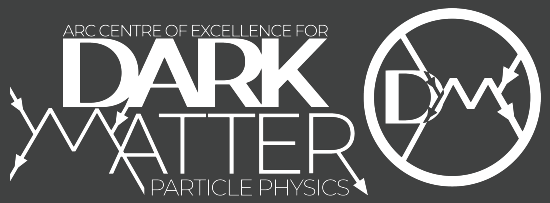
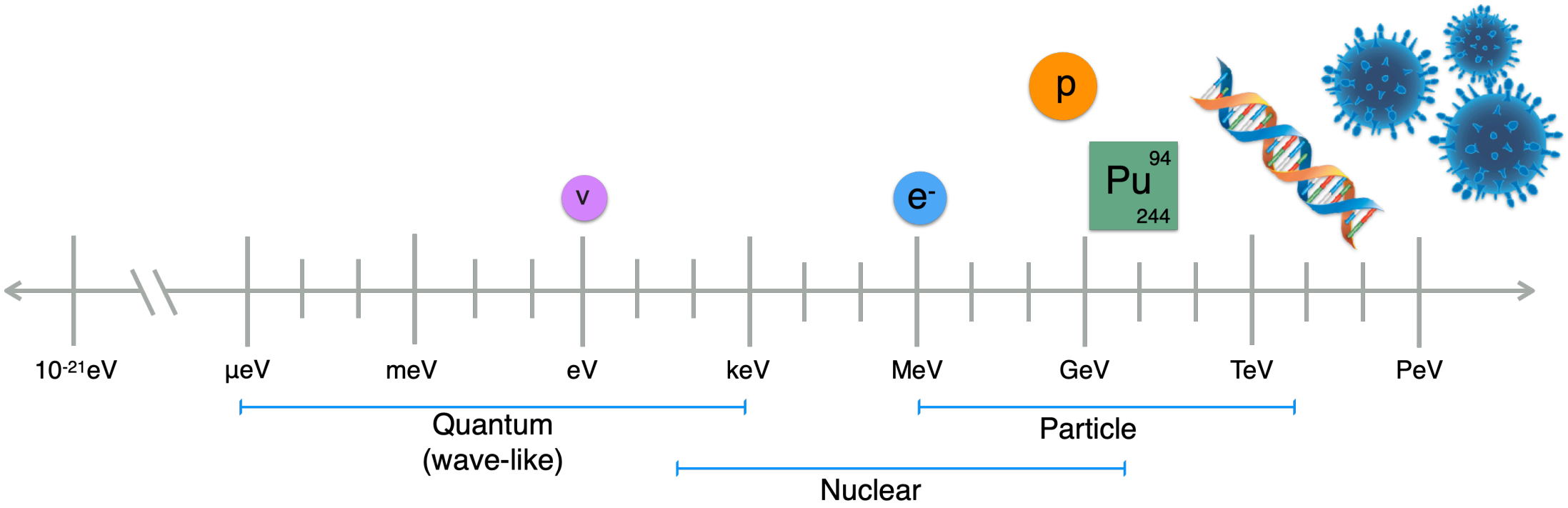


Astro / Simulating DM

Alan Duffy

CDM Annual Workshop, November 27th 2020

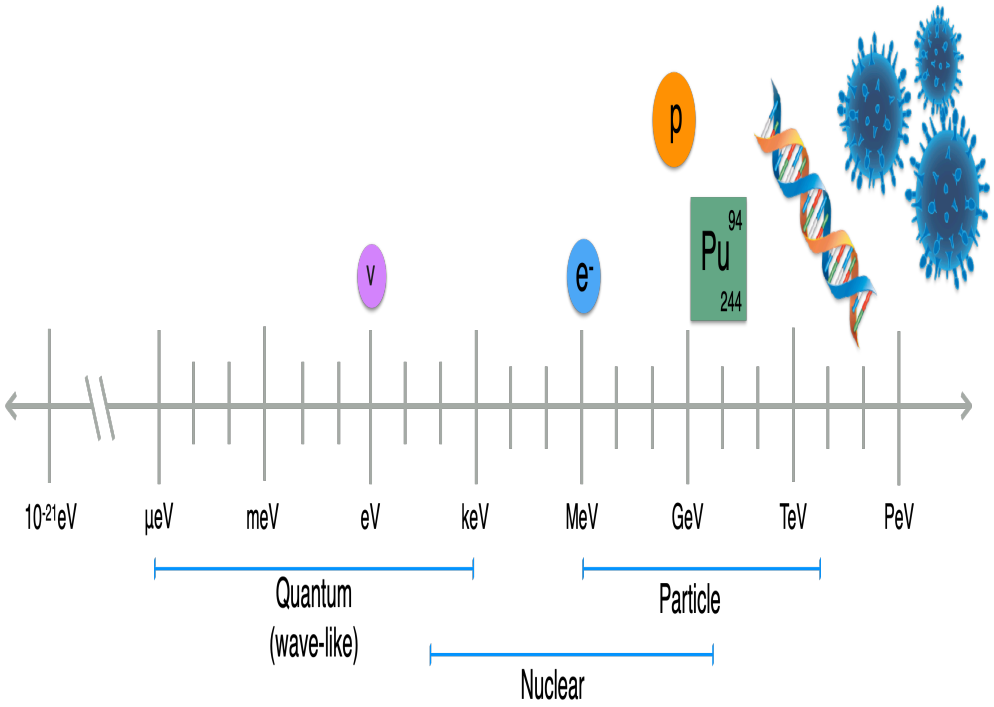
Mass Range



ARC CENTRE OF EXCELLENCE FOR DARK MATTER PARTICLE PHYSICS

Credit: Elisabetta Barberio

Mass Range



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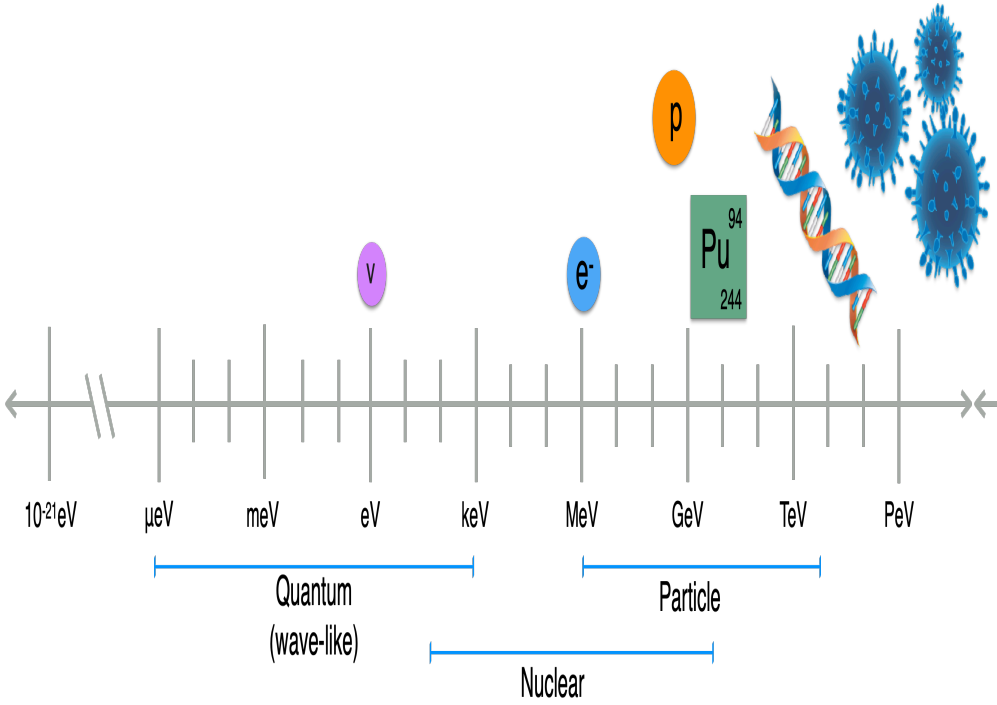
Mass Range



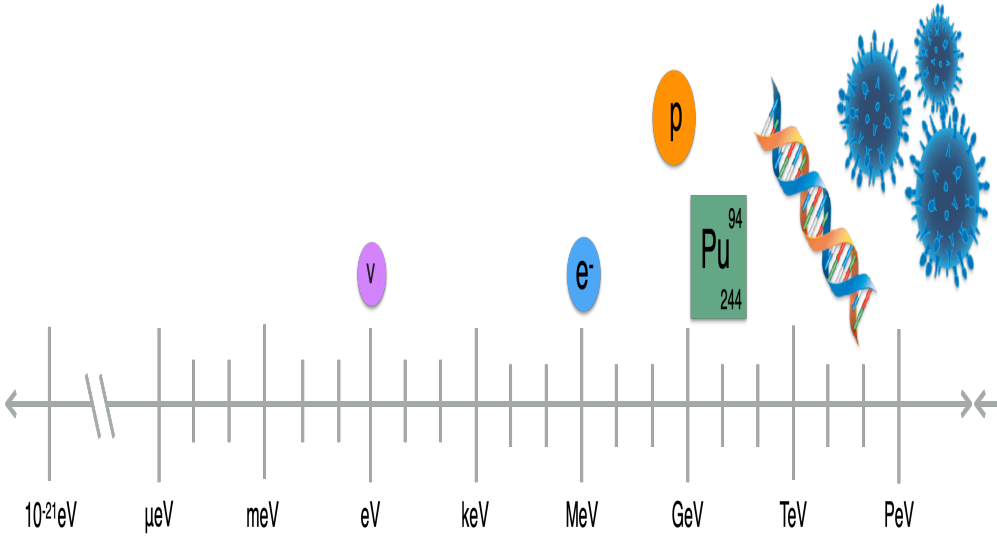
nanoEarth ~> microEarth

ARC CENTRE OF EXCELLENCE FOR DARK MATTER PARTICLE PHYSICS

Credit: Elisabetta Barberio

Credit: Mark Myers / OzGrav

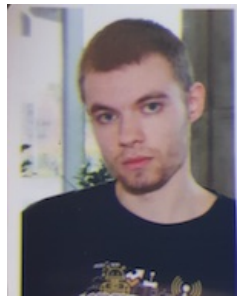
Mass Range



nanoEarth ~> microEarth



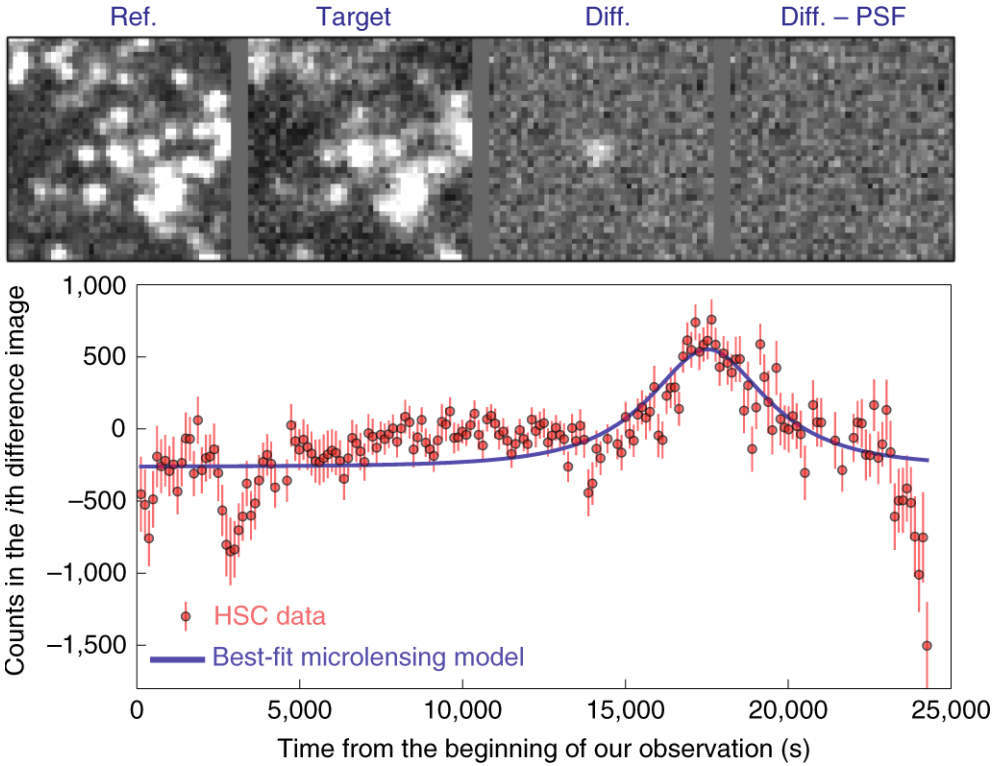




Credit: Elisabetta Barberio

Credit: Mark Myers / OzGrav

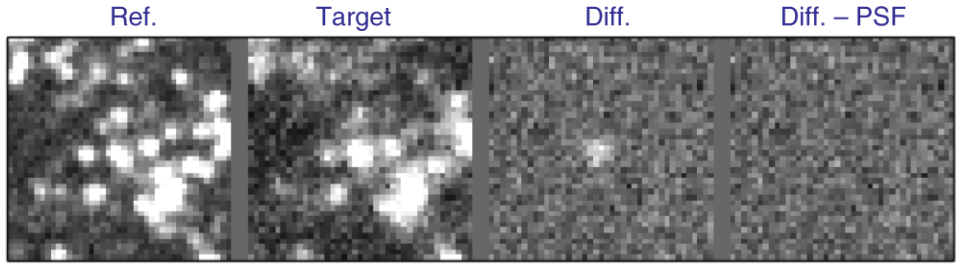
Nowhere for PBH to hide

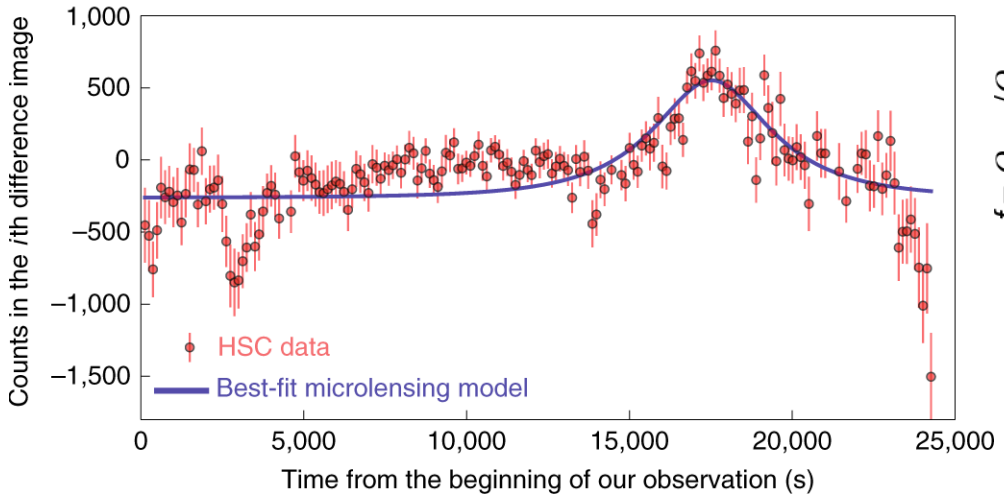


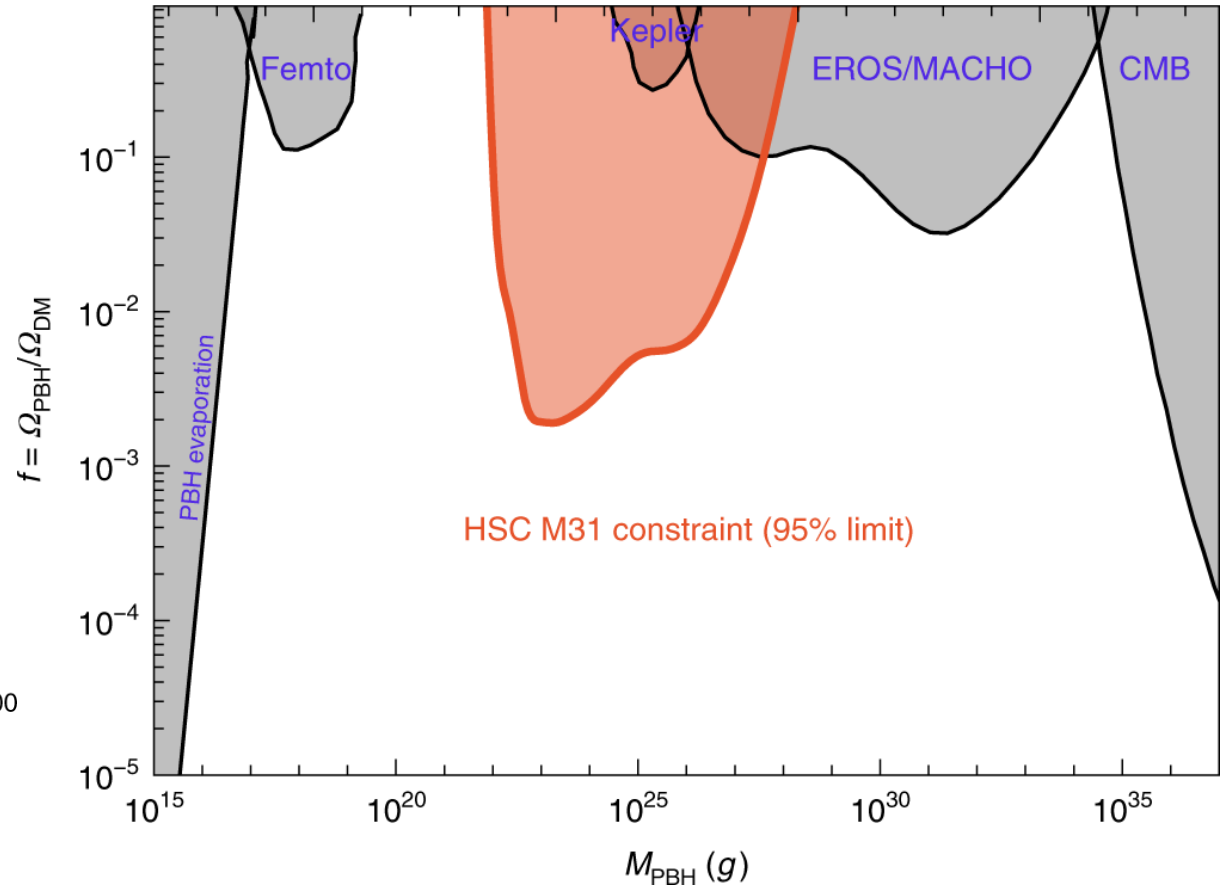
ARC CENTRE OF EXCELLENCE FOR DARK MATTER PARTICLE PHYSICS

Credit: Niikura et al (2019) Nature Astronomy 3, 524-534

Nowhere for PBH to hide

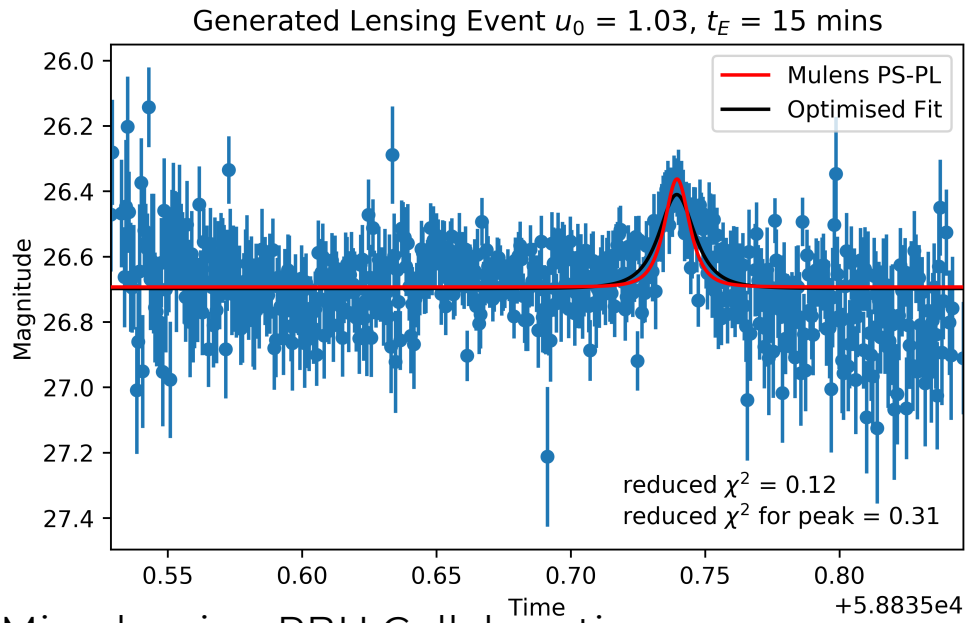


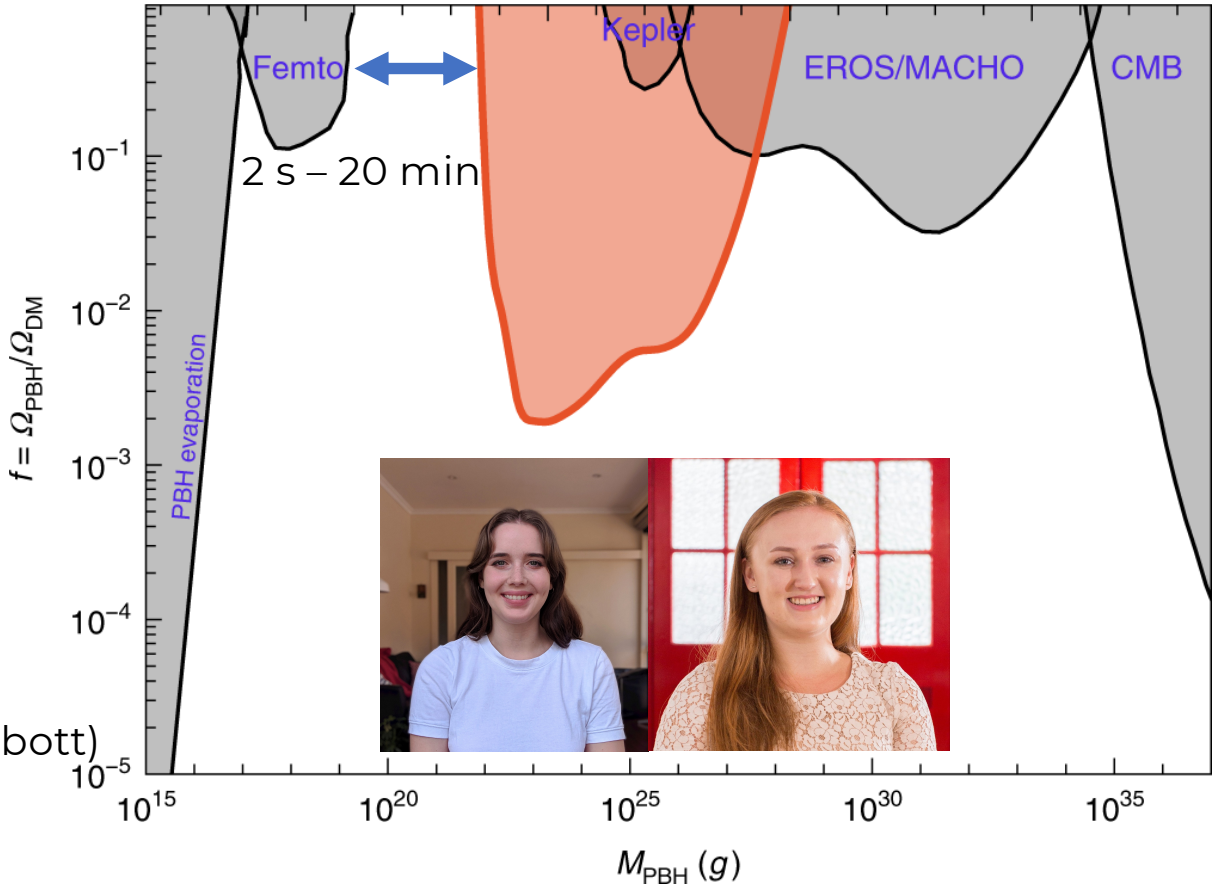




Credit: Niikura et al (2019) Nature Astronomy 3, 524-534

Nowhere for PBH to hide (soon)

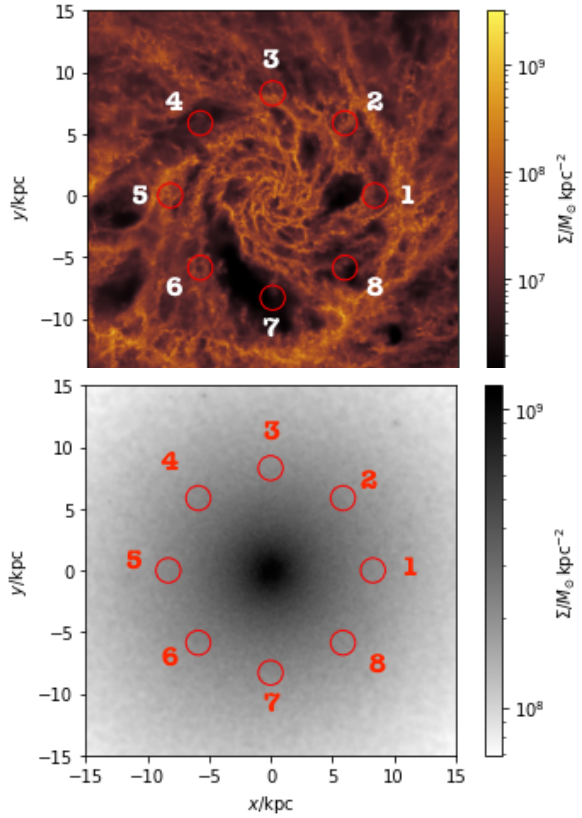




Microlensing PBH Collaboration
(Key, Lawrence, vd Velden, Mould, Freeman, Abbott)

Credit: Niikura et al (2019) Nature Astronomy 3, 524-534

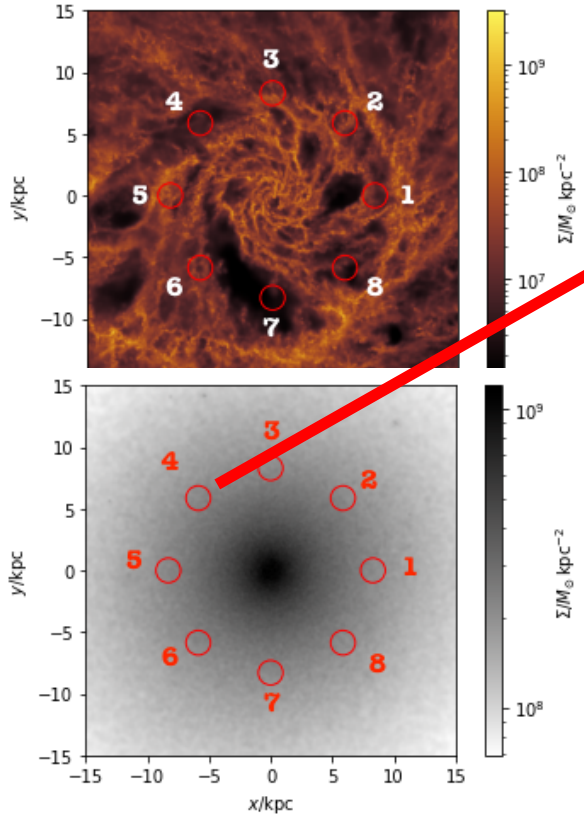
Gusts in the Headwind

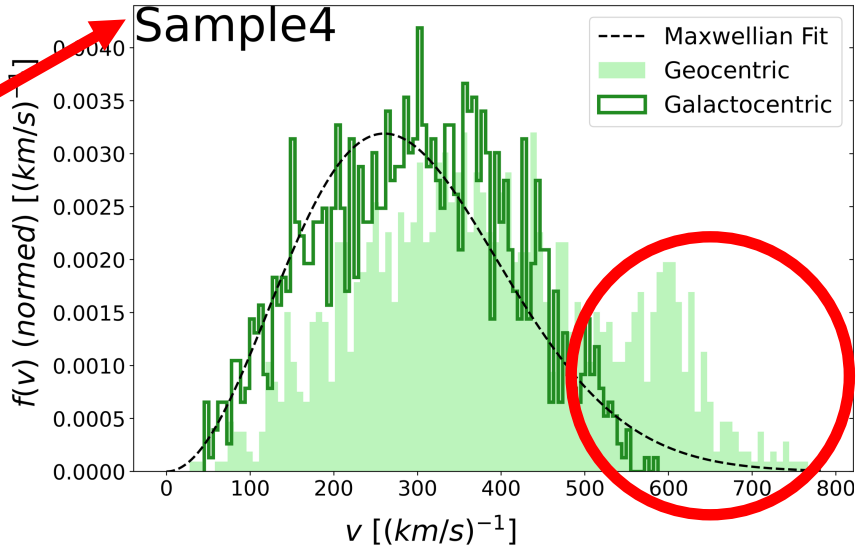


ARC CENTRE OF EXCELLENCE FOR DARK MATTER PARTICLE PHYSICS

Credit: Lawrence et al (in prep)

Gusts in the Headwind





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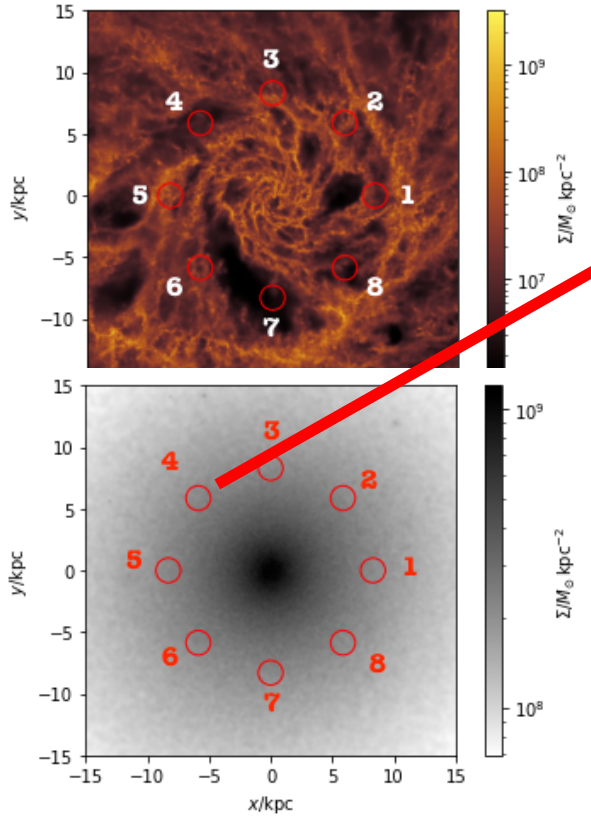
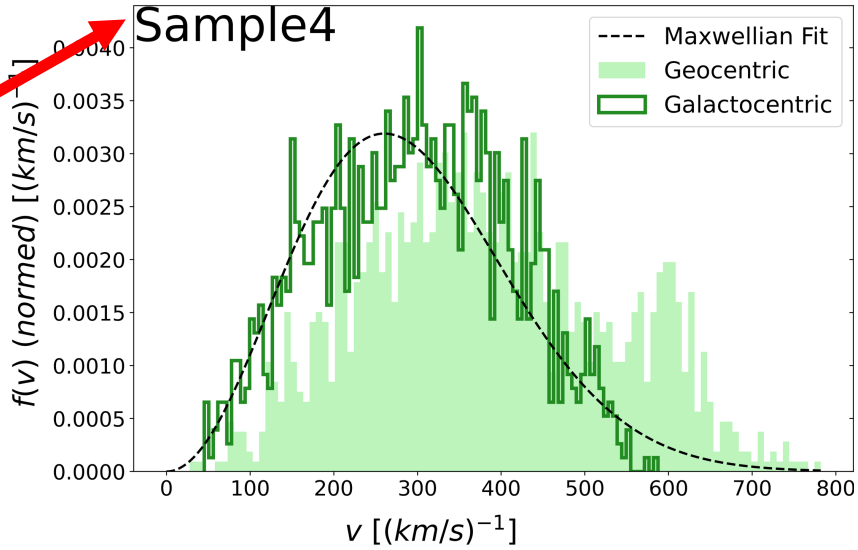
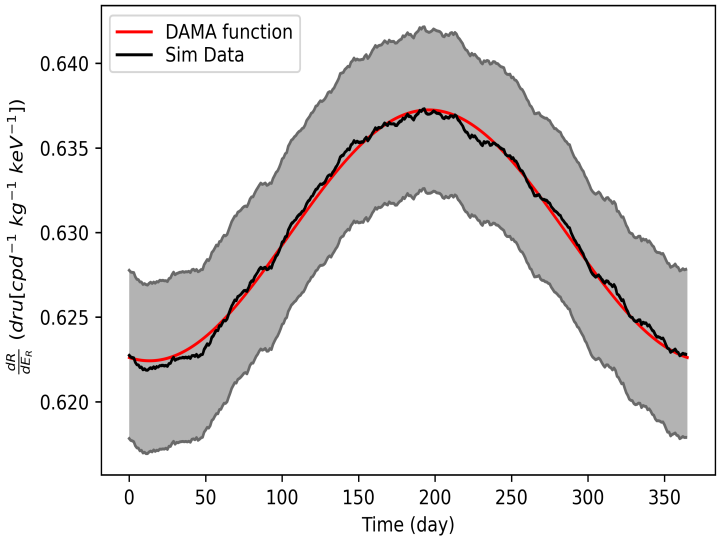
Gusts in the Headwind







Credit: Lawrence et al (in prep)

The Trouble with Hubble

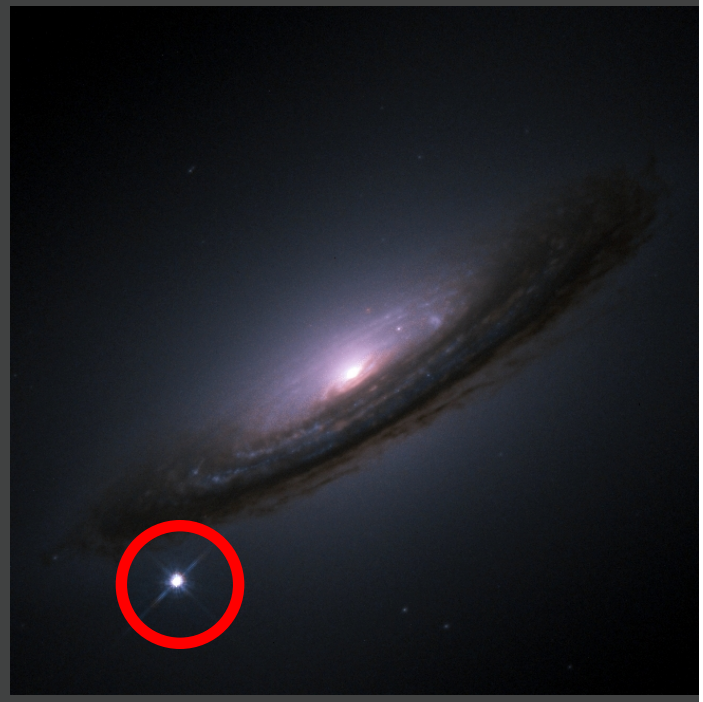
Early/Late time measures of Hubble expansion differ...
Nobel Laureate Adam Riess - signs of Sterile Neutrinos?

ARC CENTRE OF EXCELLENCE FOR DARK MATTER PARTICLE PHYSICS

The Trouble with Hubble

Early/Late time measures of Hubble expansion differ...
Nobel Laureate Adam Riess - signs of Sterile Neutrinos?

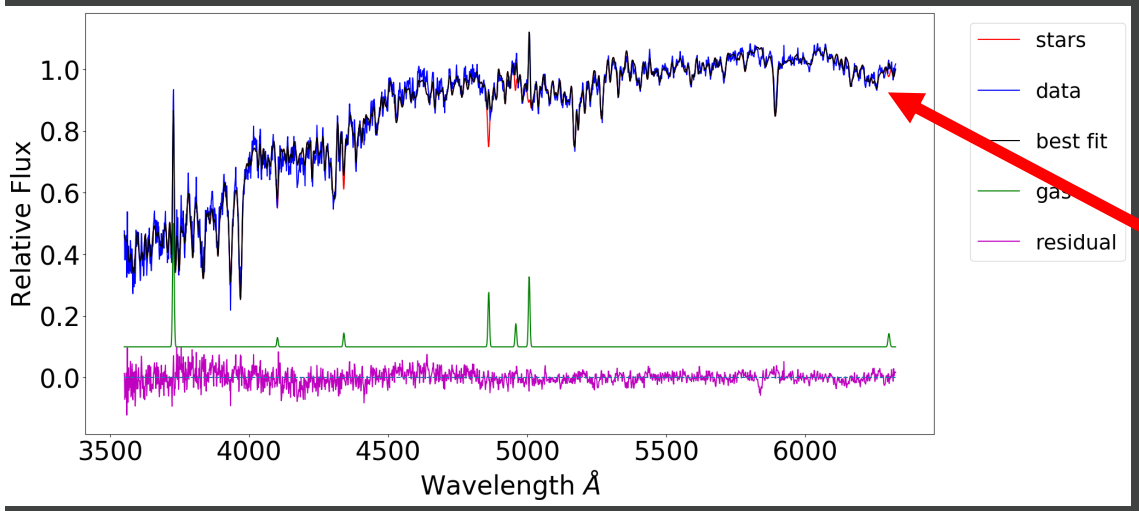
Or distance ladder errors?



ARC CENTRE OF EXCELLENCE FOR DARK MATTER PARTICLE PHYSICS

Credit: NASA/ESA, Hubble Key Project Team and High-Z Supernova Search Team

The Trouble with Hubble



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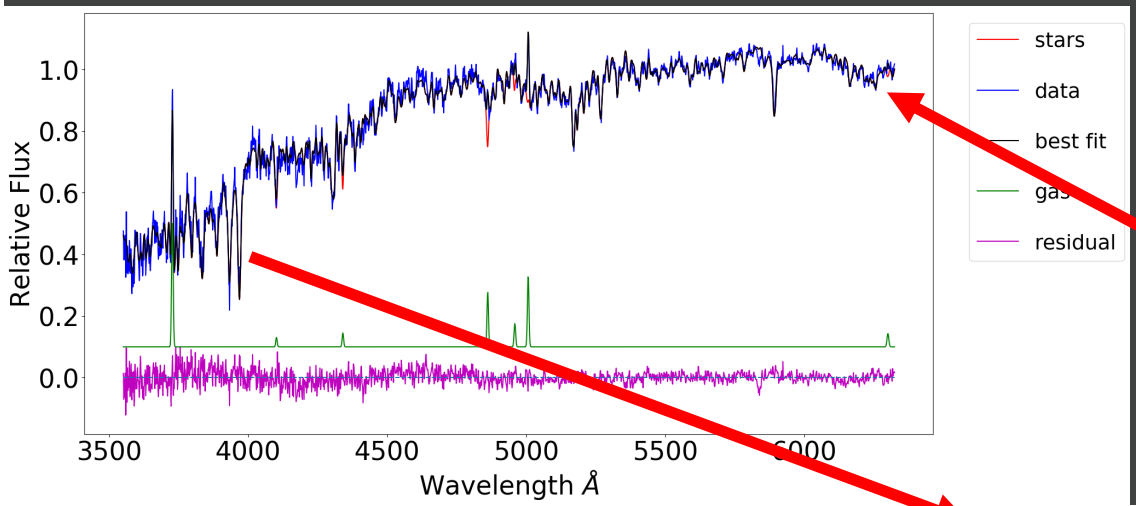
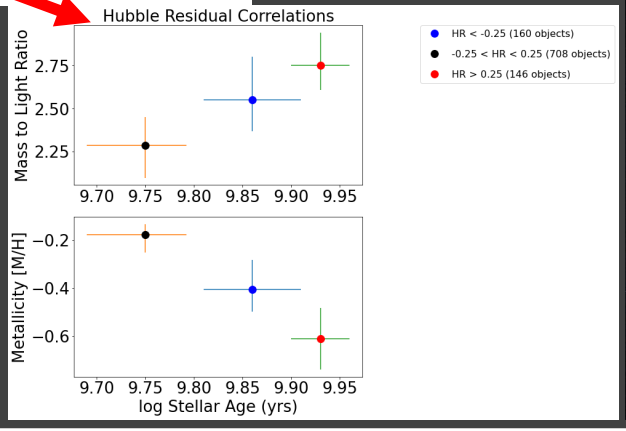
The Trouble with Hubble



Credit: Dixon et al. (in prep)



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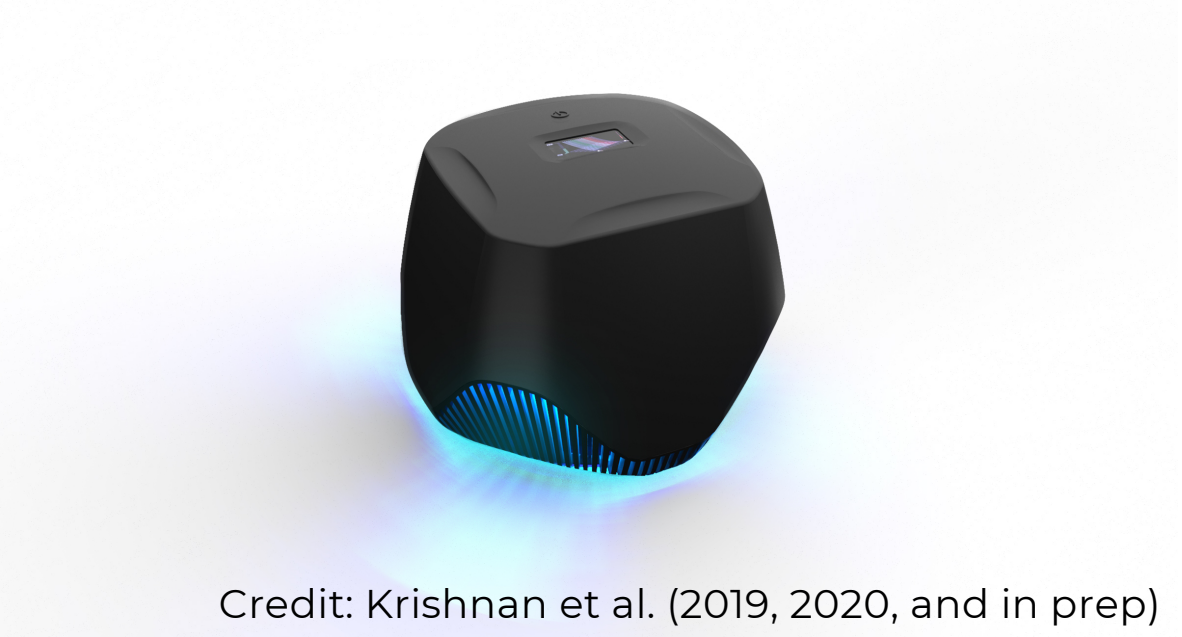
Slow control, muon backgrounds and soon a Thesis!



Credit: Krishnan et al. (2019, 2020, and in prep)