

European Materials Research Society

E-MRS President **Professor Rodrigo Martins** offers his take on how to reaffirm Europe's place in globally important markets through closer ties between research and industry. He explains the role the Society is playing in this, and in the development of sustainable solutions to humanity's challenges

Could you outline the mission of the European Materials Research Society (E-MRS)?

As an international, non-governmental, non-profit scientific association, the mission of E-MRS is to promote materials science and engineering, research, development, innovation and technology transfer to industry and commerce. This means that besides organising international conferences, workshops, summer schools, seminars and interdisciplinary brainstorming sessions, E-MRS also promotes advocacy towards the general public, European and national policy makers, stakeholders, and the future generation of materials scientists, from secondary school to university. This requires us to establish strong links with other societies and materials platforms both within Europe – aiming to have a common hub by consultation, cooperation and the exchange of information – and internationally, by contributing to the development of a global network facilitating discussion between worldwide key players in science and technology and corresponding dissemination of information and knowledge.

What does your role entail?

My role is to coordinate the different task forces within the Society – conferences, workshops and schools organisation, education, industry relations, EU policy, international affairs, publications, relations with other scientific and technical societies – and to facilitate excellence in these directions; supported by our Secretary General Paul Siffert and dedicated staff at the society.

How important do you see materials science being in achieving a sustainable global society? Can you point to any specific recent advances in the field that support this position?

70 per cent of all technical innovations in all applied fields are directly or indirectly linked to materials. This percentage has been increasing since 1970 and it is forecast to continue increasing steadily until 2030. European industry cannot remain competitive and be really sustainable without continuous innovation in materials. That is, we have to develop systems and products with exceptional performances based on eco-

friendly abundant materials, with steady prices, and we have to exploit their functionalities at the nanoscale, targeting better use of our raw materials.

Do you feel that R&D in materials science is enough of a focus for governments when it comes to sustainability and combating global change, especially in terms of funding?

First of all, as the European Commission and European Parliament are the two main governance pillars of Europe, the directions they choose will be crucial for the population because most national governments will follow their lead. Choices have to be made between high volume, low added-value industries or high added-value goods.

Presently, the European Parliament and European Commission are quite aware of the relevance of materials, as can be taken from the recent co-signing of the 2012 Aarhus Declaration by representatives of industry and materials research communities, under the umbrella of the European Commission. This declaration highlighted advanced materials as one of the most relevant key enabling technologies (KETs), and was fully accepted in the Horizon 2020 priorities, in which the KET in materials appears in second position, just after nanotechnology. Moreover, Horizon 2020 clearly states that a common hub is required to better control the cross-cutting effect of materials through all six areas selected by the programme, spanning ideas to industrial leadership and societal challenges.

At an international level, governments are aware that to promote innovation, shared knowledge concepts are required. For example, the Portuguese Government has agreed with China to establish a common laboratory devoted to advanced materials this year, where common projects should be established. Similar approaches have been taken by other governments, such Germany, France and Italy.

This means that the financial tools exist and governments are ready to support R&D in a quite competitive environment, as required to push excellence to the forefront. Of course, people may expect more or different approaches. This is why the existence of common structures where academics and industrialists can come together is important.

Within the European Institute of Innovation and Technology (EIT), we soon expect to have a knowledge innovation centre devoted to a family of materials and manufacturing techniques that does not yet exist. At the European level, the Alliance for Materials was created that aims to be the seed of this still-missing concept.

Is it important for links between basic research and industry to be improved?

Today, European market shares in strategic areas such as energy are falling. This situation clearly requires drastic modifications in how R&D is supported in Europe. Fundamental research is fragmented, and collaboration is weak between public research and industry. It is absolutely necessary that we keep knowledge-orientated universities and institutes, but in addition more regional structures should be directly linked to regional industries with well-defined priorities.

We propose to initiate a new concept based on well-known ideas involving regional, private and public funds, aiming to identify an original and economically profitable niche for each region in terms of KETs and facilitating the emergence of pan-European areas of specialisation which are competitive on a global level. In addition, start-ups should initiate innovative new products which can later be developed at a larger scale in the region of origin or shifted to large companies. We believe that combining large-scale technological platforms with regional development policies can strongly contribute to changing the degraded present situation in Europe.

How does the cross-disciplinary nature of the Society help it achieve its goals?

Due to the multidisciplinary character of materials sciences, the Society involves researchers, academics and technologists with different backgrounds, including chemistry, physics, electronics, mechanics, energy, materials and biomaterials, together with industrialists, which positions us in the first row to provide materials science and technology roadmaps in key strategic areas to help focus European efforts in the face of global competition.

Is collaboration with other materials research institutions essential – both within Europe and worldwide?

This is vital for our vision of the future and is why, within Europe, we promote the European Materials Forum (EMF) and today are involved

in active European actions such as the Alliance for Materials. Thanks to this united voice from the community, we were able to progress towards the previously mentioned Arhus Declaration signed during the Danish presidency of the EU.

Apart from that, we are also involved as partners in the International Union of Materials Research Societies (IUMRS), a global umbrella to promote studies and discussions in key areas that matter to our citizens. IUMRS promotes outreach and advocacy worldwide. Moreover, as a non-governmental body, it is a member of the international Council for Science of Unesco (ICSU), under which it participated in the Rio+20 United Nations Conference on Sustainable Development last year.

What is the significance of EMF and what is the Society's role in it?

EMF was an initiative launched by E-MRS in 2004, aiming to have a common umbrella for a broad range of scientific, education and technology issues related to the broad multidisciplinary area of materials. Besides E-MRS, it involves other societies such as the Federation of European Materials Societies (FEMS; see p32) and the European Physical Society (EPS). It is an organisation that stimulates, fosters and coordinates education, research and innovation in materials science and technology, to advance a European knowledge-based society.

The specific objectives of EMF are: to lead European materials science and technology at an international level; to provide coherence and improve coordination between national and European interests; and to assist in structuring the European materials science and technology landscape.

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