The diffuse supernovae neutrino background (DSNB) is the flux of antineutrinos and neutrinos produced by core-collapse supernovae explosions (CCSNe), and CCSNe occur at the end of a massive star’s life. In order to learn more about rates at which CCSNe happen, physicists can study the birth rate since these two rates are nearly the same when looking from the cosmology timescale. The birth rate is known as the star formation rate (SFR) in the units of $M_\odot\,yr^{-1}\,Mpc^{-3}$. Studying the SFR can help predict where to detect neutrinos in the DSNB, in which can help uncover details of many physics and astrophysics phenomena such as the cosmic history of stellar birth and death, production of chemical elements essential to life, and provide more information on neutron stars and blackholes.

### Table 1

<table>
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<td>Calafuri et al. 2012</td>
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<td>Licitra et al. 2017</td>
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</table>

**Fig. 1** - SN1987A

Around 20 neutrinos were detected in 1978 from Earth of nearby SN.

**Fig. 2** - In order to detect more neutrinos physicists have to look further into the universe because SN explosions happen at a greater rate. This requires very large and no background detectors.

In order to study the SFR, we created a database of around 200 current SFRs at low redshifts ($z$) to quantify and study their systematic trends. As seen in table 1 and 2, information such as redshift, SFR density measurements, statistical and systematic errors, active galactic nuclei (AGN) contamination, type of indicator, extinction methods, standard calibration methods and cosmology assumptions were recorded along with the hyperlink to each of the articles.

### Table 2 - Database

The database has 46 different sources total and is all current data only going as far back at 2006.

<table>
<thead>
<tr>
<th>AGN Type</th>
<th>Indicator</th>
<th>Extinction Method</th>
<th>Std. Calibration</th>
<th>Cosmology Assumption</th>
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<tr>
<td>X-ray</td>
<td>UV-FR</td>
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</table>

**Fig. 3** - All the data from the database un categorized. We can see that the current data is systematically lower than HB06.

**Fig. 4** - Dust Extinction Log Plot, the standard method (black dots) seems to be most consistent with HB06.

**Fig. 5** - Indicator Log Plot, there is no standard indicator chosen but it seems Hα is more consistent with HB06 as well does it have the largest error bars.

**Fig. 6** - IMF Log Plot, Salpeter (1955) and Chabrier (2009) are not much different systematically.

**Fig. 7** - Gold and Silver Data Samples. Gold is systematically consistent with HB06.