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In this issue

ICPE Chair's Corner

There continue to be shared global concerns on the lack of high-quality education in physics, and its applications, with detrimental consequences on scientific research and socio-economic progress. There are several aspects that need sustained attention. In this column, I flag two. One, there is an immense need for training and capacity building of physics educators. This is crucial if young students are to be motivated to pursue careers in physics or contribute to scientific and technological development as envisioned by their national goals. Given the primacy of Physics as the knowledge domain underpinning technological progress of humankind, the importance of this mission cannot be overstated.

Second, young students need to be motivated to pursue science. It is increasingly felt that the process must begin early if flight of talent from basic sciences is to be arrested. I would like to share a mammoth multi-billion initiative launched in India for attraction of talent to Science. *Innovation in Science Pursuit for Inspired Research (INSPIRE)* is an innovative program sponsored and managed by the Department of Science & Technology. The basic objective is to communicate to the youth of the country the excitements of creative pursuit of science, attract talent to the study of science at an early stage and thus build the required critical human resource pool for strengthening and expanding the Science & Technology system and R&D base. A striking feature of the program is that it does not believe in conducting competitive exams for identification of talent at any level. It believes in and relies on the efficacy of the existing educational structure for identification of talent.

Mentorship programs are an important component of INSPIRE. Scheme for *Early Attraction of Talent (SEATS)* aims to attract talented youth to study science by providing INSPIRE Award, to experience the joy of innovations, to one million young learners in the age group 10-15 years. Further, it is stipulated that annually about 50,000 students will be given exposure with leaders in science in the Summer/ Winter camps to experience the joy of innovations. Top one percent of students in their X Board Examination and pursuing science in Higher Secondary School Education, i.e. XI and XII standard are eligible to participate in this program. We are organising one such INSPIRE Internship Camp for 200 students for one week at my institution, Miranda House.

Moving upstream, 10,000 *Scholarships for Higher Education (SHE)* for undertaking Bachelor and Masters Level education in natural and basic sciences are being made available every year. Again, the top 1% students of school boards, prestigious entrance examinations for Engineering and Medical courses who opt instead for natural and basic science courses in any academic

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Physics Education in the Russian Federation

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This article is a slightly shortened version of a more complete paper, which may be read on the web site:
http://web.phys.ksu.edu/icpe/newsletters/n59_supplement.pdf
In the interest of fitting this paper into this newsletter, all tables, appendices and references have been excised from the article as it appears here. The reader is invited to refer to this web site for this extra information.

A former president of the Russian Federation (RF), Mr V.V.Putin, in his speech at VII-th Congress of university rectors of RF, pointed out that

> "the high quality of education in Russian Federation is one of the few factors making us a part of leading countries in the world".

First of all, the president meant the mathematical and natural scientific education (physics, chemistry, biology). It follows from the report of the rector of Moscow State university professor Victor Sadovnichij, that about 100 000 young specialists in Russia are leaving their country annually, getting jobs mainly in Europe and the United States. Most of them are physicists who have got free education in the institutes and universities of RF.

Physics education in the Russian Federation is based on the education system of the former Soviet Union. It is different from that of the United States or Europe. A typical educational trajectory of the individual person in Russia starts in General School when a child gets to seven years old and continues for ten years until the pupil reaches seventeen. General school in Russia combines American or European elementary school, high school and junior high school. At 17 an adolescent finishes general school and can enter university (higher education) or college (secondary specialised education).

The concepts of bachelor and master did not exist in the Soviet education system. Higher education in that system could be obtained after the period of five year's study. A corresponding diploma certifies that the owner gained a qualification in the particular field (physics, chemistry, applied mathematics, philology *etc*.). Such graduates are called *specialists*. Here one must distinguish between the specialty and specialisation. Any field of knowledge has a set of corresponding specialties, denoted by the particular code number: 010400–Physics, 010100–Mathematics, 011000–Chemistry, 040100–Medicine, *etc*. Each specialty may include several specialisations.

In the beginning of 1990s, the Russian education system took a turn towards the international educational space. Since that time the concepts of bachelor and master became a part of Russian higher education. The traditional Soviet system assumes five long years of study and is called *education over the specialty*. We will call it the SU system. In contrast with SU system, the international system assumes four or six academic years for the bachelor and master respectively. In Russia this system is called the *educational direction*, or the ED system.

At the present time Russian higher education has three different forms:

- Bachelor's degree (ED system, 4 year's study);
- Master's degree (ED system, 6 year's study, including 4 bachelor years); and
- specialist (SU system, 5 year's study).

In contrast with the first two, specialists do not receive a degree, but a qualification. The principal difference between the concepts of "bachelors" and "specialists" is that the bachelors get a broader spread of knowledge, but which, however, is not so deep. In contrast, specialists receive deeper but more specialised education within some particular branch of studying specialty. On the other hand the masters get broader and, at the same time, deeper education, comparing with that of specialists.

These three educational levels, two of which represent the ED system and one which represents the SU system, are sometimes called in RF the *1st level* (bachelor), *2nd level* (specialist) and the *3rd level* (master) of higher education. Students may get a bachelor's degree at the age of 21, a specialist diploma at 22 and the master's degree at 23.

The State University of Kabardino-Balkarian where the author is head of the Theoretical Physics Department

As a rule, in RF, nearly all of the students having a bachelor's degree continue their education in magistracy. Nowadays 530 specialties and educational directions make up the higher education in the Russian Federation [3]. There are about 900 educational institutions in RF, providing higher education for 3 million students.

The problems with physics education in Russia have been discussed in detail at the first Congress of Physics Teachers of RF "Physics Education in the XXI century" in June 2000. That was the first time in Russia that physics teachers at general, specialised and higher educational levels had been gathered together to determine a common program of development of physics education. It was noted by many participants that negative trends in the Russian education system appeared just after the collapse of the Soviet Union. The number of physics hours in the schools was reduced and physics education became less fundamental. Although it was pointed out that physics was the basis of the successful development and defensibility of any country pretending to a leading role in the world. The role of physics education in the general school for forming the correct world outlook of pupils was also emphasised.

Some important aspects of natural science education, including physics, have recently been discussed at the First and the Second International Congresses "Universities and Society" in Moscow.

The Elbrus mountain, which is a symbol of the Kabardino-Balkarian republic, and the highest peak in Europe.

Physics in the general school.

Physics in the general schools starts at the 7th grade when a pupil reaches 13 years old and continues for five subsequent years. Up to 9th grade all pupils, independent of their individual abilities, study the same program. The last two grades are specialised, *i.e.* the pupil can choose a class according to his or her abilities: physics and mathematical class, philological class, *etc*. The basic textbooks in physics, however, are the same, independent of specialisation. These books are written in such a way that they present different levels of material simultaneously. It means that pupils studying social science, for example, use the same physics textbooks as those studying in physics classes.

Besides the basic physics textbooks there are many others written by different authors with various degrees of complexity. In the present paper we shall consider only the basic general school textbooks recommended by the Russian Ministry of Education and Science (RME). Also recommended are books of physics problems. The most commonly used text book, containing the large number of problems with different levels of complexity, is that by Rimkevich A.

The numbers of academic hours per week for physics in an ordinary general school are: 2 hours at 7th and 8th grades, 2-3 hours at 9th grade and 2 hours at 10th and 11th grades. For classes with physics and mathematics specialisation, the number of hours per week can be 5-6 or even more (in 10th and 11th grades). Many universities and institutes in RF begin training the pupils in the general schools to make them future students. Usually such schools have special classes taught at the 10th and 11th grade.

According to the new educational system, which is now being introduced in the Russian general schools, the physics programs for 7th–9th grades are assumed to be common programs for all the pupils independent of their future specialisation. Physics is considered as a science, which develops facility in critical thinking, reasoned argumentation and true understanding of the nature phenomena.

Physics in the higher education system

High education system in RF has some general rules. Any specialty or educational direction is governed by the corresponding Educational and Methodical Council (EMC), which, in collaboration with Russian Ministry of Education and Science, develops the basic document, defining the educational process on particular specialty (or educational direction). This document is called the State Standard of High Professional Education (SSHPE), or simply the educational Standard. Standards are confirmed by the Ministry of Education and Science of RF. The first generation SSHPEs were established in Russian education in 1994. Since the year 2000 the second generation is in process.

Any SSHPE contains the following items:

1) general features of the given specialty (or ED);
2) requirements for applicants who have chosen the given specialty (or ED);
3) general requirements for the educational program;
4) requirements for an obligatory minimum of the contents of the given education program;
5) duration of the educational process;
6) requirements for the conditions of realisation of

the given educational program (including the qualification of the teaching staff); and

7) requirements for the final examination of the graduate (final certification). The final examination includes the state examinations and the defense of the graduation work (the bachelor, specialist or master thesis).

The curriculum is developed by the teaching departments of the universities or institutes, mainly in agreement with the items 4) and 5) given above. The amount of studying time is measured in terms of the academic hours and weeks. It is assumed that students should not study for more than 54 hours per week, *i.e.* 9 hours per working day. The number of class hours should not exceed 36 per week. The hours that a student spends in the classroom are called the *auditorium hours*, whereas the time during which a student studies by himself or herself is measured through *self-training hours*. The Standards of most specialties (and EDs) restrict the amount of auditorium hours to 27 per week. The hours of sport exercises (physical culture) and optional disciplines are not included in this 27-hour limit. But, as an exception, the physics Standards permit a 32-auditorium hour limit. This is because of the large number of laboratory classes in the physics curriculum. Unfortunately, the physics educational Standards of the third generation, which have recently been approved by EMC-physics [14], do not contain any such 32-hour requirements. In practice this means that specifics of physics education will no longer be taken into account by the university officials defining the teaching curriculum.

The EMC in physics is located in the Moscow State university, and is briefly called the EMC-Physics. As a rule the deans of the physics departments of the leading universities are members of the EMS presidium. They meet at least twice a year to discuss the current problems of high physics education. The EMS-Physics generates recommendations, rules, new physics educational programs *etc*. for all higher education institutions throughout the country.

Designing the Physics curriculum

Nowadays ten physics specialties exist in the RF. (For more detail see Appendix 1 of the extended article.) The role of specialisation on the master level is fulfilled by the master programs corresponding to any educational direction. As it has been mentioned above, the educational directions (the ED system) on the bachelor level do not have a specialisation – this fragment can be excluded.

The set of disciplines defined by the SSHPE are divided into five different sections:

- GSE (General humanitarian and social-economic disciplines, 1800 hours);
- NS (General mathematical and natural science disciplines, 3440 hours);
- GPD (General professional disciplines, 1310 hours);
- DS (Disciplines of specialisation, 1532 hours);
- OC (Optional courses, 450 hours).

The number of auditorium hours is proportional to the cost of the giving the educational program. The total staff of universities in RF depends on the number of students in the ratio 1:10, although the material of the individual specialty (or ED) depends on the number of auditorium hours.

Each of five sections contains a federal disciplines and a regional component. The latter is formed by the individual department according to its educational traditions *etc*. The department decides the elective courses for each section. The Standard does not define the number of hours for all the disciplines; this is up to the universities, who can vary the number of hours for each section within the limit of 10%.

It is not necessary to include all the disciplines of the GSE section into the curriculum. The only obligatory courses from this section are: the foreign language; physical culture (athletics, sport); the state history and philosophy. The university must include all the disciplines of NS and GPD sections.

The DS section is usually divided by the departments into two approximately equal parts: the disciplines listed in DS section and those in a DSL subsection which may contain up to 5–10 disciplines and is formed by the departments according to the specific features of the individual specialisation. The OC section contains the military courses. This is not obligatory for all the students (in the Soviet Union it was obligatory). Usually about only 10-15 percent of the student contingent can get the high military education and receive a commissioned rank (i.e. to become an officer). Usually competition among the students to enter the military department of the university is rather high. A military diploma, together with the physicist diploma, gives more opportunities in getting a job.

For a typical curriculum for specialty 010400–“Physics”, the first part is called the schedule of the educational process (SEP). (For further information refer to Appendix 4 of the extended article.) The total educational duration is 260 weeks, which is equivalent to 5 years. It follows from the SEP, for example, that from January 19 to 25 the 1st–4th year students have an examination session, whereas the 5th year students have a professional practice.

The typical curriculum plan (CP, see part 2 in Appendix 4) includes all the disciplines with their volume (in hours) and sequence. There are two types of estimation of the student's knowledge: the examination and the test (sub-examination). The exams have four degrees: excellent, good, fair and bad. The tests have only two possibilities: positive and negative. The number of exams and tests in one semester should not be more than 12.

As an example consider quantum theory. This discipline has an exam in the 7th semester and a test in the 6th semester. In the 6th semester the quantum theory has 3 auditorium hours per week whereas in the 7th semester the number of auditorium hours per week is 5. The number of auditorium hours both in the 6th and 7th semesters is 144. We may say also, that number of lecture hours per week on quantum theory is 2 in the 6th semester and 3 in the 7th semester,. Since the number of weeks for theoretical education in the 6^{th} and 7^{th} semesters is 18, the total number of auditorium hours is 2x18+3x18=90.. The total number of auditorium hours which any individual student can have per week is 36 in the 1st – 6^{th} semesters, 27 in the 7th semester, 34 and 25 in the 8th and 9th semesters correspondingly. This number never exceeds 36. Note: the concept of the credit hours does not exist in the present Russian education system.

Master's programs

Master programs are parts of ED-system. Anyone having a bachelor diploma can enter the magistracy by competitive examinations and obtain a master degree within the period of two years (104 weeks).

The master State Educational Standard provides the following disciplines, which are the same for all physics master programs: the modern problems of physics; the history and methodology of physics; the philosophical problems of natural sciences; the professionally oriented foreign language; computer technologies in education and science; the national and regional component and elective courses. These disciplines form a federal component of the master program and take 1100 hours. The special disciplines take 800 hours and are not defined by the Standard. Each university forms the set of these disciplines according to its scientific schools and traditions, but in agreement with the chosen master program. The theoretical education, therefore, takes 1900 hours and continues for 41 weeks. Examination sessions and holidays take 7 and 12 weeks correspondingly; the scientific and pedagogic practice take 15 and 5 weeks correspondingly; working on the graduate thesis (dissertation) takes 20 weeks and vacation takes 4 weeks. It is evident, therefore, that scientific research is important and large part of the master education program. The final graduate certification consists of state examination and defence of the graduate thesis.

Additional qualification

The programs of high SU-education considered in the previous chapter provide the basic qualification (see the last column in Appendix 1). The students can get the so called additional qualification, which is not obligatory. As is follows from the CP shown in the Appendix 4, the week's number of auditorium hours in the 7-9th semesters is less than 36, therefore there is possibility to fill the curriculum by some additional educational program, parallel with the basic one, shown in Appendix 4. The most popular additional education program gives an additional qualification called "The teacher". A student who graduates with such qualification receives an additional diploma, which permits to work as a teacher of physics. Some other additional qualifications are possible: "The translator of the scientific and technical literature", "The physicist-criminalist", etc.

The total amount of hours for additional qualification is equal to 1400. For teachers the corresponding curriculum includes the following disciplines: psychology and pedagogics; age-related pedagogical psychology; the theory of education and bringing up; new informational technologies in education; and special disciplines. The set of special disciplines depends on the basic qualification. For physicists the special disciplines are following: the history and methodology of physics; the principles of physics teaching; scientific basis of school physics teaching; school physics laboratories and one or two elective courses. Usually the additional qualification starts at 5th -7th semesters. In some universities the additional education is not free of charge.

The additional education in the ED-system can be obtained only in the magistracy within the limit of 1080 hours above the basic educational program. The most popular additional program for masters is "The high education teacher".

Educational Standards of 3-d generation

The new generation of State Standards of Physics High Professional Education of Russian Federation has recently been approved by the EMC-physics. The basic idea of the 3-d generation Standards is integration of the Russian education system with that of European Community. Requirements for an obligatory minimum of the contents of the education programs are not included into the 3-d generation Standards. Instead, these Standards are based on the competencies. The basic features of the new Standard, however, are in principal the same as those outlined above. The concept of specialist will not exist any more, so there will remain only two high-educational levels: bachelors and masters. Instead of "auditorium hours", "credit hours" will be in use.

The Standards of 3-d generation have been criticised by some human rights organisations and leaders of some national republics of Russian Federation [16] because of the absence of the regional component in education. From their point of view the new Standard is not in line with global standards of education, which should provide preserving the national culture of any ethnic group in Russian Federation.

Conclusion

Professor E. de Wolf impartially pointed out that

> "Russian physics was not different from Western physics. Their poor realisations were due to lack of competition, and that caused the collapse of their system".

The Russian education system as a whole is now at the crossroads. What is the correct way? Many university professors, scientists and education specialists are very distrustful to the changes towards the European and American systems. Isn't it better to keep the well organised Soviet system?

As it has been mentioned above, tuition in RF is free of charge. Nowadays, however, the parallel system of commercial education also exists. The same university (or institute) can provide both charge free education and commercial education, but the number of commercial students should not exceed 25 percent of the total student contingent. Usually physics departments have only few commercial students, in contrast with the departments of medicine, economics or jurisprudence.

The charge-free education creates many problems. The salary of the university teachers is very modest and is much lower than that of the Soviet period. The average quality of education has fallen down, although a number of elite universities exist with very high educational levels. Government can cover only about 50 percent of the real needs of the universities. It is not declared officially, but in some sense the charge free education is the price the federal government pay for the general stability in the country. Under the bad economical conditions, the charge free high education keeps 3 million young people out from the streets. Due to the internal and external "leakage of brains" the number of scientists in RF has been reduced for the last 12 years by a factor of 4-5 and amounts today to about 600-700 thousand [18]. It has been pointed out by many authors, that the only way to preserve the high level of physics education is to keep its fundamental basis. Taking into account all the negative social and economical factors accompanying the physics education in RF, one may conclude, that education is still functioning properly due to the well-constructed system, which permits one to overcome these negative factors.

Some negative trends in physics education are international. Professor Martin Huber, the President-Elect of the European Physical Society, has recently pointed out, that

> "In some European countries the number of physics students has reached dangerously low level; there, physics students aren't even numerous enough to replace today's physics teachers when they retire".

Therefore, the future of our discipline is in jeopardy [20]. To avoid such negative trends some regions of RF are working out their regional educational programs. The Kabardino-Balkarian republic of RF has created the regional "Concept of physics education in general schools", which is, of course, in agreement with federal standards. The concept has been in process since 1996 and today its positive role is evident.

The last decade has created new serious problems in the Russian education system. Formally the Russian officials declare the successful process in the way towards integration with European educational system (in RF this is called the *Bologna Process*). In reality, however, negative undemocratic processes in society have brought about reinforcement of authoritarian trends in the education system both at the Federal level and in the particular Educational Institutions. As a result, corruption in education has achieved a critical level. The role of advanced scientists in the education process has become quite small, whereas all the important decisions concerning the education process are taken by bureaucrats. The hidden motivations of many of such decisions are the criminal redistribution of funds.

One may very often face a situation when the advanced scientists with world-known publications have no grants, whereas those who are not known by scientific community receive huge amount of funds coming mainly from Russian Ministry of Education and Science. Corruption in this sphere is functioning by means of the so-called *otkats* ("rolling back") *i.e.* the funds are in the hand of some bureaucratic groups supporting only those who provide up to 25 % of the grant amount back to them. The Russian Fund of Basic Research is much less corrupt, but the funds provided by it are very modest. Since 2002 the role of the computer testing in the university physics education has been discussed at the annual meetings of Physics Educational and Methodical Council (EMC). I have also participated in such discussions.

The general opinion of the university physics community is that the computer testing can be a part of the education process, but it can not be the main instrument testing the quality of the physics education. How can the computer testing value the knowledge in theoretical physics, for example? In October 2003 the director of the Testing Center of Professional Education Mr. Vasiliev V.I. was invited to the meeting of the university physics community, where about 50 deans of physics departments of Russian universities participated. Having no reasonable arguments, Mr. Vasiliev simply said

> "Federal computer testing will be a reality independently on your decisions".

This is a typical way of solving most of the educational problems in modern Russian Federation. Such situation is in evident contradictions with the European university declarations.

Current Teaching of Physics in Poland

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Editor in Chief, Concepts of Physics

Background

The school system in Poland consists of three levels of schools: the primary schools, the secondary schools (gymnasia) and high or technical schools. Physics teaching starts at the secondary schools as a part of teaching a natural history. Of course, the teaching is quite superficial and only the rudiments are included. The teaching content is regulated by a special law established by the Education Department (Ministry of Education). Real teaching of physics is carried out only in high schools. As a rule, the teaching is conducted on two levels: basic one and extended.

The University of Łódź, where the author is Professor of Physics, and heads the Chair of Modeling the Teaching Processes.

The main goal of teaching physics is to create an awareness of the existence of physical laws. On the basis of that it is desired to train the pupils in the ability of rational thinking. It is expected that, as a result of learning, pupils will more reasonably react to results of observation and received information. They should be able to judge what is probable and what kind of heard information contradicts the basic laws of Nature. Young people should understand the meaning and the role of physics and other natural sciences in life. They should understand that without physics any technical progress is impossible. So it is desirable to create among the pupils an interest in physics. Teachers should show them how to perform observations and how to verify hypotheses in planned experiments. The educated people should be able to distinguish scientific information from popular non-scientific pseudo-information.

Topics covered

At the basic level the following topics are included in physics syllabuses:

1. Properties of matter.
2. The states of matter: solids, liquids and gases. The kinetic model of matter.
3. Motion and forces.
4. The notion of a point-like bodies.
5. The description of rectilinear and uniform motion, its differences from curvilinear motions. Trajectories, speed and acceleration.
6. Mechanical interactions and their effects. The notion of mass and gravitational interaction.
7. Newton's laws.
8. Energy, work and power.
9. Conservation laws for momentum, energy and angular momentum.
10. Other kinds of energy, the first law of thermodynamics.
11. Electricity and magnetism. Electric charges and their interaction.
12. Electric and magnetic fields.
13. Circuits with steady currents. Kirchoff laws.
14. The electromagnetic induction.
15. Electromagnetic and acoustic waves and their application to transfer information.
16. The structure of atoms.
17. Nuclear energy and radiation.
18. Solar system and elements of cosmology.

At the extended level the following new elements are added:

1. The notion of a reference frame and the description of motion in different reference frames. The relativity principle.
2. Periodic motions. The model of harmonic oscillator.
3. The relativistic effects in different motions.
4. Order and chaos in Nature.
5. Reversible and irreversible processes.
6. Entropy.
7. Elements of statistical physics with application to microscopic models of matter.
8. Light and its propagation. Diffraction and interference.
9. Quantum structure of light, the photoelectric effect and laser.
10. Matter fields, de Broglie hypothesis.

11. Basic knowledge of principles of electronics, semiconductors, superconductors, diodes and transistors.
12. The equivalence of mass and energy. The nuclear energy and nuclear plants.
13. The structure of Universe, dark matter and dark energy.
14. Physics and philosophy.

It is certainly a very rich program of teaching physics. Unfortunately, the number of classes in schools devoted to learn physics is extremely small. Therefore, there is not enough time to analyse a sufficient number of interesting examples. Many schools do not have good laboratories to perform experiments and exercises. Consequently, it is a common complaint of physics teachers that it is almost impossible to realise the teaching program in the prescribed time on the required level.

Other matters

It must also be pointed out that students are not very much interested in learning physics. The process of lack of interest in learning physics expands in recent years. According to sociological investigations in many schools, physics is classed as the least pleasant subject. This is one of the reasons that such a small number of graduate students of high schools choose physics as a subject to study at the university. In addition, public television has cut out all popular programs in physics and other natural sciences.

There are no unique textbooks for pupils. On the market some dozen textbooks are available. Practically, all teachers have the right to choose the textbook which they consider the best one for their pupils. They even have the right to write their own textbook, provided they can find a publisher.

Apart from the obligatory program of physics in schools, there are some special competitions organised for gifted pupils. They are called Olympic Games in Physics which have more then a half of a century of tradition (a similar Olympic games are organised also in mathematics, chemistry, astronomy and other topics). There are three levels of the competition. The first level is as a matter of fact a kind of additional homework. Successful pupils are invited to the second level competition, run by university teachers. The best pupils from that level then take part in the final game and the most successful participants are classified as prizewinners. The winners may enter universities without any additional examinations. They also have the opportunity to take part in many international competitions.

ICPE Council Members

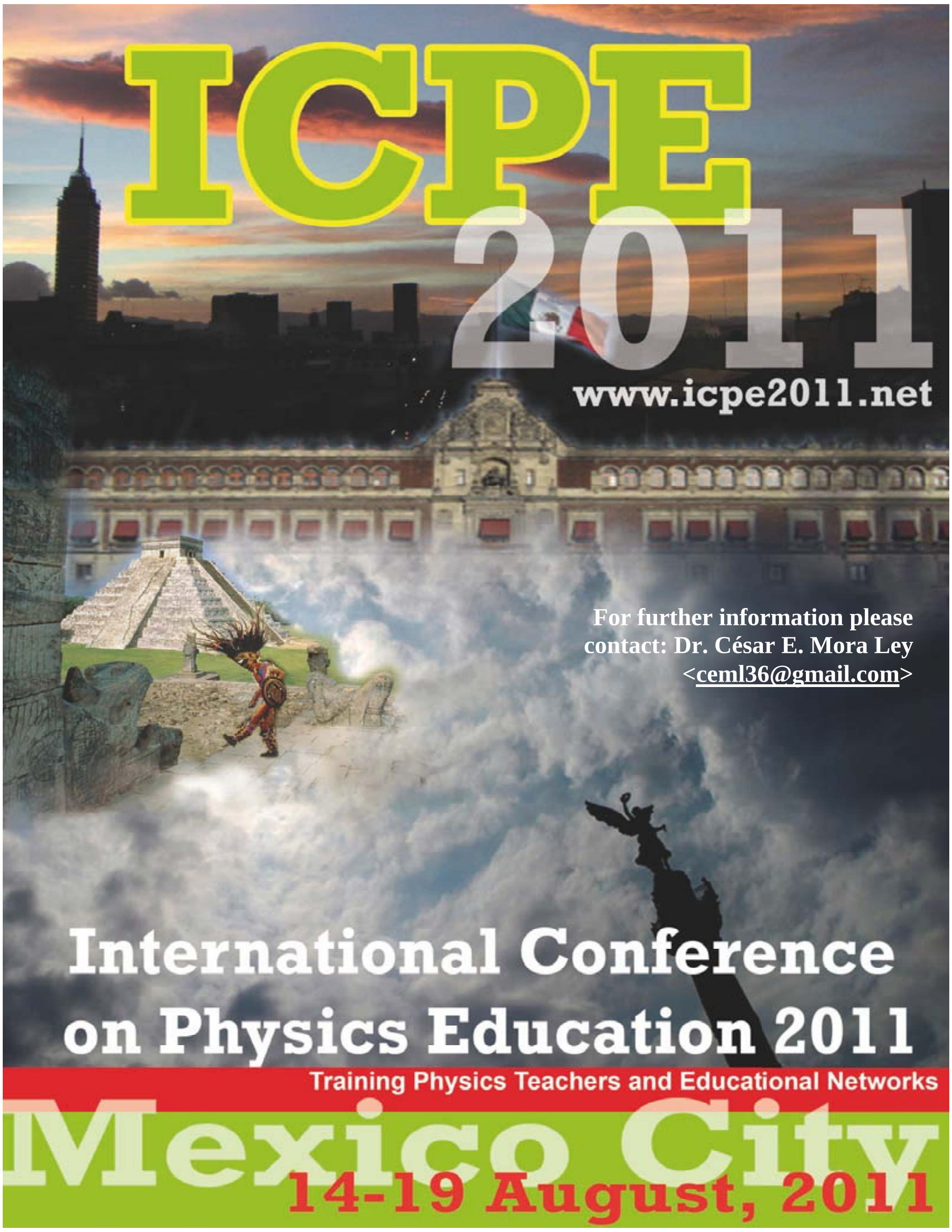
The General Assembly of IUPAP held at Japan in October 2008 brought in several new members on board the Commission for a period of three years.
The reconstituted commission is:

Officers:

Chair: Pratibha JOLLY, India
Vice-Chair: Robert LAMBOURNE, UK
Secretary: Dean ZOLLMAN, USA
Members: Elena, SASSI, Italy
Ann-Marie PENDRILL, Sweden
Hideo NITTA, Japan
Nianle WU, China
Michael VOLLMER, Germany
Dvorak LEOS, Czech Republic
Edward KAPUSCIK, Poland
Zulma GANGOSO, Argentina
Alexandru JIPA, Romania
Saalih ALLIE, South Africa
Gizaw MENGISTU, Ethiopia

Associate Members :
Minella C ALARCON, UNESCO
C. P. CONSTANTINOU, Cyprus
Cesar Eduardo MORA LEY, México
Ian D JOHNSTON, Australia

The contact addresses of the members are available at **http://www.iupap.org/commissions/c14/members.html**



ICPE Chair's Corner *(cont from page 1)*

institute or university leading to graduate and post-graduate degree are eligible for scholarship. Intensive mentoring programmes through summer attachment to performing researchers are planned. Further, the scheme aims to enhance research fellowships for doctoral studies and open up partnerships with private sector for topping the Government's efforts in nurturing talents for research. Finally, up the pyramid, INSPIRE Faculty Awards aims to provide assured career opportunities to select few that qualify a rigorous international and national peer review on basis of potential for research.

The success of this comprehensive plan rests on the quality of sustained mentoring at all levels. That brings us back to square one: what physics should we teach and how?

Pratibha Jolly
ICPE Chair

GIREP-ICPE-MPTL 2010 Reims International Conference
August 22-27, 2010 – Reims, France

Teaching and Learning Physics Today: what challenges? what potential benefits?

We kindly invite you to participate in the GIREP-ICPE-MPTL International Conference on *Teaching and Learning Physics Today: what challenges? what potential benefits?*, to be held August 22-27, 2010 at the Centre des Congres, Reims.

During the last 15 years, in most countries, the popularity of physics among students has declined. Different universities propose different ways to confront this situation and it seems that some of them have already improved it. We hope that our conference will offer an opportunity for all of us to discuss it in depth and to share our experience in order to move forward in this field.

Sculpture: Christian Renonciat, "la pierre d'heures", (1992)

The Program Committee has already received over 250 abstracts for presentations addressing the following sub themes:

PER and Suggestions for Improving Physics Teaching

- Teacher training (developing teaching competencies, etc.)
- Initial teaching
- Different ways of learning
- Teaching using History of Physics

Physics

- Physics today (spintronics, ...)
- Energy,
- System Earth (climate, environment, …)
- Physics and Human Body,
- Teaching University Physics to non physicists,

We are happy to present our invited key note speakers: Albert Fert and Laurence Viennot (France), Manfred Euler (Germany), Gorazd Planinsic (Slovenia), Sabastian Dormido (Spain), Eugenia Etkina and Ruth Chabay (US).

During the conference, the ICPE will celebrate the 50th anniversary of its creation, with UNESCO's help, in Paris in 1960. Its members will reunite in France for the first time since then. The ICPE President Pratibha Jolly will give a special anniversary lecture on Friday morning.

The venue for the Conference is *Palais des Congrès* in Reims. You can reach Reims by TGV train from Paris (45 minutes) or from CDG Paris airport (30 minutes, but twice a day only).

Oral presentations, (multimedia) workshops, (interactive) posters and symposia will take place during morning and afternoon parallel sessions.

You can find further details on the conference website

http://www.univ-reims.fr/girep2010

Online registrations and bookings in hotels are now open.

ICWIP 2011
4th IUPAP International Conference on Women in Physics
Stellenbosch, South Africa
April 5-8, 2011

The 4th IUPAP International Conference on Women in Physics (ICWIP 2011) will be held in April 2011 in the tranquil, historic town of Stellenbosch, South Africa. This triennial meeting is organised under the auspices of the International Union of Pure and Applied Physics (IUPAP) and will be hosted by the South African Institute of Physics (SAIP) and Women in Physics in South Africa (WiPiSA). ICWIP 2011 will provide a forum for both scientific presentations and for discussion of issues related to attracting, retaining and improving the status of women in physics. **It is our great pleasure to invite you to attend ICWIP 2011.**

Women in Physics

Universal access to science, and participation in science, is a principle that runs through the activities of the International Scientific Union ICSU and its member unions, including the International Union of Pure and Applied Physics.

The International Union of Pure and Applied Physics has recognised a particular need to foster the participation of women in physics. Through a resolution in 1999, IUPAP initiated a Working Group on Women in Physics. The mandate of the group is to survey the present situation and report to the Council and the liaison committees, and to suggest means to improve the situation for women in physics.

Programme

The conference will consist of:

- Plenary talks by eminent physicists
- Scientific Papers and Posters - the participants will be able to participate in two different sessions:
- Country Papers on the Status of Women in Physics & Working Group Activity
- Scientific Program
- Workshops
- Meetings of Regional Working Groups
- A Public Outreach Event in which delegates may interact with the local community

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For further information please visit the official conference website

http://www.acitravel.co.za/icwip2011/

Online registrations and bookings in hotels are now open.

Related Conference

Gordon Research Conference on Physics Research and Education

Experimental Research and Laboratories in Physics Education

The sixth in a series of Gordon Research Conferences exploring the connections between Physics Research and Education

June 6 – 11, 2010

Mount Holyoke College, South Hadley, Massachusetts, USA

Sessions:

- Undergraduate Research
- Upper-level Labs
- Experiments, Simulations and Modeling
- Advanced Lab
- Hands-on Experiments for Diverse Populations
- Innovative Labs and Approaches
- Frontiers in Experimental Physics
- Labs and Conceptual Learning
- Mentoring Through Research

Speakers for the conference:
Joseph Amato, Mark Beck, John Belcher, John Brandenberger, Peter Collings, Sara Eno, Fred Goldberg, Jerry Gollub, Charlie Johnson, Pratibha Jolly, Matthew Lang, Priscilla Laws, Hideo Mabuchi, Mark Masters, Eric Mazur, Jan-Peter Meyn, Jim Nelson, Dick Peterson, Keivan Stassun, MacKenzie Stetzer, Nilgun Sungar, Dean Zollman, Alma Zook

Chairs: Chandralekha Singh & Kiko Galvez
Vice-chair Peter Shaffer

For more information go to
http://departments.colgate.edu/physics/grc/
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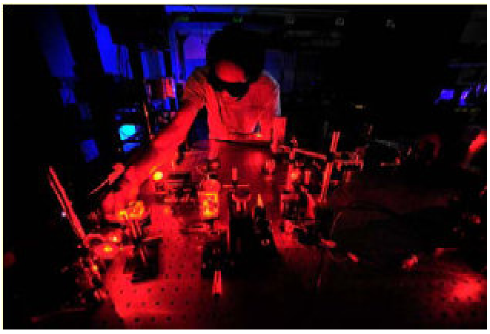

IUPAP – ICPE
International Commission on Physics Education
International Union of Pure & Applied Physics

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