ORIGIN of Structure

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- ζ is gaussian?
  - statistically isotropic?
  - statistically homogeneous?
- There's also an isocurvature matter or neutrino perturbation?

Beyond SM inflation models

1. MSSM inflation

LANCASTER Mazumdar: Dressing the inflaton with the Standard Model gauge group

Needs $A/m = 40.000000000000000000 \pm 0.000000000000000001$

HELSINKI Nurmi: Kahler potentials for the MSSM inflaton and the spectral index

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Semi-shifted hybrid inflation with B-L cosmic strings

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3. D term inflation LANCASTER McDonald/Seto

Supersymmetric inflation and baryogenesis via Extra-Flat directions of the MSSM
LANCASTER Lin/McDonald

Supergravity and Two-Field Inflation Effects in Right-Handed Sneutrino Modified D-term Inflation

General remarks on field theory models

Pessimistic: naive models might be spoiled

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Exotic possibilities:

PADUA/CERN Bartolo/Riotto: Possibly large corrections to the inflationary observables

ANNECY/AARHUS Hamann/Hannestad/Sloth/Wong:
Observing trans-Planckian ripples in the primordial power spectrum with future large scale structure probes

WARSAW Artymowski/Lalak/Szulc: Loop Quantum Cosmology corrections to inflationary models

More general inflation models

Models not using BSM ideas

PARIS/CERN Langlois/Renaus-Peter/Steer/Tanaka:
Primordial perturbations and non-Gaussianities in DBI and general multi-fi eld inflation

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LANCASTER Bueno Sanchez/Bastero-Gil/Berera/Dimopoulos: Warm hilltop inflation

Super-horizon perturbations

- If inflation started many e folds before observable Universe leaves the horizon we MAY calculate vacuum fluctuation in box size many powers of e bigger than observable Universe.
- Is such a calculation under control?
- How is it to be interpreted?

PADUA/CERN Bartolo/Matarrese/Pietroni/Riotto/Seery:
On the physical signifi cance of infra-red corrections to inflationary observables

HELSINKI Enqvist/Nurmi/Podolsky/Rigopoulos:
On the divergences of inflationary superhorizon perturbations

HELSINKI/PADUA Riotto/Sloth:
On resumming inflationary perturbations beyond one-loop

Generating ζ AFTER inflation

Curvaton model

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“Affleck-Dine” model (without baryogenesis!)

CERN/PADUA/OXFORD Riotto/Riva: Curvature perturbation from supersymmetric flat directions

Curvature perturbation from VECTOR fields

General discussions

LANCASTER Dimopoulos: Curvature perturbations and magnetogenesis from the electroweak gauge bosons

LANCASTER Dimopoulos/Karciauskas: Non-minimally coupled vector curvaton

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Statistical anisotropy: spectrum $\mathcal{P}_\zeta(\mathbf{k})$, bispectrum $f_{\rm NL}(\mathbf{k}_1, \mathbf{k}_2)$ etc.

LANCASTER Dimopoulos/Lyth/Rodriguez

Statistical anisotropy of the curvature perturbation from vector fi eld

Making the most of the data

WARSAW/OXFORD Hunt/Sarkar: Constraints on large scale voids from WMAP-5 and SDSS

ANNECY Hamann/Lesgourgues: How to constrain inflationary parameter space with minimal priors

ANNECY Lesgourgues/Starobinsky: What do WMAP and SDSS really tell about inflation?

ANNECY Valkenburg/Krauss/Hamann
Effects of prior assumptions on Baysian estimates of inflationary parameters and the expected gravitational wave signal from inflation

PADUA Liguori/Riotto
Impact of uncertainites in the cosmological parameters on the measurement of primordial non-gaussianity

Oddments

Non-gaussianity from self-coupling of inflaton field:

LANCASTER Seery/Malik/Lyth: Non-gaussianity of inflationary field perturbations from the field equation

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BH formation needs running $n' \sim 10^{-2}$

LANCASTER Kohri/Lyth/Melchiorri: Black hole formation and slow-roll inflation

Summary and suggestions

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1. Explore "'complete" scenarios: curvature perturbation, baryogenesis, CDM, axion.

2. Study statistical anisotropy from vector field contributions

A long shot but COMPLETELY NEW