Unveiling a new low-mass star formation site in NGC 1333 with SCUBA

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The Perseus Molecular Cloud is one of the most active star formation regions in the solar vicinity, therefore this region represents a suitable target for a study of protostars. Continuum submillimetre observations of star formation regions can detect dust thermal emission of deeply embedded objects. Such observations are now starting to reveal more detailed structure, including clumps, extended emission, and knots.

Within the framework of our survey of current star formation in the Perseus and Orion molecular clouds, made at 850 and 450 mμ with SCUBA at the JCMT (Rengel, Hodapp & Eislöffel, 2005, A&A submitted; Rengel, 2004, Ph.D. thesis), we have unveiled a new subset of knots in the southern part of the NGC 1333 star formation region, NGC 1333 S.

Our complete map of the NGC 1333 S region (Fig. 1) shows additional extended emission and additional emission knots to the south west of the knots discussed by Young et al., 2003, ApJS 145, 111, or by Hodapp et al., 2005, AJ 129, 1580. These newly identified structures, which we name knots SW1, SW2, and SW3, roughly double the size and number of identified knots known in NGC 1333 S. They strengthen the tentative conclusion reached by Hodapp et al., 2005, AJ 129, 1580, that NGC 1333 S is the site of secondary, low mass star formation triggered by the powerful IRAS 1-9 protostars about 1 pc north of this region. While two of the knots in NGC 1333 S are associated with outflows and near-infrared sources and therefore are clearly in the star-forming phase, the other knots do not show such signs of activity and are therefore believed to be pre-stellar.

This discovery provides useful insights into the way stars may form in embedded systems.

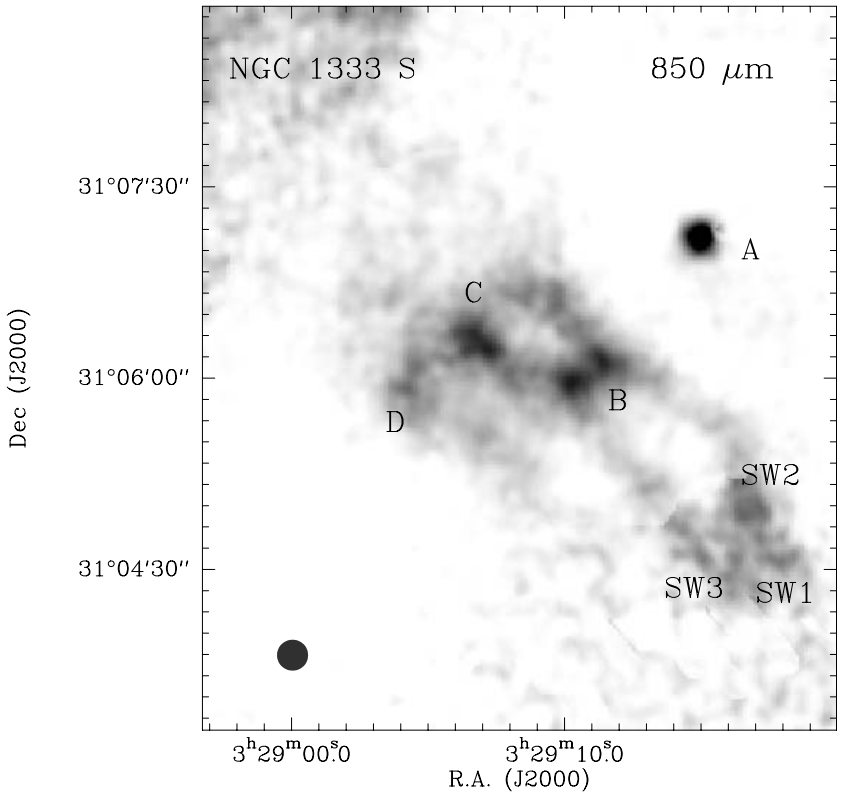

Figure 1: The NGC 1333 S deep field map at 850 μm.