AMATEUR ASTRONOMY MOVEMENT IN SLOVAKIA

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ABSTRACT. We present brief history of astronomical education in Slovakia. The actual state of public observatories network is described as well. We also give an example of educational project supported by state agency "Slovak Research and Development Agency".

Key words: History of astronomy; Telescopes.

1. History

Popularization of astronomy has an old tradition in Slovakia. The first information has appeared in the l5th century and is bind with ACADEMIA-ISTROPOLITANA (1467). Two famous astronomers also worked there: JOHANNES MÜLLER-REGIOMONTANUS and MARTIN BYLICA. In the 16th century JAKUB PRIBICER, rector of CATINA school in Banská Bystrica wrote a very interesting publication about the comet TRACTATUS de COMETA qui sub anni and also CHRISTO 1577, which is the first book about the astronomy subject on the area of contemporary Slovakia.

In the 17th century, in 1661 the first astronomical observatory has been established in Slovak town Prešov, thanks to IZRAEL HIEBNER. In 1680 MARTIN SZENTIVÁNYI established the observing place in Trnava, which was reconstructed by plan of Slovak astronomer MAXIMILIÁN HELL in 1756 to astronomical observatory of TRNAVA university. The Observatory served for pedagogical and educational purposes. FRANTIŠEK KERY, ANTON REVICKÝ, ONDREJ JASLINSKÝ, JÁN BAPTISTA HORVÁTH, are representatives of heliocentrism lectured there.

In the 19th century together with the peoples movement for national renascence increases also the renascence of science and popularization of astronomy information. Astronomy observatory of The 1st Slovak Grammar school in Banská Bystrica also performed an important role, which had been established by VÁCLAV KAROL ZENGER and later JOZEF SZAKMÁRY continued in that work. In 1871 in Hurbanovo, dr. MIKULÁŠ KONKOLY THEGE established a new astronomical observatory in the end of the 19th century. At the beginning of the 20th century this observatory belonged to the most famous astro-physical observatories in the Central Europe. In addition to expert activity in the field of spectral analysis, photometry and photography, the important place in observatory activity has the popularization.

The period before the world war the first is connected with dr. MILAN RASTISLAV ŠTEFÁNIK and his astronomy activity. He is the first world famous Slovak astronomer. He worked in Paris observatory in MEUDONE, he was the director of mountain observatory on MONT BLANC and he made several expeditions for eclipses of sun. He was also a famous statesman, general of France army and the founder of the Czechoslovak state in 1918 together with another important statesmen.

Amateur astronomy movement was formed very slowly. Astronomical circles, unions, and astronomical societies helped it very much. The total result of these activities in the period between two world wars was the rise of the private observatory, which belonged to dr. ALEXANDER DUCHOŇ in PREŠOV (1932) and astronomical observatory in Bratislava (1936). Closely to the world war the second the private observatory of ANTONÍN BEČVÁŘ was also established in ŠTRBSKÉ PLESO (1937) and in SKALNATÉ PLESO the astronomical observatory was established in 1943.

Development of amateur astronomy after the world war the second on the Slovak territory we can divide into the two stages:
The 1-st: from 1945 to 1969 it is a stage of astronomical amateur institutions and social organizations network formation.
The 2-nd: 1969 up to these days it is a stage from the 1-st Slovak Conference regarded to amateur astronomy and the stage of constructing national observatories, astronomical cabinets and planetariums.

At the first stage activities of astronomical societies culminated by a developing of national observatories in Prešov (1948), in Humenné (1952), in Levice (1956), in Hlohovec (1958). In 1961 activity of observatory in Hurbanovo was renovated, and another observatories in Banská Bystrica, Žilina, Žiar nad Hronom, Rožňava and Bratislava were established.

In 1969-1970 Slovak Amateur Astronomy Central Office was founded in Hurbanovo and it started to coordinate a growth of astronomical amateur move-

ment. Simultaneous network of national observatories was connected with the Ministry of Culture of SR, which supported them. In 1970 Slovak Union of Amateur Astronomers as a social organization coordinated amateur astronomy was founded. Today it has 312 members in 24 local societies.

In the second stage new observatories were built in R. Sobota, Svidník, Michalovce, Kysuce, Trebišov, Partizánske.

Today there are in Slovakia 15 public observatories, 3 planetaries, 6 astronomical cabinets and various individual observers stations.

2. List of public observatories in Slovakia

Astronomical institutions dedicated to amateur astronomers in Slovakia we presents in three tables divided geographically. For comparison in Table 4 we presets scientific observatories of Slovak academy of Sciences and Comenius University.

3. Educational project Universe Live

Nice example of educational activity in Slovakia is our project Universe Live supported by the Slovak Research and Development Agency. Main goal of the project is to mediate the most modern astronomical research methods to talented students from secondary schools. We want to achieve this goal during 3 years of realization of the project. The main activity of the project is **Practical astronomical exercise**. It is weekend movement for twenty people, organized at Astronomical Observatory in Kolonica Saddle. It lasts from Friday evening to Sunday morning. Participants are chosen by the school coordinator. The program is organized by the project manager in cooperation with a responsible organizer. One lecturer attends the exercise and analyzes chosen topic its theoretical and practical aspects. During the project there will be implemented three series of practical astronomical exercises concentrated on variable stars, interplanetary matter and the occultations. Practical astronomical exercises are the foundation stone of the project. Groups of students are created here and these groups will participate in the next activities. Another activities are: Expeditions, Astronomical research fellowships, The KOLOS course, The KOLOFOTA course and Informational days at regional high schools.

Expected outcomes and results of the project:

Forty-two activities are going to be realized in the Astronomical Observatory in the Kolonica Saddle during the project (total participant number about 800).

About hundred and fifty students from the secondary schools are going to participate at least in one activity.

Directly during the project activities the participants will obtain observational data: photoelectric photometry (˜ 10000 integrations), CCD photometry (˜ 10000 measurements), meteors (˜ 5000 records), lunar occultations (˜ 10 timings).

During the project we are going to address about 1500 students (during twelve informational days)

We expect there will be at least three new regular amateur observers of variable stars who will produce at least 3000 photometric measurements during the project.

At least one of the participants will break into the national round of physics or mathematic olympiad and at least three into county rounds.

4. Conlcusions

We believe, structural changes in our society wouldn't break favorable conditions for the development of amateur astronomy in Slovakia. We hope, that a flow of information, exchange of experiences and knowledge will enrich our observatories. You can regard this walk throw the history of Slovak amateur astronomical movement like an invitation for visiting territory of Slovakia, where you can find beautiful nature, historical sightseeing, but also a lot of people connected by love with sky and stars.

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Table 1: Public observatories East Slovakia

Name	***Locality***	***Main instrument***	***Main scientific program (if any)***
Observatory and Planetarium	Prešov	Planetarium ZKP 2, 10 m, 68 seats	
Observatory	Roztoky	40 cm Cassegrain	Variable stars
Vihorlat Observatory	Humenné	25 cm Cassegrain	Sun
AO Kolonické sedlo	Kolonica	**100 cm VNT**	Variable stars
Observatory	Michalovce	20 cm Cassegrain	
STM	Košice	Planetarium ZKP 2, 8 m, 41 seats	
CVČ	Košice	Planetarium ZKP 2, 10 m, 78 seats	

Table 2: Public observatories Middle Slovakia

Name	***Locality***	***Main instrument***	***Main scientific program (if any)***
Observatory and Planetarium M. Hell	Žiar nad Hronom	Planetarium ZKP 2P, 10 m, 54 seats	
Gemer Observatory	Rimavská Sobota	35,5 cm Cassegrain	Occultations
Observatory Vartovka	B. Bystrica	35 cm Cassegrain	Meteor showers
Observatory Malý diel	Žilina	25 cm Newton	Occultations
Observatory Kysuce	Kysucké n. mesto	20 cm refractor	Sun, occultations

Table 3: Public observatories West Slovakia

Name	***Locality***	***Main instrument***	***Main scientific program (if any)***
Slovak National Observatory	Hurbanovo	Solar spectrograph	Sun
Observatory and Planetarium	Hlohovec	60 cm Cassegrain, Planetarium ZKP 2, 10 m, 64 seats	Variable stars
Hornonitrianska Observatory	Partizánske	15 cm Coudé refractor	
Astronomical Observatory	Sobotište	40 cm Newton - Dobson	Variable stars

Table 4: Scientific observatories

Name	***Locality***	***Main instrument***	***Main scientific program***
Astronomical Institute of Slovak Academy of Science	Lomnický peak (2632 m a.s.l.)	20 cm coronograph 2x	Solar corona
	Skalnaté Pleso (1786 m a.s.l.)	61 cm Newton, 60 cm Cassegrain	Asteroids, Variable stars
	Stará Lesná (785 m a.s.l.)	60 cm Cassegrain, 50 cm Newton, Solar spectrograph	Variable stars, Sun
Faculty of mathematics, physics and informatics UK Bratislava	Modra (531 m a. s. l.)	60 cm Newton	Asteroids