

**CoBRAIN**

# Integrated Computational - Experimental Material Engineering of Thermal Spray Coatings

## NEWSLETTER

### Issue 5, July 2025



#### IN THIS ISSUE...

1. CONSORTIUM MEETING IN BREMEN	2
2. DISCOVERY "MINI" CHANNEL	4
3. EMMC INTERVIEWED BY CoBRAIN	6
4. NEWS AND UPDATES	10
5. AROUND THE WORLD	12
6. TECHNOLOGY BLOGS	14
7. OUR CLUSTER	16



Funded by the  
European Union

Funded by the European Union under GA no 101092211. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HaDEA. Neither the European Union nor the granting authority can be held responsible for them.

## 31M Consortium Meeting in Bremen (Germany)

The CoBRAIN team recently gathered in Bremen on July 15-16, 2025, for a productive 31M Consortium Meeting, hosted by our valued partner, BALANCE TECHNOLOGY CONSULTING GmbH.



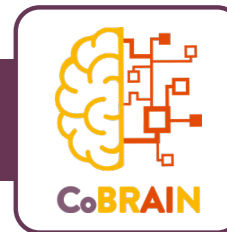
This event offered a unique opportunity for partners to come together, share updates, and outline future steps, reinforcing our commitment to advancing research in materials science.

During these two days, partners engaged in a range of presentations, interactive sessions, and strategic discussions, focusing on both current achievements and upcoming goals. The meeting provided a dynamic forum for collaboration, with networking opportunities that further strengthened our partnerships and set the stage for future innovation.



Our heartfelt thanks go to BALANCE TECHNOLOGY CONSULTING GmbH for their hospitality and to all partners for their continued dedication. As CoBRAIN progresses, we are excited to push scientific and technological boundaries together. Stay tuned for more news as we move into the next phase of our journey!



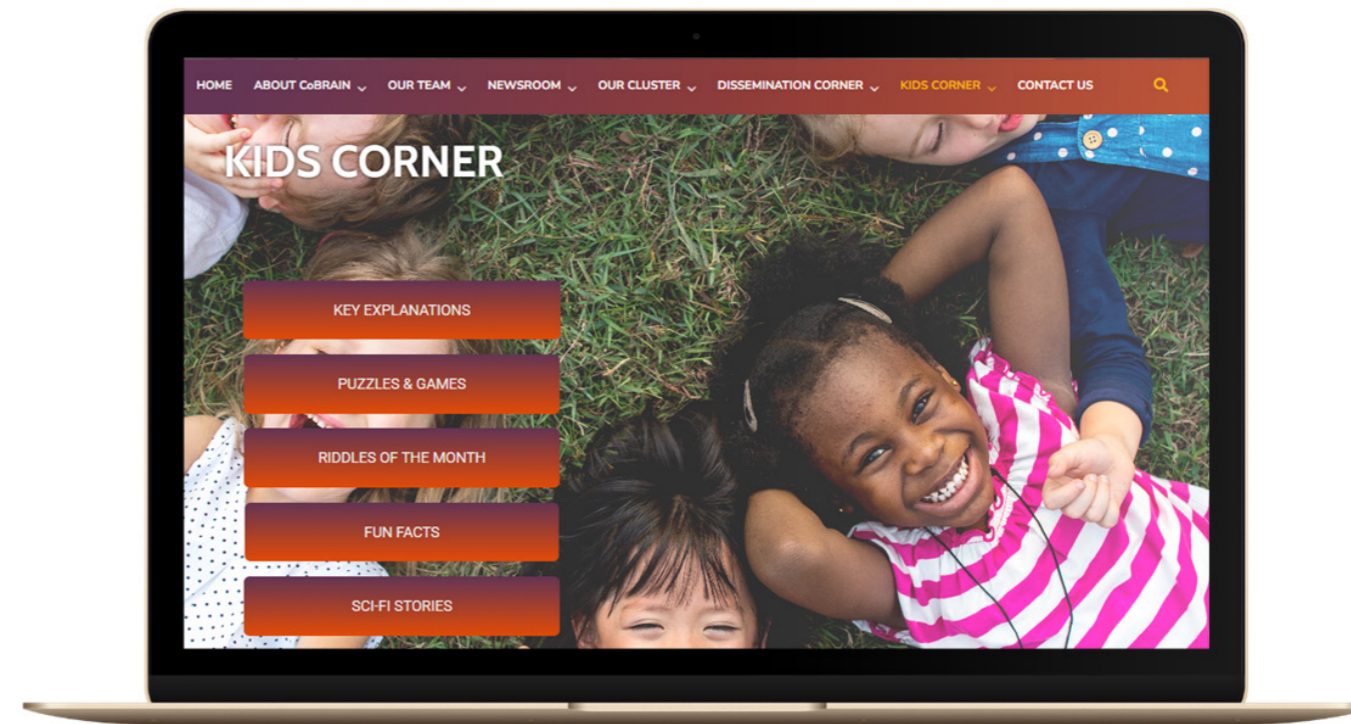


## WEBSITE UPDATE - KIDS CORNER

### MINI GAMES FOR FAMILY

We believe that science should be exciting and accessible for everyone... including kids! That's why we've launched the [Kids Corner](#), a fun and educational space on our website designed especially for young explorers and their families. Here, children can dive into the fascinating world of materials science through interactive [mini-games](#), [stories](#), [playful riddles](#), and [simple explanations](#) of what the CoBRAIN project is all about.

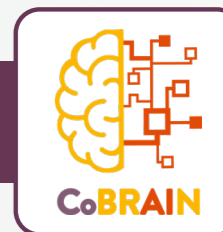
This section turns complex ideas into [kid-friendly adventures](#), showing how innovation and research help protect the materials we use every day. Whether you're solving a puzzle, reading a story for coating, or discovering how steel can be protected from rust, [Kids Corner](#) is a great way for parents and kids to learn and laugh together.



It's more than just play! It's a small break filled with fun that connects children, citizens, and families to the big impact of CoBRAIN's work.

Come explore, learn, and enjoy the world of science like never before!





## INTRODUCTION

*Please introduce EMMC organisation, yourself and key members.*



**Alexandra Simperler**  
European Materials Modelling Council (EMMC)

Facilitator, Simperler Consulting



The non-profit Association, EMMC ASBL, was created in 2019 to ensure continuity, growth and sustainability for all stakeholders including modellers, materials data scientists, software owners, translators and manufacturers in Europe. The EMMC considers the integration of materials modelling and digitalisation critical for more agile and sustainable product development. Nadja Adamovic (TU Vienna, Austria) serves as the director and Gerhard Goldbeck (Goldbeck Consulting Ltd, UK) as the executive director. The board of directors is in the capable hands of Malgorzata Celuch (QWED Sp. z o.o., Poland), Kersti Hermansson (Uppsala University, Sweden), Esther Hurtós (EURECAT, Spain), Patrycja Polińska (Goodyear S.A., Luxembourg), Jesper Friis (SINTEF Industry, Norway), Adham Hashibon (University College London, UK), and Ilian Todorov (UKRI – STFC, UK).

## BEYOND THE RESUME

*Please present EMMC's mission & goals.*

The development of new and improved materials and the use of existing materials in new applications are a key factor for the success and sustainability of European industry and society in general. The EMMC considers the integration of materials modelling and digitalisation critical for more agile and sustainable product development.

## PLANNING AHEAD

*Please give us an overview of EMMC's basic focus areas.*

### Advancements in Modelling and Characterisation

Everything that has to do with the capabilities and qualities of the materials models and the modelling workflows: development, validation and application.

### Digitalisation & Interoperability

Topics include the semantic foundation (from terminology to ontology), standardised documentation and cross-domain interoperability platforms.

### Software

Successful materials modelling software uses the best algorithms, it is numerically robust, carefully validated, well documented, easy to use, and continuously maintained during decades.

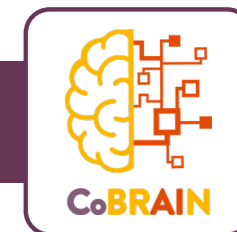
### Adoption in Industrial Ecosystems

This Focus Area is concerned with all aspects that play a role in the impactful use of materials modelling in industry, including People, relevant research and business Processes, Models use and simulations, and Data Infrastructures and Analysis.

### Community and Policy

The RoadMap recognises the importance of making advances in materials modelling and digitalisation of materials sciences to support the competitiveness of European industry.





## MEMBERSHIP & PROJECT SUPPORT

*Please describe EMMC's provided services.*

The EMMC offers three membership types, where Organisational Members and Full Individual Members pay a fee and profit from voting rights, listings, leadership in task groups, etc. Associate members are free of charge and can benefit from the EMMC outcomes such as case studies, webinars, and newsletters.

The EMMC can also be a service partner to EU projects which may comprise

- Organise projects coming together: support clustering, fostering interaction and improving synergies
- Inter-project coordination regarding EMMC objectives and cooperation with wider stakeholder community (other EMMC members etc)
- Support road-mapping activities in materials modelling and digitalisation
- Produce project related outcome documents and ensure their dissemination within the project and support their publication to wider stakeholder community
- Run (online) workshop(s)
- Support the interactions with EMCC
- Support cluster interactions with the EC

## MEMORABLE MILESTONES

*Are there any success stories related to EMMC that you would like to share with us?*

Report on NMBP-35 Workshop: "From Research to Industry: How Characterisation and Digitisation Change the Game" - <https://zenodo.org/records/10843532> EMMC: A Community Advancing Materials, Modelling and Digitalisation in Europe [https://emmc.eu/wp-content/uploads/2023/09/EMMC\\_NAFEMS\\_Sep23-minsize.pdf](https://emmc.eu/wp-content/uploads/2023/09/EMMC_NAFEMS_Sep23-minsize.pdf)

## FURTHER PERSPECTIVES

*Is there anything else you would like to share about EMMC?*

The EMMC is the home of EMMO, <https://emmc.eu/emmo/>, the Elementary Multiperspective Material Ontology. The EMMC is also the home of MODA (<https://emmc.eu/moda/>) and together with the EMCC, the home of CHADA; a CWA workshop is due to finish in Dec 2024, see <https://www.cencenelec.eu/news-and-events/news/2024/workshop/2024-04-22-nano/>

## FOLLOW OUR JOURNEY

*How can subscribers stay informed about your EMMC activities, news and major achievements?*

Join us as a member, ideally as Full Individual Member for a small fee or as an Associate Member for no fee.

See the benefits listed here <https://emmc.eu/members/membership-benefits/>



CoBRAIN partners participated in several events, the first semester of 2025 showcasing CoBRAIN project, and the achievements so far.

- 
**Joint Workshop on “Advances in Characterisation Methods & Computational Modelling” (EMMC, MatCHMaker)**  
 VTT, UR3  
 Online, 24 October 2024

---

- 
**Coating Forum 2025 by Institute of Coating Technologies - IoCT**  
 EXE  
 Athens (Greece), 18 February 2025

---

- 
**International Conference on Surface Modification Technologies (SMT36)**  
 UMR  
 Universitat de Barcelona (Spain), 27 February 2025

---

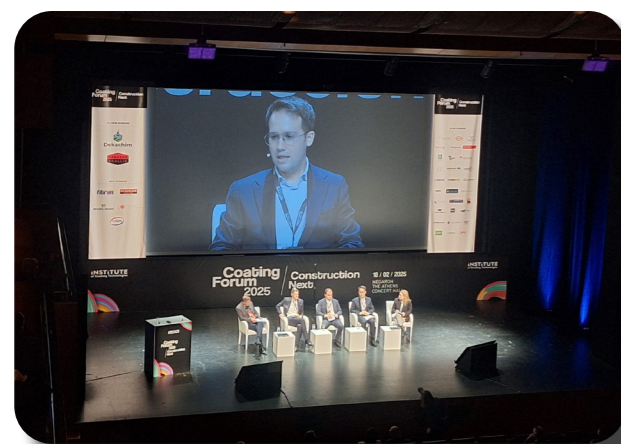
- 
**MatCHMaker Satellite Workshop EMMC2025 on “Data Life Cycles in the World of Materials Modelling & Characterisation”**  
 UoB  
 TU Wien, Vienna, (Austria), 7 April 2025

---

- 
**Showcasing Sustainable Innovation in Coating Technologies (SICT2025)**  
 UoB  
 Albufeira (Algarve Region, Portugal), 23 – 25 April 2025

---

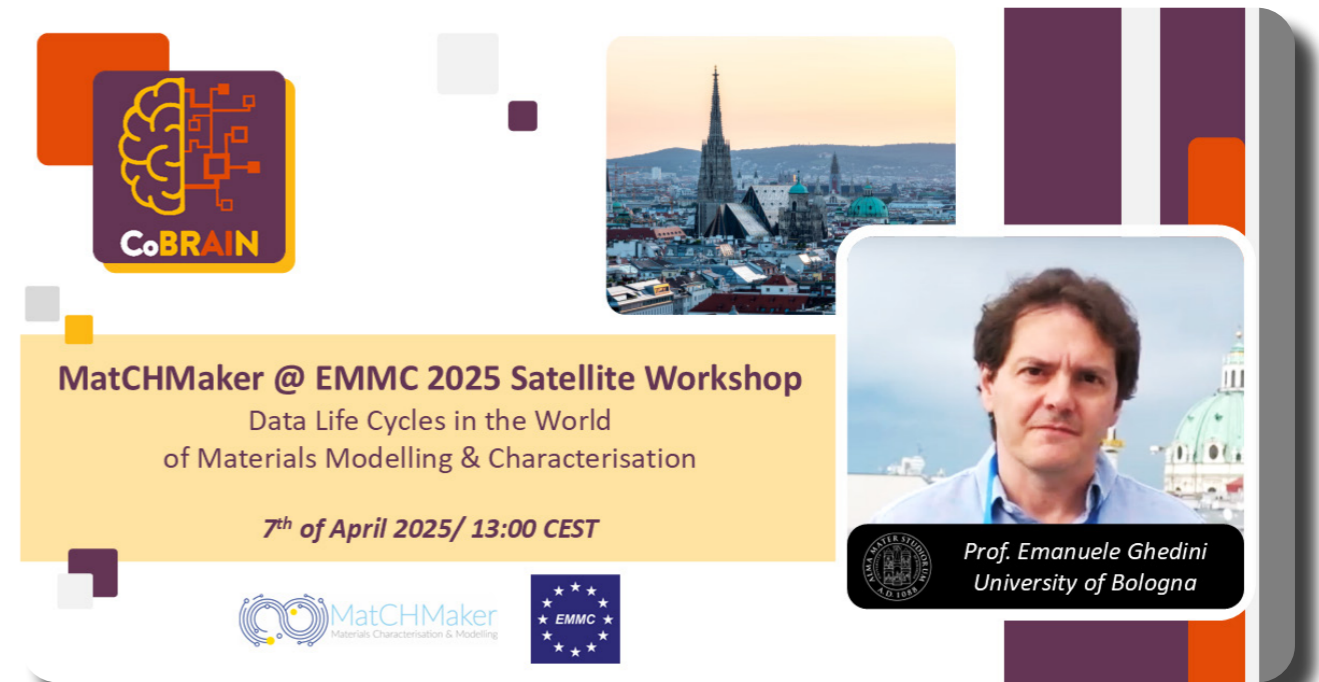
- 
**1<sup>st</sup> Training School on “Kinetic Spraying: Aerosol & Cold Spray processes”(ETSA)**  
 UB  
 Hamburg, (Germany), 15 -16 May 2025



EXE: Coating Forum 2025 by Institute of Coating Technologies - IoCT / Athens (Greece) 18 February 2025



UMR: International Conference on Surface Modification Technologies (SMT36) / Universitat de Barcelona, (Spain) 27 February 2025



**MatCHMaker @ EMMC 2025 Satellite Workshop**  
 Data Life Cycles in the World of Materials Modelling & Characterisation  
 7<sup>th</sup> of April 2025 / 13:00 CEST

Prof. Emanuele Ghedini  
 University of Bologna

MatCHMaker  
 Materials Characterisation & Modelling

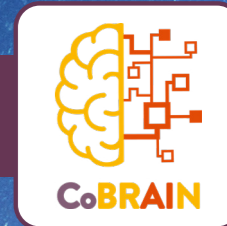
EMMC

UoB: MatCHMaker Satellite Workshop EMMC2025 on “Data Life Cycles in the World of Materials Modelling & Characterisation” / TU Wien, Vienna, Austria / 7 April 2025



UoB: Showcasing Sustainable Innovation in Coating Technologies (SICT2025) Albufeira (Algarve Region, Portugal) / 23 – 25 April 2025





## ESA'S NEW THERMAL PROTECTION MATERIALS TESTED IN SPACEX LAUNCH!

In a groundbreaking collaboration, the European Space Agency (ESA) has advanced the testing of novel thermal protection materials during a recent SpaceX Starship launch. These materials, developed to withstand the extreme conditions of atmospheric re-entry, were embedded in select areas of the Starship's surface, where traditional heat shield tiles were intentionally removed.

This experiment aimed to validate how new coatings and structures behave under high thermal stress, mirroring the challenges faced in spacecraft design, high-performance transport systems, and advanced manufacturing—domains directly relevant to CoBRAIN's vision. By leveraging SpaceX's flight as an in-orbit laboratory, ESA gained critical data that will guide the next generation of reusable spacecraft and contribute to Europe's space sustainability goals.

This milestone not only reflects Europe's commitment to innovation in aerospace materials but also highlights the growing relevance of high-temperature surface engineering—a key area of focus for CoBRAIN and its partners working on sustainable and digitally enabled coating technologies.

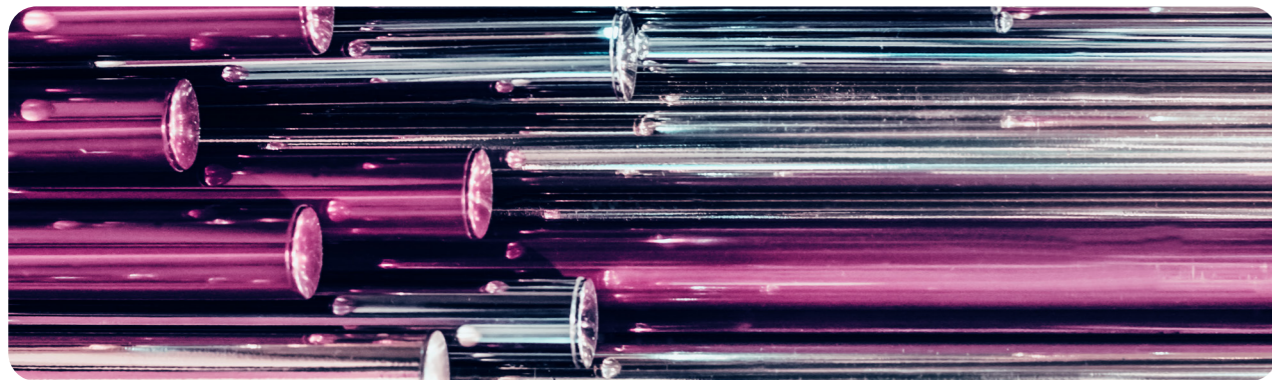
Stay tuned as CoBRAIN continues to align with the cutting edge of material science—on Earth and beyond!



**THE EUROPEAN  
SPACE AGENCY (ESA)  
DRIVES SPACE INNOVATION,  
ADVANCING MATERIALS  
THAT BENEFIT BOTH  
AEROSPACE & EARTH-BASED  
TECHNOLOGIES**

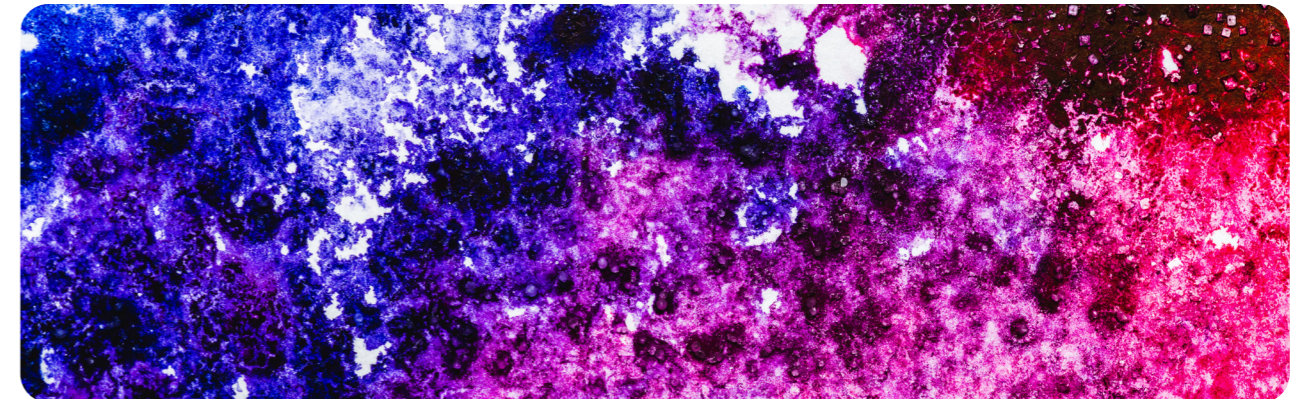
Discover the latest on CoBRAIN's Technology Blog! Explore two new articles examining the innovative field of thermal spray coatings and the patent mapping of the technologies applied in CoBRAIN. Stay informed, stay in the loop & stay ahead with fresh insights from CoBRAIN. Don't miss out! Give them a read today!

## 7<sup>TH</sup> BLOG ARTICLE - INDUSTRIAL COATINGS IN THE STEEL INDUSTRY



The steel industry relies on industrial coatings to combat corrosion, mechanical wear, and high temperatures, ensuring durability, safety, and efficiency. Technologies like galvanization, thermal spray, and nanostructured coatings protect steel in demanding environments, while eco-friendly and smart coatings support sustainability and innovation. CoBRAIN plays a leading role in advancing these solutions through research and collaboration, promoting a resilient and sustainable future for steel infrastructure. These advancements are key to reducing maintenance costs and environmental impact across industrial sectors.

## 8<sup>TH</sup> BLOG ARTICLE - PATENT MAPPING IN THERMAL SPRAY TECHNOLOGIES



EXELISIS conducted a patent mapping analysis for CoBRAIN, to monitor technological progress and guide strategy in advanced coating methods CGS, HVOF, and thermal spray technologies. The results indicate a steady rise in filings since 2016, with thermal spray reaching over 4,200 filings in 2019. China leads in patent activity globally, followed by the US and key European countries. These geographic and temporal trends help CoBRAIN identify strategic markets, manage intellectual property risks, and prioritise innovation efforts. The study also identifies underexplored areas and collaboration opportunities where CoBRAIN innovations can grow. In general, these insights help CoBRAIN's objective to provide high-performance, environmentally friendly solutions for European industry by guiding IP strategy, lowering risk, and supporting future exploitation.



To read the blog articles and learn more about CoBRAIN, visit our [website](#)

# Our Cluster

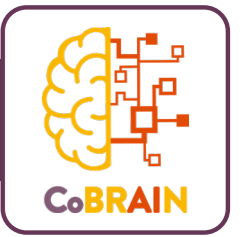


On October 24, 2024, CoBRAIN participated in the online Joint Workshop on “Advances in Characterisation Methods & Computational Modelling,” hosted by EMMC and MatCHMaker. This collaborative event brought together leading initiatives, including AddMorePower, Aid4Greenest, and D-Standart, to explore the latest breakthroughs in materials science.

Representing CoBRAIN, Prof. Laukkanen Anssi (VTT) and Prof. Marco Sebastiani (UR3) presented the project’s basic outcomes so far: “Combining Physical Modelling, Artificial Intelligence, and Experimental Verification for Developing Sustainable Coating Materials based on High-Entropy Alloys.” Their presentation highlighted CoBRAIN’s pioneering methods in merging AI, computational modelling, and experimental techniques to foster sustainable materials innovation. The workshop offered attendees valuable insights into how these advanced characterisation techniques can drive innovation across various sectors and enhance the development of sustainable and high-performance materials.

<https://emmc.eu/events/joint-workshop-emmc-matchmaker-oct24/>

**CoBRAIN PARTICIPATED IN  
THE JOINT WORKSHOP  
ON ADVANCED  
CHARACTERISATION &  
MODELLING**



## SATELLITE WORKSHOP EMMC 2025

CoBRAIN proudly participated in the MatCHMaker Satellite Workshop held on 7 April 2025 in Vienna, Austria, as part of the 5<sup>th</sup> International Workshop - EMMC 2025 events. The workshop, entitled “Data Life Cycles in the World of Materials Modelling & Characterisation”, brought together leading experts to discuss the challenges and best practices in managing data throughout the research and innovation pipeline. CoBRAIN representatives contributed to the discussions by sharing insights from the project’s approach to data generation, handling, and reusability in the context of AI-supported materials characterisation. The event provided a valuable opportunity to align with ongoing initiatives in the field and to strengthen ties with sister projects and key stakeholders. CoBRAIN’s active involvement highlights its commitment to advancing data-driven methodologies and fostering open, FAIR-compliant data practices in the materials modelling ecosystem.

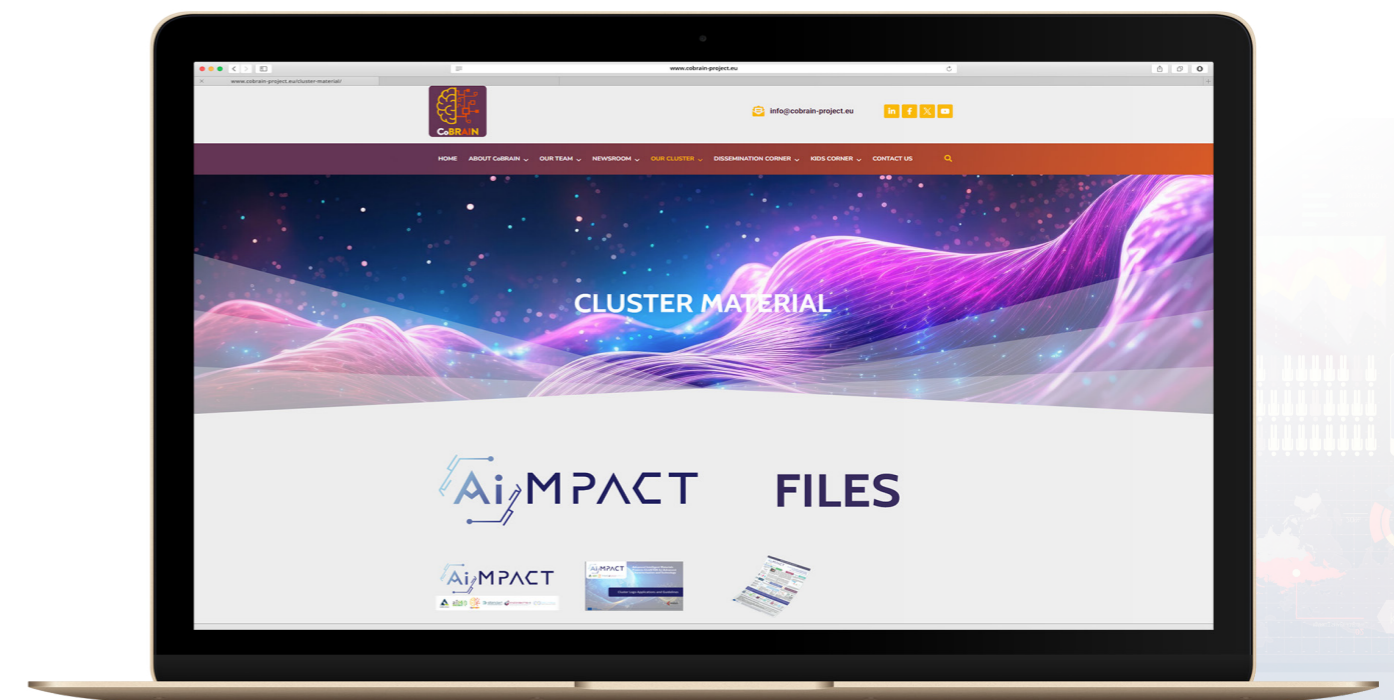
Representing CoBRAIN, **Prof. Emanuele Ghedini (University of Bologna)** delivered an interesting talk entitled “EMMO for Manufacturing: the CoBRAIN Knowledge Base for Thermal Spraying Process, Modelling and Characterisation.” His presentation highlighted how CoBRAIN leverages the **European Materials Modelling Ontology (EMMO)** to enhance data interoperability, structure, and reuse—key factors for enabling efficient collaboration and accelerating innovation in advanced coatings.

<https://emmc.eu/events/emmc-2025/>

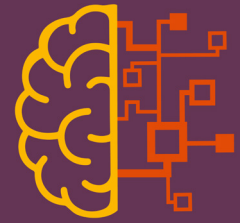


CoBRAIN—along with AddMorePower, AID4GREENEST, D-STANDART, KNOWSKITE-X, and MatCHMaker—introduced the official AiMPACT cluster poster at the 5<sup>th</sup> International Workshop – EMMC 2025, which took place on 8 – 10 April 2025 in Vienna, Austria!

Check the new section and tab of our Cluster and find everything around it



# MEET THE CoBRAIN TEAM!



CoBRAIN



**UNIMORE**  
UNIVERSITÀ DEGLI STUDI DI  
MODENA E REGGIO EMILIA



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA



UNIVERSITAT DE  
BARCELONA



[info@cobrain-project.eu](mailto:info@cobrain-project.eu)

[www.cobrain-project.eu](http://www.cobrain-project.eu)

FOLLOW US!



Funded by the European Union under GA no 101092211. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HaDEA. Neither the European Union nor the granting authority can be held responsible for them.



Funded by the  
European Union