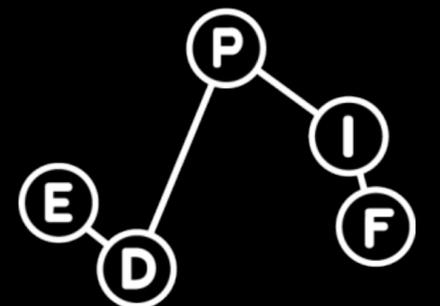


A Cosmological Solution to the Doublet-Triplet Splitting Problem

Pablo Sesma - *IPhT Saclay*

in collaboration with:

Csaba Csaki, Raffaele Tito D'Agnolo and Eric Kuflik



The D/T splitting problem

Embedding of the Higgs doublet H in a representation of $SU(5)$

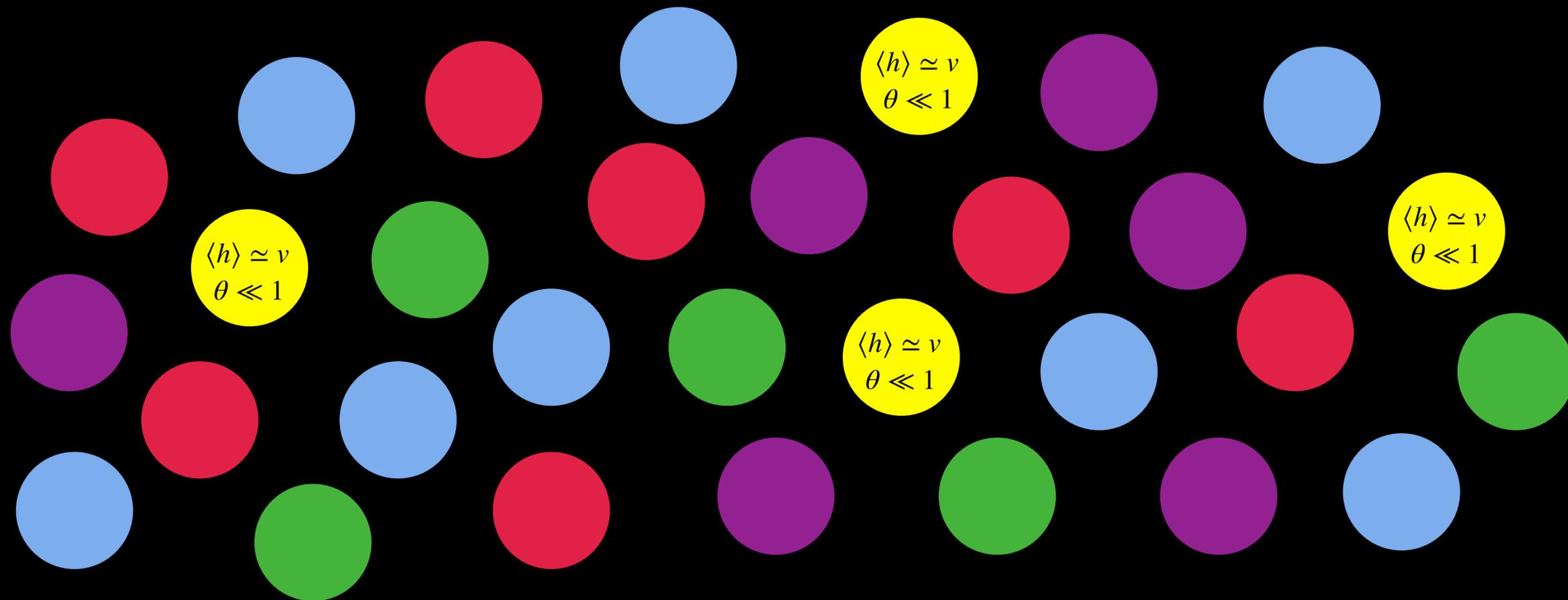
$$\mathbf{5}_H \longrightarrow (\mathbf{3}, 1)_{-1/3} \oplus (\mathbf{1}, \mathbf{2})_{1/2} = T \oplus H$$

New color triplet T with mass $\gtrsim M_{GUT} \simeq 10^{16}$ GeV from bounds on proton lifetime

What keeps the doublet light while the triplet is heavy?

D/T splitting problem: A cosmological solution

Landscape of Triplet and Doublet masses, θ and CC values



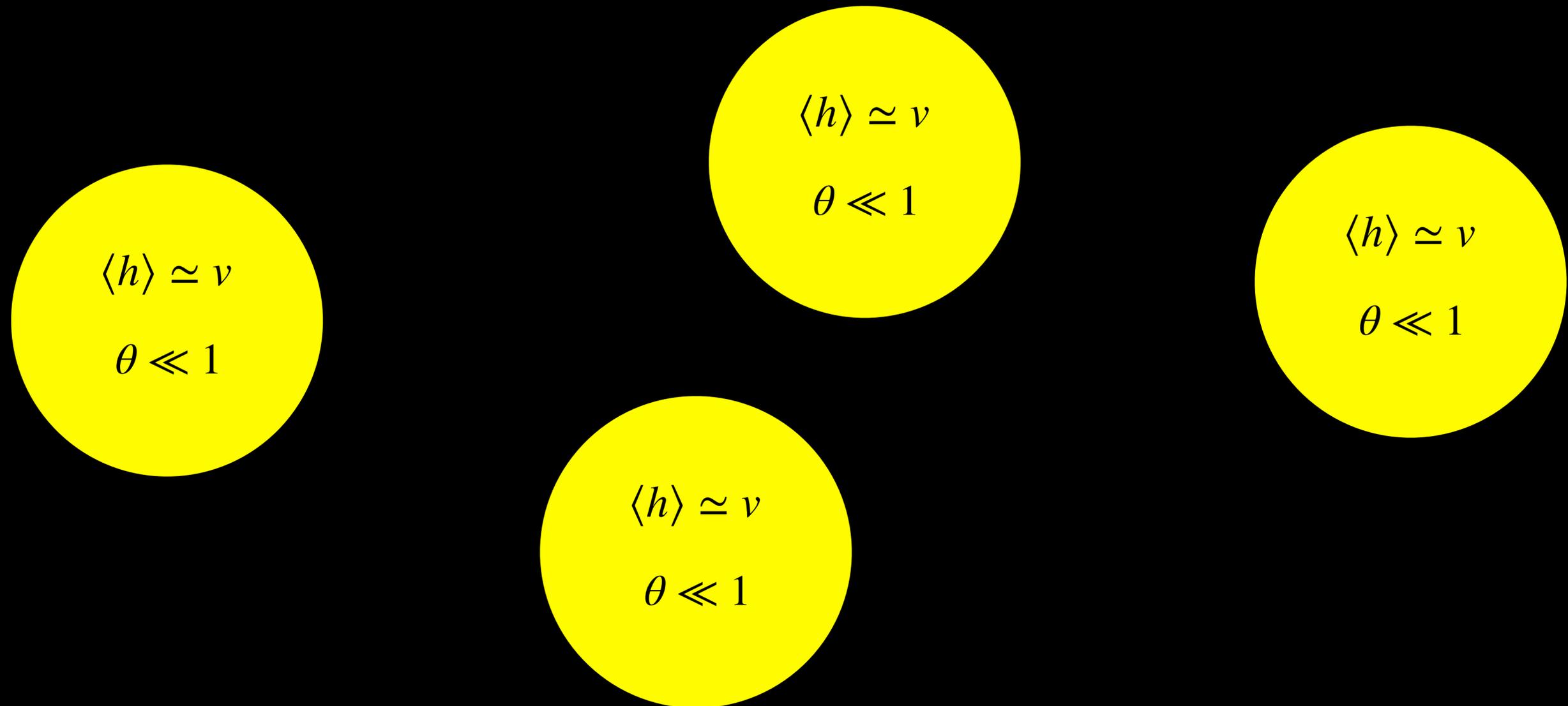
D/T splitting problem: A cosmological solution

After reheating and a time $t_c \sim 1/H(\Lambda_{QCD}) \sim 10^{-5} s$

$$\langle h \rangle \simeq v$$
$$\theta \ll 1$$

D/T splitting problem: A cosmological solution

Only universes with the observed splitting and θ can live cosmologically long times



See you at the poster #25!