

# Star-Forming Galaxies as Sources of High Energy Neutrinos

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We discuss the production of high energy neutrinos and gamma-rays in intensely star-forming galaxies. With our semi-analytic physical model of cosmic ray interactions, we analyze the radio and gamma-ray properties of nearby starburst galaxies using simplified astrophysical assumptions. Key physical processes in the models include pion production & decay, inverse Compton scattering, photon-photon interactions, and synchrotron emission. Results for nearby starburst galaxies demonstrate the utility of the model in predicting cosmic ray interaction rates and the subsequent production of energetic particles. These results also establish that even the most extreme star-forming systems are unlikely to be point sources of neutrinos, unless their cosmic ray spectrum flattens at high energies.

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