


# Closing remarks

## Mario Campanelli (UCL)



**UCL**  
**IP**  
Organisers:  
Mario Campanelli  
Georg Weiglein  
Lily Asquith  
Christine Johnston  
James Monk

**Topics:**  
QCD  
Tools  
Diffraction  
Top physics  
Vector bosons  
Underlying event

<http://www.hep.ucl.ac.uk/smlhc/>  
contact: smlworkshop09@hep.ucl.ac.uk

University College London  
30<sup>th</sup> March-1<sup>st</sup> April 2009

**Standard Model** | With early LHC data

15<sup>th</sup> anniversary edition of this conference series  
Started as a common ground between theorists  
and experimentalists to discuss preparation for the  
first LHC data

We were pessimistic (or realists?), assuming that  
the first data would only be Standard Model, while  
others were organising conferences like  
“How we will discover SUSY tomorrow”

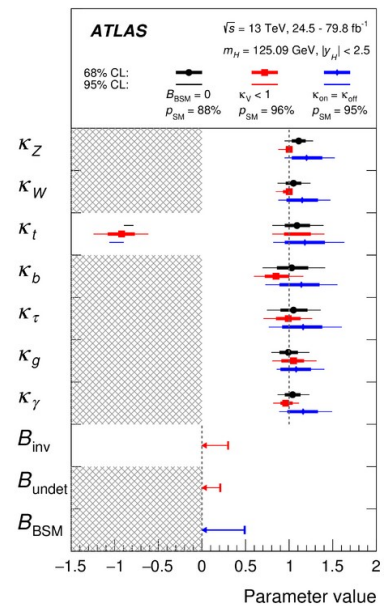
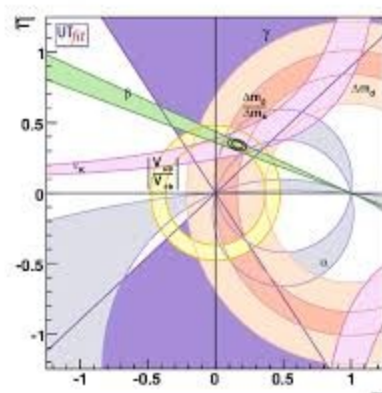
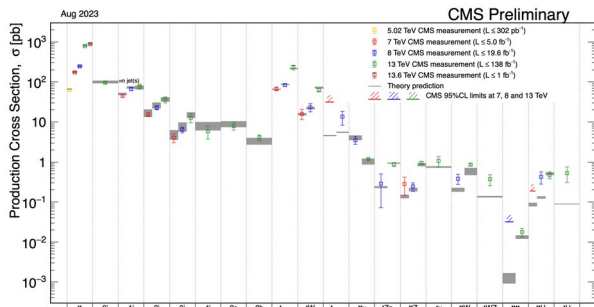
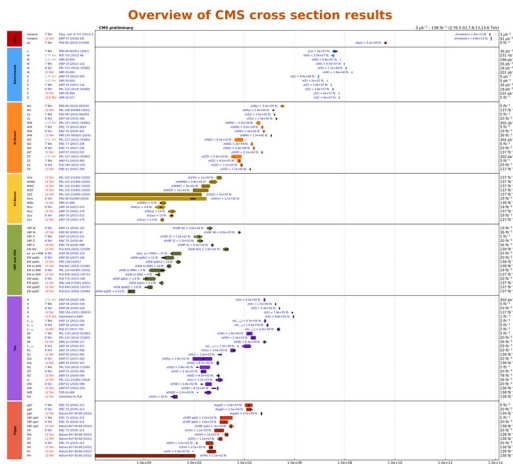
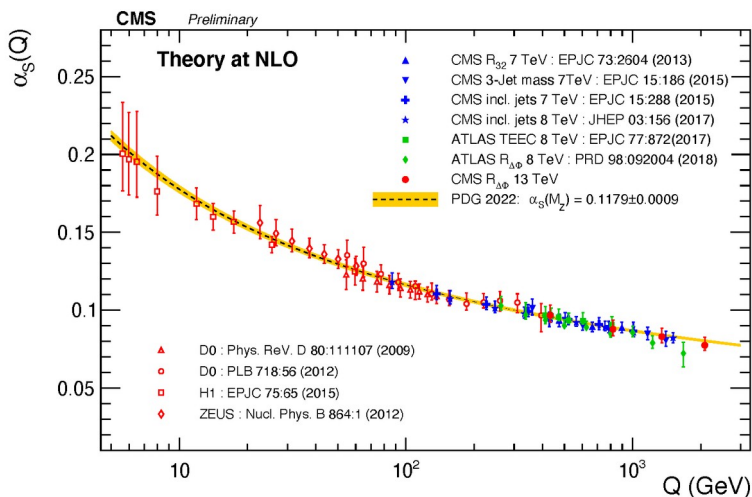
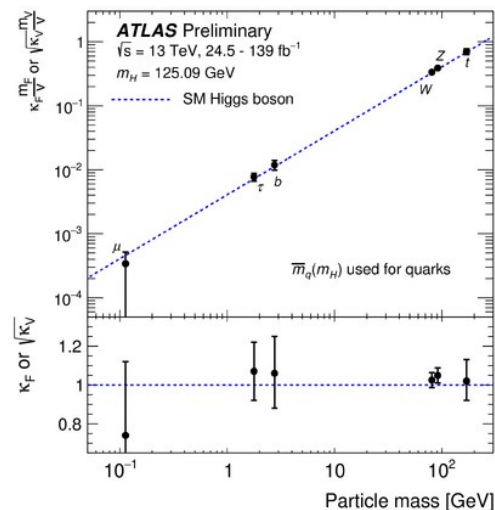
# Guiding principles

- We did not want a “fast food” conference with non-experts flashing slides and running away
- We aim at a place where people working on the analysis could discuss their results and methodology with other experts:
  - Ample time for discussion
  - Relaxed coffee breaks and lunch

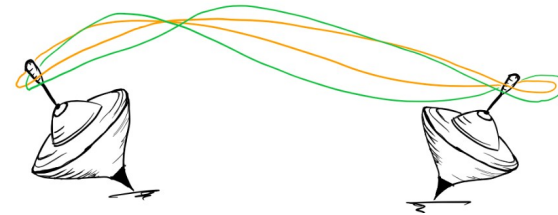
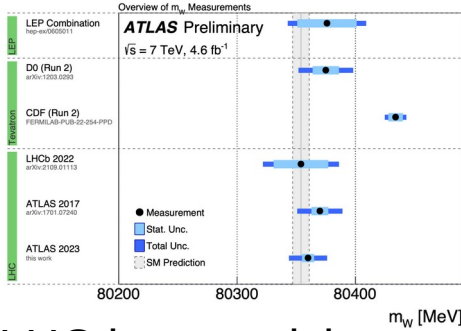


# 15 years on...

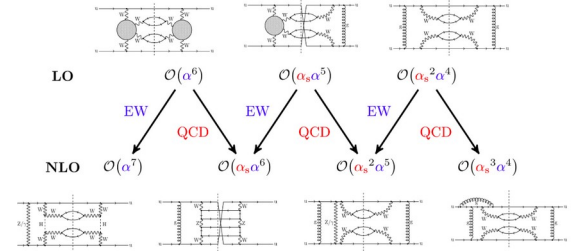
Well we are still discussing the SM (with Higgs and b-Physics) as the most precisely tested theory in history



# What was (maybe) less obvious 15 years ago

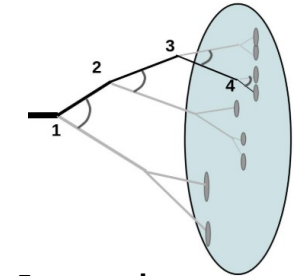


Quantum entanglement

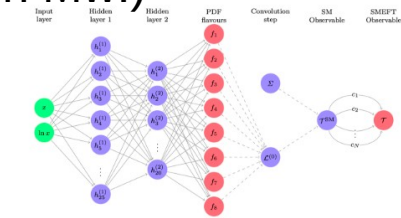


Interplay between QCD and EW corrections

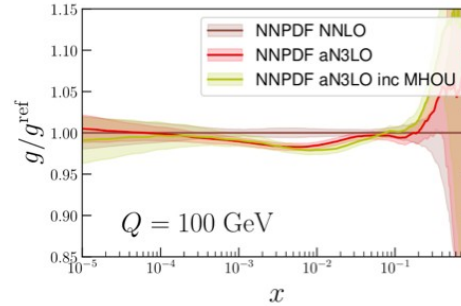
LHC is a precision machine!  
 (eg. beating LEP on  $M_W$ !)



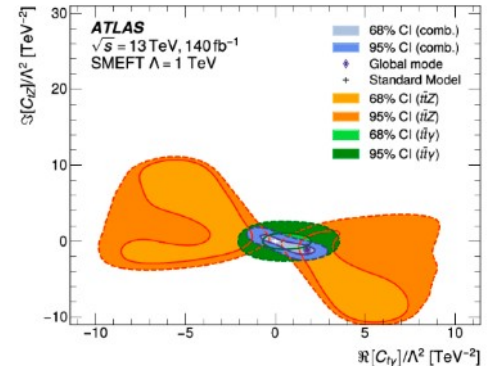
Jet substructure



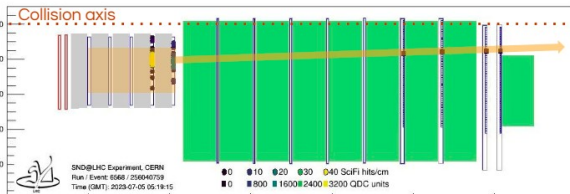
Massive use of ML  
 (also in theory!)



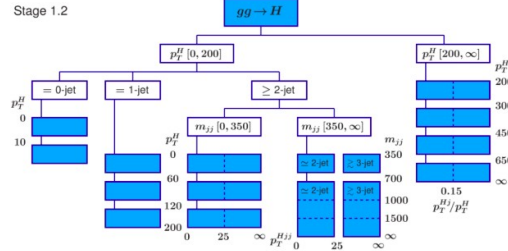
N3LO in calculations and PDFs



Extended use of EFT to combine results



Direct neutrino measurements



Higgs STXS

# Conclusions

Our goals were that you come out of this conference:

- Having learnt something
- Having made contacts with people you will collaborate with
- Got ideas on how to improve your current/future analysis
- Had fun

Thanks a lot to

All the speakers and session chairs

Aleandro, Roberta and all local organisers!!!

,,,and see you at SMLHC 2025