Rich Dark Sectors (RDS)

1. **Dark Sector Masses and Naturalness**
   Thursday, 4:30pm-6:00pm
   Where do light masses come from?
   Are they natural? Are there additional states to discover?

2. **Exotics**
   Friday, 10:00am-11:30am
   What should we look for beyond the minimal portals?
   Are we missing any experimental opportunities?

3. **Non-Minimal Dark Matter**
   Friday, 1:30pm-3:00pm
   Is DM self-interacting/inelastic/excitable/asymmetric/...?
   Are there ways to combine DM and other searches?

4. **Joint session with VDP group, Friday, 11:30am-12:00pm.**

Dark Sector Masses and Naturalness

- Where do light dark sector masses come from?

    - Stueckelberg?

    - Dark sector Higgs mechanism? Strong coupling?

- Are the masses natural?

    - SUSY? Strong coupling/warping? Dark Anthropics?

    - Is there a connection to SM Higgs naturalness (and decays)?

- What does this imply for experimental searches?

    - Are there additional states to discover?

    - What can existing/planned experiments do?

Exotics

- What should we consider beyond the standard portals?

  - Non-abelian dark forces? Direct coupling with small charges?

  - Connections through higher-dimensional operators?

  - ???

- What does this imply for experimental searches?

  - Are there additional states to discover?

  - What can existing/planned experiments do?

  - Can the LHC/ILC/FCC help?

Non-Minimal Dark Matter

- Is DM self-interacting/inelastic/excitable/asymmetric/...?

  - What does astrophysics suggest?

  - Hints from indirect/indirect detection, LHC searches?

- What does this imply for experimental searches?

  - Are there additional states to discover?

  - What can existing/planned experiments do?

  - How can laboratory searches be related to DM searches?

Rich Dark Sectors Goals

- Many theories, but how best to connect to experiment?

- How can searches for minimal dark sectors be applied to more general scenarios?

- Complementarity of different search methods? Constraints on minimal scenarios may not apply.

- Do minimal searches miss interesting, testable physics?

- New experiments to probe motivated RDS scenarios?