

SPECTRA OF BRIGHT SOUTHERN STARS.

By EDWARD C. PICKERING.

A DETAILED description of the spectra of the stars brighter than the fifth magnitude, and north of declination -30° , by Miss A. C. Maury, and forming part of the Henry Draper Memorial, will be found in the *Annals of the Harvard College Observatory*, Vol. XXVIII, Part I. A similar discussion of the bright stars south of declination -30° is now being made by Miss A. J. Cannon, and will be published in Part II of the same volume. Meanwhile, in order to furnish astronomers with a general classification of the spectra of the southern stars the annexed table has been prepared by Miss Cannon. It contains all stars south of declination -30° , whose photometric magnitude is 3.50 or brighter. The designation of the star is given in the first column. The second column contains the number in the *Southern Meridian Photometry*, taken from Vol. XXXIV, Table XIII, of the Harvard Observatory *Annals*, where the identification with various other catalogues is also given. The approximate right ascension and declination for 1900 and the photometric magnitude are given in the next three columns. The seventh column contains the class of spectrum. The classification here given is that employed in the *Draper Catalogue*, the letters A, G, M, N, and O indicating stars of the first, second, third, fourth, and fifth types respectively. The letter B denotes a star of the first type, in which the Orion lines are present and nearly as intense as the hydrogen lines. The letter F denotes a star of the first type in which the hydrogen lines are rather faint and the line K is strong. The letter K denotes a spectrum intermediate between the second and third types as indicated by sudden changes in intensity. The types B, A, F, G, K, and M, therefore, indicate divisions in a continuous sequence, in which there are many subdivisions. Intermediate spectra are indicated by two letters and a number giving the position esti-

BRIGHT SOUTHERN STARS.

	S. M. P.	R. A. 1900	S. Dec. 1900	Phot. Mag.	Class
β Hydri	57	0 ^h 20 ^m .5	77° 49'	2.89	G
α Phoenicis	59	21 .3	42 51	2.45	K
β Phoenicis	187	1 1 .6	47 15	3.39	G 8 K
γ Phoenicis	257	24 .0	43 50	3.32	K 5 M
α Eridani	290	34 .0	57 44	0.51	B 3 A
α Hydri	356	55 .6	62 4	2.96	A 5 F
θ Eridani	584	2 54 .5	40 42	3.13	A 2 F
γ Hydri	779	3 48 .8	74 33	3.12	M
α Reticuli	868	4 13 .1	62 43	3.35	G 5 K
α Columbae	1217	5 36 .0	34 8	2.74	Q
β Columbae	1284	47 .5	35 49	3.06	K
ζ Canis Majoris	1444	6 16 .5	30 2	3.25	B 3 A
α Carinae	1480	21 .8	52 39	-0.96	F
ν Puppis	1569	34 .7	43 6	3.23	B 8 A
α Pictoris	1650	47 .2	61 50	3.29	A 4 F
τ Puppis	1653	47 .4	50 30	2.76	K
π Puppis	1845	7 13 .6	36 55	2.49	K 5 M
σ Puppis	1951	26 .1	43 6	2.99	K 5 M
ϵ Puppis	2075	41 .7	37 44	3.40	K 5 M
ζ Puppis	2248	8 0 .1	39 43	2.33	Q
γ Velorum	2305	6 .5	47 2	1.91	O
ϵ Carinae	2441	20 .4	59 11	1.74	Q
δ Velorum	2623	8 42 .0	54 20	2.00	A
λ Velorum	2777	9 4 .3	43 2	2.10	K 5 M
β Carinae	2844	12 .1	69 18	1.73	A
ι Carinae	2868	14 .4	58 51	2.24	F
κ Velorum	2911	19 .0	54 35	2.59	B 3 A
N Velorum	2996	28 .2	56 36	2.98	K 5 M
ν Carinae	3095	44 .6	64 37	2.99	A 5 F
q Carinae	3293	10 13 .7	60 50	3.42	K 5 M
θ Carinae	3476	39 .4	63 52	3.01	B 2 A
μ Velorum	3495	42 .5	48 54	2.81	G 5 K
λ Centauri	3883	11 31 .1	62 28	3.31	B 9 A
δ Centauri	4093	12 3 .2	50 10	2.81	Q
δ Crucis	4134	9 .8	58 11	3.08	B 3 A
α Crucis	4208	21 .1	62 32	1.02	B 2 A
γ Crucis	4242	25 .6	56 33	1.55	M
α Muscae	4270	31 .3	68 35	2.91	B 3 A
γ Centauri	4294	36 .0	48 24	2.36	A
β Muscae	4312	40 .1	67 33	3.26	B 3 A
β Crucis	4324	41 .8	59 8	1.49	B 2 A
ι Centauri	4507	13 15 .0	36 11	2.98	A 2 F
ϵ Centauri	4610	33 .6	52 58	2.58	B 2 A
μ Centauri	4676	13 43 .6	41 59	3.33	Q
ζ Centauri	4715	49 .3	46 47	2.81	B 2 A
β Centauri	4753	56 .7	59 53	0.83	B 2 A
θ Centauri	4775	14 0 .8	35 52	2.19	K
η Centauri	4941	29 .2	41 43	2.54	B 3 A
α^1 Centauri	4960	32 .8	60 25	0.50	G
α^2 Centauri	4961	32 .8	60 25	1.75	K 5 M
α Circini	4969	34 .4	64 33	3.37	A 5 F
α Lupi	4975	35 .2	46 57	2.46	B 2 A
β Lupi	5081	52 .0	42 44	2.74	B 2 A
κ Centauri	5085	52 .6	41 42	3.36	B 3 A
ζ Lupi	5163	15 5 .1	51 43	3.46	K

	S. M. P.	R. A. 1900	S. Dec. 1900	Phot. Mag.	Class
γ Triang. Aust.....	5194	15 ^h 9 ^m .6	68° 19'	3.00	A
δ Lupi	5220	14 .8	40 18	3.37	B 2 A
ϕ^x Lupi	5230	15 .5	35 54	3.28	K 5 M
γ Lupi	5310	28 .5	40 50	2.96	B 3 A
β Triang. Aust.....	5416	46 .4	63 7	3.09	F
ϵ Triang. Aust.....	5752	16 ^h 38 .0	68 51	1.89	K 2 M
ϵ Scorpii	5787	43 .7	34 7	2.29	K
μ^x Scorpii	5794	45 .1	37 53	3.26	Q
ζ Aræ	5837	50 .4	55 50	3.02	K 5 M
η Scorpii	5930	17 5 .0	43 6	3.37	F 2 G
β Aræ	6020	17 17 .0	55 27	2.72	K 2 M
γ Aræ	6021	17 .0	56 17	3.42	B
ν Scorpii	6063	24 .0	37 13	2.84	B 2 A
λ Aræ	6064	24 .1	49 47	2.86	Q
λ Scorpii	6082	26 .8	37 2	1.79	B 3 A
θ Scorpii	6104	30 .1	42 56	1.99	F
κ Scorpii	6154	35 .5	38 59	2.59	B 2 A
ι^x Scorpii	6191	40 .5	40 6	3.10	F 5 G
G Scorpii	6204	43 .0	37 1	3.22	K 2 M
γ Sagittarii	6341	59 .4	30 25	3.02	K
η Sagittarii	6428	18 10 .9	36 48	2.96	M
ϵ Sagittarii	6471	17 .6	34 25	1.93	A
ζ Sagittarii	6686	56 .3	30 1	2.69	A 2 F
α Pavonis	7074	20 17 .7	57 3	2.05	B 3 A
α Indi	7126	30 .6	47 39	3.20	G 5 K
γ Gruis	7432	21 47 .9	37 50	3.20	B 8 A
α Gruis	7481	22 1 .9	47 27	1.92	B 8 A
α Tucanæ	7524	11 .6	60 46	2.90	K 2 M
β Gruis	7615	36 .7	47 24	2.09	M
α Piscis Aust.....	7684	52 .1	30 9	1.27	A 3 F

mated in tenths of the interval between them; thus B 8 A denotes that the spectrum is between B and A and closely approaches A. The spectra of nearly all the stars in the table can be thus described. For the remainder the letter Q is inserted, and the peculiarities of the spectra are described in the following remarks.

REMARKS.

θ Eridani. The presence of the line K in the spectrum may be due to the fainter component.

γ Hydri. Spectrum like that of α Orionis.

α Columbæ. Spectrum B 8 A, except that $H\beta$ consists of a narrow bright line superposed on a broad dark band.

π Puppis. $H\beta$, $H\gamma$, and $H\delta$ are stronger than in α Tauri, the typical star of this class.

ζ Puppis. The spectrum of this star contains two bright bands at wavelengths 4633 and 4688, and a rhythmical series of lines falling between the well-known lines of hydrogen. See Harvard College Observatory *Circular* No. 16.

γ Velorum. This is the only bright star having a spectrum of the fifth type.

ϵ Carinæ. Composite type. Spectrum K, except that the line K is barely seen, and the hydrogen lines are strong. Perhaps the star is double, the fainter component having a spectrum of Class A.

δ Centauri. B 3 A, except that $H\beta$ consists of a strong bright line, $H\gamma$ of a bright line superposed on a broad dark band, and $H\delta$ of a narrow bright line superposed on a faint dark band. The presence of additional dark lines, as in other stars of this class, is well shown in this spectrum.

α Crucis. The lines are broad and ill defined, and the photographs do not show the spectra of the two components separately.

γ Crucis. Spectrum like that of α Orionis.

μ Centauri. Spectrum B 2 A. Like δ Centauri, except that $H\epsilon$ is also bright.

μ^s Scorpii. Spectrum B 3 A. Spectroscopic binary. Period 1.4462 days.

α Aræ. Spectrum B 3 A, except that $H\beta$ is bright.

η Sagittarii. Spectrum like that of α Herculis.

β Gruis. Spectrum like that of α Herculis.

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