

Giacomo Landini

IFIC newcomers fest presentation

IFIC, Valencia, 24/11/21

- Master and Ph.D.: Pisa U. and INFN



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- ▶ *axion interactions with light mesons using Chiral Lagrangians*
- ▶ *accidental dark matter and axions from confining dark gauge sectors*

- Post-doc: Valencia U. and IFIC

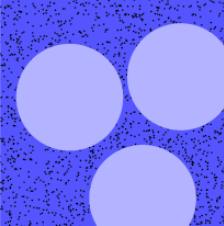
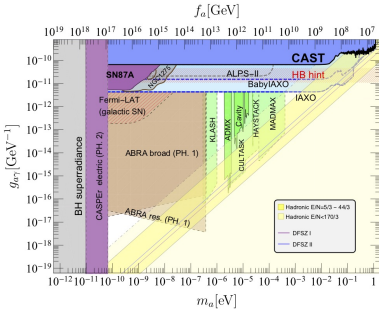
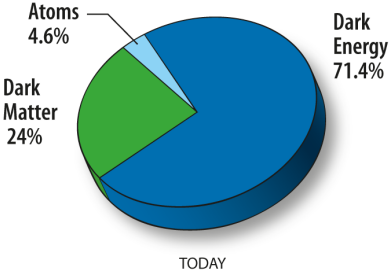


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- ▶ ESR of the ITN HIDDEN network
- ▶ *work in progress...*

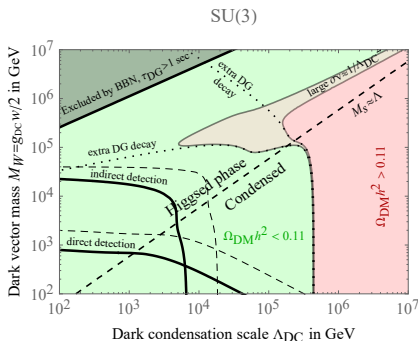


Research interests



Accidental DM from strongly coupled dark gauge sectors

- accidental symmetries imply stable DM particles
- DM emerges as a bound state after gauge confinement
- extra light states in the dark sector
- dark glue-balls lead to an early era of matter domination



Research activity

Non-thermal DM production

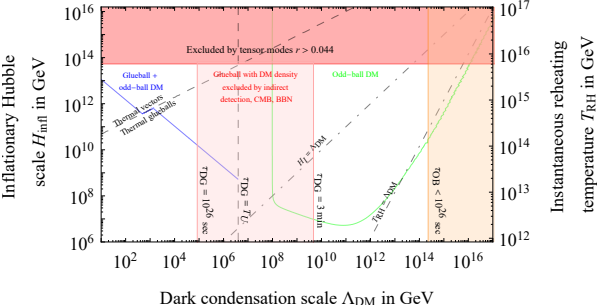
- *(ultra)light DM*: axions and ALPs (see next slide)

Research activity

Non-thermal DM production

- (ultra)light DM: axions and ALPs (see next slide)
- heavy DM: gravitational freeze-in production of vector DM

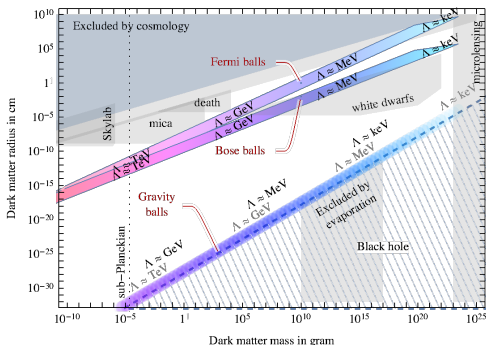
Gravitational vector DM SO(10)



Research activity

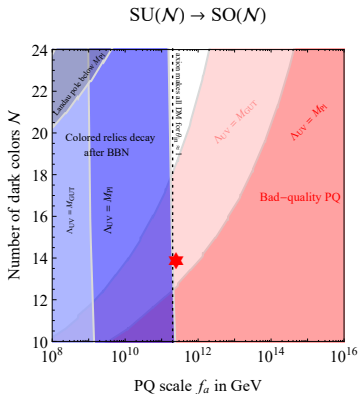
Non-thermal DM production

- *(ultra)light DM*: axions and ALPs (see next slide)
- *heavy DM*: gravitational freeze-in production of vector DM
- *macroscopic DM*: gravitational bound states from 1st-order phase transitions



(Accidental) axion quality and DM

- accidental axions from dark gauge sectors
- solutions to the Peccei-Quinn quality problem
- (non-thermal) axion DM + multicomponent DM



In conclusion...

...I am interested in the interplay between particles physics and early cosmology

- (exotic) DM production mechanisms
- DM and axions model-building and detection
- cosmological phase transitions
- baryogenesis/leptogenesis
- neutrino physics
- ...

Please contact me to discuss

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Thanks for the attention!