

NEWSLETTER

girep

Groupe International de recherche sur l'enseignement de la physique
International research group on physics teaching
Internationaler Arbeitskreis zur Förderung des Physikunterrichts

N. 25 - February 1991

This issue of the Newsletter is mainly devoted to reports on the preparation of the GIREP '91 Conference on Teaching Reference Frames and to a commemoration of Eric Rogers. In the last part of the Newsletter you will find the usual information about publications and Conferences.

The envelope label shows the date of your last payment according to the Secretary's data. If the information is wrong send me a short note, but please do update your fee if you are late. GIREP needs your contribution to be able to keep up with its commitments: at this moment, we must give our support to the Conference in Poland.

1. FROM THE EDITOR

While I am writing this issue of the Newsletter I cannot avoid thinking about the international situation. I feel compelled to express my concern for the populations that are involved in the Middle Eastern strife and for the members of GIREP among them. Communication with two members living in Kuwait before its seizure by Iraq are interrupted since last summer. The daily life and activities of members living in Israel are constantly disturbed.

I cannot help thinking that this conflict touches us not only as human beings and citizens but also as teachers of physics and educators. Our message to our students uses physics as medium. Idealistic youngsters rightly dream of a better world: what image of science do they conceive when beholding the effects of science-based, sophisticated technology applied to modern weapons? Will not more and more students be repelled by science and physics and refuse to come to us to learn the knowledge we can teach and, we believe, is essential to them as citizens? In many countries great efforts are made to make physics attractive to young people and equally attractive to boys and girls. Will these efforts be frustrated by an irrational running away of our would-be students? It already happened before - it may happen again. The gap between those who choose to be scientifically literate and those who opt away may widen yet. No doubt, this is matter for concern.

Silvia Pugliese Jona

2. A VISIT TO TORUN: Paul Black, president of GIREP, gives his impressions.

As part of the preparations for the GIREP meeting in August, I paid a brief visit to Poland early last November. The meeting will be in Torun, which is 220 km north of Warsaw. Like the capital, it is on the banks of the Vistula, which flows on to reach the Baltic sea near Gdansk, another 175 km to the north. It was down this waterway that the traders of the Hanseatic Alliance came to Torun and helped to make it an important medieval city - the second largest in Poland in the 14th century. In this inland port flourished many merchants, and one of these was the father of Nicholas Copernicus, born there in 1473. From that period, three cathedrals and parts of the castle and walls have survived, with many later features including fine Baroque houses. This was the first time, for example, that I had seen the flying buttresses of a Gothic cathedral built in brick rather than stone.

The university is modern. Its rapid growth from the foundation in 1945 was helped when scholars from the east moved in order to remain within Poland's borders after these were re-drawn following World War II. There is a flourishing Physics Department, with 25 professors and another 52 PhDs on the staff. Twelve kilometers from the city is a well-equipped observatory for optical and radio astronomy, which was started with a gift of a telescope from Harvard.

I came as President of GIREP and received a very warm welcome from all. The Rector of the University made clear how they value being hosts to our international conference. The Physics Department underlined this. Both in principle and in the practical way many of its staff are helping with the meeting. Many of the details - such as the facilities for photocopying, and whether participants would want to visit the medieval manuscripts in the library (yes please) are being sorted out. At the same time, the International Advisory Committee is assembling the main programme of speakers.

I went away happy to see the conference was in very good hands and looking forward to seeing Torun again in August. Poland is a country with many economic problems, but also with a renewed vigour and determination, so that many features are changing rapidly. I look forward to being in Torun again, hoping that the busy conference will leave me some time to enjoy the city, its surroundings and, most of all, the warm hospitality.

3. REMINDER ON THE GIREP CONFERENCE "TEACHING ABOUT REFERENCE FRAMES: FROM COPERNICUS TO EINSTEIN" (Torun, 19-24 August 1991)

The focus will be on different aspects of developing, introducing and understanding the basic physical concepts concerning reference frames with a special attention being paid to the present state of the art in educational approaches.

The conference will consist of plenary lectures, workshops, poster sessions and exhibitions. Here is the preliminary list of invited plenary speakers:

Marek Demianski (Poland), Rosalind Driver (UK), Gerard Holton (USA), Wilhelmina Iwanowska (Poland), M. Kugler (Israel), George Marx (Hungary), Jayant Narlikar (India), Jon Ogborn (UK), Clifford E. Swartz (USA), Alfred Pflug (Austria), Edwin Taylor (USA), Andrzej Trautman (Poland), Andrzej K. Wroblewski (Poland).

Tentative topics for workshops are:

- 1) Historical and philosophical aspects: a) development of reference frame concepts from Copernicus to Einstein; b) using historical and philosophical aspects in teaching.
- 2) Introducing elements of special and general theory of relativity.
- 3) Research on the understanding of basic concepts concerning reference frames.
- 4) High school and university experiments.
- 5) Computer simulations.
- 6) Other teaching technologies.

Conference fees: (before June 1, 1991)

active participant	120.00\$
accompanying person	50.00\$
GIREP, EPS individual member	100.00\$
student	50.00\$
late registration (additional fee after June 1)	20.00\$

Accommodation costs in student dormitory (per person):

a) Lodging:	double room	6 x 12.50\$ = 75.00\$
	single room	6 x 20.00\$ = 120.00\$
b) Board:		5 x 22.00\$ = 110.00\$

Further Information from:

Dr. Jozefina Turlo, GIREP '91 Secretary, The Institute of Physics, Nicolaus Copernicus University, 5 Grudziadzka Street, 87-100 TORUN (Poland)

4. IN REMEMBRANCE OF ERIC ROGERS by Brenda M. Jennison, University of Cambridge (received 29 August 1990)

Eric Rogers inspired a generation of Physics Teachers worldwide. He was very special to us all. He received the Oersted Medal (AIP), the Bragg Medal (IOP) and the Medal of the International Commission for Physics Education (ICPE). However public honours didn't reflect the pleasure he gained from turning a kitchen into chaos as he demonstrated the "wonder and delight" of physics to young children.

"Physics for the Enquiring Mind" was published in 1960 as a text book for junior physics courses in American Universities. It is found on bookshelves and in libraries worldwide. I still recommend it to my student teachers as the only book which will teach them the "bits of physics" they never quite understood. He was Organiser of the Nuffield O-level Physics Course (England). As a probationary teacher in 1964 I will remember this energetic "pensioner" talking to us about Examinations which would need no revision because pupils would understand the subject rather than just remember the facts. Pretty revolutionary in those days! At the Nuffield briefing conferences he had a whole lecture theatre of physics teachers lifting bricks to feel the pull of gravity.

Simple apparatus and simple demonstrations were his hallmark. He always made you wonder why you hadn't thought of it before. He hated "black boxes" and expensive apparatus when "string and sealing wax" would do. He encouraged the teaching of practical physics in the school little knowing that the integration of theory and practical would become the norm in Britain. He chided the Edinburgh Conference on Physics Teaching in 1975 because he had listened to lectures on physics for a week and there hadn't been a demonstration. Before his lecture he was found above the stage fixing stones to a string so that when they fell the stones hit the ground at equal intervals of time. Simple but effective and well worth the applause it received. Another vivid memory comes from the Royal Institution Children's Christmas Lectures when he left the lecture theatre on a trolley driven by two fire extinguishers!

He was a perfectionist and an eccentric. He thought nothing of hiring a taxi to send his shirts to the laundry in the middle of a conference or telephoning across the Atlantic to find out someone else's telephone number. He could be a difficult man to work with but he was always a kind man, a firm friend and always willing to offer help to anyone.

Right up until his death he was trying to make physics accessible to young children. He worked at the Cité des Sciences et de l'Industrie in Paris advising on the exhibits. He was always critical of the large exhibit which owed more to advertising than to simple but effective apparatus which demonstrated the principles of physics. In spite of his wheel chair he visited Launch Pad in the London Science Museum this summer before setting off again for one of his frequent flights to the USA to advise a Museum in the Mid-West. His last job was to visit the University Library to sort out details on a relaxation oscillator.

He taught me and many others to love and understand physics through the stories he told. His impact on physics teaching in Britain was made after he had retired from Princeton University. Few could have done more in a lifetime.

His many GIREP friends will remember him at his last Conference in Hungary in 1989. He loved trips to Hungary and in spite of needing a wheelchair he was determined to be there. His lack of mobility frustrated him but he took part in everything with good humour and his wise words will be remembered by all.

He was known world wide but sadly he died alone on 1 July 1990 in Cambridge, England, at the age of almost 88.

5. S.N.P.P.iT., THE BIRTH OF A NEW ASSOCIATION

A group of initiators of the Association of Science and Technology Teachers of Poland met in Bydgoszcz on 11th September 1990. During this first working meeting the initial version of the Statutes was discussed and the final version of the document was produced. The temporary Steering Committee was elected. The President is Alicja Wojtyna-Jodko.

Mrs. Wojtyna-Jodko, who also is a member of GIREP, is a school-teacher of physics in one of Bydgoszcz's secondary schools.

6. PUBLICATIONS

1. Relating Macroscopic Phenomena to Microscopic Particles: a Central Problem in Secondary Science Education Editors: P.L.Lijnse, P.Licht, W.de Vos, A.J.Waarlo - CD-β Press, 346 pages, Dfl. 50,-

This volume contains the proceedings of a research seminar with the same title, held in The Netherlands from October 23-26, 1989. The forty invited participants, mainly from Europe, are actively involved in research in physics, chemistry and biology education on the specific topic of why and how to deal with particle explanations in the teaching of these sciences at the secondary or early tertiary level.

Plenary lectures presented at the seminar are reported in the first part of the proceedings, among them an extensive review of research on pupils' conceptions of matter and its transformations by B. Andersson (Goteborg) and a report of a study on linear causal reasoning in thermodynamics by L. Viennot (Paris).

The second part of the proceedings contains the revised versions of working papers of which first drafts were presented at the seminar in discussion groups. Among these: A. Dreyfus (Rehovot) on teaching about the living cell; A. Pritchard (Southampton) on the role of a particulate theory in biology education; W. de Vos (Utrecht) expresses seven thoughts on teaching molecules; R. Ben-Zvi (Rehovot) sees the macro-micro relations as a key to the world of chemistry; K. Johnston (Liverpool) reports about the results of the CLIS-Project; R. Stavy (Tel Aviv) describes her research about pupils' knowledge of the quantity of matter; M. Meheut (Paris) searches for the bounds of children's atomism, while Klaassen (Utrecht) restructures the teaching of radioactivity, just to name a few of the 19 contributions.

All together this volume presents an interesting and up-to-date view of the research that is going on in this particular field of science education.

The book can be requested from: Mrs. J.Andriese, Centre for Science and Mathematics Education, P.O.Box 80.008, 3508 TA Utrecht, The Netherlands. Please include a cheque made up to Mrs. Andriese with your order, adding Dutch florins 13,00 (for cheque costs) to the total, or remit the money directly to giro account 554757 of "Natuurkunde Didactiek", Utrecht.

2. A.I.F. special issue on Computers in Physics.

The spring 1990 issue (vol. XXIII, n. 2) of "La Fisica nella Scuola", journal of the Association of italian physics teachers, is a 170 page survey devoted to different aspects of integrating the computer into education in physics. The issue is divided in sections: Research on Computer Aided Learning, Simulations, Modelling, Computers in the Lab, Software evaluation, Examples of applications in schools, Software development, Information on the italian "Piano Nazionale per l'Informatica", Information from other countries. The last section includes contributions from The Netherlands, Germany and France.

Most of the articles are by italian authors but a few were written especially for this issue by well known foreign experts: George Marx (Hungary) and Jon Ogborn (U.K.) on modelling, Joseph Depireux (Belgium) on interfacing, R. K. Thornton (USA) on the

Micro-Computer Based Laboratory (MBL). All articles are preceded by an abstract in english.

The italian Piano Nazionale per l'Informatica is a government project aimed at introducing the computer in secondary education, started at the end of 1985. The implementation primarily concerns physics and mathematics. Up to now, more than 4/5 of the senior teaching staff of these subjects took in-service courses aiming to help them take off, but problems still remain. So the main purpose of the issue is to give the readers not only a general overview of the actual but also a series of expendable ideas and concrete suggestions on how to insert computer-based activities in the physics lesson in meaningful ways for physics teaching.

It appears that practically all articles point towards using the computer in close coordination with experiments, not only when it is employed for on-line data acquisition but also when simulating or modelling phenomena. So this may be assumed to be the educational strategy advocated by A.I.F. For example:

* The only article dealing with simulations describes instructional strategies that go from the experiment to the software and then again to the experiment. The simulations aim to increase the students' comprehension of the phenomenological aspects before arriving at a formal description.

* Two approaches are apparent in articles describing actual classroom experiences by teachers. The first approach goes from the experiment to the construction of a computer model (usually of the dynamical type) in which the experimental pattern is reproduced. The second goes from studying a typical mathematical function to performing experiments on phenomena exhibiting the same behaviour (for example capacitors during an electric transient in connection with the differential equation leading to exponential behaviour).

The issue is on sale for Lit. 10000. Please address your request and prepayment in italian lire to: Dr. Marisa Michelini, Editor of "La Fisica nella Scuola", Dipartimento di Fisica, via Campi 113/A, 41100 MODENA (Italy).

7. KITCHEN PHYSICS

Recipe n.1 (always works): Two empty and dry plastic soft-drink bottles of the same size with screwed caps, two handfuls of dry sand or gravel, a big soup-pan, water.

Put one handful of sand or gravel into each bottle and a few tablespoons of water into one of them. Put the bottles upright, without caps, in the soup-pan and add water in the pan until they begin to float. Bring everything to boil.

After boiling for a few minutes close the bottles tightly, extract them from the hot water and put them side by side on the kitchen table. Wait until cold. On no account should you eat the gravel or sand.

Recipe n.2 (needs luck): Head of salad, hand-operated centrifugal salad wringer, a not-too-fixed-to-the-wall kitchen sink.

Fill the sink with water and wash the salad. Put the salad into the wringer without emptying the sink. Keeping the wringer firmly in place on the ledge of the sink with one hand, turn the handle and watch the surface of the water. If you're unlucky with the physics you can at least eat the salad.

8. FORTHCOMING CONFERENCES

1. The role of experiment in physics education, 26-29 August 1991, Skofja Loka, Slovenia, Yugoslavia.

Organized by the Board of Education of the Republic of Slovenia and the Department of Physics of the University of Ljubljana in cooperation with the European Physical Society.

The conference will explore the changing role of experiment in physics education brought by new sensors, interfaces and computer technology from elementary level up to university. The questions are: do these approaches improve learning? are they stimulating to teach? how to design experiments in which the spirit of physics would dominate over the technical intricacies?

The program foresees plenary lectures, didactical presentations, workshops and group discussions. Presentations of experiments are expected of all participants.

Conference fee: 50 DEM.

Contact: Seta Oblak, Zavod Republike Slovenije za solstvo, Poljanska cesta 28, YU-61000 Ljubljana, tel. 061/324363, fax 061/224312.

2. EPS Conference on Scientific Education and History of Physics, 28-31 August 1991, Cambridge (UK)

Contact: Ms. Ch. Blondel, Cité des Sciences et de l'Industrie, Centre de Recherche en Histoire des Sciences et des Techniques, 75930 Paris Cedex 19 (France)

3. ICPE Conference on Teaching Modern Physics: Statistical Physics and Fluid Physics, August 1992, Bajadoz, Extremadura (Spain)

Contact: Manuel Velarde, Physics Dept., UNED-Ciencias, POB 60-141, Madrid 28071, Spain

4. GIREP '93 Conference on Teaching Optics and Communication, Summer 1993, University of Minho, Braga, Portugal

Contact: Brian Davies, The Institute of Physics, 47 Belgrave Sq., London SW1X 8QX (UK)

GENERAL INFORMATION

GIREP COMMITTEE

President Paul Black, Cornwall House Annex, Waterloo Rd., London SE18TX, UK (tel 071/8365454, fax 071/8723182)

Vice-presidents George Marx, Dept Atomic Physics, R. Eotvos Univ, Puskin u.5, PB 327, 1088 Budapest, Hungary (telex 225459, tel 361/131843)

Joseph Depireux, Institut de Physique, 4000 Sart-Tilman (Liege 1), Belgium (tel 3241/563612, fax 3241/562355)

Secretary Silvia Pugliese Jona, via San Nazario 22, 10015, Ivrea (Torino), Italy (tel 0125/49869, fax 0125/631872)

Treasurer Brian Davies, The Institute of Physics, 47 Belgrave Sq, London SW1X 8QX, UK (tel 01/2356111, fax 01/2596002)

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 specifies otherwise.

The current fee (Jan 1991) is 10 £st, preferably paid into one of the two London accounts or, if that is not possible, the equivalent of 10 £st in the currencies and into the accounts indicated below. The rate of exchange will be that existing on the day of application for (or renewal of) membership, with members paying their own bank charges and mailing costs.

In cases of real difficulty of payment please contact the Secretary who will be able to advise whether special arrangements can be made.

London accounts (a) GIRO: Fees in £st should be made out to "Brian Davies re GIREP" GIRO Account n° 53 889 4806. This number must be quoted and the money sent to GIROBANK, c/o The Post Office, Eccleston Street 80 LONDON SW11 9LS, UK. At the same time, please send a note to the Treasurer confirming how much money you sent and when and for what years.

(b) Non GIRO: made out to "GIREP ACCOUNT N° 90301248" and sent to the Treasurer.

Italian Account Equivalent of £st 10 can be paid, in Italian lire only, made out to "Marisa Michelini" and sent to: Dr Marisa Michelini, Istituto di Fisica dell'Università, via Campi 213/A, 41100 Modena, Italy.

Swiss Account For historical reasons it is still possible to pay fees in S.Fr. to the equivalent of 10 £st, into "GIREP Account n°376089-91", Credit Suisse, 1002 Lausanne, Switzerland. This is not a good method but if you must choose it, please send the Treasurer a letter with every possible detail of your banking transaction with Credit Suisse. Failure to do so may, regrettably and through no fault of GIREP, mean that your payment will never appear in our databases.

Fees from countries where the above procedures are very difficult or impossible may be paid directly to George Marx after having agreed on a procedure with him.

APPLICATIONS AND NEW MEMBERS

Applicants for membership should please require the Application Form from the Treasurer.

INQUIRIES - CHANGES OF ADDRESS

Please address inquiries concerning fees to the Treasurer.

Other inquiries may be addressed to the Secretary or to any other member of the Committee.

Please send notice of changes of address to the Secretary.

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