CURRENT STATUS OF RELATIVISTIC ASTROPHYSICS IN UZBEKISTAN

Bobomurat J. **AHMEDOV**

Ulugh Beg Astronomical Institute, Uzbekistan Academy of Sciences, Tashkent 100052, Uzbekistan
Institute for Advanced Studies, New Uzbekistan University, Movarounnahr str. 1, Tashkent 100000, Uzbekistan
Orcid number: 0000-0002-1232-610X
ahmedov@astrin.uz

Abstract

The past decade has witnessed the rapid development of relativistic astrophysics in Uzbekistan, centered at the Laboratory of Theoretical Astrophysics of the Ulugh Beg Astronomical Institute (UBAI). This talk will survey the current research landscape, detailing the group's principal scientific directions. Key areas of focus include:

Theoretical Modeling: Analytical and numerical studies of accretion processes, magnetohydrodynamic (MHD) jet formation, and particle dynamics in the vicinities of supermassive and stellar-mass black holes.

Compact Objects: Investigation of the solutions of the gravitational field equations, electrodynamics of magnetised neutron stars and the energetics of gravitational compact objects.

Observational Tests of GR: Utilizing data from gravitational wave observatories (LIGO/Virgo) and Event Horizon Telescope (EHT) collaborations to test General Relativity in strong-gravity environments.

I will emphasize the synergy between theoretical work and multi-messenger data analysis, underscoring the laboratory's integration into international scientific collaboration. This presentation will illustrate how Uzbekistan astrophysicists are actively advancing the frontiers of knowledge in one of modern astrophysics' most dynamic fields.