Introduction

Editorial board*

Astronomical surveys are the main source for discovery of astronomical objects and accumulation of observational data for further analysis, interpretation, and achieving scientific results. In 1940s-1950s Palomar Observatory Sky Survey (POSS, at present digitized as DSS1) gave more data that it was collected during the whole epoch of astronomical observations before. Similarly, Markarian Survey (or the First Byurakan Survey, FBS) was the first large-area spectroscopic survey resulting at low-dispersion spectra of 20,000,000 objects. Later on, many all-sky or large-area surveys appeared (POSS2 (DSS2), SDSS, etc.). Sloan Digital Sky Survey (SDSS) so far has provided the largest database (both photometric and spectroscopic) and SDSS-based virtual sky may be explored for new discoveries. CALIFA gives a new large set of spectra. Gaia and LSST are the next source for vast amount of information. Modern multiwavelength surveys include GOODS, COSMOS, GAMA, and others. The large amount of data requires new approaches to data reduction, management and analysis. We now deal with Big Data. Powerful computer technologies are required, including clusters and grids. Virtual Observatories (VOs) have been created to coordinate astronomers' and computer scientists' actions and help in accomplishment of complex research programs using all the accumulated data. International Virtual Observatory Alliance (IVOA) unifies 20 VO projects for joint efforts toward handling of Big Data and creation of an environment for more efficient research. The International Council of Scientific Unions (ICSU) has created World Data System (WDS) to unify data coming from different science fields for further possibility of exchange and new science projects.

Benyamin Markarian (1913-1985) was the first to conduct and accomplish a large-area (17,000 sq. deg.) spectroscopic survey in 1965 to search for active galaxies. Markarian survey is until now the largest objective-prism spectroscopic survey, it was the first systematic search for active galaxies using a new method of UV-excess, it resulted in the discovery of 1515 UVX galaxies (Markarian galaxies), including many AGN and Starbursts, first classification of Seyferts into Sy1 and Sy2, and definition of Starburst galaxies. BAO is famous for other surveys as well: Arakelian and Kazarian galaxies, Shahbazian compact groups, Parsamian cometary nebulae and other objects also are well known. This gives good grounds for holding international symposia at the Byurakan observatory to discuss large astronomical surveys and the prospects they provide for solving many problems of modern astrophysics.

The first meeting dedicated to the topic "Astronomical Surveys and Big Data" was successfully held in 2015. In September 2020, the second international symposium "Astronomical Surveys and Big Data 2" dedicated to this topic was held. The organizers brought together astronomers and computer scientists who are actively involved in working with astronomical surveys, catalogs, archives, databases and VOs. The meeting will contribute to the following:

- Review and discuss large astronomical surveys to summarize observational data obtained in astronomy;

- Give tribute to Markarian Survey and other important surveys;

- Review and discuss astronomical catalogues, databases and archives;

- Learn about major current and upcoming surveys (including PanSTARRS, Gaia, and LSST);

- Learn and discuss how large observational data sets are changing astronomy;

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- Introduce tools and techniques for working with large data sets (including access, analysis, and visualization);

- Discuss the future of astronomical research by joint efforts of astronomers and computer scientists.

This issue of "Communications of BAO" includes the proceedings presented international symposium "Astronomical Surveys and Big Data 2". All the papers passed relevant peer-review