



DGM: Engineering the future for materials science

Materials Engineers are at the forefront of discovering the best material solutions for products. From designing the perfect combination of components for an aeroplane wing to developing materials for medical implants, they build the foundations of new technology and ground-breaking progress that becomes a part of our everyday. **Dr Frank Fischer**, the General Manager at DGM spoke to us at *Research Features* to discuss the organisation's role, the importance of materials science and recognition that is necessary across the globe.

Every day we encounter and use many thousands of manufactured objects that are essential to everyday modern life: the vehicles that we travel in; the clothes that we wear; the machines in our homes and offices; the sport and gym equipment we use; the computers and phones that we can't live without; and more importantly, the medical technology that keeps us alive. Everything we see and use is made from materials derived from the Earth: metals, polymers, ceramics, semiconductors and composites.

To develop the new products and technologies that will make our lives safer, more convenient, more enjoyable and more sustainable, we must understand how to make best use of the materials we already have, and how to develop new materials that will meet the demands of the future.

The technological advances that have transformed our world over the last 20 years have been founded on developments in Materials Science and Engineering. Materials are evolving faster today than at

any time in history; enabling engineers to improve the performance of existing products and to develop innovative technologies that will enhance every aspect of our lives. Materials Science and Engineering has become a key discipline in the competitive global economy and is recognised as one of the technical disciplines.

The German Society for Materials Science (Deutsche Gesellschaft für Materialkunde e.V (DGM)) is the largest technical science association for materials science and materials engineering in Europe. For more than 90 years, it has consolidated the expertise of science and industry: representing the interests of its members from specialist fields and acting as guarantor for the systematic development of the fields of materials science and materials engineering. Dr Frank Fischer, the General Manager at the German Society for Materials Science (DGM) discussed with us the importance of materials science and materials engineering to enriching our society.

We ensure that the importance of materials science and engineering is emphasised and highlighted to politicians and the general public

Can you tell us more about DGM, its almost hundred-year-old history and core mission?

The German Society for Materials Science (DGM) acts as guarantor for the systematic structural and human resources development of the fields of materials science and engineering. This is our mission statement that we have been fulfilling since our inception in 1919 as "The German Society for Metallurgy" – acting as a bridge between science and industry.

We connect the best in our fields at international congresses and conferences; communicate the status quo in various disciplines through the provision of further training and seminars; and engage in a consistent development programme for young talent. In our more than 80 technical committees and working groups, we unite and consolidate all relevant partners from research and industry. Through lobbying in Berlin, we ensure that the importance of materials science and engineering is emphasised and highlighted to politicians and the general public. Namely, around 80% of all innovative products are based directly or indirectly on materials and engineering innovations.

Can you tell us more about your role as General Manager of the Executive Board at the DGM and what this involves?

As the General Manager, I am above all responsible for the technical, structural and human resources development of materials science and engineering. Ultimately, the quality of the materials determines the success of products and successful products determine the success of a business. Successful businesses naturally create jobs and therefore contribute to the well-being of a country. The German economy is strong and thriving because we produce excellent materials, from which naturally excellent products can be created. My task is to create the right framework conditions for materials scientists and engineers.

The DGM has some 'big-name' partner organisations– how does the DGM benefit from these partnerships and how does DGM campaign for more support?

As a representative of its members' interests, the DGM has been established in an interdisciplinary and international way, as it is essential to gain input from other fields and other countries. We continue to ensure that this remains the same by hosting large congresses such as the "Materials Science and Engineering" (MSE) or "Materials Week" ▶



as well as through national and international collaborations such as the “Metals Trade Association” (WVMetalle) or the “Federation of European Materials Societies” (FEMS).

Can you tell us about some of the exciting projects currently taking place at DGM?

In our technical and community committees, several fora have formed where researchers and producers can discuss and solve concrete problems in the high-tech fields of the future: mobility, energy, security, health and communications.

We also act as a mediator, initiator and advisor for science, industry and politics. An excellent example was in 2010: the initiative “Materials for an Energy Efficient Industry and Society” (MatRessource) was established by the Federal Ministry for Education and Research (BMBF) during the “Materials Innovation for Industry and Society” (WING) programme.

At our conferences and congresses, we offer the 216 project participants a forum that allows them to introduce their latest findings regarding resource-saving and environmentally-friendly new technologies. In addition to this, we oversee the MatRessource sister project “MaRKT” which has the aim to optimally interconnect sponsored projects with the focal topics: substitution and material efficiency, corrosion protection, catalysis and process optimisation.

The DGM actively supports and promotes the emergence of young talent in the field of material science – can you tell us more



Dr Frank Fischer, General Manager of DGM



about DGM's involvement in the promotion of young talent and what DGM offers the younger generation?

The promotion of young talent in the field of material science is a central rule and aim of the DGM. With this aim at the forefront of our organisation, we have developed the Young Talent Forum on DGM Day (our main event as a society which includes a General Meeting and the awarding of DGM prizes) as an established important event for the community. The framework is ideal for young materials science talent.

During the MSE in 2016, the established elite in the field, from around 50 nations met. Having the USA as a partner country, meant one of the most important markets for new materials was there at the front line.

During the established module “Meet the Expert”, leading organisations from science and industry such as: Siemens, Lufthansa, Volkswagen, European Space Agency (ESA) or Helmholtz-Zentrum Berlin (HZB), present the field of materials science and engineering during the Young Talent Forum, in all its facets, to small

groups of participants, showing them career opportunities and possibilities of specialisation. Short, personal ‘speed-dating-discussions’ additionally unite the generations and plenary discussions with the speakers from the DGM expert committees serve to facilitate an open exchange of opinions.

In addition, in 2016, the “USA Germany Networking Symposium” was solely conceptualised and organised by students and doctoral candidates of materials science. It aimed to indicate the different career paths in the USA and in Germany, and to strengthen the German-American networking of young scientists.

Additionally, in recent years, Young DGM Groups have been established, which the materials science young talent can organise with the support of the DGM; a successful model that is expanding from year to year. In the future, it will be essential to support and stabilise the expansion of the Young DGM Network, and firmly incorporate this within the DGM structures.

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The work of the DGM in the promotion of young talent has been successful and is set on an excellent path for the future. It also gives me great pleasure to observe the commitment and fun the young people get when involved, on a voluntary basis and in the name of our Society, to serve the field of materials science and engineering.

How influential has DGM been on the development of materials scientific research since it was established in 1919?

I believe that the influence of our society on the developments within materials science and engineering cannot be underestimated – because a standardised area “Materials Science and Engineering” would not exist in Germany were it not for our input at the DGM! In addition to this, the founding of numerous national and international institutions is based on the initiative of the DGM!

What is the DGM's relationship with the rest of the world outside of Europe? Is the DGM influential for other technical science associations for materials science and materials engineering?

We have recently increased transatlantic orientated relationships and increased collaboration with the USA at the last MSE Congress – not just for the young talent as aforementioned, but also for our members, as the US technical societies “Materials Research Society” (MRS) as well as “The Minerals, Metals and Materials Society” (TMS) were our collaboration partners.

From your website, it appears the DGM has great social media resources – how is this used and how successful is your social media for the promotion of the work at DGM and materials science?

The actual influence of social media activities is very difficult to measure – and possibly does not need to be measured. We find that involvement in this area, beyond the number of clicks, is extremely important to emphasise the achievements of materials science and engineering and work of DGM. The general public, especially the younger generation, and also politicians now make use of digital media, which is why we recently updated our website and also report on DGM activities.

What does the future hold for DGM and its general principle of acting as guarantor for the systematic development of the fields of materials science and materials engineering?

The importance of materials science and materials engineering for Germany is key and central to the DGM. The core mission of the DGM, in the interests of its members and its field must be acted upon, and its importance has not diminished after 100 years – quite the contrary! Based on these traditions, we will continue to enlighten politicians and interested members of the public on the importance of materials science and materials engineering to their lives.

In addition to this, a further highlight is the Materials Week 2017 held in September,

which we organise in collaboration with the Steel Institute VDEh, where over 1,800 materials experts from all over the world attend. Dr Ulf Merbold who was the first German in space, Dr Matthias Maurer of the European Space Agency (ESA) as well as two seasoned astronauts, spoke about their scientific and personal experiences with zero gravity as well as referring to the importance of materials research for the work on the ISS and the future of manned space travel.

• For more information about the work at the DGM or to become a member, please visit their website at www.dgm.de/en/.



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