

## School of Physics

### Ph.D Defense Session

Title:

**Anisotropic Inflation and Cosmological Observations**

Candidate:

**Razieh Emami, IPM**

Venue:

**Farmanieh Seminar Room**

Time:

**15:30 am, 21 July, 2015**

سه شنبه، ۳۰ تیر ۱۳۹۴

**Abstract:**

In this thesis we study primordial statistical anisotropies and their observational signatures. Firstly, we build up a consistent inflationary model which contains a charged scalar field coupled to a  $U(1)$  gauge field. We will show that in this system, there is an attractor mechanism where the back-reaction of the gauge field on the scalar field is important. We then consider the cosmological perturbation theory in this model. More specifically, we consider the anisotropic correction in the power spectrum as well as the bispectrum of curvature perturbation. Next we generalize the well-known  $\delta N$  formalism for the anisotropic backgrounds. Finally we try to connect the primordial anisotropies to what can be observed in the CMB spectrum and study the unique signatures of statistical anisotropies on the CMB.

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