Large-scale structure: the low-z Universe @ KICC

Alex Amon, on behalf of
Leah Bigwood, Calvin Preston, Naomi Robertson, Dongwon Han, Niall MacCrann
Blake Sherwin, Anthony Challinor, Debora Sijacki, George Efstathiou



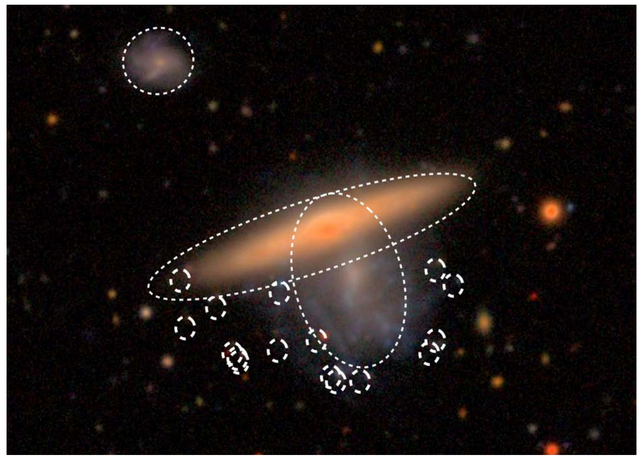




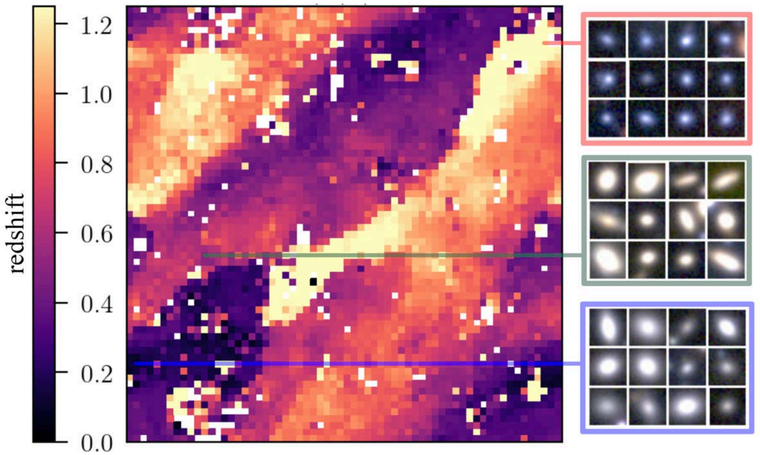



The decade for weak lensing & galaxy clustering

Testing the standard cosmological model

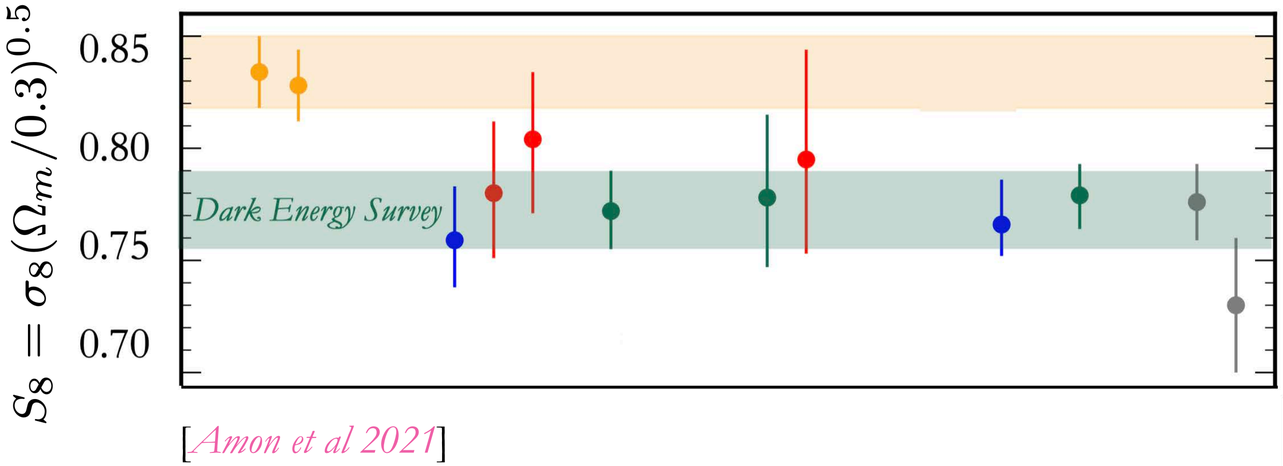


shape measurement +
machine learning +
Bayesian inference ⟶

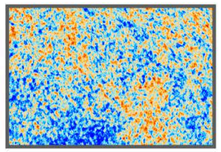


What is the nature of dark energy?

What causes the S_8 tension?

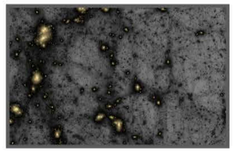


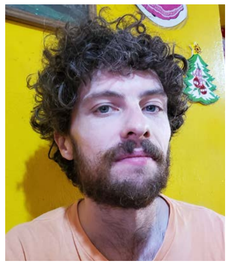
[*Amon et al 2021*]



Planck's Cosmic Microwave Background

Kilo-Degree Survey
Hyper Supreme Camera Survey
Other Constraints
Dark Energy Survey



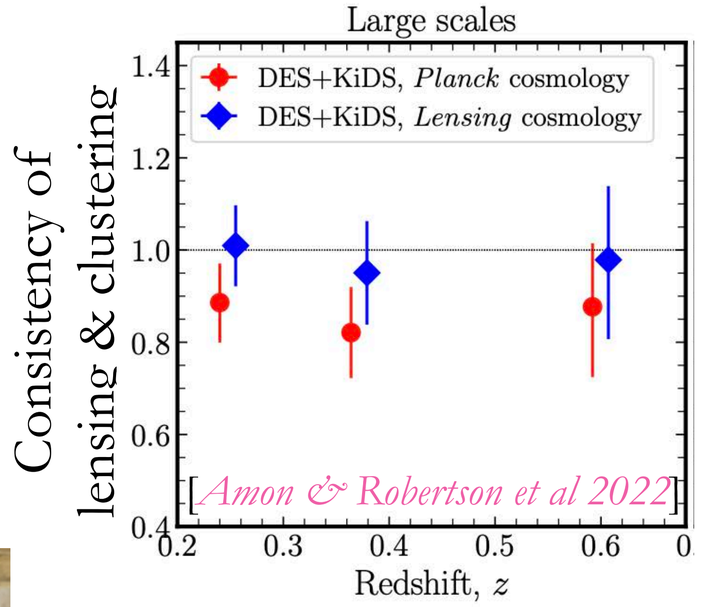


Calvin Preston, Niall MacCrann + DES

Picking apart the S_8 cosmological tension

- *Is it early Universe vs late?*
- *Is it lensing vs clustering or both?*
- *Is it small scales vs large scales?*

Test with BOSS + KiDS, DES, HSC



- *Inconsistency between lensing and clustering driven by small scales*
- *Early vs. late Universe tension not significant on large scales*

Naomi Robertson+ Miyatake, Heymans, White +

Picking apart the S_8 cosmological tension

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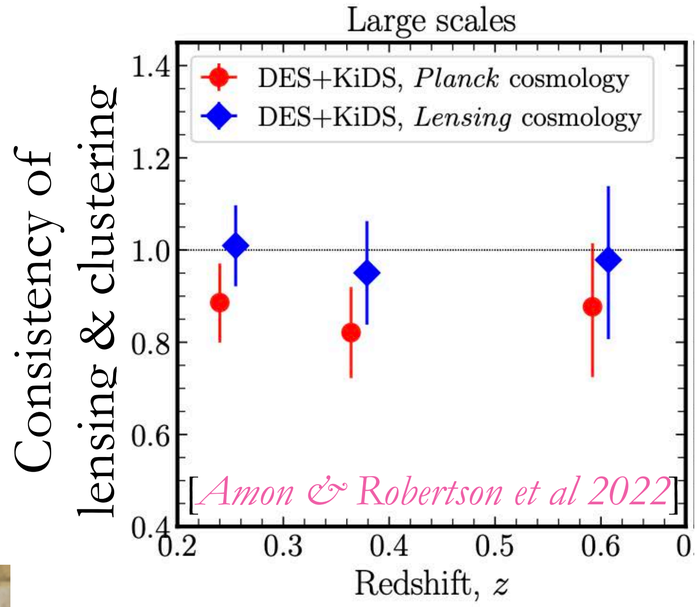
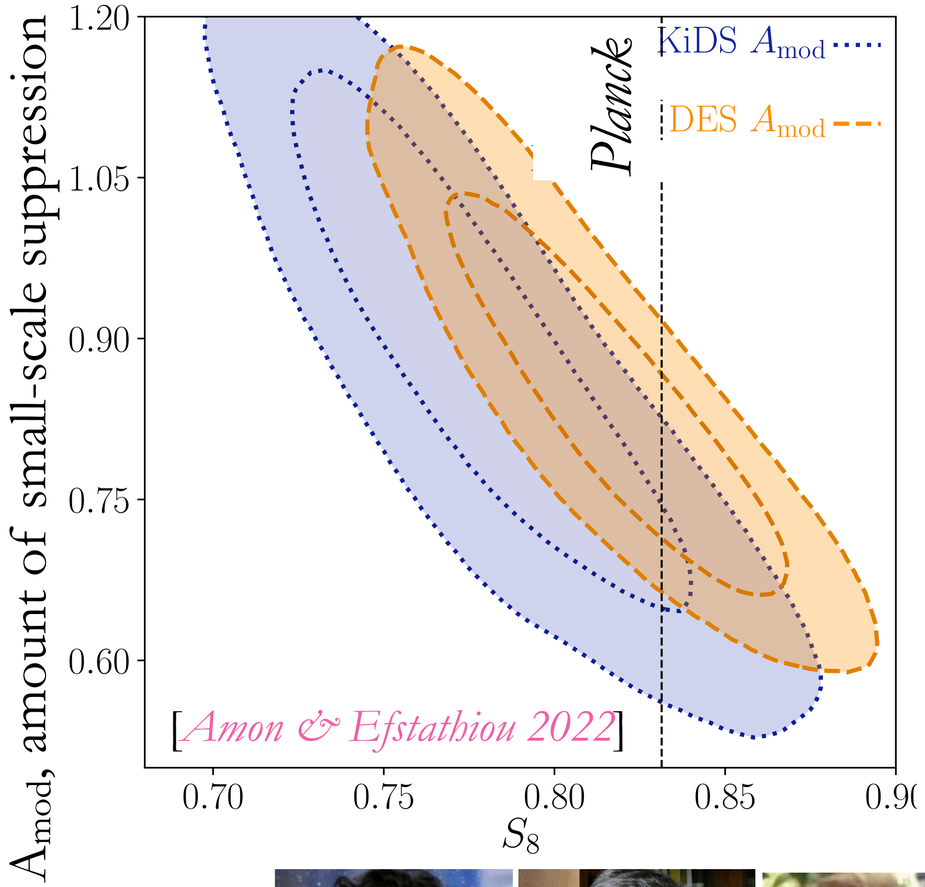


Naomi Robertson+ Miyatake, Heymans, White +

Potential solution: *Suppress power spectrum on small scales.*



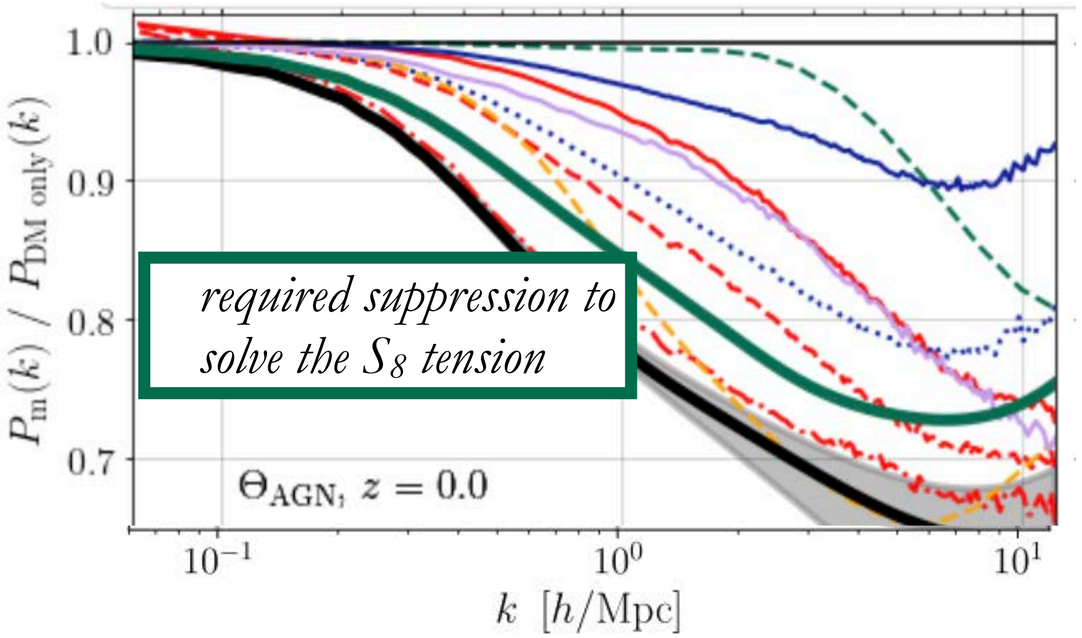
Baryonic physics or new dark matter properties?

Calvin Preston, George Efstathiou, Anthony Challinor

Probing galaxy formation: baryonic feedback with ACT

Do we understand AGN feedback enough to claim

A_{mod} = *dark matter physics?*

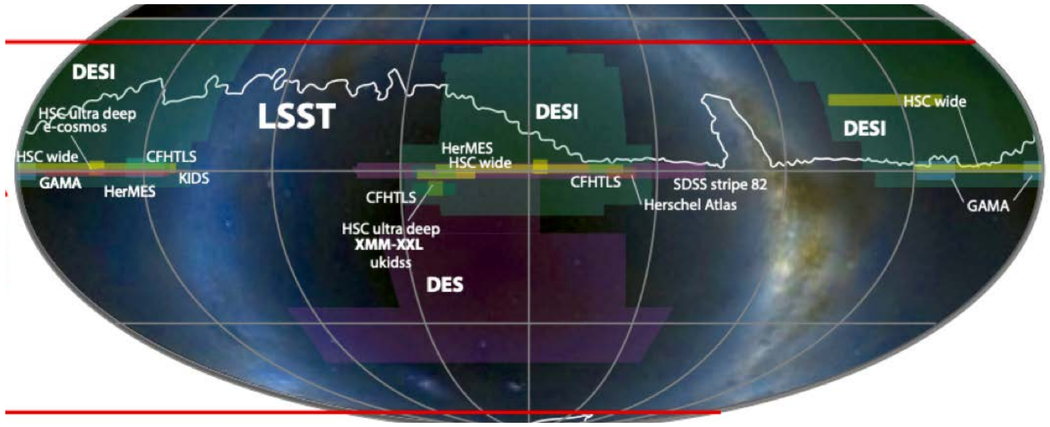


Lensing probes the distribution of matter on small scales

+

Sunyaev-Zeldovich (SZ) effect gives a handle on the baryonic content

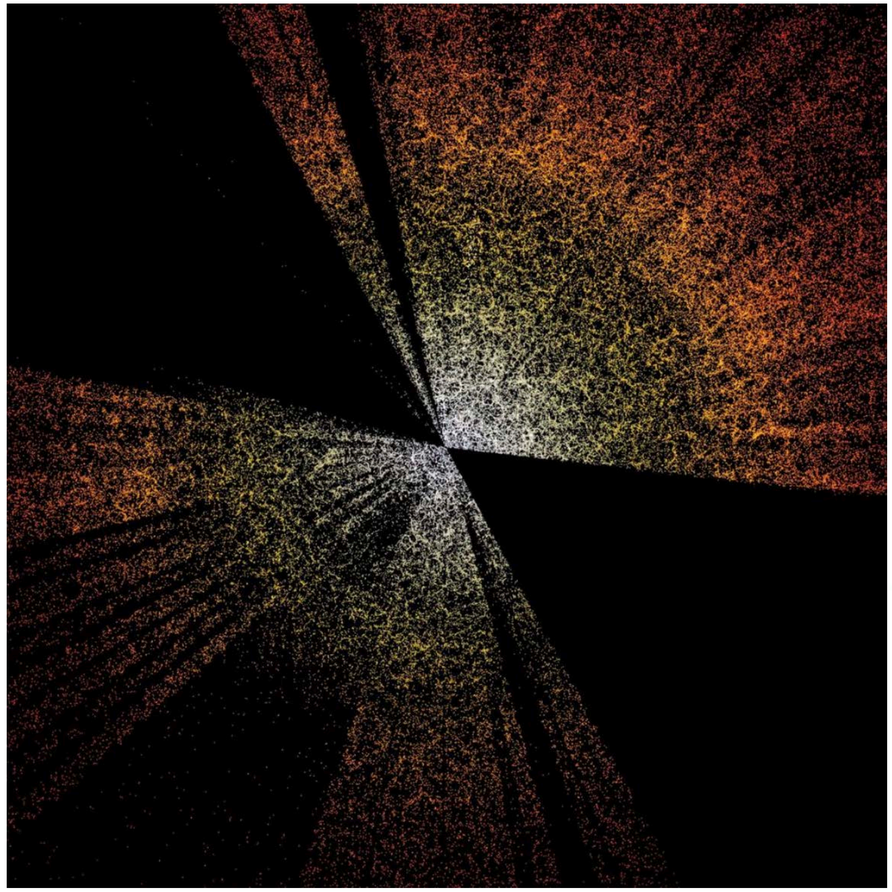
AdvACT / CMB S4



Leah Bigwood, Debora Sijacki, Naomi Robertson, Dongwon Han, Blake Sherwin, Niall MacCrann
+ Jo Dunkley, Manu Schaan

Probing galaxy formation: cosmic web with DESI

Dark Energy Spectroscopic Instrument:
A million galaxy redshifts a month



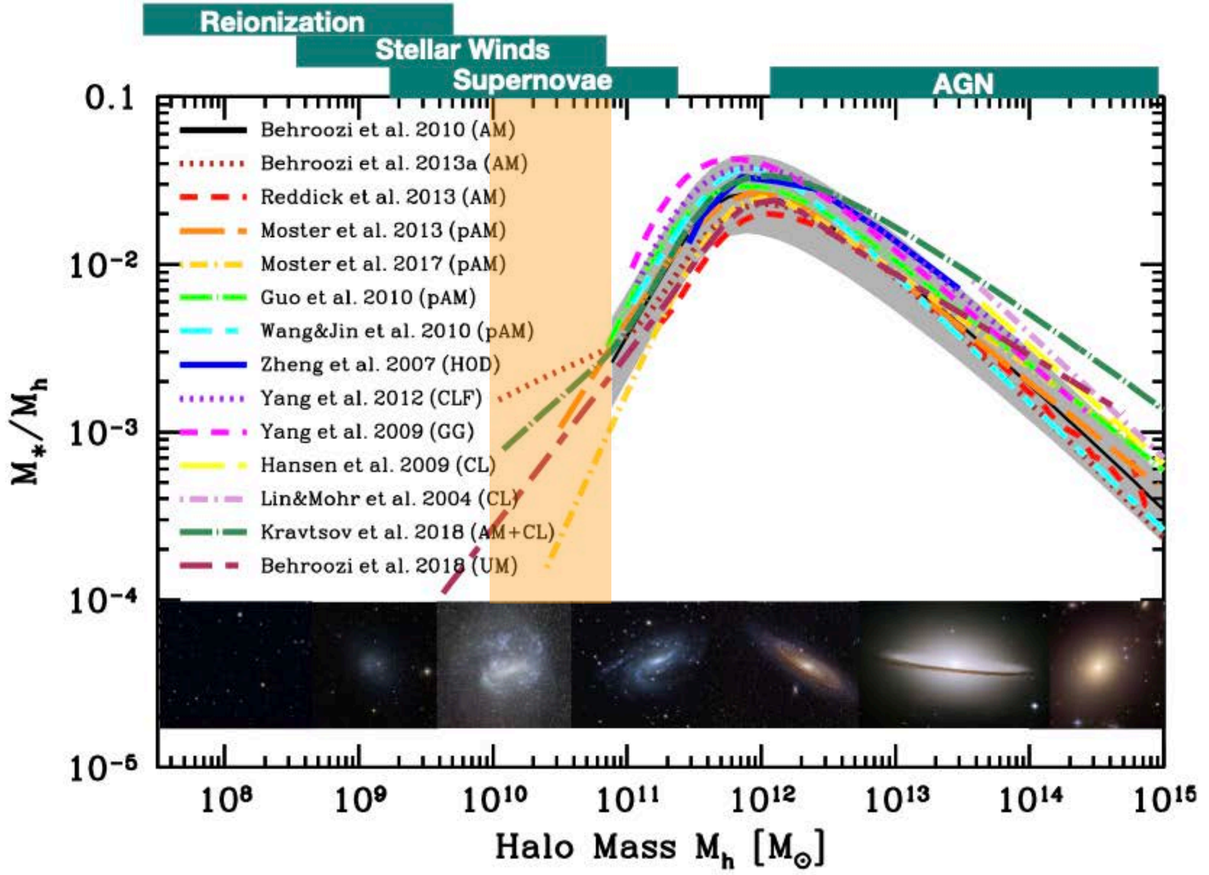
How intrinsically aligned are galaxies?
How does the effect depend on the galaxy properties:

- *redshift*
- *type*
- *luminosity ?*

+ Benjamin Joachimi

Dwarf lensing as a new probe of dark matter

SAGA survey



Joseph Thornton (Part III), Debora Sijacki
+ Risa Wechsler