

Federation of European Materials Societies

Materials science will play an ever more important role in industry and society, particularly when facing the global societal challenges of the 21st Century, and Europe needs to take the lead through innovative collaboration, argues FEMS President **Professor Ehrenfried Zschech**

To give some insight in to the Federation of European Materials Societies (FEMS), could you outline its main aims?

FEMS is a non-profit association of 28 European societies, representing about 25,000 materials scientists and engineers. Materials research, development and innovation cover the entire value chain from original fundamental research up to the integration of new materials into products for the market, including advanced manufacturing.

The main aims of our association are to promote the exchange of materials-related knowledge and information within the European materials community and to coordinate activities of our member societies in order to use resources effectively. With a broad spectrum of activities, FEMS is contributing actively to developing links and networks between materials scientists and engineers from universities, research institutes and industry. In addition, our mission is to ensure the visibility of the key role of materials with respect to the grand societal challenges and the competitiveness of European industry.

What inspired you to become involved in FEMS? What does your role as President encompass?

The President of FEMS is elected by the General Assembly for a period of two years. Before the German Society for Materials Science (DGM) nominated me for the FEMS Executive Committee and later as FEMS President, I had already actively contributed to DGM as a board member, working group leader and conference organiser.

During my two-years term as President of FEMS, I am focusing on the following three major topics: increasing the visibility of the key role of materials in Europe, in collaboration with other societies and with representatives of the EC; improving the continuity of coordination of materials-related topics, with the particular goal of strengthening European networks and extending knowledge transfer from academia to industry using new forms of collaboration; and forming a strong Executive Committee team of leading experts from materials science and engineering, alongside close collaboration with national member societies.

FEMS' work encompasses 28 societies from 23 different European countries. What achievements has such wide international collaboration brought about?

With our ambitious goals and key topics in mind, we rely on the ideas and active contributions of our entire European materials community, in close collaboration and targeted interaction between FEMS and national member societies. One of my most interesting experiences during my presidency has been witnessing the atmosphere of inter-society partnership that brings materials researchers together.

FEMS EUROMAT 2013, the largest and most important meeting of the European materials community this year, has highlighted new developments in the field of materials. The event was characterised by a dynamic, proactive dialogue within the European community between materials scientists and engineers, from students to senior scientists.

What recognition is attached to the FEMS European Materials Medal? Who have been some of the most influential recipients?

The FEMS European Materials Medal is the most prestigious award of our association. It is awarded in recognition of outstanding contributions to the field of materials science and engineering. Candidates for the award may be nominated by national member societies and by our Executive Committee. The FEMS award selection committee is in charge of selecting the best candidate for this gold medal, which is usually handed over at the EUROMAT conference.

The first recipient of this award was Michael F Ashby, Emeritus Professor in the Department of Engineering at the University of Cambridge and world-renowned authority on engineering materials, as well as author of several best-selling textbooks. This year, Michael Rappaz, full Professor and Head of the Computational Materials Laboratory at Ecole Polytechnique Federale de Lausanne (EPFL) was the winner. He inspired participants at EUROMAT 2013 in Seville with an enthusiastic plenary talk about the fundamentals of materials science, covering macroscopic and microscopic aspects of metallic materials.

How important is international collaboration in light of the recent economic crisis?

Since we are living in a European community, we are able to boost economic growth and recovery through close collaboration within Europe. This is particularly true for the interdisciplinary field of materials science.

Upcoming events

European Advanced Training Course 'Nano-scale Materials and Advanced Characterization Techniques' – Dresden, Germany, 3-4 December 2013 (www.nanooanalytik.fraunhofer.de/english/events.html)

Junior Euromat Conference – Lausanne, Switzerland, 21-25 July 2014 (www.dgm.de/dgm/junior-euromat)

Euromat Conference – Warsaw, Poland, 21-24 September 2015

FEMS, as a partner in the European MatVal project, is actively contributing to a networking initiative for materials research and innovation with the goal of strengthening the competitiveness of Europe's industry and eventually preserving and creating jobs. Materials research and innovation is playing an essential role in achieving the mentioned goal, since it has a strong impact on almost every new technology within almost every industrial sector: 70 per cent of all technical innovations hinge directly or indirectly on materials, with the forecast of increasing impact in future.

FEMS has been running since 1986, how has its role changed over the years?

Europe has drastically changed since that time, and we have seen a tremendous development and use of new technologies during that period, particularly in the field of information technology. With new technologies, the role of materials has increased significantly.

These developments have changed FEMS, and the role the Federation plays. Interestingly, the view on materials has changed. Today, we discuss not only materials per se, but materials for particular applications. In future, we will have to consider much more advanced manufacturing processes to enable the manufacture of products based on new technologies and materials – with the particular goal of developing a more competitive manufacturing industry in Europe and to create new highly skilled jobs.

What plans for development does FEMS have for the future?

We have started to implement new forms of materials-related knowledge and information exchange within our community. One example is the new FEMS-supported European Advanced Training Course. Based on positive feedback from participants in the first courses Composite Materials – organised by Polish materials societies, in collaboration with the Central European Composite Cluster; and Nano-scale Materials and Advanced Characterization Techniques – organised by the German Society of Materials Science, in collaboration with the Dresden Fraunhofer Cluster Nanoanalysis, we are encouraged to continue with our concept of European Advanced Training Courses.

Another goal is to intensify our interaction with the European Materials Research Society (E-MRS; see p34). When I met E-MRS President Professor Rodrigo Martins for the first time in January 2012, we shaped a vision to bring the European materials community, mainly organised through FEMS and E-MRS, closer together. One of our challenging ideas was to arrange a common meeting of Europe's materials scientists and engineers. Together with enthusiastic materials scientists from Poland we developed, discussed and finalised a plan: FEMS EUROMAT 2015 and the

E-MRS Fall Meeting will be held at the same venue at the same time, in Warsaw in September 2015.

You are Board Member of the Alliance for Materials (A4M). What is the purpose of this Forum and what influence does it have over EU policies?

A4M is a collaboration initiated by a number of European Technology Platforms that have a strong materials agenda. The driver of this collaboration was to ensure a value chain coverage to improve the speed of implementation of materials innovations in Europe that address the grand societal challenges and the competitiveness of European industry. Since the vision in A4M is to create the conditions for effective integration of stakeholders, views and resources in the field of materials at the EU level, A4M is a natural candidate to be a credible partner in supporting the definition and implementation of current and future programmes and initiatives of the EC in the field of materials research, development and innovation.

Is materials science key to ensuring a sustainable green economy in Europe?

Since the Industrial Revolution, there have been many inventions and innovations that have added to our consumption of our natural resources. We – materials scientists and engineers – are empowered to change the situation, i.e. to use natural resources more efficiently. This represents a unique chance for Europe to create and implement innovative ideas for a green economy, use alternative natural resources and establish sustainable manufacturing. This will be the European answer to the global societal challenges of the 21st Century and will reduce our dependence on raw materials and limited resources. In summary, the future European economy requires a strongly competitive and really sustainable manufacturing industry with continuous innovation in materials!

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