The Herschel view of the LMC

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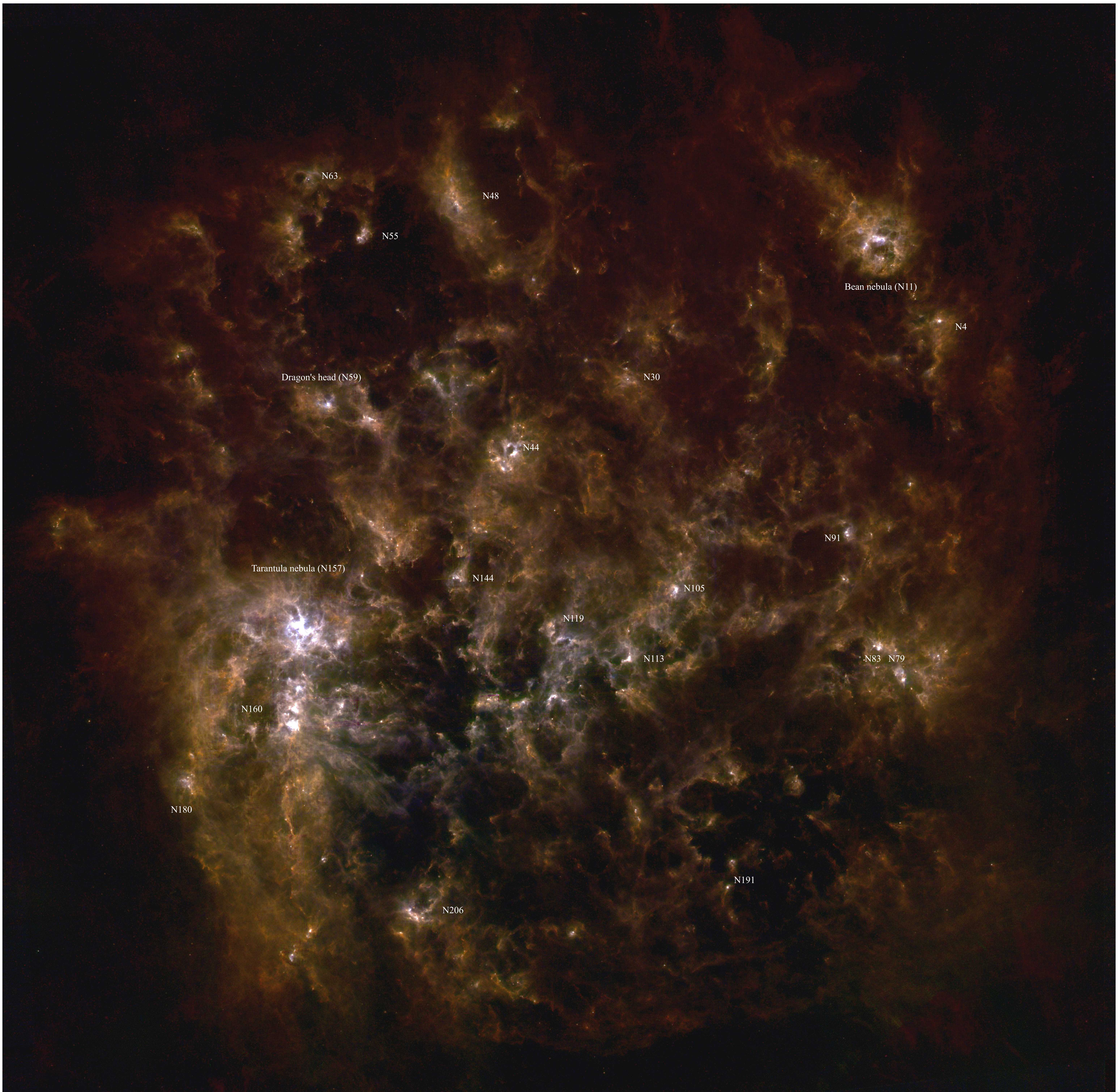
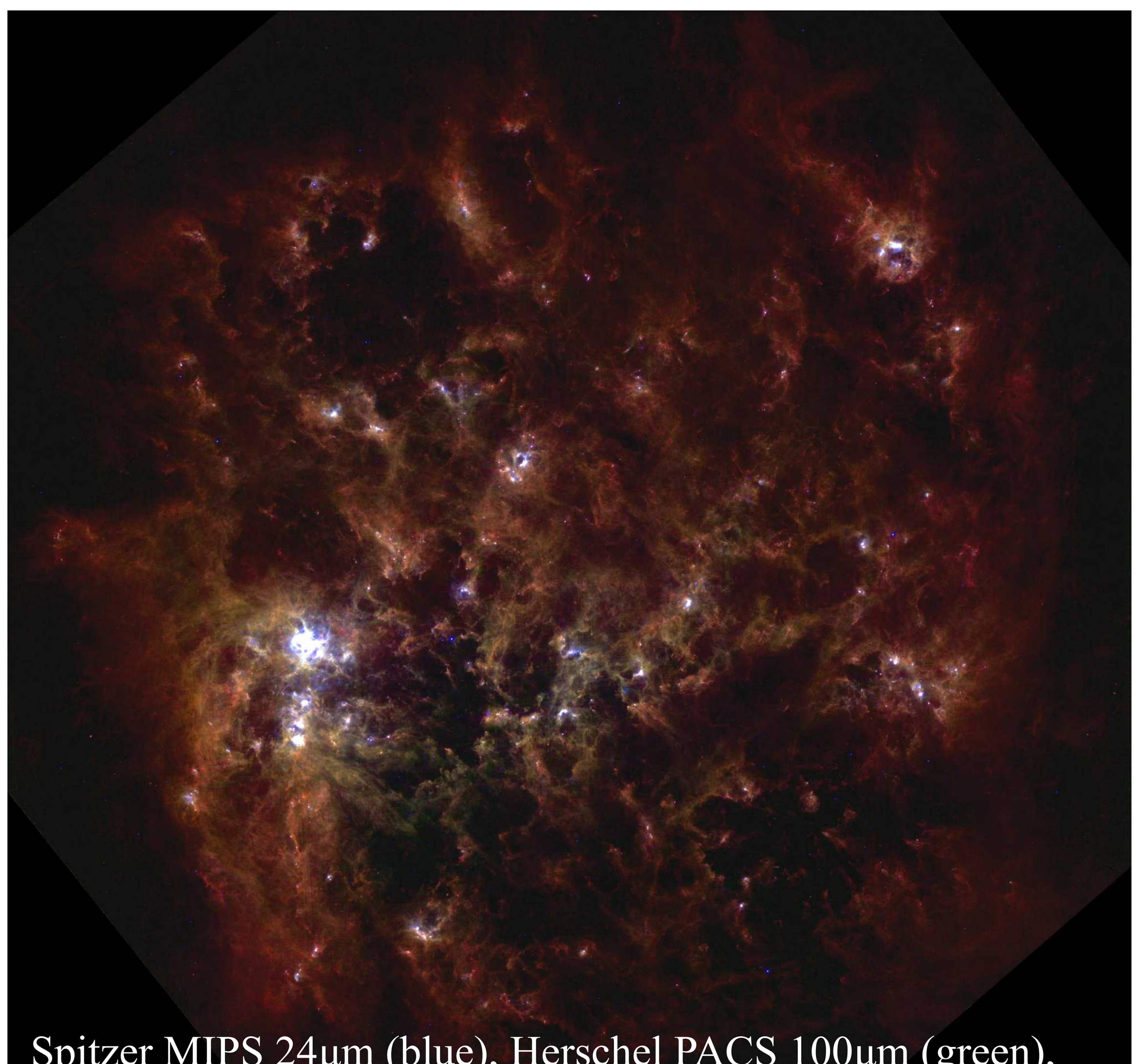
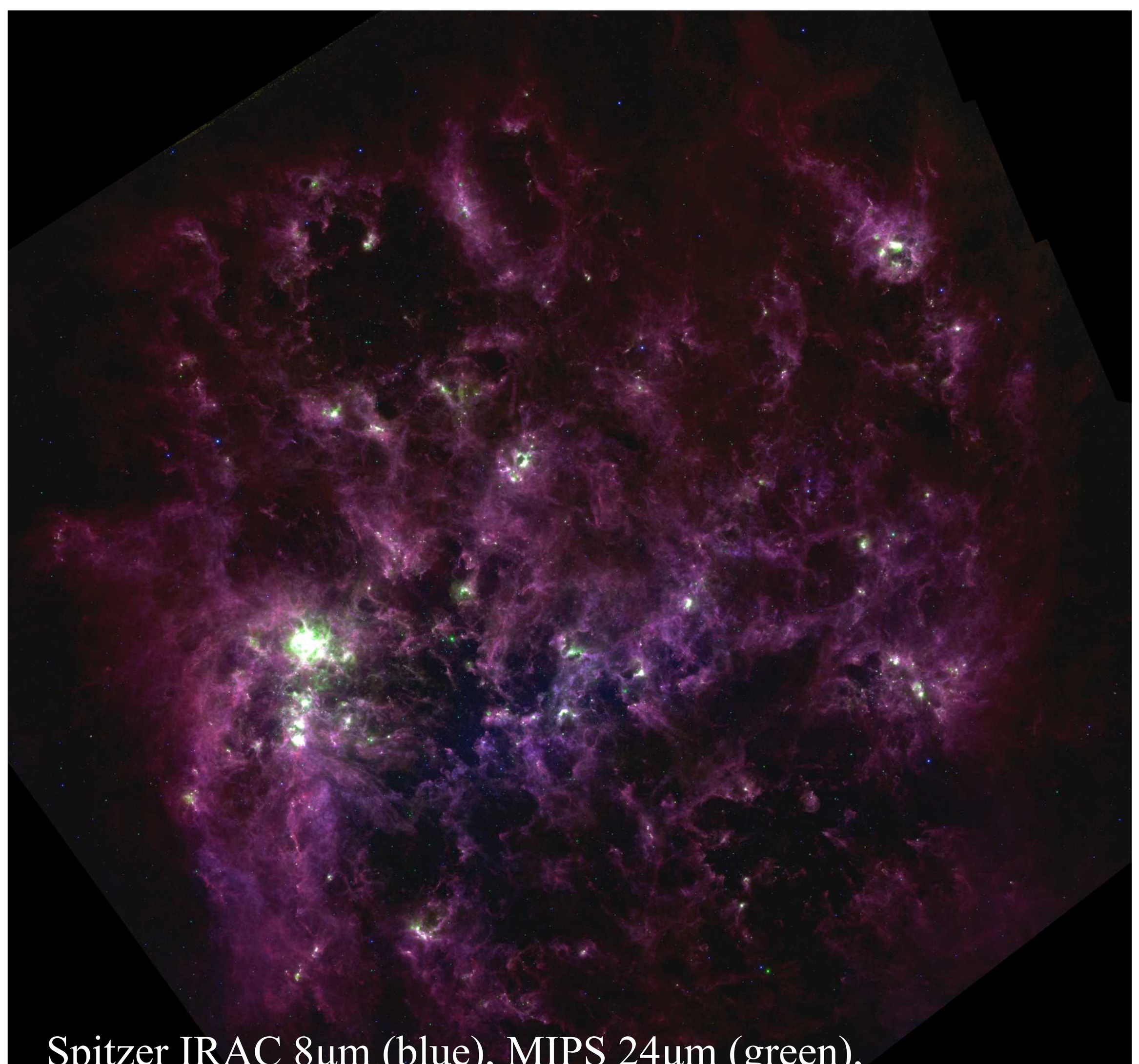


Herschel PACS 100µm (blue), 160µm (green), SPIRE 250µm (red)



Spitzer MIPS 24µm (blue), Herschel PACS 100µm (green), SPIRE 250µm (red)



Spitzer IRAC 8µm (blue), MIPS 24µm (green), Herschel SPIRE 250µm (red)

■ We present the spectacular images obtained by the **HERschel Inventory of The Agents of Galaxy Evolution (HERITAGE)** program (PI: M. Meixner, STScI) observing the Large and Small Magellanic Clouds with the ESA *Herschel Space Observatory.*

■ The HERITAGE program aims to provide key insights into the life cycle of the interstellar medium, the mass census and the characteristics of the coldest ISM dust, the star formation activity and its feedback, the massive embedded young stellar objects.

■ The LMC and SMC were observed with the *Herschel* SPIRE and PACS instruments in parallel mode in 5 bands: PACS 100 and 160 µm and SPIRE 250, 350 and 500 µm. To cover the 8.5° x 8.5° of the LMC, *Herschel* spent 160.9 hours (plus 17.8 hours in the Science Demostration Phase), while the 5° x 9° of the SMC and the Magellanic Bridge where covered in 73.9 hours.

■ The processing of HERITAGE data is challenging due to the extension of the mapped areas and the presence of extended emission. The main difficulty is a proper correction of the detectors drifts. The observations were planned so that each scan line starts and ends in "empty" sky thus a first order baseline can be estimated from the edges of scan lines and subtracted from detector signals. Each cloud was then observed in two epochs, scanning in perpendicular directions.

■ Here we summarize the processing of PACS data detailed in another poster by J. Roman-Duval. After bad/saturated pixels masking, flat field correction and photometric calibration executed with the standard PACS pipeline, the first order baseline was estimated from the edges of scan lines and subtracted from detector signals. After a multi-resolution median transform deglitching, the baseline drift was then more thoroughly estimated and removed using a custom algorithm on the base of IRAS 100 µm and MIPS 160 µm data for the PACS 100 µm and 160 µm bands respectively. In addition, in the PACS 100 µm band, a second level deglitching was applied. This band was found to also being affected by long-timescale glitches which were corrected with a custom algorithm. The baseline corrected PACS timelines were projected on two-dimensional maps using the standard projection software in HIPE. Finally, the astrometry was improved by cross-correlating point sources identified in the PACS and MIPS 24 µm maps.

■ The SPIRE data processing was performed with the standard pipeline, with the addition of a custom algorithm developed to correct the residual drift affecting scans lines executed when the cooler temperature is not stable. As in PACS, a first order baseline was estimated from the edges of scan lines and subtracted from detectors signals. No further baseline correction was needed thanks to the lower 1/f noise of SPIRE detectors and the temperature drift correction implemented in the pipeline. Finally, the astrometry was improved using the same procedure used for PACS.

■ The 3-colours images were produced from *Herschel* data of the HERITAGE program and *Spitzer* data of the SAGE programs (SAGE-LMC, M. Meixner; SAGE-SMC, K. Gordon) using the STIFF and SWARP software (www.astromatic.net).