

## ACTIVITY OF THE ASTRONOMICAL OBSERVATORY „ČOLINA KAPA“ WITH SPECIAL REFERENCE TO THE SKY ATLAS MADE AT SARAJEVO

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As is probably known, the astronomical observatory „Čolina kapa“ that works as part of the Academical Astronomical Society of Sarajevo, is one of the youngest institutions of the kind in Yugoslavia. Its construction was begun in 1969 and the first phase was completed in 1973. In the first phase, two domes were built — one 10' and one 15' (3 and 4,5 m respectively). In the smaller dome a Cassegrain—Newtonian reflector is mounted. Its diameter is 210 mm. Focal lengths are 105 and 210 cm respectively. There are two astro-cameras attached to this telescope (lenses Taylor—Hobson—Cooke). In the bigger dome there is a Newtonian — reflector. Its diameter is 30 cm (12 inch) and its focal length is 2 m (Over six feet).

After the completion of the first phase, astronomical work proceeded even more intensely. It was being done even before the completion of phase one, as far as the atmospheric conditions permitted. It was this fact—that the astronomical work was not neglected while the building was in progress—that has helped to safeguard considerable consistency in the observatory's activity. It was the thread that has held together the Society and has made possible considerably more ambitious plans.

The observatory „Čolina kapa“ is situated pretty well. On the one hand there is a fairly close proximity of the home town (it is about 12 kilometres from it) and it is situated to the South—East from the city of Sarajevo where skies are clear. The altitude of the place is about 1000 m and there are no light sources nearer than a few kilometers and this ensures good observation conditions. The number of clear nights is not high. It is fairly accurate to say that there are between 100 and 150 clear nights a year (taking into account nights when the moon is visible).

In this short report only a general summing-up of the observatory's activity will be given. Last two years only will be mentioned. On the one hand, a lot of time was spent on rectification, making of the auxiliary instruments, adapters, balancing of the various components and the like. The observational work consisted mainly of two kinds of activity. The main effort was devoted to the making of the „Sara-

jevo Sky Atlas". That was understandable as it required a major scientific effort. More about this in the second part of the report.

Apart from this, various other observations were made. For example, some interesting objects were photographed and observed. The asteroid Eros and its movements were followed during the whole period of its being bright enough for observation with our instruments. Towards the end of 1974 and the beginning of 1975 about a dozen photographic records of the object were made. Some phenomena like eclipses were also recorded. Lately, there have been intense observation and photographing of the comet „Kobayashi—Berger—Milon“. These and other sporadic observations have played an important part in the development of the Society as it has had a completely independent development.

A working group has been realizing in the last few months a special programme (possibilities of employing the AGFACONTOUR film in stellar photometry in the conditions of amateur observatories or observatories with modest equipment). This work is still going on but the material so far gathered shows that there are very good possibilities for the use of this film — measuring of the photographic brightness of the stars can be done without any special equipment and the accuracy of the measurement can be as high as 1/10th magnitude (apparent). So it is relatively easy and quick to measure hundreds of stars on one plate with a degree of accuracy which permits more serious work.

As to the „Sarajevo Sky Atlas“ or „Sarajevo Sky Survey“, it is being worked on for the third year. With financial help from the Republic Association for Scientific Work of the Socialist Republic of Bosnia and Herzegovina, photographing of the whole of the Northern sky has been initiated. The work is being done with a double astrograph (two cameras 83/375 mm) and the plates are Kodak 103a-0 (blue — sensitive) and 103a-E (red sensitive). So far about 50% of the whole programme has been completed and the photographing has been going on for over 18 months. The size of the plates is  $9 \times 12$  cm and an area of the sky photographed with one plate is  $15 \times 20^\circ$ . As there is a coma, only an area  $10^\circ \times 10^\circ$  is used for the Atlas.

The shots overlap each other by 2 to 3 degrees, depending on the choice of the control star for guiding the instruments. Stars below ninth apparent magnitude cannot be used for this purpose so another has to be found nearby. The exposure times are 12 minutes each plate and the areas to be photographed are chosen so that they are as near the meridian as possible.

The material photographed and processed so far is of high quality and even at great magnification no defects due to guiding and control systems can be detected. 230 plates so far photographed are kept in special boxes made of plexiglass and each one is catalogued. Simultaneously with photographing, copying onto positive plates is being done. Part of this job has already been completed. It is planned that the Atlas will, upon completion, be printed as a set of negative photographs with markings for the most important stars, galactic and extragalactic objects. The observatory „Čolina kapa“ will be in possession of a rich collection of photographic plates which can be used for various purposes.

In parallel with the general astronomical work, the Academic Astronomical Society has taken over the care for the Centre of the Amateur Astronomers of Yugoslavia which already has over 600 members from all parts of Yugoslavia. This Centre takes care of advancing the amateur astronomy and helps those who are just beginning to take an interest in astronomy. Much has been done already. The AA Society publishes a magazine „Astroamater“. It has been published for

two years and a copy is issued every two months. The magazine publishes texts of interest to the amateurs.

The Society has been very active publishing books. It has so far published seven books — total of 9000 copies. As the publishing houses in Yugoslavia issue practically no books on astronomy, this activity of ours has helped develop a keen interest for astronomy, especially with the young. Such practice will be continued. What is especially interesting and shows this great interest for astronomy is the fact that practically all the books published so far have been sold out, so that the Society has a positive balance in this respect.

In the last few months members of the Society have been working on the most ambitious project so far — the building of yet another observatory. For a new dome, 8 m in diameter and 15 m height, foundations have already been laid. In this dome will be situated a new telescope whose diameter (main mirror) is 62 cm (24"). On one side there will be erected a staircase for each floor. Through the centre of the building there will be a pylon of 2 m in diameter and with the four floors much more working space will be obtained. Most of the work will, as previously, be done by the members of the Society themselves. As they have a lot of experience, no major problems are expected. Only the amount of effort will be greater and it is this that requires exceptionally hard work. Another problem is, of course, finances. For the first part — the erecting of the foundations and of the first floor, the Society has provided 50% of the finances from its own sources. These finances have been earned through the publishing activity and servicing of the third parties. The rest has been provided by rationalization of spending, and a part was allotted by various companies and some political organizations.

The new telescope was built in England in two years and the price is relatively low considering the high quality of the optics and the parts. Total expenditure for the 24" telescope was around 50.000 new dinars. It arrived in Yugoslavia in the middle of September 1975. Its Cassegrain focal length is 12 m and the Newtonian focus is 3 m. Its mounting is of „fork“, — type and one part of the fork has an additional focus — the Nasmyth. The optical quality is expected to be high as the mirrors were tested by Mr. Horace Dall, one of the leading English optical experts. According to Mr. Dall, the main mirror is *exceptionally good* (he underlined it) and the accuracy of the polishing is better than 1/20th wavelength. So, the new telescope will, upon commissioning, be used for various tasks.

The members of the Society are not forgetting training of newcomers so that they will be able to take an active part in the near future. But, really serious work of scientific value is not expected to start before the completion of the new dome, and that is planned for the end of 1978.

This paper has been read at the Congress of the Society of mathematicians, physicists and astronomers in Novi Sad, on 30th August 1975.