
**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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New GIREP Committee elected

At the 1995 GIREP Conference in Udine the new Committee was elected. As the new President, with pleasure I take the opportunity to address all members of GIREP.

As all of us know, it is a difficult task to teach physics: Not only the subject itself has to be mastered properly, but also there are many additional challenges: We must realize and keep track of rapid developments in many fields, which may lead to modernizing changes in our teaching programs, we must learn about and employ new teaching aids and new teaching methods, there is new knowledge concerning learning processes, and there are changes in the student's expectations and needs. Is it possible for a teacher to face and to master all these challenges and thus to maintain a high standard of teaching for several decades of professional duties? Only persons with a high degree of idealistic motivation may be expected to succeed on long terms. However, in today's life, it seems to me, the esteem for idealism is decreasing, although the need for it is increasing.

Sometimes I was asked: "What kind of people are the members of GIREP?" It would be too simple to reply "they are physics teachers"; at least one should say "they are idealistic physics teachers". Indeed, GIREP is one channel to foster idealistic activities for the benefit of physics education. Several other such channels have been available to me for several decades; one of them was the education and training of young physics teachers at the University. More and more it became obvious to me, that an idealistic attitude is an essential requirement and component for studying physics successfully and for teaching physics successfully.

I consider GIREP to be a community of idealists. Our image in the world, established by the small number of all our members, has had and will have a decisive influence on the esteem and acceptance of physics in a broad sense: Let us expect each member to act as a multiplying factor for our idealism, let us try to inspire the neighboring colleagues, the instructors, the inspectors, the authors of textbooks, the designers of curricula and, last not least, the administrators and the employers!

In today's way of life, where superficial qualities and pleasure seem to be dominant features, we should try to show and to convey that studying physics also leads to having pleasure – I mean *intellectual* pleasure: Besides being the key to master the future problems of mankind, physics is a subject which can provide *intellectual* pleasure. As it has been pointed out quite often, an illiteracy in fine arts, in music, in literature etc is considered much more severe by the broad public than an illiteracy in natural sciences; a similarly unbalanced situation seems to exist with the esteem of the intellectual pleasure to be reached by literature etc on the one side, and by physics on the other side. Admittedly, it may be more difficult to arrive at intellectual pleasure by employing physics – but this should increase, not diminish, the attraction and esteem for it!

The members of the new Committee, again, also believe to be idealists and thus they direct their efforts to enhance the role of GIREP for the benefit of physics teaching: Seta Oblak (Secretary), Christian Ucke (Treasurer), Marisa Michelini (Vice President), Ian Lawrence (Vice President) and I myself.

Karl Luchner, President of GIREP

Report of the former president to the GIREP presidium, 1995

Conferences:

1991 Torun, From Copernicus to Einstein; GIREP, ICPE, election
1992 Badajoz, Teaching statistical physics; ICPE, GIREP
1993 Braga, Teaching about light; GIREP, ICPE
1994 Eger, Teaching environmental physics, ICPE, ICTP
(1994 Concepcion, Chile, Education for 3rd millennium; ICTP, GIREP)
1995 Udine, Teaching solid state and new materials; GIREP, ICPE, ICTP
(for 1995 Genoa applied, CERN designated, CERN cancelled, Udine accepted)

Distributed to GIREP members:

8 issues of GIREP Newsletters, edited by Esther Toth, secretary
print, mail: 1 from London (GIREP expense), 7 from Budapest (Hungarian sources)
8 issues of ICPE Newsletters, edited by George Marx
1991 Proceedings
1993 Proceedings
(possibly one volume of the two 1994 Eger Proceedings, if GIREP covers mailing)
(perhaps 1994 Concepcion Proceedings, promised, 2 big volumes?)

Budapest, 20 August 1995

George Marx

Introducing Facilities

With this entry we try to give a short report of facilities, which are devoted to enhance Physics Education; for this issue we focus on such facilities available in Germany. Although a detailed description may be of interest, we only provide a rough outline as a kind of initial information, thus perhaps provoking questions and suggestions, which may be dealt with in personal discussions.

A good opportunity for such personal discussions is any GIREP-Conference.

Introducing Facilities of Germany

In general, there are facilities provided by the universities and by governmental and federal institutions, there are professional associations with annual meetings, there are journals, and there are attractions aiming towards the broad public.

Universities:

Education of physics teachers: Subject Physics (various degrees of sophistication, also in combination with other subjects, according to the intended professional level as teacher) and "Physics-Didactics" (the latter expression describes the knowledge, insights and skills necessary to be a good teacher).

In all German universities there are around 60 professors employed to teach "Physics-Didactics" (rough estimation); in addition to their teaching duties they give examinations, advise teachers training, conduct and supervise research-work and publications, advise administrative institutions with respect to school-curricula, take care to provide further education for teachers already in service.

Institutions:

For the purpose of teachers further education (all subjects, not only physics) there are institutions ("academies") established and run by the federal states; they provide courses and materials on new developments, in many cases focusing on changed or new curricula. Typical examples are the academies in Dillingen (Bavaria) and in Soest (North-Rhine-Westfalia). Especially dedicated to research and developments in teaching Science is the "Institut für Pädagogik der Naturwissenschaften" (IPN) in Kiel.

For the financial support of research work there is "Deutsche Forschungsgemeinschaft" (DFG, German Research-Foundation), and for special cases "Volkswagenstiftung" and "Bundesministerium für Forschung und Technologie" (Federal Ministry for Research and Technology). However, research on physics education is an almost negligibly small sector in the wide field of interests of these institutions, and thus it is very difficult to attain support from them.

There are also possibilities to obtain support for exchange-programs for students or for staff-members between Germany and other countries. The main institution on this behalf is "Deutscher Akademischer Austauschdienst" (DAAD).

Associations:

The biggest association for any kind of professional work in physics is "Deutsche Physikalische Gesellschaft" (DPG), with many subgroups in it according to the many different fields of physics research. The subgroup dedicated to the teaching of physics (in university as well as in school) is "Fachverband Didaktik der Physik"; every year in spring it holds a meeting with lectures, contributions a.o. and provides a volume of proceedings.

An association mainly for teachers with the subjects Mathematics, Physics, Chemistry, Biology is the "Deutscher Verein zur Förderung des mathematischen und naturwissenschaftlichen Unterrichts", in short called "MNU" (a literal, but unauthorized translation would read about like "german association to promote the teaching of mathematics and natural science"). MNU every year in spring holds one big central meeting (there are also meetings of a more regional character) with lectures, workshops, exhibitions and excursions. Above that, MNU provides a regular journal addressing the teachers of the above mentioned subjects.

Also dedicated to the teaching of Physics and Chemistry is the "Gesellschaft für Didaktik der Chemie und Physik" (GDPC, association for the didactics of chemistry and physics), with one meeting (lectures, contributions a.o.) per year and a volume of proceedings.

Journals:

Here is only the space to give a listing of journals dedicated to physics education; a more detailed personal inspection of these journals will reveal their specific flavors:

- Mathematisch-naturwissenschaftlicher Unterricht, MNU (Dümmler, Köln);
- Physik in der Schule (Pädagogischer Zeitschriftenverlag, Berlin);
- Naturwissenschaften im Unterricht Physik-Chemie, NiU-PC (Friedrich Verlag, Seelze);
- Praxis der Naturwissenschaften-Physik, PdN-Ph (Aulis Verlag Köln);
- Zeitschrift für Didaktik der Naturwissenschaften, ZfDN (IPN Kiel);
- IPN-Blätter (IPN Kiel);
- physica didactica (Verlag Barbara Franzbecker, Bad Salzdetfurth);
- BUS (Zentralstelle für Computer im Unterricht, Augsburg).

Nationwide Competition:

"Jugend forscht" (= young researchers) is an annual competition calling for papers of extraordinary engagement and well presented results produced by students of secondary schools; it is sponsored by high-ranking governmental officials, by technical companies, a.o.

Museums, Exhibitions:

- *Deutsches Museum, Munich*. Big museum for the natural sciences and technology, from historic roots to modern applications. Recently a branch for modern applications was opened in Bonn. Small groups of teachers can be accommodated in the Kerschensteiner-Kolleg, a facility associated with the museum in Munich.
- *Spectrum, Berlin*. Museum with hands-on experiments in physics.
- *Phaenomena Science Center, Flensburg, northern Germany*. New museum for hands-on experiments in physics. Research projects for physics education in connection with university..
- *3D-Museum, Dinkelsbühl, small town between Stuttgart and Würzburg, southern Germany*. Small but nice museum; all sorts of threedimensional pictures and optical illusions.

Fair:

Each year, there is a big commercial international fair for anything useful for teaching any subject in any type of school. This fair is called DIDACTA; it is announced nationwide, and all of the important companies and producers participate.

Christian Ucke, Karl Luchner

International projects

The GIREP committee would like to spread information about international projects in physics education going on in different countries. We have started with the Tempus project Eden and we hope to motivate GIREP members to inform us about other projects.

EDEN in Slovenia

The faculty of Education in Ljubljana, Slovenia is coordinating an international project Eden financed by the EU Tempus office. One of the aims of the project is: "Development of a new integrative interdisciplinary course for secondary school teachers of physical and life sciences."

Additional three Slovenian institutions cooperating in the project are the following: Faculty of Mathematics and Physics in Ljubljana, Faculty of Education in Maribor and the National Board of Education.

The international partners in the project are: University of London Institute of Education, University of Kiel Institute for Science Education (IPN), Università "La Sapienza" di Roma Department of Physics and Universität Graz, Institute of Theoretical Physics.

In the project we shall prepare materials for updating of both lower and upper secondary science teachers in modern interdisciplinary thinking on energy and entropy including irreversible processes in dissipative structures. Special emphasis will be given to the role of energy education in the context of ecology and economy of natural resources and to the importance of public understanding of issues related to the use of materials and energy. Open systems will be dealt with and flow of substances, energy and data will be studied.

We shall organise some international workshops with small number of participants interested in the subject. Besides the guests from cooperating institutions we shall also inform about the major events in the project others who will request for informations. The results of the first year will be presented at the GIREP conference: New Ways of Teaching Physics (Ljubljana, 21. 8. to 27.8 1996).

Several attempts at teaching basic thermodynamic ideas have been developed in different places. An active group is working in Rome (1, 2). In London a new thermodynamic course for lower secondary school (Energy and Change) has been developed and will be published early in 1996 (3). A brand new course on physics for lower secondary school has been published in Karlsruhe recently (4) in which thermodynamics plays an essential roles.

The members of the Eden group are interested in getting information about all work currently going on in this field, and the relevant publications.

The coordinator of the project: Janez Ferbar, Faculty of Education, Kardeljeva pl. 16, 61000 Ljubljana, Slovenia, tel. 386 61 1892 238, fax 386 61 347 997, E-mail janez.ferbar@uni-lj.si.

(1) Tarsitani C Vicentini M (Eds.) 1991 *Calore, Energia, Entropia*, Franco Agnelli, Milano

(2) Giaquinta P V Vicentini Missoni M Wanderlingh F (Eds.) 1992 *Proceedings of the Taormina Conference on Thermodynamics*, Accademia Perolitana dei Pericolanti, Messina

(3) Boohan R Ogborn J 1996 *Energy and change* (Introducing a New approach, Activities for the classroom, Background stories for teachers), ASE, Hatfield

(4) Herrmann F et al. 1995 *Der Karlsruher Physikkurs*, Universität Karlsruhe.

Janez Ferbar, project coordinator

FOR THE NEXT GIREP MEETING WE INVITE YOU TO LJUBLJANA

GIREP 96

ICPE 96



demonstrations, labs, computers, interfacing, networking

Topics for discussion:

Rapid development of information technology in the modern world has made its impact also upon physics teaching. Interactive teaching, multimedia, sensors for measuring different physical quantities, computer interfacing in school experiments, computer networks as means for direct communication between teachers and students around the world, world-wide organised lab and school investigations are only some of the possibilities brought about by the new technology. Science hands-on museums, TV networks and information networks represent an alternative to school education and students should be encouraged to take the new media as a source of life-long scientific education.

Also, the function of physics education is redefined by the necessities of the modern world and by the findings of the education researchers, so new approaches to physics teaching are sought, proposed and critically evaluated. All this represents an everlasting challenge for physics teachers, and also new demands for their pre-service and inservice education.

The organisers call for contributions to workshops in the following topics: Computer based hands-on experiments, Exploring the properties of sensors and transducers, Hypertext in physics teaching, Multimedia in physics teaching, World-wide organised lab, Interactive video, Simulations and animations compared with "true" experiments, Historical view: from textbook to multimedia, New approaches in physics didactics.

Mailing address: Seta Oblak, Secretary of GIREP, Board of Education, Poljanska 28, 61000 LJUBLJANA, Slovenia (tel 386611333266 fax 38661310267 E-mail: Seta.Oblak@guest.arnes.si)

**REPORT OF THE GIREP-ICPE 1995 CONFERENCE
TEACHING THE SCIENCE OF CONDENSED MATTER AND NEW MATERIALS
UDINE, ITALY, 24-30 August 1995**

After 23 years a GIREP Conference in Italy! The University of Udine with its Physics Department and the Center Laboratory on Physics Education in cooperation with the International Center of Theoretical Physics of Trieste have organized the 1995 GIREP-ICPE Conference an year earlier with respect to the previsions, to perform the GIREPs request after CERN cancellation. Responsibles: G.Denardo (ICTP), M.Michelini (chairperson, Udine University), S.Pugliese Jona (Girep). Secretary: D.Cobai (Udine University).

The Conference was held in Udine Scientific University campus from 24 to 30 August 1995. The organization of the scientific program was based on the collaboration of institutions which represent the various fields involved in the topic of the Conference. Some of them such as ICASE, INFN, CISM, AIF, SAIt, IRTEC-CNR, Synchrotron and LIS of Trieste have even taken on the management of some Conference activities.

Teaching (and learning) the Science of Condensed Matter and New Materials is a difficult and important problem, because the relative contents are still belonging to current scientific and technological research, are part of the evolution of our society, influencing it in significant ways.

The introduction of such themes into a teaching context involve singling out the cultural knots of a world that ranges from the interpretation of microscopic phenomena to the potentiality of technological innovation, and to the interaction between scientific and technological aspects. It also means finding the role of new technologies in teaching: computer, audio-visuals, multimedia systems. It means discussing the specific strategies and the prototypes of integration of the more purely theoretical aspects with the experimental aspects. Additional aspects kept in the foreground while planning the Conference were the experimental techniques proper of the research in condensed matter, whose roots belong to basic physics and can be used to build a bridge for cultural innovation in pedagogy; the basic ideas of computer physics; the problems emerged from research on physics education from cognitive aspects to curricular aspects and aspects of the relation between science, technology and society considered at 3 levels of analysis: university, secondary school and basic level.

The Conference activities were revolved around three aspects, corresponding to three different educational needs.

1. Teaching the science of condensed matter and new materials at the post-secondary level: choosing the approach, the contents, the activities (lectures, problem solving sessions, practical labs), the didactic materials (simulations, videos, films, experimental apparatus), the emphasis given to technological issues according to the educational context (whether chemical, physical, technological, astronomical...).

2. Introducing topics relating to the science of matter in the secondary school curriculum: which didactic paths and educational materials can help to learn the necessary classical concepts and the main quantum ideas, which scientific foundations and cultural instruments should we give the students, which methodological choices for teaching the theoretical and the experimental aspects, to what depth and extent should we teach about the technological implications and the scientific research methods.

3. Approaching the study of the properties of matter at the primary level: which cognitive problems and learning difficulties are involved, how to induce conceptual changes from naive and common sense ideas, what methods and resources for teaching to young children. While the three aspects were explored in parallel during the Panel Talks and in Workshops, Poster Session and Exhibits, the Plenary Lectures provided a transverse view on the conceptual bases of the science of condensed matter, on possible educational approaches, on the results of educational and scientific research and on technological applications. The Plenary Lectures belonged to three general groups: A) Research topics of interest to education because of their scientific relevance and their technological importance; B) Reflections on the foundations of the science of condensed matter, in relation to the educational approaches at different levels; C) Curricular and educational proposals at the university, secondary and primary levels.

The relevance of the considered problems is probably the secret of the success of the Conference: 368 people contacted the organization, asking for participation, although the Conference announcement was only 8 months before!

The timetable of the Conference offered eighteen 40-minute General Talks in plenary session, nine 2-hour Panel Talk sessions for the presentation of 37 contributions, twelve 2-hour Workshops with 50 contributions, two 2-hour Show & Tell sessions, a special session on Science and Toys and three 1-hour Poster & Exhibit sessions with 55 contributions.

The registered participants to the Conference were 216 from 30 different countries: 40% of them were teachers. An additional group of teachers coming from the regional territory participated partially to the program choosing the sessions useful as a refreshing course, with suggestions for classroom work. This was possible thanks to the facilities realized to this scope: simultaneous translation in plenary sessions and consecutive or little-group assisted translation in parallel sessions.

The Conference proceedings will be sent to the registered participants of the Conference and to those requesting it before March 30 to Marisa Michelini, Physics Department of Udine University, via delle Scienze 208, 33100 Udine (Italy).

Davide Cobai, Marisa Michelini, Silvia Pugliese Jona

OBITUARY

Dr Ferdinando Pullella, who led the Secretarial Team during the GIREP-ICPE 95 Conference at the University of Udine, died in the evening of 13 December in the air crash of the Banat Air Antonov 24, a few minutes after takeoff from the airport of Verona. Dr Pullella was going to Romania with Prof. Bean on a mission for the University of Udine. He will be remembered by the Conference organizers and participants for his calm presence, his patient disposal and his cordial attention towards the needs of the Conference participants.

Most important elements of the program:

GENERAL TALKS

GT1-G.N.Babini, *CNR-IRTEC, Faenza (I)*, Advanced Ceramics: Materials, Properties and Applications

GT2-G.Barbaro, *University of Padova (I)*, Condensed Matter in the Universe

GT3-P.Black, *President of ICPE, Centre for Educational Studies, King's College London (UK)*, What should we teach? What can they learn?

GT4-R.Blinc, *University of Ljubljana (SLO)*, Solitons in Ferroelectric Liquid Crystals and Other Incommensurate Systems - an Example of Non-Linear Physics

GT5-S.Chandrasekhar, *Bangalore Centre for Liquid Crystal Research (IN)*, Liquid Crystals

GT6-R.Fieschi, *University of Parma-INFN (I)*, A Multimedial Course of Material Sciences

GT7-F.Hermann, *University of Karlsruhe (D)*, Teaching Magnetic Materials: Problems to Avoid

GT8-C.Humphreys, *University of Cambridge (UK)*, From Artificial Hips to Metal with a Memory - the Exciting World of New Materials

GT9-L.Kovacs, *Teacher Training College, Szombathely (H)*, Teaching Solid State Physics at Secondary School and College Level in Hungary

GT10-G.Luzzatto, *National Conference of Interdepartmental Centres for Research in Education (ConCIRD) (I)*, The Physics Teacher: More a physicist, or more a teacher?

GT11-G.Marx, *President of GIREP, Department of Atomic Physics, Eotvos University (H)*, New Materials and New Duties for Physics Teachers

GT12-W.Nicodemi, *University of Milano-CISM (I)*, What Materials for the Next 30 Years?

GT13-G.Ottaviani, *University of Modena (I)*, Solid State Interactions and Phase Formation

GT14-R.Rosei, *Synchrotron, Trieste (I)*, Synchrotron Radiation in Condensed Matter and New Materials Research: The Role of 3rd Generation Facilities

GT15-A.Sconza, G.Torzo, *University of Padua (I)*, Teaching Electrical Transport Properties in Solids: an Experimental Approach

GT16-R.Stavy, *University of Tel Aviv (IL)*, Childrens' Conceptions of the States of Matter

GT17-A.Tiberghien, *IRPEACS-Equipe COAST, ENS de Lyon (F)*, Energy Teaching at High School Level: a Challenge?

GT18-F.Wanderling, *University of Messina (I)*, Collective Behaviours and Their Relevance in the Physics of Condensed Matter

PANEL TALKS

P1 - Secondary Education

P2 - Undergraduate Education

P3 - Theoretical Approach to condensed matter

P4 - General Topics, suggestions for teacher training

P5 - Models and visualization of reality

P6 - Student investigations of the properties of matter

P7 - Material Properties

P8 - Teaching Units and Tools

P9 - New materials

WORKSHOPS

W1-Computer aided analysis of microscopic world - R.M.Sperandeo, *University of Palermo (I)*, Chairperson of National Research Group on New Technologies for Physics Teaching

W2-Multimedial environment for teaching about condensed matter - R.Fieschi, M.Biancucci, A.Cordelli, O.Tommasi, *INFN & PIC-STRIDE Italia (I)*

W3-New methods for old matters, toward a better understanding of the "old" properties of matter - M.De Paz, M.Pilo, *University of Genova (I)*

W4-Condensed Matter in School: a way forward - I.Lawrence, *Worcester King's School (UK)*

W5 A-Teaching electrical transport properties in solids: an experimental approach - A. Sconza, G.Torzo, *University of Padova (I)*

W5 B-Practical Work in Physics Lab: Sensors Based on Properties of Matter - S.Kocijanè, M.Hribar, A.Likar, S.Oblak, *University of Ljubljana and Board of Education (SLO)*

W6-Material Science from the STS (Science, Technology, Society) point of view (ICASE Workshop) - A.Wojtyna-Jodko, *SNPPiT/ICASE (PO)*, J.Depireux, *Univ. of Liege - GIREP (B)*, L.Viglietta, *IRRSAE Piemonte (I)*

W7-Teaching the Structure of Matter in the Karlsruhe Physics Course - F.Herrmann, *University of Karlsruhe (D)*

W8-Cognitive problems and conceptual profile changes in the knowledge of matter - A. M.Pessoa de Carvalho, *University of Sao Paolo (Brasil)*

W9-Problem solving: Calculating and Thinking problems - L.Kovacs, *Teacher Training College Szombathely (H)*

W10-Many faces of water - Z.Golab-Meyer, *University of Krakow (PO)*

W11-New Materials in Astronomy (SAIt Workshop) - C.Barbieri, *Director of the Galileo Project, University of Padua (I)*

W12-New Methods and Media from the experience of Italian Teachers (AIF Workshop) - F.Dalla Valle, M.Mancini, M.C.Maccario

SHOW & TELL: 2 Sessions

8 EXHIBITS, 11 EXPERIMENTS ROOMS, 3 POSTER SESSIONS,
3 SCIENTIFIC EXCURSIONS (Synchrotron, LIS and ITIS Malignani).

A personal impression of the conference

I felt the excitement of fundamental research from the very beginning, when in the Castle of Udine R. Rosei described the results of a very recent experiment at the Trieste Synchrotron facility in which a time-resolved catalytic process had been observed and measured. Did the old frescoed walls of the Castle's monumental hall feel the thrill and the solemn importance of an announcement so different in character from the official discourses of centuries past?

Foreseeably, new materials and their applications held a large place in the Conference programme. C. Humphreys demonstrated how the properties of new materials can be put to good use. Waving an artificial hip in his hand he spoke about the new prospects opened by medical applications to materials research. One of the "new" materials that are currently studied is, in fact, bone - in order to discover what makes bones grow and how to best couple true bone with artificial materials. Then after admiring other new materials I was relieved to find out that, for example, the reason for the strange behaviour of negative Poisson ratio materials is, in fact, quite simple and easy to explain.

The impact of new materials on society was also discussed by W. Nicodemi, E. Gariboldi and M. Vedani in their talk on "Materials for the future" and further debated in Workshop 6 - "Material science from the STS point of view" organized by ICASE. A highschool teaching suggestion regarding shape-memory alloys was illustrated and demonstrated by G. Airoidi and G. Riva, "Shape-memory alloys: the materials science alive".

Education was strongly present at University and lower levels. It's always something of a shock to be reminded, as R. Stavy did in her talk on "Childrens' conceptions of the states of matter", what we teachers know in the rear of our minds but optimistically tend to forget: that real learning is not a straightforward process, it takes a long time and seeds sown today are most likely to flower next year if ever. Considering the time constraints (hence the haste) that characterise school activities in many countries and the immediate return our students are supposed to give us after our physics lessons, the students' widespread poor understanding and disaffection are not surprising.

However, a teacher is always looking for ways that will enhance the student's understanding and motivation, and in this respect the Conference offered much food for thought. New curricula (F. Herrmann, "Teaching magnetic materials: problems to avoid"; Workshop 4 - "Condensed matter in the school: a way forward"), new methods (R. Fieschi, "A multimedial course on material science" and others), new series of didactical experiments (A. Sconza and G. Torzo, "Teaching electrical transport properties in solids: an experimental approach", Workshop 5B - "Practical work in physics lab: sensors based on properties of matter", G. Rinaudo, "New ways of looking at an old law: the Ohm's law") or single suggestions as those seen in the Show&Tell sessions offered many developable ideas. I was struck by the team-work of L. Sabaz-Deranja and E. Okretiè who showed how simply they introduce the physics of liquid crystals in the classroom. I was happy to be reminded by G. Radnai in his "Simple experiments - unexpected results" that complexity is around the corner of everyday phenomena, ready to jump at us without warning. This, if we are ready to accept the challenge, is the salt of our science. And I will never forget the wide-eyed attention and delight with which the young daughters of a Conference participant watched B. Davies preparing his presentation "Magnets and coins".

A number of contributions dealt with teacher training curricula and in-service training of teachers: for example L. Kovacs, "Teaching solid state physics at secondary school and college level in Hungary"; V.K. Agarwal, "Sharing science with school teachers: an overview of what we learned"; E. Mechlova et al, "Investigation of strain using ultrasound".

Actually the Conference itself proved to be a valuable in-service training experience for a number of local teachers. In fact the presence of an efficient simultaneous translation system allowed them follow the Conference with ease. The Conference succeeded in performing what is expected of every GIREP Conference: to disseminate the results of research in science and education among the local practitioners, giving them new cultural and educational insights that will hopefully help them in the everyday classroom interaction with the students.

I am now eagerly looking forward to the Conference Proceedings to make up for the many things I missed.

Silvia Pugliese Jona

GENERAL INFORMATION

GIREP COMMITTEE

President: *Karl Luchner*, Sektion Physik, Universität München, Schellingstrasse 4, München D-80799, Germany (tel 49 89 2180 3174, fax 49 89 21803391)

Vice-presidents: *Marisa Michelini*, Dipartimento di Fisica dell'Universita, via delle Scienze 208, 33100 Udine, Italy (tel 39 432 558 208, fax 39 432 558 222, e-mail : Michelini@fisica.uniud.it), *Ian Lawrence*, King's School, Worcester, WR1 2LH, UK (fax 44 1 905 25511, e-mail: lan@kingphys.demon.co.uk)

Secretary: *Seta Oblak*, Board of Education, Poljanska 28, 61000 Ljubljana, Slovenia (tel 386611333266, fax 38661310267, e-mail: Seta.Oblak@guest.arnes.si)

Treasurer: *Christian Ucke*, Physikdepartment E 20, Techn. Universität München, 85747 Garching, Germany (tel 4989 32092399 fax 4989 32092338, e-mail: ucke@e20.physik.tu-muenchen.de)

FEES

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

The current fee (1996) is 12 £st, preferably paid into the following account:

Christian Ucke, Postbank (GIRO) München

Account No. 355 28-808, BLZ 700 100 80.

BLZ (= Bankleitzahl) means a special sort of code for the postbank in Germany.

Please do not pay into other accounts.

The members should pay their own bank charges and mailing costs. 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. If you need a receipt for tax purposes or similar reasons, please ask for that. The treasurer will otherwise not send it.

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 payment (Denmark, Finland, France, Great Britain, Netherlands, Austria, Sweden).

If you prefer in order to reduce bank expenses you may pay several years fees in advance.

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

The last General Assembly of GIREP members in Udine (August 1995) accepted the following supplementary new article for the GIREP statutes:

In the October each year, those members who have not paid for the previous two years will be removed from the membership list.

Italian members: Equivalent of 12 £st can be paid, in Italian Lire only, to Silvia Pugliese Jona, via San Nazario 22, 10015 Ivrea (Torino), Italy, (tel 0125 49869, fax 0125 631872, e-mail: MC5940@mclink.it)

FUTURE CONFERENCES

1996 Ljubljana: NEW WAYS OF TEACHING PHYSICS

1998 Duisburg: HANDS-ON EXPERIMENTS AND TOYS IN PHYSICS TEACHING

1999(?) Ostrava: PHYSICS AND ENVIRONMENT