GIREP newsletter

Groupe international de recherche sur l'enseignement de la physique
International Research Group on Physics Teaching
Internationaler Arbeitskreis zur Förderung des Physikunterrichtes

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The Situation of Physics Teaching in Portugal

Maria João Martins, University of Lisboa

The data contained in this communication was obtained from two reports: one on the profile of physics research in Portugal co-ordinated by Prof. C.M. Ferreira, the president of IST and edited by the Ministry of Science and Technology of Portugal; the second report referred to quality evaluation of physics teaching in Portugal and was co-ordinated by the Fundação das Universidades Portuguesas (FUP).

As it happens in other European countries co-operation between people involved in research in physics education and physicists is difficult and can be attributed to a number of reasons:

- Research in physics education is not considered valuable by "pure" physicists.
- Scientists feel that physics knowledge of researchers in education is not completely up-to-date.
- Researchers in physics education feel that physicists want to preserve traditional teaching, blaming the students for the lack of successful learning.

In recent years, in the course of a pedagogical reform, the teaching of physics was decreased by one year. This fact, together with the international tendency of decreasing student numbers in the physics area has led to a decrease of students in technical courses.

Major problems in physics teaching at high school level were:

Lack of student/teacher interaction
Traditional way of teaching
Lack of demonstration experiments in the classroom.
Scarce use of ICT and modern techniques at high-school level

To remedy the situation a program entitled "CIÊNCIA VIVA" (Science Live) was launched by the ministry of Science and Technology in 1996. Its aims were:

- To promote the use of new technologies and modern methods in science teaching,
- To bridge the gap between the teaching community and the research community,
- To promote inter-disciplinarity in the teaching of scientific disciplines.

The program until 2001 contributed in a great measure to increase the use of ICT in science teaching. In many cases it was also possible to establish links between the university

researchers and the teachers in high schools.
The long term impact of these actions still requires some evaluation.
Other measures to counteract the desertion of technical courses and promote quality in teaching was the increase in the offer of courses for physics teaching and the Life Long Learning approach. The courses for physics teaching present mainly a four-year curriculum devoted to physics and pedagogical and didactic disciplines and one-year training period in schools.
New courses devoted to modern applications of physics are also offered in many universities, such as Medical Physics, Physics of New Materials, Optoelectronics and Optometry, Meteorology and Oceanographic Physics, and one course in Astronomy and Astrophysics in the University of Oporto.(please refer to Table 1)
The table below summarises the existing courses in physics in Portugal.

TABLE 1- Summary of Physics degrees in Portugal and awarding institutions

University	Faculty	Course title
Univesidade de Lisboa	Faculdade de Ciências	Teaching of physics Physics and Engineering Physics Geophysics
Universidade Técnica de Lisboa	Instituto Superior Técnico (IST)	Technological Physics Engineering Biomedical Physics
Universidade Nova de Lisboa (UNL)		
Universidade do Porto	Faculdade de Ciências	Physics Applied Physics Physics and Technology of Materials Mathematical Physics applied to Astronomy
Universidade de Coimbra	Faculdade de Ciências e Tecnologia	Physics Engineering Physics
Universidade do Minho		Biomedical Engineering
Universidade de Aveiro		Physics Teaching of Physics and Chemistry Meteorologic and Oceanographic Physics
Universidade do Algarve		Medical Physics Technological Physics Engineering Teaching of Physics and Chemistry
Universidade de Èvora		Teaching of Physics Biophysical Engineering
Universidade da Beira Interior		Teaching of Physics Optometry and Optoelectronics
Universidade Trás-os Montes e Alto Douro-UTAD		Teaching of Physics and Chemistry
Universidade Aberta		Promotes in service training of teachers
Univ. Madeira		Physics Teaching

Following the European directives for harmonisation of curricula in higher education - Bologna Convention - it is expected that the courses will be shortened or converted into a new 3+2 frame, giving the qualification of bachelor (3 years after finishing high school) and Master (two years specialisation after bachelor degree has been obtained).

ACKNOWLEDGEMENTS
I wish to acknowledge the help provided by Professor Carlos M. Ferreira, the President of Instituto Superior Técnico and former President of the Portuguese Physics Society for information concerning the two reports mentioned in the first part of this communication.

First International Seminar

DEVELOPING FORMAL THINKING IN PHYSICS

University of Udine 2-6 September 2001

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The logo of the Seminar

DEVELOPING FORMAL THINKING IN PHYSICS

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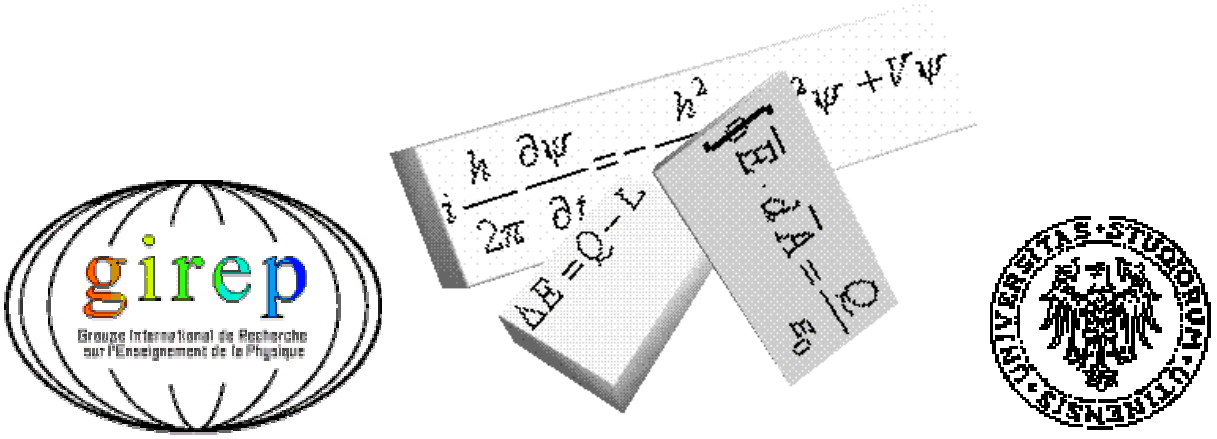


1.The Seminar

From the 2nd to the 6th September 2001 the first international Seminar of the Group International de Recherche sur l'Enseignement de la Physique (GIREP) was held at the University of Udine concerning "DEVELOPING FORMAL THINKING IN PHYSICS", organised by the Interdepartmental Centre of Didactic Research of the University of Udine (CIRD) with the collaboration of the National Conference of University Centres of Research in Education and Didactics (Concured). Ian Lawrence, from the University of Birmingham, and Marisa Michelini, from the University of Udine, were in charge of the scientific side.
In 1997 the GIREP Council had already expressed the intention of organising seminars between its international conferences, which are held every two years. The GIREP

conferences, traditionally organised with the International Commission on Physics Education (ICPE) of the International Union on Pure and Applied Physics (IUPAP), are surely one of the most important points of reference for the international community, with regard to physics teaching. They offer the opportunity to compare and exchange the results achieved in research and experimentation in class.
It is one of GIREP's main choices to create a union between experts in research into didactics and didactics professionals, to achieve an explicit collaboration between research and teaching, at all levels of didactics, from primary school to university.
GIREP conferences are held every two years and each time they are more articulated. In the few days they take place it is only possible to make contact with the many colleagues attending, who present for discussion an ever wider spectrum of works. The need for more time for discussion and for finding new ways to make comparisons and an in-depth study was expressed in a proposal for seminars between conferences, reserved to a limited number of researchers and teachers.
At first these seminars were thought of as minor conferences for colleagues of nearby countries. GIREP seminars were thought of in 1997 as moments to work on particular topics for researchers in scientific didactics from around the world, chances to begin collaboration in research and in preparatory activities for the topics of the following GIREP conferences. For various reasons, no seminar was then organised, but afterwards both the seminars and the Groups for Thematic Discussions were presented by the GIREP Newsletter n.43, November 2000, as a proposal for a new, deeper and more frequent way of interaction between researchers of scientific didactics.
Therefore, this first seminar held in Udine represents the realisation of a strongly desired project.

2.**The topic of the seminar: the development of formal thinking**

The subject of the first GIREP seminar was the development of formal thinking.
Why was this specific topic chosen?
Physics allows us to organise our knowledge of the world around us, to describe it and to interpret it, to appreciate its beauty but also to foresee its evolution. These possibilities are given to us by the different ways of looking at the world itself: mechanics, thermodynamics, electromagnetism, optics, and so on. We can concentrate on macroscopic or microscopic aspects, use the classic or quantum vision, and each one of these ways presupposes different forms of formalisation and of use of mathematics. The language of physics itself makes use of objects and instruments of mathematics, offering us the ability to describe, interpret and predict. The game of understanding in physics through experiments and theorising, which builds links between equations and data, makes physics more fascinating for us, but not many young people are so enthusiastic about it any more.
There are many reasons: the secondary role given to physics in many fields in which instead it is indispensable, the scarce recognition given to its researchers and operators, the little importance attributed to it in education and the scarce understanding of its educational value, the effort required for its study. The new ways of communication, in which meanings are made through intuitive association, languages based upon images and actions also seem to move more away from the physics processes of formalisation of mathematical language. The development of formal thinking in physics represents the acquisition of a cognitive network which assign meaning to figurative elements and which allow students to navigate around the land of physics.

If we do not want to lose this knowledge and if we still believe it to be important, we must make an effort so that physics will become more familiar to all. We must work to introduce it early to young children in the primary school, we must work to make it more easily understood, in order to connect the language of physics to everyday language.
The necessary prelude to a new way of approaching the teaching of science and especially of physics might well be an analysis of formalisation processes at all educational levels and a discussion of the connection between mathematics and physics.

3. **Structure of the seminar**

The first seminar organised by GIREP was inaugurated in Udine, in that same room of the Castle of Udine where, in 1995, the International GIREP-ICPE Conference on the teaching of science of condensed material and new materials was started.
At that time, it had been almost 20 years since a GIREP initiative had last taken place in Italy, and the Conference was most certainly a challenge. However, the realisation of this first GIREP Seminar has been even more important and demanding, because it is the start of a new initiative, towards which there are many expectations. It appears that the long awaited results have been achieved, and this makes us hope that - starting from this first year of the new millenium – the seminar will become a periodical experience.
The structure of this first seminar was long discussed: the initial idea was transformed to interpret the proposals of a more in-depth scientific study coming from the participants. The initial idea was to collaborate in the choice of works that would be useful for teachers regarding a certain topic, to take part in the selection of important contributions in practical didactics started by ICPE. A preliminary examination of the various works on certain subjects was supposed to be the fundamental part of the seminar, which aimed to elaborate a series of works to be pointed out and possibly also a standard protocol to be followed in the writing of articles able to help teachers in their daily work.
The choice of such an issue aroused the interest of many colleagues around the world, who presented a great amount of contributions specifically concerning the development of formal thinking in physics.
That is how a new work scenario came forward: an environment for discussion on research and on practice in the development of formal thinking in science education. Therefore the current organisation is the result of a long process of interpretation and proposals, carefully followed during all its course.
The work of selection and of scientific organisation carried out by the International Scientific Committee was difficult: the purpose was to assemble the contributions in various thematic areas and to maintain the two most important aspects of the project of the seminar: the deepening of the scientific discussions in workshops and the production of shared results of the problems concerned.
The seminar was structured in 8 general talks, 11 panel talks and 7 workshops.
During the seminar it was also possible to visit a display of posters which concerned works regarding the problems discussed.
The general talks had the important task of offering a panoramic survey of the topics discussed in the context of the seminar. Below are listed the titles of the presentations, with the relative authors.

- *Imagery and formal thinking (M. Euler, Germany)*
- *Physics curriculum reform (R.G. Fuller, USA)*
- *Jumping toys: a topic for interplay between theory and experiment (C. Ucke,*

Germany)

- *Real-time approaches in the development of formal thinking in physics (E. Sassi, Italy)*
- *Differences between the use of mathematical entities in mathematics and physics and the consequences for an integrated math and science learning environment (T. Ellermeeijer, Holland)*
- *An epistemological framework for laboratory work (M. Vicentini, Italy)*
- *Is formal thinking helpful in everyday situations? (S. Oblak, Slovenia)*
- *The formal reasoning of quantum mechanics: can we make it concrete? Should we? (D. Zollmann, USA)*

The panel talks presented all the contributions offered to the seminar: over one hundred. They were held in parallel the first day, to allow the scientific discussion on the works presented during the following days. The chair-person of each general talk performed the function of coordinators and reporteurs. This role appears to be a functional arrangement, since it allows plenty of time for work in the workshops, it precludes presentations from the discussions, it offers a moment of practical knowledge which can be seen from at least two points of view: that of the reporteur and that of the workshop leader.

In fact, the latter assembled, for discussion in the workshops, both the contributions most concerning the problematic aspects, which they had decided to examine, and the recommendations of the reporteurs. The workshops – divided into 4 sessions, each lasting two hours for two following afternoons – were the heart of the seminar. They determined the results of the seminar, integrating into the scientific discussions both the contributions of the general talks and those of the participants. As a result of the 4 sessions of each workshop, we have been able to:

- give a general view of the problems involved in the subject dealt with by the workshop
- develop a discussion on these problems
- examine in detail some of the specific aspects
- synthesise the results achieved

The subjects of the various workshops, with the respective workshop leaders were the following:

- *Interplay of theory and experiment (A. De Ambrosis, G. Rinaudo)*

The discussion was held on the following aspects: a) what is the meaning of "theory", "experiment", and of the "interaction" between them; b) definition of the goals to achieve; c) types of experiment, and their efficiency in favouring the process of formalisation. The presentation of many experiments, focussing on the relevant aspects for the process of formalisation, characterised this workshop.

- *Learning physics via model construction (R.M. Sperandeo-Mineo)*

The presentations and discussions were mainly connected to two topics of the seminar: a) modelling the world (subjects concerning the development of imaginary worlds and their connection with the phenomenological world), b) mathematics (the exploration of the particular case of the development of physics through the descriptive language of mathematics). The discussion ended with an analysis of the role of the development of models within the curriculum of studies.

- *Modelling for younger learners (I. Lawrence)*

The practice of developing models is already used in some pre-graduation courses. The models developed are often numeric, with the explicit use of algebra and/or arithmetic. The workshop focused on the possibility of using computers to handle the development of models, in the attempt to lower the age of the students to which it is proposed.

- *Toys for learning physics (C. Ucke)*

The starting question was: what is the role of formal thinking when physics is learned thanks to toys? Many toys allow to take the first step towards the goal of developing formal thinking. And their role does not even end at a level of university learning. However, teachers need books, publications, catalogues and indications of the kinds of toys available (this information is not always easily accessible). There was also a discussion on the idea of a special seminar/workshop dedicated entirely to toys, and the proposal of creating a database to classify them.

- *Early start in physics understanding (P. Guidoni)*

One of the problems considered most compelling, for the transmission of the culture of physics, is not so much whether to start the approach to this subject earlier or later, but rather how to create a systematic and coherent way of teaching, able to make use of the potentialities of children and to arouse their interest for the subject. In the past 20 years many different approaches to this fascinating aspect have been developed. The purpose of the workshop was to compare these approaches, and use them as a base to elaborate new ideas. The works of this workshop then integrated themselves with those of the workshop dedicated to modelling for younger learners (I. Lawrence).

- *New technology and computers in physics learning (L. Rogers)*

This workshop aimed to compare the different approaches to the use of Information Technology (IT) in the teaching of physics. After a first discussion, the topics were divided as follows: a) why is the use of IT in schools so limited, even though several years have gone by since it was introduced? b) how can teachers be induced to use IT? c) how can teachers find time to learn the use of IT? d) what problems can there be in adopting the use of IT? e) what should the teachers' role be when students are using IT? How should teachers be taught to make learning with IT more useful?

- *Textbooks as an image of philosophy of teaching (Z. Golab-Meyer)*

The main aspects discussed were the following: a) how do the new teaching methods influence text books? What is the real aim of text books? The students or the teachers? Are the preferences of students really known? Who examines and evaluates the text books? Where are the worst possible mistakes?

4. **Participants and results**

The seminar united scholars, researchers in physics didactics, and school and university teachers, in the common effort to discuss formalisation in scientific learning, taking into account physical phenomena and their interpretations, the role of technological applications, the results of didactic research, educational strategies, new curricula, teaching resources.

The initiative, of a high scientific level in the sector, was the experimentation of a new way of meeting and of doing research in intermediate dimensions, able to keep GIREP scholars in constant touch, to consolidate collaboration in research at an international level and to sustain the study of specific problems, which may be important because of their transverse nature in many other thematic studies. It also has become a commitment for the International Scientific Committee of GIREP to give a new instrument for collaboration in the research of physics didactics.

Even though the International Scientific Committee had decided to make a selection of the participants, limiting the number to 50-60 scholars at most, the number of contributions induced us to double the maximum. Therefore the Seminar included 125 experts in scientific didactics, particularly physics, from 31 different countries of the 4 continents (98 from

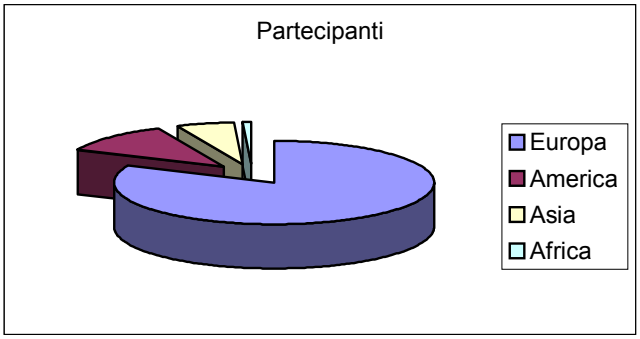
Europe, 14 from USA, 7 from Asia and 1 from Africa). Figure 1 shows the participants per continent and figure 2 shows the participants per country.
The 100 works presented were selected by the International Scientific Committee, which also chose the method for the presentation of the contributions offered. At the moment, a scientific examination of the works is being carried out, with a view to publishing the articles chosen in a volume, while all the contributions accepted for the presentation will be published on an electronic support and via internet. The initiative had various important results:

- the high scientific qualification in the management of activities was recognised
- local research in this sector was appreciated
- various agreements on international exchange were made
- Udine was entrusted with a portal for the publication of materials for the formation of physics teachers on an international level
- Udine was entrusted with the international telematic review for the diffusion of scientific culture and the management of a telematic forum on the formation of teachers of the scientific area.

The positive judgement not only on the scientific level, but also on the organisational level led to the decision that the next GIREP Seminar in 2003 on teacher training would also take place in Udine.

The picture of GIREP committee, taken in front of Udine University, was already published in Newsletter No 45.
All the material of the Seminar can be found on the following site:www.uniud.it/cird/

5. **Thanks**
The help received from Ian Lawrence, Manfred Euler, Christian Ucke, Seta Oblak and Lorenzo Santi, the members of the International Scientific Committee and other committees was fundamental. We wish to express our most profound gratitude to everyone for having made this Seminar possible.
A particular thanks goes to the many Italian colleagues who believed and took part in the initiative, particularly the great number of people from the University of Udine who made it all possible. Just to mention a few: the two rectors, Marzio Strassoldo and Furio Honsell, for their attention and support, Donatella Ceccolin and Mauro Sabbadini of CIRD, Plinio De Zorzi of CESA and two little starlets: the students Elisa Ius and Elizabeth Chamberlain.



EPS becomes partner in exciting European education project

Silvia Merlino, Roberto Fieschi, Marco Bianucci and Brian Davies

New multimedia technologies have shown their potential for providing significant steps forward both in the teaching of scientific and technological subjects, and in popularising them. In comparison with other subjects, physics and technology are often considered difficult, but interactive multimedia tools, with their simulations and video clips can be very effective for giving good preliminary intuitive approaches to
scientific concepts.

In its Report, the Educational Software and Multimedia Task Force concluded that while the European demand for educational software is steadily increasing, the offer of quality products is still limited. In particular, there is a lack of products aimed at young students and people of limited educational attainment; there is a clear need to diffuse good quality educational products across national frontiers.

The spread of computers and the Internet facilitates the use of multimedia products as a support for teaching, for raising public awareness of science and technology and for bridging the gap between science and technological achievements on the one hand and the general public on the other hand, in an accessible way.

These considerations encouraged us to initiate the project Multimedia on Energy and Semiconductors for European Countries, which has been selected by the Commission of the E.U. within its Raising Public awareness programme.

The specific objective is to provide young students, their teachers and the general public in European countries with a courses on Energy and its transformations, and on Semiconductors and their applications in the form of user-friendly multimedia packages both on the Internet and on CD-ROMs, for both PC and Mac platforms.

The starting points are the multimedia courses L energia e le sue trasformazioni and Dal Silicio al Computer , produced by the Istituto Nazionale per la Fisica della Materiale (INFM) with the financial support of the Ministero della Pubblica Istruzione (with the supervision of Inspector G. Marucci) and of the Ministero della Ricerca Scientifica e Tecnologica (MURST). These Italian versions are on CD-ROM and on line at:
http://multimedia.infm.it/energia, http://multimedia.infm.it/dsac.

In developing these courses, we kept in mind the need to capture the attention, and then encourage the interest of the student, or member of the public. If diffidence and lack of confidence can be overcome, then physics, chemistry and technology become interesting and fascinating subjects. In order to be able to convey their charm, we paid a lot of attention to finding simple, straightforward ways to introduce concepts. We often start from everyday phenomena, and then we show the underlying science. Much use is made of animations and interactivity and, where possible, simulations. A lot of attention has also been paid to the production of attractive graphics. Throughout, everything must, of course, remain scientifically rigorous. Moreover, we include several sections for consolidating ideas, and numerous historical notes and curiosities to stimulate interest in historical aspects of science. We provide a long list of suggested experiments, all of which can be easily done at home or in the classroom.
For the younger students, in particular, we provide interactive games that are amusing but at the same time provide summaries and reviews of the whole subject.

The project team involves INFM as coordinator and 4 European partners:

- Sciencewords (Consultancy), Mr. Brian Davies, U.K.;

- Ediciones del Laberinto, Dr. Juan Jose Ortega, Spain;
- The European Physical Society, Mr. David Lee [based in France];
- INFMedia Srl, Dr. Oreste Tommasi, Italy.

The participating organisations were chosen for their established skills and competence to deliver the entire project.

INFM is the co-ordinator of the consortium. This Institution coordinates and supports research on the Structure of Matter in Italian universities. Traditionally, this kind of Institution is only involved in research at an advanced level, and is not involved in problems of pre-university teaching or the popularisation of science. However, during the last few years, INFM has included these issues among its objectives, aware of the fact that researchers need to be more open to, and involved in, the problems of the society; scientists can no longer stay in their ivory towers.

Sciencewords is a consultancy with proven expertise in physics and physics education, history of science, writing and editing, the cross-cultural influences of science and in public awareness of science programmes.

Ediciones del Laberinto is involved in 6 000 educational centres in Spain and is well equipped for the promotion and the distribution to the Spanish Schools.

INFMEDIA Srl is a small company devoted to the design and realization of interactive multimedia software for the diffusion of scientific knowledge, teaching support and technical training.

EPS: the European Physical Society does not need a special description.

The main steps for each of the two multimedia packages are:

- the translations from Italian into English and Spanish.
- the implementation of the multimedia formats.
- the production of English and Spanish prototype versions of the CDs and web-sites in time for the European S&T Week 2002.
- the distribution of CD prototypes for trials in schools in England and in Spain, during 2002-2003
- production of final English and Spanish CD and web versions of the multimedia packages for wider distribution, taking into account the ideas and suggestions from the schools.

We hope that our work will contribute to the general objectives of raising public awareness of science and technology by explaining something of the impact of science, its applications and its benefits. We also hope that it will help to improve human research potential, particularly in a period when, in most European countries, there is a considerable difficulty in attracting young people to scientific careers.

Both the European Science and Technology Week in November 2002 and the European Physical Society s network support, which will continue into 2003, will provide excellent opportunities for a widespread introduction of these educational products to the general public.

Brief bibliography of related materials

R. Fieschi, O. Tommasi, M. Bianucci, and Paola Mangiarotti EDUMAT II, from stone to microchip, Introduction to Material Science , to by published by Mc Graw-Hill.

ARCHIMEDES, Multimedia on-line archive on Science and Technology in Italy: http://multimedia.infm.it/archimedes. Scientific Committee: R. Fieschi, S. Fantoni, A. Pascolini, M. Bianucci, V. Marchis, P. Galluzzi, O. Tommasi; Comitato di redazione: M. Bianucci, P. Chessa, S. Merlino.

R.Fieschi, R.Roncaglia: Technet Dal Silicio al Computer , multimedia course on line, on Silicon and its application, published on http://multimedia.infm.it/dsac.
R. Fieschi, M. Bianucci: L energia e le sue Transformazioni : Multimedia on-line course, on-line on Energy and its Transformations, R. Fieschi, M. Bianucci, S.Merlino: Proprieta Dei Materiali: interactive course on CD-ROM, for undergraduate students.
Brian Davies and Andrew Millington (Omni Productions): Inspired by Nature, a 40-minute videotape as part of the Learning from Nature video/TV. and web-site programme for European Science and Technology Week, 2000. [Related articles: Learning from Nature European Physical Society News, Sept/Oct 2000, and Nature, a breeding ground for science , RDT Info, Jan 2001]
Brian Davies: Physics like you have never had before, Physics Education, March 1998 .

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GIREP is not unique

A colleague told me, that he found with searching engines other organizations which have also the shortcut GIREP.

A French association "Group International du Rêve-Eveillé en Psychanalyse" was originally founded 1925 under a different name. But 1987 they transformed to GIREP. They have the URL http://www.girep.com.

Another French group is the "Groupement Inter-entreprises de la Région Est de Paris". (http://www.medef-estpar.org/Groupe.htm)

I found myself two other 'GIREP' nameholders. In Pakistan there is an industrial project also called GIREP: "Gas Infrastructure Rehabilitation and Expansion Project" (URL: http://lists.isb.sdnpk.org/pipermail/econo-list/2001-September/001378.html)

Furthermore there is in a Turkish football club in Germany a trainer with the name Abdullah Girep. I don't know whether this is a common Turkish surname.

Christian Ucke

Next General Assembly will be at the GIREP CONFERENCE IN LUND
http://www.girep.fysik.lu.se

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FEES

The current fee is EURO 20 (+ 1 EURO expenses for credit cards) for one year.

The accounting year runs from January 1 to December 31. Fees paid after September in any year will be credited on the following year, unless the applicant specifies otherwise.

The preferred method to pay is by credit card (VISA or EURO-/MASTERCARD; no others). Add 5% expenses to the fee; this means then totally 21 Euro for one year!. Please write or fax (no e-mail!) to the Treasurer your full card number, expiration date and the total amount.

The fee can be paid also into the following account:
Christian Ucke, Postbank (GIRO) Muenchen, 80317 Muenchen, Account No. 355 28-808, BLZ 700 100 80.
BLZ (= BankLeitZahl) means a special sort of code for the Postbank in Germany.
At the same time, please send a note (by letter, fax or e-mail) to the Treasurer, confirming how much money you sent and when and for what years.
The members should pay all bank charges and mailing costs. Please ask your bank for these costs before transferring money!
In some countries, it is possible to transfer money from the national Postbank with EUROGIRO free of charge (Belgium, Germany, Japan, Luxembourg, Switzerland, Spain) or with a small charge (Denmark, Finland, France, Great Britain, Netherlands, Austria, Sweden).
If you prefer to reduce bank or cheque expenses, you may pay several years fees in advance.
Please do not send cheques (high expenses!)

In cases of real difficulty to arrange payment, please contact the Secretary or the Treasurer who are ready to advise whether special arrangements can be made.

The General Assembly of GIREP members in Udine (August 1995) accepted the following supplementary new article for the GIREP statutes:
Each year in October, those members who have not paid for the previous two years will be removed from the membership list.

home page http://www.pef.uni-lj.si/girep or http://www.girep.org
User name: girep, password: duis98