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Constraints on dark matter from high-redshift observations

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The number density of small dark matter (DM) halos hosting faint high-redshift galaxies is sensitive to the DM free-streaming properties. However, constraining these DM properties is complicated by degeneracies with the uncertain baryonic physics governing star formation.
We use a flexible astrophysical model and a Bayesian inference framework to analyse ultra-violet (UV) luminosity functions (LFs) at $z = 6 - 8$. We vary the complexity of the astrophysical galaxy model as well as the matter power spectrum (cold DM vs thermal relic warm DM), comparing their Bayesian evidences.
Adopting a conservatively wide prior range for the WDM particle mass, we show that the UV LFs at $z = 6 - 8$ only weakly favour CDM over WDM. We find that particle masses ⊠2 keV are rejected at a 95% credible level in all models that have a WDM-like power spectrum cutoff. This bound should increase to ~ 2.5 keV with the *James Webb Space Telescope (JWST)*.

Is this abstract from experiment?

No

Name of experiment and experimental site

N/A

Is the speaker for that presentation defined?

Yes

Details

Dr. Anton Rudakovskyi, Bogolyubov Institute for Theoretical Physics of the National Academy of Sciences of Ukraine, Ukraine, http://bitp.kiev.ua/news

Internet talk

Yes

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