

# Roadmap of Dark Matter models for Run 3



**Monday, 13 May 2024 - Friday, 17 May 2024**

**CERN**

## **Scientific Programme**

## Dark Higgs

Discussion about Dark Higgs model (<https://arxiv.org/abs/1701.08780>), including  
theory overview  
experimental overview of ATLAS & CMS results  
benchmarks  
presentation of results

and other topics

## Extended Higgs sectors

Discussion focusing mainly on 2HDMa model (<https://arxiv.org/abs/1701.07427>) and variants.

The session will contain  
theory overview  
experimental overview from ATLAS & CMS  
discussion of missing signatures  
update of benchmarks for Run 3  
presentation of results

and other topics

## t-channel

Discussion on t-channel models (e.g. [enter link description here](#)) touching upon  
theory overview  
experimental overview  
new directions (unexplored signatures etc)

## s-channel & Higgs to invisible

Discussion on s-channel and Higgs to invisible  
presentation of results for s-channel models  
new interpretations  
future directions in experimental searches (e.g. ATLAS+CMS  $H_{inv}$  combination)

## Dark showers

Discussion on dark showers (dark QCD) models with  
summary of experimental results  
summary of models/benchmarks and recommendations for Run 3  
future directions for experiments

## **LLP signatures**

Discussion on synergy between DM and Long-Lived-Particle searches  
summary of experimental results and relation to DM searches  
recommendations on the presentation of results

etc

## **Low mass signatures, ALPs, dark photons**

Discussions focusing on models with low mass DM candidates  
experimental results  
theory models  
relation to other benchmarks (e.g. dark Higgs)

etc

## **Unexplored signatures & wildcard ideas**

Session focusing on unexplored/poorly explored models/signatures/experimental ideas.