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The Development of Astronomy in Odessa and its Reflection in Publications of the Astronomical Observatory, Odessa State University

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Abstract. Dramatic, rich in events, the history of Odessa Astronomical Observatory during 127 years of its existence is reflected to a certain extent in the publications of the Astronomical Observatory and Odessa State University. These publications were neither regular nor numerous for different reasons, but nevertheless they do indicate landmarks of the basic directions of the development of astronomy in Odessa.

In 1870, when the Observatory was being created, the first director, L.F. Berkevich, asked the director of the well-known Pulkovo Obsevatory, O.V. Struve, to give advice and recommendations concerning research trends at the new observatory. O.V. Struve forwarded a detailed letter, in which he noted that astrophysical investigations should be the most important in the young observatory and gave advice particularly on photometrical and spectral observations of celestial bodies, on meteor observations, etc. Berkevich could not put all of this into practice. Nevertheless he created Odessa Observatory, "the institution, which we have a right to be proud of, which other cities could envy".

The Observatory really acquired the trend in astrophysical researches at the beginning of the 20th century, in the time of the successor of L.F. Berkevich, Prof. A.K. Kononovich. He had studied astrophotometry in Germany under Prof. J. Zellner and was a pioneer of astrophysical investigations, especially of the Sun and planets, in Russia. To achieve a modern research level within small means became a leading principle in Odessa Observatory. Many astronomers of that time worked though unpaid – and at present, too.

Then under the leadership of Prof. A.Ya. Orlov, the staff of the Observatory was integrated; the observational base improved. The scientific library was established and the first Observatory publications appeared. "Transactions of the Astronomical Observatory" (1914-1915), "Circular of Odessa Astronomical Observatory" (1921-1927), "Odessa Astronomical Calendar" (1919) "Nautical Astronomical Annual" (1921-1924), as well as numerous preprints were published in Russian, French, German and Ukrainian languages. These were gravimetrical researches, investigations of planets, papers on the celestial mechanics, etc. The publications were issued until 1929.

Since 1934 when Prof. K.D. Pokrovsky, a well-known investigator of comets, asteroids, and planetary satellites, became Director, these new trends were introduced and developed at the Observatory along with the previous ones. Binary stars' research, photometrical and spectral investigations of the stars were initiated, too.

The publication activities of the Observatory were resumed. Three volumes of "Odessa State University transactions. Collections of the Astronomical Observatory" were published in 1935, 1937 and 1940. The publications were opened by a discourse of Prof. K.D. Pokrovsky about the Observatory. In the second and third volumes the expedition to Siberia for observations of total Solar eclipse, 19 June 1936, and the scientific results of these observations were described in detail (Pokrovsky & Rojtbak 1940). Varied papers on research problems, studied at the Observatory at that time were published as well. The publications were in Ukrainian or French (these had another title: "Travaux de l'Université d'Odessa. Reciel de l'observatoire astronomique O.U.") with summaries in Russian and French. It should be noted that many astronomers of those days had a complete command of French. In the last volume the articles were written in Russian and the first summary in English appeared (Shulberg 1940).

The Great Patriotic War, 1941-1945, broke off the astronomical research and its publications in Odessa, but the Observatory was saved. In 1945 Prof. V.P. Tsessevich, a well-known investigator of variable stars, was appointed Director of the Observatory. "Publications" were out once more in 1947. That edition did not continue the previous one and was commenced from volume 1, issue 1. From 1947 to 1963 five volumes (ten issues) were published in Russian. Those collections reflected the activity of the Observatory only to a certain extent. Many astronomers published their papers in central journals, such as the well-known Soviet titles "Variable Stars", "Astronomical Journal", "Astronomical Circular", etc. The global subjects of investigations and, on the contrary, small and applied works were edited in the "Publications". Articles on astrometry and instrumentation, celestial mechanics and binary stars, investigations of Solar prominences and spots were presented, but more and more articles on variable stars appeared in those issues. A huge amount of observational material accumulated by Prof. V.P. Tsessevich needed to be put into order and summarized. Many of the scientific researchers were involved in this work. Vol. 4 contained a monograph by Prof. V.P. Tsessevich "Investigations of the eclipsing variable stars", observations and descriptions of 252 stars.

Two branches of research highly developed at that time should be noted, as well.

In 1945 the Observatory began the co-operative work on photographic observations of small planets. This new field of investigations yielded significant results concerning mass and density of asteroids' ring (see, for example, Putilin 1952)

In 1957-1958 during the International Geophysical Year, Odessa Astronomical Observatory became a leader of meteors' investigations in the USSR. New original equipment constructed by the scientists of the Observatory, new research methods, the experience in the observational arrangement accumulated during the previous decade made it possible. And Vol. 5 N2 of the "Publications" was dedicated to these results.

Vol. 6 appeared almost 30 years later, in 1993. Great changes took place in our country and in the Observatory. The staff of the Observatory consisted of 12 members in 1936, of 30 in 1957 and amounted to nearly 130 members in 1992. Toward the 1980s certain developed research fields in the Observatory had been

formed as corresponding departments: astrometry, comet and meteor research, physical variable stars, spectrophotometric and photometric research on stars, eclipsing and cataclysmic binaries, artificial Earth's satellites and applied, but very important departments of telescope construction and the designing and manufacturing of astronomical equipment.

Prof. V.P. Tsessevich, who headed the Observatory for 44 years, died in 1983. Prof. Valentin G. Karetnikov was elected Director.

In 1991 the USSR was destroyed. Ukraine became an independent state. Following events as an avalanche swamped the country. In the frame of this article it is possible to note only two of the most essential moments of the process. On one side, the integration of the former Soviet science with world science. On the other side, steady and significant cuts of the financial support of many institutions, Odessa Observatory among them. Both these tendencies stimulated the scientific and "author's" activity of the research. The number of published papers was sharply increased. The necessity to have our own publication was urgent for the Observatory. The Editorial Board with Editor-in-Chief Prof. V.G. Karetnikov decided to bring out the "Publications" in English, so that the journal could be read in any country of the world.

Vol. 6 was a sign of continuity and tribute to traditions of the former Soviet science to a certain extent. Papers on astrometry, comet and meteor research were presented as a tradition. Most profound and serious works were done in the director's research field, the eclipsing binary systems. Although plenty of scientific researchers have been engaged in variable stars' observations, there were no articles on variable star observations using our own instrumentation. But a number of papers are based on the observations obtained at the 6 m telescope of SAO (Special Astrophysical Observatory, Russian Academy of Sciences). Such high quality observational material, reduced by modern methods, pushed the development of a new trend of research, chemical composition in the atmospheres of stars. These papers, written with the participation of the scientists of leading observatories of the Soviet Union and discussed at the large-scale scientific conferences, had an advanced and modern level. It should be noted that traditions of inter-observatories' cooperation prove to be very fruitful for the improvement of the research level in Odessa Observatory.

Separately, vol. 8 included "The spectrophotometric star catalogue" (Komarov et al. 1995). The catalogue comprises data on the energy distribution in spectra of 555 stars of different spectral types and luminosity classes. Results are used from stellar spectrophotometry obtained in astronomical observatories of Moscow, Alma-Ata, the Crimea, St.-Petersburg, Odessa throughout the last 25 years.

The rest of the volumes of "Publications" contained the proceedings of various conferences, which were organized almost each "mellow season" (that is early September) in Odessa, in spite of financial and other technical difficulties. The meetings in Odessa, a well-known seaport and "a capital of humor", usually were well-arranged, varied and lively. Vol. 7 was dedicated to the conference "Modern problems of astrophysics" which was held in 1993, vol. 9 - to the conference "125th Anniversary of Odessa Astronomical Observatory" (1996), and vol. 10 - (in prep.) to the conferences devoted to the 90th Anniversary of Prof. V.P. Tsessevich (1997).

In the Foreword to vol. 7 Prof. V. G. Karetnikov (1994) noted: "153 scientists from 6 countries of the Commonwealth of Independent States as well as astronomers from Canada, Estonia, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland, Slovakia, UK, USA contributed to the conference. ...15 review research reports and 109 section informations were carried out." At present the leading direction is the investigation of close binary systems. For the study of physical variable stars the widest range of variability was considered: from rapid photometry of flare activity of Wolf-Rayet stars, 1 sec., to periodogram analysis of red variables showing the periodicities to 10000 days. The investigations of chemical composition and evolution of stars of all spectral types and luminosity classes advance extremely quickly.

New branches of the science are displayed in "Publications": mathematical methods of analysis of astronomical data, cosmology and extragalactic objects, history of astronomy.

The exceedingly high activity of scientific researchers of the Observatory is remarkable. Some researchers have published 2, 3 or 4 papers each, covering different areas of science. A great contribution was made by the invited leading astronomers A.M. Cherepashchuk, R.E. Gershberg, I. Pustilnik and others.

"Publications" have gotten their "own face" thanks to a high professionalism and extremely high capacity for work of I.L. Andronov and L.L. Chinarova, the responsible for the latest issues. A large and selfless work was done by I.V. Gabestro, who translated or corrected a significant part of the articles in English.

In this way "Odessa Astronomical Publications" became actually an international collection with the latest, varied and fascinating papers. And hospitable Odessa is again waiting for guests who will bring the best presents, products of their intellectual creative work.

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