NTUHEP 25+
Reminiscence
Perspective from FNAL

Yee Bob Hsiung

Feb. 28, 2020 @R104 (NTU Physics)
I recall with my fading memory, one day in 90’ (1994?), I unexpectedly ran into George WS Hou at Fermilab Cafeteria @lunch time!

After some chatting, I was amazed that George was quite serious and “cornered” me with some serious questions:

1. Should NTU start a HEP group on experiment?
2. B physics/collider/fixed target or something else?
3. Belle or Babar? Where?
4. Can a theorist be also experimentalist? Or vice versa?
What was my answers?

- Surely YES, Maybe or Not Sure!
- Before 1986 I was working on E605 dimuon experiment to look for new resonances beyond Upsilon. My thesis experiment, also met Koji Ueno (E288) and Yoshi Sakai on E605 @12W.
- Super busy on KTeV (E832/E799II) preparation (co-spokesperson/Detector Coordinator) starting from scratch for direct CP violation on neutral kaon decays.
- Love B-physics with the discovery potential on CPV
- Participate experiment in Asia near home would be the best – Belle@KEK vs Babar@SLAC
- Enrico Fermi would be the best example!!! But how to build up the group?
- …….. Not a Wiseman, but only a Consultant!
What’s next? Before 2000

- Successes of KTeV (both direct CPV epsilon’/epsilon and rare K decays)!!!
- → KAMI (Kaon at Main Injector) proposal on direct CPV rare decays KL → pi0nunubar! → rejected!
  → Sabbatical to NTU 2002 and joining KEK-E391a.
- Fermilab collider’s top quark discovery!!!
- Start of SLAC and KEK B-facrtory!!
Discovering direct CP violation in neutral kaon decays

However, latest SM lattice calculation still gives 2.9 sigma smaller value!!!!

KTeV 2003 result (based on half of KTeV data sample):

\[ \text{Re}(\epsilon'/\epsilon) = (20.7 \pm 1.5\text{(stat)} \pm 2.4\text{(syst)}) \times 10^{-4} \]

\[ = (20.7 \pm 2.8) \times 10^{-4} \]
What’s next? After 2002

- Initiate Daya Bay @end of 2003 HKU
- KEK-E391a/Belle/CMS preshower
- CPV and rare decays @Belle
- Daya Bay R&D and inner 3m acrylic vessels 2006-2012
- Discovery of theta13 and Higgs boson in 2012
- KOTO at JPARC 2008-now
- Daya Bay ➔ JUNO since 2013
Improved new results (June 2012)

\[ R = 0.944 \pm 0.007 \text{ (stat)} \pm 0.003 \text{ (syst)} \]

\[ \sin^2 \theta_{13} = 0.089 \pm 0.010 \text{(stat)} \pm 0.005 \text{(syst)} \]

With 2.5x more statistics, an improved measurement to \( \theta_{13} \)

Yee Bob Hsiung
NTUHEP 30+, 40+, 50…

- I have seen the growth of NTUHEP since 2002.
- 3 faculties to 7 now!!!
- Keys: planning, sharing resources, physics/analysis strategies, interesting topics, discovery potentials…
- Very good staff, administration/hardware/software…
- Reliable high tech company supports!!
- Good Collaboration ➔ Cooperation and Competition!
- Physics, physics, physics……
Thank you!