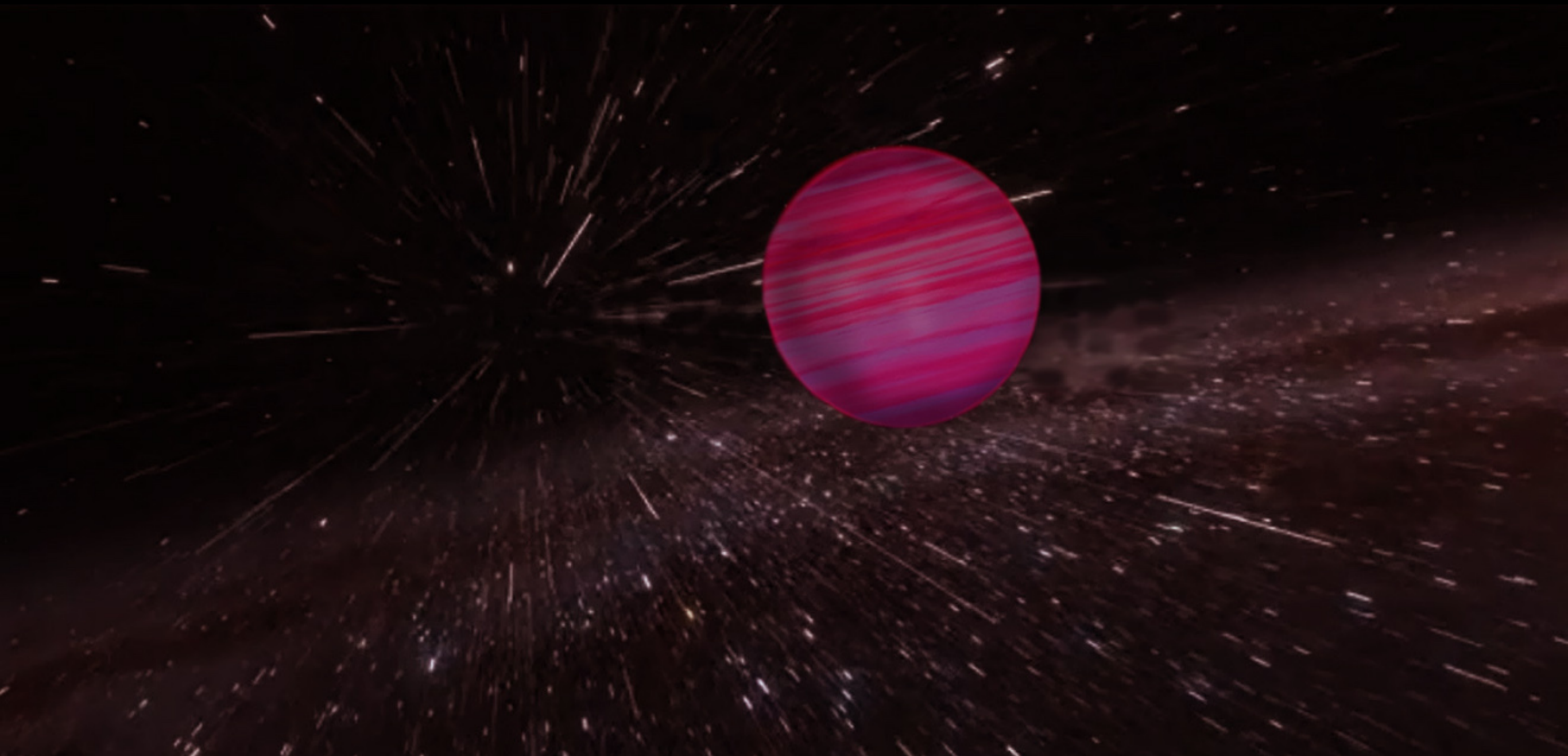


‘Backyard Worlds’ Search for Extreme T Subdwarfs

Aaron Meisner (NSF’s NOIRLab); The Backyard Worlds: Planet 9 Collaboration



artwork of WISEA J155349.96+693355.2 by Backyard Worlds citizen scientist Billy Pendrill

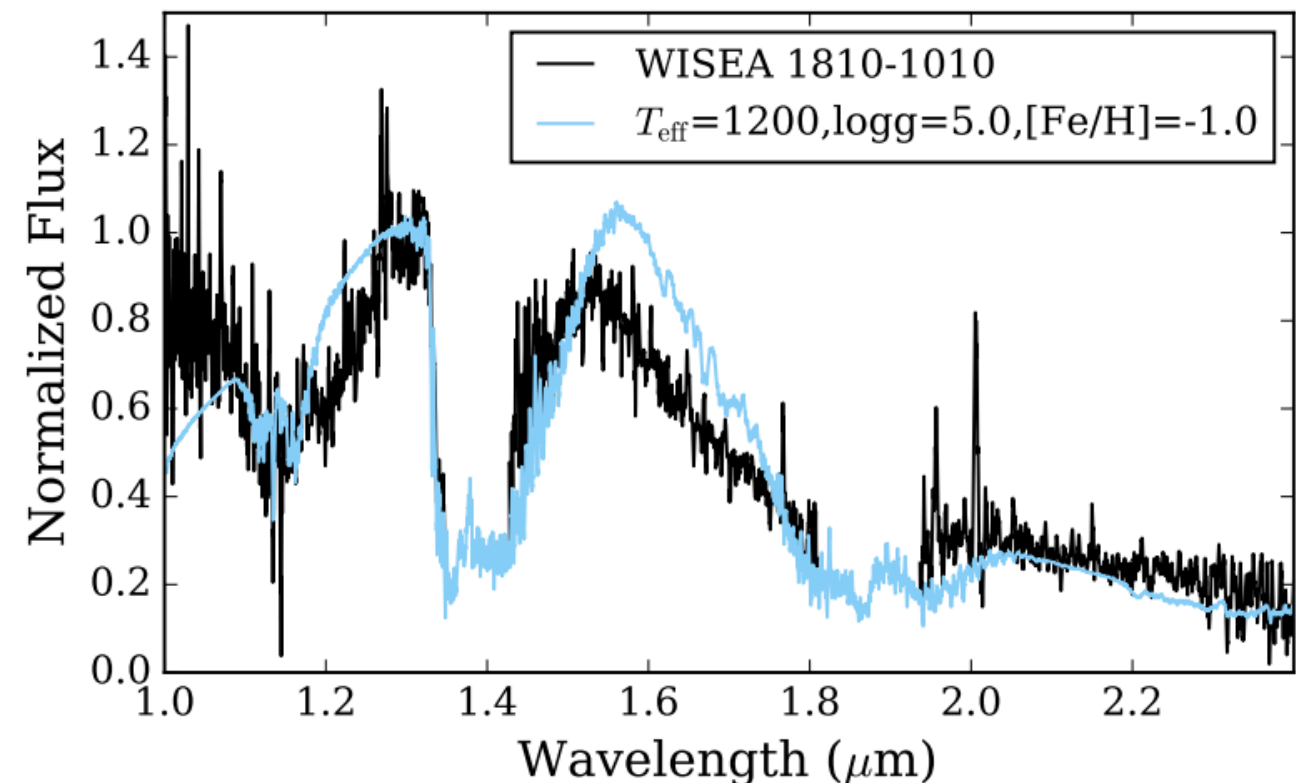
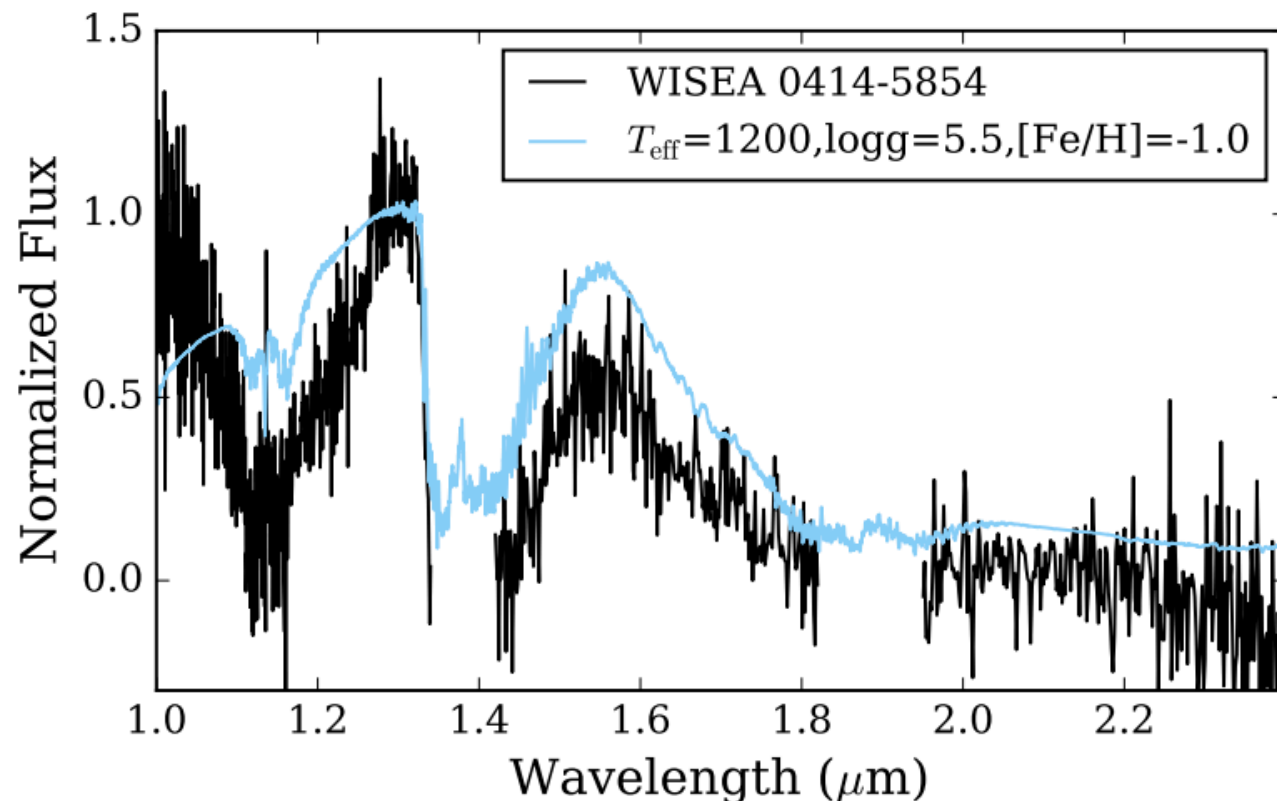
the Backyard Worlds: Planet 9 citizen science project

- launched in February 2017
- more than 100,000 volunteer contributors
- over 7 million classifications
- participants from 167 countries worldwide
- 67,000 registered users
- participants from all 50 US states plus DC and Puerto Rico



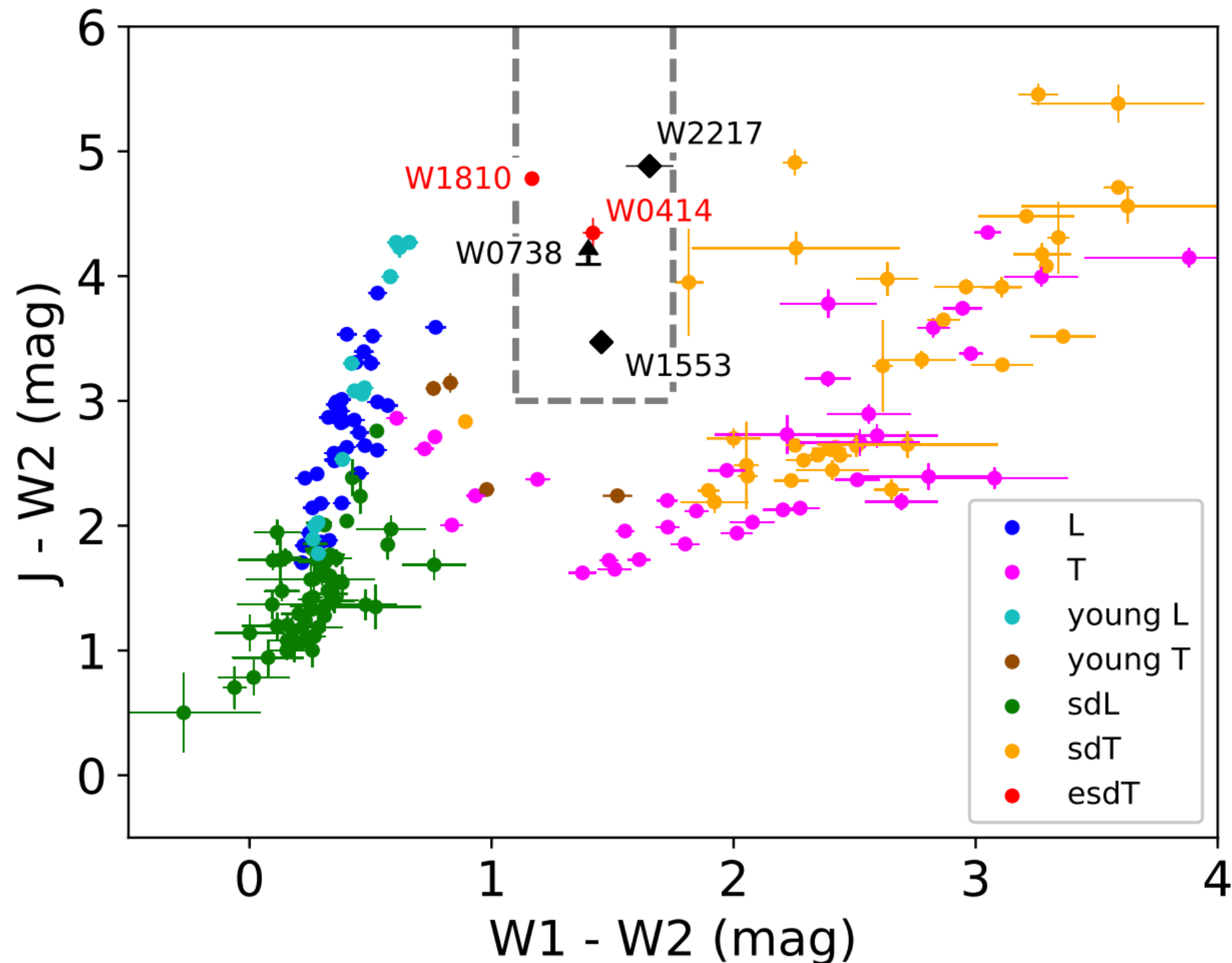
extreme T subdwarfs

- Thought to be ancient and very cold members of the Galactic halo, with $T \leq 1400$ K and $[\text{Fe}/\text{H}] \leq -1$
- First two known examples published last year by Backyard Worlds (Schneider et al. 2020)
- Spectra and colors unlike any other brown dwarfs or low mass stars; not well-reproduced by existing models

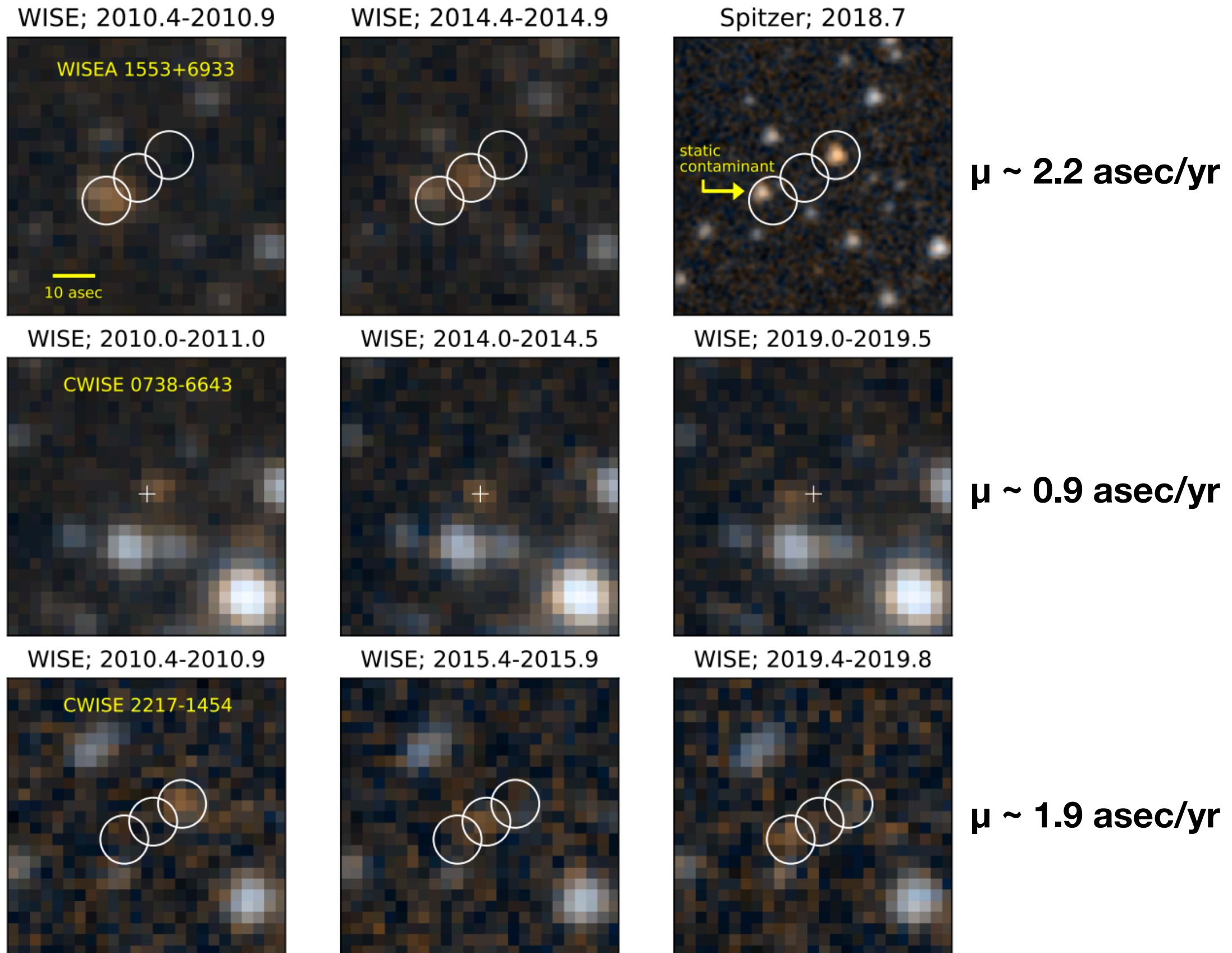


Schneider et al. (2020) - <https://arxiv.org/abs/2007.03836>

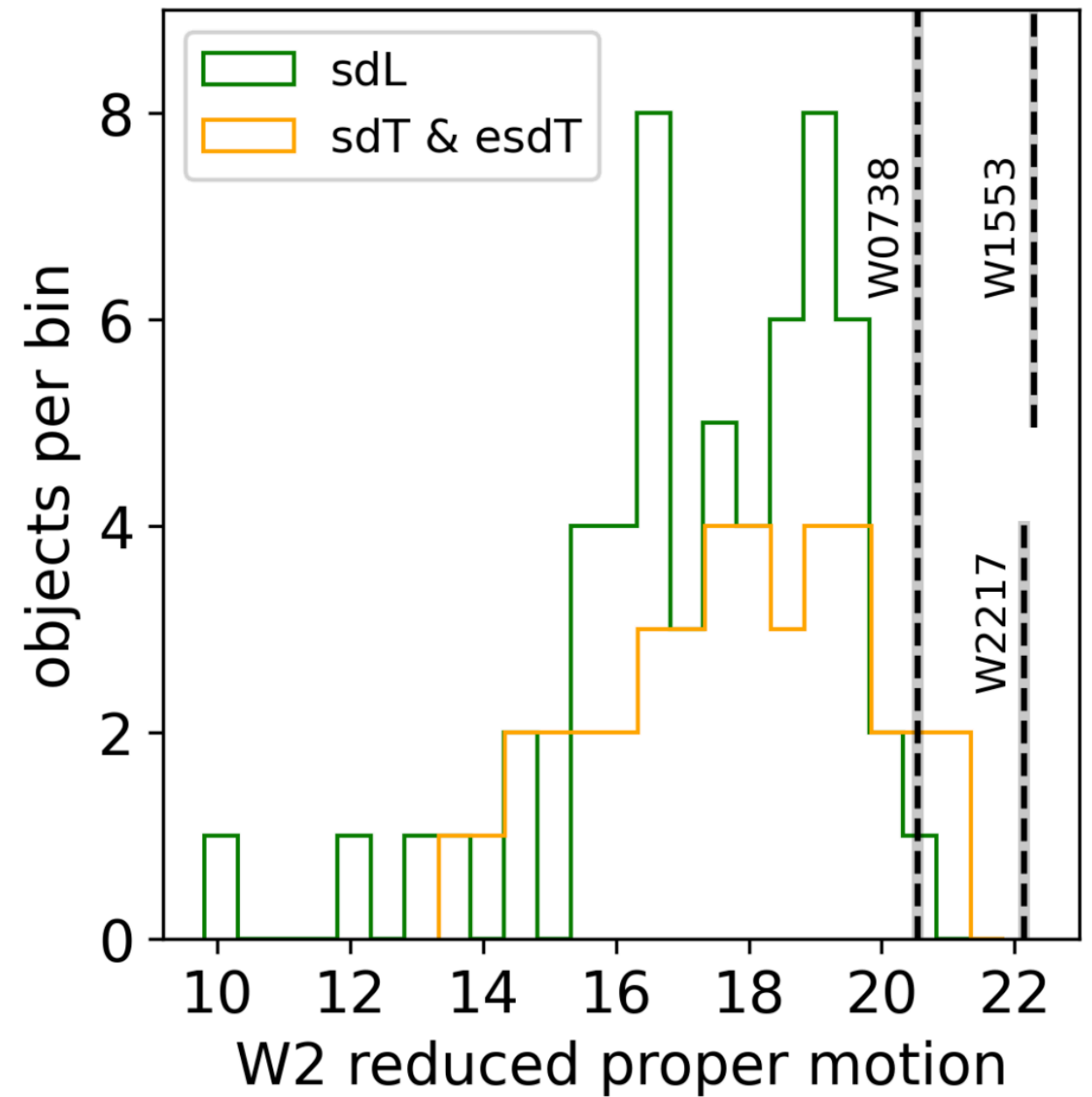
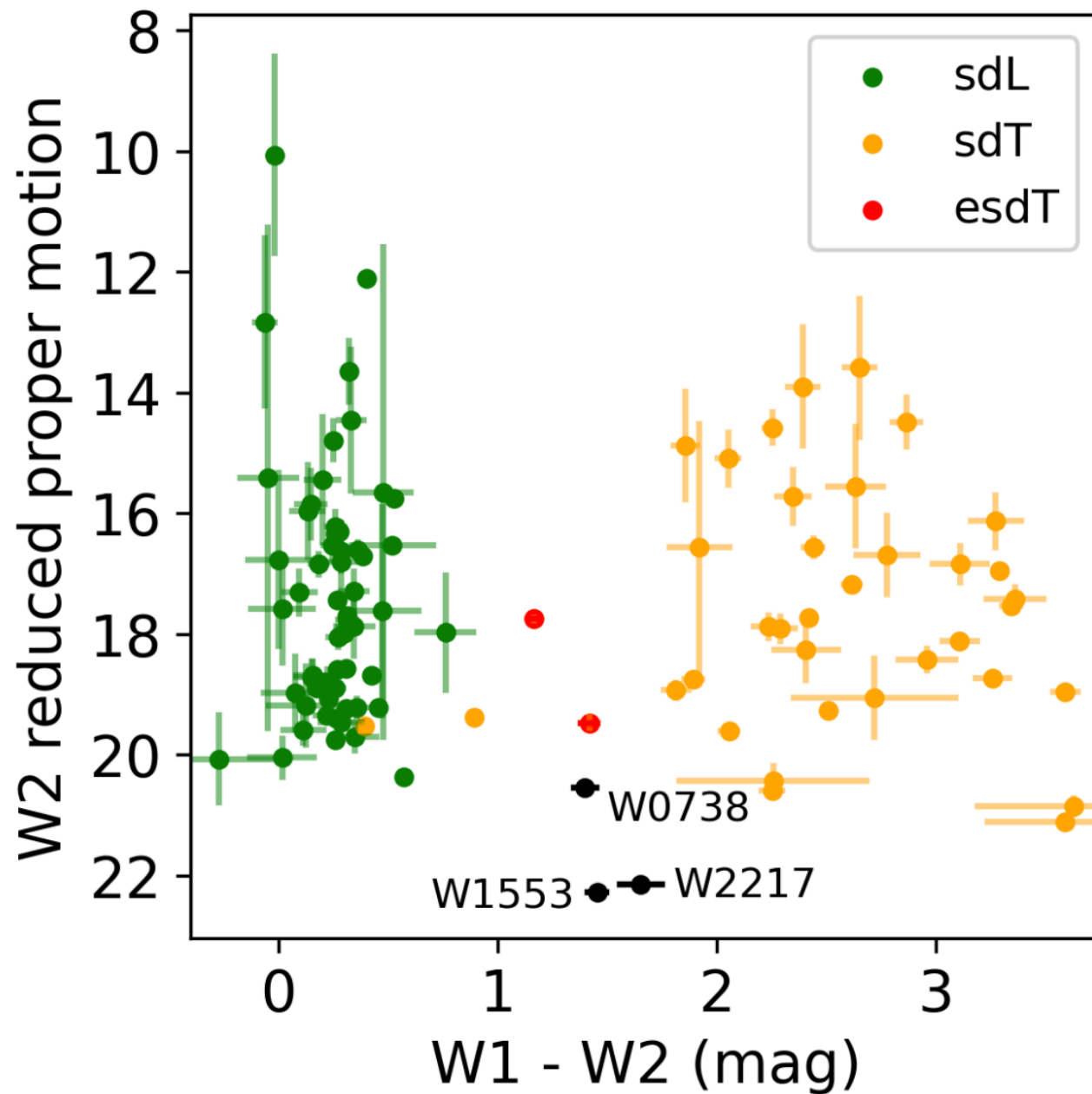
color-color selection: three new esdT candidates



new esdT candidates



new esdT candidates



Backyard Worlds: Cool Neighbors

- We have recently been awarded a NASA “Citizen Science Seed Funding Program” (CSSFP) grant to launch a Backyard Worlds spin-off project targeting T subdwarf and Y dwarf candidates
- Backyard Worlds: Cool Neighbors will launch within roughly a year, and could double the number of known T type subdwarfs

