



**ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ**

**SPECIAL PHYSICS COLLOQUIUM**

**Wednesday, 18 May 2011**

**17:00 -18:00**

**3<sup>rd</sup> Floor Seminar Room**

**“Where Galaxies Really Come From”**

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**Abstract**

The fundamental paradox of the incompatibility of the observed large-scale uniformity of the Universe with the fact that the age of the Universe is finite is overcome by the introduction of an initial period of superluminal expansion of space, called cosmic inflation. Inflation can also produce the small deviations from uniformity needed for the formation of structures in the Universe such as galaxies. This is achieved by the conjunction of inflation with the quantum vacuum, through the so-called particle production process. This mechanism is explained and linked with Hawking radiation of black holes. The nature of the particles involved is discussed and the case of using massive vector boson fields instead of scalar fields is presented, with emphasis on its distinct observational signatures.