

**The Midterm Exam program
on the discipline « Nuclear interactions in high density star matter » for students of the
fourth year of the speciality «6D060500 – Nuclear Physics»**

The proposed Midterm Exam program on discipline « Nuclear interactions in high density star matter » is made according to the discipline syllabus. The program determines the requirements for the levels of mastering the academic discipline: what the student should have an idea after studying the course for 7 weeks, which should know what skills and habits should be formed. At Midterm Exam, students will be asked two theoretical questions and one task.

Midterm addresses the following questions:

1. Stars and interstellar medium.
2. The birth of stars.
3. Galaxies and quasars.
4. The use of physical laws to the study of space objects (stars, cosmic plasma) and the universe as a whole.
5. Interaction of radiation with matter.
6. Elementary bases of the interaction of matter and radiation.
7. Radiative transfer equation and its simple solutions.
8. Physical processes in celestial sources of radiation.
9. Nuclear reactions in stars and other astronomical objects..
10. The theory of interactions.
11. The interactions and reactions of two-particle and three-particle types
12. Energy and mechanisms of nuclear fission.
13. The explosions of supernovae, quasars, pulsars, neutron stars.

BIBLIOGRAPHY

Basic:

1. Cotnikova R. T, Klimushkin DY, Fundamentals of stellar evolution and cosmology. Irkutsk: RIO 1998.
2. Cotnikova R. T Astrophysics. Irkutsk .: RIO 2005.
3. Martynov D. Y, Course of General Astrophysics. M .: Nauka, 1984.
4. Sobolev V. Course of Theoretical Astrophysics. M .: Nauka, 1987

Additional:

1. N.G Bochkarev Magnetic fields in space. M .: Nauka, 1985.
2. Vorontsov - Velyaminov B. A. Extragalactic astronomy. M .: Nauka, 1978.
3. Gershberg R. E. Active solar-type main sequence stars. Odessa: Astroprint 2002.
4. Ginsburg V. L. About physics and astrophysics. M: The Bureau "Quantum", 1995.
5. Gurevich L. E, Chernin A. D. The origin of galaxies and stars. M .: Nauka, 1987.