Advances in Astronomy

Special Issue on

New Views of the Origin of Structure in the Universe

CALL FOR PAPERS

Progress in precision cosmology over the past two decades has provided invaluable insights into the physics of the early universe and, particularly, the origin of fluctuations that seeded the present-day galaxies and other structures in the universe. Yet, many important details remain poorly understood. Fortunately, future observations might be able to probe and measure these missing pieces. This special issue aims to summarize the state-of-the-art on the current and future probes of the physics of inflation at the observational, numerical, and theoretical fronts.

The guest editors welcome original research.

Potential topics include, but are not limited to:

- Progress on gravitational waves: This would summarize the observational progress on primordial gravitational waves from current and upcoming experiments measuring Cosmic Microwave Background (CMB) B-mode polarization, polarized dust, and synchrotron emission from our Galaxy. It would include prospects on how to move forward in the field with algorithms of delensing and with new data from multifrequency measurements that will help distinguish the CMB from the polarized dust and synchrotron emission. Other topics could include measuring gravitational waves by cross-correlating the CMB with weak lensing observations and prospects from interferometric experiments.
- Progress on the primordial scalar power spectrum: This would summarize constraints on the shape of the initial curvature power spectrum and how we can improve them by using measurements of the large-scale structure of the universe (LSS)
- Theoretical targets: This would summarize the threshold values of inflationary observables that approximately separate single-field from multifield inflation, large-field from small-field inflation, and so forth. It could also include a discussion of inflationary consistency relations
- Alternatives to inflation: This would summarize progress on alternative theories to inflation and opportunities to distinguish these theories with cosmological datasets
- Primordial non-Gaussianity from the CMB: This would summarize what we have learned about primordial non-Gaussianity from CMB measurements and what we expect to continue to learn in the upcoming years. Other topics could include the effective field theory of inflation, inflationary feature models, and super cosmic variance
- Initial conditions from the large-scale structure (analytical developments): This would summarize our current ideas on ways to learn about primordial non-Gaussianity using LSS observations. It could include a discussion on recent developments on the effective field theory of inflation and perturbation theory
- Initial conditions from the large-scale structure (simulations): This would summarize developments on separate-universe simulations as a means to model the LSS
- Initial conditions from the large-scale structure (observations and systematics): This would summarize the statistical techniques proposed in the literature to measure primordial non Gaussianity from LSS observations with a comprehensive review of systematic errors

Authors can submit their manuscripts via the Manuscript Tracking System at http://mts.hindawi.com/submit/journals/aa/nvos/.

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