new variable stars.

(Harvard College Observatory Circular No. 122).

In the course of the study, by Miss Leavitt, of the distribution of variable stars, the majority of the variables discovered have been fainter at maximum than the tenth magnitude. This is owing to the long exposure of the plates, taken with the 24-inch Bruce Telescope, which have been used. Not only is the number of faint stars on these plates very great in proportion to that of stars brighter than the tenth magnitude, but the discovery of variations among the brighter stars is, perhaps, disproportionately small because their images are so large that only striking variations are noticeable. Since the beginning of this work, it has been felt that the plates taken with the 1-inch Cooke lens, which cover a region of the sky 30° square and show stars of the eleventh magnitude and brighter, would furnish a valuable means of discovering the brighter variables. The Map of the Sky, described in Circular 71 (A. N. 162.281), is composed of plates belonging to this series. In January, 1905, four of these plates, having centres in RA. = 16<sup>h</sup>, Decl. = -45°, were superposed, as described in Circular 76 (A. N. 165.187). The positive used was very dense, and not well suited for the purpose of discovering variables, for which a thin positive is now always used. The six known variables RS Librae, RU Librae, RZ Scorpil, RS Scorpil, RR Scorpil, and RW Scorpil were rediscovered, however, together with the planet Uranus. No new variables were found, and owing to the pressure of other work, the examination of plates belonging to the Map of the Sky was only recently resumed. The region selected was that covered by Plate 50, which has its centre in RA. = 12<sup>h</sup>, Decl. = -60°. The Nebula in Carina and the »Coal-Sack«, which had already been examined on Bruce plates of long exposure, with results given in Circulars 79, 115, and 120 (A. N. 166.35,

171.343 and 173.263), are seen on these plates. Six photographs were compared, and 36 new variables were discovered, besides Nova (154.1906) Velorum, announced in Circular 121 (A. N. 173.295). The sixteen known variables S Carinae, RX Carinae, U Carinae, RS Centauri, W Centauri, R Crucis, R Muscae, S Crucis, RV Centauri, 131360<sub>n</sub><sup>1)</sup>, 102458<sub>n</sub> (57.1906 Carinae), 103260<sub>n</sub> (61.1906 Carinae), 104057<sub>n</sub> (65.1906 Carinae), 104758<sub>n</sub> (69.1906 Carinae), 105160<sub>n</sub> (132.1904 Carinae), and 125564<sub>n</sub> (141.1906 Centauri) were re-discovered, the last six having been originally found on Bruce plates, and recently announced. In the entire region, within 15° of the centre of the plates, there are twenty-five known variables brighter, at maximum, than the tenth magnitude, omitting  $\eta$  Carinae, the suspected variable T Carinae, Nova (RS) Carinae, Nova (154.1906) Velorum, and RT Carinae which is too much involved in the nebula to be found by this method. The nine variables which might be found on these plates but were not re-discovered, are Z Carinae, Y Carinae, RZ Carinae, S Muscae, T Crucis, U Centauri, 104265<sub>n</sub><sup>2)</sup>, 130656<sub>n</sub> (54.1901 Centauri), and 130763<sub>n</sub> (149.1906 Centauri). It is believed that an examination of ten good plates of any region, suitably distributed as to time, may be regarded as thorough, though no examination can be exhaustive. It may be considered satisfactory, therefore, that on six plates, 16 out of 25 known variables were re-discovered, while 36 new ones were found. This indicates that there may be from 70 to 80 variable stars in the region, which are brighter at maximum than the tenth magnitude.

In Table I, the first three columns give the designation, the Harvard number and the number of the editor of A. N. The fourth column gives the number in the Cape Photographic Durchmusterung. The fifth and sixth columns give

<sup>1)</sup> Vergl. meine Fußnote in Nr. 4145 p. 264. *Kr.*

<sup>2)</sup> Der Stern findet sich nicht in den uns zugänglichen Verzeichnissen. *Kr.*

the right ascension and the declination for 1900. The seventh, eighth, and ninth columns give the brightest and faintest magnitudes so far observed, and the range.

Six of the new variables probably belong to the Algol type. All of these have been measured, but the period of only one star, 121249<sub>n</sub> (182.1906 Centauri), has been determined, as it seemed best not to delay their announcement. Results of the measurements, so far as at present known, are given in the Remarks following Table I. It is expected that the observations will be published in the Annals at an early date. Some of these variables may not prove to be of the Algol type, as was the case with variable 125564<sub>n</sub> (141.1906 Centauri), announced in Circular No. 120 (A. N. 173.263), whose light curve resembles that of an Algol

variable, but is more nearly akin to the type of  $\beta$  Lyrae. Two new Algol variables, one in Carina and one in Centaurus, were discovered on Bruce plates and announced in Circulars 115 and 120 (A. N. 171.343 and 173.263), and three other variables announced in Circular No. 120 (A. N. 173.263) are probably of the same type. The number of variables of the Algol type at present known in this region, therefore, is probably eleven. Many of the new variables have short periods, the most obvious being 092673<sub>n</sub>, 104055<sub>n</sub>, 105863<sub>n</sub>, 110060<sub>n</sub>, 110551<sub>n</sub>, 113966<sub>n</sub>, 120658<sub>n</sub>, 121548<sub>n</sub>, 123559<sub>n</sub>, 124058<sub>n</sub>, 132763<sub>n</sub>, and 133357<sub>n</sub>. The periods of the following stars are probably long: 102557<sub>n</sub>, 102861<sub>n</sub>, 105061<sub>n</sub>, 105364<sub>n</sub>, 113657<sub>n</sub>, 113662<sub>n</sub>, 114161<sub>n</sub>, 114953<sub>n</sub>, 120749<sub>n</sub>, 123753<sub>n</sub>, and 134459<sub>n</sub>.

Table I. New variable stars.

Designation	Harv.No.	Number A. N.	C.P.D. No.	RA. 1900	Decl. 1900	Bright	Faint	Range
092673 <sub>n</sub>	1269	157.1906 Carinae	—	9 <sup>h</sup> 26 <sup>m</sup> 29 <sup>s</sup>	—73° 6'3"	9.0	< 10.0	1.0
101259 <sub>n</sub>	1270	158.1906 Carinae	—59° 20'07"	10 12 30	—59 42.9	9.2	10.3	1.1
101659 <sub>n</sub>	1271	159.1906 Carinae	—59 2059	10 16 56	—59 57.0	9.8	10.5	0.7
102359 <sub>n</sub>	1272	160.1906 Carinae	—59 2135	10 23 14	—59 9.7	9.4	10.3	0.9
102557 <sub>n</sub>	1273	161.1906 Carinae	—56 3425	10 25 26	—57 6.2	8.0	9.0	1.0
102861 <sub>n</sub>	1274	162.1906 Carinae	—61 1705	10 28 30	—61 16.1	8.8	9.8	1.0
104055 <sub>n</sub>	1275	163.1906 Velorum	—55 3800	10 40 54	—55 45.8	8.4	9.4	1.0
105061 <sub>n</sub>	1276	164.1906 Carinae	—61 1955	10 50 12	—61 30.5	9.0	9.7	0.7
105364 <sub>n</sub>	1277	165.1906 Carinae	—64 1564	10 53 22	—64 35.9	9.0	10.0	1.0
105863 <sub>n</sub>	1278	166.1906 Carinae	—63 1798	10 58 19	—63 43.4	9.3	10.0	0.7
110060 <sub>n</sub>	1279	167.1906 Carinae	—60 2497	11 0 7	—60 26.3	8.8	9.6	0.8
110558 <sub>n</sub>	1280	168.1906 Carinae	—58 3216	11 5 23	—58 17.8	7.	8.	1.
110551 <sub>n</sub>	1281	169.1906 Centauri	—51 3909	11 5 29	—51 56.9	9.8	10.7	0.9
110647 <sub>n</sub>	1282	170.1906 Centauri	—47 4810	11 6 34	—47 18.0	8.7	9.6	0.9
112650 <sub>n</sub>	1283	171.1906 Centauri	—50 4289	11 26 31	—50 53.2	9.2	10.2	1.0
113447 <sub>n</sub> *)	1284	172.1906 Centauri	—47 5118	11 34 57	—47 24.5	9.1	10.0	0.9
113657 <sub>n</sub>	1285	173.1906 Centauri	—	11 36 10	—57 6.3	9.8	13.0	3.2
113662 <sub>n</sub>	1286	174.1906 Centauri	—62 2223	11 36 14	—62 8.4	8.7	9.5	0.8
113966 <sub>n</sub>	1287	175.1906 Muscae	—66 1637	11 39 49	—66 45.0	8.7	9.7	1.0
114161 <sub>n</sub>	1288	176.1906 Centauri	—	11 41 42	—61 20.2	10.6	< 11.4	0.8
114360 <sub>n</sub>	1289	177.1906 Centauri	—59 3809	11 43 5	—60 0.5	8.8	9.8	1.0
114764 <sub>n</sub>	1290	178.1906 Muscae	—64 1725	11 47 24	—64 50.8	9.4	10.3	0.9
114953 <sub>n</sub>	1291	179.1906 Centauri	—53 4824	11 49 8	—53 36.7	9.8	10.5	0.7
120658 <sub>n</sub>	1292	180.1906 Crucis	—58 4151	12 6 42	—58 13.6	8.7	9.3	0.6
120749 <sub>n</sub>	1293	181.1906 Centauri	—49 4965	12 7 51	—49 39.0	9.1	10.0	0.9
121249 <sub>n</sub>	1294	182.1906 Centauri	—49 5046	12 12 30	—49 10.8	8.8	11.4	2.6
121548 <sub>n</sub>	1295	183.1906 Centauri	—48 4730	12 15 52	—48 39.3	8.3	10.2	1.9
123559 <sub>n</sub>	1296	184.1906 Crucis	—59 4388	12 35 41	—59 14.7	8.5	9.4	0.9
123753 <sub>n</sub>	1297	185.1906 Centauri	—53 5293	12 37 37	—53 58.8	9.4	< 11.0	1.6
124058 <sub>n</sub>	1298	186.1906 Crucis	—58 4490	12 40 32	—58 34.6	8.5	9.0	0.5
130359 <sub>n</sub>	1299	187.1906 Centauri	—59 4781	13 3 10	—59 42.9	9.4	10.5	1.1
132763 <sub>n</sub>	1300	188.1906 Centauri	—	13 27 6	—63 32.4	9.5	10.5	1.0
133357 <sub>n</sub>	1301	189.1906 Centauri	—56 5865	13 33 45	—57 6.4	7.6	8.7	1.1
133561 <sub>n</sub>	1302	190.1906 Centauri	—61 3912	13 35 3	—61 15.8	9.8	10.8	1.0
134358 <sub>n</sub>	1303	191.1906 Centauri	—57 6324	13 43 50	—58 0.3	8.0	8.9	0.9
134459 <sub>n</sub>	1304	192.1906 Centauri	—59 5228	13 44 21	—59 54.7	9.7	10.7	1.0

Remarks.

101259<sub>n</sub>. Probably of the Algol type. Faint on 58 out of 453 plates measured.

101659<sub>n</sub>. A twelfth magnitude star is about 0.2 north of the variable, and renders observation difficult.

\*) Im Zirkular steht 113547<sub>n</sub>. Kr.

110551<sub>n</sub>. Cord. DM. —51°5387. Period short. Measured on 168 plates.  
 110647<sub>n</sub>. Cord. DM. —47°6583. Probably of the Algol type. Faint on 22 out of 276 plates measured.  
 112650<sub>n</sub>. Cord. DM. —50°6082.  
 113447<sub>n</sub>. Cord. DM. —47°7032.  
 114360<sub>n</sub>. Probably of the Algol type. Faint on 49 out of 351 plates measured.  
 120658<sub>n</sub>. Period short. Measured on 340 plates.  
 120749<sub>n</sub>. Cord. DM. —49°6898.  
 121249<sub>n</sub>. Cord. DM. —49°6972. This star is of the Algol type.

The variations of 101659<sub>n</sub>, 110060<sub>n</sub>, 120658<sub>n</sub>, and 124058<sub>n</sub>, which are difficult to observe on account of their small range, or from the close proximity of other stars, have been confirmed by Mrs. *Fleming*. Variations as great as 0.7 magnitude are conspicuous on these plates.

Times of minima, J. D. 2410002.90 + 5<sup>d</sup>.21943<sup>E</sup>. Faint on 30 out of 286 plates measured. Has not been observed exactly at minimum, and the range may be greater than that given in the table.

121548<sub>n</sub>. Cord. DM. —48°7357. Period short. Measured on 248 plates.

133357<sub>n</sub>. Image often looks nebulous, and sometimes unusually sharp.

133561<sub>n</sub>. Probably of the Algol type. Faint on thirty out of 233 plates measured.

134358<sub>n</sub>. Perhaps of the Algol type. Faint on 58 out of 304 plates measured.

An ephemeris for 121249<sub>n</sub> (182.1906 Centauri) is given in Table II. The first column gives the value of every fifth time of minimum, for about six months, beginning with Epoch 1450. The second and third columns give the Julian Day and decimal following Greenwich Mean Noon, and the corresponding date and Greenwich Mean Time of minima.

Table II. Ephemeris for 121249<sub>n</sub> (182.1906 Centauri).

Epoch	J. D.	Date	Epoch	J. D.	Date
1450	7571.074	1906 Dec. 26 <sup>d</sup> 1 <sup>h</sup> 47 <sup>m</sup>	1470	7675.462	1907 April 9 <sup>d</sup> 11 <sup>h</sup> 7 <sup>m</sup>
1455	7597.171	1907 Jan. 21 4 7	1475	7701.559	» May 5 13 27
1460	7623.268	» Febr. 16 6 27	1480	7727.656	» » 31 15 47
1465	7649.365	» Mar. 14 8 47	1485	7753.753	» June 26 18 7

Harvard College Observatory, Cambridge, Mass., 1906 Nov. 24.

*Edward C. Pickering.*

### Beobachtungen des Kometen 1906 g.

1906	M. Ortszeit	Vgl.	Bb.	$\alpha$ app.	$\log p.A$	$\delta$ app.	$\log p.A$	Red. ad l. app.	*
Am Äquatoreal der Sternwarte in Padua von Dr. A. Antoniazzi und Dr. G. A. Favaro.									
Nov. 20	16 <sup>h</sup> 21 <sup>m</sup> 57 <sup>s</sup>	10.10	A	10 <sup>h</sup> 4 <sup>m</sup> 25 <sup>s</sup> 36	9.307 <sub>n</sub>	+25° 20' 55".5	0.513	+1 <sup>s</sup> 78 —17".6	1
26	16 43 56	10.10	A	10 40 32.85	9.293 <sub>n</sub>	+33 45 16.9	0.306	+1.68 —21.3	2
Dic. 20	16 23 23	5.5	F	13 50 28.25	9.775 <sub>n</sub>	+56 29 18.5	9.526	—0.36 —23.7	3

Am großen Refraktor der Sternwarte in Straßburg von Dr. C. W. Wirtz.

Dez. 17 | 10 25 43 | — | W | 13 23 45.69 | —0<sup>s</sup>.61 | +54 55 9.9 | +10".0 | — | — | —

In den Kolonnen  $\log p.A$  ist die Parallaxe angegeben. Totalhelligkeit 10<sup>m</sup>.1, Durchmesser 4'.5, ohne Kern.

### Mittlere Örter der Vergleichsterne.

*	$\alpha$ 1906.0	$\delta$ 1906.0	Autorität
1	10 <sup>h</sup> 4 <sup>m</sup> 11 <sup>s</sup> 04	+25° 25' 11".7	AG. Cambr. 5231
2	10 37 54.25	+33 51 21.9	AG. Leiden 4259
3	13 55 59.29	+56 42 3.2	AG. Hels. 7778

### Note to the Editor.

Prof. Kapteyn has very kindly pointed out that the statement in Part I, Vol. II, of our Transactions with reference to the parallaxes of the stars of the two spectral types is a misapprehension of his results.

In fact for the two groups his tables give:

Type I  $\pi = 0''.076$ , Type II  $\pi = 0''.074$ ;  
 in close agreement with our values for the absolute parallax:

Type I  $\pi = 0''.076$ , Type II  $\pi = 0''.067$ .

Yale University Observatory, New Haven, Conn., 1906 Dec. 24.

*W. L. Elkin.*

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