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Radio Astronomy: The Baryonic Tully Fisher Relation for Galaxies with Supernova Distances

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We cannot measure things in space directly. Instead, we rely on mathematical relations to manipulate the limited data we can collect. The Baryonic Tully-Fisher Relation is one such relation. This equation says that the baryonic mass of a spiral galaxy is related to its rotational velocity. Unfortunately, the current data supporting the Baryonic Tully Fisher Relation has a lot of scatter. As a result, we are uncertain of the extent of its accuracy. This past summer I worked with the Undergraduate Arecibo Legacy Fast ALFA research team. We are trying to reduce this scatter by observing hydrogen emissions from spiral supernova host galaxies. Supernovae are standard candles, which means that they have a known absolute brightness. Due to this, measurements of the emissions from these galaxies will be extremely precise. This precision hopefully will reduce the scatter. Once this is done, the accuracy of the Baryonic Tully Fisher Relation will be more obvious, and the decision can be made as to whether any revisions should be made to this relation.

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