Beyond Colliders WG

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What counts as a non-collider experiment?

- Neutrino physics experiments
- Direct-detection dark matter
- Fixed target experiments
- Beam dump experiments
- Precision frontier (NA62, g-2, …)
- Collider-adjacent experiments (FASER, MOEDAL, …)
- Intensity frontier (HIBEAM/NNBAR)
- …

- Plus: don’t forget theorists working on non-collider physics!

What do we focus on?

- We focus on:
  - **Scientific contributions** of non-collider based physics
    - Not all physics cases can be probed at colliders
    - Non-collider experiments often have **complimentary sensitivities**
  - **Stronger community** allows for more impact
    - No connection to CERN means you risk missing out on opportunities and not knowing/having an impact on the field in general
    - Take inspiration from muon g-2 theory collaboration
- We want to collaborate on:
  - [Career WG] **Career implications** specific to non-collider ECRs
  - [Career WG] Potential for **non-project specific time** to work on additional projects outside main focus
  - [Neighbouring fields WG] **non-collider forum for ECRs** in combination with APPEC, NuPECC to promote interdisciplinary collaboration

Benefits and challenges of non-collider ECR careers

- **Small collaborations** are wonderful opportunities for ECRs, both experimental and theoretical:
  - **Wide variety** of opportunities - few people have to do everything!
  - Easier to achieve **recognition** among collaborators
  - Direct feedback between **theory and experiment**, through strong collaboration
- On the other hand, **career progression** is less straightforward
  - In collider physics, being a bigger community there's a **higher probability** of finding a **new position** in your field
  - In smaller groups it's **less easy** to find your **next job** if your interest isn't in collider physics
  - It's **unclear** how easy it is to **transition** from a non-collider job to a collider job
  - The **timescale** for small experiments is much shorter
  - For **theorists** it's difficult to find positions on non-collider physics

Potential white paper statements

- It is important to ECRs that non-collider experiments and activities **maintain a prominent role** in the European particle physics landscape; not only as pathfinders for collider searches but also as **groundbreaking activities** on their own.
- The ECR community advocates for a **forum for non-collider physics**, e.g. a sub-grouping within ECFA, to gain coherence as a community and have a communal voice. This would give ECRs the opportunity to **increase collaboration** between non-collider projects, and would increase awareness of career opportunities.

Collaboration with other WGs

- The **specific career challenges** for non-collider physicists require attention from/collaboration with the career WG
- A forum for non-collider physics would also enable **collaboration with neighbouring** fields, thus close collaboration with the Neighbouring Fields WG is important

Future plans for this WG

- Community is quite dispersed, so it’s a challenge to get in touch with collaborators
  - Reach out as much as possible to non-collider collaborations
- White paper kick off meeting this afternoon (fully digital)
  - Division of responsibilities

Tell us your thoughts!

A final thought to leave you with

Collider/non-collider physics are not orthogonal realities! There is and should be overlap. Non-collider collaborations are able to do many different things to support scientific research and the continued development of the particle physics community. Let’s make sure they’re valued like they should be!

What would we like from the white paper?

- Recognition of the importance of non-collider research
  - A specific ECFA subgroup, including neutrinos and small collaborations
- Advocate for creation of a community, eg through a forum, conferences, meetings…
  - Improve collaboration
  - Find your next position
- Specific attention on non-collider careers

Community feedback