STATE AGENCY ON SCIENCE, INNOVATION
AND INFORMATION OF UKRAINE
RESEARCH INSTITUTE “NIKOLAEV ASTRONOMICAL OBSERVATORY”

ASTRONOMICAL RESEARCH: FROM NEAR-EARTH SPACE TO THE GALAXY

International Conference

ABSTRACT BOOK

September 26-29, 2011,
Mykolaiv, Ukraine

compiled from observations with Freiberg-Kondratiev transit instrument and Repsold vertical circle, were included as a part in the fundamental catalogs FK. In 1931 the Time service, which was one of the best in the USSR, was organized in the Observatory. Another target of Nikolaev department was to determine the positions of the Sun and Solar system bodies.

Currently, we are working on a new book of the series of bio-bibliographical books devoted to the directors of NAO - B.P. Ostaschenko-Kudryavtsev and L.I. Semenov. Materials in the archives of the NAO, Pulkovo Observatory and personal archives of B.P. Ostaschenko-Kudryavtseva are used to write it.

THE INFLUENCE OF YARKOVSKY AND YORP EFFECTS ON DYNAMICAL EVOLUTION OF ASTEROIDS

A.V. Pomazan, A.V. Ivantsov

RI "Nikolaev Astronomical Observatory", Mykolaiv, Ukraine

The two effects are produced by a weak non-gravitational acceleration of asteroids and meteoroids, which is caused by radiative recoil due to anisotropic thermal re-emission of energy. The first one produces secular changes in orbital semi-major axis of body and is called Yarkovsky effect. The second one produces changes in rotational state and is called YORP (Yarkovsky-O'Keefe-Radzievskiy-Paddack) effect. It is believed that these effects have significant influence on orbital and rotational dynamics of asteroids less than 100 km. The Yarkovsky and YORP effects were not investigated earlier due to insufficient precision of observations.

The Yarkovsky effect was predicted in 1900 and firstly confirmed in 2003 up to now only for one asteroid (6489) Golevka using radar ranging. At present, YORP effect was detected for 4 asteroids using photometric data. All of these asteroids are NEAs, and detection of YORP and Yarkovsky effects for main belt asteroids is forthcoming.

The review presents basic principles of the Yarkovsky and YORP effects, their possible influences on dynamical evolution of asteroids and recent results. The estimation and inclusion these effects to a model of motion among with other already used factors will improve our understanding of the dynamical evolution of small Solar system bodies.