

# Theory Retreat

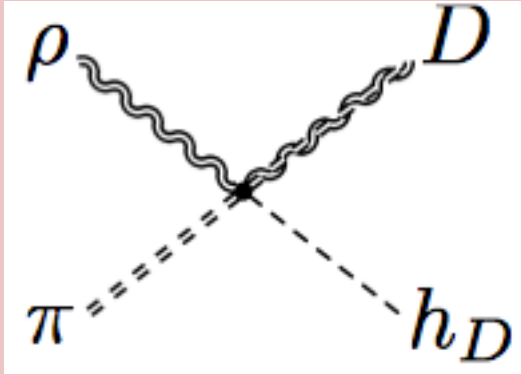
## Les Houches

### Matthew McCullough

Curriculum: Belfast, Oxford, MIT, CERN

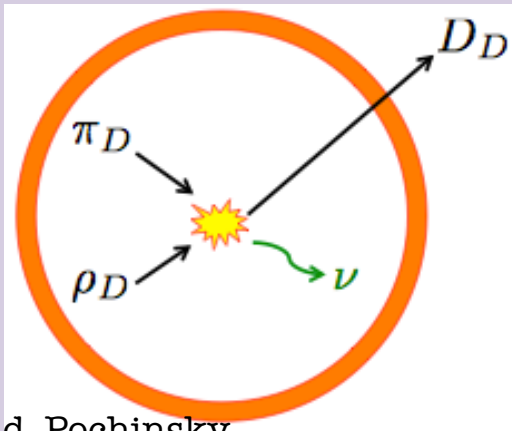
# Dark Matter

## Model Building



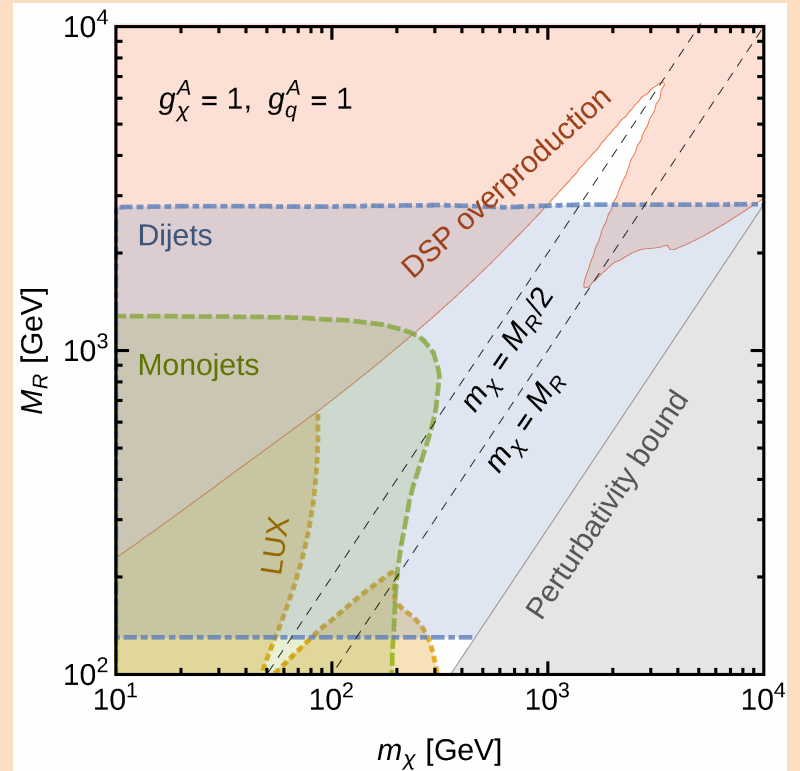
Detmold, Pochinsky.

## Indirect Detection



Detmold, Pochinsky.

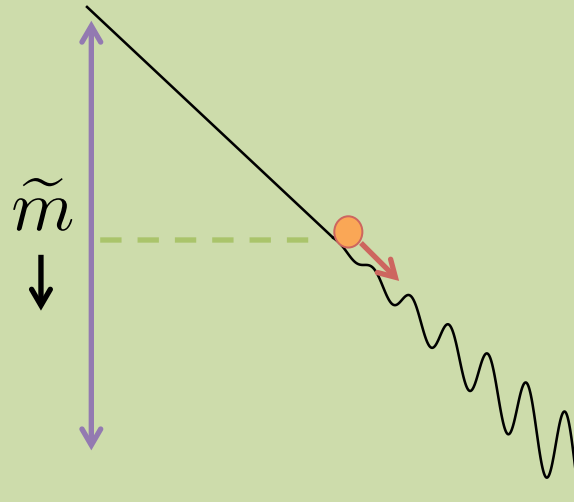
## Collider Signatures



Chala, Kahlhoefer,  
Nardini, Schmidt-Hoberg.

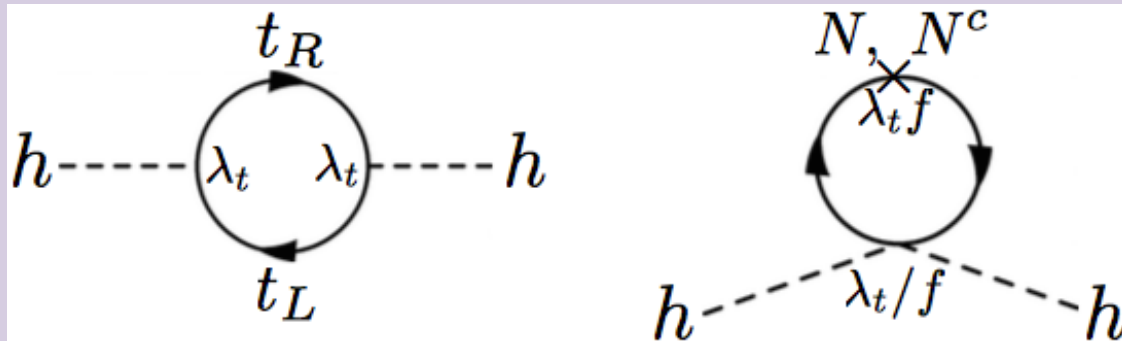
# Weak Scale Model Building

Relaxation - “Natural Heavy SUSY”



Batell, Giudice.

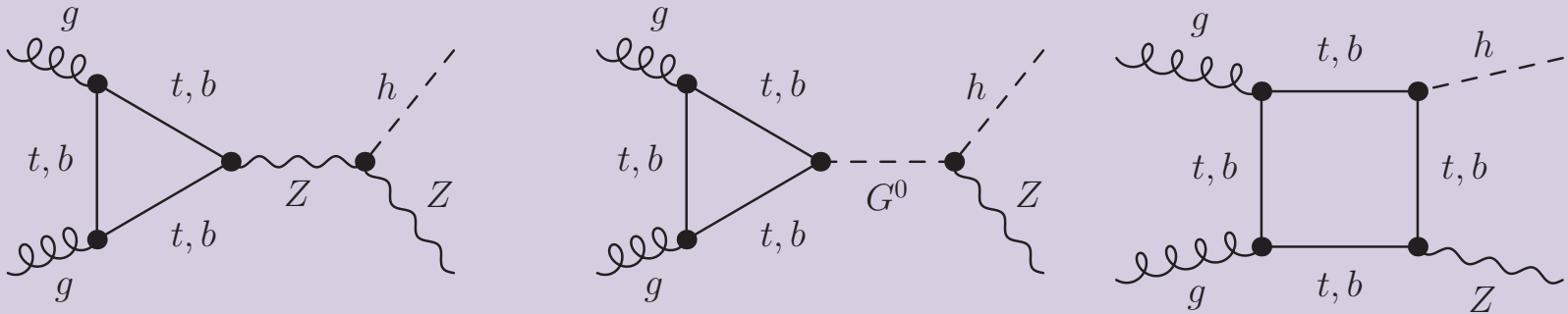
Twin Higgs - “ $\mathcal{V}$ -tral Naturalness”



Batell.

# BSM Higgs Physics

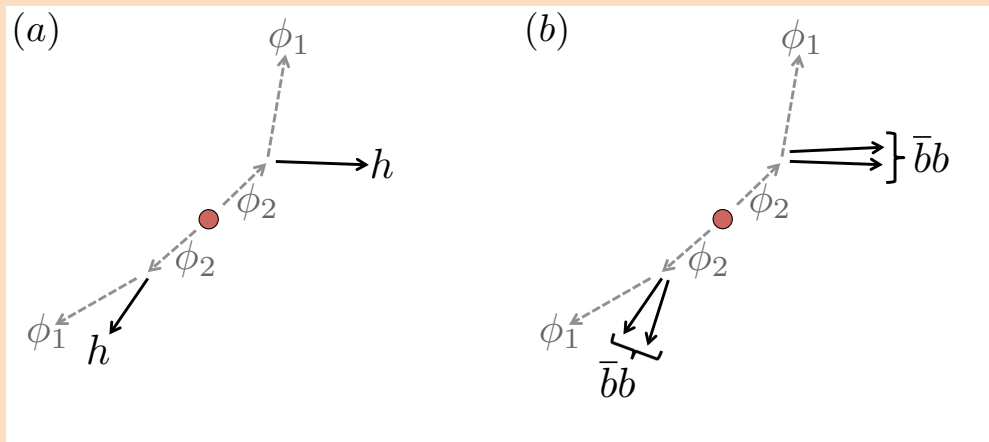
## Modified Higgs Couplings



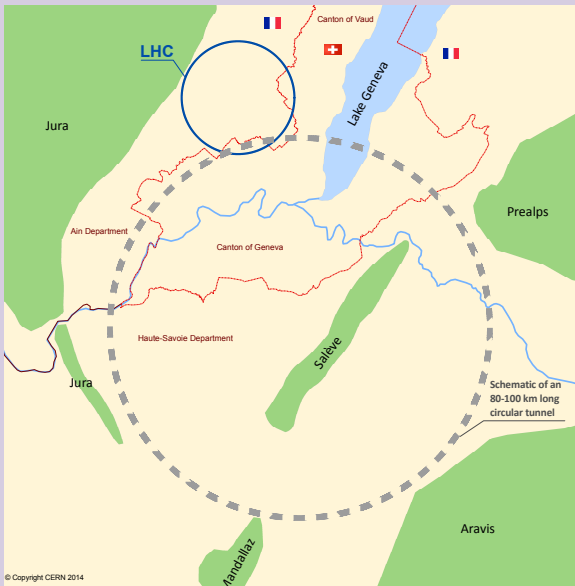
$$R_{BSM/SM}^{Boosted} = 1 - 0.42\delta_t + 0.50\delta_t^2 - 1.41\delta_t\delta_V + 2.41\delta_V + 1.90\delta_V^2$$

Englert, Spannowsky.

## Exotic Higgs Signatures



Papaefstathiou. Schwaller, Scanlon, Wang. Vesterinen. Sometime....



<https://fcc.web.cern.ch/>

Batell, Craig, Lou, Thalapillil, Stolarski, Verhaaren.

## CEPC in China

<http://cepc.ihep.ac.cn>

Craig, Englert, Perelstein, Farina. Ge, He.

