Astronomy in Serbia

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Abstract

A review of professional and amateur astronomy in Serbia is given.

1 Belgrade Astronomical Observatory

The principal astronomical institution in Serbia is the Belgrade Astronomical Observatory, one of the oldest scientific organizations and the only autonomous astronomical institute in Yugoslavia. Its past development forms an important part of the history of science and culture in these regions. The decree of its founding conjointly with the Meteorological Observatory was signed on 20 March (7 April) 1887 by the Minister of Education and Church Affaires of Kingdom of Serbia Milan Kujundžić on the initiative of Milan Nedeljković (Belgrade 27. Sept. 1857 - Belgrade 27 Dec. 1950), a professor of the Grand School (Belgrade University). Nedeljković was appointed first director of the newly founded Observatory.

On 1 May 1871 Nedeljković started his activity at the provisory Observatory in the rented Geizler family's house. Here the Observatory was operating until 1 May 1891, when it was moved into its own building constructed meanwhile - the one in which at present is Meteorological Observatory in the Karadjordje Park. In the minor museum section of this building there is, since the celebration of the Observatory's centenary in 1987, a room dedicated to the origins of astronomical science in Yugoslavia.

Nedeljković was at the head of the Observatory from 26 March (7 April) 1887 until 30 January 1924. A break took place only between 5 July 1899 and 31 October 1900, when he was sent into retirement for political reasons, in connection with the Ivanjdan attempt on King Milan, which was exploited by King Alexander for settling accounts with his political opponents. Nedeljković's place was filled during this period by Djordje Stanojević (Negotin, 7 April 1858 - Paris 24 Dec. 1921), the first Serbian astrophysicist, later on the rector of Belgrade University. Dj. Stanojević was a great popularizer of astronomy and science in general; he was the driving force in the introduction of electrical light in Belgrade, Užice, Čačak, Leskovac... He was the builder of the first hydroelectric power station in Serbia, a pioneer of industry of refrigerating appliances, the initiator of setting up a committee for cooling problems and of forming an international organization for cooling technique in Paris in 1903. He was also the pioneer of the color photography in Serbia.

Apart from its importance for astronomy and meteorology, the newly built Observatory, headed by Nedeljković, was a cradle of the seismic and geomagnetic researches in Serbia. Nedeljković borrowed the instruments for geomagnetic measurements from Tege Miklosh Konkoly, the founder of the Budapest Astronomical Observatory, and took care of building an earth-magnetism pavilion. Thanks to Konkoly, Nedeljković acquired in 1903 also a seismograph, installed next year in a special pavilion. The observations were carried out regularly and for these purposes the construction of what at present is the Seismological Institute was executed in 1906. This activity was taken over by Nedeljković's assistant Jelenko Mihailović (Vrbica, 11 Jan. 1869 - Belgrade 10 Oct. 1958) who worked at the Observatory since 1896.

During the Austro-Hungarian occupation of Serbia in World War I, the Observatory was administered by Victor Konrad from Vienna. During their flight from Serbia the Austrians took away or destroyed all the instruments. However, thanks to his extraordinary and professional skill Nedeljković contrived to acquire in Germany after the war, on account of war reparations, a number of instruments appertaining equipment for the new Observatory.

The instruments procured by Nedeljković constitute still practically the only observing basis of the Observatory, although some of them were taken away by the Germans during the World War II, two were ceded to each Ljubljana and Zagreb Universities (Djurković 1968), some of the smaller ones being left unmounted.

Currently mounted in appropriate pavilions are the following instruments procured by Nedeljković:

1. Large Refractor - ZEISS 650/10550mm equatorial;
2. Solar spectrograph (monochromatic) LITTROW, 9000 mm/100.000 developed by adapting to the ZEISS 200/3020 mm equatorial two astro cameras TESSAR and PETZVAL 160/800 mm;
3. Large Transit Instrument ASKANIA 190/2578 mm;
4. Large Vertical Circle ASKANIA 190/2578 mm;
5. Astrograph ZEISS 160/800 mm;
6. Photovisual Refractor ZEISS 135/1000 mm and 125/1000 mm;
7. Transit Instrument BAMBERG 100/1000 mm;
8. Zenith-telescope ASKANIA 110/1287 mm;

Large Meridian Circle ASKANIA 190/2578 mm burnt up on 11th of May 1999 during NATO air attack.

As Nedeljković was struggling for the new Observatory at which the acquired instruments were to be mounted and regular astronomical observations started, he suddenly was sent into retirement on 30 Jan. 1924. By ruling of the Faculty Council the Observatory was divided into two separate institutions: Astronomical Observatory and Meteorological Observatory of Belgrade University.

At the head of the Astronomical Observatory was appointed in 1925 Vojislav V. Mišković (Fužine 18 Jan. 1892 - Belgrade 25 Nov. 1976), at the time already a well established astronomer engaged at Nice Observatory, France. He began his astronomical studies in Budapest and Göttingen before the World War I. On his demobilization at the end of 1918 from the Serbian Army, in which he served as a volunteer, he was sent to France to complete his studies. He graduated in 1919 and was appointed assistant at the Marseille Observatory. Since 1922 he was engaged as an astronomer at the Nice Observatory, receiving his doctor's degree in 1924 at the Montpellier University. In 1925 he won French Academy Prize for his studies in stellar statistics. In the period 1919-1925 he published a score of papers in the French scientific journals, treating the observation of the minor planets and comets and the determination of their orbits. He came to Belgrade in 1926 taking, in addition to the Astronomical Observatory, charge of the newly established Chair of Theoretical and Practical Astronomy at the Faculty of Philosophy, whereat he was elected associated professor. In 1929 he was elected corresponding member of the Serbian Royal Academy and in 1939 its full member. He directed the Observatory's activity to a considerable degree toward mathematical and numerical works, which yielded valuable results. Of importance are numerical works connected with the Mathematical Climatology of M. Milanković as well as with Mišković's own Precession Tables.

In 1929 Mišković succeeded in getting funds for the constructions of a new, modern, observatory, at 6 km distance southeast from the city's centre, occupying a 4.5 ha area at 253 m high hill Veliki Vračar, named since, along with the entire surrounding part of Belgrade, Zvezdara (=concerned with stars).

Exceptional and highly valued complex constituting the Astronomical Observatory was drawn up by Jan Dubovi, a member of GAMP (Group of Modern Outlook Architects) founded in 1928. It is thanks to this very achievement that Dubovi was conferred a doctor of science degree in Prague. The construction works were carried out in 1930 to 1932, the instruments being mounted during the following two years.

Mišković started also publishing the scientific periodical Mémoires de l'Obs. Astr. Belgrade (issued five volumes for: 1932, 1933, 1936, 1938 and 1949), Annuaire de l'Obs. Astr. Belgrade (six volumes for 1929 through 1934) containing sidereal time, short-period nutation terms, the mean and apparent places of 189 stars, newly discovered minor planets and directions for use. Nautički godišnjak (Nautical Almanac) for years 1934 through 1941) for navigation purposes in the Navy and Godišnjak Našeg Neba (Almanac of our Sky) an astronomical calendar in Serbian, issued in the years 1930 to 1941 and 1948 to 1952 (the 1948 issue was edited by F. Dominko and the issues for 1949, 1950 and 1951 by B. Popović.

In 1936 Mišković, assisted by Milorad Protić, organized the Minor Planets and Sun Observation Service. In the same year P. Djurković discovered at the Uccle Observatory, Belgium, a minor planet, subsequently named 1605 Milanković and M. Protić, at the Belgrade Observatory, discovered the minor planet 1564 Serbia, which marked the opening of a long series of 43 minor planets discovered by the Belgrade astronomers. Protić alone, in the period 1936-1956, made 33 discoveries. Of the 43 minor planets owing their discovery to Belgrade astronomers, 12 have obtained by the IAU permanent names, three of the discoveries having later been ascribed to other authors.

Besides Serbia, using his author's right, Protić gave the following names to the minor planets he discovered: 1507 Beograd, 1550 Tito, 1554 Yugoslavia, 1675 Simonida, 1724 Vladimir (after his grandson), 2244 Tesla and 2348 Mišković. P. Djurković discovered in the period 1936-1941, 5 minor planets, one of them - Zvezdara- named by him using his discover's prerogative. In 1980 Z. Knežević discovered on the photo-plates taken according to his instructions at Piszkesteto Observatory, Hungary, four minor planets, one of which having obtained the name 3276 Paolicchi, after one of his colleagues in Italy. In 1991, as a mark of honour, a minor planet was given the name 3900 Knežević - after our fellow. Another minor planet connected with the Belgrade Observatory is that named 1555 Dejan, after P. Djurković's son.

In 1936 Mišković started issuing Bulletin de l'Observatoire astronomique de Belgrade, a scientific periodical which from No. 145 for 1992 on appears under the name Bulletin astronomique de Belgrade, and from the number 157 for 1998 under the name Serbian astronomical Journal. This periodical's editors have been: V. V. Mišković (1936-1940, 1943 – 1948 and 1952-1956), M. Protić (1941-1942, 1955-1960 and 1971-1975), B. Popović (1950), V. Oskanjan (1964), P. Djurković (1964-1970), M. Mijatov (Nos. 127-131 in 1976-1981), D. Zulević (Nos. 132-133, in 1982-1983), Dj. Teleki (Nos. 134-136 in 1984-1986) and M. S. Dimitrijević (No. 137 in 1987 successively up to date).

Since July 1941 at the Observatory were quartered German military. The Wehrmacht brought along profs. Grotrian and Kippenheur from Potsdam, the two having inscribed the Observatory's instruments as German property, dispatching to Germany the spectroheliograph and the comet searcher. On the terraces of the Observaroty's edifice and on the water storage building pillboxes were erected for directing the flak, while the library was turned into officers mess. In the course of the liberation fightings in 1944 particularly heavy damages were inflicted on the main edifice, the water storage building and on "Large Refractor" pavilion. The Observatory's reconstruction was undertaken immediately after the war. Mišković remained its director until March 1946 when he submitted his resignation, accepted not before May 1948.

In 1945 P. Djurković started and edited the professional periodical Astonomska i Meteorološka Saopštenja (Astronomical and Meteorological Reports), published by the Observatory up to 1950 (seven issues in all). In 1947 Observatory started the series Publikacije Astronomske Opservatorije u Beogradu (Publications of Astronomical Observatory). Its editors in chief were: V. Oskanjan (No. 10), P. Djurković (Nos. 12-16), M. Protić (Nos. 17-19, 20-21) Dj. Teleki (Nos. 20, 26, 32, 34 and 35), M. Mijatov (Nos. 24, 25, 27-31), G. Popović (No. 33) and M. S. Dimitrijević (Nos. 36-69).

Up to 1 July the Observatory was, as it was before the war, under the Belgrade University. From that date on, up to 18 Dec. 1950. it is under the jurisdiction of the Serbian Academy of Sciences and thereafter, under the Committee for Scientific Institutions, University and Schools for Higher Education of SR Serbia. This status was kept until 27 March 1954, when the Observatory became institution with independent financing at the Executive Council of SR Serbia. On 9 Aug. 1985 the Observatory obtained the status of autonomous scientific research institute with the Executive Council of the Assembly of SR

Serbia as its founder, its name changed into Astronomical Observatory - Institute for Astronomical Researches. At the time it was financed by the Republic Community of Sciences of SR Serbia. After Community's dissolution it is being financed by the Republic Fund for Science of Serbia through the scientific project "Physics and Motion of Celestial Bodies and Artificial Earth's Satellites" (1985-1990). Leading the Project were: Dj. Teleki (1985-1987), A. Kubičela (1987-1989) and M. Dimitrijević (1990). In the period 1991-1995 the Project is named "Physics and Motion of Celestial Bodies" and was led by M. Dimitrijević (1991-1993) and Z. Knežević (1993-1996). For the period 1996-2000 the project is named "Astronomical, Astrodynamical and Astrophysical Researches", being led by Z. Knežević. The Time and Latitude Services are financed directly from the budget of SR Serbia. On 12 May 1992 the Observatory became a scientific institute financed through the mentioned scientific project at the Republic Ministry for Science and Technology, its founder being the Government of Republic Serbia. On 20 Dec. 1994 the Observatory was re-registrated as a scientific institute, resuming its old name.

When in May 1948 V. Mišković's resignation was accepted, to the post of Observatory's director was appointed academician Milutin Milanković (Dalj 28 May 1879 - Belgrade 12 Dec. 1958) who went down in history of science by his having explained the ice ages phenomenon through the slow changes in the Earth's insolation in consequence of the Earth's axis inclination and its motion around Sun, undergoing changes produced by various influences. Milanković elucidated also the history of the climate of Earth and other planets, being the originator of the mathematical theory of the Earth's poles motion. The Observatory's direction was entrusted to the Observatory's Council, at the head of which was the director and Council's president M. Milanković, with members Anton Bilimović, V. Mišković and Pavle Savić (Popović 1951). Milanković held this post till 26 June 1951.

In 1951 P. Djurković organized the Double Star Service. Within this Service, subsequently named Group, were discovered over 200 new double and multiple stars, the bulk of the which is due to Georgije Popović, working in this Group since 1960, being at its head since 1976.

In this same year the Variable Stars Service was organized by Vasilije Oskanjan. In this he was joined by Alexander Kubičela and Jelisaveta Arsenijević (at the Obsevatory since 1956) whereby an impetuous development of the astrophysical researches took place later directed toward stellar and solar physics and astronomical spectroscopy. Initially it was the photometry of eruptive stars which was pursued. Since 1959, after Oskanjan's return from his specialization in the Soviet Union, it was the work in the field of polarimetry of eruptive stars that was taken up. Formally, the Astrophysical Group was founded in 1960. In 1969 and 1970 working in the Group was Trajče Angelov. In 1972 the Group was joined by Ištvan Vince, in 1980 by Gojko Djurašević, in 1983 by Slobodan Jankov, in 1984 by Milan Dimitrijević, in 1985 - 1996 by Vladimir Kršljanin, in 1989-1996 by Olga Atanacković-Vukmanović (at the Observatory since 1982 first in the Absolute Declinations Group), in 1991 by Sanja Erkapić and Snežana Marković, in 1992 by Luka Popović, in 1994 by Darko Jevremović and in 1995 by Silvana Nikolic. Since 15 February 1997 the Group was joined by Milan Ćirković, since 1st January of 1998 by Dragana Tankosić and Nataša Trajković (since 14 November 1998 Nataša Stanić), since 15 April 1998 up to 1 November 1999 by Desanka Šulić, since 1 January 1999 by Edi Bon, since 20 January 1999 by Nenad Milovanović and since 1 December 1999 by Oliver Vince.

From 26 June 1951 to March 1954 the Observatory's director is again V. Mišković. After he went into retirement the Observatory was headed by M. Protić in the capacity of deputy director and from 21 Nov. 1956 to 21 Nov. 1960 as a director.

After M. Protić at the head of the Observatory was Vasilije Oskanjan, first as acting director since 1960, then in 1964-1965 as the director. Following him, from July 1965 to 1970, the director was Pero Djurković. After him in the period 1971-1975 at the head of Observatory is again M. Protić. Since 1975, first as acting director and from 13 July 1977 to Sept 1981 as the director was M. Mijatov (Belgrade 3 July 1933 - Belgrade 19 Nov 1996). The director's post from 1982 to 1989 was held by Miodrag Mitrović, in 1990-1993 by Ištvan Vince and from 21 Nov 1994 on, by Milan Dimitrijević.

In 1986, on the part of the Assembly of SR Serbia and Republic Executive Council, the project was adopted and funds allocated for the building of an astrophysical observing station at Rgaj mountain near Prokuplje. Due to the investments in the Republic having meanwhile been suspended, the project has not been realized yet.

In 1987, in the presence of a number of statesmen and eminent guests from the country and abroad, the centenary of the Observatory's founding was solemnly celebrated in the hall of the Assembly of Serbia. On the occasion of this jubilee three international and one Yugoslav scientific conferences were held: IAU Colloquium 100 "Fundamental Astrometry" (8-11 Nov. - Chairman SOC H. Eichorn, Gainsville, USA), International Symposium on Astronomical Refraction in memory of Dj. Teleki, former President of IAU Working Group on Astronomical Refraction (3-4 Nov., Chairman SOC V. Milovanović), Second International Symposium on Catastrophic Collisions of the Small Sollar System Bodies (8-11 Nov., Chairman SOC V. Zappala, Italy) and Second Workshop "Astrophysics in Yugoslavia" (8-10 Nov Chairman SOC M. Dimitrijević). During these festivities a minor museum was opened in the old Observatory's building in Karadjordje Park, one of its rooms being dedicated to the development of the Astronomical Observatory.

In 1994 there took place a reorganization of the Observatory's inner structure, resulting in the establishment of : Department of Astrophysics, Department of Dynamical Astronomy and Department of Astrometry. Since 15 February 1997, Department of Astrometry was joined by Nataša Popović and since 20 May 1998 by Predrag Jovanović (working since 1 January 1996 in Time keeping and geographic coordinates determination service).

In 1995 the Observatory participated in the organization of the International Russian - Yugoslav Conference "Newcomb and Fundamental Astrometry" in St. Petersburg, of the First Hungarian-Yugoslav Conference in Baja and the First Romanian-Yugoslav Round Table on collaboration in astronomy in Temishoara; it organized the First Yugoslav Conference on Spectral Line Shapes in Krivaja.

In 1996 the Observatory organized the Second Yugoslav-Romanian Round Table on collaboration in astronomy in Belgrade and the Astrophysics Section at the 18th Summer School and International Symposium on the Physics and Ionized Gases in Kotor. The Observatory participated in the organization of the First Belaruss-Yugoslav Conference on Physics and Dynamics of Laboratory and Astrophysical Plasma in Minsk. The Observatory's fellows presented their results at 13 international and 6 national conferences. They published 129 bibliographic items of which 16 in the international leading journals. It published 4 volumes of Publ. Astron. Obs. Belgrade and 2 Nos. of its periodical Bull. Aston. Belgrade.

In 1997 the Observatory organized in the framework of celebration of its 110th anniversary the scientific conference "Development of Astronomy among Serbs". It took part also in the organization of the Third Romanian-Yugoslav Round Table on Cooperation in Astronomy in Kluj-Napoca, as well as in the Second Yugoslav Conference on Spectral Line Shapes in Bela Crkva. It fellows presented their results at 13 international and 4 national conferences. They published 152 bibliographic items, 11 of which in international journals of the highest standing.

During 1998, 154 bibliographic items have been published, with 19 among them in international scientific journals of the highest standing. Five invited lectures and progress reports have been given by fellows of Observatory at international conferences and one at national one. Four reviews and monographic texts in national publications have been published. Observatory's fellows have participated in works of 16 Scientific conferences abroad (28 participations by 19 fellows) and six conferences in Yugoslavia (61 participation by 28 fellows). Organized by the Observatory were IV Yugoslav - Romanian Astronomical Meeting, Belgrade, 5-8.05.1998; I Bulgarian - Serbian Astronomical Seminar, Belogradchik, 6-7.08 1998 and II Yugoslav - Belarussian Symposium on Physics and Diagnostics of Laboratory and Astrophysical Plasmas, Zlatibor, 5-6.09.1998. It issued four publications of the series Publ. Astron. Obs. Belgrade and two Nos. of its periodical Bull. Astron. Belgrade. As from 1998 Astronomical Observatory has an internet connection available from each personal computer on Observatory with Windows 95 installed.

During 1999, in spite of NATO air attacks on Yugoslavia and the destruction of the Big meridian circle, 112 bibliographic items have been published, 23 among them in international scientific journals of the highest standing. Six invited lectures have been given by Observatory's fellows at international conferences and five at national ones. Moreover, two Ph. D and one M. Sc Thesis have been published. Numbers 159 and 160 of the Observatory's publication Serbian Astronomical Journal, as well as Nos. 63, 64, 65 and 66 of the Publications of the Astronomical Observatory of Belgrade have been issued. These publications are regularly sent to 136 institutions and libraries in 45 countries and to 15 institutions and libraries within Yugoslavia. Observatory's fellows have participated in works of 8 scientific conferences abroad (9 participations by 6 fellows) and three conferences in Yugoslavia (35 participation by 22 fellows).

During 1999, Belgrade observatory organized or took part in the organization of the following conferences: III Yugoslav Conference on Spectral Line Shapes, Brankovac (Fruška gora), 4-6.10.1999; XII National Conference of Yugoslav Astronomers and International Workshop on the Development of Astronomical Databases, Belgrade, 19-21.11. 1999 and Symposium Milanković - juče, danas, sutra (Symposium Milanković - yesterday, today, tomorrow), Belgrade, 25-26.11. 1999.

Besides numerous newspaper articles and radio and TV emissions Observatory's fellows authored, explaining particularly the 11th August 1999 total Solar eclipse, they gave 48 lectures on astronomical subjects outside our institution contributing to the cultural life in our country. Moreover 4 lectures have been given at the Astronomical Observatory itself.

I note as well that Serbian Astronomical Journal is available on www through the Astrophysical Data System (ADS), thanks to the courtesy of the System's holders. The www address is: http://adswww.harvard.edu.BOBeo. During 1999, the web site of the Belgrade astronomical observatory has been made and the corresponding www address is: http://www.aob.bg.ac.yu. Moreover the database BELDATA has started to develop and it is available through internet with the address: http://www.aob.bg.ac.yu/BELDATA.

Currently there are 40 employees at the Observatory 32 of them are astronomers.

In the course of its history the Belgrade Astronomical Observatory grew to an institution of great importance in the history of science and culture of the Serbian people, not only in the field of astronomy but also in meteorology, seismology and geomagnetics. Linked to this institution are the names of the famous personalities in the history of science who contributed to the Observatory, and the scientific achievements of Serbian astronomers in general, having earned esteem in the international scientific community as well as to the young having a good perspective, in our country too, in engaging in this beautiful and challenging science, in an ambience enabling them to achieve results of the highest value.

2 University teaching of astronomy in Serbia after the Second world war

Beside Astronomical Observatory, there is in Belgrade also the Chair of Astronomy at the Faculty of Mathematics. As the Faculty of Sciences separated from the Philosophical Faculty in 1947, the Chair of Celestial Mechanics and Astronomy was formed, having shortly thereafter changed its name into Chair of Mechanics and Astronomy. The splitting up of this Chair into the Chair of Mechanics and the Chair of Astronomy began in 1960, being completed in 1962. The reorganization of the Faculty of Sciences in 1971 entailed the Chair of Astronomy becoming the Institute of Astronomy. In 1995 there took place the division of the Faculty of Sciences into several faculties. As the Faculty of Mathematics there remained the Chair of Astronomy which re-took, in the new organization, its old name.

In 1961 two study groups were formed - one for Astronomy, the other for

Astrophysics. Currently, there are at the Chair of Astronomy 12 full time astronomers and one engaged at one third-time basis, teaching fifteen subjects. The names of the Chair's fellows, the subjects they are lecturing on, as well as their electronic addresses are given in Appendix.

Beside Belgrade, Astronomy is taught at University in Novi Sad, Niš and Kragujevac. At the Faculty of Sciences of the Novi Sad University there is, since 1986, in 8th semester, the subject "Astrophysics and Astronomy", involving twice a week lectures and twice a week exercises. The subject is obligatory for students wishing to teach Physics in the secondary schools while being optional for students of Applied Physics.

At the Faculty of Philosophy of the Niš University in the study group for Physics, within the specialized training in General Physics, since the school year 1990/91 until 1993/94 there was taught twice a week in the 7th and 8th semesters, the subject Fundamentals of Astrophysics. The subject was thereafter dropped for two years from the curriculum, to be again taught within the 7th semester twice a week. In addition, there is in the study group for chemistry a Chair for Geo- and Cosmochemistry, occupying itself with the study of meteors and meteorites.

At the Faculty of Sciences of the Kragujevac University there has been introduced in the school year 1998/99 the subject Astrophysics and Astronomy in the 6th semester of the specialized training of the Group for Physics, with twice a week teaching and twice a week exercises.

3 Amateur astronomical societies

In addition to professional Astronomy, well developed in Serbia is also the amateur Astronomy. The largest and the oldest organization of amateur-astronomers is the Astronomical Society "Rudjer Bošković" in Belgrade (Kalemegdan, Gornji Grad 16, 11000 Belgrade), which in the course of 65 years of its existence was spreading astronomical knowledge in our country. The founding meeting was held on 22 April 1934. The first Society's President was Djordje Nikolić (1934-1936) and the second Vojin Djuričić (1936-1941), the governor of the State Mortgage Bank.

After the War, on 9 December 1951 was held the founding meeting of the Belgrade Astronomical Club "Rudjer Bošković" (as component part of the Association of students of the Natural-Mathematical Faculty (PMF)), Dr Radovan Danić being elect its President. Considering that already in 1952 there were in the Club 64 members, the majority of whom were not associated with the PMF, the Club Administrative Committee took decision on 23 March 1952, the Club to be re-registered into Astronomical Society "Rudjer Bošković". The founding meeting of the Society was held on 18 May 1952, Radovan Danić having been elected its President (1952-1966). Following him the Society' Presidents have been: Branislav Ševarlić (1966-1970), Pero Djurković (1970-1972), Nenad Janković (1972-1974), Božidar Popović (1974-1979), Zoran Knežević (1979-1982) and Milan S. Dimitrijević (1982-).

In 1953 the Society, jointly with the Aeronautical Association of Yugoslavia, started publishing the periodical for astronomy and aeronautics (currently for astronomy) "Vasiona" (Universe). The periodical's editors in chief were: Nenad Dj. Janković (1953-1972), Pero Djurković (1973-1974), Jelena Milogradov-Turin (1975-1982), Branislav Ševarlić (1983-1984) and Milan S. Dimitrijević (1985-).

Thanks to the exertion of Pero Djurković and Radovan Danić with the authorities concerned, the Society obtained for itself the permises? in the Despot Tower at Kalemegdan where, on 20 December 1964 was solemnly opened the People's Observatory, whose regular activity started in June 1965. The Society managed also to procure a Zeiss planetarium, which was installed in an old spacious steam bath-house - Turkish Hamam - in the Kalemegdan Donji Grad. The Planetarium started operating in 1969, being formally opened on 17 February 1970.

The founding meeting of the Astronomical Society "Novi Sad", ADNOS (Jaroslav Francisti, Astronomska Opservatorija, Petrovaradinska tvrdjava, 21000 Novi Sad), took place on 4 March 1974. In 1976 the Society bought telescopes 20T Observatory 108/1600 mm and 10K 80/1200 mm and 14T 60/900 mm, of the American firm TASCO, and in 1991 purchased the reflector type telescopes Meade 200/1500 mm and 102/1000 mm. In 1989 the adaptation of the Astronomical Observatory at the Petrovaradin Fortress was completed while in 1996 the premises for the planetarium were secured and its adaptation is now finished. The Society's President in the period 1974-1980 was Živojin Ćulum, in the period 1980-1984 Božidar Jovanović, 1984-1998 Djura Paunić, from 1998 - up to 1 September 2000 Svetislav Krstić, and from 1 September 2000 the President is Dragoslav Petrović.

At Petnica near Valjevo the organization of the Young Researchers of Serbia is building the House of Young Researchers. This institution, initially of a recreative character, became the Research Station Petnica (Istraživačka stanica Petnica, Petnica, 14000 Valjevo). The first programmes were carried out in 1982, the first seminar in Astronomy in 1983 in preparation for going out for Rgaj Mountain, where astroclimatic explorations were conducted. In 1968 was obtained a Celestron telescope of Schmidt-Cassegrain type, objective diameter 20 cm. Later on were purchased Celestron, opening 102 cm, as well as a reflector of 33 cm opening, manufactured by Aljoša Jovanović. The heads of the seminar were Darko Jevremović, Silvana Nikolić, Samir Salim and Nikola Božinović, the duty being currently discharged by Oliver Vince.

In Valjevo, within the framework of the Society of researchers "Vladimir Mandić - Manda", founded on 16 February 1969, there is active also the Astronomical Group founded in 1972 (Nikola Božić, Birčaninova 68, p. fah 118, 14000 Valjevo).

In Kragujevac, on the roof of the Institute of Physics of the Faculty of Sciences, there is the Belerofont Observatory (Vukota Babović, Institut za fiziku PMF, Sestre Janjić 4, Kragujevac), opened on 20 February 1986. It disposes of a telescope Meniscus Cassegrain Spiegel 130/2250 mm.

In Niš, at the close of the sixties and the start of the seventies, there was operating a branch of the Astronomical Society "Rudjer Bošković, while at the Faculty of Philosophy there existed in the period 1876-1980 the "Astro-

Geophysical Society". In the year 1996 there was founded Astronomical Society "Alpha" (Dragan Ž. Gajić, Filozofski fakultet, Studijska grupa za Fiziku, p. fah 91, 18001 Niš). The first Society's President was Zoran Sekulić, while from March 1997 on, the President is Dragan Ž. Gajić.

In 1996 Zrenjanin too got an organization of amateur astronomers, Astronomical Society "Milutin Milanković" (Miša Bradić, Zrenjaninska gimnazija, Gimnazijska 2, 23000 Zrenjanin).

The amateur astronomers societies greatly contributed to the spreading of astronomical knowledge in our midst and to keeping step with the latest astronomical achievements and discoveries, the creating a more suitable climate for the development of Astronomy in Serbia.

References

[1] Babović Vukota: 1997, Multidisciplinarnost u razvoju Belerofonta, u Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 95.

[2] Dimitrijević Milan S.: 1996, Beogradska Astronomska opservatorija u 1995, Belgrade Astronomical observatory in 1995, Publ. Obs. Astron. Belgrade, **52**.

[3] Dimitrijević Milan S.: 1997, 110 godina Astronomske opservatorije, u: Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 9.

[4] Dimitrijević Milan S.: 1997, Beogradska Astronomska opservatorija u 1996, Belgrade Astronomical observatory in 1996, Publ. Astron. Obs. Belgrade, **55**.

[5] Dimitrijević Milan S.: 1998, Beogradska Astronomska opservatorija u 1997, Belgrade Astronomical observatory in 1997, Publ. Astron. Obs. Belgrade, **59**.

[6] Dimitrijević Milan S.: 1998, Belgrade Astronomical observatory, Proc. 4th Yugoslav-Romanian Astronomical Meeting, eds. M. S. Dimitrijević, L. Č. Popović, Publ. Astron. Obs. Belgrade, **60**, 162.

[7] Dimitrijević Milan S.: 1999, Beogradska Astronomska opservatorija u 1998, Belgrade Astronomical observatory in 1998, Publ. Astron. Obs. Belgrade, **63**.

[8] Dimitrijević Milan S.: 1998, Astronomija u Srbiji, Proc. I Bulgarian - Yugoslav Astronomical Meeting, eds. M. S. Dimitrijević, L. Č. Popović, M. Tsvetkov, Publ. Astron. Obs. Belgrade, **64**, 19.

[9] Djokić Milorad: 1989, Arhivska gradja o Opservatoriji Velike škole i Univerziteta u Beogradu u vremenu od 1887. do 1924. godine, u: Sto godina Astronomske opservatorije u Beogradu, Publ. Obs. Astron. Belgrade, **36**, 177.

[10] Djurković Pero: 1968, Sedamdeset pet godina rada Astronomske opservatorije u Beogradu, Publ. Obs. Astron. Belgrade, **12**, 15.

[11] Djurković P.: 1969, Rapport sur l'activité de l'Observatoire Astronomique de Belgrade de 1966 á 1969, Bull. Obs. Astron. Belgrade **XXII**, No 2, 143.

[12] Djurković P.: 1970, Rapport sur l'activité de l'Observatoire Astronomique de Belgrade en 1970, Bull. Obs. Astron. Belgrade **124**, 195.

[13] Francisti Jaroslav: 1997, Astronomsko društvo "Novi sad" - ADNOS, u Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 91.

[14] Gajić Dragan Ž.: 1997, Astronomija i astrofizika na Univerzitetu u Nišu, u: Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 109.

[15] Janković, Nenad Dj.: 1984, Zapisi i sećanja na Astronomsko društvo, Publ. Astron. Društva "Rudjer Bošković", No. 3.

[16] Janković Dj. Nenad: 1989, Milan Nedeljković, profesor Velike škole i osnivač njene Opservatorije, u: Sto godina Astronomske opservatorije u Beogradu, Publ. Obs. Astron. Belgrade, **36**, 107.

[17] Jeličić, Milan: 1984, Pedest godina Astronomskog društva "Rudjer Bošković", Vasiona, XXXII, No 1, 1.

[18] Michkovitch V.V.: 1930, Rapport annuel sur l'état et les travaux de l'Observatoire Astronomique de Belgrade pour l'année 1929, Annuaire pour l'an 1930, 125.

[19] Michkovitch V.V.: 1931, Rapport annuel sur l'état et les travaux de l'Observatoire Astronomique de Belgrade pour l'année 1930, Annuaire pour l'an 1931, 133.

[20] Michkovitch V.V.: 1932, Rapport annuel pour l'année 1931 sur l'état et les travaux de l'Observatoire Astronomique de l'Université de Belgrade, Mémoires I, 38.

[21] Michkovitch V.V.: 1941, Services et travaux d'observations en 1939 á l'Observatoire Astronomique de l'Université de Belgrade, Bull. Obs. Astron. Belgrade **V**, No 1-2, 1.

[22] Michkovitch V.V.: 1950, Services et travaux d'observations en 1940 á l'Observatoire Astronomique de l'Université de Belgrade, Bull. Obs. Astron. Belgrade **VI**, No 1-2, 1.

[23] Michkovitch V.V.: 1952, Rapport annuel présenté à l'Academie des sciences Serbe, sur l'état et l'activité de l'Observatoire en 1951, Bull. Obs. Astron. Belgrade **XVI**, No 1-4, 1.

[24] Milogradov - Turin J.: 1996, Astronomy education in FR Yugoslavia 1993 - 1996, Publ. Astron. Obs. Belgrade, **54**, 165.

[25] Milogradov - Turin J.: 1997, Jedan prilog istoriji Katedre za astronomiju Univerziteta u Beogradu, u Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 65.

[26] Milogradov - Turin, J.: 1998, Chair of Astronomy of the University of Belgrade, Proc. 4th Yugoslav-Romanian Astronomical Meeting, eds. M. S. Dimitrijević, L. Č. Popović, Publ. Astron. Obs. Belgrade, **60**, 193.

[27] Milogradov - Turin, J.: 1999, Astronomy Education in FR Yugoslavia 1996 - 1999, Proc. XII Nat. Conf. Yug. Astronomers and Int. Workshop on the Development of Astronomical Databases, eds. L. Č. Popović, M. Dačić, Publ. Astron. Obs. Belgrade, **65**, 185.

[28] Naumovski Krste, Bradić Miša: 1997, Astronomsko društvo u Zrenjaninu, u: Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 115.

[29] Nedeljković Milan: 1904, Izveštaj Opservatorije Velike škole i njenih meteoroloških stacija, 1899-1903, Državna štamparija, Beograd.

[30] Nedeljković Milan: 1905, Izveštaj Opservatorije i Meteoroloških stacija, 1904, Državna štamparija, Beograd.

[31] Nedeljković Milan: 1907, Izveštaj Opservatorije i Meteoroloških stacija, 1905-1906, Štamparija Davidović, Beograd.

[32] Nedeljković Milan: 1908, Izveštaj Opservatorije i Meteoroloških stacija, 1907, Državna štamparija, Beograd.

[33] Nedeljković Milan: 1909, Izveštaj Opservatorije i Meteoroloških stacija, 1908-1909, Državna štamparija, Beograd.

[34] Nedeljković Milan: 1910, Izveštaj Opservatorije i Meteoroloških stacija, 1910, Državna štamparija, Beograd.

[35] Nedeljković Milan: 1914, Izveštaj Opservatorije i Meteoroloških stacija, 1911-1912, Merkur, Beograd.

[36] Nedeljković Milan: 1923, Izveštaj Opservatorije, za 1919-1920, 1922 i 1923, Beogradska opservatorija, Beograd.

[37] Nedeljković Milan: 1925, Izveštaj Opservatorije, za 1924, Beogradska opservatorija, Beograd.

[38] Popović B.: 1950, Services et travaux d'observations en 1949 á l'Observatoire astronomique de l'Université de Belgrade, Bull. Obs. Astron. Belgrade **XIV- 1949**, VII.

[39] Popović B.: 1951, Rapport annuel sur l'état et l'activité de l'Observatoire astronomique de Belgrade en 1950, Bull. Obs. Astron. Belgrade **XV - 1950**, VII.

[40] Popović, L. Č.: 1997, Razvoj i aktivnosti Astronomskog društva "Rudjer Bošković", u Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 77.

[41] Popović, Luka Č.: 1999, Amaterska astronomija u Jugoslaviji, Proc. I Bulgarian - Yugoslav Astronomical Meeting, eds. M. S. Dimitrijević, L. Č. Popović, M. Tsvetkov, Publ. Astron. Obs. Belgrade, **64**, 89.

[42] Protić, M.: 1975, Izveštaj o radu Astronomske opservatorije u Beogradu tokom 1973. godine, Publ. Obs. Astron. Belgrade, **20**, 231.

[43] Protitch M.: 1950, Services et travaux d'observations en 1941 á l'Observatoire astronomique de l'Université de Belgrade, Bull. Obs. Astron. Belgrade **VII - 1942**, 1.

[44] Protitch M.: 1956, Rapport annuel sur l'état et les travaux de l'Observatoire en 1955, Bull. Obs. Astron. Belgrade **XX**, No 3-4, 16.

[45] Protitch M.: 1960, Rapport annuel sur l'état et les travaux de l'Observatoire en 1959, Bull. Obs. Astron. Belgrade **XXIV**, No 3-4, 42.

[46] Salim Samir: 1997, Astronomija u Istraživačkoj stanici Petnica, u: Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 101.

[47] Sekulić Miodrag: 1997, Astronomsko društvo "Alfa" - Niš, u: Razvoj astronomije kod Srba, eds. M. S. Dimitrijević, J. Milogradov-Turin, L.Č. Popović, Publ. Astron. Obs. Belgrade, **56**, 111.

[48] Simovljević Jovan: 1987, Astronomija, Četrdeset godina Prirodno - Matematičkog fakulteta u Beogradu, Beograd, 166.

[49] Stanojević M. Djordje: 1905b, Beogradska opservatorija i njen izveštaj za 1899 - 1903. god., str. 32, Beograd.