1. Introduction:

During the last two decades cosmology turns out to be one of the fast developing subjects both theoretically and experimentally in modern physics. The discovery of late time acceleration of the expansion of the Universe pose some serious and at the same time fascinating problems for the cosmologists. This phenomenon leads to redefine the entire theory of gravity. Many new theories of modified gravity are being proposed. At the same time a completely new idea known as dark energy has been proposed. Many models of dark energy are on the table. Our project is related to the problem of late time acceleration.

2. Basic:

The participant can will be familiar with the problems of modern cosmology and learn to solve some problems of this field using Maple.

3. Description of the problem:

3.1. Computer with Maple;
3.2. Using Maple derive the Einstein equations for a given metric;
3.3. Solution to the Einstein equations using Maple;
3.4. Exploiting mean square method fitting of the theoretical results with observational data.

3.5. Report in seminar.

4. The student should be familiar with analytical calculations using Maple, elements of Differential Geometry and minimization methods of functional.

5. Literature: S. Weinberg Gravitation and Cosmology; S. Weinberg Cosmology; Handbook on Maple

6. Number of participants:

Maximum 3 students

7. Руководитель проекта со стороны ОИЯИ:

Bijan Saha, leading research fellow, D.Sc., Laboratory of Information Technologies, Scientific sector of physical calculations, Gravitation and Cosmology, Electrodynamics, Solitons. I have more than 160 publications with more than 100 in well-known international journals. http://spinor.bijansaha.ru and Victor S. Rikhvitsky, Engineer, LIT, JINR.