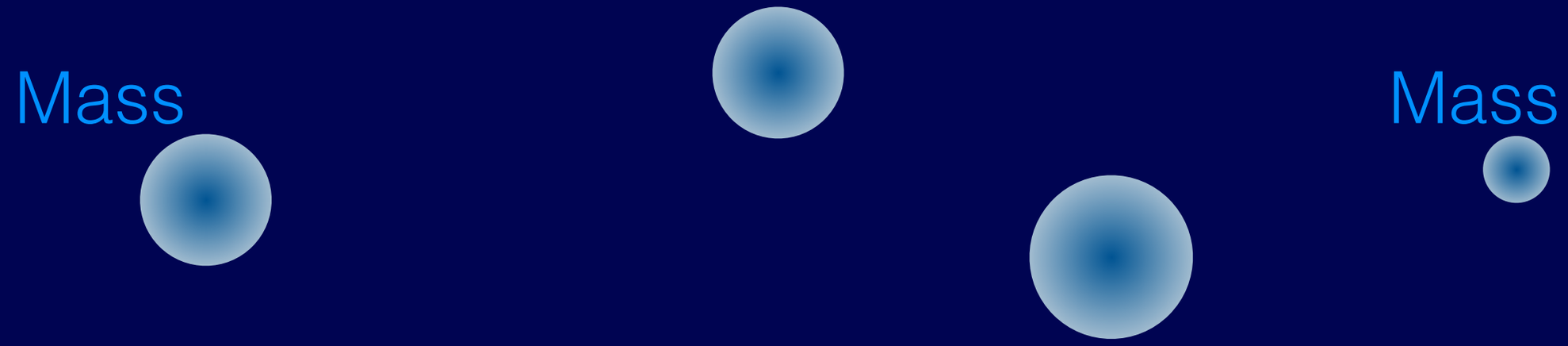
De Higgs-logía

(free adaptation from Latin: “Discussion on the Higgs”)



Luca Merlo

UNIVERSIDAD AUTONOMA DE MADRID

elusives neutrinos, dark matter & dark energy physics

invisiblesPlus

ift Instituto de Física Teórica UAM-CSIC

CSIC

Higgs zoología

Higgs zoología

Status and Prospects for the SM Higgs

Donega
Fuentes-Martin
Canelli
Brivio

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2 or more Higgses

Perdomo
Karkkainen
Houtz
Carena

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2 or more Higgses

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Not necessarily the SM Higgs, but similar…

Garcia-Garcia
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Not necessarily the SM Higgs, but similar…

Garcia-Garcia
Carena

…how much?

SM Higgs or not?

Elementary of Composite?

Only 1 or more?

Doublet of something else?

Present Situation

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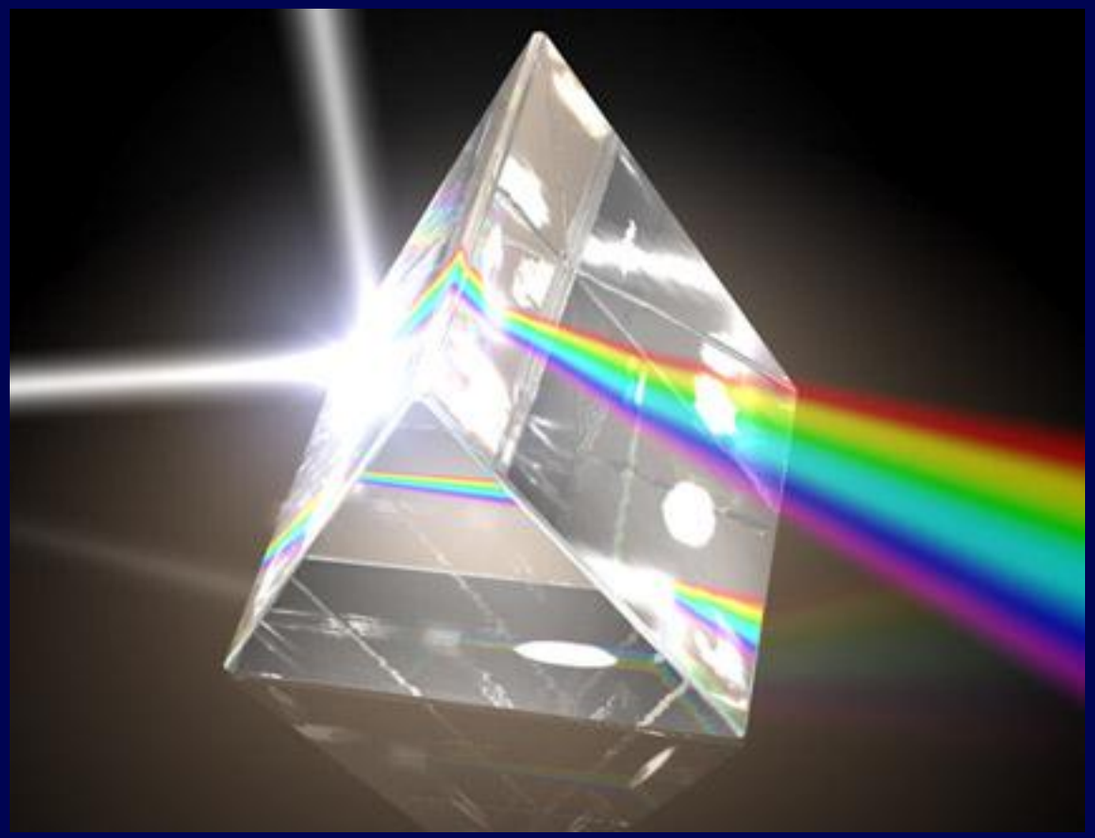
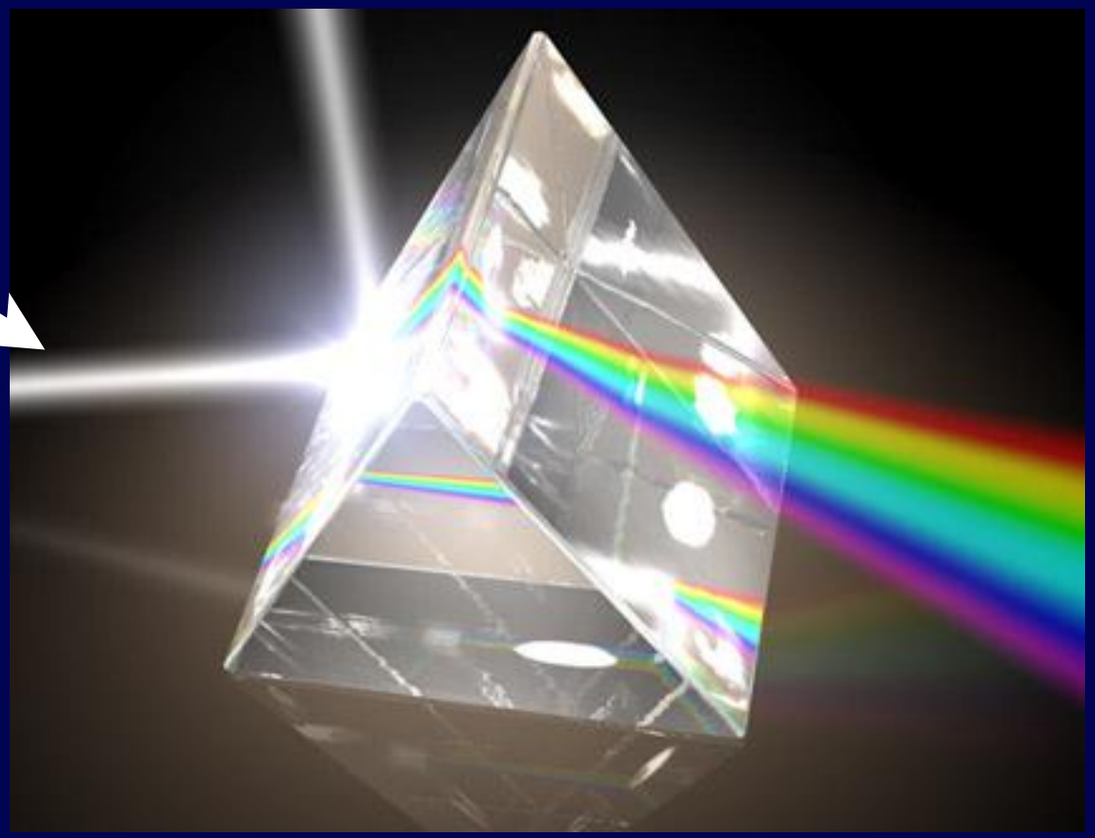


Present Situation

LHC



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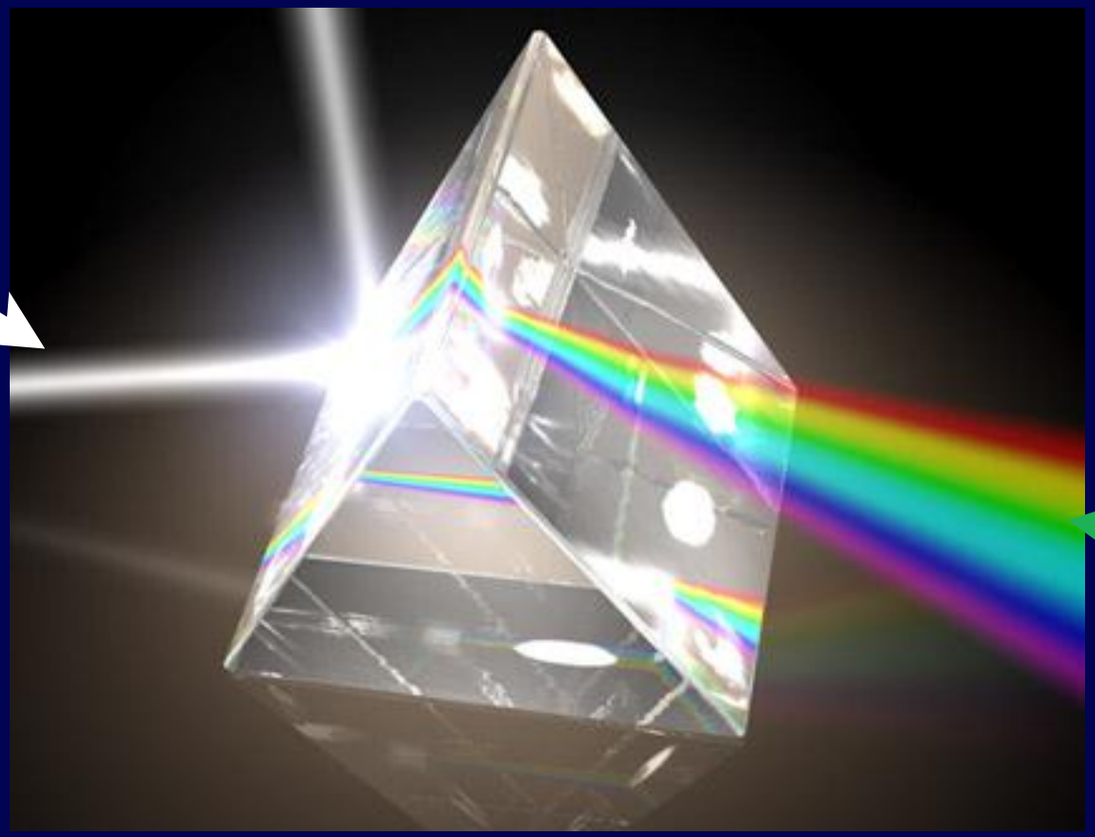
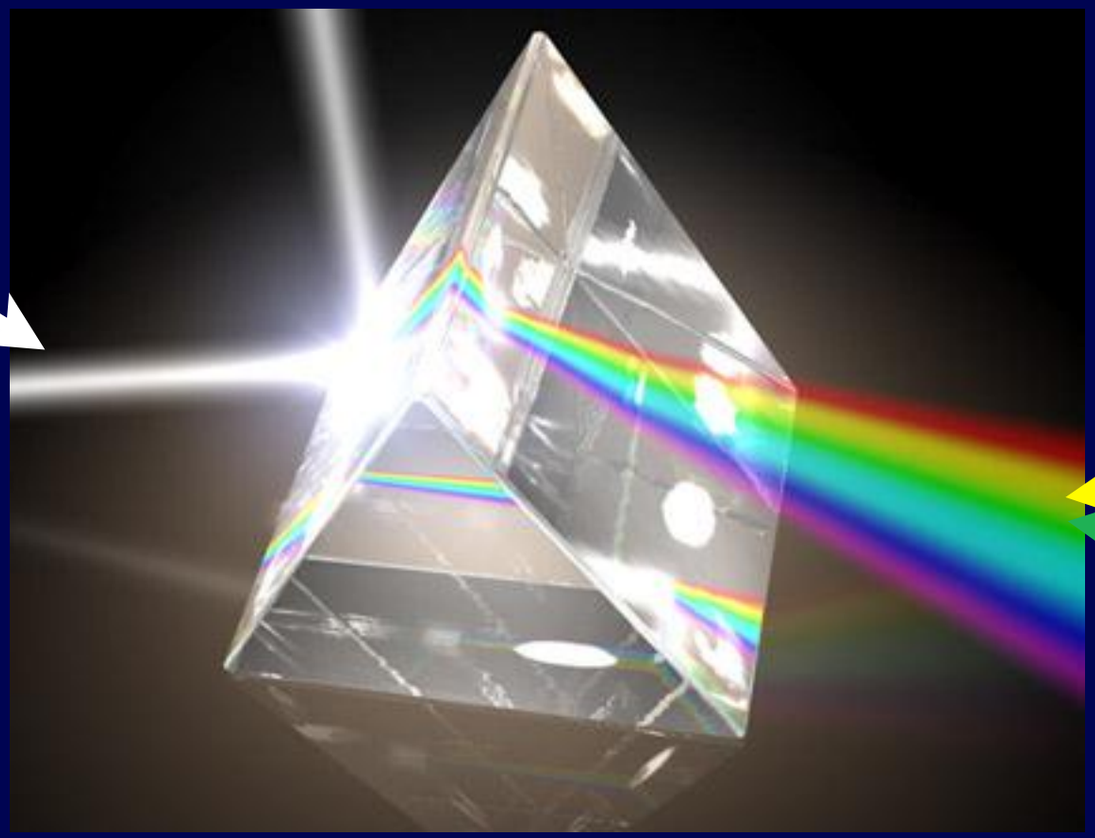


SM

Present Situation

LHC

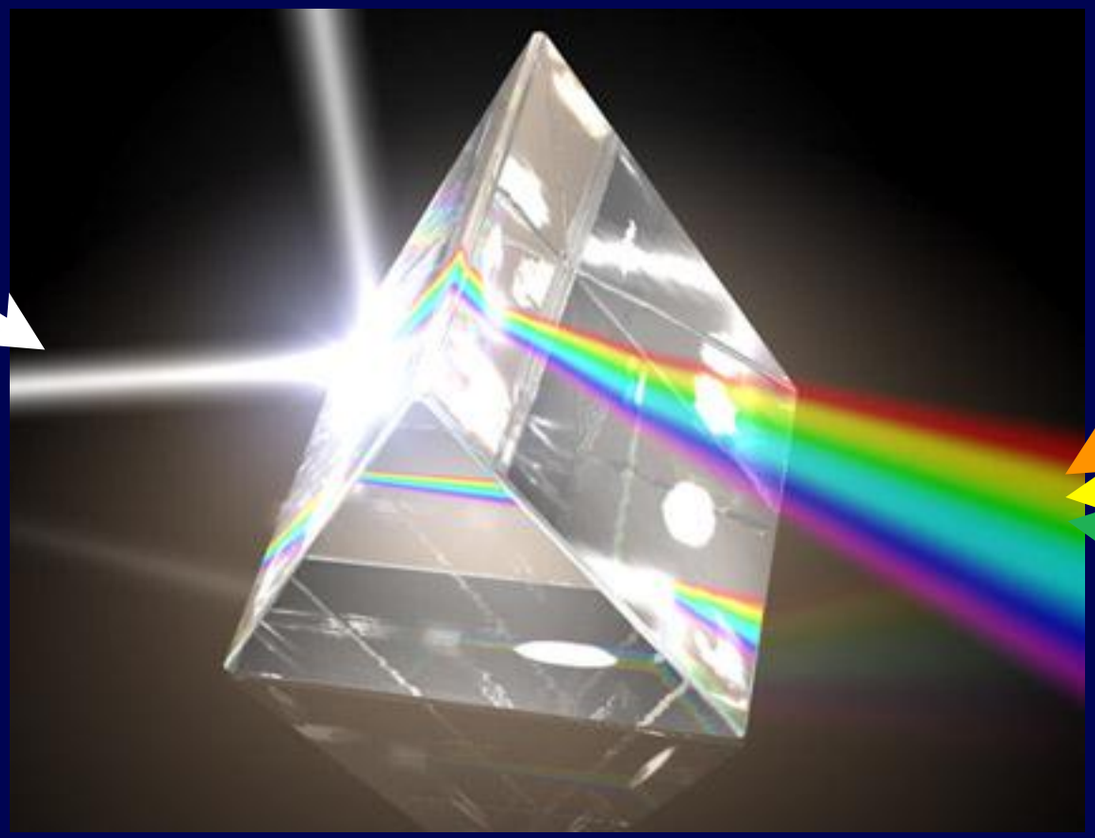


SUSY

SM

Present Situation

LHC



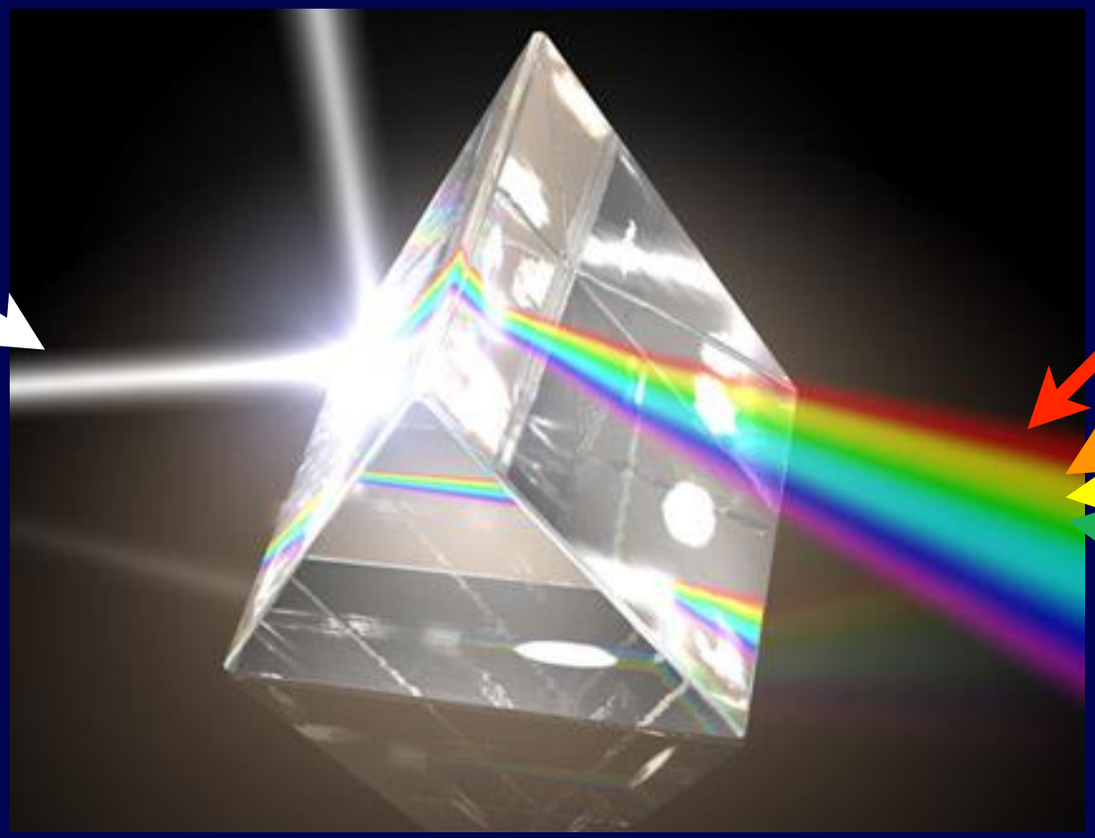
nHDM

SUSY

SM

Present Situation

LHC



SMEFT

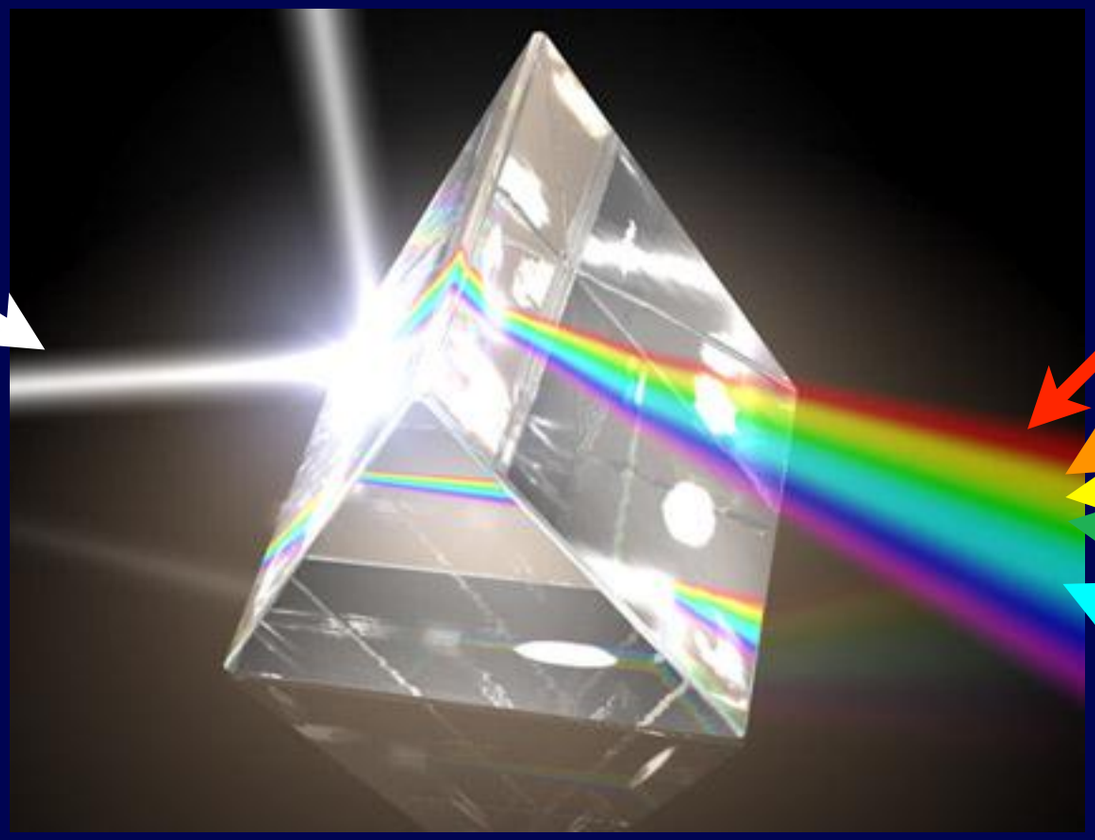
nHDM

SUSY

SM

Present Situation

LHC



SMEFT

nHDM

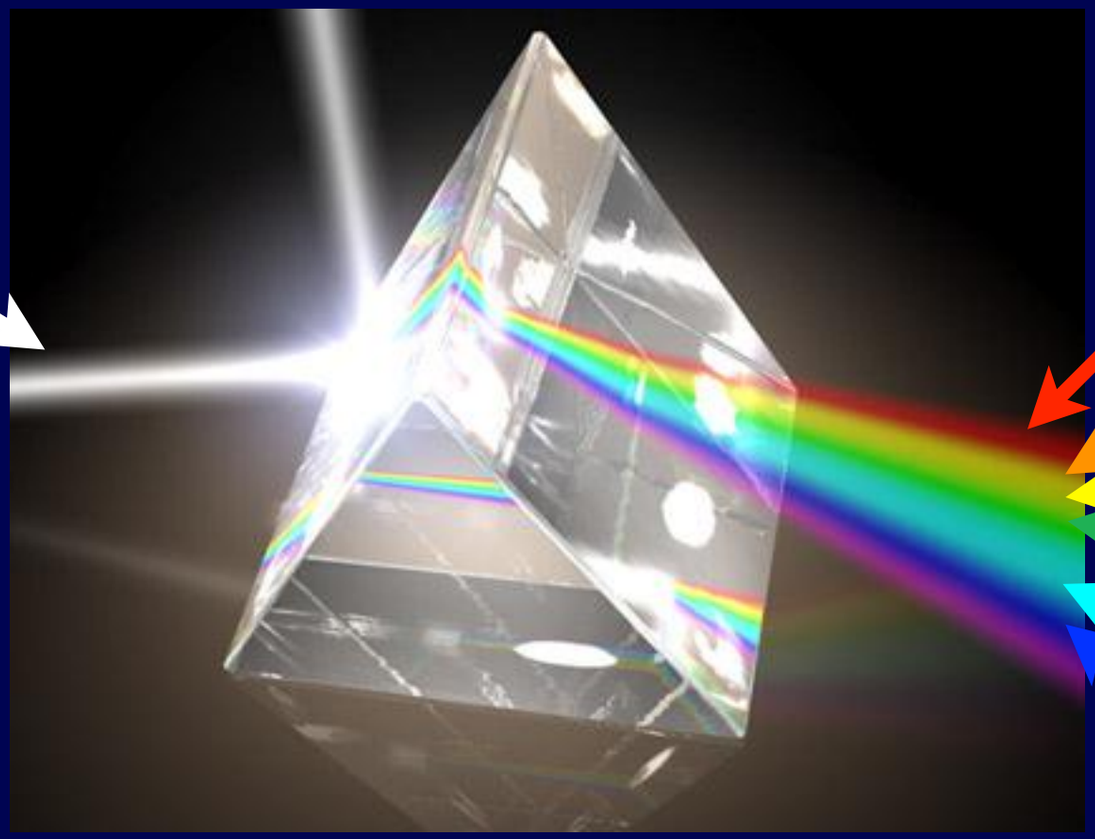
SUSY

SM

CH

Present Situation

LHC



SMEFT

nHDM

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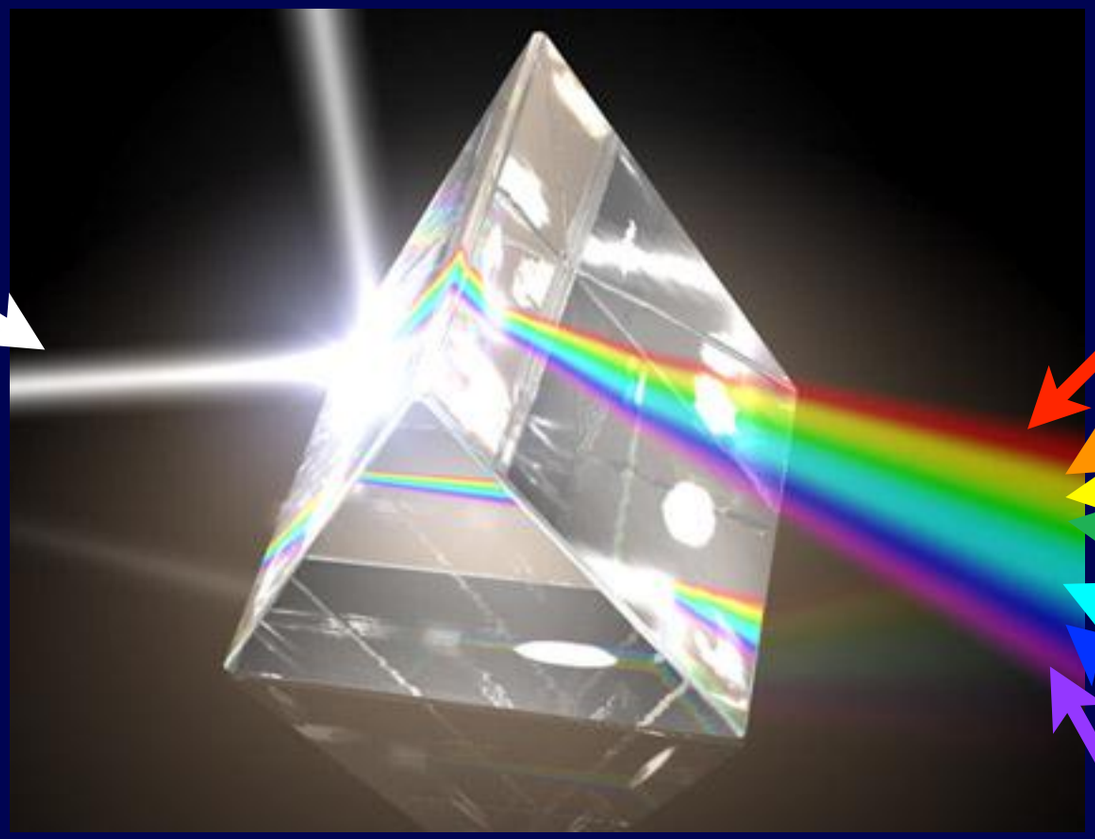
CH

HEFT

Present Situation

LHC



SMEFT

nHDM

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HEFT

Which are the most important couplings to disentangling THE Higgs?

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Y's coupling

h self couplings

pure-gauge couplings

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Timescale to have a definitive (??) understanding?

Which are the most important couplings to disentangling THE Higgs?

Y's coupling

h self couplings

pure-gauge couplings

Timescale to have a definitive (??) understanding?

Which is the best machine for it?

Which are the most pressing questions experimentalist want to make to theoreticians?

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Which observables need more theory precision?

Which are the most pressing questions experimentalist want to make to theoreticians?

Which observables need more theory precision?

What should theoreticians do, but they are not doing?

Without a clear UV picture

Without a clear UV picture → **EFTs**

Fuentes-Martin
Garcia-Garcia
Brivio

Without a clear UV picture → **EFTs**

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Which EFT?

Without a clear UV picture → **EFTs**

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Which EFT?

Are they safe?

Without a clear UV picture → **EFTs**

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Which EFT?

Are they safe?

What if light NP?

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Which EFT?

Are they safe?

What if light NP?

pseudo-observables?