

High Latitude Galactic Star Clusters with EDR3

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The discovery of high latitude star clusters with WISE data is very crucial to our understanding of the galactic halo. We study a sample of 9 such clusters reported in literature using Gaia EDR3. We find that some of these clusters most likely exist, while some are not confirmed. We also use GALEX data to confirm their youth and estimate their parameters. The implications and the physical processes possible to explain their existence are also discussed.

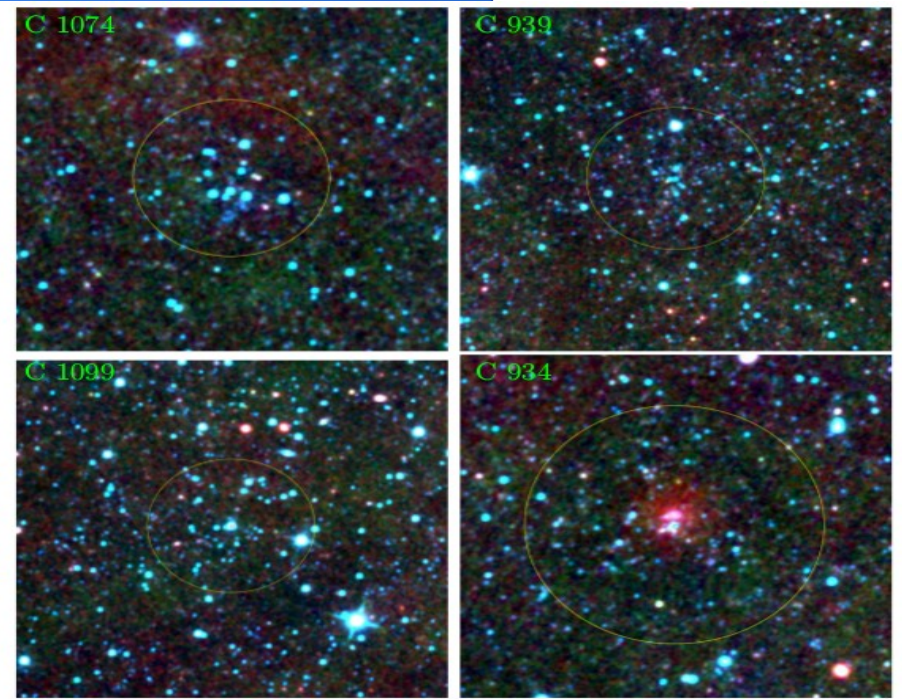


Fig. 1. WISE ($15' \times 15'$) multicolour images centred on the central coordinates of the embedded clusters C 1074, C 939, C 1099, and C 934. North is to the top and east to the left. Circles encompass more probable cluster stars (Sect. 2).

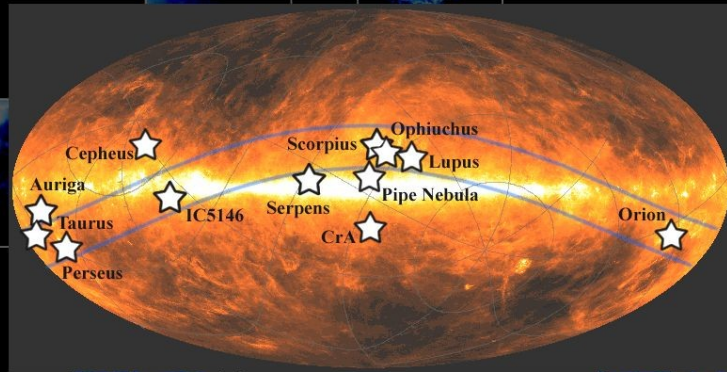
Cluster	RA	Dec	A_V	Age	d_0	R_{GC}	N_{GC}	\bar{V}_{GC}	\bar{z}_{GC}
			(mag)	(Myr)	(kpc)	(kpc)	(kpc)	(kpc)	(kpc)
C 438	00:19:17	-18:47:55	0.99 ± 0.03	2 ± 1	5.09 ± 0.70	8.69 ± 0.40	07.04 ± 0.02	$+0.97 \pm 0.13$	4.99 ± 0.69
C 439	00:17:30	-17:49:18	0.99 ± 0.03	2 ± 1	5.09 ± 0.47	8.70 ± 0.26	07.05 ± 0.02	$+1.06 \pm 0.10$	4.97 ± 0.46
C 932	2:05:02	-18:09:26	1.40 ± 0.03	2 ± 1	5.7 ± 0.53	10.55 ± 0.29	9.07 ± 0.17	0.29 ± 0.03	5.38 ± 0.50
C 934	2:05:34	-17:56:17	1.46 ± 0.06	2 ± 1	5.31 ± 0.51	10.27 ± 0.27	8.97 ± 0.17	0.27 ± 0.03	5.01 ± 0.48
C 939	2:07:08	-18:13:15	1.30 ± 0.06	3 ± 2	5.40 ± 0.50	10.34 ± 0.27	9.00 ± 0.17	0.31 ± 0.03	5.09 ± 0.47
C 1074	10:39:27	-2:00:39	0.93 ± 0.06	3 ± 1	4.14 ± 0.39	9.12 ± 0.15	8.18 ± 0.09	2.66 ± 0.25	3.02 ± 0.28
C 1099	11:49:55.7	-32:41:42.8	0.71 ± 0.06	5 ± 1	4.32 ± 0.61	7.32 ± 0.30	6.03 ± 0.17	3.61 ± 0.51	2.05 ± 0.28
C 1100	12:11:39.9	-34:44:45.5	0.93 ± 0.06	1 ± 1	6.87 ± 0.36	8.00 ± 0.23	4.76 ± 0.13	5.59 ± 0.29	3.16 ± 0.16
C 1101	12:14:24.5	-35:02:04.2	0.96 ± 0.06	3 ± 1	3.91 ± 0.55	6.83 ± 0.27	5.78 ± 0.20	3.16 ± 0.44	1.78 ± 0.25

Table 1. High latitude Star Clusters

Spatial Distribution

Survey Areas

Most star formation within 0.5kpc lies in a region known as the Gould Belt



A ring around the sky containing molecular clouds centered on a point ~ 200 pc from the Sun and tilted at $\sim 20^\circ$ to the Galactic Plane

Gould Belt Survey (GBS)

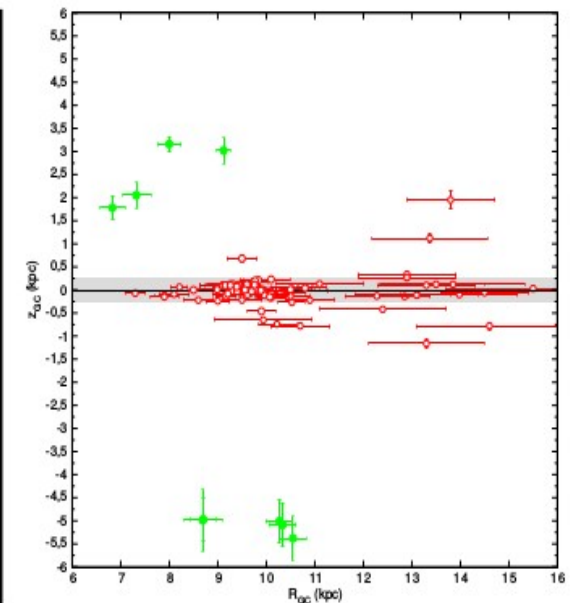
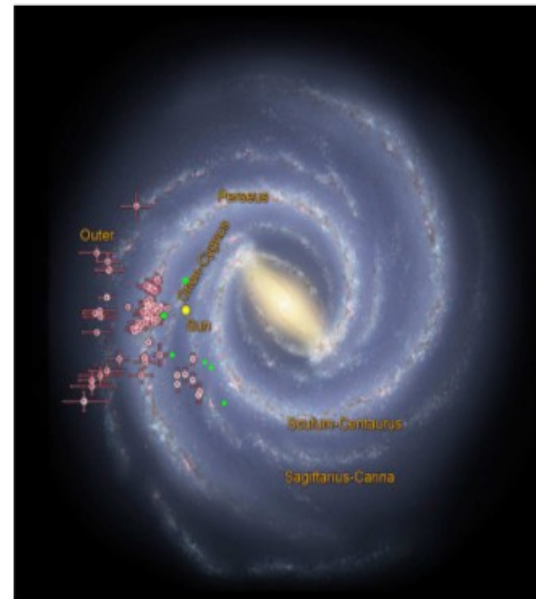
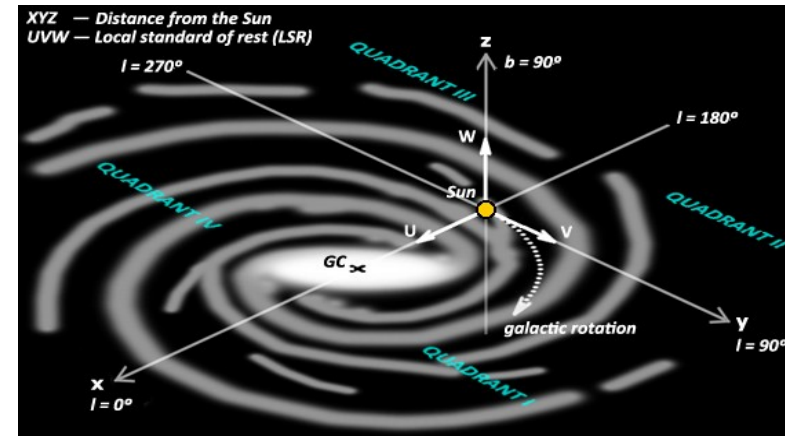
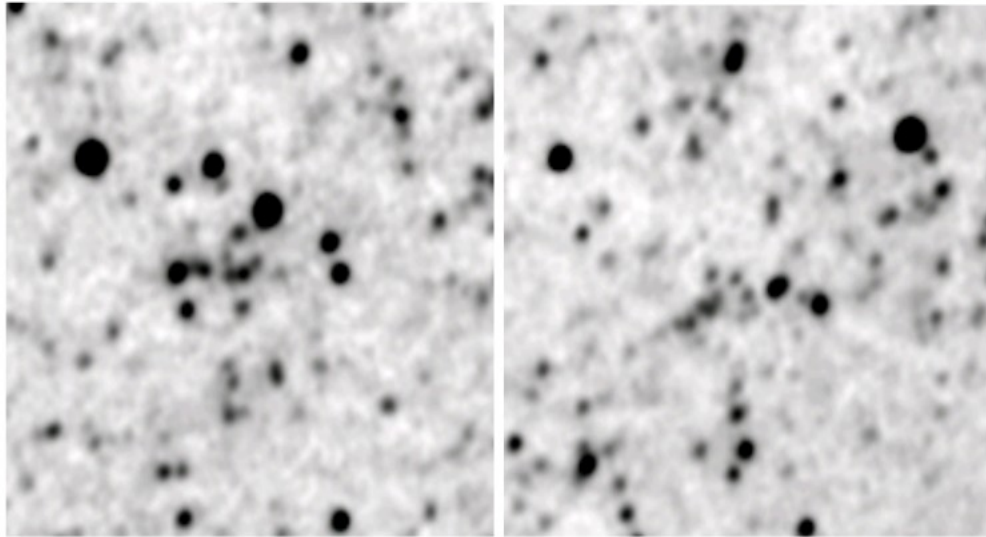


Fig. 11. Spatial distribution of the ECs in this study and Paper I (green circles) compared to ECs in our previous works (red circles). Credit: Robert Hurt (NASA/JPL) and [Camargo et al. \(2015c\)](#).

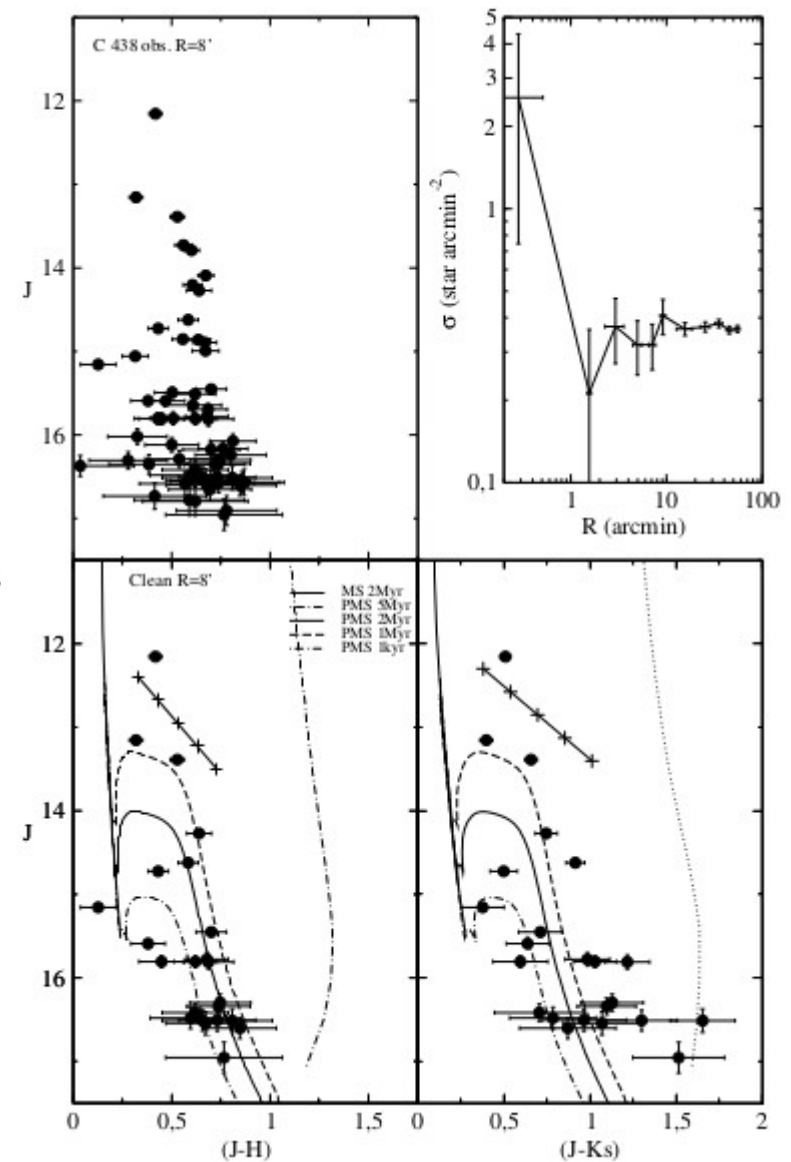
C 438 & 439



2. The new embedded clusters. *Left*: WISE W1 ($5' \times 5'$) image centred on the C 439 coordinates. *Right*: the same for C 43

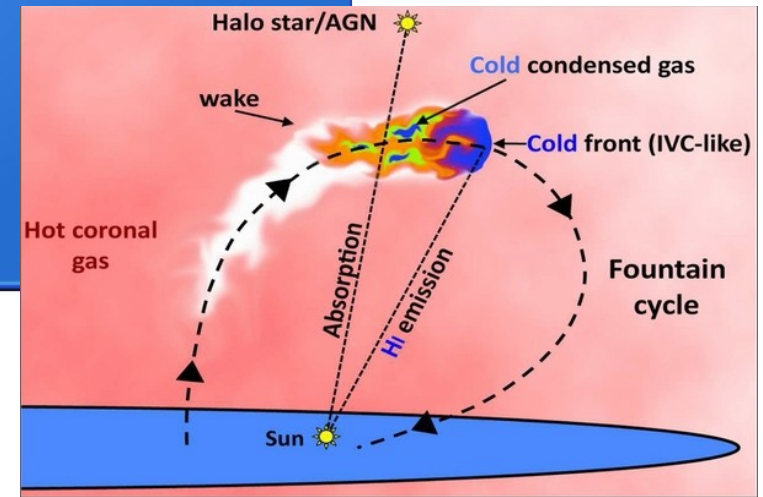
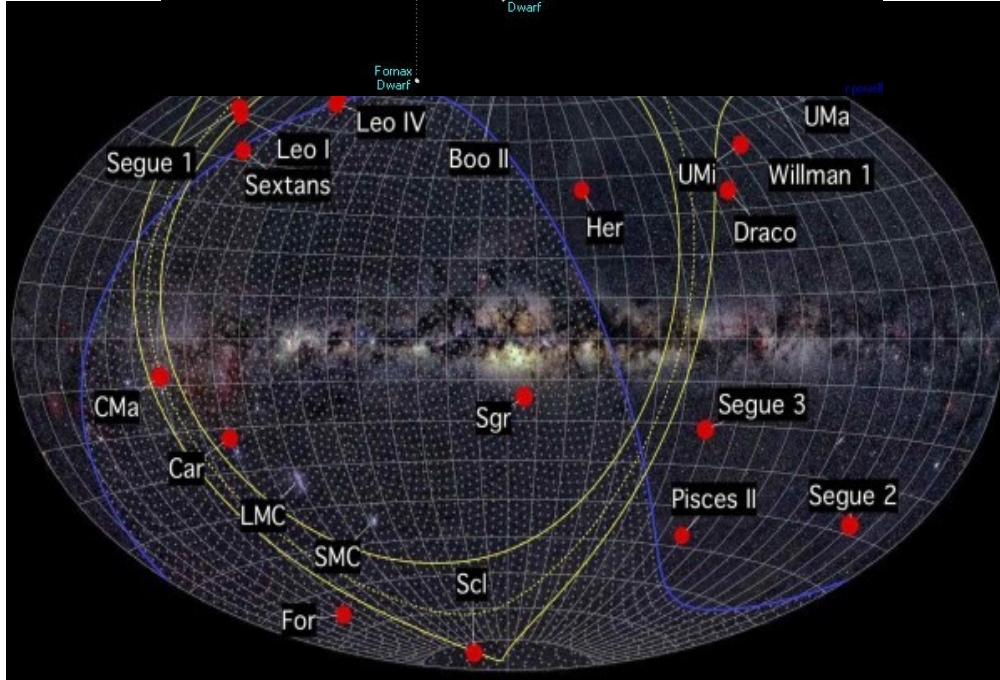
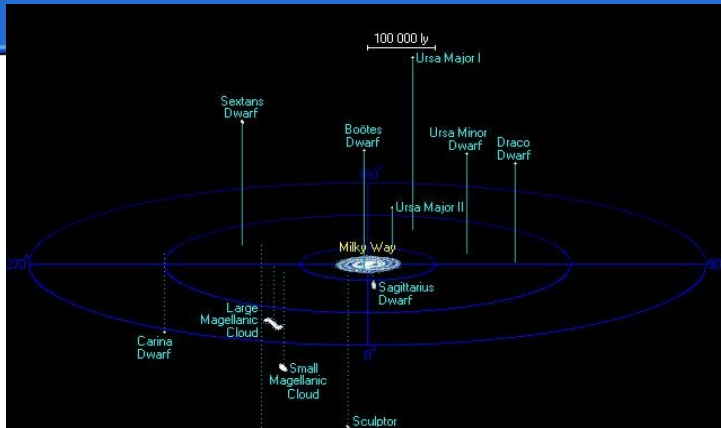
2 ± 1 Myr, $d = 5.1 \pm 0.7$ kpc

Turner, Carraro, Panko, 2017 reject the claim, suggest error in analysis.



Conclusions

Origin? Infall? Extragalactic origin?



Doubtful Clusters C:438, C 932

Most Probable Clusters: C:439, C 934,

C 939, C 1074, C 1099, C 1100, C1101

Clusters seem to exist, needs to be further explored

Further to be explored with multiwavelength data.

Fits with the findings of Gaia that the halo is an active region of stellar streams and star formation.

References:

Camargo, D., Bica, E. & Bonatto, C. 2015b, NewA, 34, 84

Camargo, D., Bica, E., Bonatto, C. & Salerno, G. 2015a, MNRAS, 448, 1930