

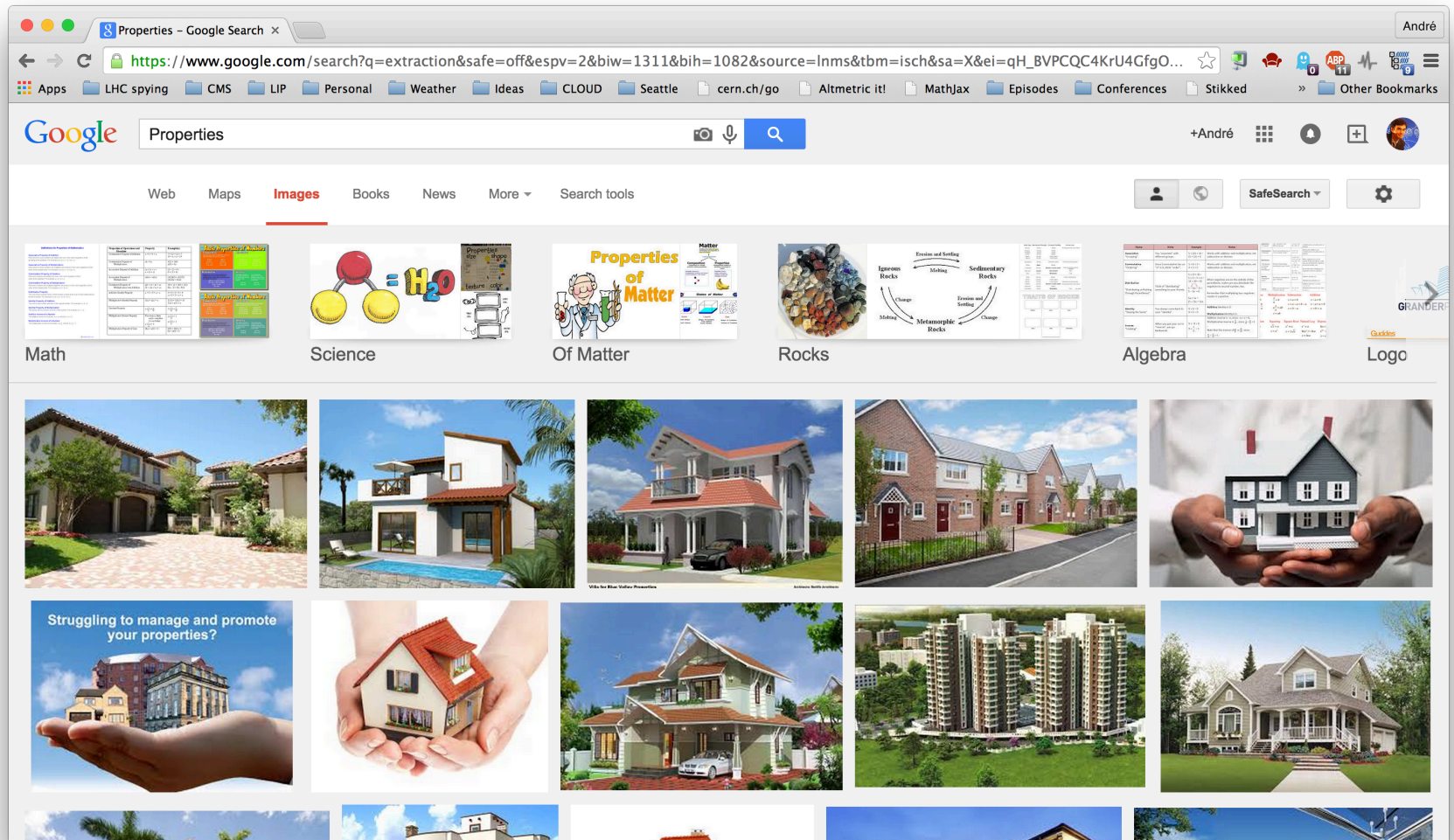
WELCOME TO WG2

A. David, A. Falkowski, G. Isidori, and M. Duehrssen

WG2 – properties



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WG2 – properties

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The screenshot displays a Google search for "Higgs Properties". The search results include:

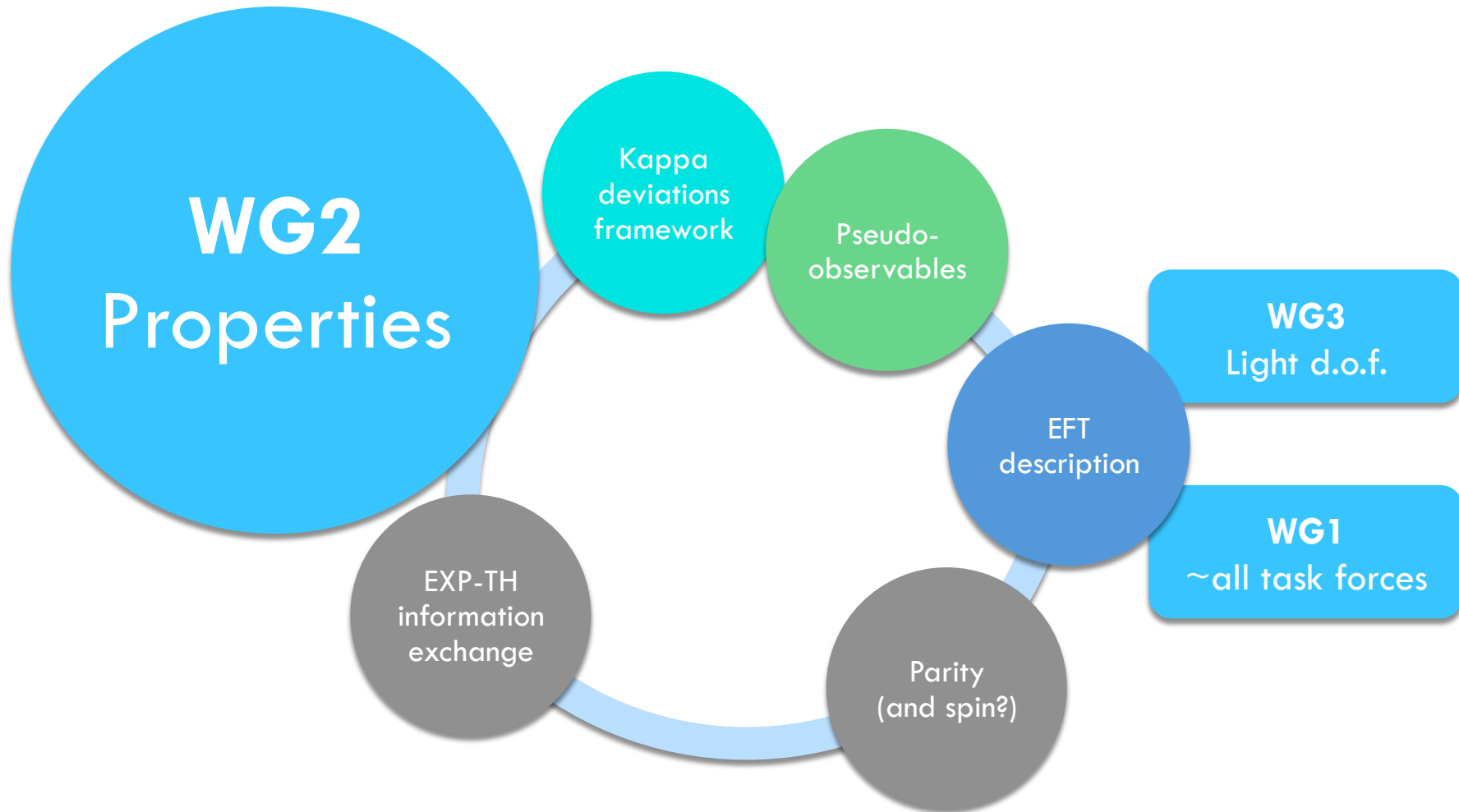
- ATLAS Preliminary:** A plot of $\sigma_{\text{Higgs}}/\sigma_{\text{SM}}$ vs m_{Higgs} [GeV] for $H \rightarrow ZZ \rightarrow 4\ell$ with $\mu = 1.0$ and $\sigma = 20.3 \text{ fb}$.
- CMS Preliminary:** A plot of Weighted Events (1/EZ) vs m_{Higgs} [GeV] for $H \rightarrow ZZ \rightarrow 4\ell$ with $\mu = 1.0$ and $\sigma = 20.3 \text{ fb}$.
- In summary:** A plot showing the Higgs mass m_{H} [GeV] with various constraints.
- Particle Physics Basics:** A diagram showing the Standard Model particles and their interactions.
- ATLAS Preliminary:** A plot of $\sigma_{\text{Higgs}}/\sigma_{\text{SM}}$ vs m_{Higgs} [GeV] for $H \rightarrow ZZ \rightarrow 4\ell$ with $\mu = 1.54$ and $\sigma = 20.3 \text{ fb}$.
- CMS Preliminary:** A plot of $\sigma_{\text{Higgs}}/\sigma_{\text{SM}}$ vs m_{Higgs} [GeV] for $H \rightarrow ZZ \rightarrow 4\ell$ with $\mu = 1.54$ and $\sigma = 20.3 \text{ fb}$.
- Branching Ratio:** A plot of Branching Ratio vs Higgs mass in GeV^2 for various decay channels.
- Best fit μ/σ_{SM} :** A plot showing the best fit for μ/σ_{SM} vs m_{Higgs} [GeV] for $H \rightarrow ZZ \rightarrow 4\ell$.
- Best fit m_{H} :** A plot showing the best fit for m_{H} [GeV] vs μ/σ_{SM} for $H \rightarrow ZZ \rightarrow 4\ell$.

Google probably knows that I am from CMS.



Main axes of action

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Since the reboot

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[<https://indico.cern.ch/category/5848/>]

WG2: Higgs Properties subgroup meetings

December 2014

 08 Dec [Information Exchange between Theory and Experiment](#)

November 2014

 25 Nov [LHC Higgs XS WG2: EFT bases](#)

September 2014

 05 Sep [LHC Higgs XS WG2: EFT kickoff meeting](#)

July 2014

 18 Jul [LHC Higgs XS WG2: extension of kappa-framework](#)



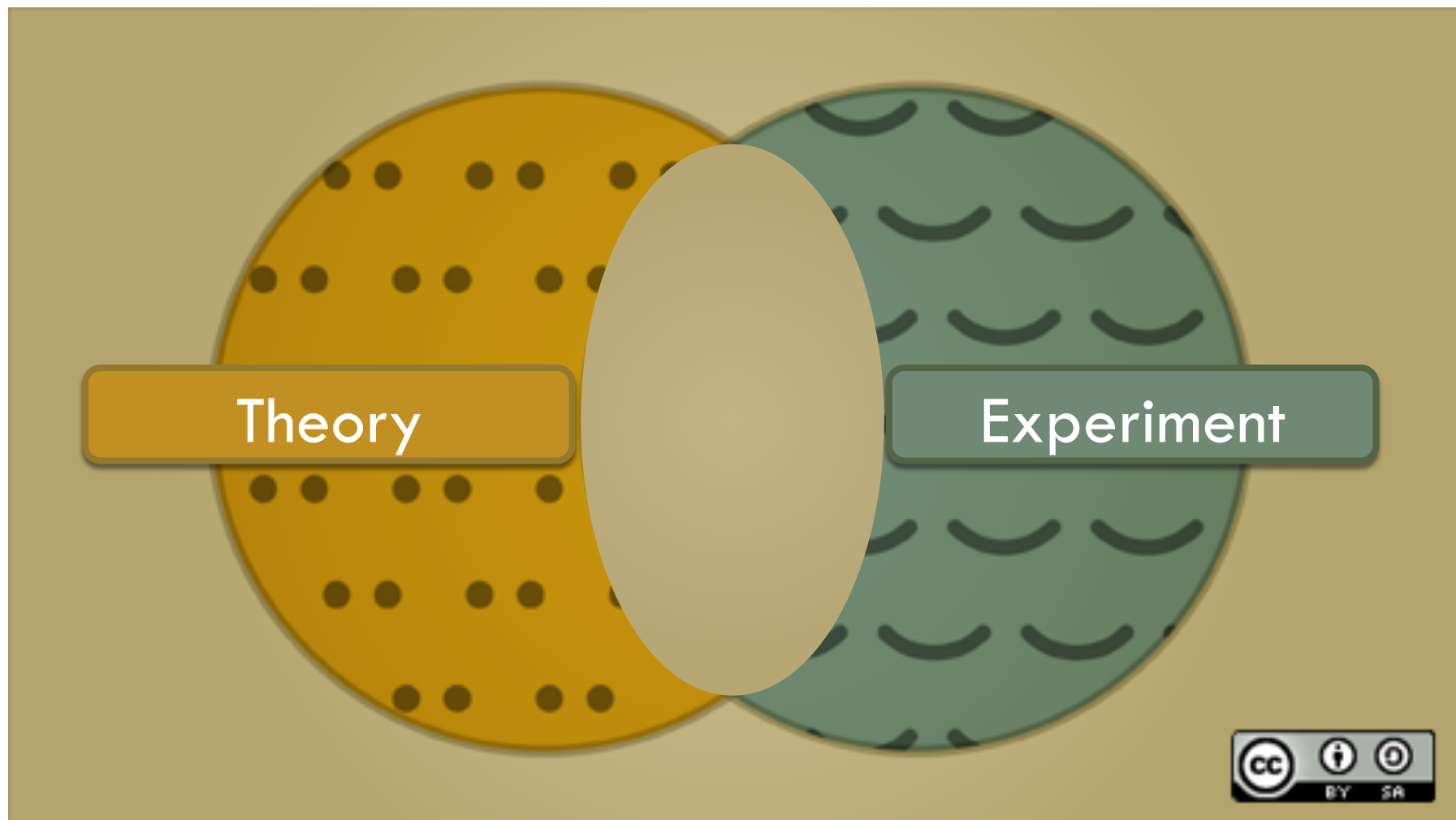
Theory

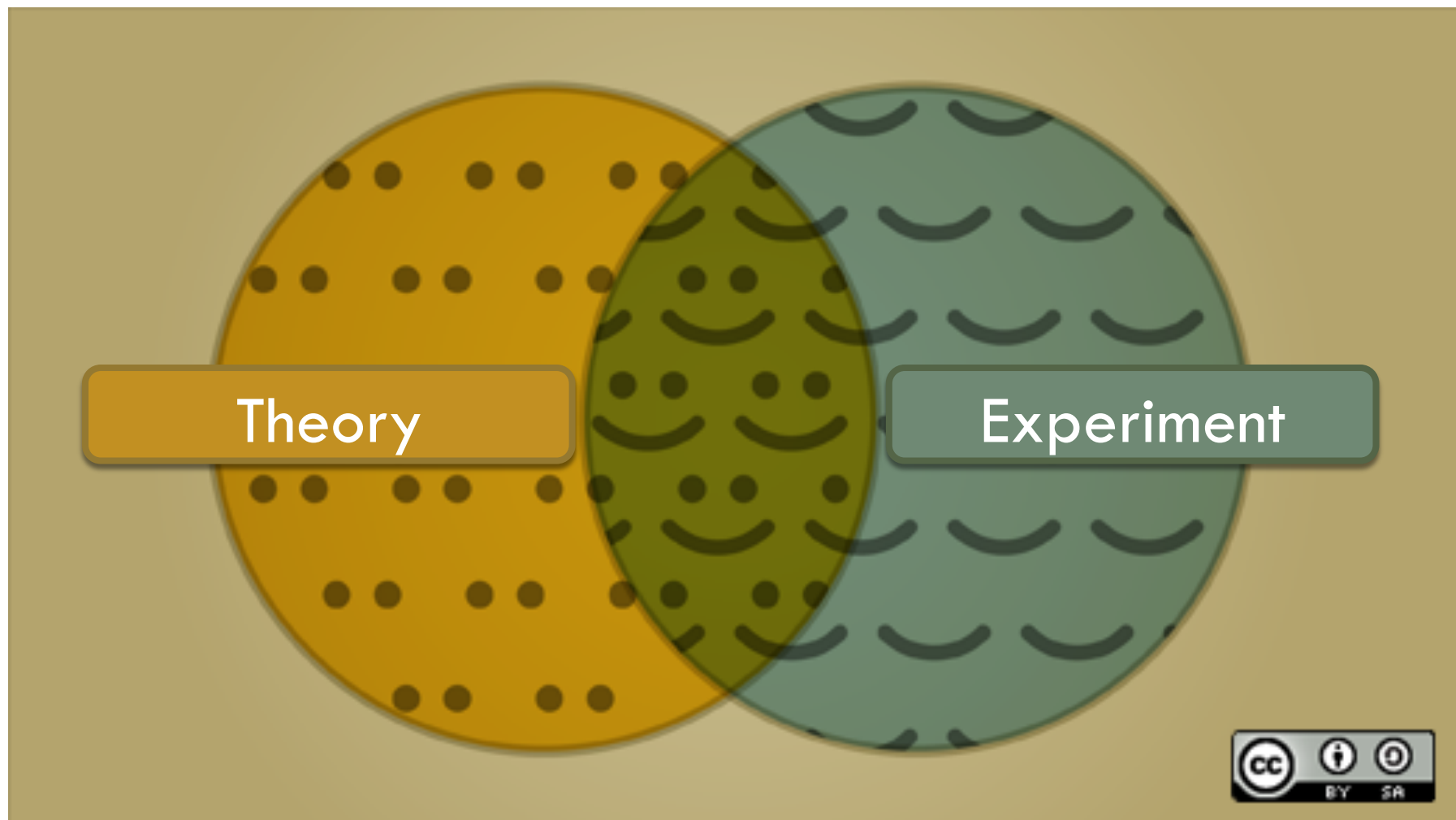




Experiment









Since the reboot

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[<https://indico.cern.ch/category/5848/>]

WG2: Higgs Properties subgroup meetings

December 2014

Thank you to all who

November 2014

25 Nov LHC Higgs XS WG2: EFT issues

contributed to the

September 2014

05 Sep LHC Higgs XS WG2: EFT kick-off meeting

lively discussions!

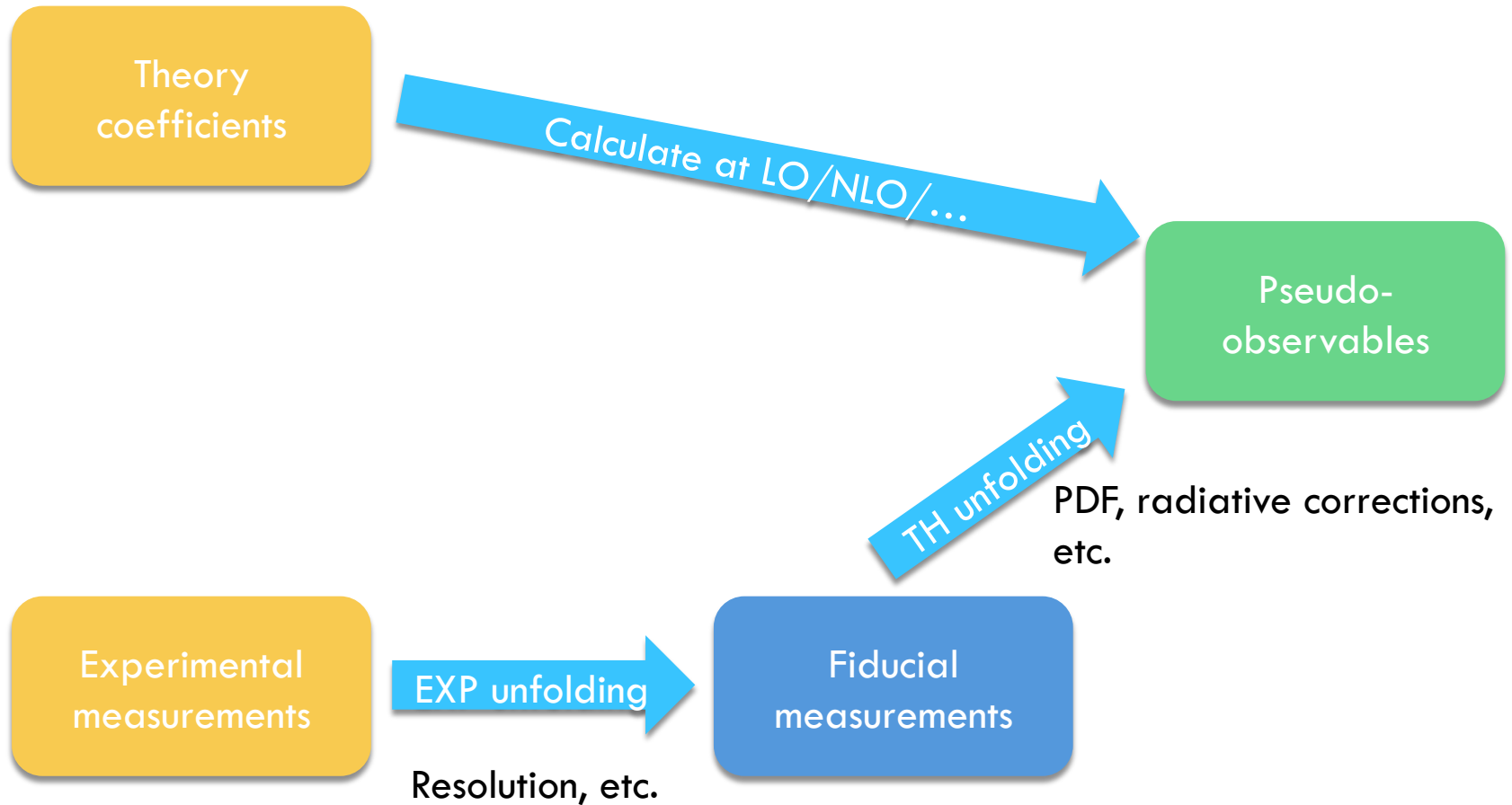
July 2014

18 Jul LHC Higgs XS WG2: extension of kappa-framework



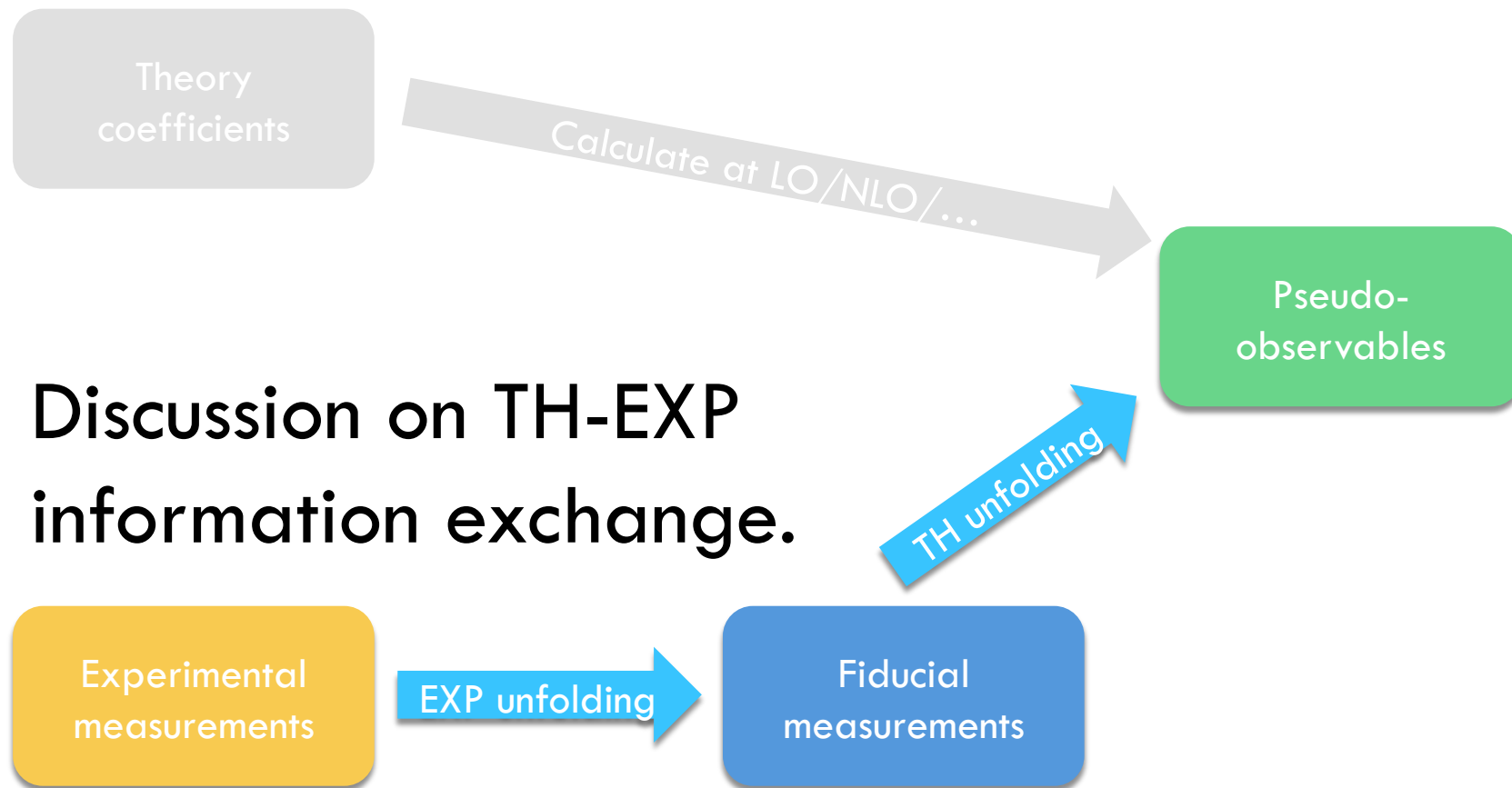
Almost back to LEP

11

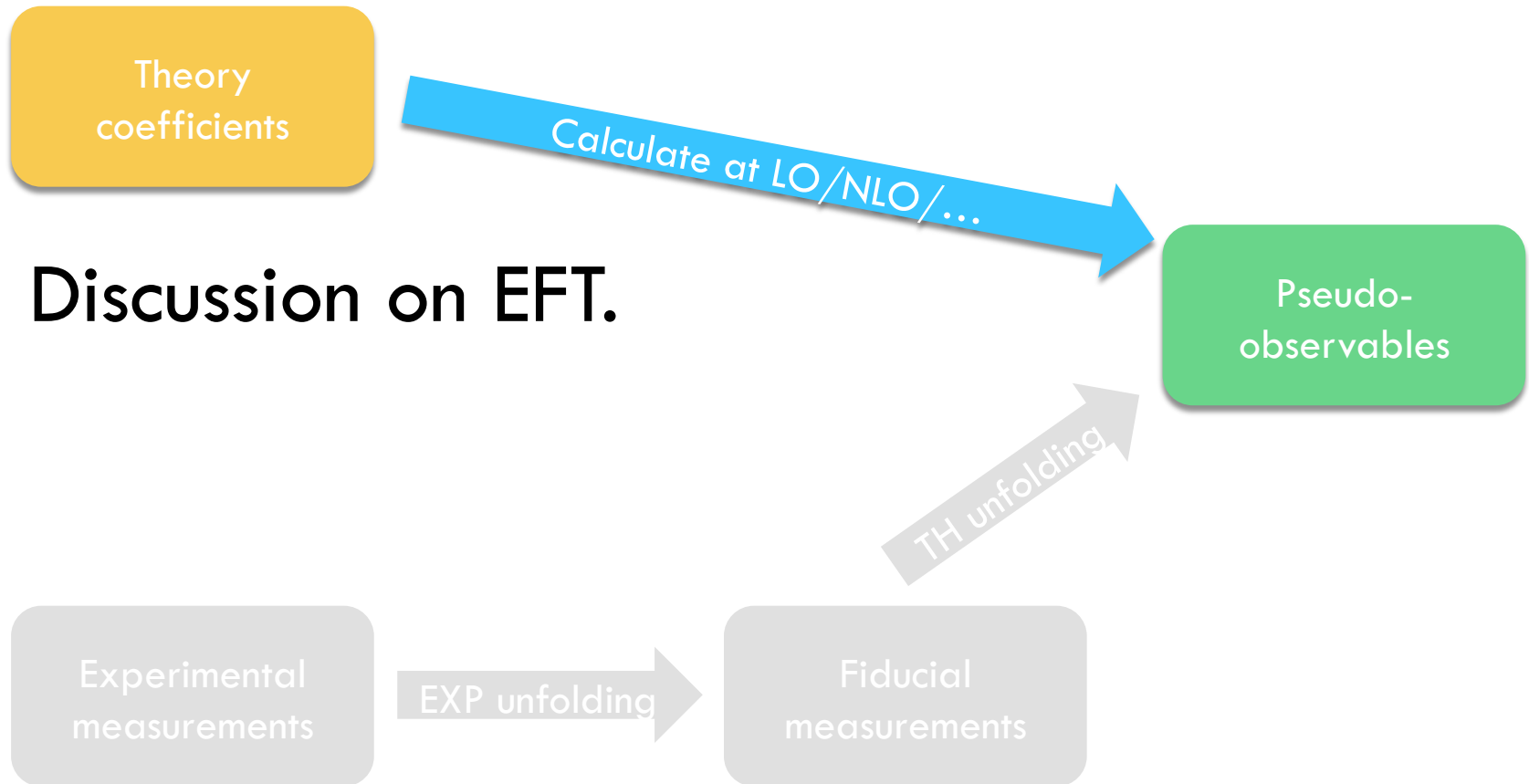




Almost back to LEP

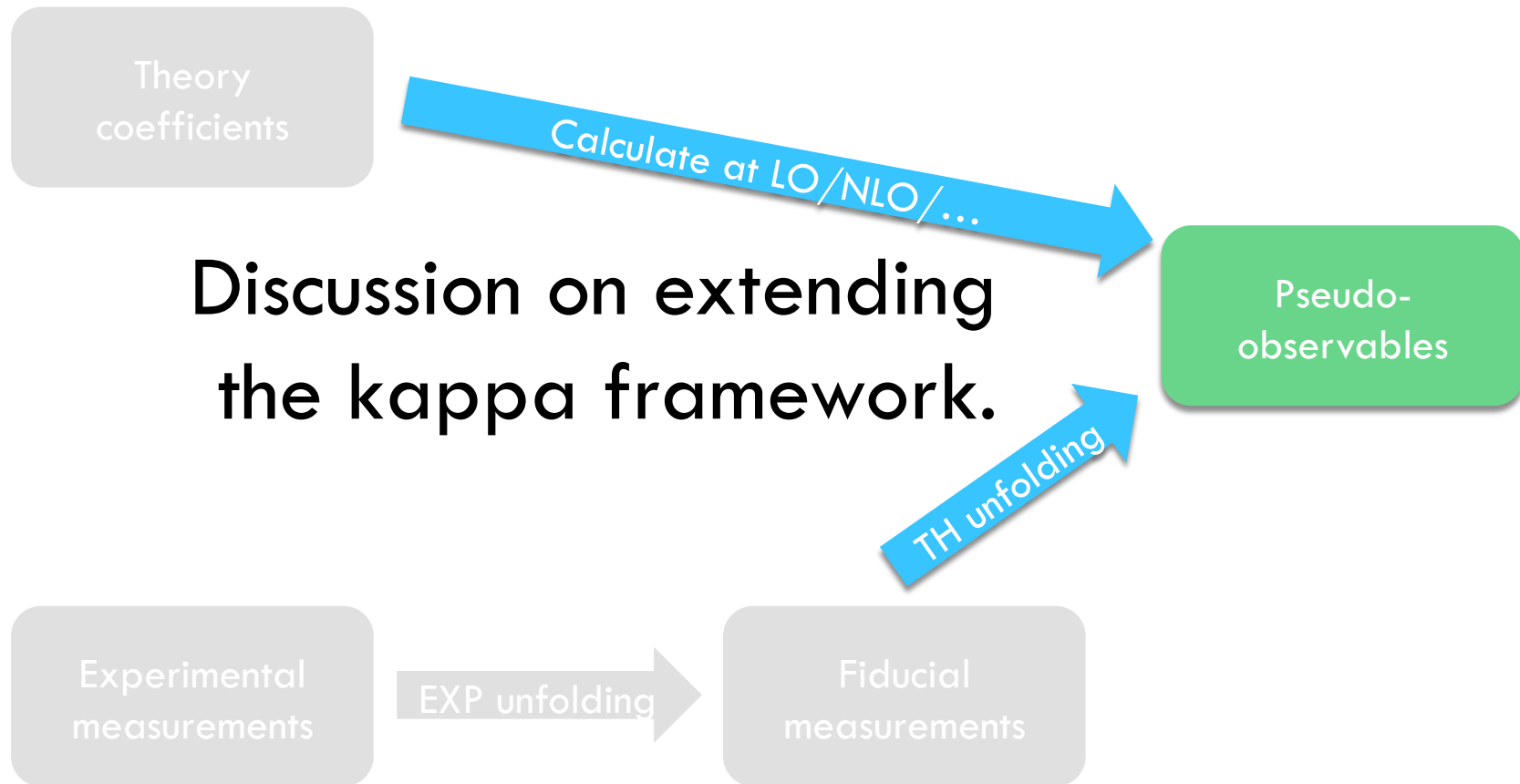


Almost back to LEP





Almost back to LEP





From kappas that fit little stuff...

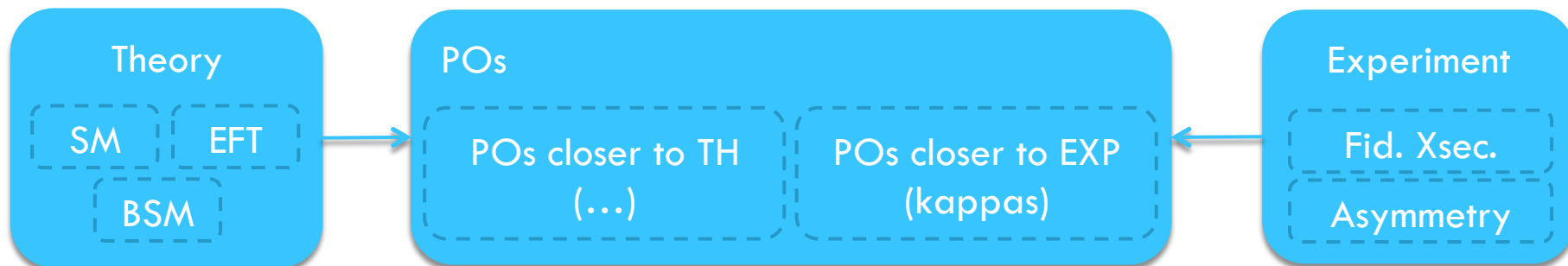


...to kappas that fit more stuff.



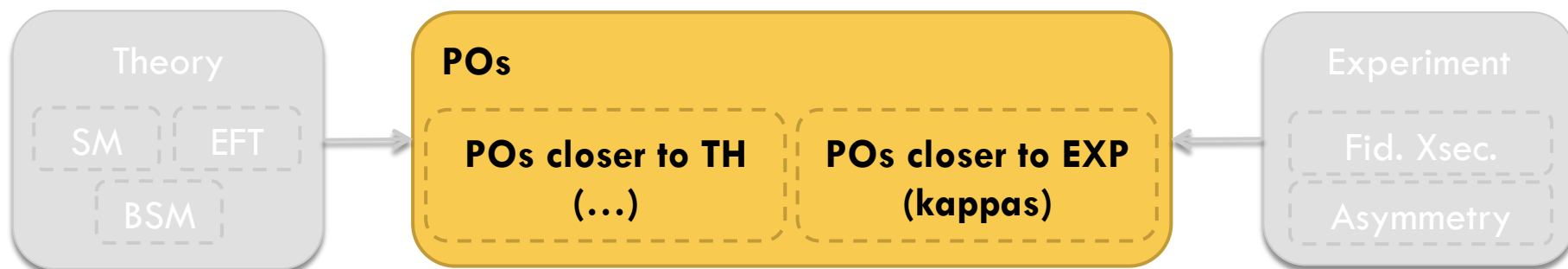
Kappas might have been our first POs

- It is not that:
 - ▣ kappas are the best POs.
 - ▣ kappas are the only POs.
- In fact we know that **we must to extend them to**:
 - ▣ Differential quantities.
 - ▣ Remove some assumptions.
 - ▣ Better cover all possible smooth deviations from the SM.
- But even with better/more POs, kappas may remain as an intermediate layer in the PO framework:



Our challenge

**Find pseudo-observables
that are useful and
relevant.**





And for today...

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Friday, 23 January 2015

09:00 - 11:00 **WG2** ▼
 09:00 **Overview of WG2 activities 10'** ▼
 Speakers: Michael Duehrssen-Debling (CERN), André David (CERN)

Kappa

09:20 **Towards a recommendation on extending the kappa formalism 20'** ▼
 Speaker: Gino Isidori (Universitaet Zuerich (CH))

09:40 **Discussion 20'** ▼

10:00 **Flash talks on specific aspects for extending kappa formalism 20'** ▼

H→4f decays 5' ▼

VH production 5' ▼

VBF production 5' ▼

Gluon-fusion production kinematics 5' ▼

10:20 **Discussion 40'** ▼

11:00 - 11:30 Coffee break

PO

11:30 - 12:30 **WG2** ▼
 11:30 **Pseudo-observables: an independent safety assessment 30'** ▼
 Speaker: Giampiero Passarino (Torino University)

EFT

12:00 **Towards an EFT basis recommendation 30'** ▼
 Speaker: Adam Falkowski (LPT Orsay)

12:30 - 14:00 Lunch

14:00 - 15:00 **WG2** ▼
 14:00 **After lunch discussion on EFT basis recommendation 1h0'** ▼



**KEEP
CALM
BECAUSE**

EVERY EFT BASIS IS EQUIVALENT

TO EVERY OTHER EFT BASIS