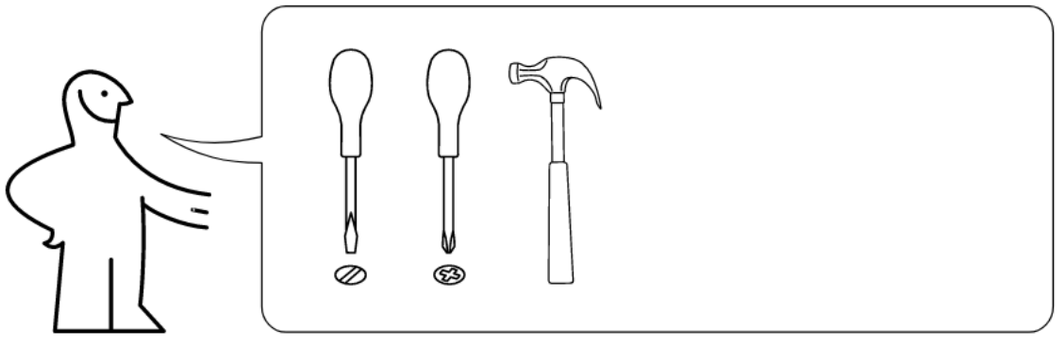
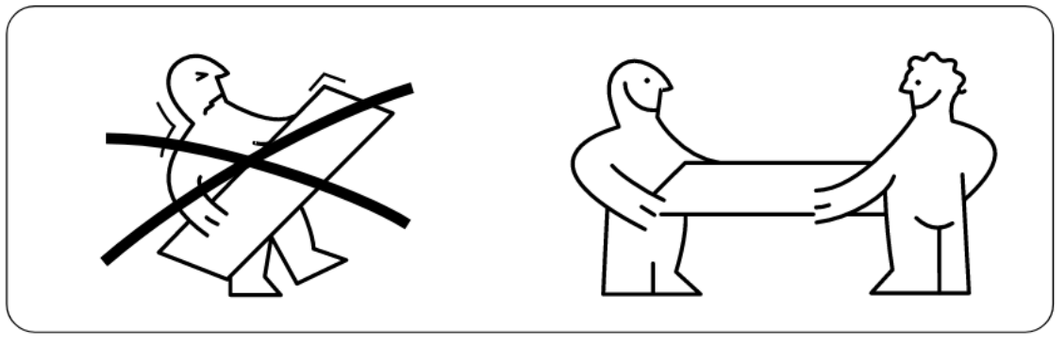
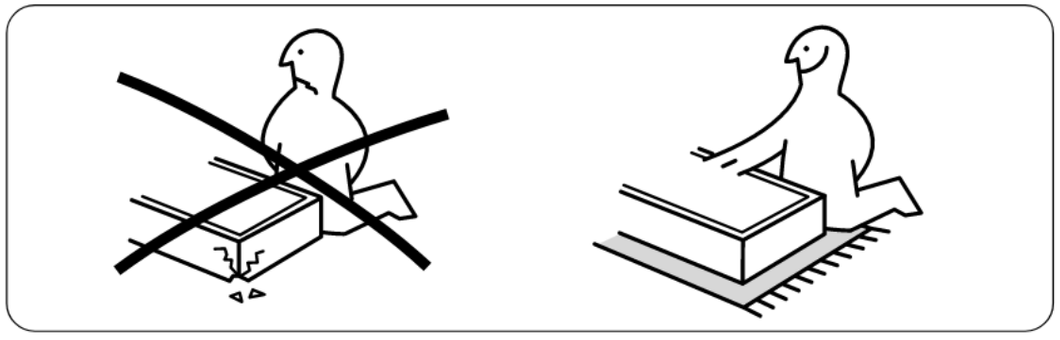
TOPPKVARK

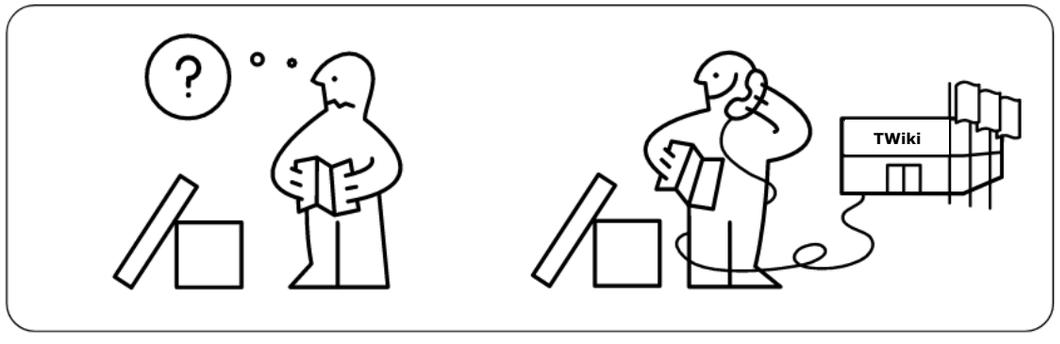
María Aldaya
Rebeca Gonzalez Suarez
Assembly instructions
CMS top PAG workshop
14-15 Nov 2017

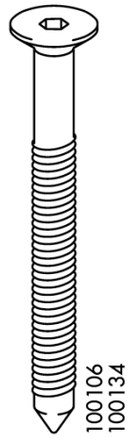
Design and Quality
CMS of the LHC



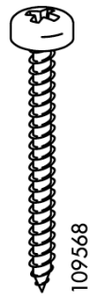




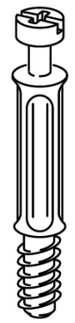




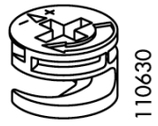
2 x cross sections



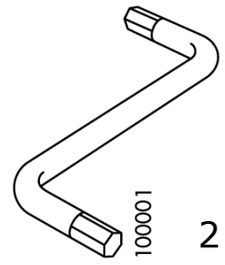
2 x single top



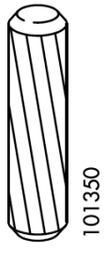
2 x properties



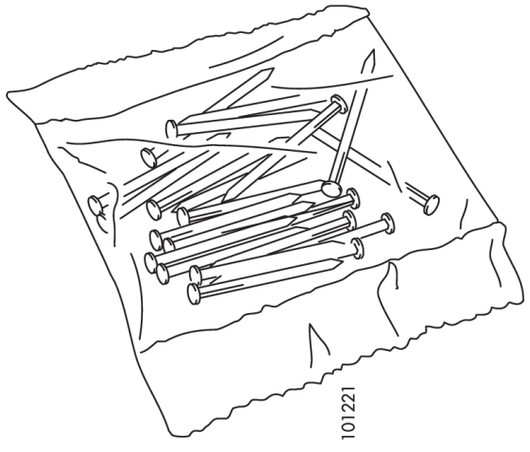
2 x mass



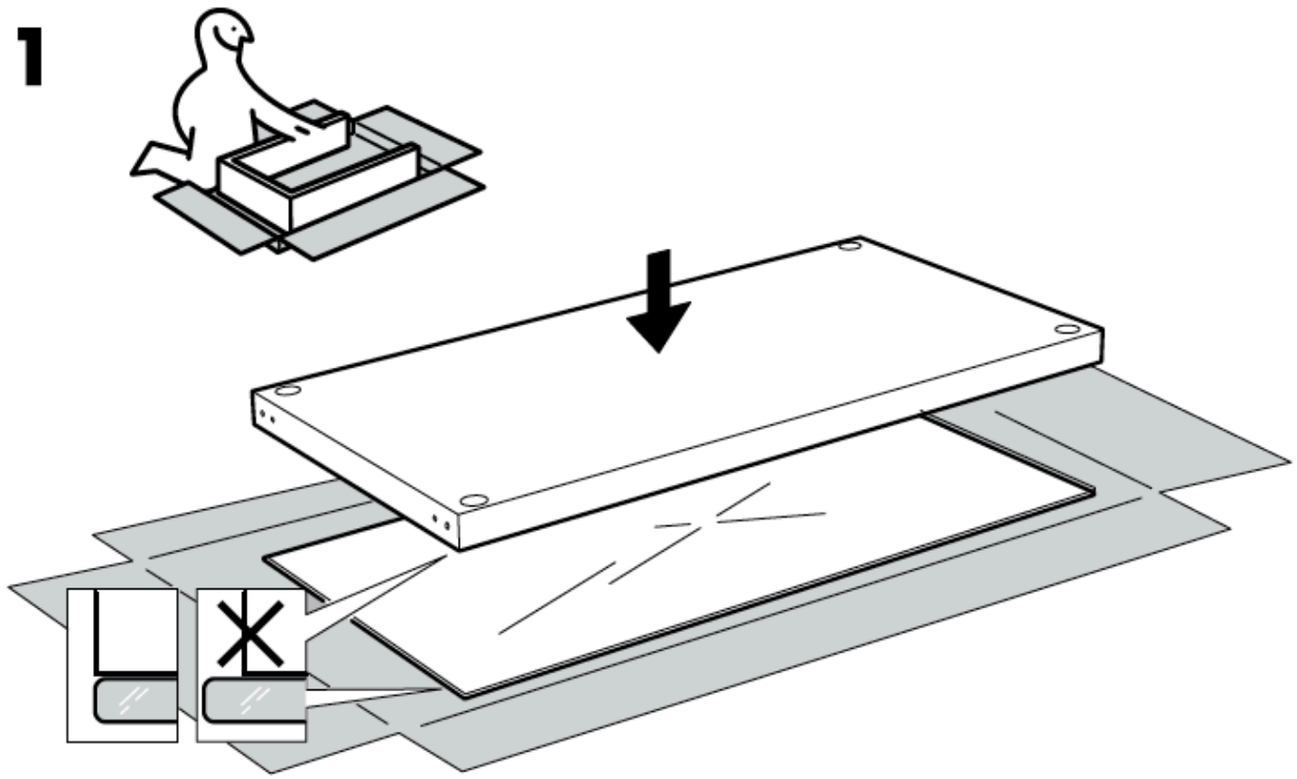
2 x TMG



27 x contacts

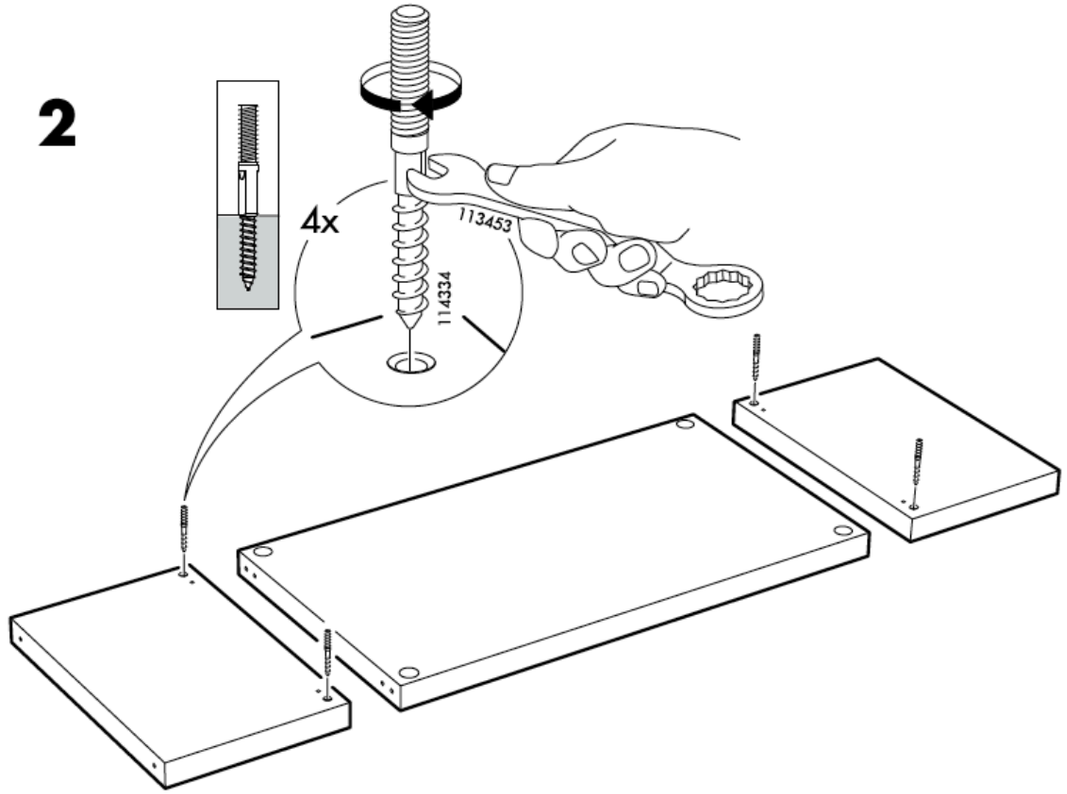


81 x publications

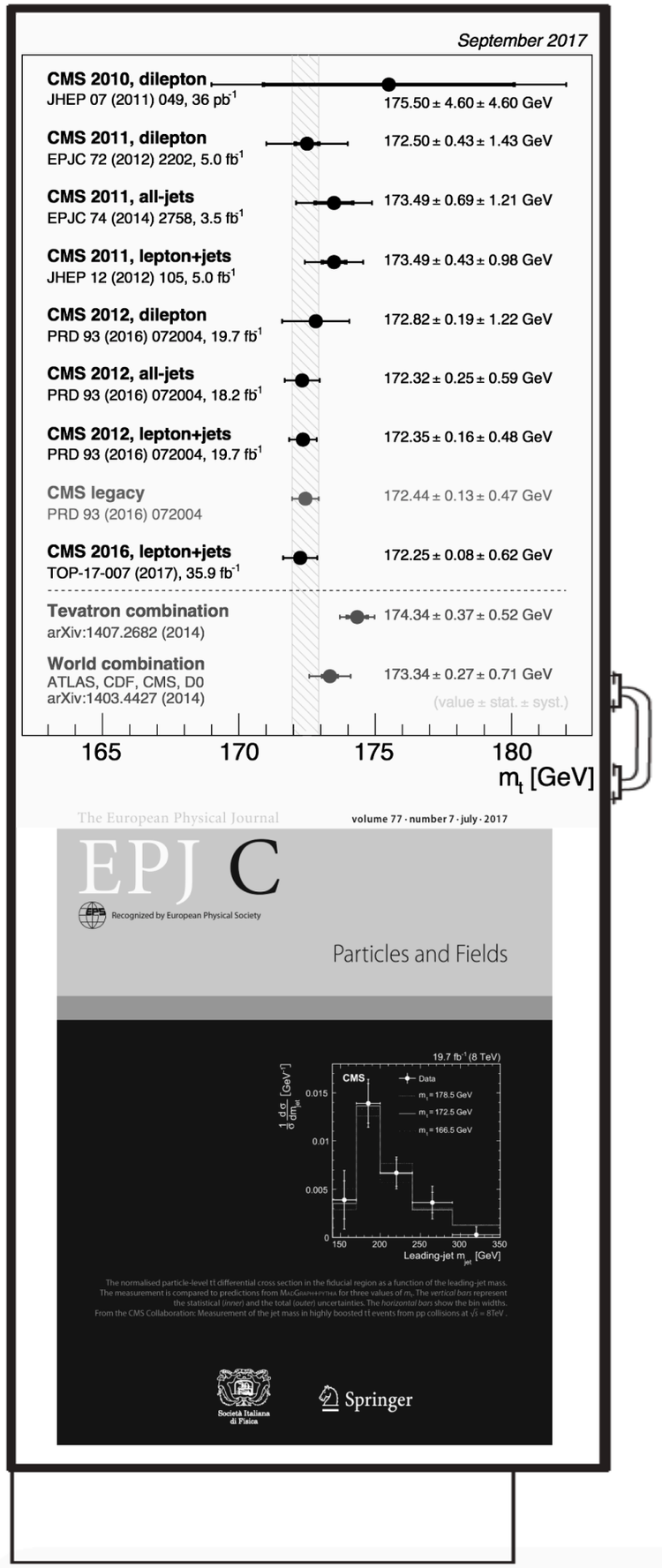


- In 2015, the TOP PAG held a workshop at CERN:
  - https://indico.cern.ch/event/456748/
  - We were just **starting to open the box of Run-2**

- Last year (2016) we met again for the 100fb^{-1} workshop
  - https://indico.cern.ch/event/568255/
- We **laid out the physics motivation for the full dataset of Run-2** in a few key components
  - Probing top production and decays as a whole
  - Couplings
  - Re-interpretation
- We discussed the limitations/challenges
  - Modelling
  - Ancillary measurements
- We tried to identify synergies amongst groups



- **Since then we have made good progress**
  - We submitted 17 papers
    - 6 Run-1 papers, the rest are all Run-2
    - 10 of them already published in journals
  - We have made public 13 PASes, and our fist CMS Note
  - We covered all bases: Precision measurements (inclusive, differential), properties, mass, rare processes, and for the first time TMG (TOP-16-021, NOTE-17-004)



- Currently, with over 80fb^{-1} recorded at 13 TeV, **we are ready to start mass-assembling** *(that is: Hammer the top quark down!)*

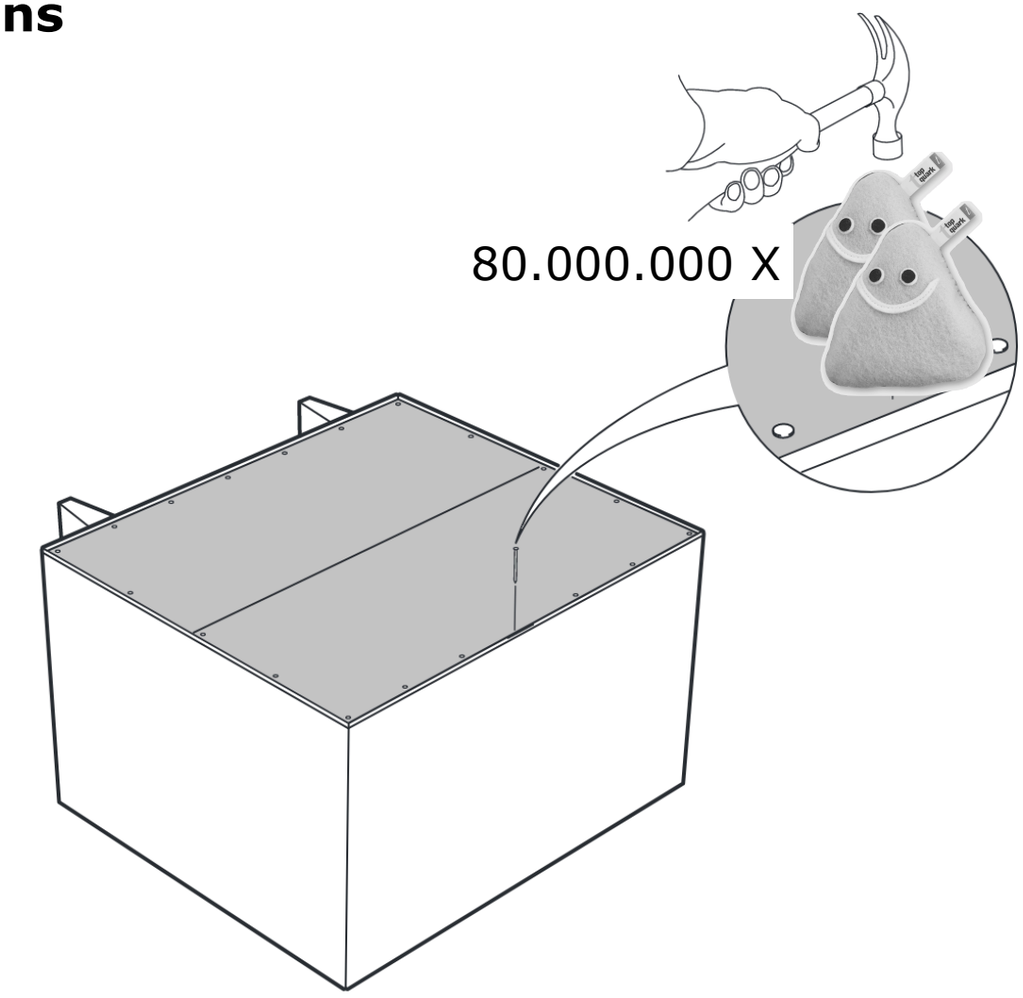
  - **Modelling and predictions**
    - NNLO everything
    - Generators: how to bring HERWIG7, SHERPA, WWbb NLO to the CMS mainstream
    - Current systematic prescriptions
    - Data features: top pt, jet multiplicities

  - **State-of-the-art of CMS recommendations**
    - Objects and tools

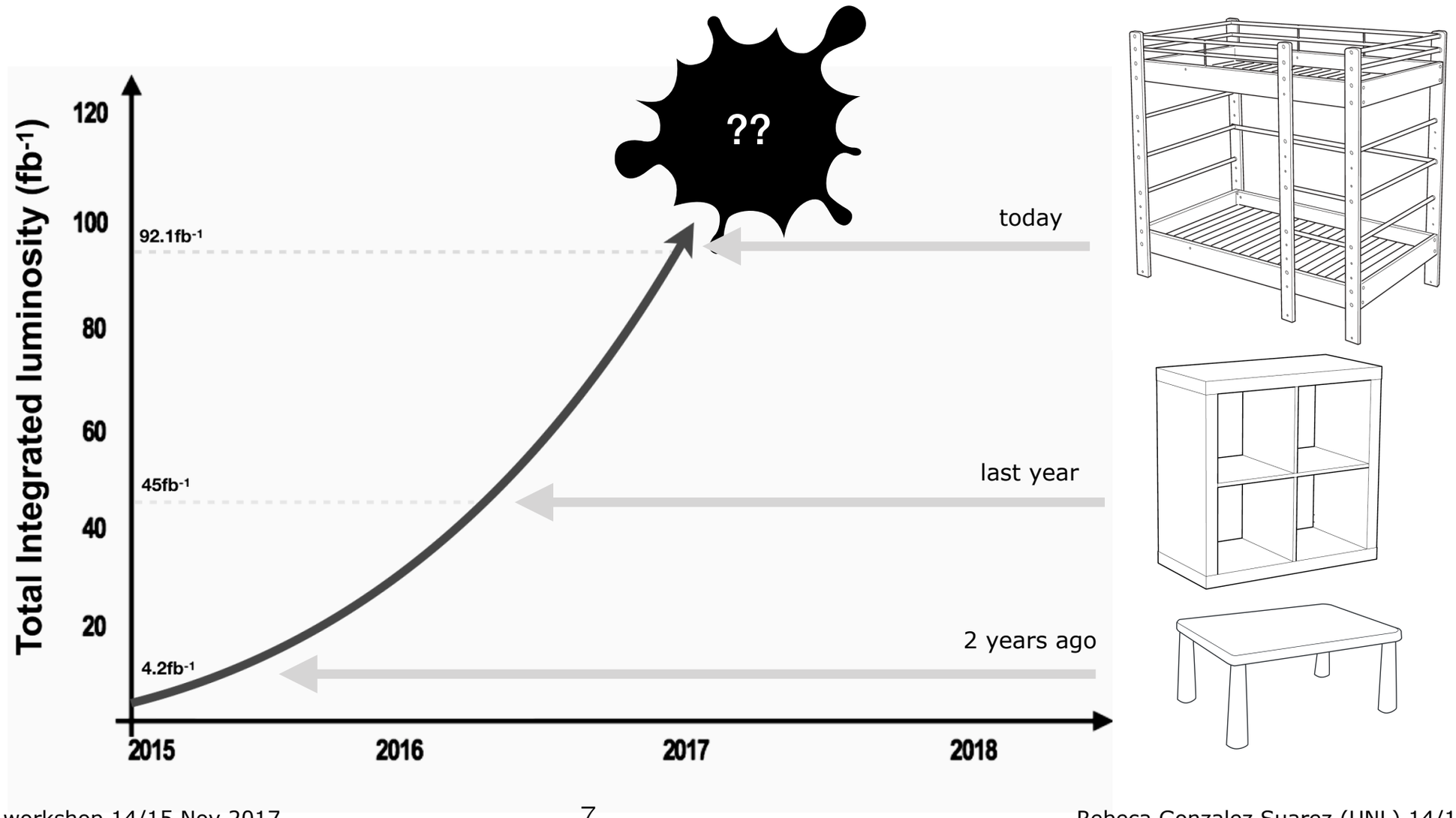
  - **Where are your limits?**
    - Statistics, systematics
    - and the grey area in between

  - **Re-interpretation**
    - EFT and other new angles

- **Synergies amongst groups?**
  - We mixed it all together!



- With:
  - The resources that we have at hand (**This afternoon**)
  - What we already measured (*not in this workshop, but* elsewhere)
  - What we are measuring now (**Tomorrow**)
  - Ideas on what we want to measure next (**Tomorrow**)
  - One more year of collisions (*2018*)
- We are ready to build a rich physics program and an outstanding Run-2 top quark legacy!



Further reading: arXiv:1202.3665