

# The puzzle of Dark Matter – assembling the pieces

Symposium on joint interpretation of collider, direct and indirect dark matter searches

29-31 October 2018  
DESY, Hamburg



# Panel discussion

- **The goal is to discuss**
  - I will start with a few questions to break the ice
  - You are all invited to interact (ask/answer questions/comments)  
...please, do!

# Panel discussion

- **Panel members**

- Michael Duerr (DESY, Theory)
- Caterina Doglioni (Lund, Colliders)
- Jan Conrad (Stockholm, Indirect Detection)
- Nassim Borghoznia (Durham, Direct detection)

# Some very broad questions

- Did we miss anything in the discussion? What are we *not* looking at?
- Do you think hints of DM will appear in the next 10 years? If not, what does it mean for DM searches?

# Other general questions

- Comparing limits: what benchmarks are preferred by which community and why? Complete or simplified models?
- Comparison plots: are we doing it right? Should we do more in this direction?
- Input from astrophysics/cosmology: how seriously should we take the relic density calculation?
- Are there other cosmological hints that we should take into account? (early star formation, baryogenesis, small-scale tensions...)
- Complementarity with gravity waves? *Eg* dark sectors featuring phase transitions

# Theory

- Can theory guide experiments to spots where we are not looking yet? Any things left on the wish-list?
- “Less” simplified models: are they becoming too complicate? Or are they still too simple?
- Should we study more models with multi-component dark matter?
- Is there model-building effort to explain B anomalies ( $R(K^*)$  etc) while providing a dark matter candidate?

# Searches

- **ID:** Is the model-independent presentation of the results that is currently used optimal for comparing with other detection techniques? Should more model-dependent interpretation be provided?
- **ID:** What is the status of positron/antiproton excesses?
- **DD:** What would be your wishlist/next steps for detectors
- **DD:** How to beat the kinematic threshold
- **DD:** How do we beat the neutrino floor?
- **Colliders:** What will come after the White Paper?
- **Colliders:** Are you providing likelihoods to tools like gambit?