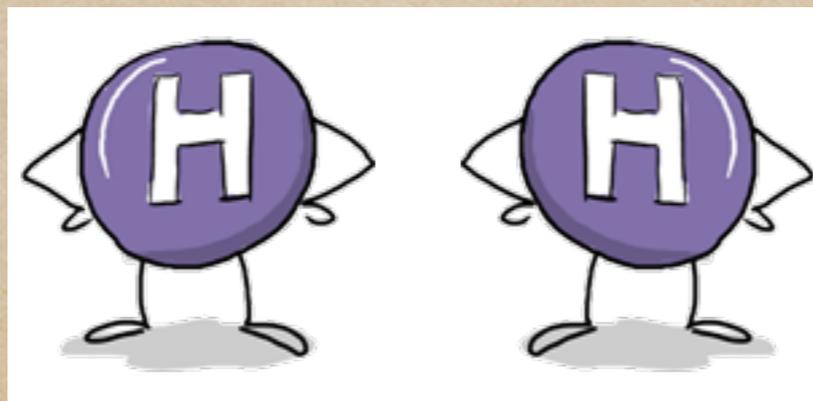


# Twin Discussions

CERN Workshop on Neutral Naturalness

24.04.2015



# How do we know if it's true?

- ◆ What LHC signature could be a smoking gun for neutral naturalness?
- ◆ Is there a set of result at the LHC that may convince us neutral naturalness is NOT realized?
- ◆ What about the 100 TeV collider? Will failure to see the resonances from the UV completion be enough to kill the scenario?

# How do we know if it's true?

- ◆ What LHC signature could be a smoking gun for neutral naturalness?

Higgs  
Couplings

Glueballs

Long-lived  
states

Exotic  
Higgs  
Decays

$Z'$

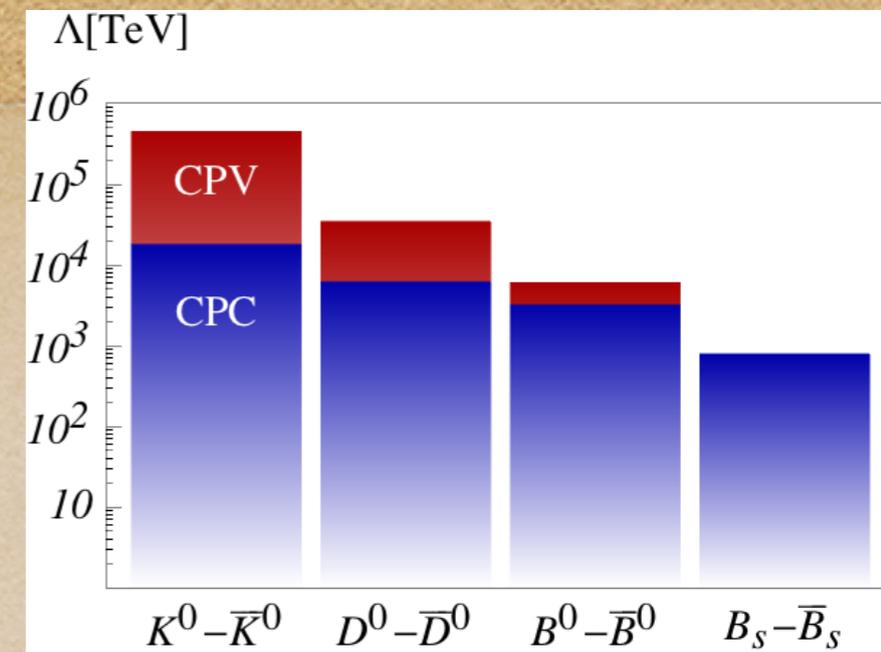
Folded  
Sleptons

(s)quark  
annihilation

Singlet  
Scalar

Odd-charge  
particles

# Flavor stupid



Plot borrowed from J. Kamenik

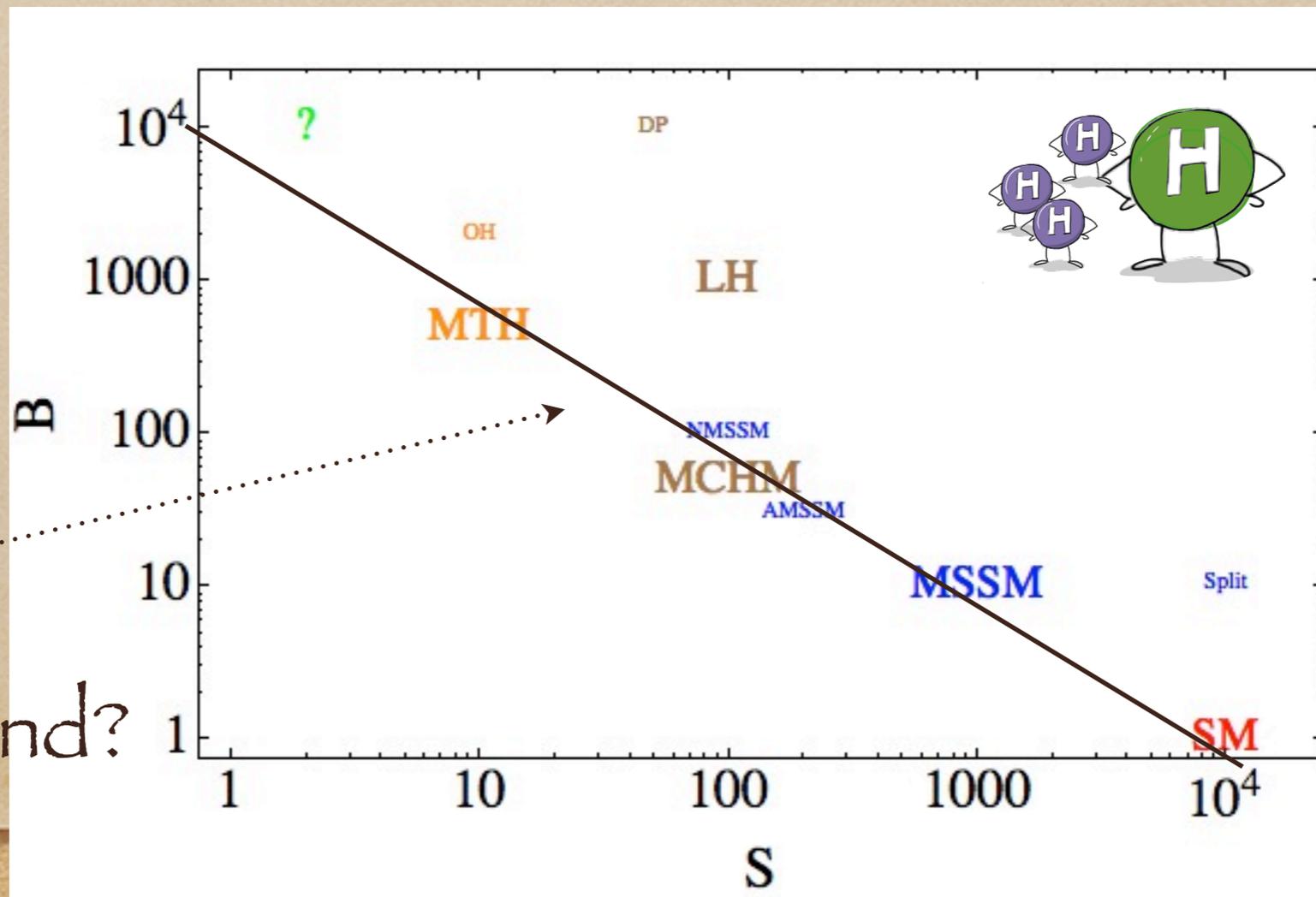
- ◆ Is there any complete flavor theory within the neutral naturalness paradigm?
- ◆ Could such a complete theory give us a focus as to what to look for at low energies?

# Where are the bodies buried

- ◆ UV completions?
- ◆ Flavor?
- ◆ Cosmology?
- ◆ ...

# Landscape

- Any BSM theory can be characterized by 2 quantum numbers:  $B$  (baroqueness  $\equiv$  complications) and  $S$  (strangeness  $\equiv$  fine-tuning)



Entropy bound?

# Model Building...

## MAP OF THE SQUARE AND STATIONARY EARTH.

BY PROF. ORLANDO FERGUSON,  
HOT SPRINGS, SOUTH DAKOTA.

Four Hundred Passages in the Bible that Condense the Globe Theory, or the Flying Earth, and None Sustain It.  
This Map is the Bible Map of the World.

Copyright by Orlando Ferguson, 1892.



PROF. ORLANDO FERGUSON,  
HOT SPRINGS, S. DAKOTA.



These men are flying on the globe at the rate of fifteen miles per hour around the sun, and four miles per hour around the center of the earth on their orbits. Think of that again!



### SCRIPTURE THAT CONDENSES THE GLOBE THEORY.

And his heels were steady until the going down of the sun.—Job 9: 4. And the sun ceased still, and the moon stopped.—Job 9: 6. The world also shall be dark that it be not moved.—Job 9: 7. As he that stretched out the earth, and made great light (not world)—Job 9: 8. The sun shall be darkened in his going forth.—Job 9: 10. The four corners of the earth.—Job 9: 11. The whole earth is of one.—Job 9: 12. The passages concerning the globe theory.—Isaiah 40: 4-5. And to the multitude of children, which the Lord shall take comfort, his son of man.—Isaiah 40: 6. As the sun returned into his place.—Isaiah 40: 7. It is in the north upon the circle of the earth.—Isaiah 40: 8. The stars spread forth the earth.—Isaiah 40: 9. Then appeared a sign in the north.—Isaiah 40: 10. My word shall fall, and the foundation of the earth.—Isaiah 40: 15. Then saith the Lord, which dwelleth above the earth, shall be a light by day, and the moon and stars for a light by night (not world).—Job 9: 12-15. The sun shall be turned into darkness, and the moon into blood.—Isaiah 34: 4.

Send 25 Cents to the Author, Prof. Orlando Ferguson, for a book explaining this Square and Stationary Earth. It Shows the Globe Theory Class Out. It will Teach You How to Forestall Satan. It is Worth Its Weight in Gold.

# Back-up

Partner quantum #s	Global dim-6 mixing	SUSY dim-8 mixing
QCD x EWK	CHM, Little Higgs	MSSM
Neutral x EWK	Quirky Little Higgs	Folded SUSY
Neutral x Neutral	Twin Higgs	????

borrowed from  
Nathaniel's talk