

# Understanding the role of morphology and environment on the dynamical evolution of isolated galaxy triplets

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Galaxy triplet are systems composed by three physically bound galaxies, constitute the simplest group of galaxies. To better understand the formation and evolution of these systems, in this project I am developing a statistical study of the morphology, color and dynamic properties of galaxies in 315 isolated triplets, and how the properties relate to their local and large-scale environments.

We find that isolated triplets with higher values of  $R_h$  and  $H_0 t_c$  usually have lower  $Q_{trip}$  this means that the tidal force is not strong by the triplet galaxies. On the other hand, triplets with higher  $Q_{trip}$  show lower values of  $R_h$  and  $H_0 t_c$  where their configurations is a consequence of an ongoing-mergers.

## Dynamical

- Harmonic radius:

$$R_H = \left( \frac{1}{N} \sum R_{ij}^{-1} \right)^{-1}$$

- Dispersion velocity:

$$\sigma_{vr}^2 = \frac{1}{N-1} \sum (v - \langle v \rangle)^2$$

- Virial Mass:

$$M_{vir} = \frac{3 \pi N R_H}{\sqrt{3} \sigma_{vr}}$$

- Crossing Time:

$$H_0 t_c = \frac{H_0 \pi R_H \sigma_{vr}^2}{(N-1) G}$$

## Environment

- Tidal Force:

$$Q = \log \left[ \sum_i \frac{M_i}{M_p} \left( \frac{D_p}{d_i} \right)^3 \right]$$

