

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. 22 - July 1989

Dear members,

This is an election year for GIREP. The mandate you gave the Committee in Utrecht in 1984 is expiring and the General Assembly that will take place in Balatonfüred in the month of September will be called to elect a new Committee and two auditors.

At page 6 you will find the list of members who, having paid their 1989 fee, are entitled to vote.

Please look for your name in the list and then check your yearfee on the envelope label. If your fee is due, please update it immediately.

GIREP is in the grip of financial difficulties and needs your timely contribution to be able to keep faith to its statutory commitments. Like many other small organisations, GIREP suffers of cashflow problems: but we believe that, through the membership's good will, GIREP has the potential to solve them. Please notice that at this moment GIREP's mailing list includes more than 300 names but less than 100 have updated the fee for 1989.

If, instead, you are resolved not to be a member of GIREP any more, please write a note to the Treasurer or to the Secretary to inform them of your decision so, at least, we can know where GIREP stands and be able to plan accordingly.

1. INTERNATIONAL CONFERENCE ON ENERGY ALTERNATIVES (RISK EDUCATION) - Girep, Iupap/Icpe, Unesco - Lake Balaton (Hungary), 7-13 Sept. 1989

The participants have already received the necessary documentation from George Marx. The programme provides for Plenary Sessions in the mornings and Workshops in the afternoons (an excursion is planned for the afternoon of 11th Sept.). The programme is very rich and full of interesting and exciting activities and includes all the ingredients that always make the Balaton Conferences such a great success.

2. GIREP GENERAL ASSEMBLY

The GIREP General Assembly will take place at Balatonfured on 12th September 1989 at 12 o'clock. Among the other points, the agenda will carry a couple of proposals of changements of the Statutes:

1. Article 2 now states that the main target of the activities of GIREP is the teaching of physics at the secondary level. This is now seen as too restrictive and it seems more appropriate to include all levels of schooling explicitly in the Statutes.
2. Article 11 requires that the President and Treasurer reside in the same country. This also now seems to the Committee to be unnecessarily restrictive.

3. PAYMENT OF GIREP FEES

During the Balaton Conference the Treasurer Brian Davies will receive fees from members every day, provided they are paid in one of the following currencies: DM, Italian lire, £st or Austrian schillings, at the rate of the day for £st. 10.

Please notice that payment through Credit Suisse is now strongly discouraged by the Treasurer, who intends to propose closing that account altogether. The Bank's inefficient handling of information has been the source of many difficulties for GIREP. Lack of information still causes the following 1987 payments to be unacknowledged: 2 June 87, \$US 10; 8 Aug 87, \$US 30; 13 Aug 87, \$US 30; 14 Aug 87, SF 15.65; 9 Sept 87, SF 44.10; 19 Sept 87, SF 15.10; 21 Oct 87, SF 29.75; 20 Nov 87, SF 30.00; 23 Nov 87, SF 22.00.

Dear members, do you recognize your unacknowledged payments in this list? If you do please inform the Treasurer!

4. PROCEEDINGS OF THE ICPE CONFERENCE ON "TEACHING MODERN PHYSICS - CONDENSED MATTER"

The Proceedings have now been printed and are being sent to members for 1988 directly from the publisher, World Scientific in Singapore. If you are entitled, you may expect to receive your copy by surface mail after the end of June. Copies of the Proceedings will be available for sale at half-price for GIREP members (whole price for non-members), at Lake Balaton in September.

5. EUROPHYSICS STUDY CONFERENCE ON THE HISTORY OF PHYSICS (contributed by J. Depireux)

The Group dealing with pedagogical uses of history of physics which recently joined the Advisory Committee on Physics Education of the European Physical Society held its first Europhysics Study Conference on "Science Education and the History of Physics". This meeting took place in Orsay (France) from November 21st to 24th, 1988 and brought together some fifty people: researchers, teacher educators and practising teachers. Participants had an opportunity to exchange their experience in

using historical aspects in teaching in fields like the evolution of concepts, reconstruction of historically decisive experiments, physics in relation to other sciences and society, teaching aids, etc.

The last day was devoted to specific interaction with the "Union des Physiciens" (the French Association of physics and chemistry teachers) and gave rise to a lively presentation of actual experience in classes at the upper secondary level.

A survey is launched to know what kind of material suitable for teaching already exists in various countries and to select some productions that might be translated in numerous European languages so as to avoid duplication of efforts in trying to build up a common teaching material.

The next activities of this group will be an Open Meeting on the same subject to be held in Cambridge (U.K.) in August 1990 (28 to 30) and a Symposium during the 8th General Conference of the EPS in September 1990 (4 to 8).

For contacts with this group, please write to the Secretary: Dr. Christine Blondel, Cité des Sciences et de l'Industrie, F-75930 PARIS Cedex 19, France or to the European Physical Society.

6. PUBLICATIONS

1) FITEC - Notas Metodologicas de Fisica y Tecnologia

Prof. Marilù Rioseco, Didactica de la Fisica, Universidad de Concepcion, Casilla 119-C, CONCEPCION, Chile sent the first issue of FITEC, a new publication she is editing.

The publication is in Spanish and is addressed to physics teachers in Technological High Schools in Chile. The first issue, dated Jan-March 1989, deals with Electrical Energy and is sponsored by the National Electricity Board of Chile ENDESA.

The next issues will deal with Telecommunications (sponsored by Chile's main Telephone Company), Forces and Work (sponsored by a forestry industry) and Metals and their Properties (sponsored by a big Steel Processing Co).

Prof. Rioseco would be very pleased if any GIREP member would like to collaborate with FITEC, sending a short paper in spanish, english or german.

2) A special offer to GIREP members from the Institute of Physics, London, U.K.

The Publishing Division of the Institute of Physics has agreed to supply GIREP members with the six annual issues of the magazine "Physics Education" at the special reduced rate of £st 14.50 per year.

Sample copies of "Physics Education", which is concerned with physics education in secondary schools from the age of 14 and above, may be obtained by writing to Mrs. Geraldine Pounsford, IOPP, Techno House, Redcliffe Way, Bristol, UK.

If you subscribe for 1989, then back copies of all existing 1989 issues will be sent straight away.

Methods of payment. GIREP members whose fees are paid up to this year (1989) can either send a cheque for £st 14.50, made out to "IOP Publishing Ltd", to the GIREP Treasurer Brian Davies (see address on page 7 of the Newsletter) or you can simply send the Treasurer your credit card number and expiry date. American

Express, Visa, Access and Diners Club cards are currently accepted.

Don't forget... that individual subscriptions to the IOP's flagship magazine "Physics World" is currently only £st 20 per year for 12 issues. If you want details, sample copies, etc, please write to Mrs. Pounsford at her address given above.

7. SUMMER SCHOOL ON PHYSICS EDUCATION

A Summer School on Recent Developments in Physics Curricula will be held in Crikvenica, Yugoslavia, from 15 to 21 September 1989, with the sponsorship of the Union of Societies of Mathematicians, Physicists and Astronomers of Yugoslavia.

The programme of the School is:

- * Nuffield Advanced Physics
- * Nuffield Co-ordinated Science
- * Presentation of the Karlsruhe Physics Course
- * Recent developments in Physics Curricula in some Yugoslav Republics

It is now too late to enrol for the school but if you are interested in receiving further information or documentation please contact: Ms. P. Pecina, Dept of Physics, Faculty of Science, P.O. Box 162, Marulicev trg 19, 41001 ZAGREB, Yugoslavia

8. FORTHCOMING CONFERENCES

1) "Interdisciplinary Aspects of Physics Education" July 30 - August 4 1989, Altmuenster (Austria)

Contact: Prof. H. Kuehnelt, Institut fur Theoretische Physik, Boltzmanngasse 5, A-1090 Wien, Austria.

2) "Conference on Physics Education" Sept. 1989, Biecz (Poland)

Contact: Dr. Andrzej Puch, Physics Institute, Pedagogical University, Rejtana 16a, 35-310 Rzeszow, Poland.

3) "III Congreso Internacional sobre la Didactica de las Ciencias y de las Matematicas" 21-23 Sept. 1989, Santiago de Compostela (Spain)

Theme: LA INVESTIGACION DIDACTICA Y EL TRABAJO EN LA AULA.

Major activity: Workshops in which effective school-room activities will be presented, having their basis on the results of research on education in the sciences and in mathematics, and aimed at all educational levels.

Other activities: Invited lectures, contributed papers, poster session, exhibits of journals and other materials related with the theme of the Conference.

Contact: Enseñanza de las Ciencias, ICE Universitat Autonoma, 08193 Bellaterra (Barcelona), Spain.

4) 5th International Conference of Gender and Science and Technology (GASAT) 17-22 September 1989, Technion - Israel Institute of Technology, Haifa (Israel)

The Conference aims to:

- * explore diverse aspects of gender differentiation at all levels of education and employment in science, engineering and technology;

* examine policies which will help eliminate or surmount barriers to women's participation in scientific, engineering and technological fields and to improve women's prospects and position in the labour market;

* develop innovative strategies and interventions for encouraging girls and women to embark on education and careers in science, engineering and technology;

* provide an international network of resources which will assist and strengthen those working towards gender equity in education and employment in science, engineering and technology.

Contact: Secretariat, GASAT 5, Atzeret Ltd, PO Box 3888, Jerusalem 91037, Israel.

5) International Conference on History, Philosophy and Science teaching 6-10 November, Florida State University, Tallahassee, USA

This Conference is the culmination of an international project which began in 1987, aimed to improve science teaching by showing the benefits that history and philosophy of science can bring to the development of curricula, the presentation of classroom lessons and the training of teachers. The Conference sessions will be partly based upon papers published in a number of journals related to the theme. These papers will be available prior to the Conference.

Contact: Dr. Michael R. Matthews, Conference Secretary, School of Education, University of New South Wales, PO Box 1, Kensington, NSW, Australia

6) IDSTE 5th International Symposium Dec. 1989, Manila (Philippines)

Contact: J. van Trommel, PO Box 2061, 7500 CB Enschede, The Netherlands.

7) International Symposium on Fieldwork in the Sciences 22-29 April 1990, Flevohof (The Netherlands)

Sponsored by ICASE, Dutch Fieldstudies Council, NVON, KNAG, FEE.

The Symposium aims to acquaint the participants with the different international curricula and developments of fieldwork for the subjects of Geography, Physics, Biology, Chemistry and Science. Fieldwork is a methodology, a didactical approach to Science education, in which the pupils are encouraged to learn about the reality of the physical and life world.

The results of the Symposium will be the basis for an ICASE publication.

Contact: Henk Lindeman, Secretary of FISFIS, Fieldstudy Centre, Zuideresweg 10, 9441 TZ Orvelte, The Netherlands. Telephone number 09/31 5934 263.

8) GIREP Conference on Teaching about Reference Frames (from Copernicus to Einstein) August 1991, Poland

The Conference will be organized by Prof. G. Bialkowski, Institute of Theoretical Physics, University of Warsaw, Hoza 69, 00-681, WARSAW, Poland.

9. LIST OF MEMBERS OF GIREP, 1989 AND OVER

AGNES Corrado, Dip. di Fisica del Politecnico, cso Duca degli Abruzzi 24, 10129 TORINO, Italy
AGUIRRE Carlos, Technological Policy Group, Junta de Acuerdo de Cartagena, Casilla de Correo 548 LIMA, Peru
AL-OMARI Tawfig Ahmed, Min.of Education, Science Supervis., P.O. Box 43453, HAWALLI 32049, Kuwait
AUBRECHT Gordon J., Ohio State University, Physics Dept, 1465 Mt. Vernon Ave., MARION OH 43302, U.S.A.
BALDACCI Ornella, , viale Argonne 48, 20133 MILANO, Italy
BAROJAS WEBER Jorge, The American Institute of Physics, 2000 Florida Ave, NW WASHINGTON DC 20009, U.S.A.
BEERDEN Lucien, , Stevoortse Kiezels 219, 3512 HASSELT, Belgium
BERGOMI Nydia, , via Tolmezzo 5/3, 20132 MILANO, Italy
BLEZZA Franco, , viale Nazioni Unite 120, 31100 TREVISO, Italy
BORMANN Manfred, abtg 12, Fachdidaktik Physik, Universitatstr. 150, 4630 BOCHUM, Germany (Fed Rep)
BRUNI CIAMPINI Maria Luigia, , viale Italia 183, 57127 LIVORNO, Italy
BYSKOV Asger, , Saorumvej 36, 2700 BRONSHOJ, Denmark
CALVELLI Giulio, Dip.di Fisica 'G. Galilei', via Marzolo 8, 35131 PADOVA, Italy
CERRETA Pietro, , via F. Tedesco 36, 83045 CALITRI (Avellino), Italy
CHYTILOVA Marta, , Bayerova 2, 60200 BRNO, Czechoslovakia
CORTINI Giulio, Istituto di Fisica, piazzale Aldo Moro, 00185 ROMA, Italy
CSILLAG Ana, , 130 Fenelon Drive, DON MILLS, Ontario M3A 3K6, Canada
DAVIES Brian, The Institute of Physics, 47, Belgrave Sq, LONDON SW1X 8BX, UK
DAVIS Douglas A., Physics Dept, Eastern Illinois University, CHARLESTON IL 61920, USA
DAVIS Kenneth E., Reed College, , PORTLAND OR 97202, USA
DE SOUZA BARRROS S., Inst. de Fisica, Univ. Federal, L. do Fundao, RIO DE JANEIRO, Brazil
DEACON John A., Physics Dept, Western Australian, Institute of Technology - Kent st., SOUTH BENTLEY 6102, Australia
DEPIREUX Joseph, Universite' de Liege, Institut de Physique B-5, 4000 SART TILMAN (Liege 1), Belgium
DI BIASIO Valeriano, , via Ascatiello 6 bis, 04023 FORMIA (Latina), Italy
DREYFUS Tommy, Center for Technological Education, pob 305, HOLON 58368, Israel
DUIT Reinders, I.P.N., Olshausenstr 40, 2300 KIEL, Germany (Fed Rep)
ELLIOT Ian, Dunsink Observatory, , DUBLIN 15, Ireland
FAZIO Michelangelo, , via Italia 97, 20053 MUGGIO', Italy
FERBAR Janez, Pedagoski Institut, Gerbiceva 62, 61111 LJUBLJANA, Yugoslavia
FUGLSANG Ole, , Jens Jensens vej 5, 7540 HADERUP, Denmark
GADGAARD Finn, , Violvej 321, 7800 SKIVE, Denmark
GELLER Zvi, , 11 Haamoraia str, RAMAT AVIV, Tel Aviv, Israel
GUNSTONE Richard, Faculty of Education, Monash University, CLAYTON 3168 Victoria, Australia
HALKJAER E., , Ny Skelgordsvej 15, 2770 KASTRUP, Denmark
HARRAP Martin J., , 22 Garden City, EDGWARE HA8 7NQ Middlesex, UK
HERKRATH Juan, , Carrera 8 n. 89-03, BOGOTA' 8, Columbia
HRASTAR Andraz, , Poljijskapot 8, 64270 JESENICE, Yugoslavia
HRIBAR Marjan, Dept of Physics - FNT, Jadranska 19, 61000 LJUBLJANA, Yugoslavia
IPN, Universitat Kiel, Olshausenstr 40-60, 2300 KIEL, Germany (Fed Rep)
JENSEN Ejvind F., , Tornevej 7, 3200 HELSINGE, Denmark
JOEL Nahua, , 46 rue Fabert, 75007 PARIS, France
JOSSEM E. Leonard, Physics Dept. Ohio State Univ., 174# 18 Avenue, COLUMBUS OH 43210, USA
KLINC Dedimir, , Iga Grudna 7, SEZANA 66210, Yugoslavia
KNUTSEN K. Jostein, , Granlivn. 24, UGLA, 7000 TRONDHEIM, Norway
KUELER G., , Ia Seifilde 37, D-8000 MUNCHEN 83, Germany (Fed. Republic)
LEWIS John L., , Pump Cottage, Colwall Green, MALVERN Worcs WR13 6DX, UK
LOPES DE ALMEIDA PADUA Jesuina, Inst. Fisica, Univ. de Sao Paulo, Cidade Universitaria cp 20516, SAO PAULO, Brazil
LORIA Arturo, , via Drazio Vecchi 31, 41100 MODENA, Italy
LUOVA Kaarle P. A., , Toistaentie 2 B 21, 20310 TURKU, Finland
LYBECK Leif, Dept of Education, box 1919, University of Goteborg, S-40126 MOLNDAL, Sweden
MACFARLANE John T., Mount Allison University, Physics Dept, SACKVILLE NB E0A 3C0, Canada
MADSEN Kurt, P.O. Box 2006, FR155 ARSIR, Faroe Islands (via Copenhagen), Denmark
MARIANI Cesare, Istituto di Fisica, via Celoria 16, 20133 MILANO, Italy

MARRAFFA Francesco, , Parco Eucaliptus 8/b, 81043 CAPUA (Caserta), Italy
 MARTIN SANCHEZ Manuela, , Caspamor 19/1 D, 37001 SALAMANCA, Spain
 MARTIN SANCHEZ Maria Teresa, , Caspamor 19/1 D, 37001 SALAMANCA, Spain
 MARTINS Anabela B., R. Danish School of Educ. Studies, Emdrupvej 115 B, 2400 COPENHAGEN NV, Denmark
 MATAR Fatima. Dept of Physics, University of Bahrain, P O Box 32038, Bahrain
 MAYER Michela, , via Rosa Ramonci Garibaldi 30, 00145 ROMA, Italy
 MERZYN Gottfried, , Waldweg 26, 3400 BOTTINGEN, Germany (Fed Rep)
 MICHELINI Marisa, , via Wagner 11, 41100 MODENA, Italy
 MIKELSKIS Helmut, IPN, Olshausenstrasse 49, 2300 KIEL, Germany (Fed Rep)
 MIKULICIC Branka, , Preradoviceva 34, 41100 ZAGREB, Yugoslavia
 NEUMANN Hans Ludwig, , Bismarckstr 68, 6050 OFFENBACH, Germany (Fed Rep)
 OGBORN Jon M., Inst.of Education, Univ. of London, 20 Bedford Way, LONDON WC1H 0AL, UK
 OTT Aadu, , Batsmansvagen 11, S-43364 PARTILLE, Sweden
 PELLEQUER Bernard, Observatoire Astronomique, BP 14, ANIANE 34150 Gignac, France
 PEREZ DE LANDAZABAL M. Carmen, , Carretera de Canillas 140, 28043 MADRID, Spain
 PESSOA DE CARVALHO Anna Maria, Fac de Educacio, univ. de Sao Paulo, Cidade Universitaria cp 30303, SAO PAULO 055
 Brazil
 PESSOA QUEIROZ S. Regina, Inst. Fisica, UFF, Outorio de S. Joao Baptista s/n, VALONGUINHO-NITEROI, Rio de Janeiro
 Brazil
 PSCHIEDL Kari-Heinz, , Tuipenweg 22, 7159 ADESWALD 1, Germany (Fed Rep)
 PUGLIESE JONA Silvia, , via San Nazario 22, 10015 IVREA (Torino), Italy
 RESNICK Robert, Rensselaer Polytechnic Inst., Dept. of Physics, TROY NY 12181, USA
 ROBERS Eric M., , Nuffield Lodge, Regent park, LONDON NW1 4RS, UK
 ROSENBERG Erkki, , Korostentie 6 C A7, 00280 HELSINKI 28, Finland
 RUHLA Charles, Institute de Physique Nucleaire, 43 Blvd du 11 Novembre 1918, 69521 VILLEURBANNE, France
 SCHUSTER David G., Physics Dept, University of Natal, DURBAN 4001, South Africa
 SEGURA MALAGON Juan Jose', Centro de Profesores - Zaragoza, Paseo Reyes de Aragon 20, ZARAGOZA, Spain
 SETTE Daniele, Dip. di Energetica, Univ. di Roma, via A. Scarpa 14, 00161 ROMA, Italy
 SHADMI Yehuda, Orania, University of Haifa, KIRYATH-TIVON, Israel
 SHAQALAH Jaber Mahmood, Min.of Education, Science Supervis., P.O. Box 7, SAFAT 13001, Kuwait
 SUAREZ DE LA FUENTE Jose Luis, , General Davila 129-2, 1°B, 39007 SANTANDER, Spain
 TEDDORO Dario, , via Grassi 16, 20060 CASSINA DE' PECCHI (Milano), Italy
 THOMSEN Poul, R.Danish School of Educ. Studies, Emdrupvej 115 B, 2400 COPENHAGEN NV, Denmark
 TRICARICO Hugo Roberto, , Jacinto Rosso 367, 1834 TEMPERLEY (Buenos Aires), Argentina
 UCKE Christian, , Madelegapfelstr. 73, 8000 MUNCHEN 82, Germany (Fed Rep)
 VITALI Anna, , via Lamarmora 21, 20122 MILANO, Italy
 VOLD Per, , Postboks 25, 5034 Y. LAKSEVAG, Norway
 VDS Henk, , Dr.Zaenhoflaan 216, 7522 KW ENSCHEDE, Netherlands
 WELTNER Klaus, , Shumaunstrasse 57, 6000 FRANKFURT 1, Germany (Fed. Republic)
 WESSELS P., M.N.U., Arensburgstrasse 28, 2800 BREMEN, Germany (Fed. Republic)
 WUBBELS Theo, Physics Dept Rijksuniversiteit, Princetonplein 1, 3598 TA UTRECHT, Netherlands
 YUN YING, Physics-Chemistry Dept, Nanjing Institute of Technology, NANJING, Jiangsu, China
 ZANETTI Vittorio, Dipartimento di Fisica, Universita' di Trento, 38050 POVO (Trento), Italy

10. GENERAL INFORMATION

GIREP COMMITTEE

President Paul Black, Centre for Educational Studies, King's College London (KQC), 552 King's Rd, London SW10 0UA, UK (tel 01/3512488)

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

Piet Lijnse, Rijksuniversiteit, 3508 TA Utrecht, pob 80008, The Netherlands (tel 09/3130531179)

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

Treasurer Brian Davies, The Institute of Physics, 47 Belgrave Sq, London SW1X 8QX, UK (telex 918453, tel 01/2356111)

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 (June 1989) 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 BO 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, regretfully 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.

COPYRIGHTS ON GIREP MATERIALS

Reproduction of materials published in GIREP Proceedings or in the Newsletter is permitted free of cost, either in their original version or after translation, provided that the source is fully quoted and acknowledged.

This issue of the Girep Newsletter is printed by:
Centro Stampa, I.T.I.S. "C. Olivetti" - Ivrea, July 1989