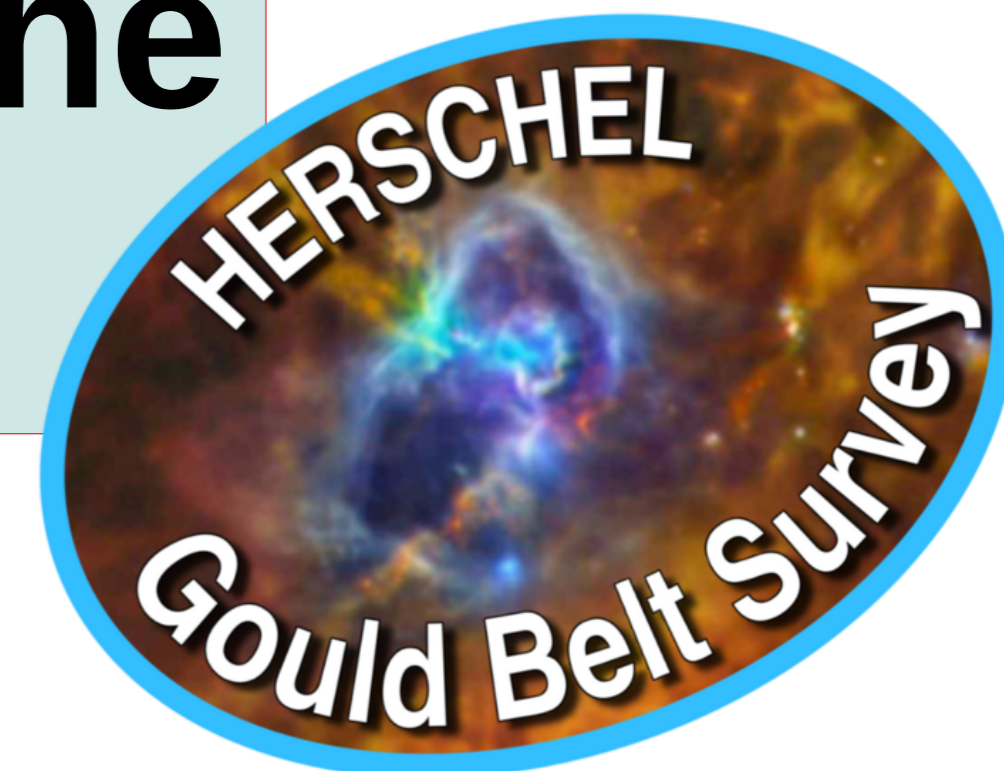


# A study of the cold cores population in the star-forming region in **Serpens**



**Eleonora Fiorellino**

IAPS – INAF

Eleonora.fiorellino@iaps.inaf.it

& the

“Herschel Gould Belt Survey” consortium

PhD Student at Tor Vergata University of Rome



As part of the Herschel Gould Belt survey, the Serpens star-forming region was observed with the *Herschel* PACS and SPIRE instruments. Sources catalog is almost completed and will be available in a short time; first results in terms of sources position and Core Mass Function are given.

**1.**

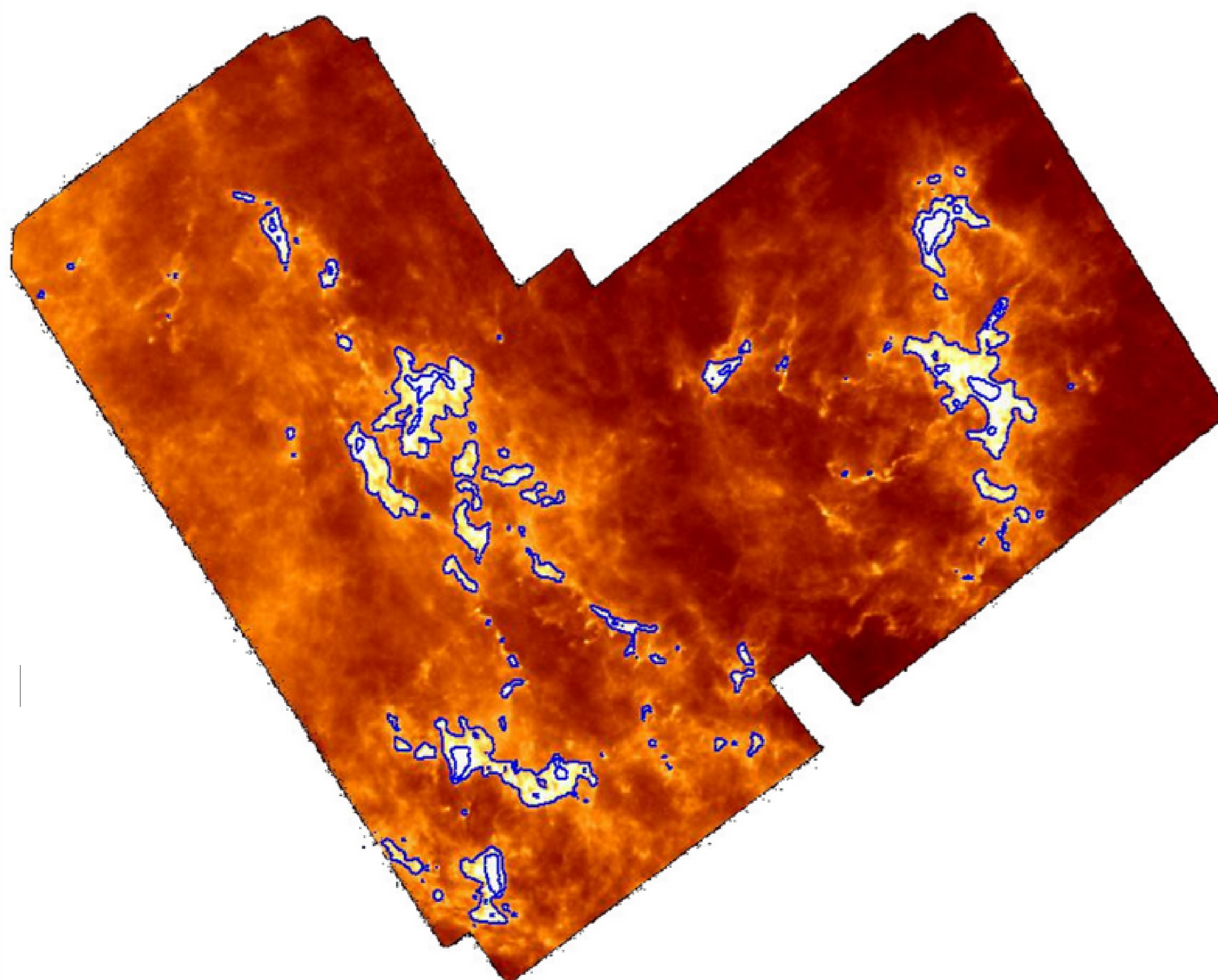
The Serpens star-forming region was observed as part of the Herschel Gould Belt survey (GBS, André et al. 2010) which aims to obtain a complete census of pre-stellar cores and Class 0 sources in the closest star-forming regions. The survey was executed with the Herschel (Pilbratt et al. 2010) instruments PACS (Poglitsch et al. 2010) and SPIRE (Griffin et al. 2010).

Traditionally, this region is divided in two main fields: Serpens Main and South, we observed both.

Their distance is a matter of controversy: recently Ortiz-León et al. (2016) has derived an average distance of ~436 pc similar to the ~415 pc previously known (Dzib et al. 2010) but distances as small as 230 pc are reported in literature. In this work we adopted 436 pc.

The data analysis of this region was my degree thesis, discussed last September at Università di Roma “La Sapienza”. In this poster I show the results.

The column density maps of the Serpens star-forming region. In blue are shown the contours at  $4.5 \times 10^{21}$   $H_2$  molecules/cm<sup>2</sup> and  $1 \times 10^{22}$   $H_2$  molecules/cm<sup>2</sup>.



**2.**

Maps were calibrated for the zero-level of the diffuse dust emission following the procedure given by Bernard et al. (2010); intensity maps at 160, 250, 350 and 500  $\mu m$  were used to compute the  $H_2$  density column map, shown in the figure on the left for both Serpens Main and South.

All the intensity maps plus two auxiliary maps (see Könyves et al. 2015, for details) were used to identify and to measure candidate sources; to this aim we adopted the getsources code (Men'shchikov et al. 2012).

From the 736 sources that have been identified, 154 sources have been removed after the cross-checking with external databases (WISE, Spitzer, NED, Simbad) to remove possible contaminant. A detailed description of the selection procedure can be found in Könyves et al. (2015).

A tentative list of 582 cold cores has been generated; its analysis is ongoing.

**3.**

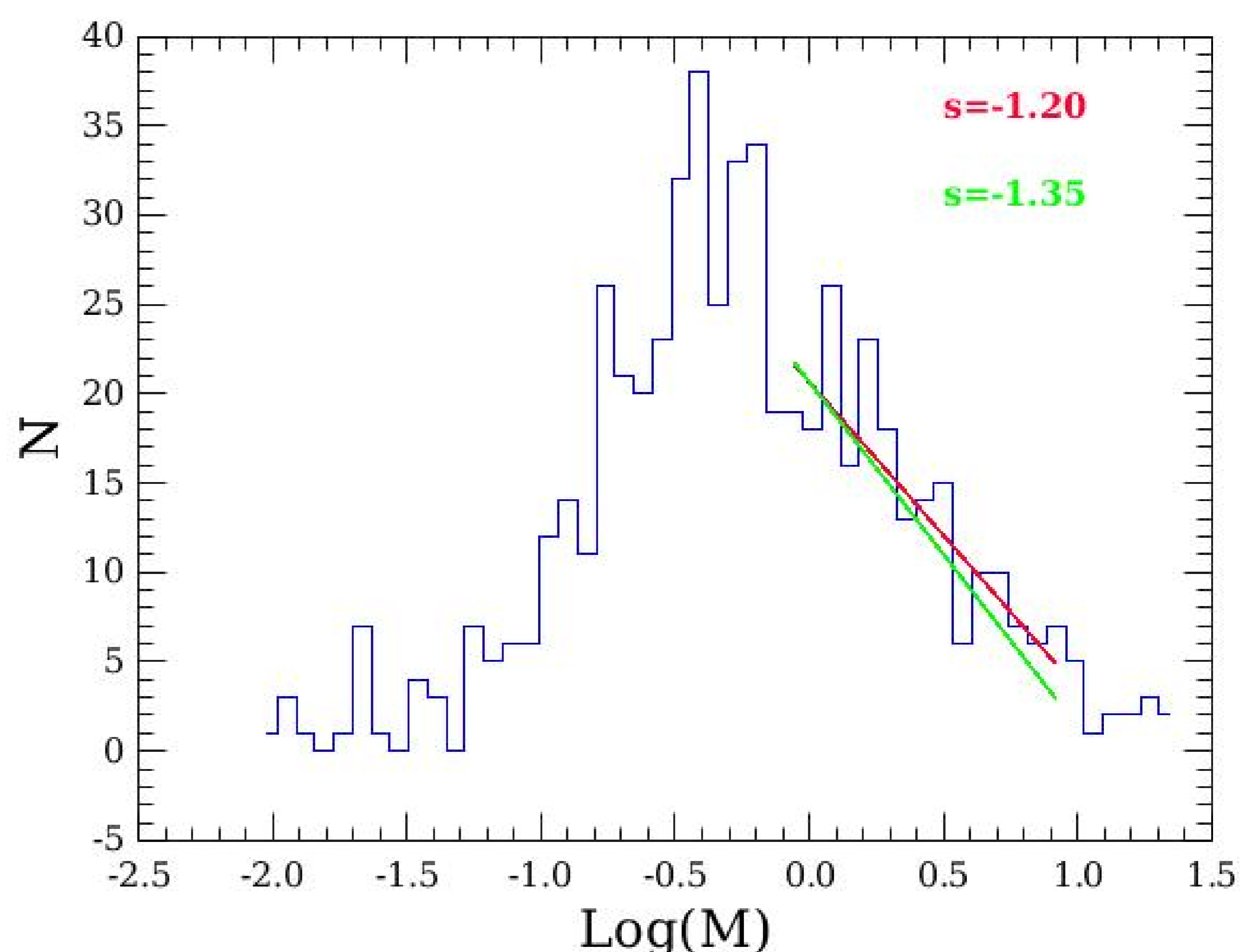
In the figure on the right we show the Core Mass Function (CMF) for the sources having reliable fits (574 or 98.6%); the green line shows the  $dN \propto M^{-1.35}$  Salpeter law, the red line shows our result for Serpens region:  $dN \propto M^{-1.20}$ .

**4.**

A full discussion of the cores physical properties as well as of the whole region is under preparation (expected March 2018). The numbers reported in this poster may change (few checks remain to be done) but the overall picture should not.

If interested in the flux densities or in the physical properties of some sources, please contact the author.

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