R37a Visible and Hidden Star Formation and Dust Extinction in the Universe

○竹内 努 (名古屋大)、Véronique Buat、Denis Burgarella (LAM)、Jorge Iglesias-Páramo (Instituto de Astrofísica de Andalucía)

We select far-infrared (60 μm) and far-ultraviolet (1530 Å) samples of nearby galaxies in order to discuss the biases encountered by monochromatic surveys (FIR or FUV). Very different volumes are sampled by each selection, and we must be very careful to apply volume corrections in all the analyses. The distributions of the total luminosity of young stars are compared for both samples: they are found to be consistent with each other for galaxies of intermediate luminosities but some differences are found for high ($> 5 \times 10^{10} L_{\odot}$) luminosities. The shallowness of the *IRAS* survey prevents from a secure comparison at low luminosities ($< 2 \times 10^{9} L_{\odot}$). The ratio of the total IR luminosity to the FUV one is found to increase with the bolometric luminosity in a similar way for both samples up to $5 \times 10^{10} L_{\odot}$. Brighter galaxies are found to have a different behavior according to their selection: the $L_{\rm TIR}/L_{\rm FUV}$ ratio of the FUV selected galaxies brighter than $5 \times 10^{10} L_{\odot}$ reaches a plateau whereas $L_{\rm TIR}/L_{\rm FUV}$ continues to increase with the luminosity of bright galaxies selected in FIR. The volume averaged specific star formation rate (SFR per unit galaxy stellar mass, SSFR) is found to decrease toward massive galaxies within each selection. The SSFR is found larger than that measured for optical and NIR selected sample for the whole mass range for the FIR selection and for masses larger than 10^{10} $M_{\odot}$ for the FUV selection. Luminous and massive galaxies selected in FIR appear as active as galaxies with similar characteristics detected at $z \sim 0.7$. We also present the first results from a parallel analysis at $z \sim 0.7$.