

h uge potential for tiny technology

“ *It is an exciting prospect to bring together national funding agencies in this promising technology field for joint programme design, monitoring and exploitation* ”

Please note that this fact sheet replaces the previous one, known as MNT ERA-NET, and included in Series 1 of this publication

Micro- and nano-technologies (MNT) are key enabling technologies of the 21st century, and are already making an impact on everyday products. The US, China, Japan and Korea are investing large sums of public money into research programmes to help their industries meet the challenge. Europe has a strong research base in MNT, but its programmes are fragmented and dispersed among many national funding agencies. The MNT ERA-NET will stimulate co-operation between national and regional R&D programmes in Europe with combined annual public funding of more than 365 million. The aim of this long-term partnership is to exploit synergies in order to improve the impact of public investment, strengthening the position of European companies in this crucial new market.

Micro- and nano-technologies (MNT) encompass an emerging area of research and development that includes micro-technologies, nanotechnologies and micro-systems. In essence, it is the technology of the very small, from the simply microscopic (micro), right down to the scale of individual atoms and molecules (nano). MNT is developing techniques to make structures and devices that function at these very small scales. Sectors that could benefit from work in MNT include telecommunications, automotive, medical devices, life sciences, consumer electronics and process control – all sectors which are expected to grow rapidly in the years ahead. Some early applications of MNT are already on the market, such as surgical dressings, inks, water filters, and other products. The tiny magnetic heads that read and write data to computer disk drives are a commonplace but sophisticated example. In the near future we can expect many medical applications such as diagnostic tools and implantable devices to administer drugs. Further ahead, MNT is likely to accelerate the miniaturisation of computers and usher in another revolution in information technology. More broadly, MNT will contribute to environmental protection and sustainable development. There seems hardly a facet of commerce that will not be affected by MNT in some way.

Big public investments

This has not escaped the notice of the big industrialised countries. Worldwide, there are some 20 000 researchers in MNT, and public funding was estimated to exceed \$2 billion in 2002. The US, Japan, China and Korea all have major programmes to develop MNT, and the US alone intends to spend almost \$850 million of federal funding in 2004 with at least as much again expected from private sources.

Compared to the rest of the world, Europe has a strong track record in MNT research and has a receptive industrial base. Governments have certainly recognised its potential and made considerable public investments. But compared with its major competitors, Europe's efforts are still highly dispersed and fragmented – it is not making the most of its collective expertise.

While there have been collaborative projects on MNT – for example, within the EUREKA programme – there have been few attempts to coordinate national research efforts. MNT is a major priority for support in the Sixth Framework Programme – a whole thematic area is devoted to nanotechnologies – but it has an impact on other priorities too, such as information society technologies, aeronautics and space, and genomics and biotechnology. This makes it an ideal topic for an ERA-NET.



Coordination Action MNT

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From micro- and nano-scale science to new technologies for Europe

Research field:

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Coordinator:

Austria: Austrian Research Promotion Agency, Division General Programmes (FFG BP)

Partners:

- Belgium: Instituut voor de Aanmoediging van Innovatie door Wetenschap en Technologie in Vlaanderen (IWT)
- Belgium: Directorate General for Technologies, Research and Energy (DGTRE)
- Finland: National Technology Agency (TEKES)
- France: Conseil Régional Midi-Pyrénées
- Germany: VDI/VDE Innovation + Technik GmbH
- Germany: Forschungszentrum Karlsruhe (PT Karlsruhe)
- Ireland: Enterprise Ireland
- The Netherlands: SenterNovem
- Norway: The Research Council of Norway
- Poland: Ministry of Scientific Research and Information Technology (MSRIT)
- Romania: Politehnica University of Bucharest (PUB)
- Slovakia: Slovak Academy of Sciences (SAS)
- Slovenia: Ministry of Education, Science and Sport (MESS)
- Spain: Industry, Trade and Tourism Department of the Basque Government
- Spain: Ministry for Education and Science (MEC)
- Sweden: Swedish Agency for Innovation Systems (Vinnova)
- Switzerland: TEMAS AG Technology Management
- United Kingdom: Invest Northern Ireland (Invest NI)

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“ This will be the first time that cross-border co-operation between universities and companies can be efficiently supported through the coordination of national funding schemes ”

Led by Austria, the 19 members of this network of funders represent national and regional MNT programmes and research management agencies in 16 countries, which together control annual MNT budgets totalling €365 million. Their aim is better coordination between the national MNT efforts at European level. Other partners are expected to join as the ERA-NET progresses and two further organisations (from the UK and Czech Republic) are currently associated to the work of the project without formally being partners.

Trans-border partnerships

The MNT ERA-NET will coordinate the currently fragmented research programmes and exchange good practice on aspects of programme design and management. The biggest impact is expected to come from promoting co-operation between national programmes. This could involve trans-border partnerships between businesses and research centres, avoidance of duplicated effort, cost-sharing, a common framework to ensure programmes are complementary, better technology platforms for dissemination of results, and discouragement for spending on small regional or national programmes where co-operation at

European level would be more cost-effective. The network will consider ethical, safety-at-work and consumer-protection issues, which often vary between Member States, and make recommendations where appropriate. The economic development stimulated by MNT activities will support other EU policies in enterprise, employment, environment, regional development, consumer protection and health and safety. The ERA-NET may have an additional role to play in the development of industrial standards for MNT – especially the critical issue of the design of interfaces between micro-components.

Finally, the members propose to create a ‘pan-European institutional framework’ to ensure long-term co-operation between MNT initiatives in the EU Research Framework Programme and other European programmes and networks, as well as drawing together national and regional activities.

The four-year MNT ERA-NET is expected to have a big impact on Europe’s contribution to this new technology. The sharing of best practice should lead to better designed research programmes, and the strong, transnational partnerships should yield results of lasting value to both science and industry.