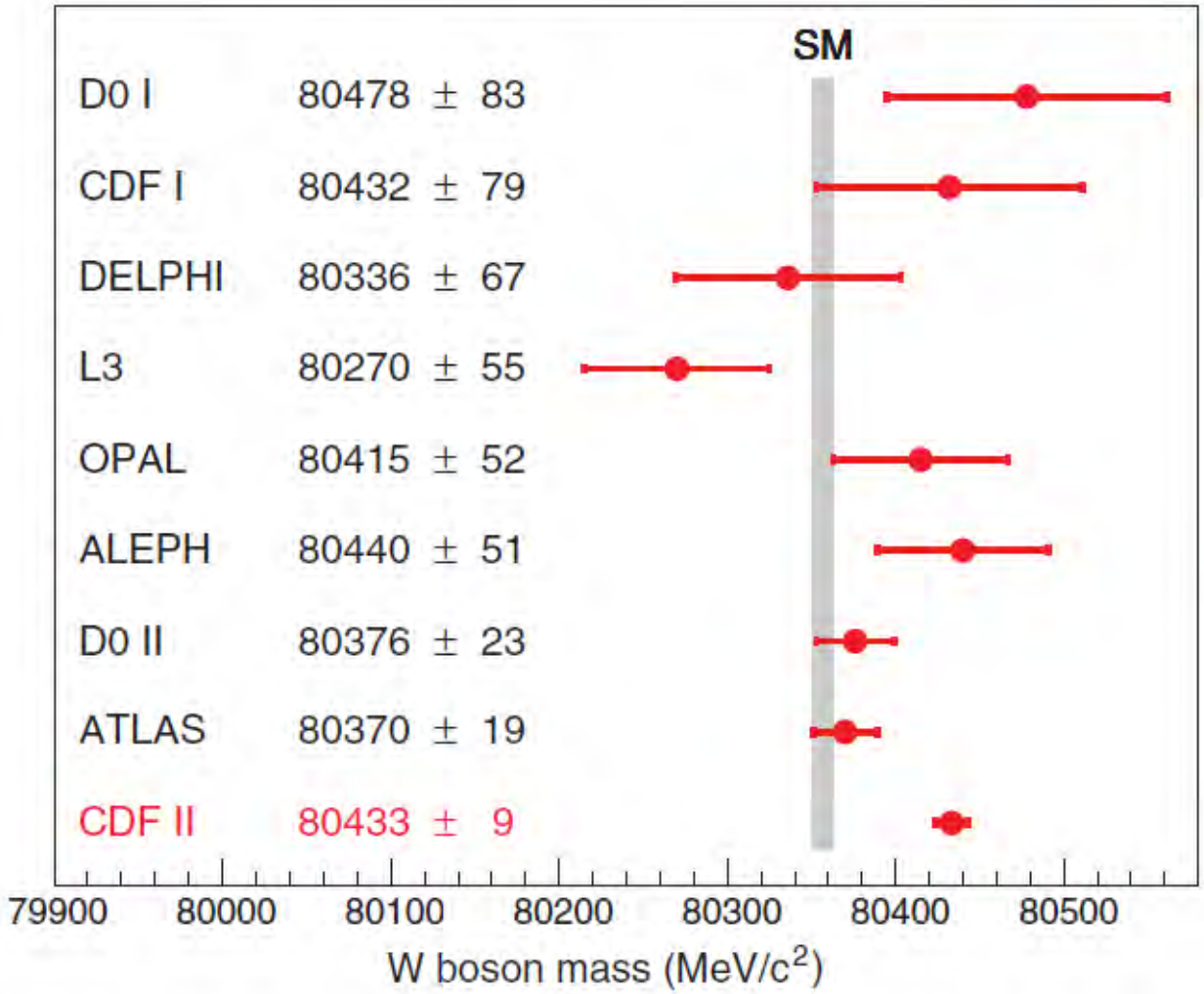
Dark Matter and the *W* Mass

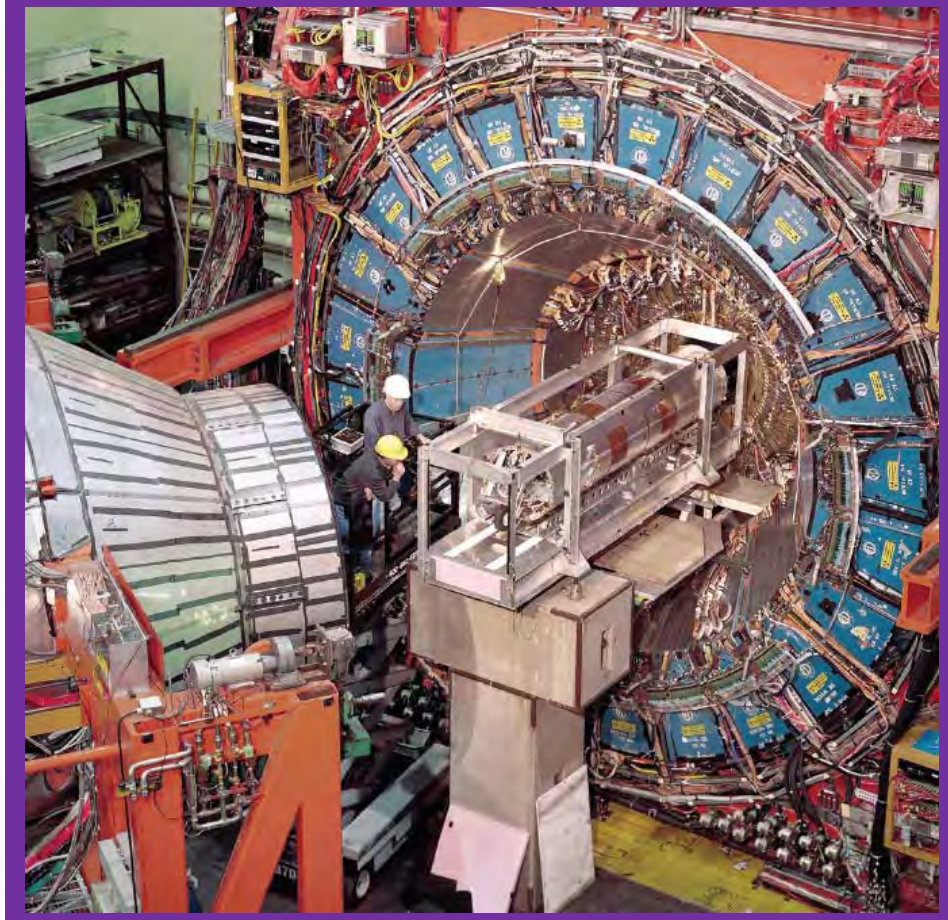
Mount Saint Mary's University
LOS ANGELES

Noah Bray-Ali 21-25 Aug 2021 52nd ISMPD Gyongyos

CDF II Lands 7 Sigma from Standard Model (SM)

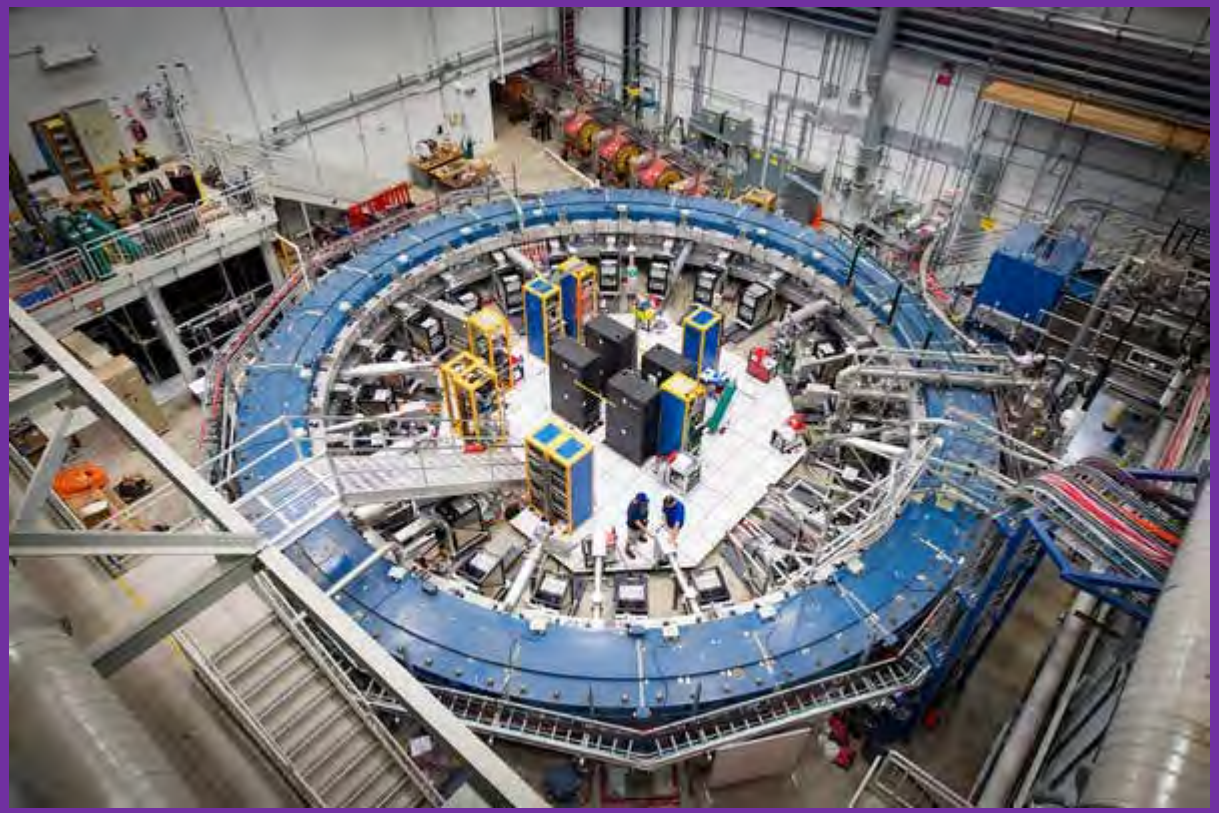
CDF II, Science **376**, 170 (2022)

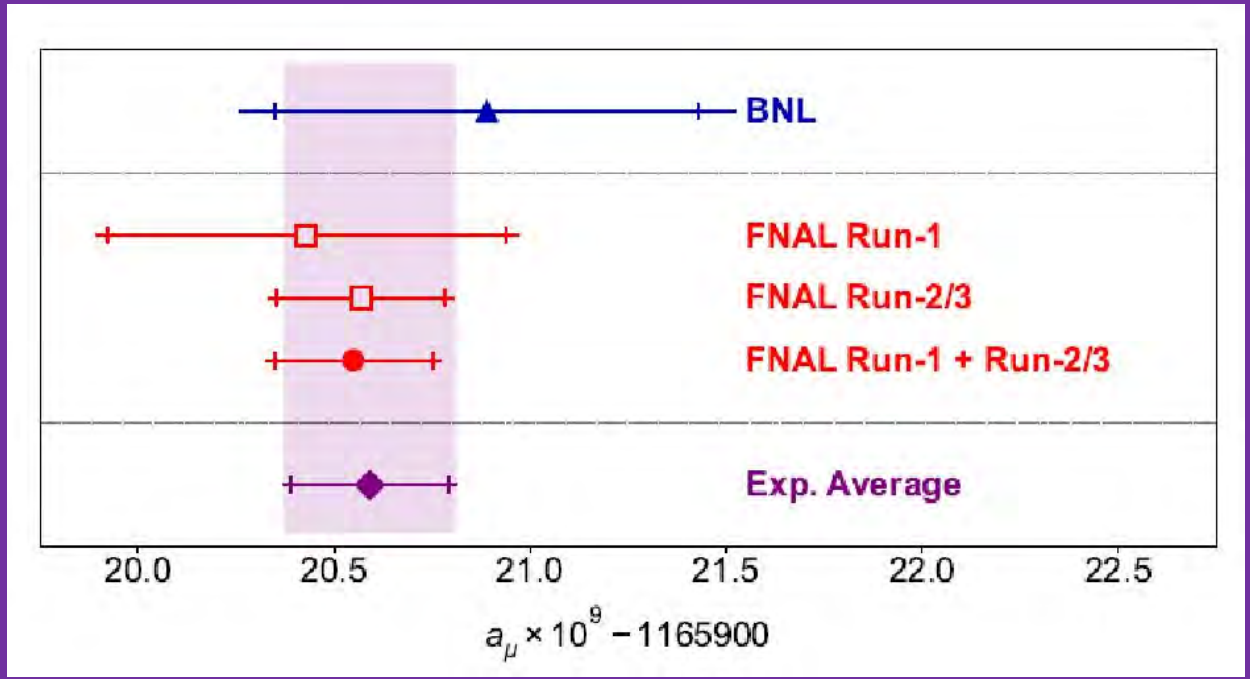




Muon *g*-2 Now More than 5 Sigma from "Standard Model"

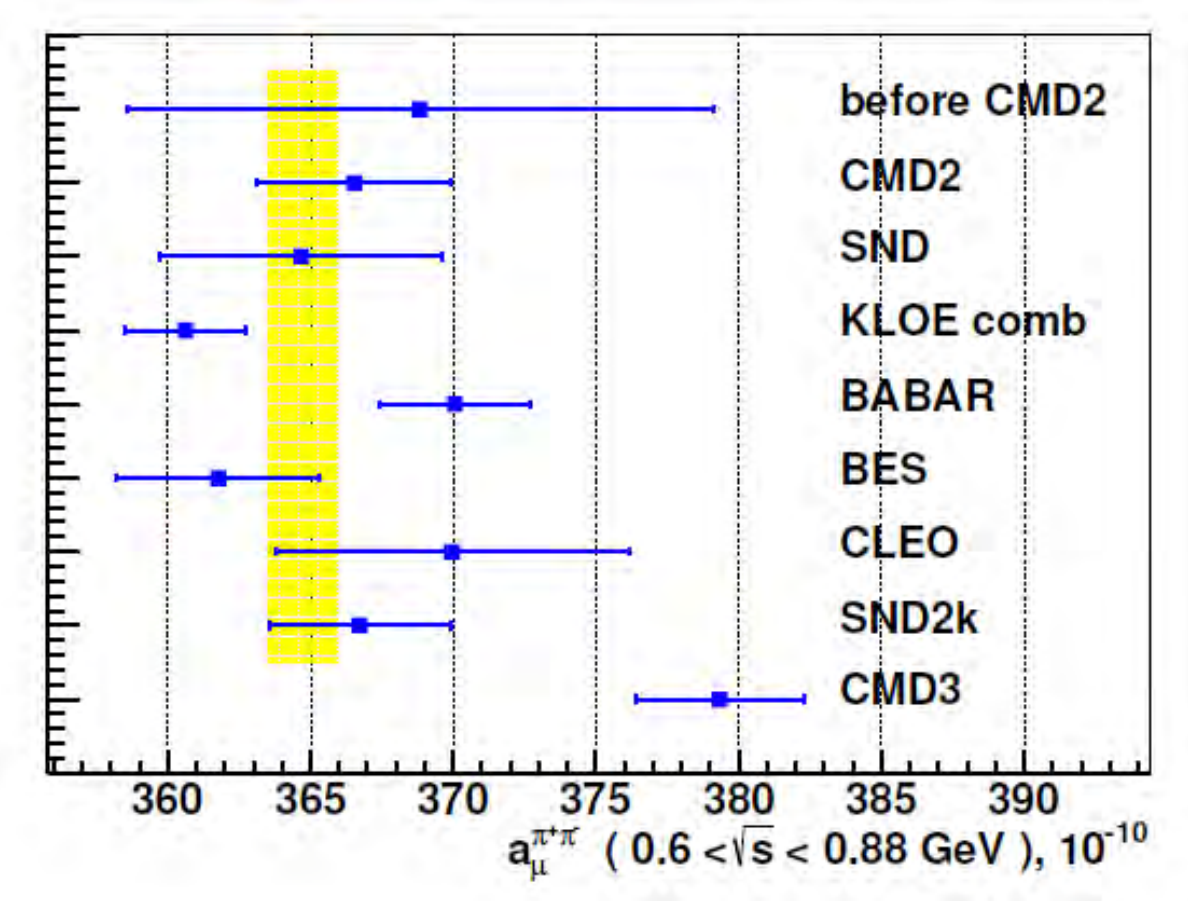
Muon *g*-2, 10 August 2023



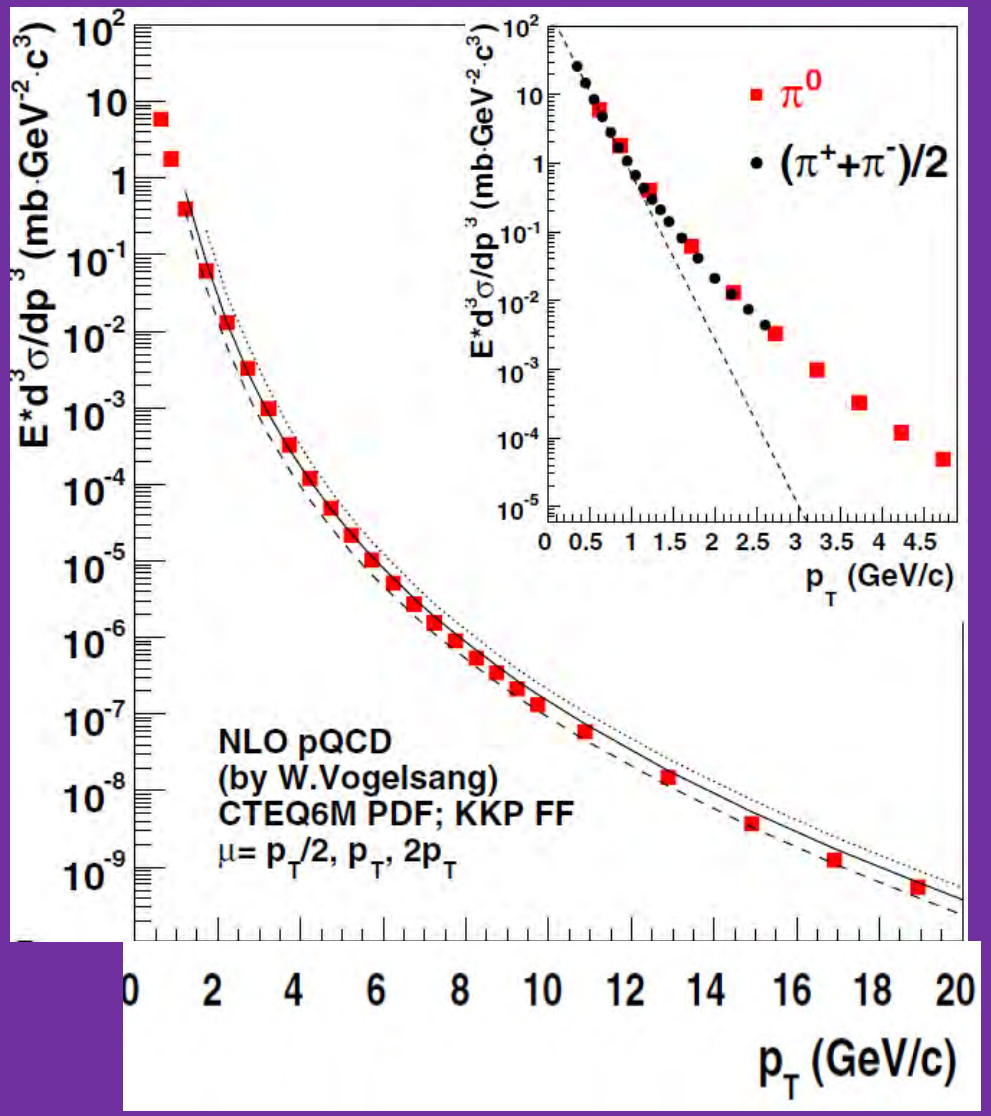


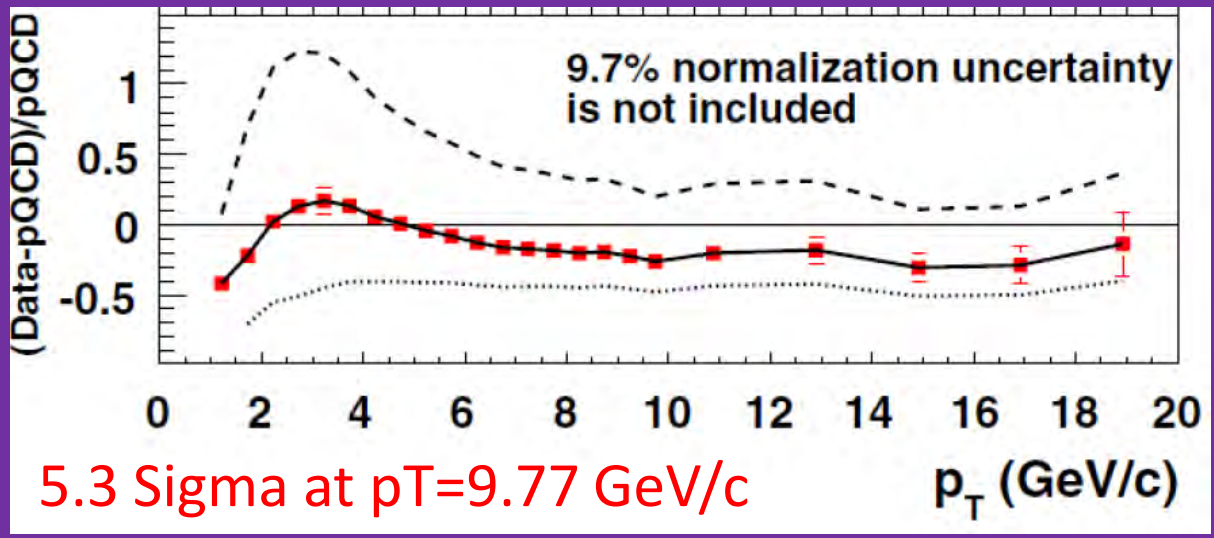
CMD-3 Lands 5.1 Sigma from KLOE (Yellow is "SM")

CMD-3, arXiv:2302.08834 (2023)



Mid-Rapidity pi0 Production from p+p at 100+100 GeV PHENIX, PRD **76**, 051106 (R) (2007)



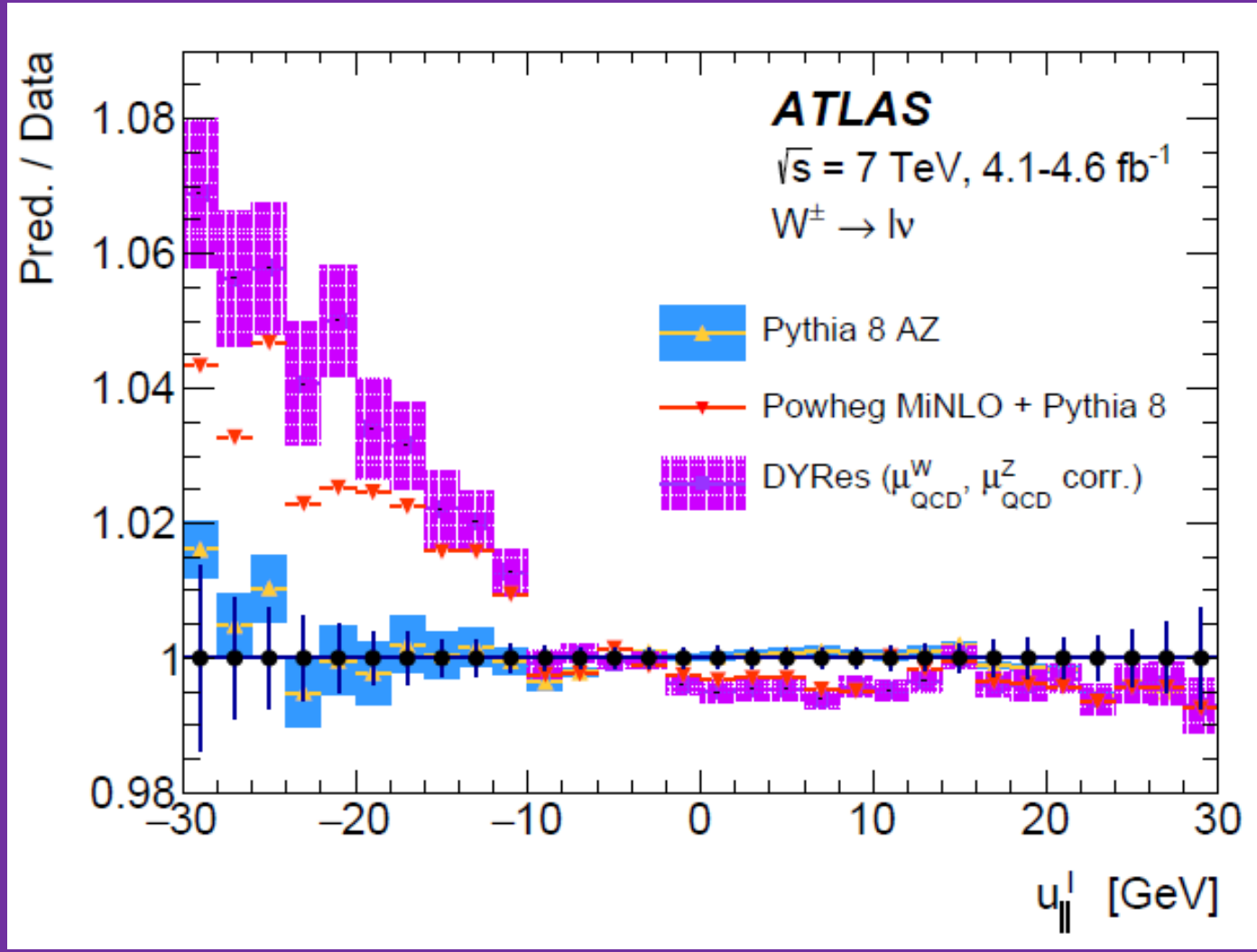


"The most spectacular agreement between data and theory," PHENIX Collaboration (2005)

Clue from ATLAS (using SM *W* mass)

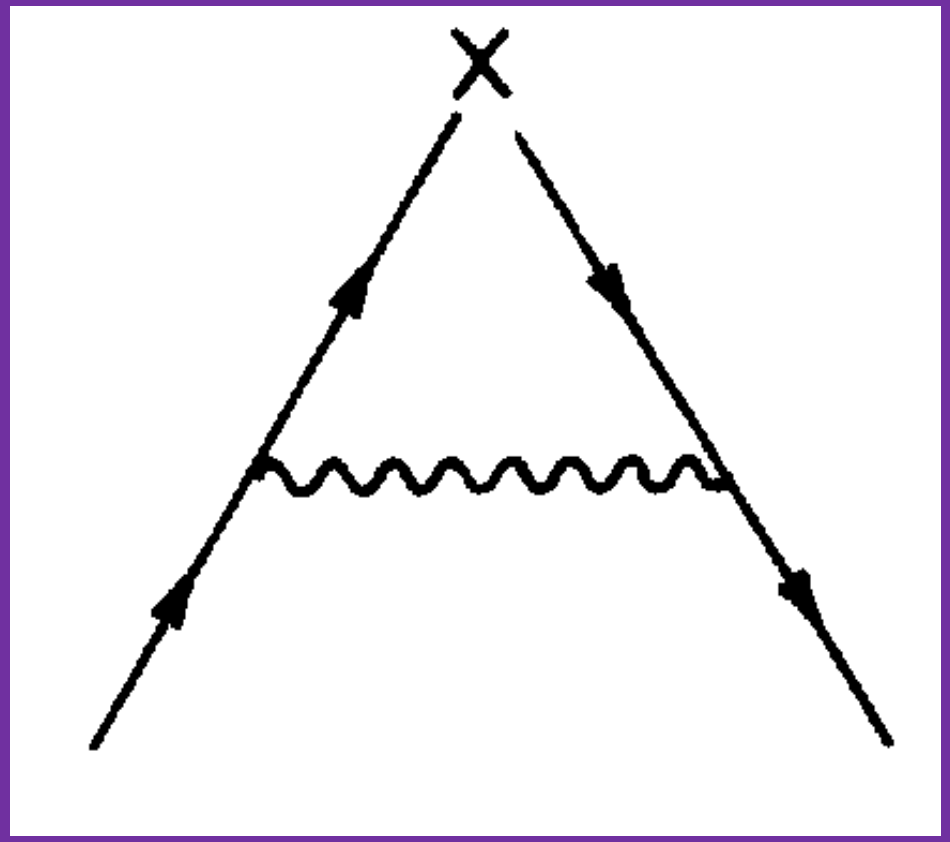
ATLAS, EPJ C **78**, 110 (2017)

…“predictions matched to the NLO [pQCD] *W*+jet cross section are in disagreement with the observed [hadronic recoil momentum] distribution…”



Electroproduction Scaling in NLO pQCD

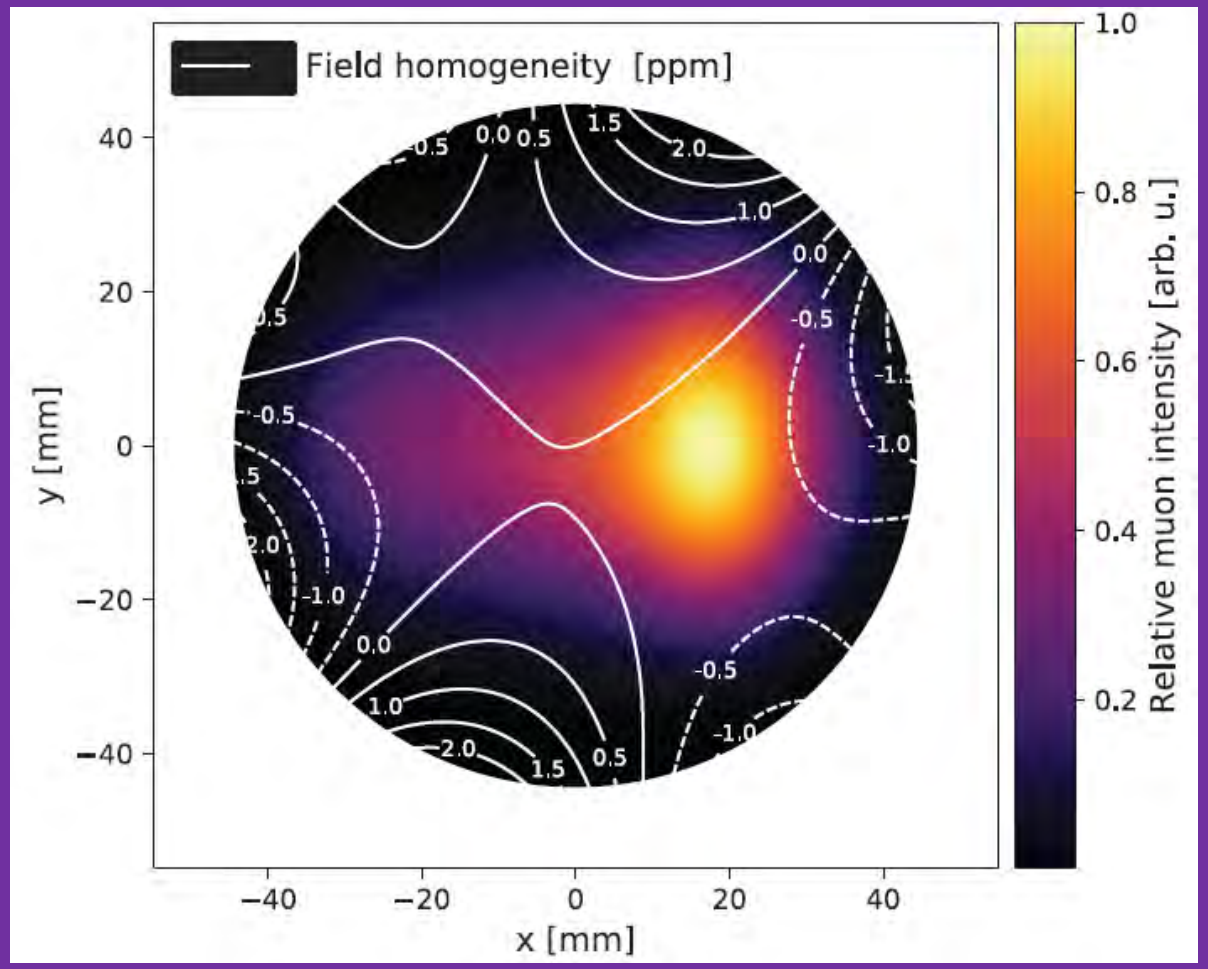
H. Georgi and D. Politzer PRD **9**, 416 (1974)

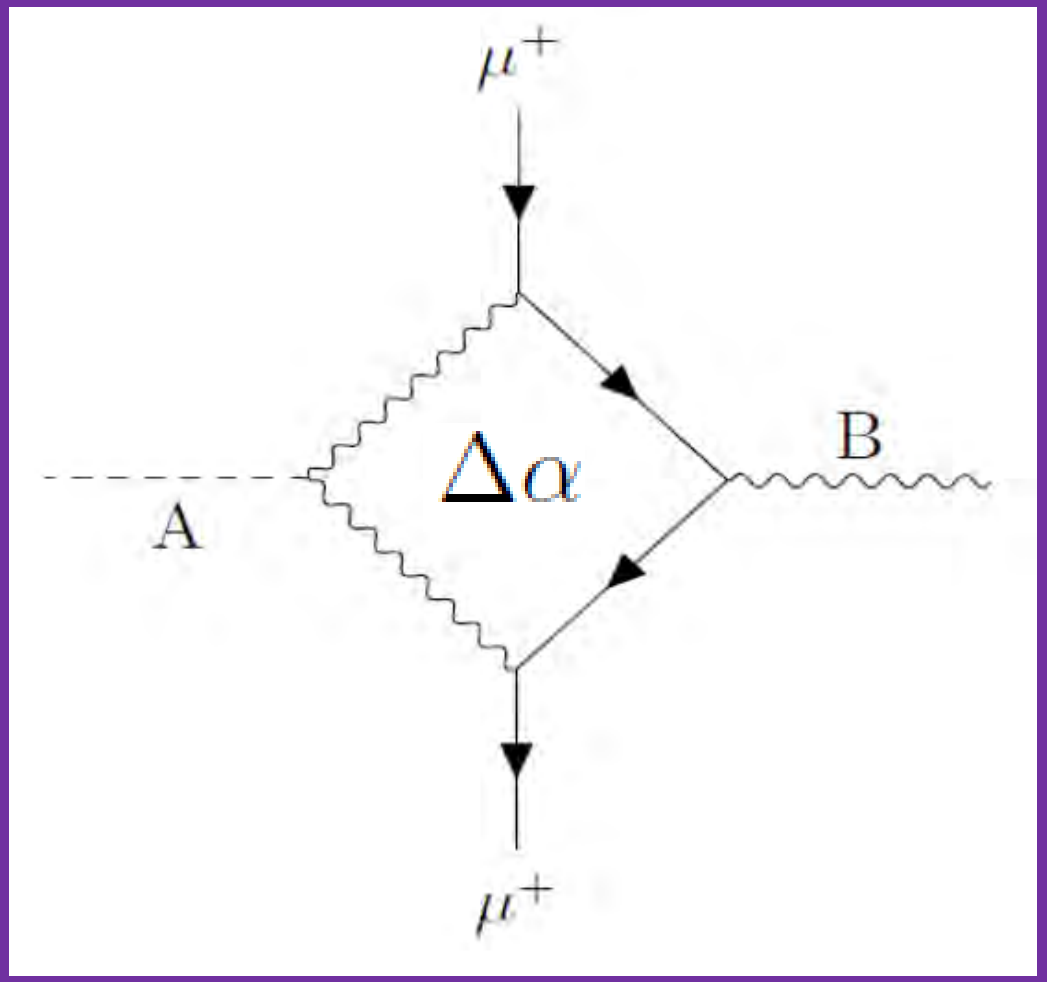


$$\frac{g^2}{16\pi^2}\ln\left(\frac{-p^2}{M^2}\right)$$

Dark Matter and Muon *g*-2

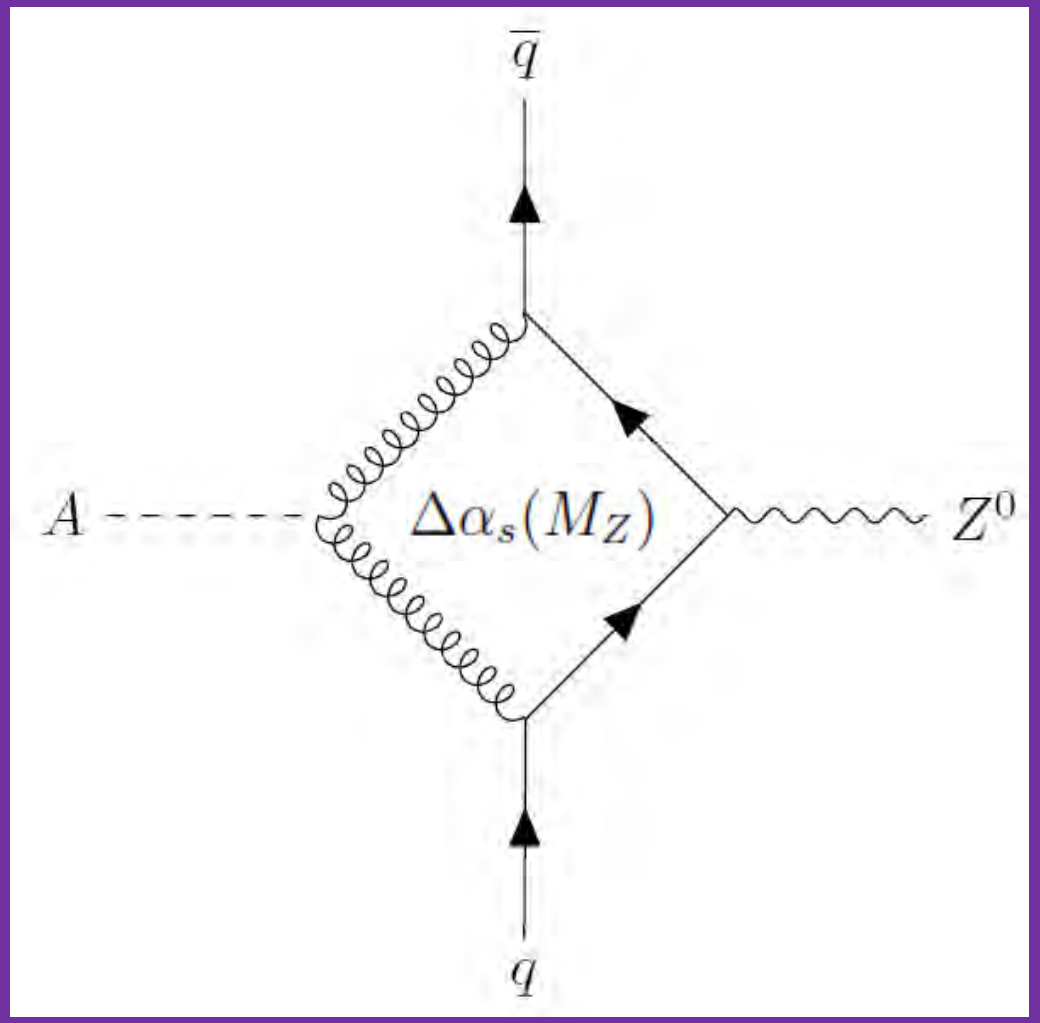
arXiv.org:2108.12243 (2021)

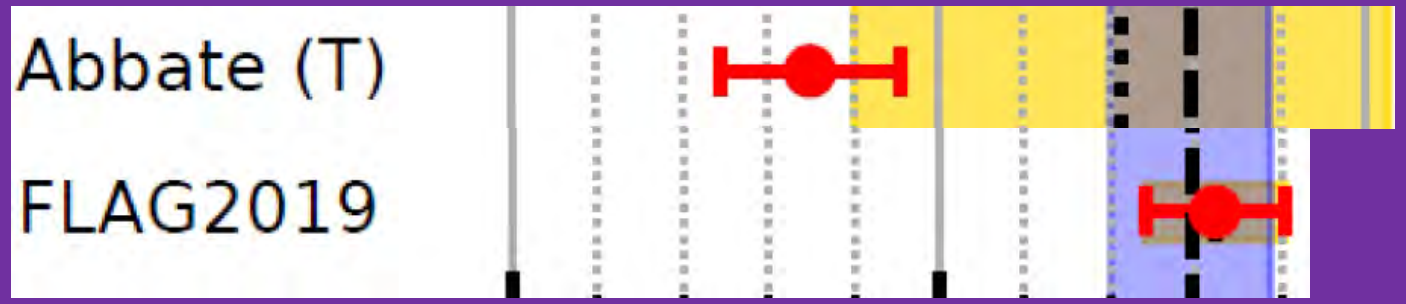




Dark Matter and the QCD Coupling Constant

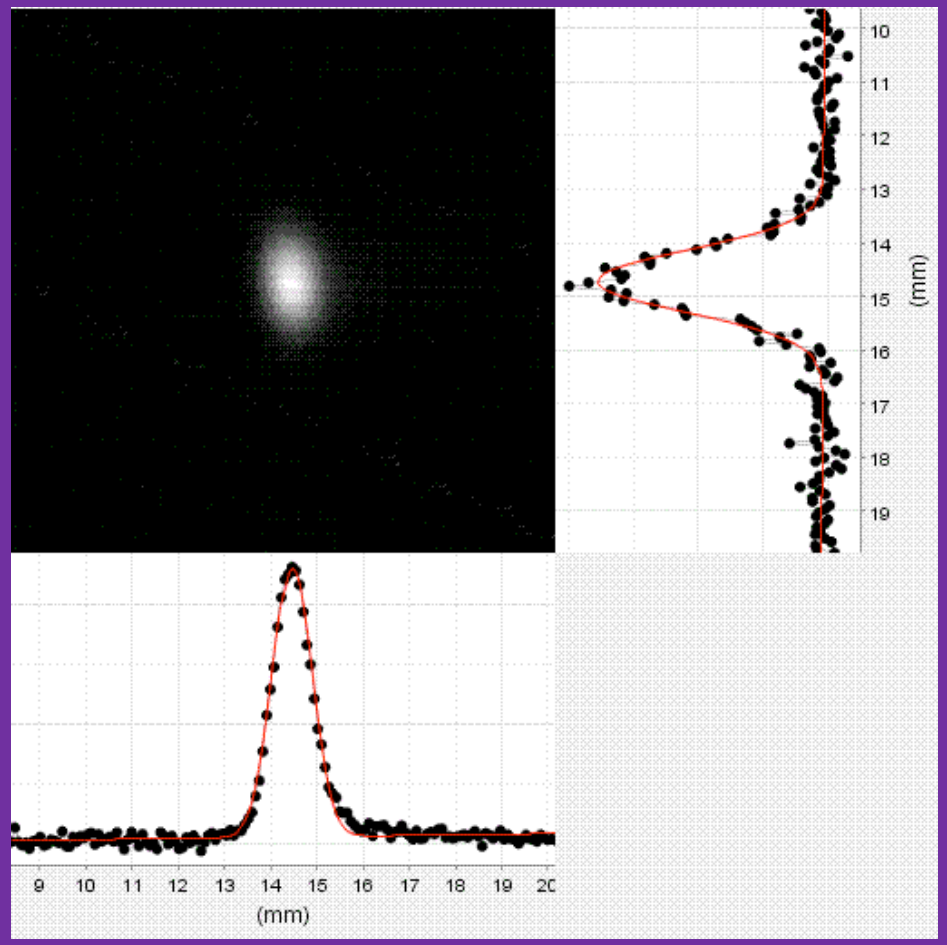
Quantum Chromodynamics in PDG (2020)





"…the deviation from HPQCD is 3.5σ."
(Abbate+, 2010)

Dark Matter and the *W* Mass



Tevatron Rookie Book (2009) pg. 157