

# Induced Star-Formation In Interacting Galaxy Pairs



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Star-formation (SF) enhancement is known to be found in interacting systems (Larson & Tinsley 1978). Usually SF efficiency increases as separation between merger nuclei decreases (Gao & Solomon 1999). It has also been found that the starburst (SB) phase in interacting galaxies occurs at a late stage of merging and that it is confined to the central kpc (Kennicutt etal. 1987; Nikolic, Cullen & Alexander 2004).

**However**, some systems have been found to be harboring important SF during what seems to be the early stages of the interaction, or at least when both galaxies are easily distinguished

## <u>The Luminous Infrared Galaxy Pair Arp 240</u>



SA(s)b:pec; HILLINER b + SAB(s)b pec HILLIRG b  $L_{FIR}$  = 1.5 x 10<sup>11</sup> Lo (Dopita et al 2002)  $\rightarrow$  LIR galaxies SFR= 27.8 & 24.9 Mo/yr (Iono et al 2005)

 $\rightarrow$  Starburst galaxies

What could be driving this enhanced SF?

How frequent are these episodes?

How significant are they in the evolution of interacting galaxies?

#### **Star-forming activity in outer parts of galaxies**

Fig 1.- SDSS color image of Arp 240 (NGC 5257/58). Strong SF can be seen in the arms, while almost none is seen in the central parts of the galaxies.

## <u>Hα velocity fields</u>



## **Non-circular velocities**



### **Preliminary Results** (Fuentes-Carrera et al. -in preparation)

Both velocity fields (radial and residual) as well as the FWHM map indicate important SF along the arms of both galaxies.

For the residual velocity maps, points where Vres  $\sim$  0 km/s correspond to regions in the galaxy where circular motions predominate. For points where Vres >> 0 km/s or V res << 0 km/s, non-circular motions might be present. For NGC 5257, positive residual velocities are seen in the south-central part of the galaxy; high values are seen on the eastern arm of the galaxy associated with the presence of a large HII region. For the western arm, negative values follow the distribution of the H $\alpha$  emission. Negative values are also seen on the tip of this arm. For NGC 5258, large positive residual velocities are seen at the location of the intense HII region. Negative residual velocities are seen on the southern tip of the galaxy.

Large FWHM values in NGC 5257 are seen along both spiral arms For the eastern arm, the highest values match the location an HII region. High values are seen along the western spiral arm, matching the location of the H $\alpha$  maxima, as well as on the tip of this arm coinciding with the beginning of the tidal arm. For NGC 5258, large values are seen on the southwestern side of the galaxy matching the location of the largest HII region of this galaxy.

#### References

Fuentes-Carrera et al. 2004, A&A, 415, 451; Kennicutt et al. 1987, AJ, 93, 1011; Larson, B. & Tinsley, R. 1978, ApJ, 219, 46; Nikolic, Cullen & Alexander 2004, MNRAS, 355, 874; Rosado et al. 1995, RevMexAA, (Serie de Conferencias), 03, 263

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