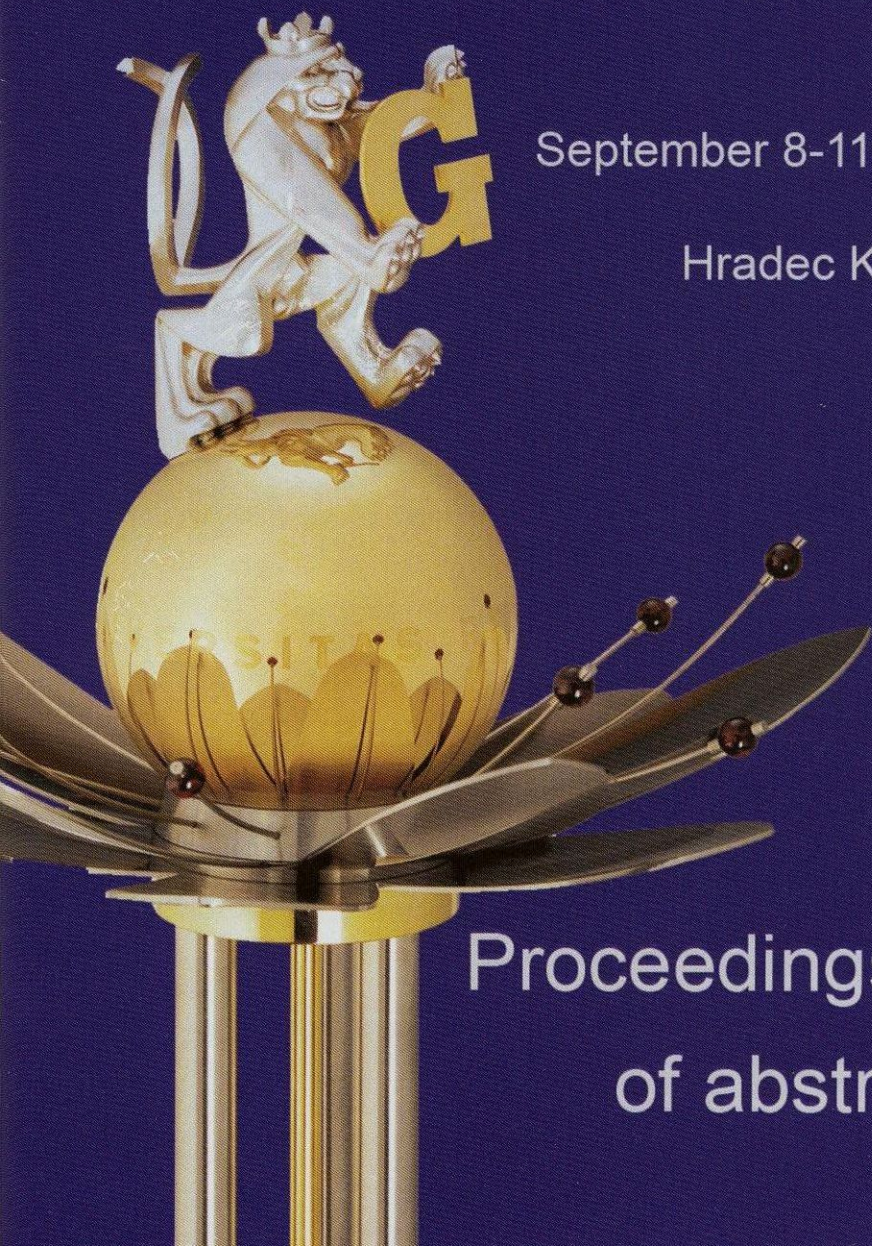


16-th Conference of Czech and Slovak Physicists

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16th Conference of Czech and Slovak Physicists

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Physics is often supposed to be difficult and not popular subject by secondary school students. Students are learning biology rather than physics. This fact is confirmed by many papers and also by my own pedagogic experience. The aim of my talk is to show how it is possible to make physics more attractive by integration of relevant biological items into it. It is in accordance with the demand of interdisciplinary teaching. The paper contains also particular illustrations of possible integration of biological problems into the secondary school physics (theoretic application and simple biophysics tasks) and a questionnaire designed for secondary school students that aims to verify if the nature is motivational element for students for learning physics.

I deal briefly also with problems of motivation theory. In my point of view, cognitive needs will be most important. Interest of students in nature around us can help them to understand that physics is useful and that it interprets things relevant to animated nature, including human organism. First, students can be satisfied by physics through their interest in biology. Gradually, students can be satisfied by physics itself. Such an interiorization of motives would be an ideal consequence of used manner of motivation.

Simple mechanical view of light bending on celestial bodies

I. Túnyi¹, D. Krupa²

¹*Geophysical Institute SAS, Bratislava*

²*Institute of Physics, SAS, Bratislava*

As it was shown earlier the Newton's gravitational equation can be obtained from the Hooke's elasticity relation within a simple string model by elementary mathematical procedure. Mechanical view of gravity generation was also derived within this framework. The phenomena of light beam bending in passing around the celestial body can be explained by the same way in a simple visual manner. Present paper deals with application of the above-mentioned model as supplementary pedagogical device in physics classes for elementary school.

Technical education in the area of laser technologies

M. Gajtanská, R. Igaz

Faculty of Wood Sciences and Technology, Technical University in Zvolen

The paper deals with technical education in the area of lasers and technologies with laser applications. The goal of this education process is make students acquainted with all typical types of available lasers utilized in technical applications. This article describes principles of single of lasers, their parameters and possibilities of application.

Students have possibility to obtain knowledge about basic principles, parameters and possibilities of laser devices. Plan is compile so, that students pass from introduction with basic units used in light and laser problematic, through basic light characteristics, next single types of devices, and to finally is practical application in different branch of science, technologies, industry and praxis. Task of lectures is theoretical knowledge from actual problematic and task of practical exercise is enable students practical contact with laser technique.

Modern interactive teaching methods in physics

J. Hanč

Faculty of Science, P. J. Šafárik University, Košice

In our contribution we will introduce two methods belonging to successful modern interactive teaching methods in physics: Interactive Lecture Demonstrations developed at Tufts University (Boston, USA) and Peer Instruction developed at Harvard University. We also present first results of their pilot application at Institute of Physics, Faculty of Science, P.J.Šafarik University in Košice.

Teaching supported by tasks and experiments in physics

L'. Krist'ák

Faculty of Wood Sciences and Technology, Technical University in Zvolen

Experiments are a standard part of physics education. In other countries are experiments out of nuclear physics common part in education. In Slovakia is this part of physics taught only theoretical without practical experiments. This article deals with a method using classical experiments in nuclear physics at secondary schools. It contains results of pedagogical experiment made on two schools during two years on about three hundred students and practical samples of experiment in a nuclear physics. These subjects are a part of physics education at higher levels of secondary schools.

Physics at Technical University in Zvolen

M. Nĕmec

Faculty of Wood Sciences and Technology, Technical University in Zvolen

This paper deals about actual status of education system in Slovak republic. Our education system has been transformed by school reform (regional and university). Results of this reform is reduction of science and technical subjects - especially physics. Three-degree university education system is reflected in all faculties in Technical University in Zvolen, too. We imagine actual status of physics teaching in each faculty in Technical University in Zvolen.

Physics teachers and universities: not only one-way interaction

L. Dvořák

Faculty of Mathematics and Physics, Charles University, Prague

Quite often the interaction of universities and teachers at secondary schools is considered as one-way process: universities educate future teachers and then (sometimes) provide their in-service training. To put this approach in the extreme, teachers would be regarded as more or less "passive objects" of training and universities as the (only) source of knowledge. It was stressed e.g. in European program Physics On Stage that the role of teachers should be more active and teachers and universities should cooperate as partners. The article will present some experience with various examples of two-way interaction between physics teachers at schools and university: courses for teachers accenting their active approach, conferences "Physics Teachers' Inventions Fair", participation at Physics on Stage and Science on Stage programs, participation of teachers at some parts of physics education research and the Heureka Project.

Project education of physics and scientific activities at secondary school

Z. Kluiber

University of Hradec Králové and Faculty of Biomedical Engineering in Kladno, Czech Technical University