HERSczel Inventory of The Agents of Galaxy Evolution (HERITAGE) in the Magellanic Clouds

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**Summary:** We will perform a uniform survey of the Large Magellanic Cloud (LMC, 8x8.5 degrees), Small Magellanic Cloud (SMC, 5x5 degrees), and the Magellanic bridge (4x3 degrees) in SPIRE 250, 350, 500 microns and PACS 100 and 160 microns bands in order to produce a HERSczel Inventory of The Agents of Galaxy Evolution (HERITAGE), the interstellar medium (ISM) and massive stars. HERITAGE images will provide key insights into the life cycle of galaxies because the far-infrared and submm emission from dust grains is an effective tracer of the coldest ISM dust, the most deeply embedded young stellar objects (YSOs), and the dust ejected over the lifetime of massive stars. The ISM dust map will directly measure dust on a scale size of individual regions (~10pc, ~5-20 K) with column densities >0.85x10^11 and >6x10^11 H atoms cm^-2 for the LMC and SMC, respectively. Dust emission per beam will be detected for regions with >0.1 Msun at ~25 K, >5 Msun of 10 K. HERITAGE will complete 1) the census of massive YSOs down to >4 Msun Class 0 sources and 2) the inventory of dust injected into the ISM by massive evolved stars and supernova remnants (SNRs). The variation in dust properties discerned from the dust maps of SNRs will quantify the effect of shocks on the interstellar grain size distribution. HERITAGE will create an archival data set that promises a lasting legacy to match current LMC and SMC surveys at other wavelengths. HERITAGE will bridge the gap between Herschel studies of the Milky Way and those of nearby galaxies and provide a template for high red shift galaxies.

**Go Herschel!**

The Spectral Energy Distributions (SEDs) of the entire LMC, based on data from Spitzer, IRAS and FIRAS (Bernard et al. 2007), and SMC, based on data from Spitzer, IRAS (Leroy et al. 2007) and DIRBE (Stanimirovic et al. 2000). SEDs are fitted with the dusty PDR model of Garalla et al. (2008). Also shown are the main cooling lines of [CII] (144 micron), [OIII] and [OIII] (158 micron, [NII] 122 micron) that would probe the warm neutral medium in the Magellanic Clouds.

**Comparison of a star formation region in the SMC bar with MIPS 160 microns and a simulated PACS 170 microns.**