

ETH zürich

Dark Shower
Workshop 2025
Part I
Welcome

Annapaola de Cosa

From theory to experiments

Echoes of a Hidden Valley at hadron colliders
Phys.Lett.B651:374-379,2007

2007 2008 SUEP
arXiv:0801.0629 (2008)

Semivisible jets
Phys. Rev. Lett. 115, 171804 (2015)

2015

CMS SVJ
J. High Energ. Phys. **2022**, 156

2019

2022

ATLAS SVJ
Phys. Lett. B 848 (2024)

2024

Glueballs
arXiv:2202.12899 (2008)

Emerging Jets
J. High Energ. Phys. **2015**, 59 (2015)

CMS Emerging Jets
J. High Energ. Phys. **2019**, 179 (2019)

CMS SUEP
PhysRevLett.133.191902 (2024)

SVJ Workshop

2021

2022

2023

Dark shower Workshop

2025

Snowmass 2021

Colours in darkness Workshop

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(2024)

2022, 156

2022

2024

Number of theory papers quickly growing
Number of ongoing data analyses follows

Novel developments in terms of trigger strategies and reconstruction/identification techniques to cope with such “bizarre” signatures

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2019)

CMS SUEP
PhysRevLett.133.191
902 (2024)

J Workshop

2022

2023

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Workshop objectives

Broaden the available suit of dark shower signatures

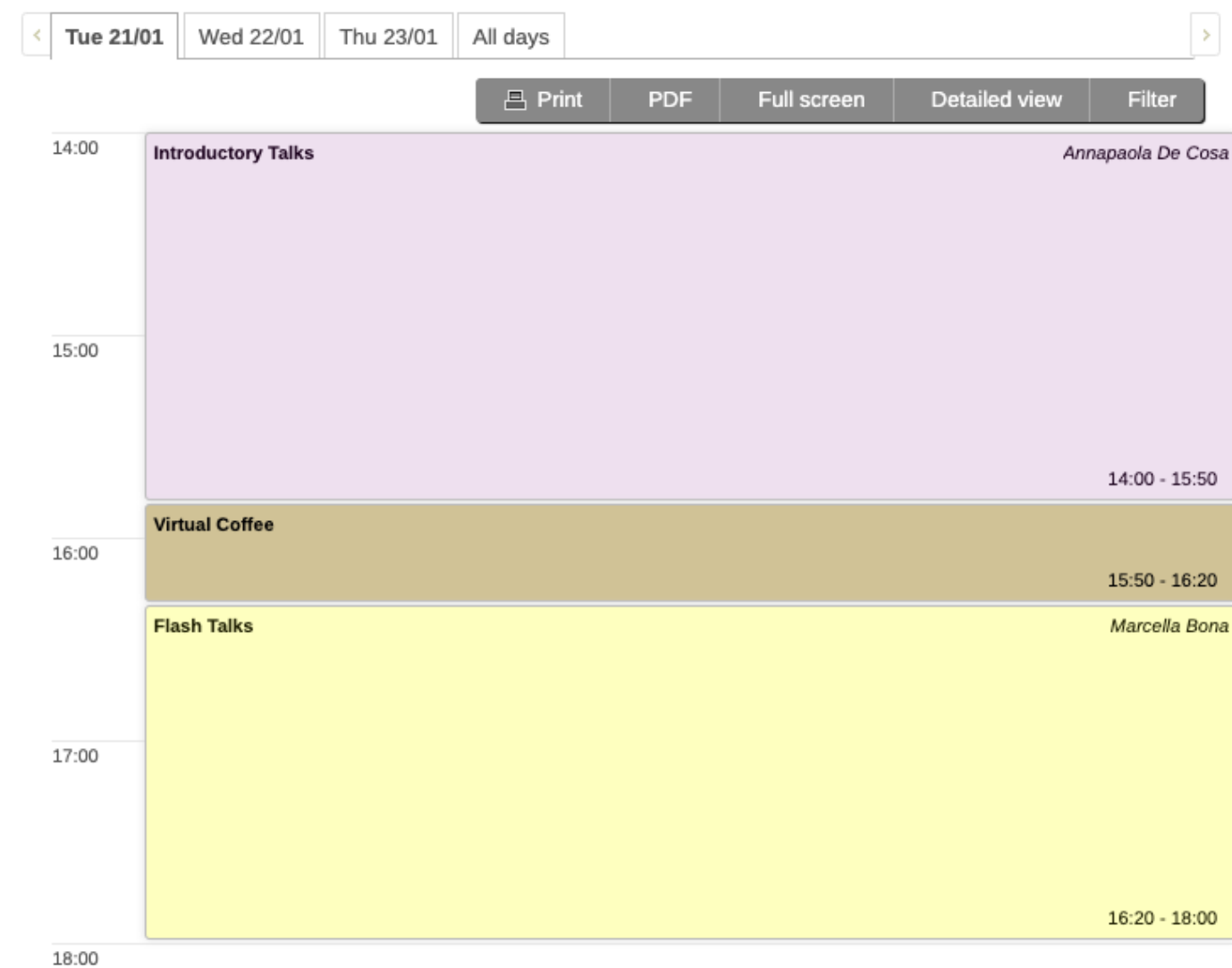
- Not to leave unexplored scenarios
- To drive experimental developments in triggering/reco and identification strategies for Run 3 and beyond

Define a common set of benchmark models for interpreting dark shower search results

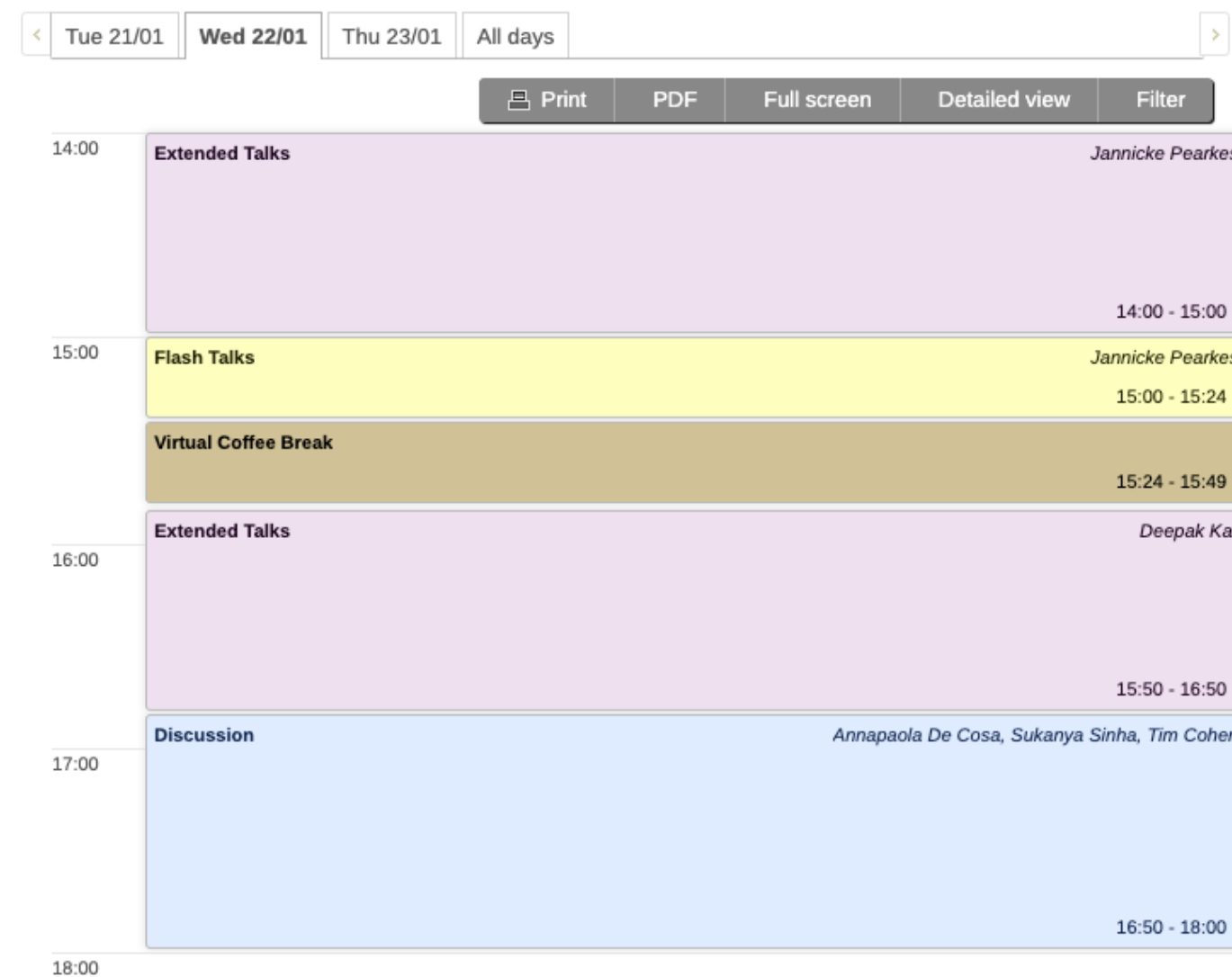
- Identify minimum set of observables covering a wide range of signatures
- Define meaningful set of simplified models

Timetable

Day 1



Day 2



Day 3



Working groups

- A workshop Part II will follow (date to be fixed) where updates from single groups or team groups will be presented on new signatures studies and/or benchmarks
 - Team groups: groups of experimentalists and theorists joining the efforts
 - Will discuss more on day 3
- Workshop outcome: will be summarised in a community report