Implications of LHCb measurements and future prospects

Welcome and Introduction

J. Ellis, T. Gershon, G. Isidori,
G. Perez, F. Teubert, G. Wilkinson

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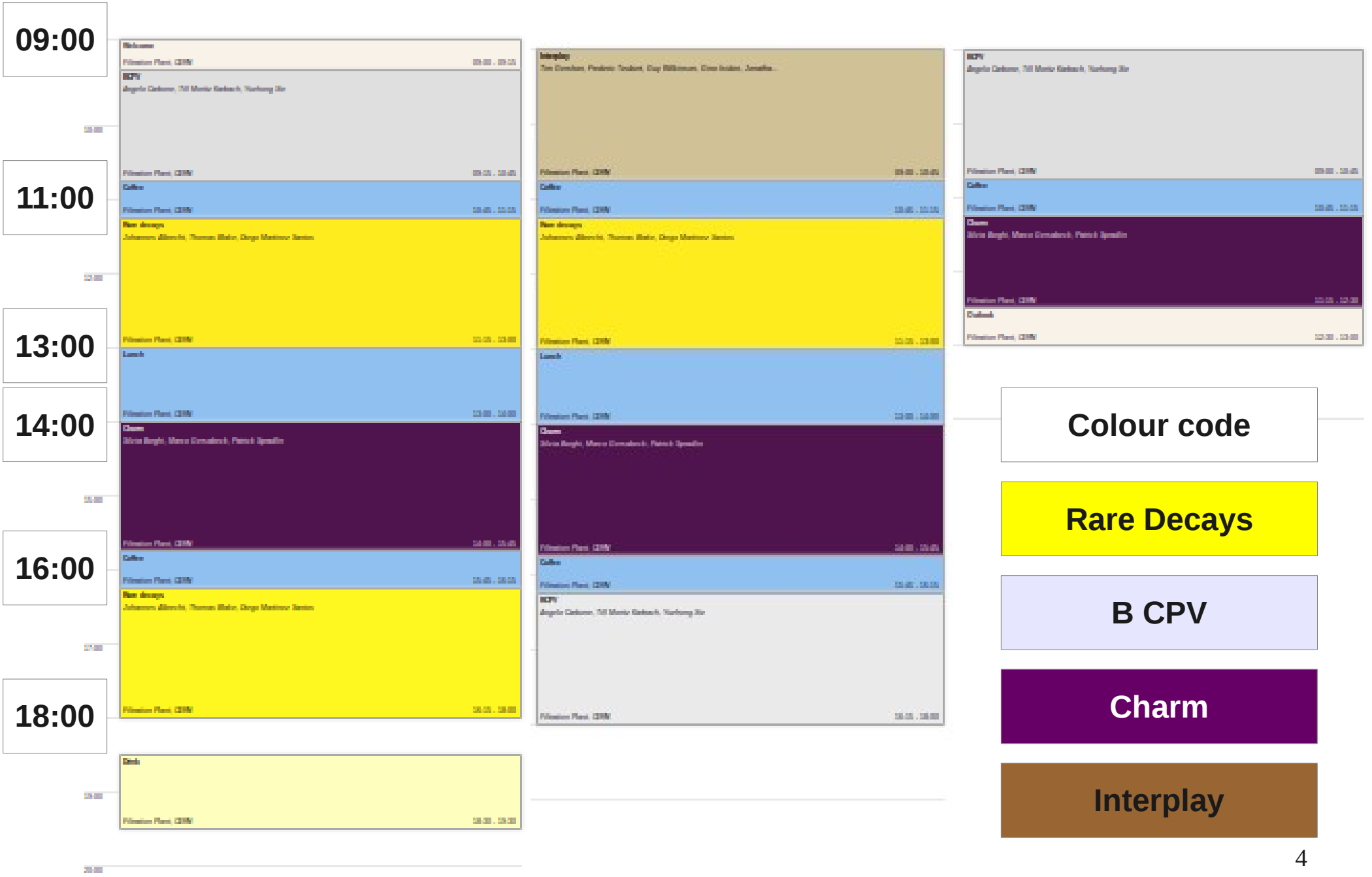
Purpose of the workshop

- Follow on from successful previous workshop, Nov.10-11, 2011
  - many new results using full 2011 1.0/fb dataset
- Satellite of series of workshops on "Implications of LHC results for TeV-scale physics" (March 26-30 2012, 13-17 July 2012)
- Develop new ideas for future analysis
  - further refine physics case for LHCb upgrade

Structure of the workshop

- As last time, three “streams”
  - charm mixing and CP violation:
    - Silvia Borghi, Marco Gersabeck, Patrick Spradlin
  - B mixing and CP violation:
    - Angelo Carbone, Moritz Karbach, Yuehong Xie
  - rare decays:
    - Johannes Albrecht, Tom Blake, Diego Martinez Santos
- New this time
  - interplay session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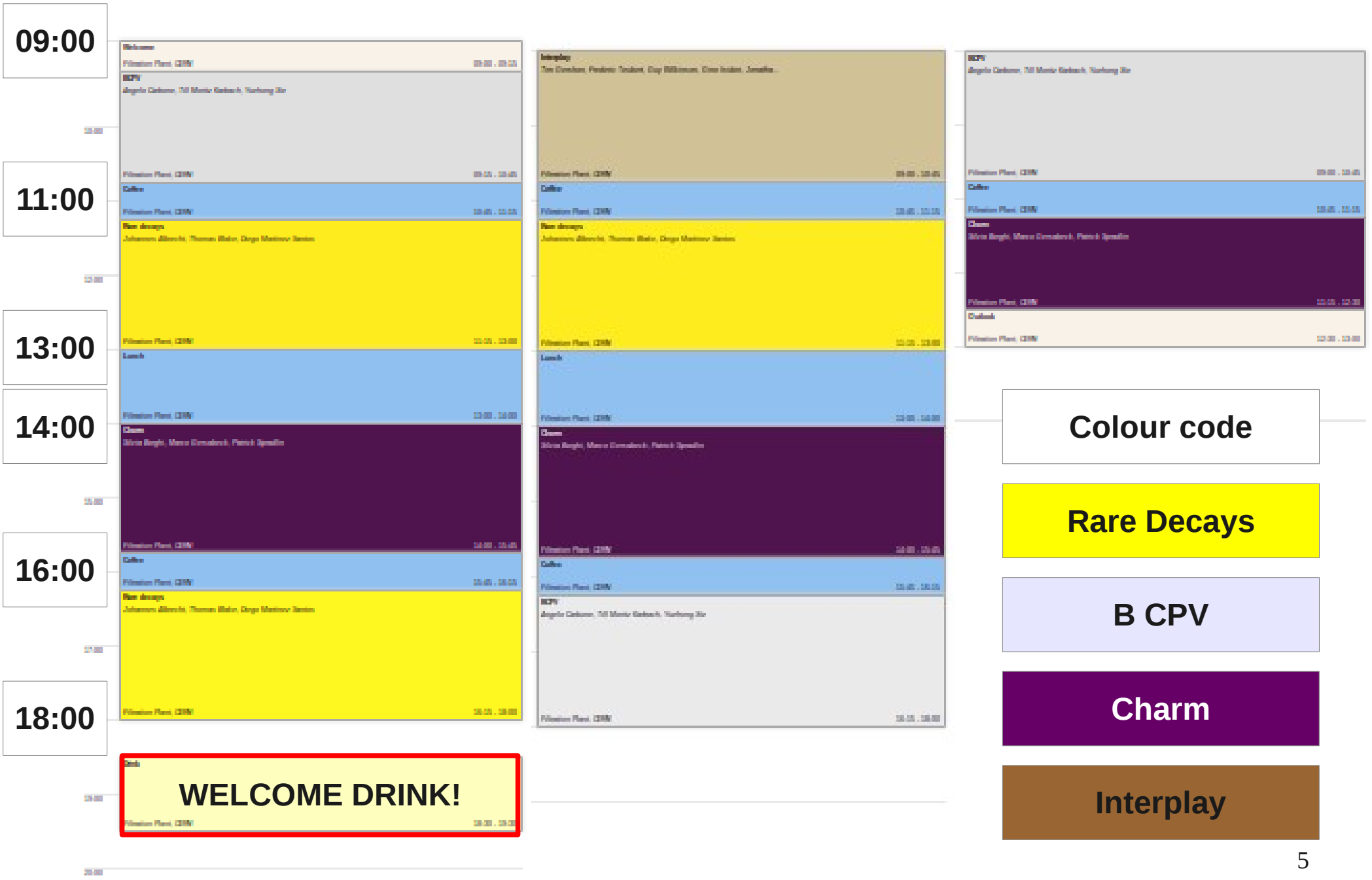
Rare Decays
B CPV
Charm
Interplay


09:00
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WELCOME DRINK!
Colour code
Rare Decays
B CPV
Charm
Interplay

Outcome of the workshop

- Work has started to prepare a document that will serve as basis for input to the European Strategy Preparation Group
- Emphasise the potential for flavour physics (*) at the LHC, and the need to exploit fully all opportunities provided by the machine
  - (*) not only flavour! Unique kinematic region accessed by LHCb
- Your input to this document very welcome
  - please contact the session organisers, who are also responsible for editing the relevant sections
  - … otherwise, expect that they may contact you
  - N.B. timescale to prepare the document rather short

Latest results

- Previous meeting was characterised by
  - excellent talks
  - lively discussion
  - excitement over new results (charm ΔA_{CP})
- We hope for the same this time
  - several anomalies squashed by LHCb results, but new ones emerge ...

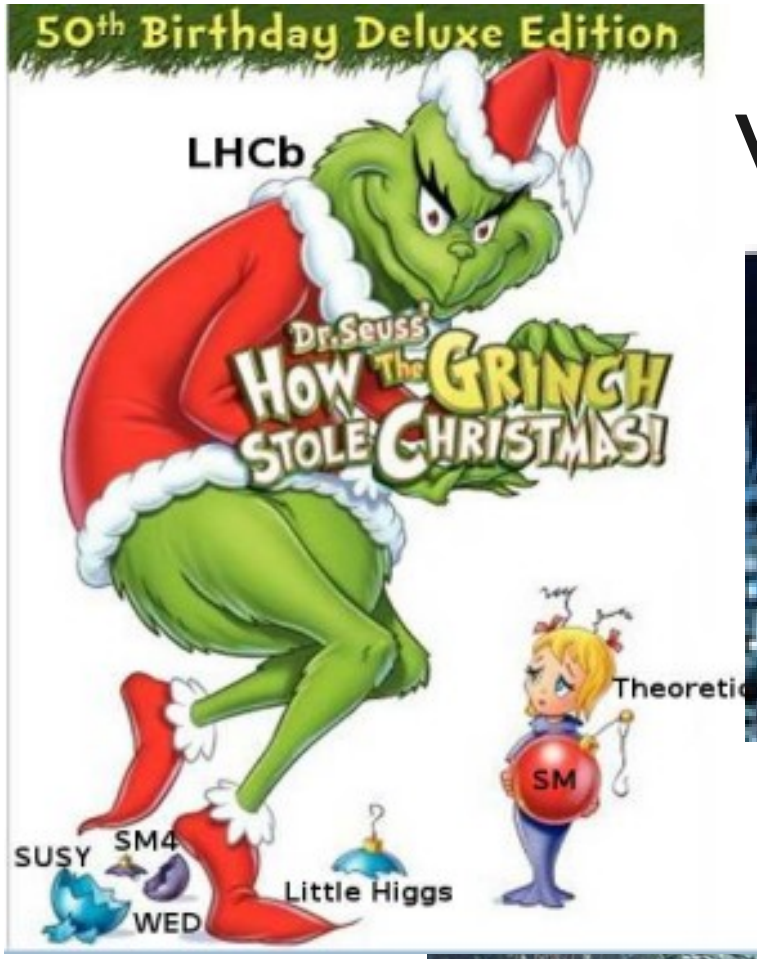
Flavour physics anomalies before LHCb

- $(g-2)_{\mu}$
- $\Sigma^{+} \rightarrow p\mu^{+}\mu^{-}$ (HyperCP)
- $B \rightarrow \tau\nu$ & CKM fit (BaBar & Belle)
- $B_s \rightarrow \mu^{+}\mu^{-}$ (CDF excess)
- φ_s (CDF & D0 hints of large value)
- A_{fs} (D0 evidence)
- $A_{CP}(B \rightarrow K\pi)$ puzzle (BaBar & Belle)
- $A_{FB}(B \rightarrow K^{*}\mu^{+}\mu^{-})$ (BaBar, Belle & CDF hints)
- $A_{I}(B \rightarrow K^{(*)}\mu^{+}\mu^{-})$ (BaBar, Belle & CDF hints)

Flavour physics anomalies ~~before LHCb~~ at start of 2012

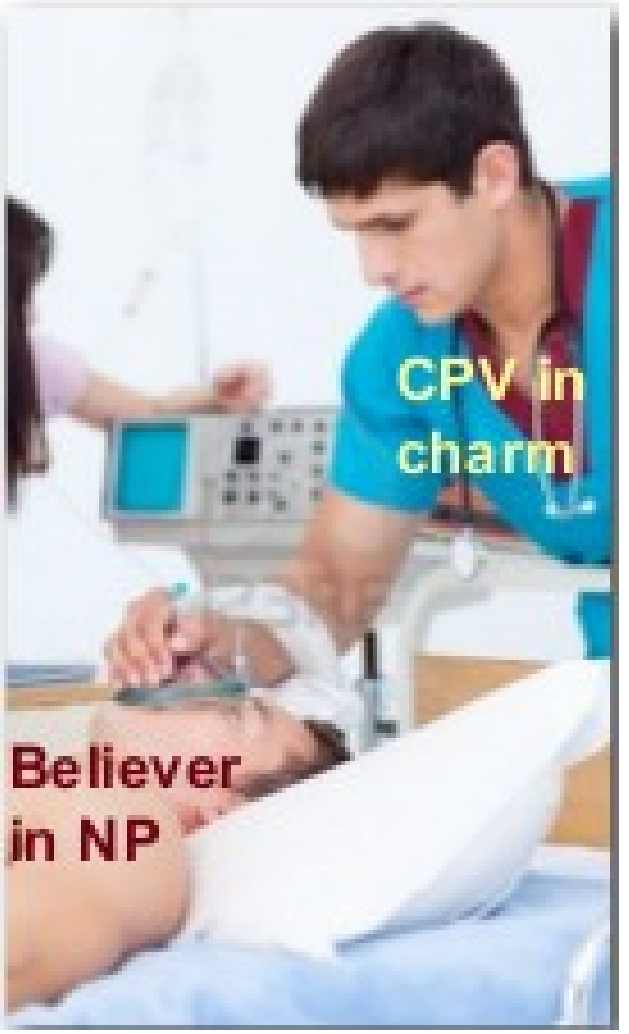
- $(g-2)_\mu$ — tension with $B(B_s \to \mu^+\mu^-)$
- $\Sigma^+ \to p\mu^+\mu^-$ (HyperCP)
- $B \to \tau\nu$ & CKM fit (BaBar & Belle)
- $B_s \to \mu^+\mu^-$ (CDF excess) — consistent with SM so far
- φ_s (CDF & D0 hints of large value) — consistent with SM so far
- A_{fs} (D0 evidence) — stay tuned ...
- $A_{CP}(B \to K\pi)$ puzzle (BaBar & Belle)
- $A_{FB}(B \to K^*\mu^+\mu^-)$ (BaBar, Belle & CDF hints) — consistent with SM so far
- $A_I(B \to K^{(*)}\mu^+\mu^-)$ (BaBar, Belle & CDF hints) — stay tuned …
- $\Delta A_{CP}(D \to KK,\pi\pi)$ — also seen by CDF

Viewpoints



A.Lenz

G.Dissertori



H. Murayama

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- Hope for some analogies with some better films!