

STATE AGENCY ON SCIENCE, INNOVATION  
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RESEARCH INSTITUTE “NIKOLAEV ASTRONOMICAL OBSERVATORY”

**ASTRONOMICAL RESEARCH:  
FROM NEAR-EARTH SPACE  
TO THE GALAXY**

International Conference

**ABSTRACT BOOK**

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## **NEW OBSERVATION RESULTS FROM ROTATING- DRIFT-SCAN CCD**

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After moved to a new site, the 300mm telescope with rotating-drift-scan CCD has observed many space objects. Statistic results of observation are given. The limited magnitude can be fainter than 14 magnitude with ~10 seconds exposure time under drift-scan mode.

## **INVESTIGATION OF SELECTED STARS WITH LARGE PROPER MOTIONS AND DETECTION OF $\Delta\mu$ -BINARY SYSTEMS**

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Astrometric investigation of stars with large proper motions yields new data on the nature of low-luminosity objects, searches for stars with invisible companions, analyzes the distribution and kinematics of stars in the solar neighborhood. A catalog of astrometric positions and proper motions of stars (9 -16)<sup>m</sup> in fields of ecliptic zone and around higher proper motion stars was obtained by results of CCD-observations during 2008-2009 years with Axial Meridian Circle (AMC) of RI NAO. Cross-correlation of obtained data with astrometric catalogues, such as TYCHO2, 2MASS, CMC11, CMC14, PPMX, XPM, LSPM and USNOA2.0, was made for investigation of irregular proper motions and detection of  $\Delta\mu$ -binaries with probable invisible companions. 147 stars may be considered as  $\Delta\mu$ -binaries candidates.

## **FROM CREATION OF DIGITAL ARCHIVES TO DATA PROCESSING BY USING VIRTUAL TECHNOLOGIES**

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We present background and current results in development of digital archives and astronomical databases obtained during 2008-2011

years at Nikolaev Astronomical Observatory. Creation of a digital archive should be considered as the first necessary step on the way to development of any database. In their turn, the databases should be considered as a basis for construction of a data centre, which provides data processing in accordance with the standards of virtual technologies.

A standalone database has been developed since 2008 to process initial textual data concerning photographic observations carried out in the 20th century. Using this database, we can prepare output textual data in any given format, for example in accordance with the format developed by the Institute of Astronomy (Bulgaria).

Online database of photographic and CCD observations has been developed since 2008 to provide wide access to textual data and processed images. Update of this database is regularly carried out using new textual data obtained with the standalone database. There are two possibilities to get access to the database via a browser and via a standalone application such as Aladin.

The digital archives also contain the whole bulk of raw and processed images of the celestial bodies as well as the results of data reduction in the form of scanned publications of astrometric stellar catalogues and positions of the solar system bodies. Obtained images of printed catalogues were processed using semiautomatic software for optical character recognition. Using obtained textual data, all astrometric stellar catalogues were compiled in the standard VOTable format using eXtensible Markup Language, and online database of the solar system bodies was created.

Using access to the given databases via a browser, it is possible to use various data selection options, such as, search by: equatorial coordinates, type of celestial object, time period of observations, telescope name, etc. Aladin as a standalone application also provides a wide range of data processing tools in accordance with the standards of virtual technologies.

## **THE PULKOVO CATALOGUE OF REFERENCE STARS FOR OBSERVATIONS OF GALACTIC RADIO SOURCES**

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Pulkovo catalogue of reference stars for 78 fields around galactic radio stars (Pul GRS) of northern sky from H.G.Walter's list was created. Coordinates of 12577 stars from the photographic plates, which were received during 1994-1999 at Pulkovo Normal Astrograph