ID de Contribution: **3** Type: **Talk**

Constraining Dark Matter and Shear With Strong Gravitational Lensing

mercredi 8 juin 2022 11:20 (40 minutes)

The cold dark matter (CDM) paradigm makes a prediction of ubiquitous clumps of DM with masses <10^9Msun, which do not form in alternative models of warm or self-interacting DM. Using galaxy-scale strong gravitational lenses, the presence (or lack thereof) of these DM clumps can be inferred by looking for distortions in the lensed source's emission. I present results scanning for DM clumps in HST imaging of over 50 strong lenses, which includes an independent reproduction of a previous detection found in the system SDSSJ0946+1006. Simplifications in the lens galaxy's light and mass models produce false-positive detections of DM clumps and I discuss strategies for mitigating this.To translate these results into constraints on the DM particle I show how properly accounting for scatter in the DM mass-concentration relation significantly improves our ability to distinguish between DM models, by making high concentration low mass DM halos (e.g. <10^9Msun) detectable.

These lens models include an "external"shear term, which is expected to measure the line-of-sight structure surrounding a lens. However, I show that the inferred shear depends on internal assumptions about the lens galaxy's mass and that care is required to distinguish this internal shear from external shear in strong lens samples.

Auteur principal: NIGHTINGALE, James (Durham University)

Orateur: NIGHTINGALE, James (Durham University)

Classification de Session: Sub-haloes and interlopers