

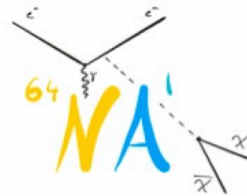
FIPs in the ALPs Round Table

Henri Hugo Sieber
Final year PhD student, group P. Crivelli
18.05.2023

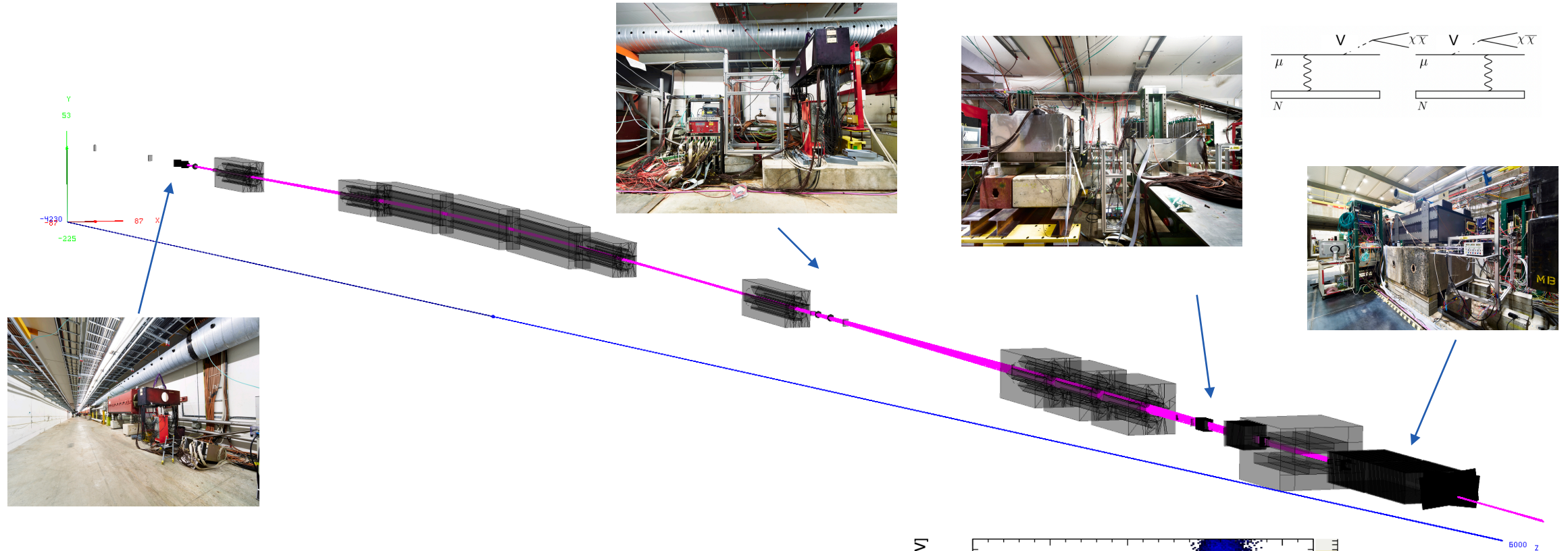


About myself

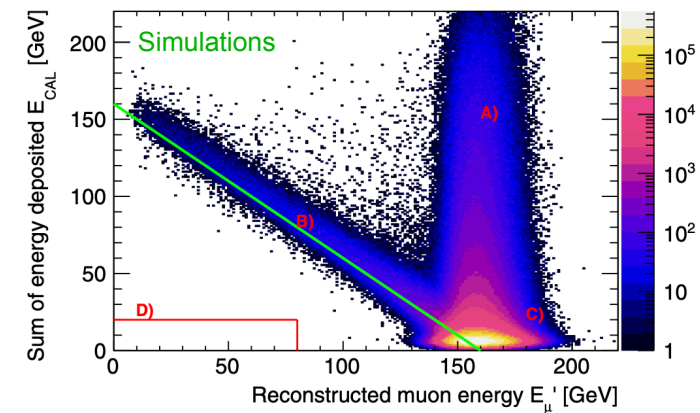
- Final year PhD student at ETH Zurich, supervised by **Prof. Paolo Crivelli** (ETH Zurich) and **Dr. Laura Molina-Bueno** (IFIC Valencia)
- **Experimental** physicist based at CERN
- Member of the **NA64 collaboration**
- Main domain of research: **sub-GeV** dark matter coupled to **muons**, track **reconstruction**
- Hobbies: (ski-)mountaineering



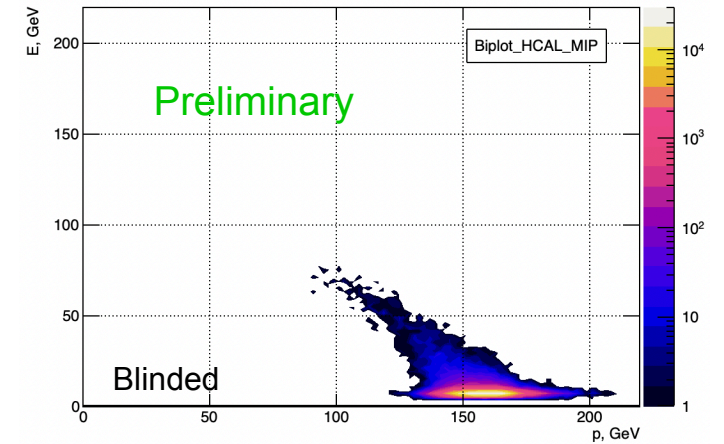
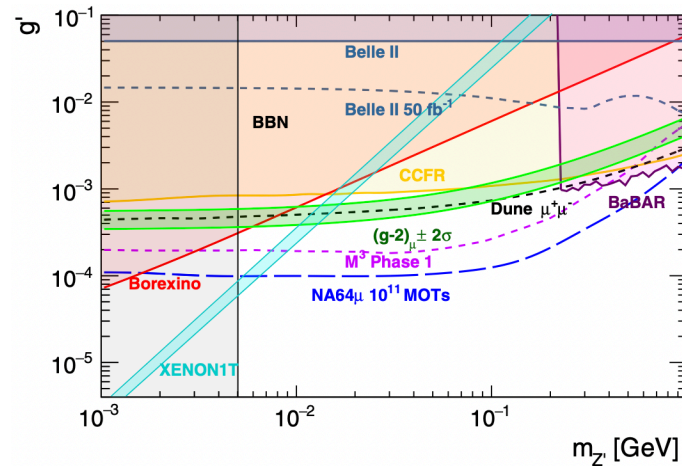
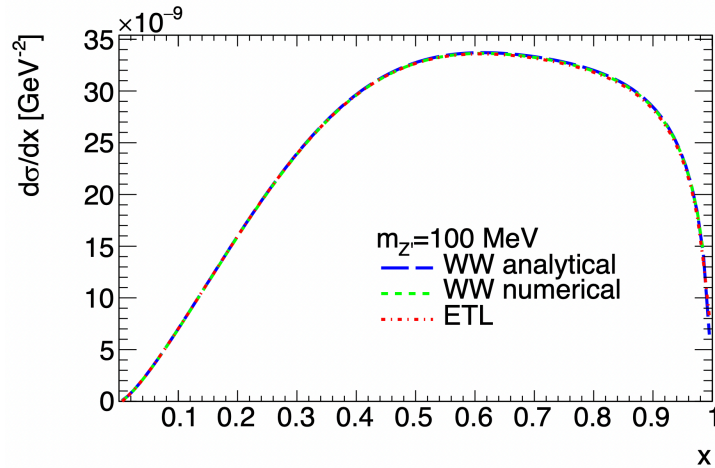
NA64 in muon mode (NA64 μ)



- **160 GeV/c** muon from CERN SPS at **M2** beam line (north area)
- Pilot runs: **5e9** MOT (2021) and **4e10** MOT (2022)



Overview of the work



- Calculation of **production cross-sections** for vector and (pseudo-)scalar mediators and **sensitivity estimation**

[PRD 104, \(2021\) 076012](#)

[arXiv:2305.09015](#) (this week)

- **Feasibility** study and GEANT4-based **DM generator** and propagator

[PRD 105, \(2022\) 052006](#)

[CPC 269, \(2021\) 108129](#)

- **First** data analysis of the **NA64 μ combined 2021 and 2022 pilot runs**

Status: 10% processed, analysis being finalised ...