

## PROJECT OF PROMOTION OF ASTRONOMY: "SKY IS THE LIMIT"

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**Abstract.** Project 'Sky is the limit' is realized within the framework of SUPERSTE program as one of the ten winners of the program for 2016. The project itself is realized in rural areas of the Kruševac Municipality, where public observations and lectures are organized. In this way, in addition to promoting astronomy as science, astronomy is also promoted as a potential offer for rural tourism in the Kruševac area. Also, the first astronomical camp, as well as the training of 25 young people to become young "ambassadors" of astronomy will be done, so they can work on promotion of astronomy in Kruševac in the future. The project was completed by the end of 2017. This paper presents the results achieved in the project so far.

### 1. INTRODUCTION

Astronomical Association Eureka was founded in 2010 with the aim to promote astronomy and science in Kruševac and its surroundings. The Society was officially registered in 2016. The Society now has ten active members who are actively working on implementation of standard activities in the promotion of astronomy (lectures and observing), but also deal with writing projects through which they can realize activities for promotion of astronomy in Kruševac. The final objective of the Society is to build an astronomical observatory on the Bagdala hill in Kruševac.

In its work, most of the time is devoted to organizing astronomical observation events. From the start, the Society has used telescope as the main instrument of promotion of astronomy. When the Society started working, it used a telescope that was owned by Gymnasium Kruševac and founders of the Society. After 7 years of work the Society has managed to procure additional equipment, receiving some as donation. Now Eureka has 5 telescopes including: 127/1500 on AZ GoTo mounting, 130/650 on EQ2 mounting, 60/900 on EQ1 mounting, TeleScience 60/700 and 150/750 telescope mounted on motorized mount EQ3 and NEQ5 computerized mount. The telescopes are equipped with a special filter which makes it possible to use them in day-light observations. The Society also has two CCD (DBK 21AF04.AS and 120MC ASI) 3 that can be used to capture planets, but deep sky objects as well. The observation events are mainly organized in the center of Kruševac or on the Bagdala hill, while in 2017 the Society started activities of astronomy promotion in rural areas around the city of Kruševac.

In addition to observations, Eureka organizes scientific and popular lectures. The lectures are mainly organized in schools or in the Center for Professional Development and the National Library of Kruševac at the invitation of professors and teachers. The lecture topics are mainly current developments in the world of astronomy and physics, while for younger generations the lectures are organized on the topic of our Solar System, telescope and night sky. Also, the Society has hosted a large number of lecturers outside Kruševac, who had the opportunity to hold their lectures for audience in Kruševac.

In addition to these activities the Society is active in national and international projects. Some of the projects Eureka initiated to be implemented at the national level. In this period, the Society has taken part in the following projects: Serbia photographed Moon 2016, Science Festival Days of Eureka in Kruševac, NOU fest in Čuprija, the realization of a large number of projects concerning the youth are the Law of the Ministry of Youth and Sports and project 'Sky is the limit' under the program SUPERSTE. On the international scene, the Society took part in the following projects: International observe of the Moon night, World Space Week, Great World Wide Star Count, the International Asteroid Search Campaign, Asteroid Day, etc.

In addition to the above-mentioned Eureka actively participates in events and camps, such as Letenka, but also cooperates with other associations in the field of astronomy and other field of science. Eureka has established a cooperation with the Air Force Academy in Belgrade which will be discussed in the last part of the paper.

The aim of this paper is to present results of project 'Sky is the limit', which was implemented during 2017 in the area of Kruševac.

## 2. PROJECT "SKY IS THE LIMIT"

'Sky is the limit' is one of the ten winners of the Club SUPERSTE 2016 program. The aim of project 'Sky is the limit' is to strengthen the capacity of the Astronomical Society Eureka for further successful promotion of astronomy. The project includes the following activities: acquiring the necessary astronomical equipment for further successful work of the Society (NEQ5 installation and CCD camera); organized and carried out visits to a minimum of 25 rural local communities around the city of Kruševac; a competition for the selection of new promoter of astronomy which will be included in the work of the Society and have the opportunity to organize independently the following training astronomical activities in their regions; organization and implementation of training, popular science lectures and astronomical observations in the city.

The target groups are young people aged 14 to 30, with emphasis on the rural area around the town of Kruševac. The project is being implemented now and will continue until the end of 2017 when the first results will be presented.

### 2. 1. WHAT HAS BEEN DONE SO FAR?

So far, the project team have carried out a tour encompassing 17 rural and two urban local communities and organized two public lectures in the city and held a large number of public observations. The procurement of equipment allowed the activities of the Society to be raised to a much higher level.

The first observation was organized on the Bagdala hill on March 4. That was the time when the new equipment was tested. About 150 people had the opportunity to observe Venus, Mars, the Moon and Jupiter. Also, the Pleiades star cluster (M45), the star Sirius, a double star in the Great Bear and the M42 nebula in Orion were observed. While observers were eagerly waiting to look through a telescope, the members of Eureka took this opportunity to explain how easy it was to use constellations in the night sky for the purpose of space orientation.

Protocols on cooperation with the Tourist Organization of Kruševac and National Library of Kruševac that help in the project have been signed. Also during this period, a protocol was signed on cooperation with the Air Force Academy in Belgrade.

Astronomical Society Eureka has taken an active part in this year's second edition of the International Balloon Festival in Kruševac. The festival was held from June 30 to July 2 on the Bagdala hill. It is estimated that the festival was attended by over 20,000 people from Kruševac and the region. During the festival, in addition to the activities related to ballooning, parachuting and aircraft, the visitors were enabled to attend concerts, visit the dino park, meet bikers, learn to deal with archery and many other attractions. Eureka organized during the day-light observing the Sun, and by night observations of the Moon, Jupiter and Saturn.

During day-light we organized observing the Sun through a special solar telescope that we had gotten to use by the Astronomical Society "Alpha" from Niš. Although the Sun was not too active, i. e. we failed to notice more than one sunspot, it was excellent to see the granular structure of the Sun and the protuberance. A large number of photographs was made during the festival. By night we used the telescope that had been purchased through project 'Sky is the limit' under the program Superste.net. We could observe the Moon, Jupiter and Saturn.

The reviewer thinks: which was photographed many times. The reviewer's question: Did I understand coorrectly?

According to our estimates, over 3000 people looked through our telescopes and had the opportunity to learn about astronomy and the work of Eureka. We are pleased with the results we have achieved thanks to the Tourist Organization of Kruševac that gave us the opportunity to be part of this event. We expect a successful further cooperation and we will certainly respond again next year.

The Society has taken part in other activities, so has held a lecture for the participants of ecological camp EKOBUDUĆNOST held in Ribarska Banja. Also members have contributed to the realization of project 'My piece of the Universe'. My piece of the Universe, which was implemented by members of the Astronomical Society Eureka. After five days of intensive work with the 20 workshop participants have successfully mastered the basics of astronomy. Young astronomers led by Angela Petrović realized workshops for pupils of 'Veselin Nikolić' school.

## 2. 2. ASTRONOMICAL CAMP EUREKA CORNER

The camp was organized on the Jastrebac mountain in the period 11 – 13 August. The camp was organized as part of the project 'Sky is the limit', which is realized with the financial support of Mensa Serbia. For the camp attendance 60 applications were submitted, while at the camp there was a total of 40 participants.

The distribution of the participants according to their places of living is: Belgrade 16, Kruševac 13, Jagodina 4, Smederevo, whereas for Vršac, Kragujevac, Paraćin, Vla-

sotince, Nova Pazova and Novi Bečej each had 1 representative. The accommodation of the participants was organized in mountain hut 'Žarko Zarić' on Jastrebac. The camp program included interesting lectures on astronomy, especially observations, as well as aerospace and econophysics. Lecturers were Jovan Aleksić member AD Rudjer Bošković, Marko Veljković professor at the Air Force Academy and Zoran Tomić from Eureka.

The camp itself was covered by the media and on that occasion the local television reports on the camp were made by the regional TV Kruševac, TV Plus and RTS. RTS aired show 'This is Serbia'. The camp was also mentioned in the show on YouTube channel Gabatron. At the end of the camp we organized for the participants a visit to the National Museum in Kruševac.

Based on the survey the camp received an average rating of 4.20 out of people who filled in the questionnaire. The camp realization was supported by the Tourist Organization of Kruševac, the representatives of which visited the camp during the course and assisted in the promotion, the National Museum of Kruševac, which provided to the campers to visit free the museum and by the PE "Water supply" Kruševac, which provided bus for the campers. Also, large contributions by the members of AS "Eureka" Miloš Stanković, Aleksandar Ristić, Darko Jovanović and Miona Jovanović should be mentioned, who helped in the realization of the camp.

In the end it can be concluded that the implementation of the first astronomical camp Eureka corner was successful and that we hope that Mensa Serbia will help organize this camp next year again.

### 2. 3. SCIENCE FESTIVAL EUREKA PICNIC

On 7th of October Eureka organizaed Science Festival "Eureka picnic". Over 80 participants of the festival of science from Kruševac, Belgrade, Niš and Čuprija enabled people on that day to learn about science through interesting experiments, workshops, exhibitions and lectures. The festival also had a competition character because the audience voted for the best science setting. Over 1000 people had the opportunity to experience the Eureka moment in elementary school 'Vuk Karadžić'. Although initially the festival was scheduled to take place in Milicina street, because of rain it was realized in primary school 'Vuk Karadžić' and exceeded the expectations of the organizing team. Below we briefly describe the event itself. More about settings of the Science Festival you can see on web site or Eureka [www.eureka.nebjak.net](http://www.eureka.nebjak.net).

In addition to the settings the participants in large numbers attended the lectures. The lectures were opened by Prof. Dr. Milan Dimitrijević, Astronomical Observatory of Belgrade, who is still very keen in Kruševac and thanks to whose support in the previous years, the festival Days of Eureka was held in the Gymnasium. Besides prof. Dr Milan Dimitrijević interesting lectures by prof. Dr Dragan Gajić, prof. Dr. Saša Bubanj, Jovan Aleksić, Nevena Ćirković and Aleksandra Bajić also took place. All the lecturers are awarded for participation in the festival, in addition to AS Eureka badges in gratitude for all our great promoters of science in Serbia.

During a break from the tour, the visitors had the opportunity to visit our Scientific cafe which is located immediately next to the room where lectures were held. You are able to sit down and with some of our eminent speakers to talk topics related to science, research and other things. Of course they could drink coffee, juice or water to refresh and prepare for the further tour of the festival or going to the planetarium.

In the school gym, there is a large planetarium Center for the Promotion of Science, which can accommodate 50 people. For the planetarium, as always, ruled the huge interest, so it can be said that often during the festival came a crowd in front of the planetarium. A large number of visitors attended the lectures, and at the end of the lecture organized for volunteers and participants of the festival. The lecturer was Jovan Aleksić, who in a masterly way put closer the concepts of the universe. Around the Planetarium an exhibition of photographs was organized by AD "Ruder Bošković" dedicated to the Universe and astronautics.

### **3. ASTRONOMICAL OBSERVATORY IN KRUŠEVAC**

One of the goals of the members AU "Eureka" is to form an astronomical observatory in Kruševac. In fact, every astronomer wants to have her/his own corner where it will be possible to monitor the activities taking place in the night sky. Our hope is that following an example of colleagues from AD "Alfa" from Niš and AD "Universe" from Bačka Palanka we shall be able to build our astronomical observatory and thus classify Kruševac among those 5 cities in Serbia, which have their public observatories. Therefore AU "Eureka" is actively working on the preparation of projects aimed at purchasing an astronomical dome in that a telescope would be placed. In the past interviewed city officials supported this initiative. The idea is that the observatory should be on the Bagdala hill and that, in addition to promoting the benefits of astronomy, it also contributes to the development of tourism in Kruševac.

### **4. CONCLUSION**

The project 'Sky is the limit' is certainly the most successful project of the Society Eureka implemented so far. A large number of villages visited where astronomy was popularized, a number of activities that have contributed to familiarize young people with science was organized, but certainly a great contribution in the field of promoting tourism and educational potential that it has in Kruševac. This is certainly the beginning of activities of Eureka on the realization of the final goal, which is to build the observatory, where project 'Sky is the limit' has had a major contribution in realization of the idea.

### **References**

[www.eureka.nebjak.net](http://www.eureka.nebjak.net)