

Local starbursts seen when the Universe was 2–4 Gyr old

S. M. Petty,^{1,2} D. F. de Mello,^{1,2,3} J. P. Gardner² and J. S. Gallagher⁴

¹The Catholic University of America, Washington, DC, USA

²NASA/Goddard Space Flight Center, Greenbelt, MD, USA

³The Johns Hopkins University, Baltimore, MD, USA

⁴University of Wisconsin, Madison, WI, USA

Abstract. We explore the multiwavelength properties of three nearby starburst galaxies: NGC 3079, NGC 7673, and Mrk 08. We established that each of these galaxies has similar rest-frame far-ultraviolet (FUV) morphologies as Lyman-break galaxies (LBGs) at $z \sim 1.5$ and 4, when the age of the Universe was ~ 4.3 and ~ 1.6 Gyr, respectively. LBGs are at an important stage in galaxy evolution when the Universe had a peak in the star-formation-rate density. Many LBGs are primarily composed of star-forming clumps, i.e., stellar clusters, with a significant lack of older stellar populations. Here, we present the comparison of the spectral-energy distributions (SEDs) of three nearby starburst galaxies with those of typical LBGs. From our nearby sample, each object has been artificially redshifted to observe what the galaxies would look like at $z \sim 1$ to 4 in the rest-frame FUV. NGC 3079 is an edge-on Seyfert 2 galaxy. It has a bright bulge and is interacting with two other galaxies, with extended HI only along NGC 3079. The redshifting process changes its appearance, so that at high z it looks like a chain galaxy with multiple knots of star formation and no bulge. NGC 7673 has extended HI and the star formation is mostly within the inner optical region in the multiple star-forming clumps defining the galaxy morphology. In the FUV, the galaxy looks highly compact with little detail resolved. As it is artificially redshifted, the galaxy continues to look more spherical. Mrk 8 is a merging pair, with the two galaxies observable in the visible spectrum. It is classified as a Wolf–Rayet galaxy, which suggests a very young burst, and is composed of several large star-forming regions. The FUV image does not resolve the separate galaxies, and the appearance remains similar for each redshift. We use the Gini coefficient, M_{20} , and the Sérsic index to quantify the morphologies. The SEDs of the objects have similarities with LBG stellar population models. Because these local galaxies can be studied in more detail, they act as a bridge between nearby observations of starburst galaxies and high- z starburst galaxies such as LBGs.

Keywords. galaxies: individual (Mrk 8, NGC 3079, NGC 7673), galaxies: starburst, galaxies: evolution

The full poster (in pdf format) is available at
<http://www.astro.iag.usp.br/~iaus266/Posters/pPetty.pdf>.