

INSIDE E-MRS WORLD



Vol. 5 | No. 2
September 2026
ISSN: 2958-7751

EDITORIAL

Can Research Become Part of the Climate Solution?

Franck Tessier, E-MRS Vice President



**Franck
TESSIER**
Vice President

The materials research community has every reason to be proud of its contribution to society. We develop batteries for the energy transition, catalysts for cleaner chemistry, materials for low-carbon construction, sustainable electronics, and technologies that will help future generations adapt to a changing world.

Yet an uncomfortable question deserves equal attention: can we claim to build a sustainable future without transforming the way research itself is conducted?

This question is no longer theoretical. Across Europe, universities and research organisations are measuring the environmental footprint of their activities and discovering a common pattern. Scientific excellence carries an environmental cost that cannot be ignored. Laboratory equipment, consumables, energy-intensive infrastructures and international travels all contribute significantly to greenhouse gas emissions. In experimental sciences such as chemistry and materials science, purchases alone often represent the largest share of a laboratory's carbon footprint.

The challenge, however, is not simply to reduce emissions. It is to rethink research without compromising creativity, scientific ambition, or international collaboration.

The Rennes Institute of Chemical Sciences (ISCR), France, recently chose to approach this challenge differently. Rather than imposing a catalogue of top-down measures, they launched a laboratory-wide participatory process involving researchers, engineers, technicians, administrative staff, and students. The objective was not merely to produce another sustainability plan, but to build a shared vision of what responsible research could look like.

The process began with evidence. A comprehensive carbon footprint assessment identified where the impacts actually arise, replacing assumptions with data. They then used this information to stimulate discussion rather than prescribe solutions. Through workshops, collective deliberation, and democratic voting, the laboratory progressively co-designed an Environmental Footprint Reduction Plan that reflects both scientific realities and the diversity of professional perspectives.

The result extends well beyond carbon accounting.

INSIDE THIS ISSUE

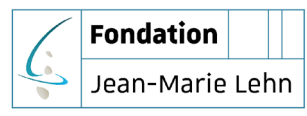
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Yes, practical actions emerged: increasing equipment sharing, extending instrument lifetime through maintenance and repair, promoting chemical sharing, improving laboratory energy practices, encouraging rail travel whenever possible, and experimenting with solvent recycling and lower-impact laboratory protocols.

But perhaps the most valuable outcome has been cultural rather than technical. Environmental transition cannot succeed if it is perceived as an external constraint imposed on researchers. It becomes meaningful only when scientists themselves participate in defining the questions, evaluating the trade-offs and designing the solutions. Sustainability is not simply another administrative requirement; it is becoming a new dimension of scientific quality.

“...institutional incentives often reflect yesterday’s priorities rather than tomorrow’s constraints.”

This experience also highlighted an important reality. Many of the most effective actions lie beyond the responsibility of individual laboratories. Funding mechanisms continue to favour the acquisition of new instruments over maintenance, repair, and sharing. Research assessment still rewards productivity more readily than resource efficiency or long-term robustness. Travel policies, procurement rules, and institutional incentives often reflect yesterday’s priorities rather than tomorrow’s constraints.

If laboratories are expected to reduce their environmental footprint, institutions must evolve alongside them.

Fortunately, this evolution is already underway. Across Europe, initiatives are emerging to quantify research

emissions, develop common methodologies, promote green laboratory practices, and encourage more sustainable research infrastructures. These efforts deserve to be shared widely, not as isolated success stories but as a collective learning process.

The European-Materials Research Society (E-MRS) is uniquely positioned to foster this dialogue. Moreover, for a decade the Society has been promoting the development of materials to face the climate change challenge in some fields and has also been participating in projects funded by the European Union toward that aim. In fact, E-MRS materials science has always advanced through collaboration across disciplines, institutions, and borders. The environmental transition calls for the same spirit of cooperation. Sharing experimental protocols is no longer enough; we should also share better practices for conducting research itself.

Ultimately, the question is not whether sustainability will transform research. It already is.

The real question is whether we, as a scientific community, will choose to lead that transformation or merely adapt to it.

The laboratories that thrive over the coming decades will not simply be those producing the highest number of publications or the most sophisticated instruments. They will be those capable of combining scientific excellence with environmental responsibility, social cohesion, and long-term resilience.

If materials science aims to build the technologies of a sustainable future, our laboratories should become living demonstrations that such a future is possible. [Ω](#)

Contacts and more data about the ISCR initiative can be found at: <https://iscr.univ-rennes.fr/environmental-footprint-reduction-plan-pree>

Inside E-MRS World is a quarterly newsletter published by the European Materials Research Society.

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PUBLISHER: European Materials Research Society – 23 Rue du Loess, BP 20 – 67037, Strasbourg Cedex 02, France

COMPOSITION AND LAYOUT: Cycloid Fathom Technical Publishing, Illinois, USA

ISSN: 2958-7751 (print); 2958-776X (online)

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ISMES Schools: Seventeen years of high-quality educational training for young researchers and PhD students.

Contributed by Antonio Terrasi (University of Catania, Italy)



Antonio
TERRASI

In June of this year, the 13th International School on Materials for Renewable Energy and Sustainability (ISMES) was held in Hirschegg, Austria. Founded in 2010 through an agreement between MRS and E-MRS, ISMES was initially held biennially and hosted solely at the Ettore Majorana Foundation in Erice, Italy. The school has grown in popularity and reputation

over the years and since 2015 it has been held annually, alternating Erice with other stimulating locations. Only interrupted by the Covid pandemic, we can count seven schools in Erice, two each at the Colorado School of Mines (Golden, Colorado, USA) and Caltech (Pasadena, California, USA), one at the Scuola Superiore of the University of Catania (Catania, Italy), and the last one at the Darmstädter Haus of the Technical University of Darmstadt (Hirschegg, Austria). Over the years, approximately 700 PhD students and young researchers from over 30 countries and many continents have attended lectures and training activities led by leading

international experts from academia and industry. With the changes taking place in the world, the focus of topics has moved from being dominated by Solar, Wind, Geothermal, and Nuclear, in that order, to wider aspects of current and future energy sustainability. Nowadays the emphasis is on the most promising materials and technologies, strongly addressing availability, monetary and environmental costs, efficiency, and life cycle, from extraction to end-of-life of the devices. A global perspective on climate change, resources efficiency, energy demand, production, and storage was and is addressed with great attention, which included over the past decade the importance of technology transfer and of publications for young people entering the world of science and technology.

All of what is taught and discussed culminates in challenges presented to the students who work in small groups to devise ways to meet them. They present their solutions in a final school session on, for example, how to design, build, and survive in a community located on, below, or outside earth.



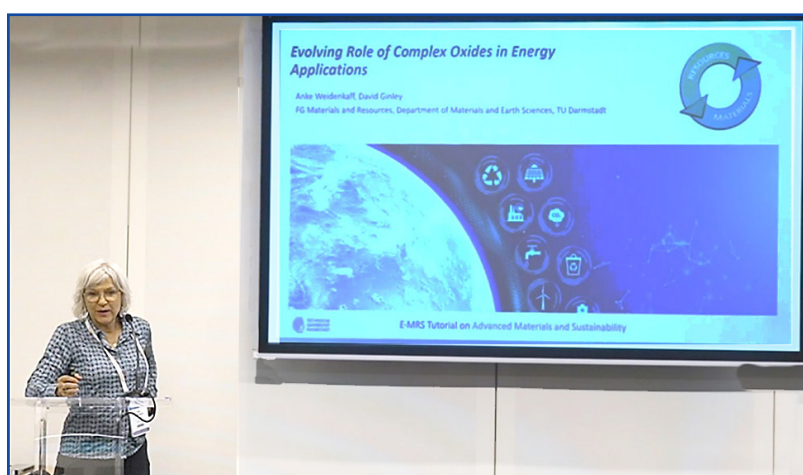
School in Erice 2023

Furthermore, in recent years, the impact and educational opportunities were increased through in-person tutorials during MRS and E-MRS meetings, as well as through recordings for the web. The tutorials focus on specific topics, all of which are related to materials for renewable energy and sustainability. During the E-MRS 2026 Spring Meeting, a tutorial was organised with three lectures:

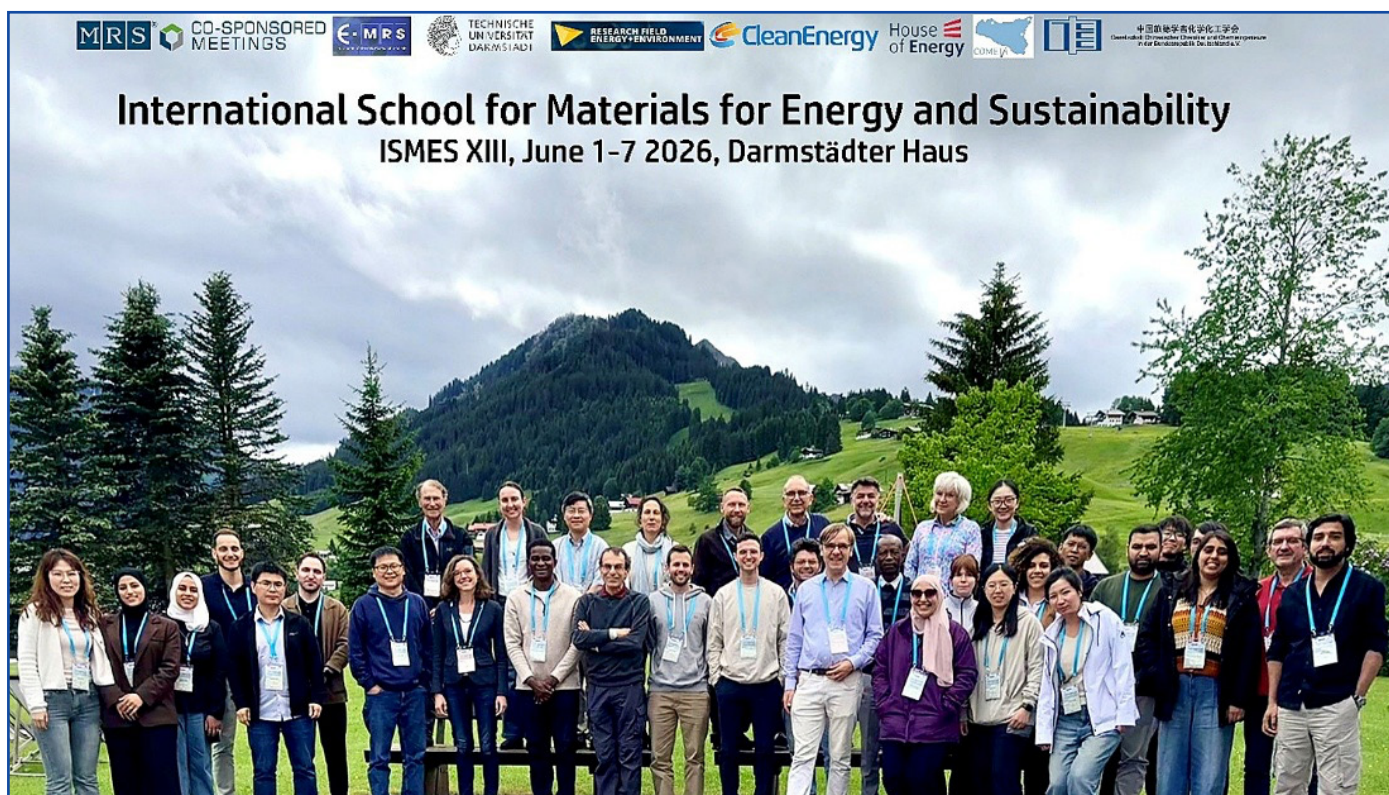
1. *Evolving Role of Complex Oxides in Energy: Applications: Synthesis, Characterization, and Combined Computation for Materials Discovery and Optimization*, by Anke Weidenkaff (Technical University of Darmstadt)

2. *Inverse Design of Sustainable Materials*, by Hongbin Zhang (Technical University of Darmstadt)
3. *Purification approaches for recovered carbon black*, by Stefan Hannemann (BASF)

In the coming days, the five-year MoU between MRS and E-MRS will be renewed to continue supporting the ISMES schools. The intention is to maintain Erice as the biennial Italian headquarters but also to extend it to other countries, possibly in Asia, given the growing role that countries like China, India, and South Korea play in Energy and Sustainability. 



Anke Weidenkaff at the tutorial during E-MRS Spring Meeting 2026



School in Hirschegg 2026

...about textiles in Europe

Artificial intelligence is becoming an increasingly valuable tool for navigating the rapidly expanding scientific literature. In this department, We use AI to synthesise information from multiple authoritative sources into concise overviews that highlight key themes, emerging trends, and areas of active discussion. Every summary is reviewed and edited by a human for clarity, relevance, and focus before publication; however, such review does not constitute independent verification of every statement, interpretation, or citation generated by AI. Readers will notice that no effort has been made to alter grammar or syntax simply to conceal telltale habits of AI composition. These articles are intended as informative overviews and should not be relied upon as substitutes for the original scientific literature. Readers are encouraged to consult the cited publications which remain the definitive source for the topics covered.

Recycling and Circularity – The Technology [1]

The transition from a linear to a circular textile economy has become one of the defining challenges in contemporary materials research. While recycling technologies for single-fibre textiles continue to mature, blended polyester (PET)-based fabrics remain among the most difficult materials to recover efficiently. Combining synthetic and natural fibres in a single product enhances performance during use but significantly complicates separation and recycling at the end of a garment's life. As global textile consumption continues to rise, addressing this challenge has become increasingly important from both environmental and economic perspectives.

Current research suggests that no single recycling technology is capable of managing the full diversity of blended textile waste. Mechanical recycling remains attractive because of its relatively low cost and established industrial infrastructure. However, repeated processing often degrades polymer properties, particularly when feedstocks contain mixed fibres and contaminants. Consequently, attention has increasingly turned towards chemical, biochemical, and hybrid recycling methods that aim to recover high-quality raw materials suitable for re-entering manufacturing supply chains.

Chemical recycling offers the possibility of selectively recovering polyester through depolymerisation or solvent-based separation techniques, potentially producing monomers or other intermediates that can be reused in the manufacture of new polymers. Enzymatic approaches represent another promising area of investigation, using biological catalysts to separate or degrade specific components under comparatively mild processing conditions. Hybrid strategies that combine mechanical pre-treatment with chemical or biological processing may ultimately provide practical solutions capable of balancing efficiency, cost, and environmental performance.

The technical performance of these approaches, however, is only one aspect of successful implementation. Their long-

term viability also depends upon factors such as energy consumption, solvent recovery, process scalability, product quality, and overall environmental impact. Increasing emphasis is therefore being placed on comprehensive life-cycle assessment and techno-economic analysis to determine whether emerging technologies offer genuine sustainability advantages when deployed on an industrial scale.

Attention is also shifting upstream towards the design of textile products themselves. Many modern garments incorporate increasingly complex fibre blends together with dyes, coatings, finishes and functional additives that improve durability and performance but make subsequent recycling considerably more difficult. Design-for-recycling

“Rather than relying upon a single technological breakthrough, future progress is likely to emerge from the coordinated application of multiple complementary strategies.”

principles—including simplified fibre compositions, reduced use of incompatible additives, and clearer product labelling—are gaining recognition as effective means of improving end-of-life material recovery.

At the same time, advances in recycling technology must be supported by improvements elsewhere in the textile value chain. Efficient collection systems, reliable sorting technologies, standardised material identification, and stable markets for recycled products are all essential components of a functioning circular economy. Without these complementary developments, even highly effective recycling processes may struggle to achieve widespread industrial adoption.

Recent research demonstrates encouraging progress across all these areas. Improvements in polymer chemistry, biotechnology, and process engineering are steadily expanding the range of textile waste that can be recovered while improving the quality of recycled materials. Nevertheless, significant challenges remain before many laboratory-scale technologies can be translated into economically competitive commercial processes. Continued efforts to increase separation efficiency, reduce environmental impacts, lower processing costs, and maintain material performance will be critical in determining which approaches prove most successful.

The overall trajectory of research is becoming increasingly clear. Circular management of blended polyester textiles will require an integrated approach that combines advances in materials science with thoughtful product design, effective waste-management infrastructure, supportive policy

frameworks, and collaboration across the textile industry. Rather than relying upon a single technological breakthrough, future progress is likely to emerge from the coordinated application of multiple complementary strategies. As research continues to mature, these developments offer a pathway towards reducing textile waste, conserving valuable resources, and improving the sustainability of one of the world's largest manufacturing sectors.

Primary source:

[1] Răpă, M., Gaidău, C., Matei, E., & Dincă, F.-A. (2026). "Toward Circularity in Blended Polyester-Based Textile Waste: Microfiber Pollution, Recycling Technologies, and Implementation Challenges" *Microplastics*, 5(2), Article 85. <https://doi.org/10.3390/microplastics5020085>.

Recycling and Circularity – The Policy [2]

While technical innovation is essential for reducing microfiber pollution, technology alone cannot transform the textile sector without an accompanying policy framework. Paleari examines the rapidly evolving European Union legislative landscape designed to move textiles away from the traditional linear "take–make–dispose" model toward a genuinely circular economy.[2]

The review argues that the EU has shifted from isolated environmental regulations to an integrated policy strategy that addresses the entire textile value chain. Rather than concentrating solely on waste management, recent legislation increasingly targets product design, manufacturing, consumer information, durability, repairability, reuse, recycling, and producer responsibility. This systems-level approach recognises that environmental impacts are largely determined long before a garment reaches the consumer and continue long after it is discarded.

Among the most significant initiatives are the Ecodesign for Sustainable Products Regulation, Digital Product Passports, revisions to the Waste Framework Directive, Green Claims legislation, and enhanced textile labelling requirements. Together, these measures seek to improve transparency throughout supply chains, discourage overproduction and the destruction of unsold goods, increase recycled fibre content, and provide consumers with more reliable sustainability information. The intent is not simply to manage textile waste more effectively, but to redesign the economic incentives that create waste in the first place.

The paper also acknowledges that legislation alone will not guarantee success. Significant challenges remain, including limited recycling infrastructure, insufficient fibre-to-fibre recycling capacity, inconsistent data collection, fragmented

"...circularity depends on the interaction of many policy instruments rather than any single regulation."

supply chains, and the practical difficulty of implementing traceability across global manufacturing networks. In addition, consumer behaviour and purchasing habits continue to influence the environmental footprint of the textile sector, meaning that educational initiatives must complement regulatory measures.

A particularly valuable observation is that circularity depends on the interaction of many policy instruments rather than any single regulation. Requirements for recyclable product design, for example, are only effective if collection systems, sorting technologies, recycling facilities, and markets for recycled materials develop in parallel. The legislation therefore functions as an interconnected package in which each component reinforces the others.

Achieving a sustainable textile economy will require coordinated participation by manufacturers, retailers, consumers, recyclers, researchers, and policymakers

alike. Technological advances can reduce environmental impacts, but enduring progress depends upon governance structures that encourage durable product design, responsible consumption, material recovery, and transparent supply chains. In that sense, policy provides the framework within which technical solutions can achieve their greatest environmental benefit. 

Primary source:

[2] Susanna Paleari, “Advancing Circularity in the Textile Value Chain: A Critical Analysis of EU and Member State Legislation” *Sustainability* 2026, **18**(11), 5437.

<https://doi.org/10.3390/su18115437>.

E-MRS FALL MEETING 2026

September 14–17, 2026 | Warsaw University of Technology

The 2026 Fall Meeting & Exhibit of the European Materials Research Society (E-MRS) will take place from September 14 to 17, 2026 at the main campus of the University of Technology in Warsaw (Poland) and will consist of parallel symposia with invited speakers, oral and poster presentations, and including one plenary session to provide an international forum for discussing recent advances in the field of materials science.

The conference will be augmented by an exhibition of products and services of interest to the conference participants.

The high quality scientific program will address different topics organised into 5 symposia arranged in 6 clusters covering the fields of Materials for Electronics, Optoelectronics and Sensing; Functional Materials; Bioinspired and Biomaterials; Nano and Smart Materials; Modelling and Characterisation; and Energy and Environmental Applications.

The latest scientific results will be presented and authors are invited to submit papers in the selected journals that fit the scope of each symposium.

The focus of the scientific program will be both on fundamental investigations and technological applications, providing an international forum for discussing recent advances related to the different aspects to be considered to promote innovation.

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**Oliver
WILLIAMS**

Professor Oliver Williams is Chair, head of the Quantum Materials Group, School of Physical, Chemical, and Environmental Sciences at Cardiff University in the UK. After completing his doctoral studies on the electronic properties of diamond at University College London in 2003, he moved to Argonne National Laboratory where he held a Distinguished Postdoctoral appointment at the Center for Nanoscale Materials. In 2004 he joined the Institute for Materials Research in Leuven, Belgium, an affiliated lab of Interuniversitair Micro-Electronica Centrum (Imec) vzw, where he developed nanocrystalline diamond growth, specialising in the nucleation of ultra-thin diamond films and control of diamond electrical conductivity from intrinsic to superconducting. On receiving the Fraunhofer ATTRACT award from the Fraunhofer-Gesellschaft, he moved to the Fraunhofer Institute for Applied Solid State Research in Freiburg, Germany where he developed micro electro-mechanical systems (MEMS) from nanocrystalline diamond. In 2011, he became a Marie Curie Fellow through the EU-FP7-supported Marie Curie Actions (MCA) program, and he moved to Cardiff as a Reader in Experimental Physics. There he established Cardiff Diamond Foundry, the largest diamond growth facility in UK academia. His group focuses on MEMS, superconductivity, single photon sources in diamond nanoparticles, SAW high frequency filters, thermal management of semiconductors, and anything that exploits the extreme materials properties of diamond. He currently holds a Personal Chair in Experimental Physics and is a European Research Council (ERC) Consolidator Grantee.

E-MRS: Thank you for agreeing to participate in our *Inside E-MRS World* 'Profile' program. We see that much of your R&D work has focused on diamond. What drew you to that material in particular? And, do you see your interests evolving toward different and/or broader fields?

OW: Diamond is an interesting material with extreme properties that are largely due to its atomic density and the low atomic mass of carbon. However, the atomic density has consequences, for example it is very hard to dope, but at the same time makes it possible to grow extremely pure material which is critical for quantum technologies. The density and low atomic mass also result in a very high Debye temperature, thermal conductivity, and acoustic wave velocity.

My interests have evolved from active diamond electronic devices to high frequency surface acoustic wave (SAW) filters / MEMS, thermal management of semiconductors, and biosensing using nitrogen vacancy (NV) centres in diamond nanoparticles. There are a couple of critical shifts there – firstly we don't really work on devices that exploit electron transport in diamond due to the aforementioned doping issues. Secondly, we are mostly integrating with other materials such as piezoelectrics for MEMS / SAW, or silicon / GaN / AlN etc., for thermal management. So heterogeneous integration is a major thread running through almost all we do. Critically, diamond is just one of the materials. The exception to this is our fabrication of diamond nanoparticles with NV centres for biosensing. We also have a couple of other materials in development such as the ultra-high temperature ceramic hafnium carbide and glass-like carbon for devices operating in temperature regimes under which diamond would graphitise or burn in air.

E-MRS: What are the near and long-term goals you want most to accomplish in your diamond work?

Also, can you tell us to what extent your work with diamond informs the science and technology of other materials.

OW: In the near term we are trying to integrate diamond with silicon, compound semiconductors, and piezoelectric devices, as well as develop scalable production of diamond nanoparticles with quantum centres. Longer term would be the demonstration of these devices in real-world scenarios including power systems and clinical diagnostics.

As mentioned above, the extreme properties of diamond have consequences and handling these can help us exploit other materials. A good example is the anomalously low coefficient of thermal expansion which, coupled with the high growth temperature, leads to significant stress which exceeds the fracture strength of many materials. It is critically important to accept such limitations and not stick your head in the sand. It is also common to hear cherry-picked superlative properties of diamond that are mutually exclusive. For example, the intrinsic mobility of diamond is often used in calculating diamond's Baliga figures of merit for power electronics devices when it is clearly understood that those values are significantly lower when doped. Another good one is that thin films of diamond (<10µm) have poor thermal conductivity due to the granular structure of diamond growth on non-diamond materials. We can probably learn the most from diamond's failures and try to avoid making similar mistakes.

E-MRS: What is your perspective on the technology innovation process in general, that is, how the product of research eventually supports development of useful products? And specifically, are applications of diamond films entering the marketplace?

OW: Don't be a solution looking for a problem, just because you find something interesting, that doesn't make it useful. I appreciate this may sound anti-intellectual to the more academic readers but we should prioritise our responsibility to the taxpayer. Research is really expensive and there are a lot of incumbent technologies that are cheaper, deeply embedded and supported by existing supply chains. We try to focus on areas where there isn't such competition, and we engage as early as possible with the end users for sanity checks.

The largest markets for CVD diamond films at the moment are still in thermal management and optical windows. The majority of these are from freestanding

“There is significant growth in quantum grade diamond with estimates of the NV centre market being larger than the entire graphene market.”

diamond but there is a slow evolution into heterogeneous systems. There is significant growth in quantum grade diamond with estimates of the NV centre market being larger than the entire graphene market. Of course, diamond materials are already a significant market in abrasion, cutting, deep drilling, etc.

E-MRS: What has been your experience with research supporting agencies in the UK and the broader EU? Have industrial sponsors indicated interest in supporting diamond film work at universities or in their own laboratories?

OW: UK funding agencies are generally less bureaucratic than the EU. There has been a steady erosion of the scientific content in applications for funding in both systems, but the UK has been slightly more resilient to this. I think it would take too much space to compare the countries I have worked in here and it would be out of date. A big difference however is between university and national lab. National labs tend to be more focused and share resources far more efficiently, although in the UK at least, universities are getting a lot better at equipment sharing and focusing on areas of strength.

We have had significant industrial support via collaboration and contractual work over the years. Diamond is very much a working industrial material that is often seen as exotic due to its gem lustre. In the UK, we have Element Six (E6) who have been instrumental in supporting Centres for Doctoral Training (CDT) in Diamond Science and Technology as well as a plethora of more specific collaborative projects. They are also very active in research on their own sites. They are by far the most advanced in quantum grade diamond growth for example. In my previous job at the Fraunhofer IAF, they founded Diamond Materials GmbH which to my recollection is one of the most successful spin out companies from the Fraunhofer Society. We currently have funded collaborations with both amongst others. The key message is diamond is very much a significant engineering material with market estimates around \$2B. It is worth noting that this dwarfs more fashionable carbon materials such as graphene.

E-MRS: How would you describe the rewards and challenges associated with educating the next generation of researchers? What advice would you give to early career researchers who are just starting out?

OW: Early career researchers generally have less baggage and are less committed to ideas. This is important for team agility and keeping fresh. They can also ask questions that the more experienced have ignored or come up with better approaches that our internal biases have obscured. The challenge is sometimes focus and the need for them to publish quickly for their career advancement where you might want to hold back for the bigger result. I have always left publication decisions to the first author.

My advice would be to leave the lab where you did your PhD as soon as practical to explore others. Your accumulation of knowledge will approach an asymptote, and you can reset this diminishing return by going somewhere new. My second bit of advice would be to ignore everything I just said as the exception proves the rule and older people are riddled with internal biases.

E-MRS: Before coming to Cardiff, you worked in other countries in Europe and even in the USA. How would you characterise the differences in R&D “styles” where you've worked and would you recommend that kind of early career diversity to students just now leaving university?

OW: It's a bit too easy to fall into a cliché here but it is true that in the USA people tend to be more positive and less critical. In research that's an important balance to get right and by working in multiple places you will be more aware of it.

E-MRS: Beyond your current job, would you tell us about any roles you may have as advisor and volunteer for European or international organisations?

OW: I review grant applications for several countries outside the UK including EU Horizon / ERC. I am a scientific advisor for a few companies and Fellow of the Institute of Physics and Learned Society of Wales.

E-MRS: Were you always interested in science and technology from an early age? Who were the mentors and role models, if any, who influenced your educational and career choices?

OW: Pretty much, I have been lucky enough to learn from and work with many people smarter than myself.

E-MRS: Can you tell us a little about your personal goals and avocations outside of your work? What do you enjoy doing outside of the office?

OW: My wife and I have just welcomed a daughter, so that's the personal goals done for the next 20 years or so. I play guitar when I'm not dealing with her, which currently is never.

E-MRS: Thank you again for agreeing to provide our readers with this 'Profile' conversation. Before we close, would you like to add more about your views on education, researcher mobility, national and EU policies, or other factors that affect your fields of interest?

OW: The biggest threat to education and research worldwide is currently anti-intellectualism. We all must do our part to call this out. We have serious existential threats to our existence such as climate change and vaccine denial whilst populists are telling us they have had enough of experts. This cannot stand. We must be ready to justify what we do and explain it quickly in simple language. Working in education and research is an enormous privilege and we should never lose sight of that. 



European Materials Research Society
Strasbourg Convention Centre

2027 SPRING MEETING

MAY 17 TO 21, 2027

The 2027 Spring Meeting of the European Materials Research Society (E-MRS) will take place from May 17 to 21, 2027 at the Convention & Exhibition Centre in Strasbourg (France).

**Palais de la Musique et des Congrès
Place de Bordeaux
F-67082 Strasbourg
<http://www.strasbourg-events.com/en>**

The scientific programme will highlight the latest advances in materials research at an international level, with a strong emphasis on interdisciplinary research in both fundamental and applied areas.

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SYMPOSIUM SUMMARIES — E-MRS 2026 SPRING MEETING

Symposium G: Future Photovoltaics Based on Earth-Abundant Materials II

Advancing Sustainable Solar Technologies for a Greener Future

The transition to a low-carbon society requires photovoltaic technologies that are not only highly efficient but also sustainable, scalable, and based on widely available resources. Addressing this challenge, the “Future Photovoltaics Based on Earth-Abundant Materials II” symposium brought together researchers from across the globe to discuss the latest advances in next-generation solar energy materials and devices.

As part of the E-MRS Spring Meeting, the symposium provided a multidisciplinary platform where experts in materials science, physics, chemistry, engineering, and computational modelling could exchange ideas and foster new collaborations. The event aimed to accelerate the development of photovoltaic technologies that rely on abundant, non-toxic, and environmentally responsible materials, helping to reduce dependence on critical raw materials while lowering production costs and ecological impact.

The scientific programme spanned the entire value chain of thin-film photovoltaics, from fundamental materials science to device engineering and sustainability assessment. Contributions covered the synthesis and characterisation of emerging absorber materials, innovative transparent conducting electrodes, novel solar cell architectures, advanced modelling approaches, and the study of defects, interfaces, contacts, and buffer layers. Particular attention was also devoted to life-cycle analysis, recyclability, and end-of-life strategies, reflecting the growing importance of circularity in photovoltaic technologies.

Among the materials addressed were a wide range of promising earth-abundant compounds, including sulfides, selenides, nitrides, phosphides, oxides, and related multinary semiconductors. By exploring these alternatives, the community seeks to develop photovoltaic devices that combine high performance with long-term sustainability and industrial viability.

Beyond the scientific sessions, the symposium offered a valuable opportunity for networking and knowledge exchange between established researchers, early-career scientists, and industrial stakeholders. Invited lectures, contributed talks, and poster presentations showcased cutting-edge developments and stimulated discussions on the future directions of sustainable photovoltaics. Two satellite events were organised with a coupling to EIC Responsible Electronics and INFRACHIP communities.

By bringing together expertise from different disciplines and promoting innovative approaches to solar energy conversion, the symposium contributed to the broader mission of making clean, affordable, and environmentally friendly solar power accessible to society.

We warmly thank all speakers, contributors, and participants for making this event a vibrant forum for scientific excellence and collaboration, and we look forward to the exciting discoveries and partnerships that will emerge from this year’s discussions.

The symposium awarded one travel grant (Geoffrey Aligula), sponsored by Ossila Inc., two best oral presentations (Robin Schot and Nico Kawashima), and three poster awards (Luna Warzawa, Zilu Lin, and Clara Brendstrup Møller). The young researcher award (YRA) for Symposium G was awarded to Helena Rabelo Freitas after careful evaluation by the committee. All the awardees gave excellent presentations with good scientific contents in their research fields. 

SYMPOSIUM ORGANISERS



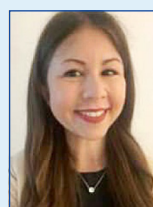
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Catania University & CNR – IMM, Italy



KONSTANTINOS ROGDAKIS
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Greece



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SYMPOSIUM SUMMARIES — E-MRS 2026 SPRING MEETING

Symposium W: Synthesis and Characterization of Functional Nanocomposite Materials

Advanced functional nanocomposite materials continue to command attention at the cutting edge of research. They are prized for their exceptional properties and their capacity to unlock new possibilities across energy, environmental, sensing, and biomedical applications. Symposium W brought together the field's leading voices to explore the growing promise of functional nanocomposites in electronics, energy storage, biosensors, gas sensors, optoelectronics, aeronautics and aerospace, automotive engineering, anti-corrosive coatings, printing technologies, biomedicine, and microwave absorption.

The symposium's scope was reflected in its scale: 13 invited talks spanning the full breadth of the field, 60 contributed oral presentations delivered across 13 sessions, and roughly 110 posters showcased over two dedicated poster sessions. Attendance held strong throughout the week, drawing audiences of up to 150 participants. The animated discussions that unfolded in both the sessions and the poster halls testified to the field's momentum, offering rich opportunities for exchange among senior researchers, industry professionals, and emerging scientists alike.

Each day of the symposium opened a new window onto the field. Day one's session on 2D nanocomposites spotlighted graphene-nanoparticle hybrids as multifunctional materials with striking potential for next-generation devices and smart textiles. Day two turned to hybrid perovskites, tracing a remarkable materials lineage from perovskites and quantum dots through to hard ceramics, before shifting focus to nanocomposites for healthcare, where carbon-based nanostructured materials took centre stage for their role in biosensing.

On day three, attention turned to the electrochemistry of nanocomposites, highlighting oxide-coated metallic nanowire networks as versatile, multifunctional platforms. This was followed by a session on photonic nanocomposites, which explored the promise

of highly luminous scintillating materials. The symposium's final day examined electromagnetic nanocomposites, with particular emphasis on polymer-based (nano)composites engineered for electromagnetic interference shielding.

Symposium W was also an occasion to celebrate rising talent. Young Researcher Awards went to Bharti Rana (Indian Institute of Technology Delhi, India) and Sanjoy Sur Roy (Indian Institute of Technology Guwahati, India). Poster prizes were awarded to Ofer Burg (The Hebrew University of Jerusalem, Israel), Claire Blaga (Institute of Materials, École Polytechnique Fédérale de Lausanne, Switzerland), Perumalla Aneela (Indian Institute of Technology Madras, India), and Kim Dong-Seog (Jeonbuk National University, Republic of Korea). Our thanks go to Academia Nano and to Wiley's Advanced Electronic Materials and Advanced Physics Research for sponsoring these poster awards and championing excellence in emerging nanomaterials research.

By every measure — the breadth and depth of the science on display, the enthusiasm of participants, and the warmth of the scientific community that gathered — Symposium W was an unqualified success. The organisers extend their heartfelt thanks to all the colleagues whose contributions made this symposium possible. 

SYMPOSIUM ORGANISERS:

AURORA RIZZO, University of Salento – CNR NANOTEC, Italy
RAGHVENDRA SINGH YADAV (Main organiser), Tomas Bata University in Zlin, Czech Republic
TAYEBEH AMERI, Kiel University, Germany



From left to right, Tayebah AMERI, Aurora RIZZO, Gaia TOMASELLO (Wiley), Claire BLAGA (Poster Prize Awardee, École Polytechnique Fédérale de Lausanne, Switzerland), and Raghvendra Singh YADAV.