

Questions on the paper “Investigating the dark matter minispikes with the gamma-ray signal from the halo of M31” by Zi-Qing Xia et al. (arXiv:2108.09204)

For discussion on September 22, 2021

1. What is the evidence that 85% of the mass in the universe is dark matter? [Shyam]
2. Why are WIMPs considered to be a good dark matter candidate? At what time do they exist in the early universe? [Gula]
3. What is the thermal relic cross section? [Yenuel]
4. What limits have been placed on dark matter-regular matter interactions from “direct detection” experiments”? [Brad]
5. Have particle accelerators reached energies capable of producing particles of the masses of the DM particles discussed in this article? [Andrius]
6. What is the mechanism for WIMP annihilation? What are the decay channels? Why are $b\bar{b}$ and $\tau^+\tau^-$ chosen as the annihilation channels of interest? [Joey]
7. How are mini-spikes formed around an IMBH? Have they been detected? How confident are we regarding the MNSP profile adopted in the paper? [Robert]
8. What is the line-of-sight integral? Why does it take the form of Eq. (2.2)? [Justin B]
9. How does the muon $g-2$ measurement relate to the best fit DM mass for the $b\bar{b}$ channel? How does the best fit DM mass for this channel also explain the gamma-ray excess at the Galactic center and the antiproton excess of AMS-02? [Ibrahim]
10. What is the theoretical justification for the NFW profile adopted in this and other studies? [Justin W]
11. How significantly would BH rotation change $\rho_{\text{MNSP}}(r)$? [Joseph]