

COSMIC FRONTIER THEORY

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Snowmass, Theory Panel Plenary, 4 August 2013

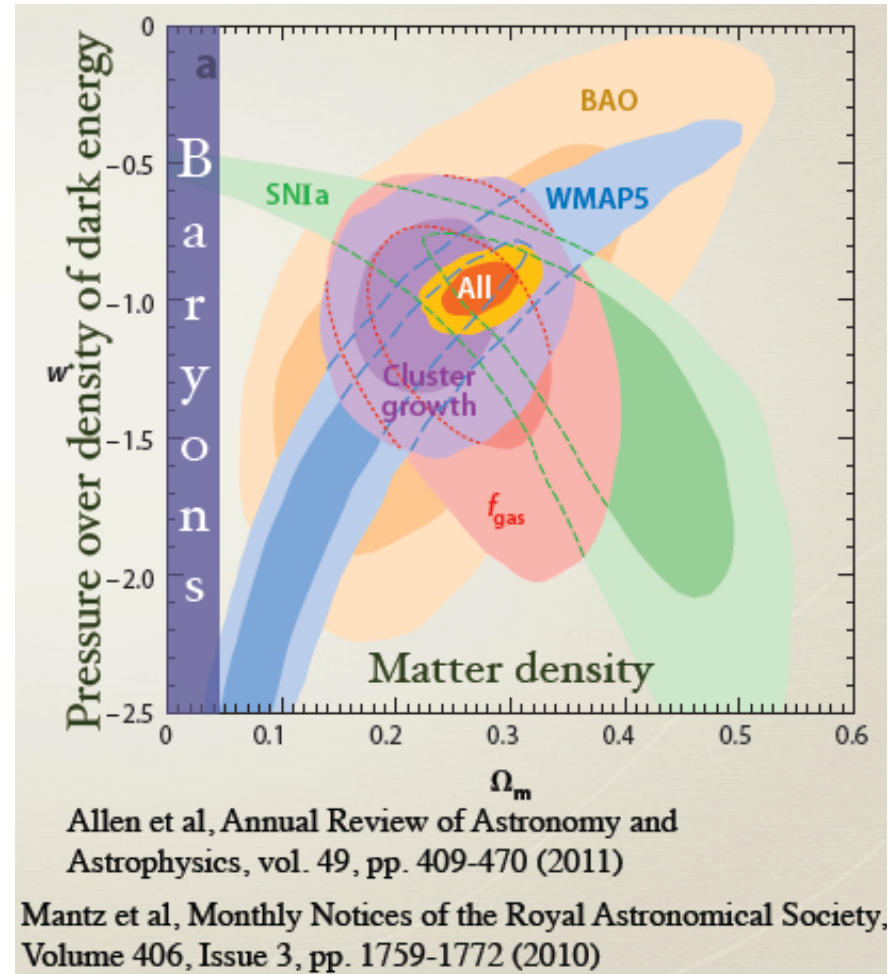
WHAT WERE THE MOST IMPORTANT BREAKTHROUGHS OF THE LAST ONE TO TWO DECADES?

Λ CDM

Theory shines when it provides simple explanations of diverse physical phenomena.

In the last two decades, Λ CDM has been established as the standard model of cosmology, a unified theory that explains stunningly diverse sets of data.

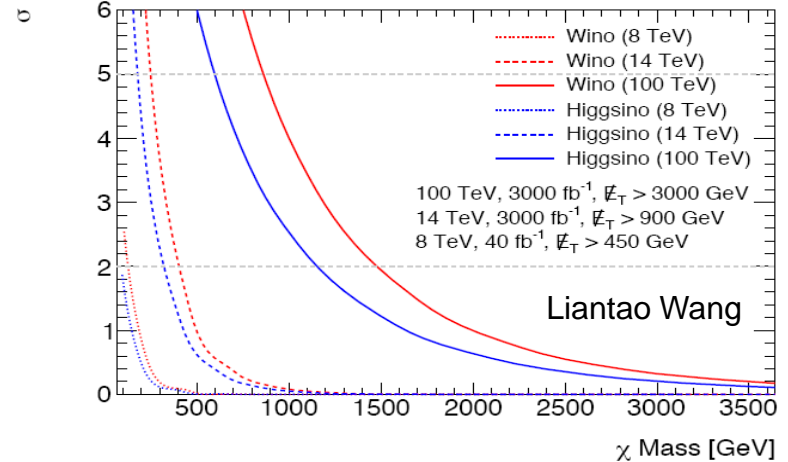
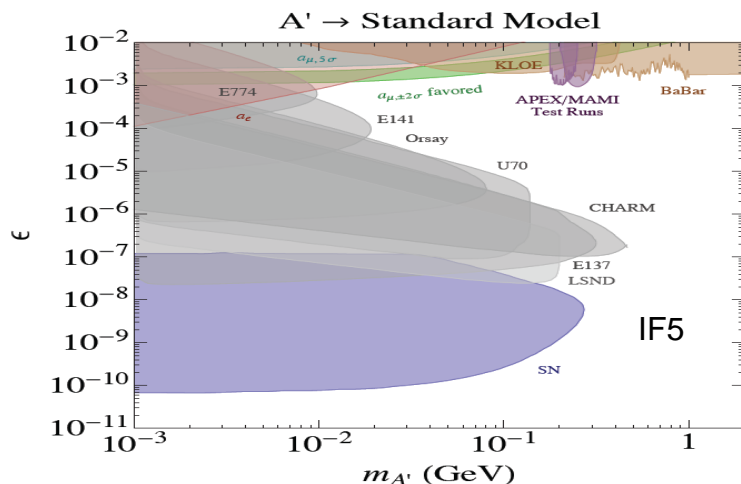
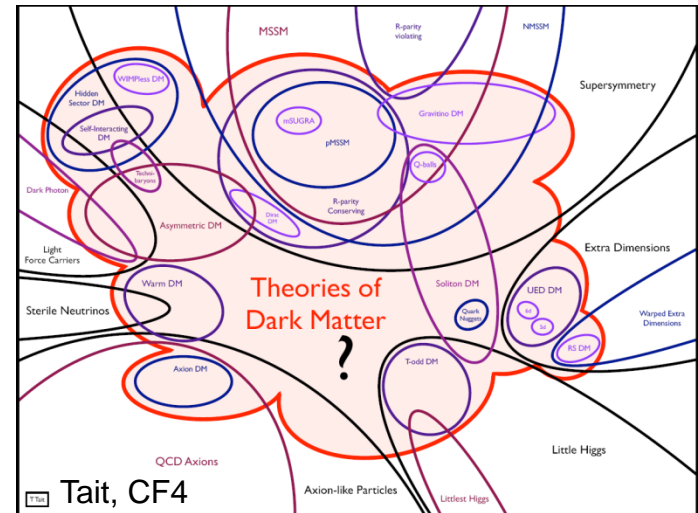
Theory contributes in many ways – see Scott Dodelson's talk on Tuesday



HOW HAS YOUR SUBFIELD CONTRIBUTED TO PROGRESS IN OTHER THEORY SUBFIELDS?

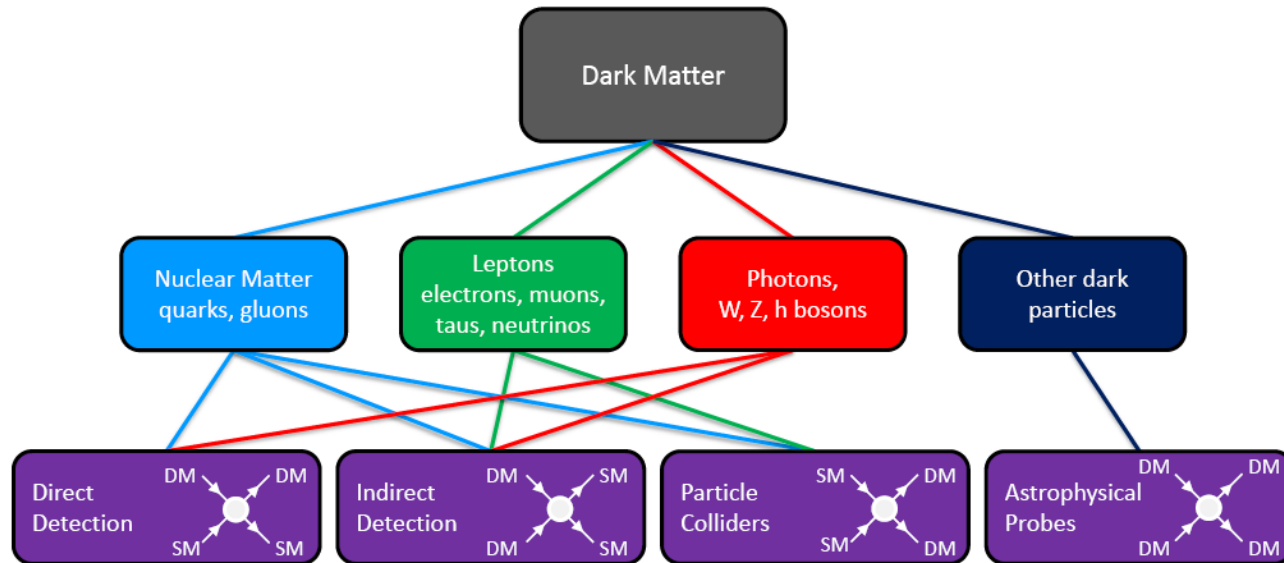
An Example: Dark Matter Candidates

The need for cold dark matter has become a criterion for model building and particle phenomenology, and become a guide and motivation for experimental searches for new physics at colliders and elsewhere.



WHAT ARE POTENTIAL BREAKTHROUGHS IN THE NEXT DECADE, NEXT 25 YEARS?

- Next decade: identification of dark matter. Theory will be essential!



- Next 25 years: natural solution to the dark energy / cosmological constant problem