

MINISTRY FOR EDUCATION & SCIENCE OF UKRAINE
UKRAINIAN ASTRONOMICAL ASSOCIATION
RESEARCH INSTITUTE “NIKOLAEV ASTRONOMICAL OBSERVATORY”

**ENLARGEMENT OF COLLABORATION
IN GROUND-BASED ASTRONOMICAL RESEARCH
IN SEE COUNTRIES. STUDIES OF THE NEAR-EARTH
AND SMALL BODIES OF THE SOLAR SYSTEM**

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ABSTRACT BOOK

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are the basis for determination of asteroid albedos and diameters, as well as obtained from photometry color indices of asteroids allow also to classify them into the types of surface mineralogy.

Recently photometry showed itself as an effective tool (along with radar observations and direct imaging) for the detection and study of binaries in each of the major populations of minor Solar system bodies (main-belt asteroids, near-Earth asteroids and trans-Neptunian objects). The number of known binary systems is growing rapidly and it is about 100 now [3]. There are 38 main-belt asteroids (one with two satellites), 28 near-Earth asteroids, 5 Mars crossing asteroids, 1 Jupiter Trojan asteroid, and 24 trans-Neptunian objects (one with two satellites) among them. Their study gives possibility to derive masses and densities of the objects, which is necessary for understanding their internal structure, porosity and correlations between bulk-physical and surface-spectral properties.

We will review the current state of knowledge in the three aforementioned directions of photometric studies of small Solar system bodies.

1. *J. Torppa, M. Kaasalainen, T. Michalowski et al.* 2003, *Icarus*, 164, p. 346-383.
2. *I. N. Belskaya, V.G. Shevchenko.* 2000, *Icarus*, 147, p. 94-105.
3. *K.S. Noll.* 2006, in “Asteroids, Comets, Meteors”, *Proceed. of the 229th Sympos. of IAU, D.Lazzaro, S.F. Mello, J.A.Fernandez (eds.)*, Cambridge Univ. Press, p. 301-318.

CCD OBSERVATIONS OF FIELDS AROUND ECLIPTIC IN DRIFT SCAN MODE

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CCD observations at the AMC are carried out to create wide calibration fields around ecliptic in drift scan mode since 2002. The size of one strip was $3^\circ \times 12'$ or 8000×1094 pixels in 2002 year, and then the length of strip was increased up to 13000 pixels in 2003 year and up to 20000 pixels in 2004 year.

The AMC2002 and AMC2003 catalogues were compiled from observations made in 2002 and 2003 years. The UCAC2 was used as a reference catalogue during the reduction of observations. All the reductions

were made by using SurfAstro software package, which was developed in our observatory. This package includes determination of the rectangular coordinates for star-like objects, matching of stars with the reference catalogue, and calculation of the equatorial coordinates for given objects.

The AMC2002 catalogue consists of positions for about 11000 stars in declination zone of -7° . The mean number of observations per one star is 5.3. The catalogue accuracy is $0''.030$ in right ascension and $0''.048$ in declination for stars of 9-12 mag, $0''.045$ - $0''.052$ for stars of 12-13.5 mag, and up to $0''.12$ for stars of 14-15 mag.

The AMC2003-2005 catalogue contains more than 13000 stars in the ecliptic zone around extragalactic radio sources. The mean number of observations per one star is 4.5. The catalogue accuracy is about $0''.05$ in right ascension and $0''.060$ in declination for stars of 9-10.5 mag and $0''.08$ - $0''.12$ for stars of 14-15 mag.

ON THE CREATION OF AUTOMATIC IMAGING 0.8 M TELESCOPE FOR LVIV ASTRONOMICAL OBSERVATORY

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The optical layout of fully automated 0.79-m reflector is presented along with design of mounting and drive systems. The telescope is intended to use for various projects such as search for potentially dangerous asteroids, comets, supernovae, space debris monitoring, observations of artificial Earth's satellites, studies of optical counterparts of gamma-ray bursts and gravitational lenses, educational purposes. Optical part of the telescope consists from high-quality glass-ceramic mirrors designed for Ritchey-Chretien system with focal ratio of $f/10$. Those telescopes possess extremely low aberrations and have sufficiently wide field of view. For instance, the Airy disk at equivalent focus for the described telescope accounts $15\ \mu\text{m}$ or 0.4 arcsec. Linear field of view for the aberrations less than the Airy disk equals to 28 mm and can be covered completely by 14 Mpixel CMOS detector. The designed original construction of fork mounting with reduction-free high-torque device enables pointing with