

## Colored Dark Matter / Super-cool Dark Matter

Alessandro Strumia  
Università di Pisa  
Italia

We explore the possibility that Dark Matter is the lightest hadron made of two stable color octet Dirac fermions  $Q$ . The cosmological DM abundance is reproduced for  $M_Q \approx 12.5$  TeV, compatibly with direct searches (the Rayleigh cross section, suppressed by  $1/M_Q^6$ , is close to present bounds), indirect searches (enhanced by  $QQ + \bar{Q}\bar{Q} \rightarrow Q\bar{Q} + Q\bar{Q}$  recombination), and with collider searches (where  $Q$  manifests as tracks, pair produced via QCD). Hybrid hadrons, made of  $Q$  and of SM quarks and gluons, have large QCD cross sections, and do not reach underground detectors. Their cosmological abundance is  $10^5$  times smaller than DM, such that their unusual signals seem compatible with bounds. Those in the Earth and stars sank to their centers; the Earth crust and meteorites later accumulate a secondary abundance, although their present abundance depends on nuclear and geological properties that we cannot compute from first principles.