**The target**

The target of our research is NGC 281, an active star-forming nebulosity about 9200 light-years away in the constellation Cassiopeia with several (how many? reference) molecular clouds and an HII region containing the galactic cluster IC 1590 centered about the OB trapezium system HD5005 (Guetter 1997). The young cluster IC 1590 contains several very hot, massive stars which appear to produce large amounts of UV radiation and blow strong stellar winds (reference). The winds from the OB stars are believed to ionize the molecular gas in the nebulosity and photoevaporate the clouds forming the HII region (Roger & Pedlar 1981). The UV radiation and stellar winds from the trapezium may very well be triggering star formation in the molecular clouds in NGC 281 (Megeath 1997).

**Evidence for the existence of young stars**

Embedded in NGC281 is IC 1590 a young, galactic cluster with 63 identified probable members. It is a very young cluster— approximately 3.5 x 106 years old. Twenty-two of the 63 stars are identified as pre-main sequence and show evidence of gravitational contraction (Guetter & Turner 1997). This facts further supports the evidence for the extreme youth of the cluster and its central trapezium system, HD 5005 which has four fairly hot, young main sequence OB stars.

Color-magnitude diagrams of IC 1590 indicate main sequence stars of spectral types O6.5 to B9.5. The pre-main sequence stars detected in IC 1590 have very little variability indicating spectral types ranging from A8/9 to G8. Guetter & Turner (1997) suggest that a survey of the nearby class 0, I, II and III embedded protostars should reveal “cluster members of that type.” Indeed, Guetter and Turner suggest that “…much information related to the star formation process could be obtained by imaging the field to fainter magnitude limits.” Hershel data should provide the ability to analyze the class 0, I, and II protostars embedded in the molecular clouds of NGC281.

**Evidence for triggering star formation**

The Megeath *et al.*(1997) radio and near-infrared studies of the 3 clumps in the nebulosity of NGC 281 West near the HII/molecular cloud interface provided a deduction of the kinematic behavior in the clumps in the molecular cloud. These studies indicated that the kinetic and gravitational energy of the clumps appear to be approximately equal indicating that the clumps are not strongly gravitationally bound. This indicates that some other mechanism is confining the clumps. Megeath *et al.* suggest that the confinement of the clumps may be provided by external pressure (possibly from photoionized gas at the clump surface) or shock compression.

VLA 20 cm imaging by Megeath *et al.* (1997) of the clumps in NGC 281 West indicates emission from ionized gases at the northern edge of each of the three clumps. This supports the proposal that all three clumps are exposed to the UV radiation from the O-type stars in the HD5005 trapezium.

The clumps in NGC 281 West exhibit complex kinematical structures which may be the result of shocks. Megeath *et al.* find that the observed velocity structures in the clumps can be explained and are consistent with models of radiation driven implosions.

K’ band imaging of the northern and southern clumps in NGC 281 West shows an asymmetry in the distribution of the low mass stars in these clumps. There is a large concentration of stars near the northern edge of the NE and NW clumps and very few stars on the southern edges of the clumps. Megeath *et al.* suggest that since the stars in the NW and NE clumps are concentrated on the edges of the clumps facing the OB group (HD 5005 trapezium), it is “…likely that the asymmetrical distribution of stars is the results of photoionization of the clumps.” Evidence of ongoing shocks in the clumps suggest that shock triggered star formation is the best explanation for asymmetry in star distribution in the clumps.