

Dark showers activities in Snowmass: Aims and goals

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Welcome to Snowmass 2021

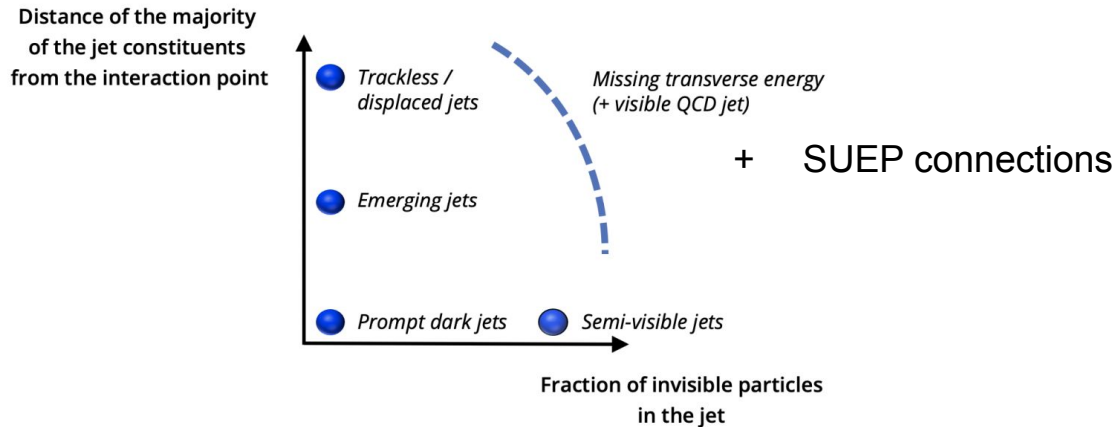
The logo for SnowMass2021, featuring the text "SnowMass2021" in a stylized, handwritten font. "Snow" is in blue, "Mass" is in white, and "2021" is in black. The text is set against a dark, rectangular background.

The Particle Physics Community Planning Exercise (a.k.a. "Snowmass") is organized by the Division of Particles and Fields (DPF) of the American Physical Society. Snowmass is a scientific study. It provides an opportunity for the entire particle physics community to come together to identify and document a scientific vision for the future of particle physics in the U.S. and its international partners.

<https://snowmass21.org>

Context & signature parameter space

- We are working towards a snowmass whitepaper answering phenomenological dark shower questions, focusing on present/future collider benchmark signatures



- How is the signature space populated by different theory scenarios?
- What kind of tools do we need? E.g. is pythia sufficient to simulate every SU(N) model we can think of? If not, how to develop it further?

Wishlist

- Start from studies & directions in LLP Community Whitepaper
- Comparison of benchmarks currently used at the LHC
 - SUSY/MET searches (monojet-like, MET+cascades...)
 - Prompt dark jets model
 - Semi-visible jets
 - Emerging jets
 - Trackless/displaced jets (primarily applicable for neutral LLPs)
- What theory models lead to maximum overlap between different signatures?
 - Maybe not all signatures are in the same model, so one can try and understand excesses at the LHC that appear in only one or two of the signatures and guide further studies more along those models
- This is an initial possibility - we have scope for expansion within and beyond this Snowmass effort, and we welcome more people working with us!

If you'd like to get involved & timelines

- **Timeline:**
 - We aim at first draft of white paper around May 2021
 - Submission deadline for Snowmass whitepapers is end of July 2021
- **We are creating shared documents / repositories to share information**
 - A common github community is created [here](#), we are committing model files and their documentation
- **Mailing list <<dark-showers-snowmass21>> can be subscribed to via CERN e-groups - feel free to sign up if you want to get involved!**
- **More information**
 - Link to our Letter Of Intent is [here](#)
 - Link to our meetings is [here](#)
 - Next meeting in about three weeks, doodle will be circulated on the mailing list