

SCIENCE AND TECHNOLOGY PROGRAM - EU

regional S&T centers, with 20 of the 60 top cities or regions. Barcelona, Rome, Milan, and Lyon all significantly increased their scientific publication.

The technological performance of the EU, measured in terms of patents, has halted its decline, but still remains well below that of the US in many fields and behind Japan in information and communication technologies. The EU fields of specialization are aerospace, chemistry, pharmaceuticals, motor vehicles and mobile communications.

3. Future S&T Directions

The implementation of FP5 will continue over the next three years in the context of continuing European integration, enlargement and consolidation. Criticisms so far have been rather muted, except for usual complaints about the excessive bureaucracy and delays associated with the administration of FP5. It is also said that FP5 may lean too much in favour of applications, to the detriment of more basic research. In the meantime, the European Science Foundation is undergoing a renaissance, with the recent launch of seven new scientific programmes and four new networks in a variety of fields drawn from the physical, life and social sciences, and the humanities.

In recent interviews, Mr. Busquin said that European research is too fragmented due to protectionist reflexes to maximise prosperity in one's country first, strategies which have become increasingly ineffective in the face of globalization. He invited the French CNRS and the German Max Planck to consult more in order to eliminate overlaps in research and be more effective. He expressed concern about S&T indicators pointing in the wrong direction when 25 - 50% of European economic growth is directly linked to innovation. For example:

- (1) the EU's overall research effort in relation to its GDP has been steadily declining for 10 years, down to 1,8%, and the gap is widening in relation to the US and Japan where research expenditures are approaching 3% of GDP;
- (2) the gap between R&D expenditure in American and European firms is much wider than the difference in public spending;
- (3) overall the EU has fewer researchers in comparison to the United States and Japan; furthermore, European firms employ significantly fewer researchers than their American and Japanese counterparts;
- (4) levels of R&D investment in the Member States still vary widely;
- (5) intensity of R&D in applicant countries is substantially lower than the EU-15 average, and
- (6) the EU trade deficit in high-technology products has been worsening since 1987.

Consultations on a strategy for a "real" research policy in Europe were launched in January 2000. The goal is the creation of a European research area, where scientific resources will be used more to create jobs and increase Europe's competitiveness, with special attention given to the networking of centres of excellence, and development of a European approach to large research infrastructures. This will be combined with measures to promote spin-offs from research. The problems of fragmentation and lack of collaboration between public and industrial research in Europe are to be addressed through better co-ordination and by encouraging the mobility of researchers. It is hoped that Member States will open up their national research programmes to