POSSIBLE GROUPINGS OF IRREGULAR (ORION) VARIABLES

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Abstract. New groupings of Hα-emission stars connected with young clusters, associations and nebulae are considered to be possible regions of clusterings of irregular (Orion-type) variables. They are listed in Table I and an example, No. 19, is shown in Figure 1.

Finding charts of individual stars and more detailed data will be given in two forthcoming papers in the *Bulletins of the Abastumani Astrophysical Observatory*.

TABLE I

Regions of possible clustering of irregular (Orion) variables

(1) No.	(2) Regions	(3) Hα em.	(4) α_{1900}	(5) δ_{1900}	(6) Central O or T Ass	(7) Type
1	NGC 281 + Kh 215	1	$00^h45^m.2$	55°51′		a:
2	IC 1805; 1795 + Kh 237	11	02 25.2	61 01	43, Cas OB 6	b:
2	O Cl 357, NGC 1027	1	02 35.0	61 07	43, Cas OB 6	
3	S 126, O Cl 435 + Kh 281	2	05 08.1	32 37	8, IC 405	a:; c
4	MWC 789 + Kh 297	1	05 56.4	16 49		a
4	S 34, McD 43 + Kh 297	1	06 03.3	15 48		
5	IC 4601 + Kh 569	1	16 15.5	−20 00	ν Sco	a:
6	S 190	4	18 13.0	−12 00	9, Ser OB 2	
7	O Cl 38, IC 4725 + D	1	18 25.0	−19 19		c
8	NGC 6820, 6823	3	19 39.0	23 06	13, Vul OB 1	b:
9	O Cl An(Do 1974) + D	4	19 40.7	24 20	14, Vul OB 4	b:; c:
10	S 67, B 346	6	20 21.5	43 00	39, T2 Cyg	a:
11	Kh 100	3	20 38.0	33 20		a:
12	S 86 + D	1	21 00.3	59 04		
13	S 88 + Kh 127	1	21 15.2	42 57		
14	near (NGC 7086 + Kh 141)	2	21 25.0	49 50		
15	Kh 160	5	21 47.1	55 56	27, Cep OB 2	a:
16	Kh 172	5	22 01.6	58 48		a:
16	S 94, Mi 16 + D	9	22 20.2	58 17		
17	S 95, McD 30 + D	2	22 21.4	63 04		
16	S 96, W 94 + D	5	22 33.2	58 00		
18	O Cl 248, An (King 10) + D	4	22 51.0	58 36		c; d
19	Sh 155 + D	10	22 52.3	62 00	30, Cep OB 3	b:; d
20	MWC 1080 + D	4	23 11.7	60 20		a
21	Kh 198	1	23 50.8	58 03		a:

Sherwood and Plaut (eds.), Variable Stars and Stellar Evolution, 109–111.
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Notes to Table I

Column:

1 – Different parts of single regions are marked with the same number.

2 – if the cluster is not numbered, NGC and IC nrs. belong only to the nebula.

– Kh or D – Khavtassi J. Sh.: 1960, *Atlas of Dark Nebulae*, Abastumani Astrophys. Obs.

– O-Cl and O- Ass – Alter, G., Ruprecht, I., Vanýsek V.: 1970, *Catalogue of Star Clusters and Associations*, Budapest.

– S – Hase, W. F., Shaijn, G. A.: 1955, *Izv. Krymsk. Astrofiz. Obs.* **15**, 11.

– Sh – Sharpless, S.: 1959, *Astrophys. J. Suppl.* **4**, 257.

3 – the number of new Hα-emission stars.

6 – T – Ass – Kholopov, P. N.: 1970, in A. A. Boyarchuk, R. E. Gershberg (ed.), *Eruptive Stars*, Ch. 6, p. 281.

– O-Cl and O-Ass – as for Column 2.

7 – Type of possible groupings of Orion variables.

(a) in T – associations with only one In type star in the grouping, or, other morphological signs peculiar to T – associations.

(b) in a mixed O + T – association; i.e. in an O – association involving faint Hα-emission stars.

(c) The cluster is connected with a dark nebulae, the cluster as a rule being located at the edge of the nebula, and Hα-emission stars may be connected with only one of the objects. It is not out of the question that the object has been formed through the projection effect. IC 5146 + + Kh 145 and NGC 7023 + Kh 175 are examples.

(d) possible groupings of Orion variables. The group contains stars with variable Hα-emission.

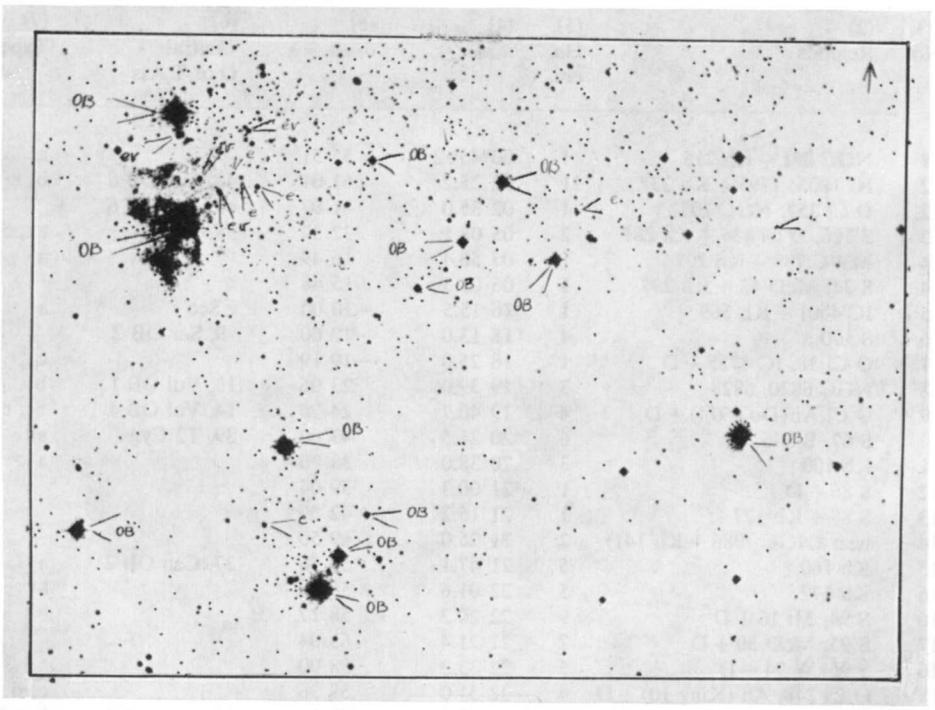

Fig. 1. The part of the chart O-874 from the Palomar Sky Atlas with O-association Cep III is given. OB denotes early-type stars – members of O-association, *e* – new Hα-emission stars and *ev* – the stars with variable Hα lines.

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REMARKS

G. Ponomareva (Sternberg Inst., Moscow): draws attention to 2 groups of T Tau stars embedded in nebulosity:

(1) The group around FU Ori, studied by *Götz* (Sonneberg) and *Ponomareva* (Sternberg Inst., Moscow), and considered as a T association.

(2) A group near NGC 225, consisting of a few Hα emission stars one of which is *Herbig's* Be star associated with nebulosity, classified as a T association according to *Kholopov*. *Strom et al.* found more than 50 objects with $(V-1\mu)$ colors $> 3^{m}.0$ around MWC 419; emission and variable stars may be found among these stars.

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