

# WIFAI2024: CKM & CPV

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# A story full of successes

1960's

CP violation in K decays

1970's

Discovery of J/ $\psi$  and charm quark

1980's

Inference on top quark mass  
from B mixing

2000's

CP violation in B decays

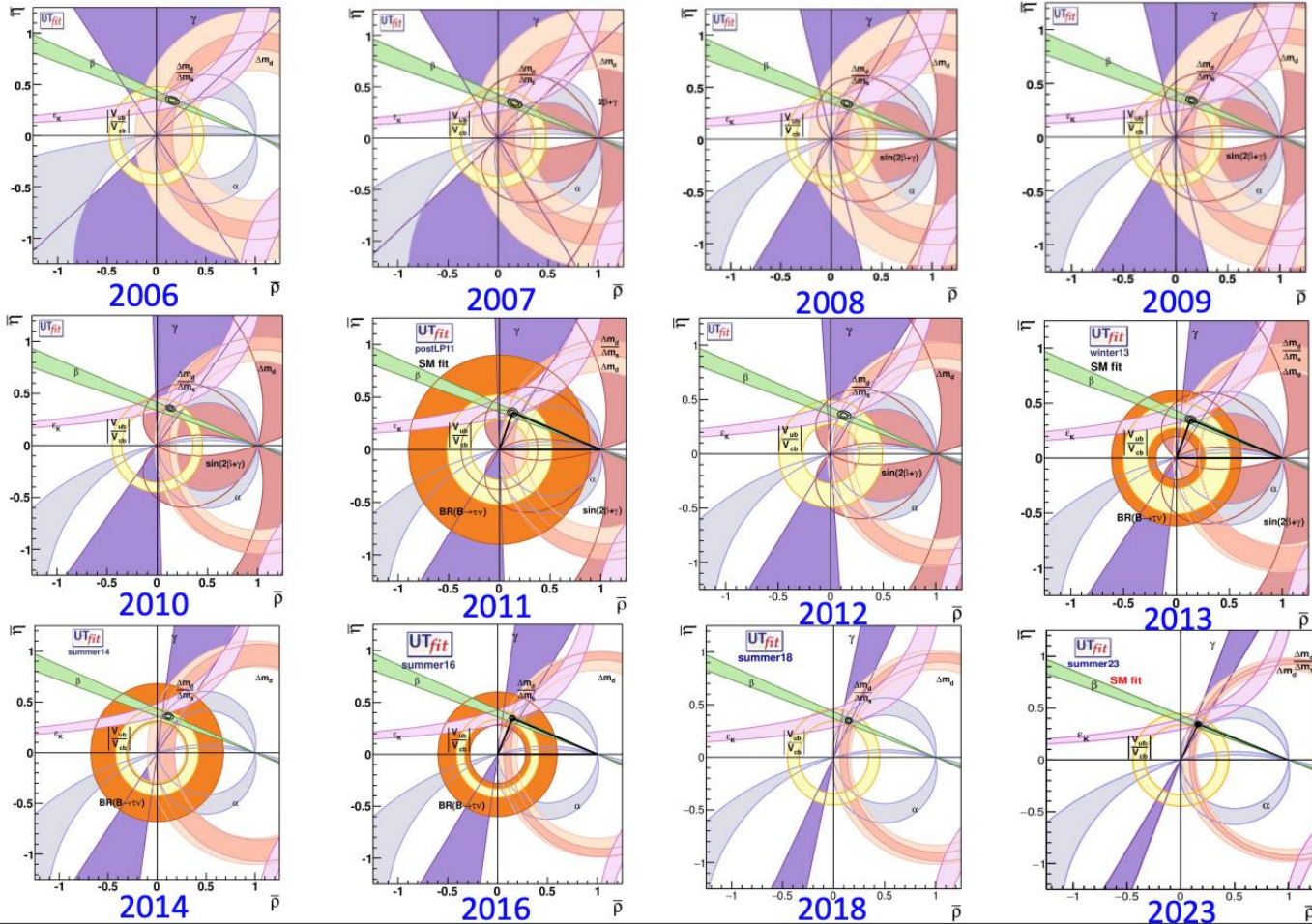
2020's

CP violation in D decays



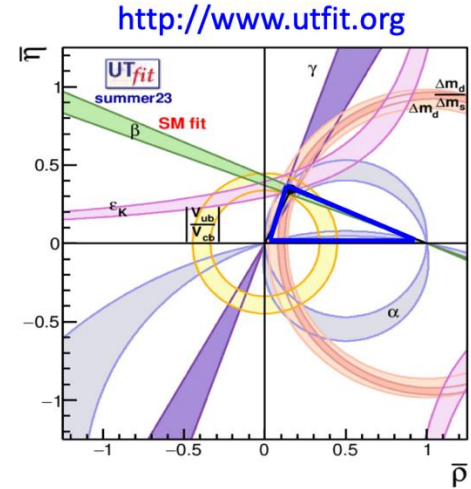
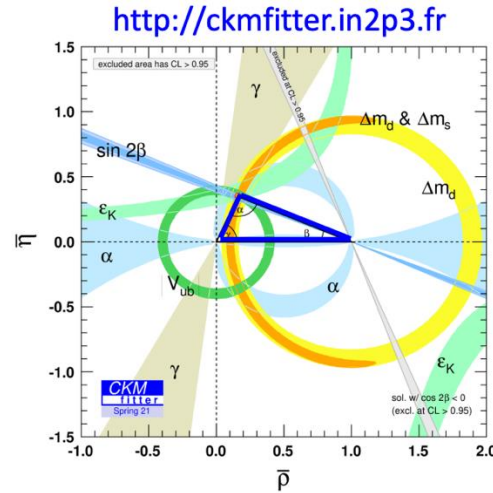
Cartoon presented by N. Cabibbo at the Berkeley conference in 1966

# More modern story



# Status of CKM & CPV measurements

- Few decades of CKM measurements provided an impressively consistent picture of CPV in the quark sector of the SM
  - Remarkable agreement within the current precisions of all measurements
  - Effects of BSM physics at the 10% level are still possible
  - Few places show puzzling tensions, but no definitive answer can be given with the current precision
- Chasing BSM physics in this sector will require to enter an era of extreme precision measurements and accurate theoretical interpretations



# Purpose of this session

- Discuss the current status of CKM Matrix and CPV landscape
  - Latest measurements from running experiments
  - Interpretation of current measurements in terms of CKM parameters and/or Physics Beyond the Standard Model
- Have a look to the future
  - How theory can/will cope with the shrinking of experimental uncertainties
  - What theory can do to exploit less “clean” sectors (e.g. charmless hadronic decays, charm physics...)
  - What are the experimental challenges for the next generation of detectors
    - Limiting factors for measurements in the high-precision era
    - Not only technological challenges, but also person power and costs...
- Hope to have a fruitful discussion