IRAS 20050+2720
Anatomy of a young stellar cluster

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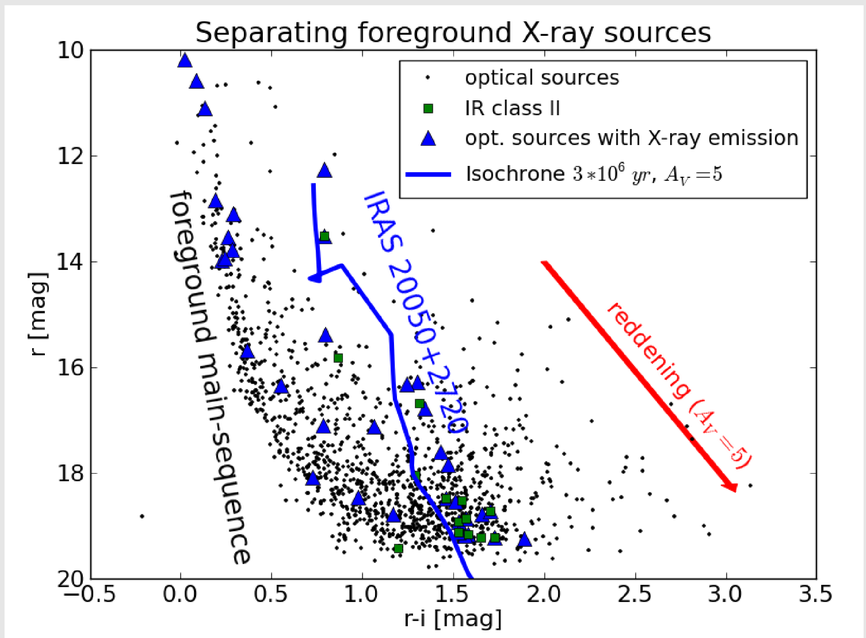
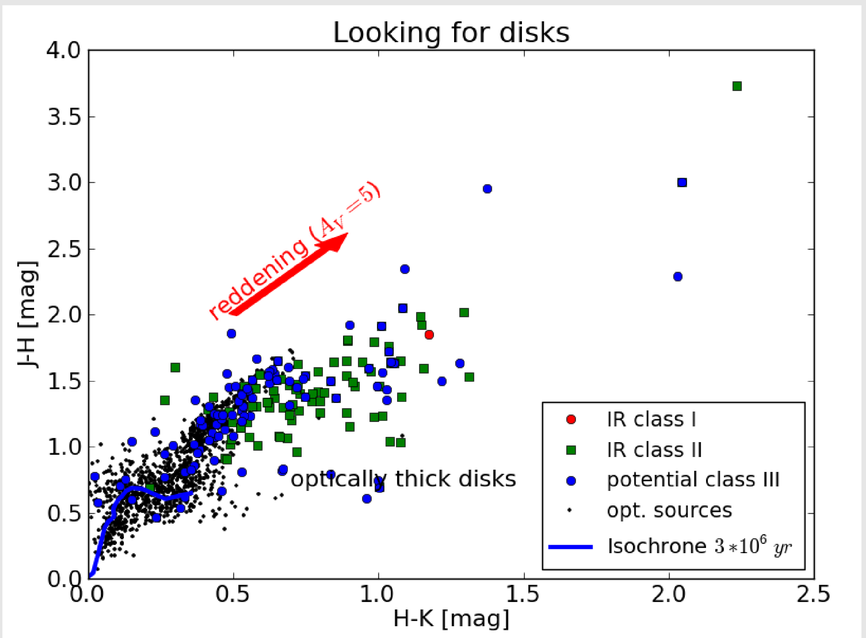
We present intermediate results of our multiwavelength study of IRAS 20050+2720, a young stellar cluster, which is thought to be located at 700 pc (Wilking et al. 1989). IRAS 20050+2720 displays an exceptionally low 24μm background, because no massive stars are present. This allows us to achieve a more complete sample at 24μm than in other star forming regions.
We analyze Chandra observations, Spitzer, 2MASS and UBVRI photometry, but contrary to our expectation when we submitted the abstract for this conference, the analysis is still ongoing.



Left: X-ray sources with r,i detection. We regard all X-ray sources left of the blue isochrone (Siess et al., 2000) as foreground, all other X-ray sources as potential class III sources (weak-line T Tauri stars).

Right: A number of sources have optically thick K-band disks. This includes class III sources, which should be non-accretors.



IRAS 20050+2720 in numbers

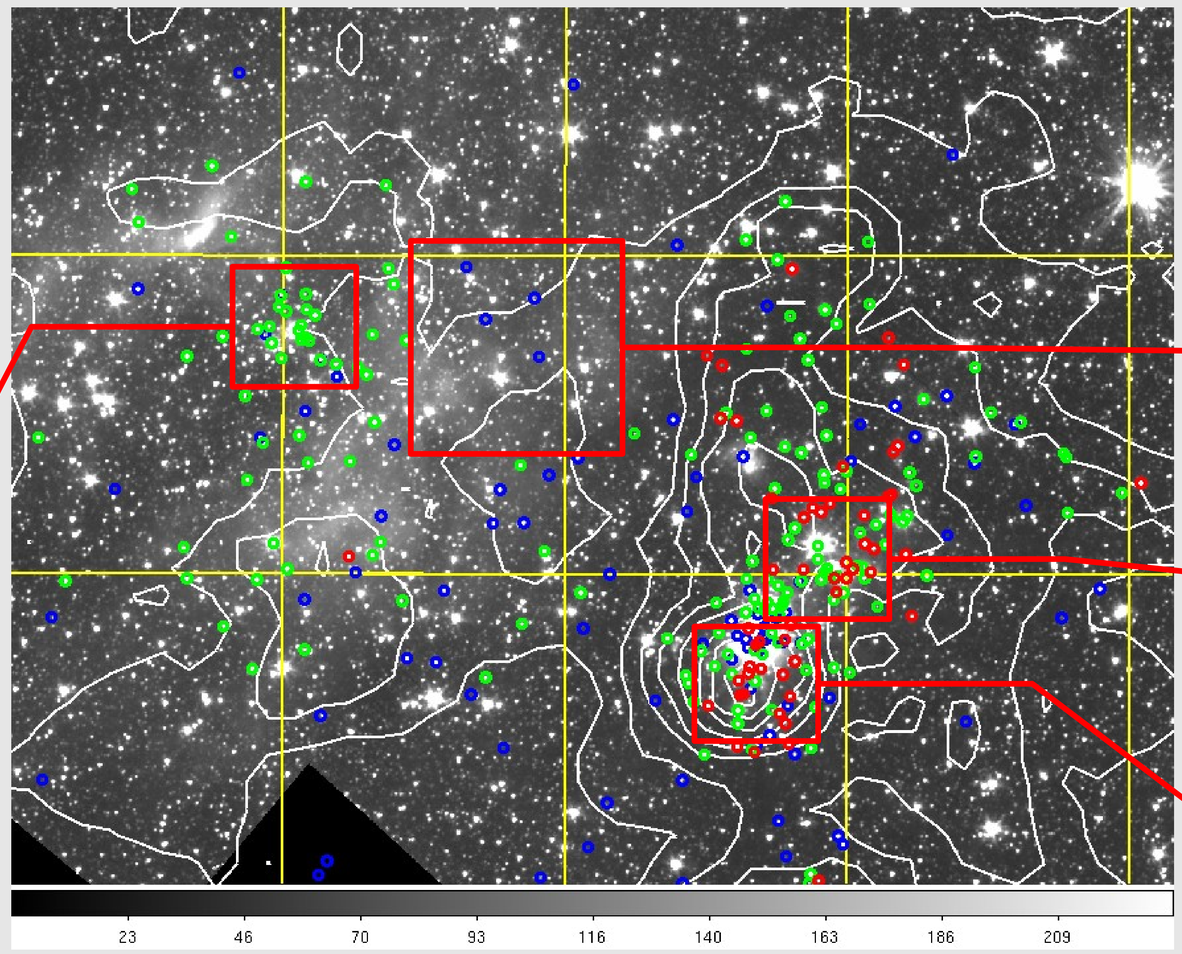
Luminosity: 230 $L_\odot$

Cloud mass: 430 $M_\odot$

183 X-ray sources

Ca. 100 cluster members with K < 17.2 mag (Gutermuth at al. 2005)

In cluster core:
33 class I, 62 class II
i.e. class I/class II = 1.9
(Gutermuth at al. 2009)



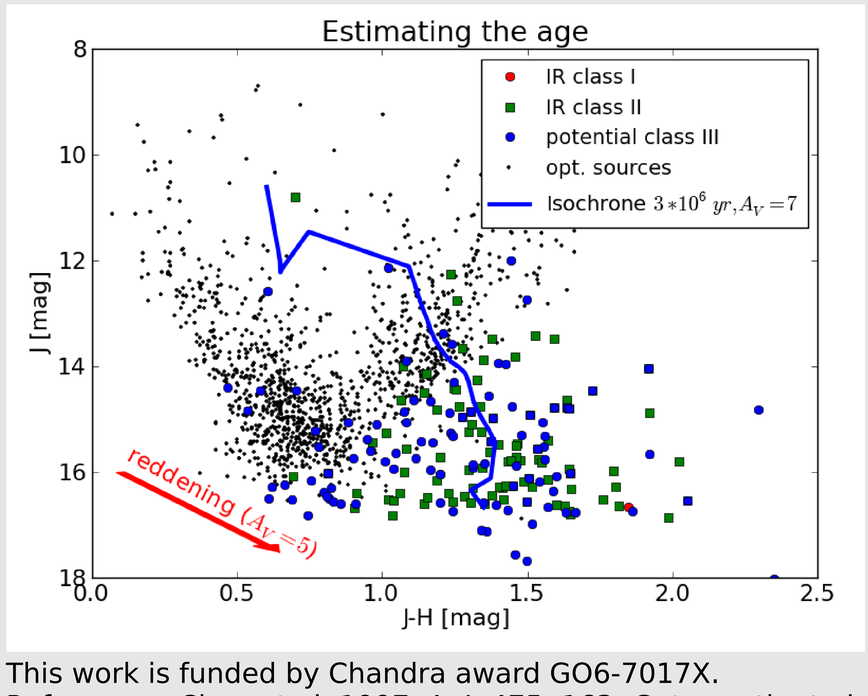
Class I, class II and (potential) class III sources on an IRAC 3.6 μm map. White contours show A_V from a 2MASS extinction map in steps of 2 mag (Gutermuth et al. 2005). Grid (yellow) spacing is 5'.

Class III sources are most dispersed → They leave the dense regions of the cloud within a few Myrs.

Subcluster C (Chen et al. 1997): No class III. Recent star formation event or low gravity, so all class IIIs escaped already?

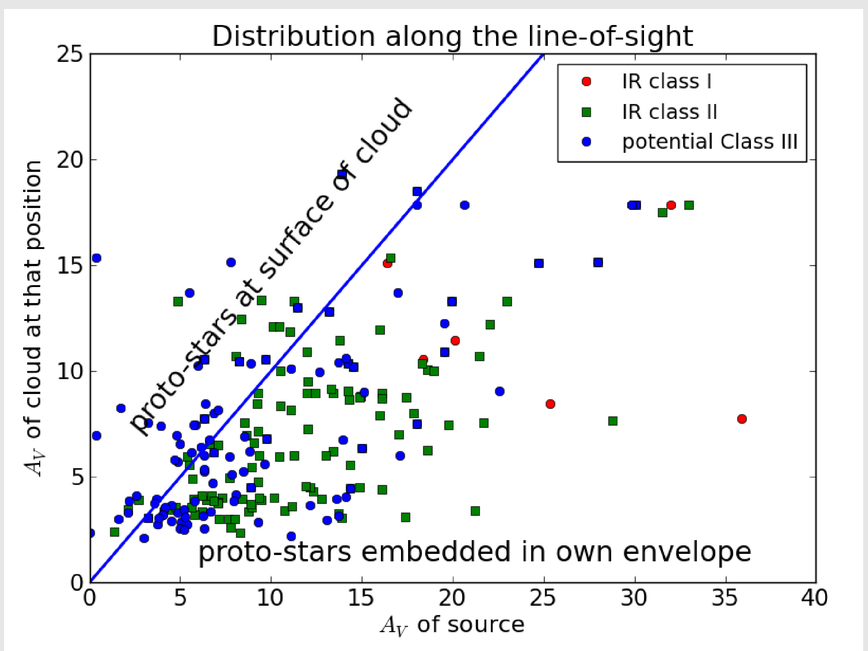
Subcluster A+B, highest stellar density, highest gas density, most active star formation

Newly identified subcluster: No class I, many class II, few class III, probably recent star formation event.



Left: Color-magnitude diagram. The optical data is not deep enough to see embedded stars. The scatter of class I and II sources is much larger than the instrumental error.

Right: For each proto-star we estimate A_V from its H-K color and compare it with A_V from a 2MASS extinction map (Gutermuth at al. 2005). Most stars are redder than expected, thus they are embedded in individual envelopes above the average cloud density.



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References: Chen et al. 1997, ApJ, 475, 163; Gutermuth et al. 2005, ApJ, 632, 397, Gutermuth et al. 2009, ApJSS, 184, 18; Siess at al 2000, A&A, 358, 593; Wilking et al 1989, ApJ, 345, 257