

Synergies for/and beyond standard physics

A chapter(s) proposal

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Chapter questions:

- Have we settled chapters/contributions based on science/FGs (i.e., type of object used)?
- Only AAA4? (Some of the interesting science cases for beyond SM of Cosmology need SKAO on steroids)
- Shall we take "synergies" as the science that can only be done with a common analyses of 2+ datasets?
- In 2014 there was "Large Scales", "Cross-Correlation", "Testing foundations of modern cosmology", "Real time Cosmology" which may fit here;

Proposed Chapter: "Beyond Standard Cosmology"

- PNG with MT, bispectrum and 1PT statistics;
- test of GR: μ , σ , with GR effects - do they belong to the Extreme Universe?
- Dipole (all of them) - own chapter together with the next point?
- Tests of the Copernican principle, scale of homogeneity, fractal number;
- others...
- Shall we divide it between tests of the fundamental assumptions of FLRW and other physics beyond?

Proposed Chapter: "Science with Radio x GW events Synergies"

- Does this make sense or goes into a general chapter?
- Calibrate redshifts of Dark Sirenes;
- Cross-correlations between HI (gal + IM), Continuum and GW to improve GW science;
- others...

Proposed Chapter?: Synergies with specific LSS Surveys/Facilities

- DESI;
- 4MOST;
- DES;
- Euclid;
- Athena?;
- Vera Rubin;
- SPHEREx;
- Mega Mapper?;

Shall we do a Synergies with Optical/NIR chapter?

- other not GW?

Proposed Synergies Chapter

- Do we want a synergy chapter for ISW - not really BSC - or goes into continuum?
- Do we want a chapter on xCMB experiments which also includes Spectral Distortions and CIB?
- CMB lensing x Radio?
- Redshift Drift - HI gal or "synergies" (we won't really have a DE physics chapter)?
- 1pt statistics - own chapter or merged with fNL or HI IM?
- Where should cosmology with FRBs go? The Extreme Universe?
- any other thing I am missing?