

# Quick summary

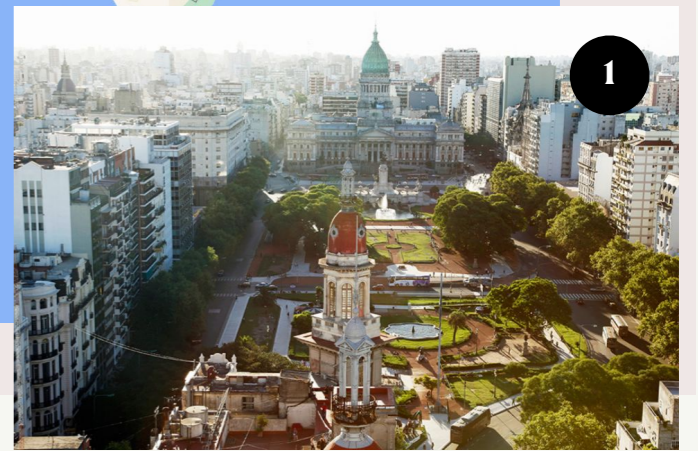


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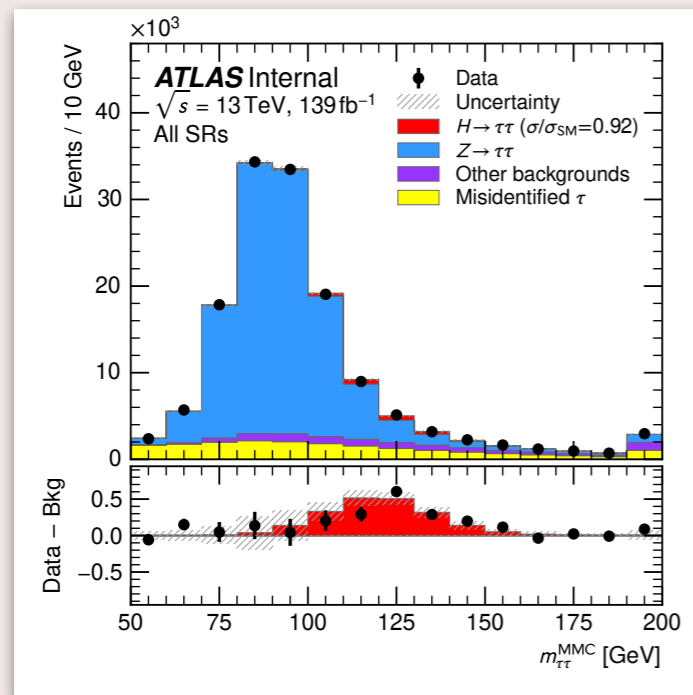
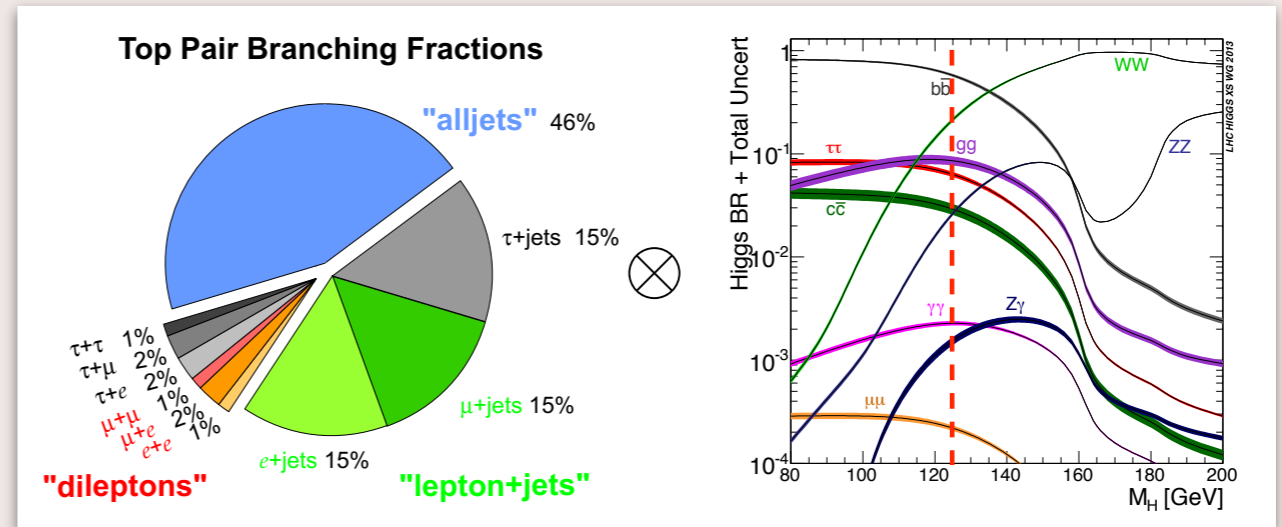
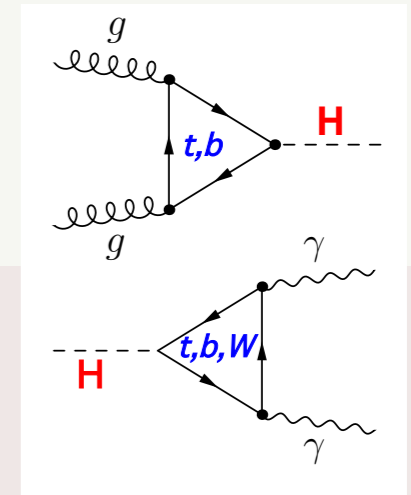
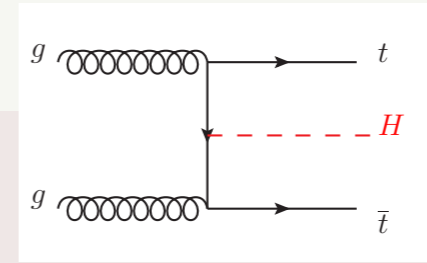
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# My PhD: a lot of $\tau$ 's

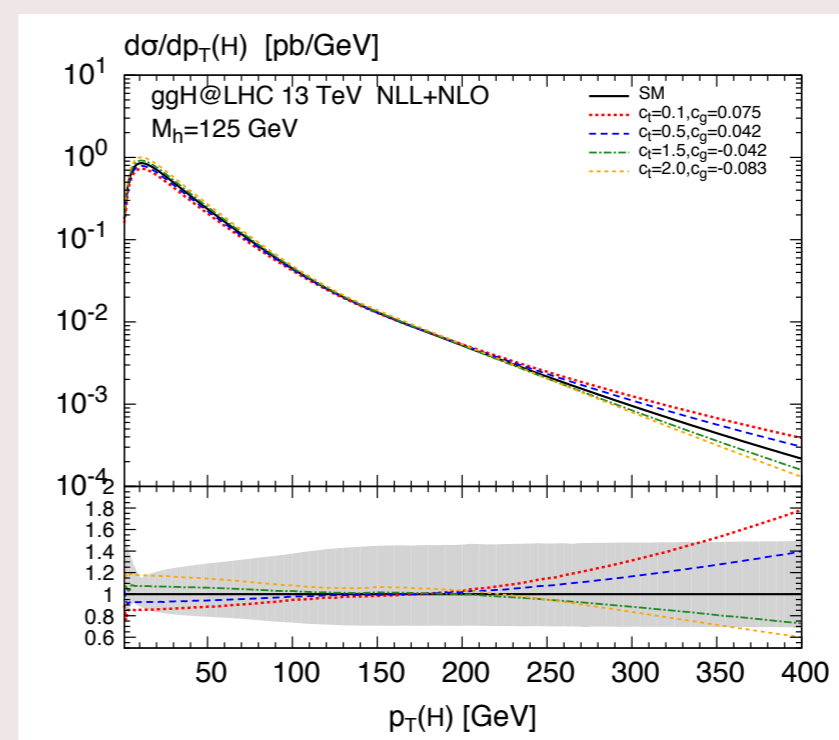
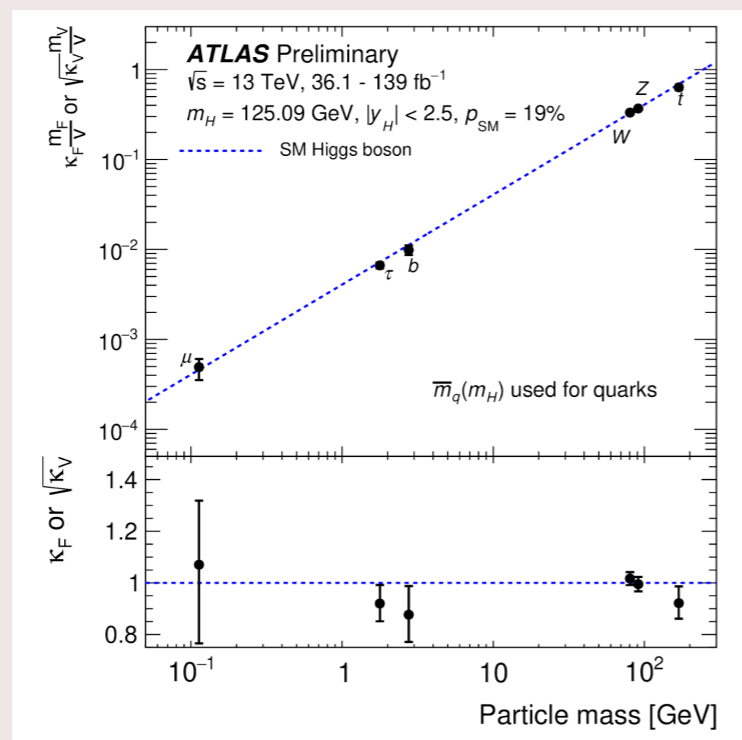
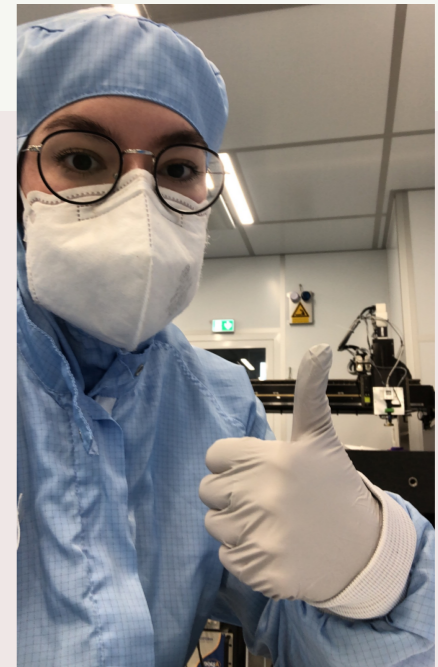
- $t\bar{t}H \rightarrow$  **multilepton search** (towards observation)
  - Complimentary to other measurements sensitive to  $Y_t$
  - Challenges:
    - Small production cross section (~1% of total cross section)
    - Many final states possible
  - Had not been observed before in ATLAS or CMS (or in combination)



- **Simplifying embedding**
  - $H \rightarrow \tau\tau$  measurements with full Run 2 dataset
    - Largest background:  $Z \rightarrow \tau\tau$
    - Irreducible, known issues with modelling
  - Embedding: technique to use  $Z \rightarrow \ell\ell$  events to predict  $Z \rightarrow \tau\tau$  distributions
- **Upgrading  $\tau$  reconstruction and identification algorithms for the HL-LHC**

# Now: (almost) no $\tau$ 's

- **ATLAS Inner Tracker (ITk)**
  - Working on the HL-LHC upgrade on the hardware side now
  - (Hadn't been in a lab since 2014!!!)
- **Higgs combination**
  - Studying other Higgs boson properties by combining different results
    - Coupling of Higgs boson to other particles (including  $\tau$ 's 😊)
  - Looking at Higgs boson produced with high- $p_T$  to see if there are any BSM-like deviations



# Favorite plot

