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Questions asked by high school students to Professor Koshiba, the Nobel laureate 2002

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Three years ago some few hundreds high school students were asked to formulate the questions to Nobel laureates of 1999. Among those questions some were chosen and presented via Internet Professor Koshiba, the Nobel laureate of 2002. Professor Koshiba was kind to answer. The interview was not very interactive. Some questions from which we could learn how Professor Koshiba got interested in physics remained not answered.
To give our GIREP readers an idea of Professor Koshiba's school time, the author of this paper describes from her point of view a Japanese school.

Could you share with us, how to come out with an idea for which one gets the Nobel

Prize?
Don't know how to answer.

For how long have you been working on the problem for which you were awarded with the Nobel Prize?
For 20 years.

What do you like most in the profession of physicist?
To find out something new.

Do you prefer to work alone or in a group?
In a small group.

Did you enjoy your school?
Yes, and no.

Did you like physics and mathematics at school?
Not particularly.

Did you have a private tutor, like today many Japanese schoolchildren have?
No.

When you were young, did you like to talk with your parents or anyone from your family about physics?
No.

What were your hobbies and your favourite subjects at school?
Nothing particular.

What is your hobby at the present time?
Listening Mozart.

Did your children enjoy physics as well?
No.

Do they work in physics?
No, but my son is an engineer.

This is a very personal question: How did you meet your wife?
Meeting was arranged by our common senior friends.

Do you ever talk with your wife or children about your work and progress in the research?
No.

Did you enjoy reading literature?
Sometimes.

What kind of sport did you exercise?
None.

Student in a Japanese school

Let us imagine a school, which Professor Koshiba attended fifty years ago. Fifteen years ago I spent a couple of months in Japan with my son, who was a second-grade high school student at that time. My son attended a typical provincial school, the so-called middle high school, which is equivalent to a lyceum in Poland. On the picture below you can see professor Koshiba in a school uniform.

Student Masatoshi Koshiba with his younger brother.

Student Stanis³aw Go³¹b mathematics professor of Jagellonian University, in his school uniform, about 1916 (Cracow).

About fifty years earlier my father posed for a photo in a similar uniform. Throughout Japan, high school students wear such uniforms. The school principal exempted my son from wearing the uniform and let him wear only a suit, which we fortunately did not forget to take from Cracow. The classes were numerous (44 students per class). Japanese classes are very numerous in general, exceeding 40 students. In that particular school there were ten classes per each grade.

About one hundred years ago one started to construct school facilities in Middle Europe, which were very modern at that time (and are often much better than contemporary schools). These schools have a characteristic architecture (for example the four hundred years old Nowodworski's Lyceum in Cracow). You can easily recognize these schools in the cities of Krakow, Lvov, Vienna, Bratislava and other Eastern European cities. The same is with the Japanese schools, which have a characteristic, modern architecture. One takes a look and recognizes immediately: this is a school. The photo below shows the school of my son in Yashiro.

School in Yashiro

I have some doubts whether this kind of architecture is optimal for the climate: large windows at corridors made the school chilly in winter and hot in summer. Schools have no heating (except for schools in Hokkaido). In the staff room there was only one oven with a kettle with boiling water. The modernity of the schools is marked by huge sport halls. Perhaps during the times of Professor Koshiba they were not as common as today.
The school day was organized into two parts. In the morning there were four classes, then there was a one-hour lunch break, and in the afternoon two classes, slightly lighter than the morning classes: foreign languages, art and sport. Teachers were obligated to stay at school as long as students. The beginning of the day was marked by a loud gong (like bells in a church) and the signal is same in all Japanese schools. Professor Murata, whom I met at the 2003 GIREP Conference in Udine, wrote down for me the melody of this signal. It resembles the music of the Big Ben Clock.
Before the classes get started, teachers have a briefing and students attend an assembly, similar to that of my school times.
As I mentioned, uniforms are obligatory in all schools. Some are similar to British uniforms, and others to Austro-Hungarian, as you can notice on the photos above. Trinkets (bijoux) and dyed hair were banned. Girls were allowed to keep their hair short or braid them. Girls, with braids and dressed in uniforms, look really cute and so do the kids from kindergarten, dressed in uniforms, who wear small hats on their heads, and carry identical, small bags. The picture, which was presented at the 2003 GIREP Conference in Udine, shows students during a physics class; the students here are dressed "normal", but this is not very common.
The students attend school on Saturdays as well, but this is changing. Nowadays, only on some Saturdays in the month they have to go to school. A new semester begins with tests, which last for three days. This means that the six weeks summer vacation is spoiled by preparations for the tests. Have you noticed that you do not find many Japanese tourists with children? If you see young people, they must be college students.
The students have also mid-term tests. These are very extensive and the students do not have much time to think about the possible answers. You have to know the answer precisely. This is not easy. Therefore, many students take extra-curriculum classes, either individual or organized by evening-and-Sunday schools, the so-called *juku*. *Juku* is a big business in Japan. In *juku* the students prepare themselves not only for current classes, but also for the final tests and entrance examinations for the university. Considering the fact

that the classes in the Japanese schools are overcrowded and the curriculum is overloaded, juku seem to be necessary.
In Japan the school year is longer that in Europe or in the USA. Perhaps this may explain why the Japanese students are so good in test solving. They always score top results. They simply study more.
The Japanese students are overworked. They do not have much free time. During his six-months stay in Japan my son managed to spend together with his friends only one Sunday; they went for skating. His friend was usually busy on Saturdays and Sundays with homework and extra studies. They could not even imagine, how Polish students spend their time on Sunday and who organizes their time. The only time the students could socialize was during sports activities, or during a school trip for skiing, but this was under a strict supervision of teachers. The school trip, organized for 1000 students, was like a real logistic operation, planned in every detail, such as the time of group picture taking, the time of bath (public bath) etc. From early years, young Japanese are trained to work in a group, where everyone is assigned its role and position. They are incredibly disciplined. In a classroom you can keep laboratory glassware and be sure that nothing will happen to it. Obedience and discipline rises with the age.
But on the other hand, students are less and less spontaneous and they do not show willingness to ask questions. You can see it on the pictures. On the picture below you can see many students raising their hands. Students asked me many questions after the class. But classes in high school are carried out in silence. The students are taught by means of chalk and blackboard.
Every subject has a precisely planned curriculum. Teacher knows precisely how much time he or she shall spend on a particular problem. It is precisely described, which experiments students shall perform alone, which experiment they do in groups (they work in groups of two or four persons), and which experiments are demonstrated by the teacher. The picture below shows students conducting experiments. All the students do the same experiment.
We can predict with a quite good accuracy that, for instance, on the second Thursday of May the second grade students conduct experiments of measuring the specific heat of water, and during the first Saturday of September there are long distance running competitions in all Japanese schools. The way of teaching physics is very traditional and has all shortcomings typical for the traditional teaching, which are particularly visible when the teacher is not trained well or the students are poor. A fixed *curriculum*, of course, does not guarantee an equal level for all schools. There are better and worse schools. Schools are ranked. Parents do their best to send their children to the best schools, as this is the way to a renowned university, and the graduation from a good university is the only guarantee of a prospective career. The race toward renowned schools begins in kindergarten. The best kindergartens are very much wanted.
The social status of teachers is very high. They are titled as “professor” and they earn good money. However, they have more working hours than teachers in Poland and in the most schools they have to spent there the whole day. Even during the six weeks summer vacation they have to spend some of their time at school. Regularly they are assigned to another schools.
My son, who visits Japan often, says that Japanese schools are changing quickly. There are many influences from America, which are welcomed by the students, but not necessarily by the parents and the teachers. Nowadays the students may be allowed to bring to school Coca-cola, not only tea or water, as it used to be when my son was in school.

Children in elementary school in Yashiro. They are very active.

Physics lessons in junior high school in Yashiro. Students in uniforms.

Young Masatoshi in kendo dress dress.

Fot. ZG-M

The role of the co-operation between Schools and Universities in order to improve teacher education

Silvia Pugliese Jona, *A.I.F. Associazione per l'Insegnamento della Fisica, Italy*

1. Foreword

What I will say reflects not only my personal views but also the views of the AIF, the Association that I represent.

I am a schoolteacher with a lifelong experience in teaching to pupils in a technical school: youths in the 14-16 age slot who are oriented towards science and technology but generally are not as well equipped academically as, possibly, their high-school colleagues.

I was not originally trained as a teacher but I took up teaching 5 years after graduation. If I look back to my University years, I recognise that much of what I studied then, although useful as qualitative personal knowledge (with the years going by I forgot much of the mathematical formalisation), was never used in my professional life. I also recognise that some parts of my university training - for example (but not only) self-organised work in the physics lab - although not finalised to teaching, have been an absolutely invaluable base for my work with these practical-oriented youngsters.

I do not want to imply that student teachers should only study what they are expected to transmit to their future pupils. A wider cultural background is absolutely necessary to all teachers, not only to be able to satisfy the extra-curricular curiosities of some youngsters but also in order to understand the rationale underlying certain conceptual priorities and to foresee and prepare the bases for further conceptual developments: in short, to organise ones teaching.

Probably many school teachers have similar feelings about their initial education. In order to understand the attitudes of teachers in service, it might be worthwhile to know what they think about the usefulness of their initial university education. Indications of which courses the physics teachers perceive as useful for teaching in the schools can be found in [1].

2. School-University co-operation: for what?

The end users of school education are the children and the young generation at large: future not-specialists in many fields - in our case, not-specialists in science or physics.

Therefore, although our main interest here is for the professional education of teachers, I think that we must also constantly keep in mind the thousands of pupils to whom a teacher might be expected to teach during her/his working life, for whose education s/he is responsible, at least for the part for which s/he is entrusted by the schools and by society.

Since the early '90s there is a growing (but maybe not yet universal) consent that in the case of school children and pupils science should be taught as "science for all" - in our case as "physics for all". Many reasons sustain this view, they have been amply illustrated in many publications and I will not dwell on them here [2].

What "physics for all" means in practice, which new methodological approaches in order to allow the students to build useful meanings at their level of understanding, at what age the "physics for all" point of view might be relaxed in favour of a more academically oriented approach for the scientifically minded, are matters that depend on many factors, not last the specific structures of the different national educational systems. They are, however, issues that should interest schools and Universities alike: the schools because of the good service they are expected to offer to the young generations, the universities

because of their involvement in the training of young teachers and also because they would need to re-calibrate their own internal teaching practices in order to adapt to the changing attitudes and preparation of their fresh students.
In any way, the implementation of the changes is a difficult issue because the inflow of new teachers in the schools is slow and the main influence on the teaching in any single school is likely to stay in the hands of the older teachers for many years. Therefore the process that will eventually produce a generalised renovation of the teaching practice needs to be very well supported by a multilateral co-operation in which the actors are the schools, the (regional, national…) school authorities, the expert and innovative teachers wherever they might be found (see frame) and the Universities in the measure in which they are aware of the real educational and societal problem and not only concerned with the quality of the academic preparation of their incoming students.
Many practising teachers would probably need to acquire and adopt new attitudes and new conceptions on teaching [3]. This is not easy to achieve: resisting to new ways of thinking, falling back to old comfortable habits, is only human. It might be possible to make leverage on some teachers' dissatisfaction for the scarce rewards they get in terms of pupils' understanding. Probably new forms of in-service updating must be conceived, based on the same didactical approaches that we wish to promote: active learning, wider horizons, adoption and integration of a variety of learning experiences etc. New textbooks based on a different philosophy, new approaches to the assessment of pupils, newly conceived examinations might be needed [4].

An important source of interested and dedicated teachers can be found in the teachers' disciplinary associations. AIF (Association for Physics Teaching, Italy, www.a-i-f.it) is one of such associations.
The individual members of AIF are mostly secondary school teachers of physics and of mathematics and physics. A smaller but significant number of individual members work in universities and are strongly involved in research in physics education and in educating future teachers of science and physics for different school levels. Furthermore, many secondary schools are associate members of AIF. AIF has a wide experience in a number of fields that concern teacher education, especially in the secondary school sector. It is directly involved in in-service updating activities of various kinds (local actions, summer schools…). These activities are carried out

- most often (but not exclusively) in collaboration with persons who are active in universities and with the support of the local or national school authorities;
- by appointment of the Ministry of Education, e.g. in supervising WEB Forums that offer advice and support to young teachers in their first years in the school, or in producing materials for the updating of secondary school teachers [5].

Through the activity of many of its members - university teachers and school teachers who collaborate with the universities as supervisors and as school based tutors of the student teachers - AIF has an indirect experience of initial teacher education as it has been realised in the last few years after its late inception in Italy in 1999.
AIF is not an exception. In many countries Teachers' Associations work pro-actively towards the improvement of learning in schools. In fact one of the main reasons for the existence of a free association of teachers is to promote the professional growth of its members through the circulation and dissemination of relevant information (e.g. on new scientific trends and results), of practical ideas on educational methods and innovative ways of teaching, of significant teaching experiences and class activities. This is usually achieved through their journals, meetings and other activities. The strength and know-how of such organisations derives from the real-life classroom experience of their members and from first-hand knowledge about the burdens and constraints that characterise the different contexts in which teaching takes place.

Thus the teachers' associations can be regarded as organisms that, possibly without indulging in occasional fads, collect year after year the good teaching practices, put them into context according to the typical situations that characterise different kinds of schools, disseminate them to their membership and hopefully, through their members, promote their diffusion towards the educational system at large. But trusting in the spontaneous diffusion of better teaching practices would be, at the best, unwise: there are good reasons, therefore, for including the Teachers' Associations as partners of the multilateral co-operation that aims to help to improve teaching practices in the sciences and in physics.

3. A double problem

I will separate the discussion about the initial education of teachers from the discussion about in-service updating.

3.1 Initial education

In the field of the initial education of teachers AIF insists on the fundamental role of partnerships between Universities and schools, each ones acting according to their particular competencies.
Such collaboration is important for the University Departments involved because it allows them to approach a range of different school environments in which their students might eventually be engaged in their working life and to understand the underlying needs and peculiarities.
Such collaboration is important for the schools because the teachers who act as tutors and/or receive the student teachers in their classes are stimulated by these interactions to rethink and consolidate their own professional strengths.
This is, after all, a common teacher training practice in many European countries [6].

Schoolteachers need:

1. disciplinary knowledge
2. pedagogical knowledge, general and specific to their subject
3. ability to translate the disciplinary knowledge in a form that is understandable by their pupils
4. ability to choose adequate teaching methods, at a level suited to the pupils
5. ability to link, recall, reuse concepts from different fields of the discipline
6. ability to involve pupils in an effort for significant learning, proposing a variety of activities [7] in which their learning can be used in a variety of ways - including references to everyday contexts [8].

All these needs are well served by offering the student teachers the different experiences that the University environment and the school environment can provide, but there must be coherence and an efficient connection and collaboration between the two components. If, for any reason, one of the components of the partnership is not really interested in what happens in the other environment a mismatch is almost certain to appear, the two experiences will be detached or perhaps even in conflict with each other and the educational results can be quite dissatisfactory [9].

It helps the young teacher to have followed a good initial course but, even if the initial formation were of the best quality, it takes time and effort to become professionally proficient in the senses listed above. Usually it also requires a supportive environment, such as the one experienced during the practical teaching exercises in schools when still studying. It is not guaranteed that the particular school environment in which the young teachers start their working life is supportive: the school might be small, the colleagues might be discouraged or too busy etc [10]. But even when the school environment is

supportive it might not be oriented in accordance with the educational approaches that the young teacher experienced during the years in university. This is a cause of concern because some important aspects of the earlier studies, especially the research-driven aspects, risk to be gradually forgotten and eventually effaced [11].

3.2 In-service updating

In-service formation, too, should be open to different actors with different and complementary competencies. For example university professors and expert schoolteachers have different contributions to bring: on one side, knowledge acquired through fundamental research in various areas including, foremost in usefulness for teaching, research on learning physics; on the other side the know-how that comes from the everyday teaching experience in the school environment. Both aspects are essential for a balanced in-service formation. But the possibility of actually performing updating actions depends on other factors too.

The willingness of the teachers: in-service updating has sense only if the teachers

- perceive a personal need to grow professionally
- are willing to do so
- can dedicate time to attend, to reflect on the consequences, to include the innovations in their planning and to try them out in the classroom.

The awareness of the school authorities that, in principle,

- time spent on updating in the teachers' disciplinary field is important for the quality of the services offered to the pupils of the school, and
- updating should be officially considered an institutional right of the teachers.

This implies that a reasonable allowance of time for updating must be recognised to the teachers alongside with their other institutional duties. The EUPEN inquiry [1], besides indicating which in-service courses were perceived by the polled teachers as most useful for teaching physics in the schools, has clearly shown that one important factor that works against in-service updating is the lack of time [12]. But even self-updating or working in a collaborative mode with colleagues requires appreciable efforts by the people directly involved and concrete actions by the school authorities. No effective collaboration and collective growth of the teaching staff would be possible without providing the necessary logistic facilities and without considering the time spent as working time.

A special and delicate case is represented by the teachers who are not experts in the subject they are asked to teach. For physics this happens ever more frequently: in many countries there is a severe shortage of physics teachers and the schools are compelled to entrust classes to unspecialised teachers. In other countries, like Italy, in the secondary schools mathematicians frequently teach physics and in the middle schools (ages 11-13) science is mostly taught by biologists. Usually the disciplinary knowledge in physics of these teachers is quite poor; their knowledge of disciplinary didactics is even less; their ability for practical work in the physics lab is almost null. So physics is taught by the textbook, and the textbook might become the main reference not only for the pupils but for the teacher too [13,14].

I lack information on how this serious problem is tackled in other countries. It cannot be faced by the schools alone (the schools cannot spare these persons whose presence is required in the classrooms), nor by the universities alone. The needs of these persons require emergency treatments for what concerns their knowledge of the subject and of the teaching of the subject. They cannot go through a regular course. Helping them to overcome their difficulties requires new methods and techniques and special, sometimes day by day timely support.

Here the role of an independent association or of a discussion group on the web might become essential. The teachers' associations, thanks to the presence of their membership

across the country, can offer a pool of expert teachers to which other institutions and subjects can resort for advice and collaboration when it is necessary to fulfil local needs.

A completely different issue is the possibility that schoolteachers participate in research with the universities. This could very well be realised on a personal teacher-to-university basis, out of real inter-institutional school-university collaboration; but it would be strongly advisable that the schools be informed and, in the case of educational research, actively involved [15].

Notes and references

[1] Ferdinande H, Pugliese Jona S and Latal H, 1999, The training needs of physics teachers in five European countries: an inquiry, EUPEN Consortium, Universiteit Gent, Belgium

[2] 1994, The Project 2000+ Declaration - The way forward, *UNESCO*; 1995, Science in schools and the future of scientific culture in Europe, *EC*; 1995, Science Education, a case for European action? A White Paper on Science Education in Europe, *EC and Calouste Gulbenkian Foundation*, etc.

[3] Furió C, Vilches A, Guisasola J and Romo V, 2001, Finalidades de la enseñanza de las ciencias en la secundaria obligatoria. Alfabetización científica o preparación propedéutica?, *Ens. Ciencias*, **19**, 365-376

[4] It is well known that an important parameter used by the school authorities for distinguishing "good" teachers is the success of their pupils in exams. This is a very strong incentive towards matching ones teaching to the exam requirements. A paradoxical extreme example is reported in Mahmood N, Shinohara F, 2002, Recognizing the Influence of Assessment Pattern in the Formation of Teaching Style, *J. Sci. Educ. Japan*, **26**, 187-196 (English Edition)

[5] Dibilio BM, 2003, Producing resources and materials for the in-service training of physics teachers, contributed paper to this same GIREP Seminar.

[6] This author had the opportunity to read several STEDE (Science Teacher Education Development in Europe, www.biol.ucl.ac.be/STEDE/) reports in which, with variations, the scheme "study in the University and practical work in schools" is described (e.g. Fischler E, Free University of Berlin; Buck P, Müller M and Schallies M, University of Education, -Université Paris 7 and IUFM Créteil; Redfors A and Eskilsson O, Kristianstad University)

[7] See, for example: Newton L and Rogers L, 1996, Teaching physics at advanced level: a question of style, *Phys. Ed.* **31**, 265-270: «…*We believe that these needs are best served by a variety of teaching methods. A key justification for variety lies in recognizing that no single approach may foster the development of this diverse set of skills and abilities. Also, no two learners will necessarily derive the same learning benefits from a particular approach. Furthermore, variety is stimulating, change enhances attention and learning can be more effective when it is organized in manageable episodes*.»; Labudde P, 2001, Chancen für den Physikunterricht in der heutigen Zeit - Zehn Thesen zur physikalischen Bildung, *Plus Lucis*, (2), 2-6: «*Summative assessment should be based on testing many forms of learning, in order to offer the students the best conditions for expressing their abilities in the context of the different formative purposes of teaching physics*.»

[8] Many authors affirm this need. Although it is not fully circumstantiated I will only quote Recommendation 1: Workshop 3A: Physics in Secondary Education: Content (30 participants, mostly schoolteachers, from 11 countries), in "Physics on Stage, Full Proceedings", 2000, *European Space Agency*:
«*Learning should be based on everyday life in contexts highlighting physics, past, present and future. Today's physics teaching very often is based on university physics transferred to a lower level. These traditional course designs, however, have proved unsuccessful in maintaining the interest and motivation of our students. As personal experience shows, physics lessons should therefore be based on contexts that not only show the importance of physics for students' everyday life but also include findings in recent physics. By working on topics like "Physics in Medicine", Environmental Physics" or by including aspects of Astronomy or the History of Science into coursework, students are more likely to find physics*

a highly interesting subject to choose and study. This especially seems to apply to physics taught by teachers who are fascinated by the topics themselves.»

[9] Stumpo P, tutor in an Italian secondary school, personal communication.

[10] see, in [1], pages 148-149 for statistical data on the extent to which teachers of physics manage to collaborate with their colleagues in schools.

[11] For example the STEDE report by Fischler E, Free University of Berlin, quoted in [6], states that in Germany the young teachers continue their formation in the schools for a couple of years after their University years under the tutorship of older teachers appointed by the State authorities. At this point the connection between school and university is clearly broken. This period is very important because it opens the way to a permanent teaching post. It seems to impact the later teaching practice of the young teachers more than what they learnt in the University. The concern is that the tutors' vision of the teaching-learning process usually is not consistent with the preceding studies of the young teachers.

[12] see, in [1]: *Professional usefulness of in-service courses*, 139-143.

[13] This doesn't happen only in Italy. See for example Hubisz J, 2003, Middle- School Textbooks Don't Make the Grade, *Physics Today*, **56**,(5), 50-54.

[14]This generates a vicious loop: for marketing reasons many textbooks are written as simplified (and degraded) versions of the academic courses in general physics that the teachers might feel as most authoritative, of which they might have some pale remembrance and with which they might feel comfortable. Thus not only these textbooks are not adjusted to the pupils' needs but also, without an adequate background, they do not improve the teachers' conceptual understanding nor do they allow them to grasp the methodological aspects of teaching physics to young pupils. The issue of textbooks, of their connections with teacher education, of how they contribute to the resistance to curricular and methodological change in the schools, might well be worth exploring in the context of joint school-university activities.

[15] Taber KS, 2000, Should physics teaching be a research-based activity?, *Phys. Educ.*, **35**, 163-167

IN MEMORIAM

Tomass Romanovskis 1944 - 2004

With deep sorrow we have to announce that Tomass Romanovskis, Physics Professor of the University of Daugavpils/Latvia died, January 29th in Merseburg, Germany. His death was completely unexpected, the day before Tomass gave a lecture at the Fachhochschule in Merseburg.
Born Mach 7, 1944 in Liepaja, he went to school in 1951. In 1961 he was the youngest student of the Department of Physics-Mathematics of the University of Riga. He finished his Master study in Physics in 1969, in between he served 3 years in military. He started his scientific work in the field of solid state physics. In 1972 he went to Moscow for a postgraduate study, and in 1973 he received his PhD for a thesis on the Theory of Ferro-electrics. In 1975 Tomass went for a period to Prague, Charles University, for a postdoc position. He returned to Riga in 1978 for a position at the University and was appointed as Physics Professor in 1986. In the last few years Tomass has worked at the University of Hamburg in a Physics Multimedia project. Beginning of February he was supposed to return to Riga.

The Physics Education community of GIREP has benefited over the years from many contributions of Tomass to the GIREP conferences. For a long-time Tomass scientific work also addressed questions from physics education, especially he was interested in the use of new media and computers in laboratory work and during lectures. In this field he demonstrated beautifully his broad understanding of physics and creativity. He has shown us from a wide range of possibilities (measurement with sensors, video, applets, use of computer algebra, etc) his ability to use these for better and more attractive physics learning. His outstanding research record has inspired many of his colleagues and will continue to do this.

Many physics educators know Prof Romanovskis very well, from the GIREP meetings and from the MultiMedia in Physics meetings. Just last September he participated at both meetings, in Udine and in Prague, and we could enjoy his presentations and discussions. Furthermore his fine scholarship and character made Tomass had many friends in our community, and we will miss his presence in our meetings deeply.

Ton Ellermeijer

E V E N T S

GIREP 2004 International Conference on *"Teaching and Learning Physics in New Contexts"*

Term: 19-23 July 2004
Place: Ostrava, Czech Republic
Important dates: Deadline for the registration: **31 of March 2004**
Deadline for the reduced conference fee: **31 of March 2004**
Deadline for the abstract: **30 of April 2004**
Deadline for the conference fee: **30 of April 2004**

Registration fee for the GIREP and EPS members is **350 EUR**. The fee includes

Extra services
- All meels for all days of conference from the opening to the closing
- Conference dinner
- Transport to/from conference center

Normal services
- Conference materials
- Book of Abstracts
- Conference proceedings on CD

The conference fee for the GIREP members excluding Extra services is **300 EUR (deadline 31 of March 2004).**

Conference organisers:
- Prof Erika Mechlova, Department of Physics, Faculty of Science, University of Ostrava, Ostrava, Czech Republic, e-mail: erika.mechlova@osu.cz
- Prof Petr Wyslych, Department of Physics, Technical university Ostrava, Czech Republic, e-mail: petr.wyslych@vsb.cz

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Conference website: http://www.girep2004.cz

More about the Conference

The International Conference of **GIREP 2004 "Teaching and Learning Physics in New Contexts"** will include physics and the physics teaching/learning process with regard to ecology, climate, biology, biophysics, chemistry, medicine, industry, economics, the arts, and all processes that can improve our living conditions from the point of view of physics.

Research into physics teaching is also included in the programme. Topics cover the impact of educational research on the physics teaching/learning process, interactive tutorial-based online laboratories, and a learning environment that will make introductory physics courses at college level accessible to anyone through research, physics distance education etc.

Transformation processes in teaching/learning physics: Changes in secondary school education, in introductory physics courses at universities. Distance education is a phenomenon of everyday life, and the interdisciplinary nature of physics has to be taken into account in new curricula of physics and new branches of physics, etc.

Participants at the conference will be any physicists and physics teachers who are involved in the education of physicists and scientific workers in physics with new ideas on the teaching/learning process in physics. The conference is open to all.

The structure of the conference will be as is standard at GIREP conferences

Plenary lectures focus on current problems that are being researched in many countries and must be discussed at an international forum. Topics are: interdisciplinary approaches to teaching/learning physics as results of physics research and physics distance education, information and communication technology in physics education, introductory physics courses at universities, etc.

Invited speakers are from all over the world.

- Jirí Dolejsí, Charles University, Prague, Czech Republic
- A. I. Ellermeijer, University of Amstrdam, Netherlands
- Paul G. Hewitt, City College of San Francisco, USA
- Robert J.Lambourne, Open University, Walton Hall Multon Keynes, UK
- Jerry Meisner, LAAPhysix – FIPSE, Greensboro,USA
- Jaromir Pistora, Technical University Ostrava, Czech Republic
- John Rigden, American Institute of Physics, College Park, USA
- Vladimír Spunda, University of Ostrava, Czech Republic
- M. N. Thompson, School of Physics, University of Melbourne, Australia
- Dean Zollman, Kansas State University, USA

Sections

1 Physics & Ecology in the Teaching and Learning Process
2 Physics & Climate in the Teaching and Learning Process
3 Physics & Biology in the Teaching and Learning Process
4 Physics & Biophysics in the Teaching and Learning Process
5 Physics & Chemistry in the Teaching and Learning Process
6 Physics & Medicine in the Teaching and Learning Process
7 Physics & Industry in the Teaching and Learning Process
8 Physics & Economics in the Teaching and Learning Process
9 Physics & Arts in the Teaching and Learning Process
10 Physics & ICT in the Teaching and Learning Process
11 Research in Physics Education

Panel discussion as a continuation of plenary lectures with information about the state of inquiry in different countries.

Working groups and workshops – Topics: computer-based experiments, hands-on experiments, application of physics in different types of technologies, investigation of the water and air around us, etc.

Poster sessions. **Show-and-tells** and **Exhibits** will also be included in the programme.

Exhibition of companies with physics instruments

Social Program – Trips and Excursions

1 OLOMOUC (historic centre) (25 €)
2 BOUZOV castle, HELFŠTÝN castle ruins (25 €)
3 BESKYDY mountains (25 €)
4 KRAKÓW – WIELICZKA – AUSCHWITZ (35 €)
5 Chateau HRADEC NAD MORAVICÍ and Arboretum NOVÝ DVÙR (20 €)
6 KOPØIVNICE (museum of veteran cars) – ŠTRAMBERK castle (20 €)

7 HUKVALDY castle ruins – NOŠOVICE (Radegast brewery) (20 €)
8 FULNEK – KLIMKOVICE spa (20 €)
9 MINING MUSEUM in Ostrava (**1**0 €)
10 Ostrava - sightseeing tour by historical tram (**1**0 €)
11 COAL MINE in Karvina-Lazce (colliery tunnels) (**1**0 €)

Accomodation: Preliminary registration of accomodation is on website of Conference
Hotel Category A in centrum of Ostrava, about 10 km from Conference center
Prices for Single room 50 – 100 €, Double room 70 – 120 €
Hotel category B in centrum of Ostrava, about 10 km from Conference center
Prices for Single room 40 – 60 €, Double room 60 – 100 €
Hotel category C in Campus, in Conference center
Prices for Single room 25 €, Double room 40 €

The abstract book will be published before conference. The manuscript for abstract is on website of conference. The abstract should not exceed 200 words.

The conference proceedings will be published on CD with full lehth. The proceedings will also be published on book for special interest of individuals. The special instruction for manuscript is on website of conferece.

The conference participants will have the opportunity to meet many experts engaged in the same field of investigation, especially in working groups, workshops, poster sessions, and show-and-tells. **Participants can launch future collaboration and take part in networking.**

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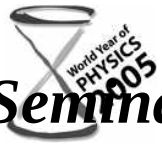

Third INTERNATIONAL GIREP Seminar
on
Informal learning and public understanding of Physics

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Contact: gorazd.planinsic@fiz.uni-lj.si

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