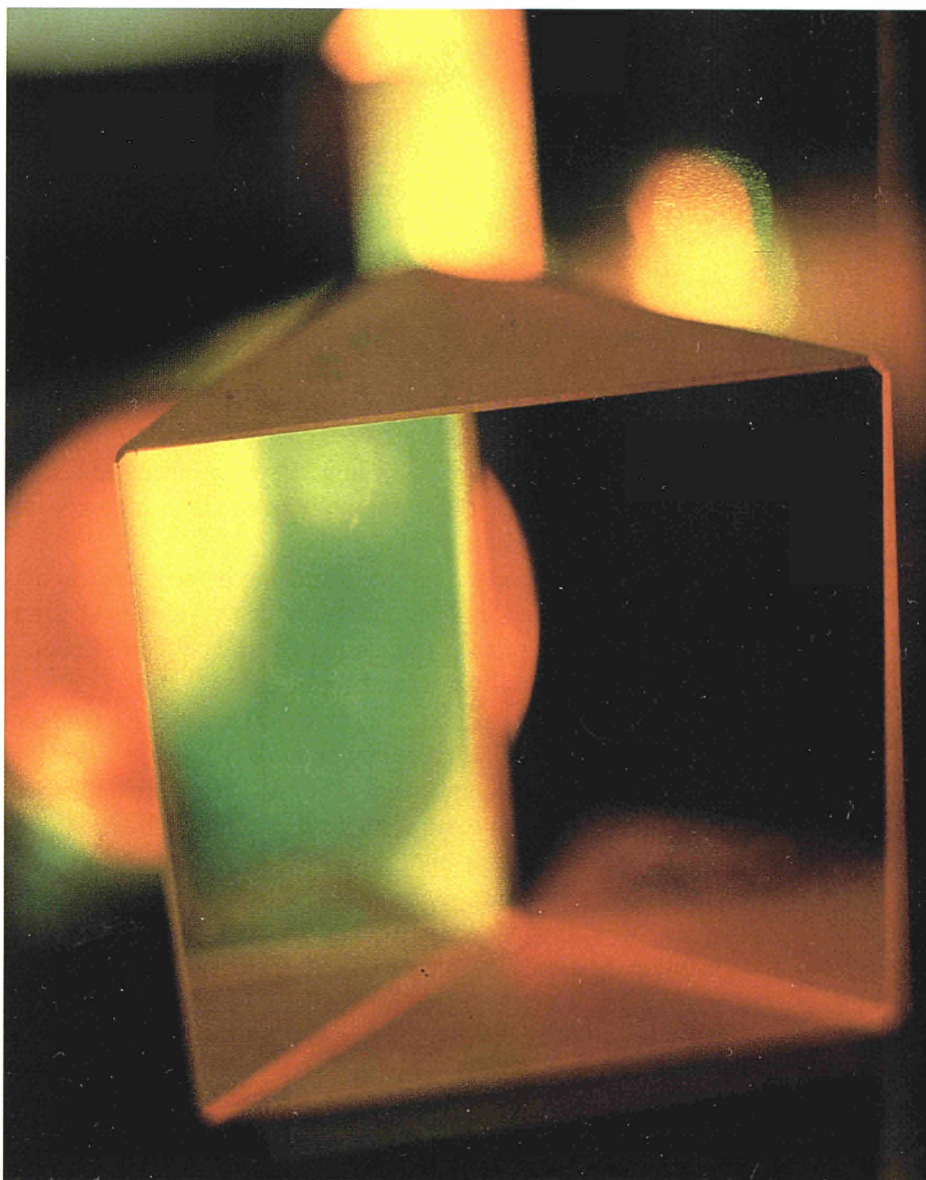


# Innovation+ Technology Transfer

4/93

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*SMEs  
SPRINT  
ESPRIT NETWORKS OF EXCELLENCE  
RESULTS OF COMMUNITY R&D  
PROGRAMMES  
ONGOING DEVELOPMENTS  
PUBLICATIONS – CONFERENCES*



**DG XIII-D**

Directorate for Dissemination  
and Exploitation of RTD Results,  
Technology Transfer and Innovation



**PROMOTING  
WIDER USE OF TECHNOLOGIES  
BY SMALL AND MEDIUM-SIZED  
ENTERPRISES**

Readers of *Innovation and Technology Transfer* need no reminding of the importance of small and medium-sized enterprises (SMEs) to European competitiveness. Many factors are vital for European SMEs to thrive. Not the least of these is their ability to keep abreast of new technological developments, and to apply these developments when they are relevant to their area of business. Yet as we all know, SMEs are often too busy with the routine problems of cash flow, daily management, and keeping afloat in a difficult business scene to take the long term view that is essential for technological innovation.

The Commission of the European Communities is well aware of this and is very active in creating an environment which encourages SMEs to think in terms of technology and innovation. This issue of *Innovation and Technology Transfer* focuses on some of the measures that are especially targeted to SMEs. It is introduced by Vice-President Bangemann, the Member of the Commission responsible for industrial affairs and for information technologies and telecommunications, who gives an overview of the Commission's research and technological development policy specifically as it concerns SMEs. Other articles look in more detail at some of the measures set up to facilitate the participation of SMEs in Community-supported research programmes.

In this issue we are also pleased to publish an interview with Dr Linkohr of the European Parliament's Committee on Energy, Research and Technology (CERT). In it he sets out many of his views on the future direction of Community research, including ways of encouraging the involvement of SMEs.

The vitally important subject of training in technological development is covered in an interview with Dr Thomas O' Dwyer, Director-General of the Commission's Task Force for Human Resources, Education, Training and Youth.

In the areas of particular concern to my Directorate – the promotion of dissemination and exploitation of the results of research, and of technological innovation – I would like to draw attention to the article describing some of the first activities of the relay centres set up earlier this year under the VALUE programme, as well as the article covering news from the SPRINT programme. In both cases SMEs are a particular focus of attention. I would also like to mention the assistance in finding partners for research and research exploitation which is offered by CORDIS, the Community Research and Development Information Service, described in these pages. In addition to the on-line service, part of the RTD-Partners database is now available as a printed directory.

As explained by both Vice-President Bangemann and Dr Linkohr, the Commission's proposals for the Fourth Framework Programme for Research, Technological Development and Demonstration, to cover the years 1994 to 1998, contains several new initiatives specifically for SMEs, which we look forward to putting into practice in the coming months and years.

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*Vice-President Bangemann  
explains Community RTD policy  
for Small & Medium-sized  
Enterprises*



— *How do you want SMEs to view the Commission and its RTD initiatives?*

There is a symbiosis between SMEs and big companies. SMEs make a major contribution to increasing the Community's global competitiveness. They represent a dynamic and innovative part of the industrial fabric.

It is therefore a main objective to increase participation by SMEs in Community RTD programmes. For example, in the Fourth Framework Programme, the Commission proposes to increase SME participation by extending to other Community R&D programmes the feasibility awards already implemented under the BRITE/EURAM programme. This scheme makes it possible to finance a significant part of costs aimed at establishing the feasibility of an RTD project. Some exploratory actions, notably in the ESPRIT Programme, have also been undertaken to define the coming calls for tender in such a way that they meet the SME needs. Furthermore under the umbrella of the Euromanagement initiative about 50 technological advisors selected by the Commission were placed at the disposal of SMEs to carry out a technology audit and to help them preparing for research. Fifty per cent of these costs are covered by the Commission.

Another objective is to strengthen dis-

semination and application of research results, and technology transfer. Access to technology is essential to help SMEs innovate. Here, as in the previous case, the approach is pragmatic and the actions undertaken are regionally decentralised: implementation of Relay Centres and development of the CORDIS information service under the VALUE programme, so as to establish a bridge between Brussels and the regions and circulate the results of RTD; organisation of SPRINT technology brokerage days where SMEs meet potential partners, and of technology and strategy audits to help SMEs integrate new technologies (the MINT scheme, also part of SPRINT); ESPRIT clubs which place SMEs as privileged observers to achieve partnerships with big companies.

These actions are accompanied by back-up measures aiming, for example, at helping SMEs to identify partners for transnational cooperation. The BC-Net System, which is approaching the end of its experimental phase, has been improved to facilitate the seeking-out of partners for commercial and technological cooperation. Two other examples can be mentioned: the promotion of the venture capital market for transnational innovation projects (Eurotech Capital Scheme and SPRINT/Evca Investment Fora) and the improvement of existing

business training activities such as training in strategic management and in alliance strategies, which are particularly adapted to SME managers.

Through all these actions, the Commission wants to help SMEs to seize the opportunities of the Community internal market. Even if some obstacles remain, the SMEs must dare to enter the European market. A lot of support measures were implemented with SMEs in mind.

— *What approach would you recommend for the many SMEs which would like to explore transnational opportunities and partnerships?*

The internal market is the best training field for transborder transactions. SMEs must take the challenge of leaving their regional market and enter other European markets. It is easier than expected, even if there are still some obstacles, such as differences in language, culture or regulations, and problems that stem from the distance of markets. Partnerships seem to be the only solution for SMEs. For that reason, the Commission puts different means at their disposal: databases to identify potential partners through the BC-Net System, technology brokerage days and networks of brokerage and liaison services under the SPRINT programme to promote contacts

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between SMEs and technology providers, regional relay centres to provide assistance (VALUE centres, Euro-Info Centres).

— *What do you anticipate will be the benefits of the Fourth Framework Programme and what will be the practical dimensions of these expectations?*

The Fourth Framework Programme for RTD will contain new initiatives specifically for SMEs. First, a high priority will be given to the dissemination policy. European industry is generally less efficient than its rivals at turning research results into commercially viable products or processes. To remedy this situation, the dissemination activity will be reinforced to create conditions favourable to the transfer and take-up of new technologies, whatever their origin, by industry and especially SMEs. Secondly, the Fourth Framework Programme has to be able to respond rapidly to industrial and technological developments. Among other means, greater flexibility will be sought through limited amounts of funds that should be set aside, in each specific programme, for unsolicited research proposals, notably from SMEs, which have to be processed very quickly. Finally, the links between Community activities and EUREKA will be strengthened. Considerable progress has been made to enhance the synergy and the basis for greater cooperation has been established. Some SMEs already participate in EUREKA: a clearer definition of the respective roles of the Community Framework Programme and EUREKA and a better exploitation of the complementarity of both frameworks can only benefit SMEs in the future.

— *What would you say to those readers who sometimes perceive the Community and its initiatives as distant and difficult to understand, but who nonetheless wish to participate fully in the Community?*

The internal market makes life easier, especially for SMEs. Before, they had to respect twelve different national laws or technical standards. Now they have to know just their own national laws which represent either European law or have to be acknowledged by other member states. The internal market means less regulation, not more. The Commission politically wants to be in closer contact with these SMEs and to reduce the difficulties they must overcome in order fully to understand and participate in the Community's activities. One of the first means is to set up networks and channels through which information can circulate and a dialogue can be developed. This is being done through the use of the networks of relay centres connecting the regions with the Commission. At the same time, an effort is currently being made to promote and describe the Community's activities in which SMEs can participate. In the case of RTD, various brochures provide information on RTD programmes and contain all the necessary operational information. Finally, shortening the distance between SMEs and the Community also means simplifying administrative procedures and reducing the participation costs supported by SMEs. On this point, the Commission is about to adopt a Communication to ensure a better coherence between its RTD policy and actions devoted to SMEs. This document will contain a list of current actions and proposals to increase the participation of SMEs in the RTD Framework Programme.

## Future Community RTD Policy

### The Implications for SMEs

The Commission recently presented its proposal for the Fourth RTD Framework Programme for 1994-98, requesting a budget of ECU 13.1 billion. The proposal centres on four main activities which are: RTD and demonstration programmes; cooperation with countries outside the Community; dissemination and exploitation of results; promotion and mobility of researchers.

One frequent criticism of Community RTD programmes is that they are so far from the actual marketing stage that they present too much of a risk for the average SMEs. While the Commission is anxious to avoid too much overlapping of RTD programmes and other initiatives such as EUREKA, which favours activities nearer to the marketing stage, it is proposing more synergy between the various initiatives to attempt to offset the risk factor for SMEs.

Many SMEs are potential users of the results of RTD programmes rather than actual innovators involved in research projects themselves. With this in mind, the proposed Fourth Framework Programme aims to increase efforts to disseminate the results of Community-funded research. In particular, a new initiative will be introduced on a pilot basis to promote the exploitation of research results by SMEs, for example by offering assistance such as interest rate subsidies, guaranteed loans, management and technical advice.

Two other initiatives of interest to those SMEs which have the technical capacity actually to participate in Community research projects are the proposals put forward by the Commission to simplify procedures for participation and to continue certain RTD initiatives specifically targeted at SMEs.

The Third Framework Programme contains certain instruments created specifically for SMEs, notably two under the Industrial Technologies and Materials Programme: subsidies for feasibility studies and CRAFT, which permits groupings of SMEs to conduct research through an outside organisation in an area of common interest. It is proposed to continue this type of initiative in the Fourth Framework Programme and to extend the CRAFT principle to other sectors, including agriculture and agro-industry.

Commissioner Ruberti recently proposed certain measures to make procedures for participation in Community RTD programmes more transparent. A major change, which has already been introduced, is to publish invitations for participation at regular intervals, four times per year on fixed dates. The first series of invitations following this proposal have already been issued, on 15 June. Another proposal involves setting aside limited sums for each

specific programme under the Fourth Framework Programme to fund projects suggested by SMEs and technical centres on their own initiative and to ensure a speedy response from the Commission.

One of the objectives the Community's Enterprise Policy is to improve the accessibility of Community R&D technology to SMEs. Euro Info Centres exist to improve the flow of information to businesses and enterprises and to feed information back to the Commission on SME requirements; in addition to their general role as advisers on the whole range of EC policies and programmes. A group of some 40 Euro Info Centres work together on joint R&D initiatives, organising events to promote EC R&D and technology programmes and provide feedback to the Commission on how such programmes function from the point of view of SMEs.

In the framework of DG XXIII's business cooperation activities, there are a number of instruments relevant to technology transfer. INTERPRISE enables organisations from at least three Member States to organise events promoting direct contacts between SMEs with a view to establishing partnerships and also promotes events focusing on a particular sector or area of technology. BC-Net and BRE (Bureau de Rapprochement des Entreprises – Business Cooperation Centre) both provide assistance for partner-searches in technical areas.

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## *Towards a better financial environment*

### *Commissioner sets up panel to look at financing for SMEs*

In July, Mr Raniero Vanni d'Archirafi, Commissioner in charge of Enterprise Policy, held the first meeting of a new panel with banking industry representatives to look at funding opportunities for SMEs.

The panel is made up of senior representatives of financial institutions in a number of Member States and is chaired by Mr Marc Vienot, President of Société Générale (France). It will begin a detailed analysis of the financing difficulties facing SMEs and of possible solutions to those problems. The analysis will not be confined to access by SMEs to credit but will also cover access to risk capital. The panel wants to identify the best practices in the Community, to assess the scope for transposing such practices to other Member States and to suggest new ways of developing a better financial environment for SMEs.

The panel's initial findings may be discussed by the Council in November and could be included in the White Paper which the Commission is in the process of drafting.

## **CRAFT**

### *Technology development for SMEs*

CRAFT is part of the Industrial and Materials Technologies Programme (BRITE EURAM II) and is designed to meet research and technological development needs of groupings of SMEs with common or similar problems but which have limited or no RTD resources of their own.

The Commission provides 50% funding for projects of a total cost in the range of ECU 400,000 to 1 million; the other 50% is covered by the SMEs themselves through cash or contributions in kind (for which some internal costs and expenditure can be considered as allowable costs). The research should be carried out by third party undertakings, universities or research institutes.



**Cetim, M. Kermarec**  
**Roto-dynamic pumps**

CRAFT emphasises a bottom-up approach whereby any proposal that responds to real industrial SME needs and is compatible with the general technological areas and industrial sectors of the BRITE-EURAM II programme may be eligible for funding. Consequently, as was expected, large numbers of proposals have been received from the many traditional sectors of industrial activity (textiles, mechanical engineering, construction, wood and furniture, etc.)

CRAFT has an open call for proposals procedure, with evaluation exercises carried out three or four times a year. There is a two-step procedure for submitting a proposal, Step 1 consisting of a brief outline proposal, subject to an initial first screening before full Step 2 proposals are evaluated. Proposals accepted at Step 1 can receive reimbursement of 75% of the costs of preparing the expanded Step 2 proposal, up to a maximum of ECU 15,000. The minimum requirement at Step 1 and Step 2, respectively, is for two and four SMEs from at least two Member States to be among the proposers.

A number of CRAFT thematic workshops have been organised for this autumn to encourage proposals. Ideas for CRAFT projects will be presented and discussed by SMEs looking for partners. General and specific information and other advice will be available to potential participants.

*Continued on p. 7 »*

*A European network for information in the 90's.*

*Under the VALUE II programme (centralised action for dissemination and exploitation of EC RTD results), the Commission, in January of this year, launched a network of advice centres, the VALUE Relay Centres (VRCs) with the objective of bringing Community RTD closer to business and industry.*

*Successful exploitation of research results is a crucial for international competitiveness. The network of 27 VALUE Relay Centres throughout the Member States have been given the strategically important task of giving European competitiveness the edge in transnational technological innovation.*

*The VRCs actively promote the exploitation of the EC RTD programmes results with the objective of achieving their wider use in industry, especially among SMEs, and to increase the participation of industries and research institutions in Community programmes.*

*A list of the VALUE Relay Centres appeared in ITT 1/93*



**UNITED KINGDOM**

The English VALUE Relay Centre is managed by Maureen Firlej and funded by VALUE. The Relay Centre assists in the dissemination and exploitation of EC funded research results, with particular attention to the needs of SMEs.

Firstly, the Relay Centre is a source of advice and information for companies seeking involvement in EC funded R&D activities. The Centre provides basic information on all the Community's Framework Programmes and on useful contact points at the Commission and within the Department of Trade and Industry in London. The Centre also has particularly close links with the National Focal Point for the Community's CRAFT programme (Collective Research Action for SMEs) and with the Small Business Research Centre at Cambridge University.

Training is provided to companies participating in Community R&D activities, on matters such as the protection of intellectual property rights, market strategy and planning for the exploitation of research results. The Centre also gives seminars and workshops, which are sponsored by VALUE and therefore cost little or nothing to attend. The Centre works in collaboration with TECs, local councils and other established networks to ensure that seminars are brought to the attention of small organisations.

The Centre has a database of SMEs and identifies the technological area in which they are working. This enables contact to be made with companies which may be interested in developing a particular technology emerging from one of the Framework Programmes.

With a view to advising SMEs on all aspects of expanding their business, the Centre is studying the experience of small businesses which collaborate with large companies engaged in European research.

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**SPAIN**

CIDEM (Centre d'Informació & Desenvolupament Empresarial) helps to increase the level of technological and productivity in industry in Catalonia region.

With this in mind, CIDEM is working to increase the participation of Catalan companies in national and Community technological programmes for R&D, to promote the use of the existing R&D infrastructure in Catalonia, to assist with international technological cooperation and to develop custom designed technological programmes of interest to Catalan industry.

CIDEM offers the following services to companies in the Catalan region:

- advice on technological innovation business projects at two levels: technological specialisation (quality of life, production techniques, agriculture, food and natural resources, information and telecommunications technologies) and decentralisation of company services (technologists covering the whole of Catalonia);
- access to a number of interface organisations to promote joint R&D projects between industry and the Catalan universities (technology transfer centres network);
- information on national and Community technology programmes and assistance in preparing project proposals for participation in such programmes;
- information on the existing technological potential of Catalonia (laboratories, R&D centres) through databases and the promotion of technological centres;
- access to a broad network of industrial and technological sources throughout Europe through CIDEM's participation in joint projects with developed European regions (RECIT, Four Motors, Southern European High Technology Routes, etc.).

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*ITT takes a look at three VRCs and outlines the services they provide*

» Continued from p. 5

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Fax: 44/81/983 1799**LIBRARIES****Expansion awards for SMEs under the programme**

The advanced notice of the LIBRARIES third call for proposals for expansion awards was recently published in the Official Journal. This proposed third call is scheduled for November 1993, depending on availability of funds. The results of the two previous LIBRARIES calls showed that there was a problem in matching the technological skills of suppliers of library-related systems and services, mainly SMEs, with the requirements of libraries as users of new or

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emerging technologies. To facilitate communication between SME suppliers and libraries the Commission is examining the possibility of providing financing to partly fund the expansion of suitable projects. These expansion awards would be made only in conjunction with the proposed third call, and are intended for SMEs established within the Community, in partnership with libraries. Qualifying consortia would be invited to submit proposal outlines for themes of LIBRARIES action line 4, which promotes a European market in telematic products and services specifically for libraries, feasibility and requirements. A final decision concerning the proposal expansion awards initiative will be taken by October. However, interested organizations are invited to contact the Commission for information.

Further information is available from:

**CEC DG XIII-E/3**  
**LIBRARIES Expansion Awards**  
**JMO (C5 66)**  
**L-2920, Luxembourg**  
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**Fax: 352/4301 33530****ITALY**

The Recnova Relay Centre is located in north-western Italy and the Centre's activities to promote R&D development for local SMEs have so far concentrated on the following:

- a database of SMEs in all industrial sectors, listing the company name, legal form, address, contact point, sector of activity, brief description of activities/products/services, number of employees, turnover; the database is used for providing information on the activities of the Centre, for partner searches as well as information days and meetings, etc.;
- a questionnaire to establish the requirements of SMEs in relation to Community research projects and Value Relay Centre activities as well

- as their awareness of opportunities for participating in R&D and technology transfer projects;
- the diffusion of information through the Centre's Gerico News magazine, informing companies how to participate in Community R&D programmes and of the results of Community funded projects;
- collaboration with international associations such as Chambers of Commerce, regions and other consortia belonging to the Città Ricerche network, MIDA (Microelectronics Development Association), INFIM (Consorzio Nazionale di Fisica della Materia), etc.;
- the organisation of info-days, meetings, seminars, presentations of community research results and exhibitions; the Centre is organising an exhibition of prototypes from community biotechnology research, which

- will be held at the end of November;
- the provision of information and assistance on participating in Community funded projects, for finding partners and for the exploitation of the most interesting results from research projects through CORDIS.
- the development of a multimedia presentation of the Italian Relay Centres Network and of the VALUE II Programme to be used at meetings, exhibitions, workshops, etc., to inform companies about VALUE services and opportunities.

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*A new dimension to European R&D and Technology Transfer*

ESPRIT Basic Research develops new knowledge and expertise from which industrial research can draw and thereby promote innovation and the proper training of researchers. One of the three types of activity supported by Basic Research is the development of Networks of Excellence.

A Network of Excellence comprises a group of academic and industry research teams in a particular area of scientific R&D. The teams share long-term technological goals and closely coordinate their policies for research, training and information dissemination in order to reach these objectives. Each team, working in its home institution, forms a node of the network to which it belongs. These nodes share a common infrastructure, including electronic mail links and databases. Together, the teams of a network possess a critical mass of top-flight experts and interdisciplinary skills in all technology areas pertaining to their research goals. They collectively attain a potential and leverage far greater than when considered in isolation.

A Network brings the benefits of a Centre of Excellence to all the regions in which its nodes are located. Access to one node gives access to the expertise and skills of the whole network. Technology transfer to local industry is enhanced, a benefit of particular importance in peripheral regions. In addition, researchers do not need to move away from their home regions to participate in state-of-the-art research. This helps remove one of the causes of brain drain. While small institutions in some remote areas cannot hope to have a Centre of Excellence emerge there, they can still have a viable node in a Network of Excellence.

The collective strength of a Network makes it attractive for young researchers who may be able to spend their time in different areas of a Network which collectively provide the interdisciplinary skills needed. The majority of researchers trained this way, through research staff, will eventually find their future in industry, supplying the skills

industry really needs.

Three Networks were set up in 1991 in the areas of speech and natural language (ELNET), computational logic (COMPULOG-NET) and distributed network architectures (CABERNET). The success of these led to the establishment in 1992 of six more Networks covering multimedia and database systems (IDOMENEUS), organic materials for electronics (NEOME), multifunctional microsystems (NEXUS), high temperature electronics (HITEN), machine learning (ML) and mesoscopics systems (PHANTOMS).

Infrastructure development is a primary concern of new Networks. CABERNET has installed a data communication network and is in contact with other networks to share experience and to promote a common solution.

Defining a common strategy to meet the Network's technological goals by identifying the technology needed to achieve them is an essential condition for the existence of a network as a single entity. Integrating industry's needs and views into this process is of paramount importance. The Industrial Working Group of NEXUS recently produced a strategy paper reflecting the common position of most major European companies engaged in microsystem technology R&D and demonstrating how industrial needs can be met.

Coordination of research in particular in interdisciplinary areas is another preoccupation of Networks. Training and education activities are also among the primary objectives; the principle that access to a single node gives access to the resources of a Network as a whole enhances temporary mobility of researchers who wish to work closely on an individual project. The dissemination of research results and information, through newsletters and conferences, etc. is another crucial activity. Networks also offer considerable scope for international cooperation and some existing Networks have already been extended to include nodes in the Central and Eastern European countries.

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## *Dr Linkohr, of the European Parliament*

### *The European Parliament Committee on Energy, Research and Technology (CERT) calls for more coordination on Research Funding*

— *What effect will Maastricht have on Community R&D?*

We are at the starting point for a new generation of Community R&D programmes and this opportunity and turning point should be used to pave the way for the future. Therefore, notwithstanding the scientific and industrial significance of the programme, it also has major political significance because it is a test for the Maastricht Treaty.

The Committee still feels that the financial envelope on offer is inadequate, in particular given that, unlike the former programmes, the new programme will not only cover research but demonstration activities as well.

The problem of inadequate funding could be at least partially overcome by introducing a more integrated approach between the Community's R&D programmes and its regional programmes, the Regional Fund and the Cohesion Fund. This would also help to respond to the needs of SMEs in a more appropriate and effective way.

— *Science and technology can no longer be viewed as isolated Community objectives. How do you see their relationship with other Community initiatives?*

Much better use could be made of the Regional Fund and the Cohesion Fund in the areas of science and technology programmes. This would certainly be a far more appropriate manner of dealing with those scientific activities which have a regional dimension of their very nature, such as activities in the fields of telecommunications, transport and the environment. This approach would also generate much greater integration and coordination

between Community and national funding.

— *How will SMEs benefit from changes in the funding application procedures proposed under the Fourth Framework Programme?*

Making access to Community funding easier will also help SMEs to benefit from the Community's R&D base. A two-stage procedure is being considered which should help SMEs and universities and, indeed, the Commission itself, to reduce the administrative costs, manpower and time currently incurred in application

*"... Applicants could present a short description of their proposed programme to the Commission, rather than preparing lengthy applications in numerous copies ..."*

procedures for funding. Applicants could present a short description of their proposed programme to the Commission, rather than preparing lengthy applications in numerous copies; the Commission could then reply briefly whether or not the proposal is likely to receive funding. The proposer will then be able to see quickly whether it is worth pursuing funding with a more detailed application, which would form the second stage of the procedure. It is estimated that the amount of indirect costs saved by introducing such a procedure could increase the amount of Community funding available by 30 to 40%.

— *How will transnational opportunities develop for SMEs?*

One crucial issue for SMEs involves a more effective means of technology transfer. This is a key element to be tackled by the new Framework Programme since many SMEs, especially those located in the more remote areas of the Community, do not have a sophisticated technological infrastructure. They cannot afford to finance a research laboratory and therefore need to overcome this problem by going to the nearest institution which has the appropriate facilities and expertise.

There is a need for far more services and trans-border information to help SMEs to keep up-to-date on latest developments and on whom they can approach to update themselves on these. The networking system needs to be expanded and improved so that a wide range of networks of research institutions is developed to answer the questions posed by SMEs and to undertake work for them. At the same time, access to the information needed and as to the research capacity in institutions must be improved. New flexible structures are needed to overcome this problem. Again, the Community's regional programmes could help funding in this area since networking has a regional aspect.

Turning to the opposite end of the spectrum, there is a need for increased Community R&D activity to help solve problems of an international order. In this context, another important element of the proposed Fourth Framework Programme is its environmental impact. The major problems confronting us in the 90s

*Continued on next page »*

## Dr Rolf Linkohr of the European Parliament

» Continued from previous page

are the population growth and the greenhouse effect. Both have a global aspect and the research programme must involve activities which can help to solve these crucial issues. R&D must become global.

— *How do you see international research cooperation developing?*

Obviously, the Community cannot solve all problems on its own but it could increase its commitment to research in third world countries. So far, research cooperation has tended to be between the 'haves', namely the industrialised countries, while little cooperation has occurred between those and the 'have nots' in the third world; the cooperation which existed with the third world concentrated on health and agriculture but other issues must now be included, in particular energy and the environment. To solve global problems, we need a global research network. No new Community funding is in fact needed; funding is available but only for traditional issues and not R&D.

Another important element under the proposed programme is energy research. Eight per cent of Community research funding goes into thermal nuclear fusion. This should be maintained but it would make better sense if the same amount of money was spent on renewable energies, another important energy source. However, funding is also needed for development and demonstration projects, not just research. Again, the funding for this should not need to come from the Fourth Programme alone; funding could also come from the Mediterranean Programme and the Regional Funds.

— *How do you view Europe's competitive position?*

Europe needs to expand its industrial base and become far more competitive vis-à-vis its competitors on the world

stage. The largest part of the Fourth Framework Programme is in fact dedicated to industry and competitiveness, for example telecommunications, micro-electronics, biotechnology. The Community must learn to treat research policy as part of industrial policy. We miss the target if we fail to link these activities with industrial policy and coordinate our efforts.

For example, take the automobile industry: if it could bring its efforts together with a view to coordinating on fundamental research on markets or on pre-competitive research, the Community could then help fund activities in certain areas, such as new battery systems and recycling techniques. If an industry can develop common ideas, the Community should offer support as part of industrial policy to develop the competitiveness of that industry. The aerospace sector is a particularly apt example, given that it must now diversify into non-military activities. If the industry could become more integrated, the Community could support some of the development and research now needed for the process of conversion from military to civil purposes, especially in the aeronautics field.

The Community needs new developments and new technologies; in other words, it needs initiatives from industry.

*"... The Community must learn to treat research policy as part of industrial policy. We miss the target if we fail to link these activities and coordinate our efforts ..."*

Another industrial sector which offers considerable opportunities is remote sensing, a new technology which can have a very positive effect in all sorts of areas, such as the environment, agriculture, weather forecasting. New developments are also crucial to bring the Community closer together and so more competitive through a more united effort: as an example, new technologies, in particular new developments in telecommunications and translation systems can play

an important role in overcoming the problems presented by the numerous different language cultures of the Community.

— *How do you see the role of the Commission in this important area of Community development?*

The Fourth Framework Programme and other Community funding can play their role in all this but other funding is also needed from the Member States and from private sources. This funding should be seen as an essential part of

*"... The Fourth Framework Programme could provide the necessary impetus to make science more European than in the past ..."*

overall industrial policy in the Community and these various efforts should be coordinated by the Commission, as the obvious forum to bring policy makers, industry and researchers throughout Europe together. The Commission could offer guidance through intelligent dialogue, money and ideas.

This is of course a political process and the Commission should take the lead here by giving the process a push in the right direction. In fact, a European Science Summit is being held on 14 and 15 October between the Commission, the European Parliament, industry and science organisations. It is hoped that this will produce the message that Europe has many possibilities which are not being fully used and that Europe needs courage from industry, science, the national governments and the Commission itself.

Although the Community is still very good at basic science, the climate is currently pessimistic since we are losing ground in the high technology field. Everyone complains about this but does nothing to solve the problem; action is needed. The Fourth Framework Programme could provide the necessary impetus if the Commission takes that opportunity to make science more European than in the past.

## EUREKA AND THE EC

*Steps to improve synergy between EUREKA and the Community*

Recent developments, both in the Community and in EUREKA, open up new prospects and are evidence of a joint intent to extend cooperation and improve synergy between the Community R&D programmes and EUREKA for the benefit of European industry and research.

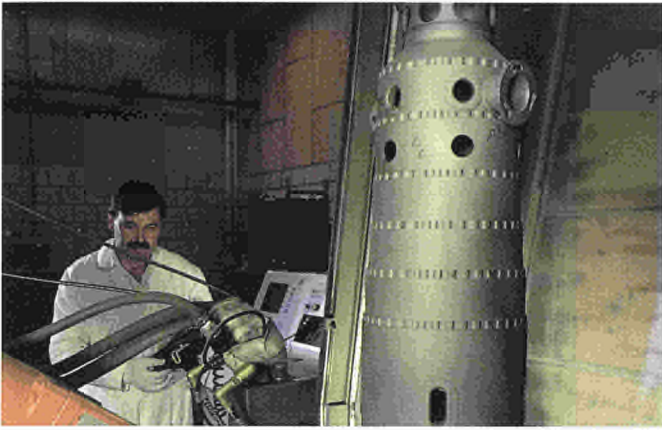
The EUREKA medium term plan for 1992–96 stresses the strengthening of links with other European research programmes. In addition, a number of priority objectives of the medium term plan are directly connected with interaction between Community programmes and EUREKA. Among these, the Commission considers that major strategic projects and participation by SMEs are particularly important.

The Treaty on European Union, when ratified, will reaffirm the reinforcement of industrial competitiveness as an objective of Community R&D policy and will broaden the areas covered by the Framework Programme, thus making it more necessary to improve complementarity with EUREKA.

The Treaty on the European Economic Area allows the EFTA countries to participate fully in the Community's Framework Programme and, in addition, Community R&D cooperation agreements with other European countries are either concluded or are being negotiated. EUREKA already facilitates the participation in its projects by Central and Eastern European countries.

The improved complementarity between EUREKA and the Community Framework Programme must be based on the specific features of each of the two approaches. The Framework Programme follows the policy of directing research towards priority programmes which it selects after consulting industry and research; this cooperation facilitates the development of generic technologies and the dissemination of knowledge. Initiatives for projects within EUREKA are taken by companies or laboratories and members may then back projects which meet their criteria for intervention; this flexible approach, giving primacy to initiative by industry is particularly well-suited to market-oriented research and development projects.

With these two varied approaches in mind, future concertation between EUREKA and the Community and the financing of projects or parts of projects will be guided by industry's wishes and needs but also by the principle that projects or parts of projects within the Community framework will mainly involve the development of key generic technologies with a strong and pervasive effect on the product network or with a broad social impact; projects or parts of projects within the EUREKA framework will generally involve applied research, close to the market and intended for specific products, production processes or services.



Rungis, France — Mr E Haug  
Innovative design methodology for sheet metal working

*EXPLOITATION OF R&D RESULTS*

A recent Commission study tried to identify the most effective measures for exploiting results in France, Germany, Japan, Sweden, the United Kingdom and the United States and makes recommendations for Community R&D activities.

The exploitation of R&D results is part of the wealth-creating innovation process, by which new and improved goods and services are introduced into the economy. Until the mid-1980s, it was felt that intervention by public authorities should be mainly limited to funding basic research. Since then, it has become increasingly clear that economic growth is not related to the volume of public R&D expenditure in any simple way, but depends crucially both on the conditions under which this R&D is performed and on supporting measures.

The report recommends that firms, whether as R&D performers or as users of results, should be more closely involved in both the planning and the execution of R&D. A vehicle which has already proved its worth in Japan and the United States is the research consortium; research consortia may include private or public bodies, research centres and higher education institutions. Special factors identified in the report as being important for further Community assistance in helping the efforts of higher education institutions, SMEs and research centres to bear fruit include: advisory and information services, industrial property rights, programme management, performance evaluation, licensing, finance, regional policy considerations and training.

In the context of the subsidiarity debate stimulated by the Maastricht Treaty, the report raises the question of how far measures to promote the exploitation of R&D results should be centralised or decentralised. The evidence suggests that neither is adequate on its own and, in the context of Community R&D activities, the report recommends measures for implementation at three levels: by bodies in the Member States, by sectoral Community R&D programmes (BRITE, ESPRIT, etc.) and by the Community's horizontal programme (VALUE and Centralised Action).

## CENTRAL AND EASTERN EUROPE

The Commission has selected 194 new projects under its scientific and technological cooperation scheme with the countries of Central and Eastern Europe: Albania, Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia. The projects will involve a total of 666 partners and will receive ECU 31.4 million assistance in 1993.

A large number of projects have already been supported by the Commission since the scheme was launched and these absorbed the full amount of ECU 55 million earmarked for 1992. Those projects consisted in particular in the award of 2,531 study grants to researchers from the East, enabling them to spend an average of three months in some of the Community's leading laboratories and to acquire fresh knowhow to be put to use on their return home, while establishing valuable contacts for the development of networks in the future. Support was also given for scientific conferences, seminars and workshops and for projects to develop pan-European scientific networks and to enable Central and Eastern Europe to participate in Community research programmes or COST projects (European cooperation in the field of scientific and technical research).

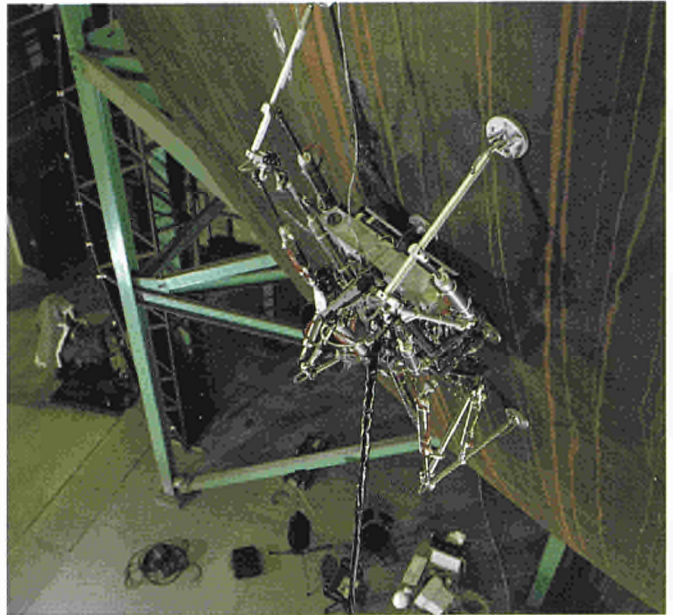
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### TROPICAL FOREST MONITORING

The first TREES (TRopical Ecosystem Environment observations by Satellite) project conference will be held on 20 to 21 October 1993 in Belgirate (Italy). The conference is being organized by the Joint Research Centre of the European Communities in collaboration with the European Space Agency and the Directorates-General I and XII of the Commission of the European Communities. This conference marks the end of the first phase of the JRC-ESA TREES project which has focused on the development of remote sensing techniques for addressing tropical forest monitoring issues. The conference will report on current results and achievements in the fields of monitoring tropical forest ecosystems on regional and global scales. It will also provide an opportunity for other related programmes and projects to present their current activities and future plans. Finally, an extensive proposal by the Joint Research Centre, together with other services of the Commission, to initiate a TREES II project will be presented. While only invited papers will be presented during the session, there will be space available for poster displays.

*For more information, please contact:*

**Commission of the European Communities**  
**Joint Research Centre**  
 Attn. Mr. J. P. Le Gorgeu  
 Ispra Site, T.P.440  
 I-21020 Ispra (VA)  
 Tel. +39-332-785214; Fax +39-332-789502/785409



Model of top of reactor pressure vessel — UK

### EC-JAPAN ISDN CO-OPERATION

The European Commission has issued a call for tender to study various aspects of EC-Japanese ISDN cooperation. In the context of the regular EC-Japan plenary meetings, the Network Working Group (a subgroup of the plenary meeting) is conducting an EC-Japan ISDN interconnection Experiment (EJIX). The objective of the envisaged study in the domain of EC-Japan ISDN scientific and technological cooperation is to verify the portability of a file transfer protocol to a Japanese ISDN board and to promote industrial cooperation between EC and Japanese companies.

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 200 rue de la Loi  
 B-1049 Brussels  
 Tel. +32-2-2968342; Fax +32-2-2968393

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### SEVILLE SITE FOR INSTITUTE FOR PROSPECTIVE TECHNOLOGICAL STUDIES

The Commission has decided to locate the Institute for Prospective Technological Studies of the Joint Research Centre in Seville. This Institute has already been established within the JRC with a remit to carry out work under the Fourth Framework Programme of Community activities in the field of RTD. Since the Spanish Government attaches a growing importance to technology forecasting, particularly in the field of innovation, it has expressed a desire to be more closely associated with the activities of the JRC and intends to make available to the Community the necessary facilities and equipment to locate the Institute in Seville.

## CROSS-BORDER CONTROL OF AUDIOTEX AND VIDEOTEX SERVICES

Under the chairmanship of David Wiseman, a working group of the European Information Industry Association (EIIA) has developed a "code of practice" for the provision of pan-European premium rate or kiosk-billed telecommunication services. In collaboration with the European Commission, detailed discussions have taken place between members of the working group, on the one hand, and, on the other, between network operators, service providers and regulators across Europe. In its present form, the code has been presented to, and discussed with, all major European PTTs, a number of whom are understood to have accepted the code for adoption to cover a series of bilateral inter-connect agreements which, it is hoped, will be the precursor of full pan European audiotex services. EIIA will now discuss the guidelines further with the responsible European Commission officials (from DG XIII) and its Legal Advisory Board (LAB) seeking Commission approval so that the guidelines can serve as a basis for developing pan-European services and so they may be incorporated into the

necessary agreements, both between network operators themselves and between network operators and service providers. A meeting with the LAB is scheduled for end October 1993 and a joint meeting between the Commission, LAB, industry representatives and the network operators is scheduled for 1 December 1993. Finally, the Commission will arrange a meeting with the regulatory bodies for the beginning of 1994.

*For more information, please contact:*

**European Information Industry Association**  
B.P. 262  
L-2012 Luxembourg  
Fax +352-34 98 12 34

or

**CEC DG XIII**  
**Mr. David Buckley**  
**Jean Monnet Building**  
L-2920 Luxembourg  
Tel. +352-430132898; Fax +352-430132847

**INTERVIEW**

## A NEW APPROACH TO TRAINING

**DR. THOMAS O'DWYER**

THE NEW DIRECTOR GENERAL  
OF THE TASK FORCE  
FOR HUMAN RESOURCES, EDUCATION,  
TRAINING AND YOUTH,

TALKS OF HIS PLANS  
FOR TRAINING AND TECHNOLOGY

— *What influence will Maastricht have on Commission plans for training?*

The education and training programmes and the Youth Programme (young workers' and people's exchanges) have developed in rather a piecemeal way over the last 15/16 years, but especially over the last 4 or 5 years. As a result, there are now some 8 or 10 different programmes, some in the area of education, some in the area of training as well as the Youth Programme.

The Maastricht Treaty is about to form the basis for a new policy. Article 126 covers education and the Youth Programme while Article 127 provides the basis for training.

The Commission's objective now is to bring together the programmes which currently exist in a sensible fashion; instead of having a whole proliferation of smaller programmes, we want to find a programme which is identifiable as an education programme, a programme which is identifiable as a training programme and a youth programme.

As regards training, there are a number of training programmes at present: PETRA, which deals with vocational training of young people; FORCE, which deals with continued vocational training for those with work experience;

COMETT, which provides a link between universities and private firms and public firms (i.e. the transfer of technology between universities and industry through the movement of people/students); EUROTECNET, which deals with innovation in vocational training in response to technological changes in the information technologies field.

What is needed is a single training programme to enable people leaving school or in the school system to have access to the training system.

— *How do you view the role of training in technological development?*

Continuous training is now vital. It is no longer enough to be trained once and for all; the rapid technological developments now taking place mean that continuous training of some sort is essential for firms to remain competitive. We need to convey the message throughout the Community that the nature of the job is changing on a continuing basis because of technology and the organisation of the society in which we live.

— *How important is training for improving development for SMEs?*

For SMEs in particular, this changing pattern poses major problems. It is very

INTERVIEW

Dr Thomas O'Dwyer

**A NEW APPROACH TO TRAINING***» Continued from previous page*

difficult for an SME to have a training system; to overcome this problem, SMEs need to be grouped together either on a geographical basis or on a sectoral basis and preferably with contact with other parts of the Community. We have to try and encourage SMEs to work together in small groups to understand why the workforce needs to be trained regularly and, then, to determine how that training can be done effectively and sensibly, given the limited resources available to SMEs.

When the training programmes were being built up, the important issue was to determine what people could do and why they were interested in working together. We have now moved beyond that stage. What is now needed is for more institutions and firms to work together. If that involves more networks, then more must be developed. Firms need to get together and discover their training needs. They need to discover what sort of expertise they need and what sort of training must be given to their staff to meet those needs.

— *What part can individual firms and individuals themselves play?*

While the Commission can be expected to provide the opportunity for this coordination to develop, it is the firms which must group together, and decide their needs and then the Commission can see whether it can support these through funding. The firms must take the lead here. We are not talking about huge groups or organisations, but just one or two individual firms who are close to the market and know better than anyone else what their requirements are.

It is also important to recognise that technology is transferred through people more than anything else. Scientific publications can transfer a certain amount of technology but tend to be available to and read by fellow scientists and select groups. At present, there is a tremendous distribution divergence in technological know-how throughout the Community. Firms cannot solve their problems by reading books; they must send people to other firms to learn and then return with new knowledge. By encouraging and making it possible for students to move across the Community, the transfer of technology is facilitated, just as the extent of knowledge about the available technology is expanded through training people.

The Commission is in the process of preparing proposals to form the basis for a more coherent set of training programmes and to provide a more transparent system with improved and easier access. This will have one very important objective of facilitating technology transfer and the part it can play in the Community's economic well-being.

**Human Capital & Mobility****CALL FOR PROPOSALS**

The Commission of the European Communities is inviting proposals within the framework of the specific programme on human capital and mobility. The central objective of this programme is to increase the quantity and quality of human resources available for research and technological development within the Community. The current call for proposals concerns only one of the four activities of this programme which is the the Community system for fellowships to be allocated by institutions. The deadline for receipt of proposals is 19 November 1993.

*First selection round for institutional fellowships*

Following the call for proposals for the specific programme of research and technological development in the field of Human Capital and Mobility, a selection round was organized, and the Commission approved funding proposals made by a number of institutes. The Commission has published a list of institutes resulting from the call for proposals for activity 1 of the Human Capital programme (institutional fellowships). Each of the institutes on the list has available a number of places for young researchers to take part in research projects. Through this new call, which is continuous, the Commission invites young scientists to apply directly to the institutes listed in the Official Journal. Further selection rounds will be carried out at regular intervals for those institutions which have not been able to fill their vacancies during the first round.

*For more information, please contact:*

**CEC DG XII-G/1**

**Human Capital and Mobility Call for Proposals**

**75 rue Montoyer**

**B-1040 Brussels**

**Tel. +32-2-2953696; Fax +32-2-2963307**

**Telex 21877 COMEU B**



**BRITE: Citroën laser robot systems**

## JRC

## FELLOWSHIP OPPORTUNITIES

The Joint Research Centre (JRC) of the Commission of the European Communities offers individual research fellowships to scientists. The fellowships are awarded to individuals to allow them to spend from one to three years at one of the Institutes of the JRC, which are:

- IRMM (Institute for Reference Materials and Measurements, previously called the Central Bureau for Nuclear Measurements);
- ITU (Institute for Transuranium Elements);
- IAM (Institute for Advanced Materials);
- ISEI (Institute for Systems Engineering and Informatics);
- EI (Environment Institute);
- IRSA (Institute for Remote Sensing Applications);
- IST (Institute for Safety Technology);
- IPTS (Institute for Prospective Technological Studies).

A fellowship may be awarded to postgraduate students, Ph.D. students, scientists at post doctoral level and experienced scientists who are nationals from EC or EFTA countries or residing in these countries.

*Details may be obtained by writing to the relevant JRC Institute:*

**Institute for Reference Materials and Measurements**

Mr. A. Deruytter  
Steenweg op Retie  
B-2440 Geel  
Tel. + 32-14-571272; Fax +32-14-584273

**Institute for Advanced Materials**

Mr. M. Cundy  
PO Box 2 NL-1755 ZG Petten  
Tel. +31-2246-5332; Fax +31-2246-3393

**Institute for Transuranium Elements**

Mr. J. Fuger  
Postfach 2340  
D-7500 Karlsruhe  
Tel. +49-7247-84354; Fax +49-7247-2712

**Institute for Systems Engineering and Informatics**

Mr. G. Nulls  
I-21020 Ispra (VA)  
Tel; +39-332-789529; Fax +39-332-789923

**Institute for Safety Technology**

Mr. S. Zanella  
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Tel. +39-33-789700; Fax +39-332-789903

**Environment Institute**

Mr. G. Rossi  
I-21020 Ispra (VA)  
Tel. 39-332-789981; Fax 39-332-785631

**Institute for Remote Sensing Applications**

Mr. P. Churchill  
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**Institute for Prospective Technological Studies**

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## THERMIE

COMMISSION SUPPORTS ENERGY TECHNOLOGY  
PROJECTS WITH ECU 129 MILLION

The THERMIE programme is designed to bring new energy technologies to the market place and offers financial support to help overcome the commercial and technical risks associated with projects at the leading edge of innovation. Over ECU 415 million has been awarded to more than 520 new and innovative energy technology projects since THERMIE started in 1990.

On 20 July, the Commission announced that it would be granting ECU 129 million support to 137 energy technology projects under THERMIE which will save energy, provide additional energy supplies, improve the environment by reducing pollution emissions, such as CO<sub>2</sub>, and generate real investment and employment opportunities:

- ECU 44.7 million for 41 projects in the improved use of energy sector
- ECU 32.3 million for 50 projects in the renewable energy sector
- ECU 23.8 million for 9 projects in the solid fuels sector
- ECU 28.3 million for 37 projects in the hydrocarbons sector.

A decision on a further ECU 11 million for solid fuels projects may be made later in the year.

In the rational use of energy sector, the Commission decision includes large European collaborative projects in the buildings and transport sub-sectors designed to have a major impact on energy and the environment in the Community. Two such projects are: Jupiter – joint urban project in transport energy reduction, to be implemented in the United Kingdom, Belgium and Denmark; Entrance – energy savings in transport through innovation in the cities of Europe, to be implemented in Germany, the United Kingdom and Greece.

THERMIE BRINGS SUBSTANTIAL BENEFITS  
TO THE COMMUNITY

A cost-benefit analysis, carried out by DG XVII, proves that successful selection and dissemination of THERMIE projects brings substantial benefits in helping to achieve the Community's energy and environmental policy objectives. The technologies selected for support and dissemination offer cost-effective options for lowering the overall energy consumption of the Community. Closely linked to this is the contribution which these technologies make to reducing pollutant emissions, particularly CO<sub>2</sub>. This is extremely important in relation to the Community objective of stabilizing its CO<sub>2</sub> emissions by the year 2000 at the 1990 level.

*For more information about THERMIE please contact:*

**CEC DG XVII - THERMIE**

**Attn. Mr. W. Folkertsma**

**200 rue de la Loi, B-1049 Brussels**

**Tel. +32-2-2957485; Fax +32-2-2950577**

## DELTA

**TELEMATICS SYSTEMS OF GENERAL INTEREST**

The Annual Technical Report on Research and Development: Flexible and Distance Learning (DELTA - Developing European Learning through Technological Advance) has been published. This report is one of seven annual reports on the Community's Programme for the Development of Telematic Systems in Areas of General Interest.

The DELTA 1993 report provides an overview of the programme and includes a short description of the 23 projects and 9 concerted actions, involving 176 organisations, all cooperating towards improving education and training systems in Europe. 1993 is a crucial year for these projects, being the second year of their operation with the launching of experiments and the beginning of consolidation of results. The report describes progress to date.

The Review Board Report was published in May. The Board reviewed the objectives of the programme on flexible and distance learning and recognised the positive effect of DELTA in widening interest and promoting research in technology based learning in and between Member States, noting that DELTA has made a substantial contribution to flexible and distance learning opportunities across Europe. The Board recommended that future activities should concentrate on developing and testing technologies which improve access to and efficiency of education and training.

*Copies of the DELTA 1993 report and of the Board Review, together with general information, is available from:*

**DELTA Central Office**

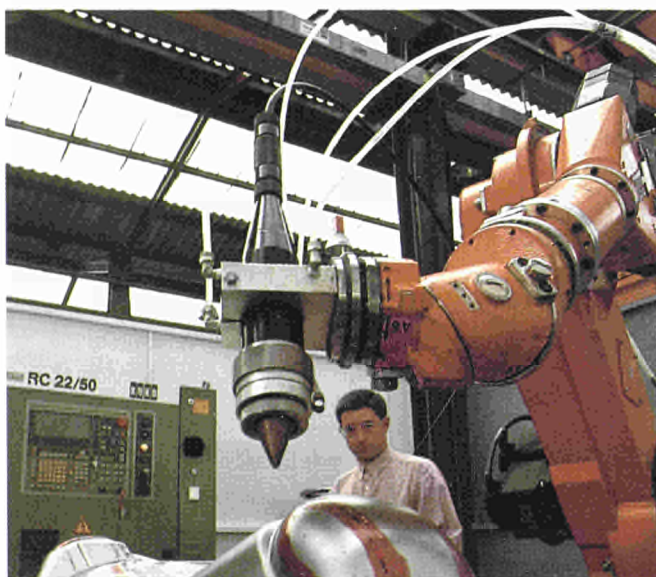
*Telematics Networks and Services*

*Applied to Flexible and Distance Learning*

**BU29 4/05**

**B-1049 Brussels**

**Tel: 32/2/296 3416; Fax: 32/2/296 2392**



*Mungia, Spain*

*Robotics for online laser operation for the automotive industry*

**BUILDING EUROPEAN RESEARCH PARTNERSHIPS WITH RTD-PARTNERS**

Building transnational partnerships for European research is an essential factor in the development and exploitation of the Community's RTD potential and, by extension, is crucial for creating a successful and healthy internal market.

This is one of the main reasons for the emphasis placed on cross-border cooperation in the Community's RTD programme. For a project to be selected for funding, it must involve independent partners from at least two Member States. But it is not always easy to find the right partner in another country or to know where to start. SMEs, while being encouraged to participate in Community programmes, in fact frequently encounter major problems in this respect.

RTD-Partners is part of the Community's contribution to creating the necessary infrastructure to facilitate partner searches and so to overcome this problem for SMEs. RTD-Partners is provided on the CORDIS database (Community R&D Information Service) and run by DG XII as part of the VALUE programme (the Community's programme for the diffusion and utilisation of scientific and technological research results).

RTD partners was launched in January 1992 and can be accessed through ECHO (European Commission Host Organisation) available through your national telecommunications network. To increase and facilitate access to different parts of the RTD community, a Directory of Research Partners is published periodically. In addition, RTD-Partners, along with the other on-line CORDIS services, is now available on CD-ROM (updated every three months).

There are currently over 7,600 entries from organisations located in the Community and the EFTA countries. The research areas covered include information technologies, telecommunications, materials and manufacturing, energy, environment, medicine, quality of life, biotechnology, agriculture and marine technology.

A team run from the CORDIS Information Collection Unit constantly seeks out new entries throughout the Community and EFTA, through a variety of informative activities, and continuously updates existing information.

RTD-Partners is not simply an isolated partner search service. It is in fact part of a much greater information system: CORDIS. Becoming a user of RTD-Partners means that you automatically gain access to a powerful source of European RTD information, including opportunities to participate in Community research programmes, advance notice of new programmes under preparation, details of current research and research-related programmes, details of individual research projects, research results with potential for exploitation and publications.

*Further information available on RTD-Partners from:*

**Ms Alie Menzies, RTD-Partners Team**

**Tel: 00/44/334/77180; Fax: 00/44/334/77660**

*Further information available on CORDIS from:*

**ECHO - CORDIS Customer Service**

**BP 2373, L-1023 Luxembourg**

**Tel: 352/3498 1240; Fax: 352/3498 1248**



## SAVE

PROPOSED LIMITATION OF CO<sub>2</sub> EMISSIONS  
BY IMPROVED ENERGY EFFICIENCY

An amended proposal for a Council Decision aiming at the limitation of CO<sub>2</sub> emissions by improving energy efficiency, presented in the framework of the SAVE programme (COM(93) 279), sets out amendments made by the European Parliament at its first reading of the proposal and accepted by the Commission. In its initial proposal (COM(92) 182 of 20.5.1992), the Commission put forward a number of measures. These are:

- Energy certification of buildings;
- Billing of heating, air-conditioning and hot-water costs on the basis of actual consumption;
- Promotion of third-party financing for energy efficiency investments in the public sector;
- Thermal insulation of new buildings;
- Regular inspection of boilers and of vehicles;
- Energy audits of businesses and of industrial establishments.

## CAMAR

## PROGRESS REPORT

The Commission of the European Communities, Directorate-General for Agriculture, has published a synopsis of 80 research and technological development projects undertaken in the context of the Community RTD programme in the field of "Competitiveness of Agriculture and Management of Agricultural Resources" (CAMAR), 1989-1993, one of the specific programmes under the Second Framework Programme. CAMAR has a duration of five years with a total Community financial appropriation of ECU 55 million. The programme is structured around five specific research objectives of prime relevance to the Common Agricultural Policy and to the rural society:

- To help farmers adapt to the new situation created by over-production and a restrictive policy on prices and markets;
- To maintain incomes from holdings and to encourage structural reform while controlling output and reducing production costs;
- To care for and improve the agricultural situation, in line with the market in all regions which have weak agricultural structures and which have been slow to develop, thus promoting greater economic and social cohesion in the Community;
- To conserve natural resources and the countryside, ensuring that an improved environment will result from the application of the technologies developed and from changes in production systems;
- To develop agricultural information services and infrastructures to improve the dissemination of research results within and between Member States.

The five programme objectives outlined above are pursued via research projects carried out in four sectors:

- Research into conversion, diversification, including widening of production, reduction of costs, and protection of the rural environment;
- Research on product quality, new use of traditional products, and aspects of plant and animal health;
- Investigation of socio-economic aspects and specific actions for all regions in the Community which are lagging in development;
- Research in methods and services to disseminate agricultural RTD information, particularly information stemming from this programme.

*Copies of the "Progress Report" and further information on Community research and technological development actions in the field of agriculture, forestry and rural development are available from:*

CEC DGVI/E.II-3  
Attn. J. Connell (L130 06/227)  
200 rue de la Loi  
B-1049 Brussels

## IMPACT

## IMAGE AND GRAPHICS CODING STANDARDS

A study of graphics standards has been carried out by PIRA (UK) within the framework of the Community's programme for the establishment of an internal information services market (IMPACT). It is one of a number of activities undertaken in the context of IMPACT to promote the development of Open Information Interchange (OII) standards in Europe. The 92-page study provides an introduction to each of the main standards for image and graphic coding for still images and their application and use, plus a general statement of the factors to be taken into consideration when using graphics standards. Covered are the official standards from the International Standards Organization (ISO) and other bodies as well as the main "de facto" standards in widespread use in industry.

*Copies of the report in English may be obtained free of charge from:*

CEC DG XIII/E  
IMPACT Central Office  
D Buckley  
JMO B4/036  
L-2920 Luxembourg  
Fax +352-430132847

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## LRE

## NATURAL LANGUAGE PROCESSING DEVELOPMENT TOOL DISTRIBUTION AND MAINTENANCE

The Commission of the European Communities calls for tenders in the context of Area 6, Language Research and Engineering (LRE) of the specific programme in the field of tele-matic systems in areas of general interest, 1990-1994. Tenders concern the distribution, maintenance and support of a portable non-proprietary development tool kit for natural language processing (NLP) research, training and applications prototyping known as the ALEP system. ALEP results from previous RTD projects carried out within the framework of the EURO-TRA and LRE programmes. The Commission has retained the intellectual property rights to the system, which can be made available to any interested European organization. An early version of the system is currently used in several Community sponsored RTD projects, and a more advanced implementation is to become available in 1994. The Commission intends to distribute actively and support the ALEP system in 1994-1995 with a view to fostering re-use and sharing of RTD results in the language engineering field through the adoption of common methods, formats and tools. Tenders are invited to address the following tasks:

- Distribution of the ALEP tool kit
- Provision of training and user support services;
- Maintenance of the ALEP system;
- Establishment and management of a user group;
- Improvements and developments of additional components

The contract is expected to start on 1 April 1994 and will have a duration of 21 months. Tenders are invited from eligible consortia comprising industrial and/or research organizations with extensive engineering experience in the NLP field and able to provide professional support and development services in the areas defined above.

*The economic and technical standards required of the contractors are specified in the tender documents available from:*

CEC DG XIII/E-4  
Jean Monnet building (B4-200)  
L-2920 Luxembourg  
Tel. +352-430132886  
Fax +352-430134655

## RACE

## R&amp;D AND ADVANCED COMMUNICATIONS TECHNOLOGIES FOR EUROPE

The final report on Phase I (1988-1992) of RACE (Research and development in Advanced Communications technologies in Europe) has recently been published by the European Com-

mission. This report summarises and documents the results of the first phase. The context, organization and results of the programme are described and the organization and results of programme evaluations and audits are summarised. Links with other EC and European actions are discussed as is the exploitation of the results of Phase I along with the transition to Phase II. Future requirements and options for work at European level are also included.

This publication is available from the Office for Official Publications of the European Communities.

## ESPRIT III

## RESULTS OF CALL FOR PROPOSALS

A total of 217 projects have been accepted for Community funding under ESPRIT III, the Community programme of RTD in the field of information technologies, following a March 1993 invitation for proposals for research and technology development projects and accompanying measures issued in Official Journal No C 67 of 10.3.1993 (closing date 22 April 1993). Following the invitation to tender, coordination sessions were held among interested parties to aid the establishment of consortia sharing specific areas of interest. The breakdown of proposals accepted by the Commission for funding in the seven domains covered by the call is as follows (number of projects in parentheses):

- Microelectronics (32);
- Design and engineering technology for software intensive systems (19 projects)
- High performance computing and its applications (36);
- Advanced business and home systems - peripherals (23);
- Computer integrated manufacturing and engineering (40);
- Basic research (45);
- Open microprocessor initiative (22).

In addition supporting initiatives were to be undertaken as accompanying measures and concerted actions, as described in the ESPRIT 1993-1994 work programme. Submissions for the supporting initiative ESSI (the European System and Software Initiative) were the subject of a separate call published in OFFICIAL JOURNAL No C 114 of 24.4.1993, closing on 7 June 1993.

*Further details, plus the ESPRIT 1993-1994 work programme, are available from:*

ESPRIT Information Desk  
200 rue de la Loi  
B-1049 Brussels  
Tel. +32-2-2968596  
Fax +32-2-2968388

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## Update on Commission Agro-industrial Research Activities

Since the introduction of the Single European Act in 1986 the Agro-industrial division of DGXII has been very active and successful in instigating a number of measures promoting a closer harmonisation and collaboration between agriculture and industry in Europe. It has done this mainly through launching rolling research programmes of which there are three main ones currently running, ECLAIR and FLAIR from the second framework programme and AIR from the third. The AIR programme is jointly managed by the services of DGXII agro-industry, DGVI agriculture, and DGXIV fisheries.

The projects and actions carried out by these research programmes have the objectives of seeking through research and exploiting new technologies, new markets for European agriculture, agro-industry, forestry, and fisheries. The programmes have been implemented in a number of different ways but the following factors indicate the level of activity the Commission is sponsoring in this area:

- The current project portfolio amounts to 380 projects with a total estimated cost of one billion ECUs and involves nearly 3000 participants from all the Member States, with an EFTA participation of around three percent. There are on average eight participants per project who meet on a regular basis to discuss results and strategies.
- Twenty-one different Pan-European studies which describe the current state of the art and the needs for future research in selected Agro-industrial topics have been launched and details of the findings of the finished studies are described below.
- Over two hundred young scientists have taken up research positions in laboratories participating in these programmes through EC agro-industrial fellowship grants.

Most of the projects are searching new markets for Europe and involve innovative research to help Europe exploit new technologies which will prove decisive in the Worldwide race for competitiveness, and as such are extremely important for future economic and political relations within the single market.

The fourth framework programme text has now been presented to the Council for approval and the money allocated to the Life Sciences and Technologies theme amounts to 1325 Million ECU. The actual share for agro-industrial research has yet to be decided upon. The next step is for the Council to approve the document as early as possible, and to launch at least some of the programmes in 1994. Important things to notice in the document concerning agro-industrial research include, the continued emphasis on food research, and the growing and marked increase in non-food research, particularly in the domain of research into processing and extraction of new non-food materials. Networks of excellence in the non-food areas will be encouraged.

The third call for proposals for the AIR programme was published in the Official Journal on September 15th 1993. The clos-



Wageningen, Holland  
Soil pollution and effects of agricultural practices

ing date for proposals is the 14th of January 1994. Finally mention should be made of a Colloquium which is to take place in Brussels on the 3rd and 4th of November this year entitled "Research, Training and Agriculture in Europe: The New Challenges". This high level meeting, organised jointly by DGXII and DGVI will address the future of the important agricultural challenges facing the Community over the coming years with respect to, new technologies, training, rural development, environment, production, food, non-food, and forestry.

Further information available from:

Commission of the European Communities  
Secretariat, Agriculture and Agro-Industry, incl. Fisheries  
Rue Montoyer 75  
B-1040 Brussels  
Belgium

D Desyllas, DG VI  
Tel: 32-2-295.86.12  
Fax: 32-2-296.30.29

F Rexen, DG XII  
Tel: 32-2-296.31.64  
Fax: 32-2-296.43.22

W Brugge, DG XIV  
Tel: 32-2-295.51.37  
Fax: 32-2-295.78.62

*This article looks at how the SPRINT Programme promotes innovation and technology transfer to SMEs*

SPRINT (Strategic Programme for Innovation and Technology Transfer) is the Community's programme to promote innovation and technology transfer to SMEs.

SPRINT disseminates new technologies and innovation by integrating national innovation infrastructure into a European network, by supporting projects which are of particular demonstration value for innovative technologies, by coordinating national innovation promotion policies and, in association with this, carrying out innovation monitoring, by means of the European Innovation Monitoring System (EIMS).

The programme supports cross-border, technology-oriented structures for cooperation such as:

- inter-firm technology transfer networks, whose main emphasis is on linking innovation agents, such as regional technology advisory centres, research centres and technology brokers and consultants;
- networks of research and technology organisations, which encourage transnational European cooperation between them in projects or through common technology dissemination activities;
- transnational technology transfer projects (specific projects), which transfer new technologies between sectors and regions as well as the practice of these technologies; international groups of technology users and technology suppliers from the private or public sector are supported under this initiative.

A number of measures which support the networks have been developed, including technology transfer days, investment fora and the dissemination of best practices in network operation. Financial schemes, such as technology performance financing, help to reduce the potential risk of acquiring new technologies.

Management techniques with a direct effect on innovation within SMEs are also covered by establishing working groups on design, value analysis, quality and intellectual property. A recent and important action line on managing innovation is now under way to help companies to manage the integration of new technologies (MINT), which is a consultancy scheme aimed at promoting the absorption of new technologies by SMEs.

One of the main objectives of SPRINT is to strengthen the European infrastructure of support services for innovation and technology transfer, of which science parks are a vital part. The programme is supporting consultancy studies aimed at helping promoters plan or develop science or technology parks. Telematic networking between parks is another important part of this initiative.

*For further information on SPRINT please contact:*

**Mr Jacques Bonnin**  
**SPRINT Technical Assistance Unit**  
 119 Avenue de la Faiënerie  
 L-1511 Luxembourg  
 Tel: 352/46 55 88; Fax: 352 46 55 50

## WORKSHOPS ON LASER TECHNIQUES FOR INDUSTRIAL MEASUREMENTS

A series of workshops on laser measurement techniques and the benefits of these techniques to manufacturing, processing and energy generation industries are being organised by SPRINT. The benefits lead to improved quality, reduced waste, greater efficiency and enhanced competitiveness.

Workshops will be held in the UK, Italy, France and Germany during September and October.

The content and structure of each workshop has been carefully designed to meet market-researched regional needs. In addition to presentations on various topics, exhibitions and demonstrations are planned on the latest technology and methods from leading suppliers of instrumentation and consultancy. Information and advice will be available for participants with specific technical requirements.

### **23 September 1993: Coventry Hilton, Coventry, UK**

Contact: Mrs Debbie Warren  
 ETSU Harwell  
 Didcot Oxfordshire OX11 0RA  
 Tel: 44/235/43 23 77; Fax: 44/235/43 64 61

### **5-6 October 1993: CNR, Milan, Italy**

Contact: Prof. Aldo Coghe  
 Dipartimento di Energetica, Politecnico di Milano  
 Piazza Leonardo da Vinci 32, I-20133 Milano  
 Tel: 39/2/2399 3837; Fax: 39/2/2399 3940

### **12-13 October 1993: Gaz de France, Paris, France**

Contact: Ms. Jocelyne Bardeau  
 Laboratoire de Chimie Physique de la Combustion  
 Université de Poitiers, Domaine du Deffend  
 F-86550 Mignaloux Beauvoir  
 Tel: 33/49/46 80 19; Fax: 33/49/46 83 82

### **21-22 October 1993: Universität Erlangen-Nürnberg, Germany**

Contact: Dipl.-Ing. Manfred Stieglmeier  
 Lehrstuhl für Stromungsmechanik  
 Universität Erlangen-Nürnberg  
 Gauerstrasse 4, D-8520 Erlangen  
 Tel: 49/9131/85 94 90; Fax: 49/9131/85 95 03

## SCIENCE PARKS

The increasing number of science and technology parks raises issues of communication and coordination and networking possibilities and advantages. These networks could include universities, research centres, public agencies, private enterprises, etc. In order to steer this development in the most efficient directions, the Commission services responsible for innovation and technology transfer, telecommunications and regional policies are jointly looking into the needs for, and feasibility of, supporting networks of science parks and the dif-fusing of advanced telematic tools (SPNET). Following a call for tenders, a consortium of experts and international consultants led by Segal Quince Wicksteed Ltd. (UK) has been appointed to carry out a feasibility study on networking science parks. The study will have three main objectives:

- To verify the validity and opportunity of constituting or strengthening networks of European science parks;
- To evaluate if the use by science parks and by their tenant companies of telematic applications, could support the transfer of technology, exchange of experience and cooperation between science parks, firms as well as research centres locally or internationally;
- To assess the potential role of the science parks as demonstration centres for local SMEs especially in the least favoured and/or peripheral European regions.

Results, including the opportunity and conditions of eventual Commission actions on the promotion of networks between science and technology parks are expected to be available at the end of this year.

*CEC DG XIII-D/4*

*Mr Gottfried Thesen*

*JMO, L-2920 Luxembourg*

*Tel. +352-4301 32508; Fax +352-4301 34544*

or

*SPRINT Technical Assistance Unit*

*(full address, telephone and fax numbers on the previous page)*

INFO

The United Kingdom Science Park Association has just published a manual entitled "The Development and Operation of Science Parks". This is a very useful summary of the best practice in starting up and running such a development based on the experience in the United Kingdom.

*Available from:*

*The United Kingdom Science Park Association*

*Aston Science Park*

*Love Lane, Aston Triangle*

*Birmingham B7 4BJ, UK*

## MINIMAL PROCESSING OF FRUIT & VEGETABLES

A fully documented training course "Minimal Processing of Fruit and Vegetables", complete with slide material has been produced by the European Food Research Association under the leadership of the Spanish organisation, AINIA.

The training course has been developed under the auspices of SPRINT, the European Community Strategic Programme for Innovation and Technology Transfer.

This course is the first of its kind and should be particularly valuable for those looking for expert information on fruit and vegetable processing.

The material for the course is self-contained and can be used for both group and individual instruction.

*The course material is available from:*

*AINIA - Parque Tecnológico*

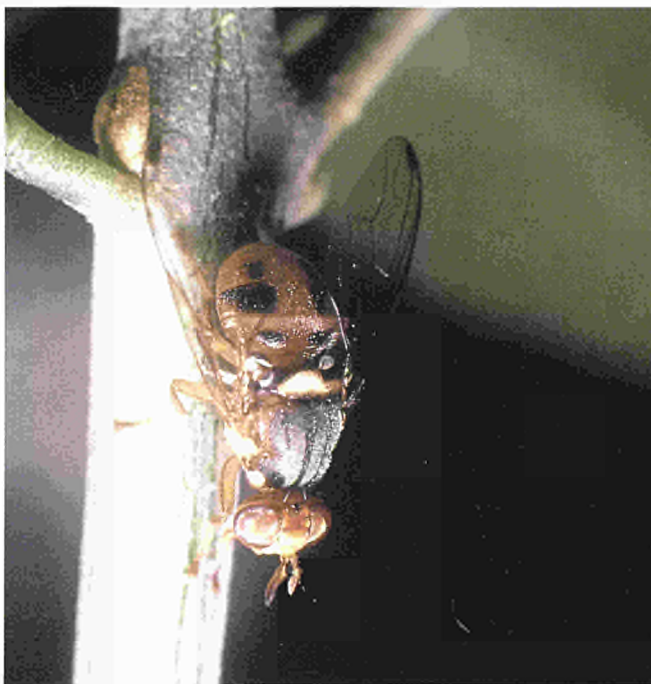
*Aptdo 103*

*E-46083 Paterna (Valencia)*

*Spain*

## OLIVE PEST MANAGEMENT: BIOLOGICAL BRANCH-OUT

For the EC's Mediterranean countries, the long-lived olive tree *Olea europaea* has a very special social, economic and even cultural significance. These countries produce some 65% of the world's olive oil and 50% of the fruit. Every year, 15% of this production (worth about ECU 560 million) is destroyed by insect pest complexes, the two key pests being the olive moth *Prays oleae* and olive fly *Bactrocera oleae*. Though growers have extensively used chemical pesticides to protect their crops, there have been dramatic secondary effects: reduced yield, poorer quality oil and fruit, safety problems for growers and consumers, pesticide resistance, and environmental pollution.



*Olive fly*

To counteract pollution and increase the value of the oil, an EC project is aiming to reduce the amount of chemicals used in this area of European agriculture. Prospects are good for microbial pesticides specific to the olive tree pests. Also being developed are pest behaviour-modifying chemicals and the manipulation of the existing natural enemy complex. Control systems like these will help to reduce pesticide residues, thereby enhancing oil and fruit quality.

Olive culture is well-suited to the development and testing of an "Integrated Pest Management" system. IPM is a pest management strategy which utilises all suitable techniques and methods by making them as compatible as possible, and maintains the pest population below that causing economic injury. The next step is to convince farmers and growers to accept and operate the IPM system, by pointing out the practical and economic advantages.

Significant progress has been made in defining new microbial technology and natural insecticides against the olive moth and the olive fly. For example, different types of trap, and food

and/or sexual lures allow the detection of olive fly and olive moth populations. Once identified and located, it is easier to make a decision as to whether and how appropriate treatment can be carried out. The different partners involved in this collaborative research are fairly sure that by the project's end (1994), they will have a field-tested IPM system ready to use.

*For further information contact:*

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**School of Pure and Applied Biology**  
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**Cardiff CF1 3TL**  
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**Tel + 44 222 874000**  
**Fax + 44 222 874305**



**ABRASION: METALLIC GLASS  
 TO THE RESCUE**

Abrasion is a major problem for turbines and hydraulic pumps. Every year large hydroelectric machines grind to a halt because the abrasive particles found in water, pitting and corrosion have worn away machinery. The costs of repairs and stoppages are inevitably high, so operators would welcome anything that could extend the life of their machines.

R&D focuses the materials and surface coatings used for such machinery. One promising solution, now being worked on by the Eromat consortium under the BRITE programme, is to use amorphous alloys on an industrial scale. The "ideal" substance, developed by this consortium, is a new, amorphous metallic alloy, otherwise known as metallic glass because it is not crystallised. To obtain what is a very unusual state for a metal, the liquid alloy is cooled at a rate of a million degrees per second. Other partners in the consortium have helped define the alloy according to industry's needs, as well as material characteristics and component/surface interface. A series of real-life tests on coated equipment is now

underway.

After two years' research, results are highly promising: a range of alloys and their specific characteristics have been defined. Among other properties, they are highly ductile and extremely durable. Moreover, the coating and its substratum can be used without problems in sea water. Coating trials have also shown the fusion between the amorphous surface and the metallic base is very good: this allows, for example, a turbine blade to bend and twist without losing its coating.

Industry is already convinced of the usefulness of this kind of surface coating for hydroelectric plants, pumps and boats. A second BRITE programme backing up industrial development of the coating procedure is to begin this year. It will look at maintaining the coating parameters and properties in the case of large surfaces, and then go on to the construction of automated equipment.

*For further information contact:*

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**France**  
**Tel + 33 76 39 30 69**  
**Fax + 33 76 39 30 01**



**GEOHERMAL ENERGY:  
 A SERIOUS ALTERNATIVE**

European researchers have high hopes for geothermal energy. Thirty years from now, this energy source should be a serious alternative to nuclear power.

Geothermal energy is very different from other "alternative" energy resources such as wind and solar power, because it has the potential to produce power at an industrial scale, of the order of hundreds of megawatts. Italy, for instance, already produces 500 megawatts of electricity per year this way.

The intention is to construct a giant underground heat exchanger linked to

a turbine to test the industrial viability of this renewable source of power. However, significant difficulties include the economic and technical viability of recovering this energy in small fields (typical in Europe) and the high costs of hot dry rock research. Consequently, the success of the latest Community projects will determine the future of geothermal energy use.

Under the Joule II (non-nuclear energy) programme, scientists at Soultz-sous-Forêts (France, Lower Rhine) began work in December 1992 on a project consolidating research underway since the 1970s. The aim is to inject water into hot rocks at a depth of 4,000m (in a granite platform criss-crossed by numerous faults forming a giant "radiator" at 180°C), to produce sufficient energy to drive an electricity generator.



Two other sites are being examined in the UK and Germany. Some 60 scientists are involved in this project (ECU 5.5 million, plus a further ECU 3.3 million for 1994-95), from around twenty universities and institutes in France, United Kingdom, Germany, Sweden and Switzerland.

In Soultz, the first stage involves drilling boreholes through the sedimentary layer and granite platform, to prove the technical feasibility of an industrial-scale pilot with a capacity of several Megawatts. Equipped with a generator, this industrial pilot will be built after 1995. If all goes well, a prototype geothermal energy power station

(producing 5-10 Megawatts) will follow around the year 2000. It will be linked to the electricity grid and work as a complement to traditional, small power stations.

Better understanding of the basement rock fracture systems has already allowed researchers to produce a model of a Hot Dry Rock reservoir. A 3,950 m borehole has been drilled and could form the first part of the future pilot system, while the next borehole (4,000m deep) will be used to test the circulation of hot water. With these holes, researchers will be able to begin construction of the pilot and study problems like corrosion, pumping, and modelling (chemical and thermal) of the rocks.

Corrosion problems, which are crucial to the industrial phase, will be solved by removable internal tubing systems and/or injection of corrosion-inhibiting substances. Hydraulic models of the rocky massifs exploited (over 3,000 km<sup>3</sup>) will be made to check the impact on deep water resources in the region. Calculations show a balance could be quickly established between the pumping system and natural water circulation between the rock faults. An early estimate of progress and planning of the industrial pilot project will be presented in Soultz in 1994.

Whatever the future of geothermal energy, this research has already improved understanding of rock mechanics and drilling techniques. This knowledge will find applications in the oil and civil engineering sectors. Another spin-off has been the composition of an Atlas of Geothermal Resources in the EC, Switzerland and Austria, to be updated this year to include Central Europe.

For further information contact:

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## CURRENT RESEARCH INFORMATION IN EUROPE

The Netherlands Current Research Information Agency (NBOI) is organising a three-day conference, Current Research Information in Europe, on user needs and the relation to other science information sources. The conference will be held in Amsterdam on 2-4 December 1993. The European Commission's DG XII and DG XIII are subsidising, in part, the conference. Four major themes will be in focus:

- Users and usage of current research information;
- Integration with other information sources;
- Access to current research information on a European level;
- New technologies and methods in database production and publication.

For more information, please contact:

**Nederland Bureau voor  
 Onderzoek Informatie  
 Dr M van der Graaf**

or

**Dr M J de Goede  
 Jan Luijkenstraat  
 1071 CJ Amsterdam  
 Tel. +31-20-6626101  
 Fax +31-20-6627271**

## SIXTH EUROPEAN SYMPOSIUM ON THE PHYSICO-CHEMICAL BEHAVIOUR OF ATMOSPHERIC POLLUTANTS

The sixth European symposium on the physico-chemical behaviour of atmospheric pollutants will be held from 18 to 22 October 1993 in Varese (Italy) at the Congress Centre, Villa Ponti. This symposium is organized by the DG XII/D-1 of the Commission of the European Communities and the Environment Institute of the Joint Research Centre of the European Communities. Each day of the symposium is organized around one or more themes as well as poster sessions.

The themes are:

- Oxidation efficiency of the atmosphere;
- Transport processes;
- Instrumental and analytical techniques;
- The role of clouds in tropospheric chemistry.

Additional information from:

**CEC Public Relations &  
 Publications Unit  
 Joint Research Centre  
 Mrs C Lucia  
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 I-21020 Ispra (Varese)  
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 Fax +39-332-789502/785409**

or

**CEC DG XII-D  
 Mr G Angeletti  
 200 rue de la Loi  
 B-1049 Brussels  
 Tel. +32-2-2958432  
 Fax +32-2-2963024**

The deadline for submission of papers to be included in the Symposium proceedings is 30 November 1993.

## OII IMPACT WORKSHOP

A two-day workshop on Open Information Interchange (OII) standards in Europe is to be organized by IMPACT, the Community's programme for establishing an internal information services market. The workshop, one of a number of IMPACT activities will be held in Luxembourg on 2-3 December 1993. Intended as a follow-up to a successful OII workshop held in June 1991, the first half-day of the event will provide a progress report on IMPACT's OII activities. Attendance at the workshop is free.

For registration details and further information please contact:

**CEC DG XIII-E  
 G Heine  
 L-2920 Luxembourg  
 Tel. +352-430133260  
 Fax +352-430133190**



A major conference on technology transfer and innovation, TTI '94, will be held at the Queen Elizabeth II Conference Centre in London on 18-20 July 1994. The conference is intended for industrial and commercial staff to learn how academic research may assist problem solving; for academic and research personnel looking for opportunities to apply their work in industry and commerce; and for personnel working at the academic/industry/commerce interfaces.

Riccardo Petrella, Head of the Forward Studies Unit of the Commission of the European Commission will be one of the keynote speakers. Others will include John Ashworth, Director of the London School of Economics; David Crawford, Advisor

to the US Government on Technology Transfer policy; John Preston, Director, Technology Development, Massachusetts Institute of Technology, and Michiyuki Uenohara, Executive Director, NEC Corporation, Japan.

Promoters of TTI '94 include the Department of Trade and Industry and the Confederation of British Industry.

For further information contact:

Mrs Kate Smith  
 TTI Conference Secretar  
 Hillside House  
 79 London Street, Faringdon  
 Oxon SN7 8AA  
 UK  
 Tel: +44/ 367/ 242 822  
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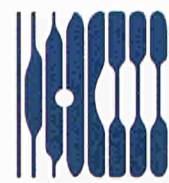
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