Workshop goals, logistics & how to contribute

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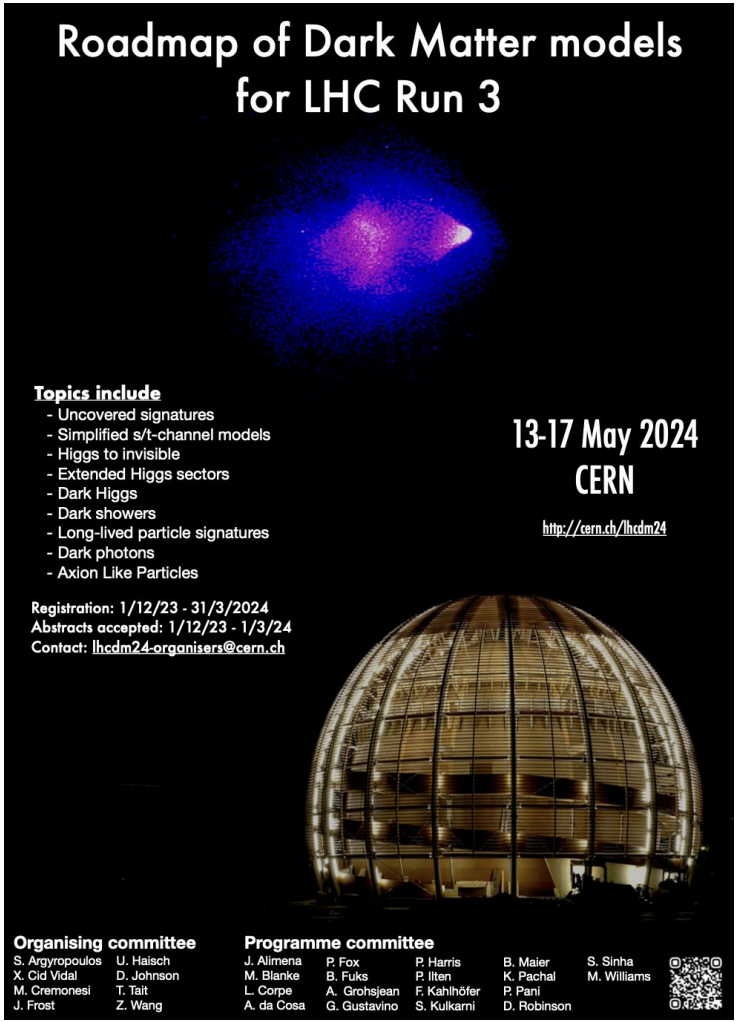
WS organisers & chairs



Goals

1. Discuss **new signatures** that have not been explored until Run 3
   - Note: **the emphasis is on experimental signatures and not models** (that give signatures very similar/same to those already explored in Run 2)
   - New signatures = completely new final states for which no analysis exists, final states with non-standard objects (funny-looking jets), final states that require new analyses techniques (e.g. soft b-jets + MET), …
   - When in doubt: feel free to ping us for clarification
2. We also want to discuss **how to improve existing benchmarks / DM searches**
   - What we did wrong
   - Items (interpretation plots, re-interpretation material, …) missing from DM searches that would be useful for theorists to have to have
3. **Synergies with other groups / experiments**
   - LLP , low-mass searches, …
4. We aim for the studies presented in the workshop + follow-ups to be summarised in a **white paper(s) with updated recommendations for Run 3 DM searches**

Sessions & chairs

- We envisage 8 sessions:
  - Dark Higgs (Felix Kahlhöfer & Matteo Cremonesi)
  - 2HDMa / extended Higgs sectors (Uli Haisch & Priscilla Pani)
  - T-channel (Benjamin Fuks & Benedikt Maier)
  - S-channel & Higgs to invisible (Paddy Fox, Phil Harris, Kate Pachal)
  - Dark showers (Suchita Kulkarni, Sukanya Sinha, Annapaola de cosa)
  - LLP signatures (Juliette Alimena, Louie Corpe, Dean Robinson)
  - Low mass / dark photons / ALPs (Mike Williams, Phil Ilten, Zirui Wang)
  - Unexplored signatures & wildcard ideas (Monika Blanke, Alexander Grohsjean, Giuliano Gustavino)

Preparation for the workshop

- Good opportunity to perform studies (that will eventually end up in the white paper) in order to have a more informed discussion at the workshop, e.g.
  - Dark shower follow-up studies on the discussion items in the recent workshops
  - t-channel studies that might eventually go beyond of the scope of the current white paper
  - For cases where we expect updated benchmarks studies sensitivity projections (?)
  - For new models => re-interpretations of existing searches / sensitivity projections / …
    - This could/should be a joint effort between theorists & experimentalists

How to contribute - general

- We (chairs & organisers) will converge on a set of high-priority topics where concrete studies would be welcome (end of December) - we will circulate this before the xmas break

- If you want to contribute to a topic get in touch with us to express your interest

- We encourage theorists to make available their UFO models in this repository: https://github.com/LHC-DMWG/model-repository

How to contribute - for theorists

- Here things are easy - you don't need any approval
- Just submit an abstract via the ws indico page

- Given the goals of the workshop we would **highly encourage you to**:
  - explain in what respect the model/idea you are proposing is new/unexplored
  - If you are proposing a new model
    - explain if there are existing LHC searches that have used this model or that could be re-interpreted
    - explain if you foresee that dedicated analyses would be needed (completely new final states, or very different kinematics from existing signal benchmarks etc)
- NB: the above is not to restrict your ideas but to ensure that we stay in line with the main goal of the ws, i.e. new signatures/experimental improvements for Run 3

How to contribute - for experimentalists

- For truth-level studies there are different workflows that can be used
  - Using public software only: UFO -> standalone MG + Pythia -> Rivet/MadAnalysis (no approvals needed)
  - Using a mix: UFO -> MG+Py via athena/cmssw -> custom format (ntuples) -> SimpleAnalysis/other experiment-specific sw (a light-weight approval would be needed to show plots)
- One workflow does not fit all purposes (e.g. analyses already exist in SimpleAnalysis and would take time to be ported to a different format)
- Just **get in touch with us** to express where you would like to contribute & which tools you are familiar with/prefer to use
- Experiment contacts will propose a workflow & corresponding approval steps on a case-by-case basis
  - For workflows involving experiment-specific software approval steps need to be discussed with respective experiment PC's - **the responsibility lies on the experiment contacts to the LHCDMWG/respective conveners and not on the LHCDMWG itself!**
  - **In any case please keep us (admins) informed about the steps**

Logistics

- Workshop page: http://cern.ch/lhcdm24
- E-mail of admins + session chairs: lhcdm24-organisers@cern.ch
- Start - end time: Monday 13 May - Friday 17 May
- Registrations: 1 December 2023 - 31 March 2024
- Abstract submission: 1 December 2023 - 1 March 2024
- We will also have a social dinner on one of the evenings (time/place TBD)

Looking forward to receiving many contributions

and having a lively workshop!