

GRAVITATIONAL LENSING

LENS MODELLING II

R. Benton Metcalf
2022-2023

MODELLING GALAXY CLUSTERS

- Galaxy clusters are much more complex than galaxies
- Need to include many mass components
- Many free parameters
- Possibility to have many lensed sources at the same time
- Possibility to use lensing to recover the mass distribution over a large range of distances from the lens center (e.g. combining strong and weak lensing).

FINDING MULTIPLE IMAGES IN A GALAXY CLUSTER

- In order to build a strong lensing model of a galaxy cluster, we must first find **families of multiple images** to use as constraints
- For this, it is very important to have **high resolution imaging data** (at the moment, the only option is **HST**):
 - Images of extended sources typically have **features** that can be identified in the multiple images
 - The **parity** changes help recognising conjugate images
- **Colors** also help separating the lensed sources from the cluster galaxies:
 - Cluster galaxies are typically red elliptical galaxies (but not only)
 - Background galaxies typically have different spectro-morphological types (colors)































