

# The Disconnect Between Radio and Gamma-Ray Emission in Arp 220

*Tuesday 28 August 2018 18:05 (15 minutes)*

Recent analyses of the gamma-ray flux from Arp 220 have shown that the observed gamma-ray flux is larger than can be accounted for by the measured star formation rate. In contrast, the radio spectra observed for the galaxy's two nuclei are consistent with the observed rate. This indicates an excess of cosmic rays or additional cosmic ray population which produces more gamma-ray emission but not more radio emission. Investigating potential resolutions to this disconnect between the radio and gamma-rays, we find that an optical depth (for infrared emission) greater than unity allows for an increase in the cosmic ray energy injection rate to increase the gamma-ray emission without also increasing the radio emission. Further, our results are consistent with estimates of optical depths at millimeter and submillimeter wavelengths.

**Primary author:** YOAST-HULL, Tova (Canadian Institute for Theoretical Astrophysics)

**Presenter:** YOAST-HULL, Tova (Canadian Institute for Theoretical Astrophysics)

**Session Classification:** Gamma Rays

**Track Classification:** Gamma-rays