DISKS SURVIVAL IN THE MASSIVE STAR FORMING REGION CYGNUS OB2

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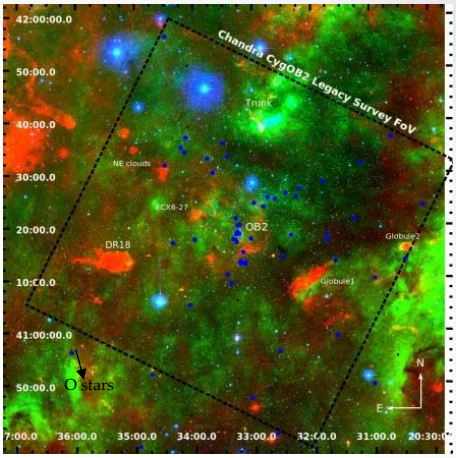


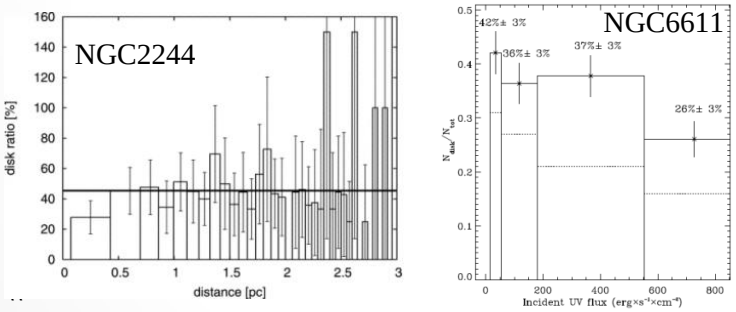
ABSTRACT

Cygnus OB2 in the Cygnus X region is the best target in our Galaxy to study star and planet formation in presence of massive stars. It is the closest massive star forming region to the Sun (1400 pc [1]) and it hosts a rich population of OB [2] and low-mass young stars [3,4]. Cyg OB2 has been recently surveyed with Chandra/ACIS-I (the Chandra Cygnus OB2 Legacy, CCOL, Survey, P.I: J. J. Drake). We also collected a large set of very deep optical [5] and NIR [4] data. Fig. 1 shows an RGB image of Cyg OB2 (red=8.0 μm, green Hα, blue r band), the CCOL survey field and the positions of the known O stars (blue dots).

Members selection

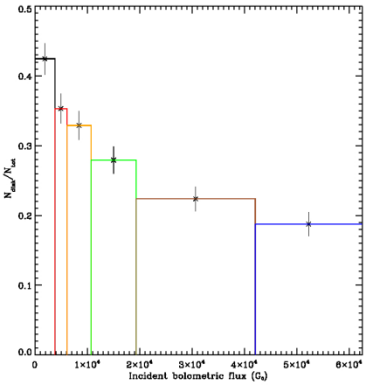
- 1843 disk-bearing members are selected by combining various optical and infrared diagrams, while carefully removing foreground and background contaminants [4]
- 4075 candidate disk-less members selected as OIR sources with X-ray counterpart and both OIR colors and extinction compatible with the association

Different disk dissipation timescale in massive and intermediately massive clusters?

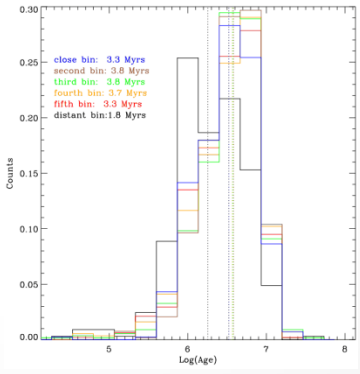


- In intermediately massive clusters (i.e. NGC6611 e NGC 2244 [6,7]) the DF is observed to decline only close to the massive stars (d<1pc). [8] have shown that close to OB stars the photoevaporation is driven by EUV radiation, leading to a fast disk dissipation.
- In Cyg OB2 a smooth decline of DF is observed also in the outer region. Larger EUV dominated zone or more intense FUV field?

Spatial variation of disk fraction (DF) in CygOB2



DF decreases with the intensity of the radiation field created by the O stars.



Stars in the regions at different incident flux are coeval, except for the most distant.

Disk evolution and planet formation unaffected by UV radiation from O stars in the outer parts of intermediately massive clusters, while the massive associations may be harsh environments for disks evolution and planet formation.

References: [1] Rygl+ 2012; [2] Knödlseder 2000; [3] Wright+ 2010; [4] Guarcello+ 2013; [5] Guarcello+ 2012; [6] Balog+ 2007, [7] Guarcello+2010, [8] Johnstone+ 1998