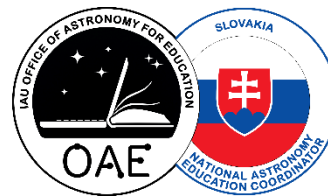


Astronomy Education in Slovakia



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Structure of education:

Children begin formal schooling at age of 4 or 5 in kindergartens (pre-school education). It is followed by nine years of primary education, since age 6. Length of secondary school programs is usually four years, studying all subjects offered by their school during the first three years. Students take seminars in 3 - 4 subjects which they have selected for the National graduation exam in the final year of the study. There are ten compulsory years of schooling in our state education system (nine of the primary school plus one of the secondary school). All thirteen years of education at public (state) schools are free of charge. There are also private (independent) schools which charge fees. The primary language of most schools is Slovak, but there is a significant percentage (7%) of pupils attending Hungarian-speaking schools, several pupils are attending other minority language speaking schools. Most schools are non-religious but there are many church-owned schools as well.

Undergraduate university education in Physics is offered by various universities. Graduate and postgraduate education in astronomy and astrophysics is carried out at two universities, in Department of Astronomy, Physics of the Earth, and Meteorology, Faculty of Mathematics, Physics and Informatics, Comenius University in Bratislava and in the Department of Theoretical Physics and Astrophysics of the Institute of Physics, Faculty of Science, Pavol Jozef Šafárik University in Košice.

Education facilities:

Slovak primary schools have typical class sizes of 22 - 29 pupils. However, practical subjects have smaller classes. Some small schools have only a few pupils per school year and teachers teach groups consisting of pupils from multiple years. Secondary schools have typical class sizes under 30 students, whereas practical subjects having smaller classes. All Slovak schools have access to running water and good internet connections.

Governance and organization:

Public (state) primary schools are run by local city/village councils and the secondary schools by local county councils. The curriculum is set by the central government in Bratislava and it is the

responsibility of the Ministry of Education, Science, Research and Sport of the Slovak Republic. The curriculum was gradually reformed in the last decades.

There are public, state (both are financed by the government) and private universities in Slovakia. Studies at the state and public universities is available free of charge for residents of the EU.

Teacher Training:

Primary school teachers mostly study undergraduate degrees in education at universities (first stage of university education). Secondary physics teachers either study for a joint degree in particular subject (physics, mathematics, informatics, etc.) at universities, or study for a graduate qualification (second stage of university educational) after obtaining an undergraduate degree in physics. Special lectures and courses on astronomy and astrophysics intended for teacher training students are available at various universities (e.g. Comenius University in Bratislava and at Pavol Jozef Šafárik University in Košice). A lifelong education for working teacher is typically done with a few “in-service” training days per year.

Astronomy in the curriculum:

There are no specialized school courses in astronomy in the state educational program. However, the astronomy topics are taught in a playful way in kindergartens (basics about the objects of the Solar System), they can be also found as a part of the course on Basics of Natural Sciences (years 3-4 of primary school), Geography (5th year of primary school) and in Physics (years 6-9 primary school and years 1-2 of secondary school). More detailed study of physics and astronomy are included in optional courses in secondary school (years 3-4). The Slovak Central Observatory in Hurbanovo, in collaboration with the local Secondary Industrial Construction School, runs a two years undergraduate education qualification course of astronomy for students having secondary school level National graduation exam (there is no age limit for an applicant).

Astronomy education outside the classroom:

There is a network of public observatories in many districts of Slovakia which are run by local county councils. There are several private observatories that carry out also public outreach. The Slovak Central Observatory in Hurbanovo, run by the Ministry of Culture, has methodological and scientific competences for public observatories. Some observatories, including the Slovak Central Observatory, have planetariums as well. Most of the observatories carry out guided tours for general public and visitors consisting of public astronomical observations. They also organize exhibitions, art competitions for pupils, knowledge competitions for pupils and students, astrophotography competitions for young and adult amateur astronomers, summertime astronomical youth camps. Public outreach is significant part of activities in the Slovak Astronomical Society of the Slovak Academy of Sciences and the Slovak Union of Astronomers. The Slovak Astronomical Society organizes Astronomical Olympiad in collaboration with the Slovak Central Observatory. The best students participate in the International Olympiad on Astronomy and Astrophysics, where Slovak students are usually very successful. There are several science or astronomy outreach centers, leisure-time centers in cities and towns around Slovakia. Local astronomy clubs are active at observatories and in some cities and larger towns. Astronomy is also given to participants of the University of the Third Age in Bratislava (Comenius University) as well as in Košice (Pavol Jozef Šafárik University).

Astronomical Institute of the Slovak Academy of Sciences in Bratislava and Tatranská Lomnica, Comenius University in Bratislava, Pavol Jozef Šafárik University in Košice also participate in astronomy outreach activities. They organize public lectures and observations, educational seminars and

workshops for primary and secondary school teachers, students as well as for general public, produce educational YouTube videos, events for young people within the project “With a telescope on the road”, activities within the European researchers' night, Science and technology week in Slovakia, Science café, activities related to protection against light pollution (e.g. Earth Hour, Globe at Night), the IAU100 activities in 2019. The universities also participate in tutoring of students in their high school research activities, as well as prepare them for various astronomical competitions. Institute of Experimental Physics of Slovak Academy of Sciences runs the project Space Lab and organize monthly lectures on space sciences.