

What questions about our universe could be productively addressed in the 2025-2035 time frame?

How compelling are alternative gravity models? GR provides the backbone of our cosmological model, should we stress-test GR to the maximum extent possible? Is that a compelling argument to make going beyond DESI?

Could we get a *reliable* measurement of neutrino mass from cosmological surveys?

How can we tie into advances in GW physics? Possibly there will be increasing interest in GR science. We will be interested in probing GR effects as well as testing GR.

One of key issues in astro community in next decade might be “life and the Universe”. More earth-like exoplanets will be discovered, and the effort to search for the evidence of exo-life will be made. Can cosmologists add to this: new paradigm for initial conditions, entropy argument and the fate of the Universe etc.?

What advance in technology or data analysis would greatly increase the science output of surveys?

Germanium CCDs will make large-scale production of IR spectrographs much less expensive and enable galaxy surveys to higher redshifts. More close-packed arrays of fiber positioners will enable higher density sampling of cosmic structure in the same integration time as current surveys. Any other technique to more densely sample the focal plane would be quite useful. In combination, the IR coverage and increased density would increase science output of surveys by opening up the $z > 1.5$ regime.

There will be better understanding of non-linear physics in data analysis. The advanced technology will demand precision in non-linear analysis.

Statistics beyond 2pt, eg Cosmic Web characterisation.

Time domain cosmology: SN, GW, ...

How will the combination of different surveys be much greater than the sum of the individual projects

LSST will provide a full sky-map of the 3d lensing potential. A comparable spectroscopic survey would provide a full 3d map of the galaxy field and velocity field. These would be excellent in combination.

We need to plan those in consistent way. For instance, LSST surveys the southern sky, then the spectroscopy survey can be considered to have the corresponding potential. It would be great if we can plan the surveys considering synergy effects among different surveys.

Combining WL from imaging surveys and dynamics from redshift surveys can test modified gravity, eg are the two potentials equal?

Future Surveys Discussion

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What specific contributions can Korea make?