

NEWSLETTER #3

July 2024



Open data and industry-driven environment for materials characterisation and modelling combining physics and data-based approaches

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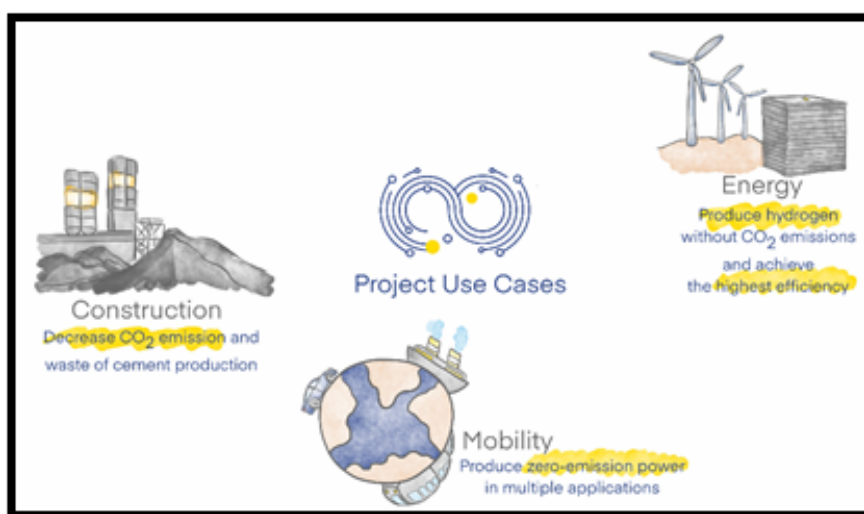


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MatCHMaker YouTube Channel

We are happy to present our project video! Learn about our main objectives, Use Cases and contributions to the bigger picture:



Developing more resilient and sustainable advanced materials is an essential aspect of the European Green Deal striving for climate neutrality. The MatCHMaker project is especially targeting the goal of emitting less CO₂. In our cases, reducing emissions in the construction, energy and mobility sectors will have an impact not only on the environment but also on society.

A huge thank you to all partners for their contributions and to the amazing team behind the video!

- Drawing: Emmanuelle Kiener (Manuka)
- Animation: Cyril Blasco Besse
- Sound design: Rémi Chenaud
- Voice-over: Emily Van Bel

Spotlight on our Partners: AIMEN and Heidelberg Materials



Andrea & Christian
(AIMEN, Spain)
Artificial Intelligence Researchers



Alexandre
(Heidelberg Materials, Germany)
Research Scientist

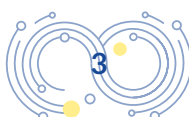
Artificial intelligence (AI) and machine learning are important components in our project. In the first interview, Andrea Gregores Coto and Christian Precker from AIMEN talk about their work and professional experiences. They also provide more insight into the Construction Use Case focusing on cement, for example, how they try to predict physical properties and durability.



AIMEN is an Innovation and Technology Centre in Spain specialising in Digitalisation, Advanced Materials and Advanced Manufacturing Technologies, especially laser technologies, robotics and automation. As a national leader in research and in providing advanced technological services, it aims to improve the technological capabilities.

After clean water, cement is the second most produced material. Reducing CO₂ emissions from cement production thus contributes to the global decarbonisation efforts. Alexandre Ouzia from Heidelberg Materials talks about the importance of research in this field and also what fascinates him about cement.

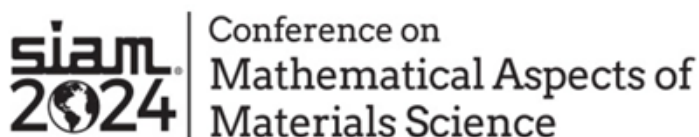
Heidelberg Materials is one of the world's largest integrated manufacturers of building materials and solutions with leading market positions in cement, aggregates, and ready-mixed concrete. Their products and services are used in the construction of houses, infrastructure, commercial and industrial facilities.





Event Highlights

Internally and externally, a lot of events related or relevant for the project happened in the course of 2024. Here are some highlights!



SIAM Conference on Mathematical Aspects of Materials Science (MS24)

Pittsburgh, PA, U.S.A

19.-23.05.2024

Website: <https://www.siam.org/conferences/cm/conference/ms24>

The Society for Industrial and Applied Mathematics (SIAM) is an international community aiming to advance applied mathematical and computational methodologies in engineering, industry, science and society. The Activity Group on Mathematical Aspects of Materials Science has been organizing the SIAM MS conference since 1994. The focus lies on interdisciplinary approaches and provides a forum to showcase advances and challenges in mathematics and materials science.

Project partner Heidelberg Materials participated and gave a presentation at the conference on the use of Scanning electron microscopy (SEM) image analysis with machine learning techniques. The work is a collaborative effort among Heidelberg Materials, AIMEN and CEA Saclay and is related to our technical poster. Take a look [here](#).

CEN Workshop: Revision of CWA 17815:2021: “Materials Characterisation – Terminology, Metadata and Classification”

24.05.2024

Website: <https://www.cencenelec.eu/news-and-events/news/2024/workshop/2024-04-22-nano/>

ASRO and SINTEF participated in the online Kick-off meeting of the European Committee for Standardization (CEN) Workshop on the revision of CEN Workshop Agreement [CWA 17815:2021](#) “Materials Characterisation – Terminology, Metadata and Classification”. It has been organised by the Horizon 2020 project [NanoMECommons](#). The resulting Agreement will strengthen communication among experts encompassing all areas of materials characterisation and modelling and foster interdisciplinary exchange.





MaterialsWeek 2024

Limassol, Cyprus

17.-21.06.2024

Website: <https://materials-week.org/>

NW2024

MaterialsWeek 2024 brought together interdisciplinary Research & Innovation communities in advanced materials. As a synergising activity with the European Materials Modelling Council (EMMC), the MatCHMaker project was also present at the EMMC stand to promote the project and connect with other EU projects and initiatives.

The conference provided a unique opportunity for small and large communities across diverse value chains and industries to meet in an effort to bridge the silos. The European Commission initiative “Innovative Advanced Materials for Europe” (IAM4EU) proposes a partnership focusing on the research, development and uptake of “safe and sustainable by design” materials, which was highlighted across talks during the conference.



Project Cluster CODEX

Together with Horizon 2020 projects [DOME 4.0](#), [CHARISMA](#), [OntoTrans](#), [OpenModel](#), [MUSICODE](#) and [NanoMECommons](#), we have formed a project cluster named ‘CODEX’ – **Collaborative Open Data Exchange for Advanced R&I**. The goal of the cluster is to advance materials science and develop open and accessible methodologies, tools and platforms to provide solutions to industrial challenges.

Find out more about collaborations [here](#).





MatCHMaker YouTube Channel

The MatCHMaker project aims to promote science communication through various channels and using different formats. Alongside the project [website](#), [LinkedIn](#) and [X](#) account, a [YouTube](#) account has also been created to showcase our videos!



We are looking for long-term partnerships!

Materials' microstructure is fundamental for our understanding of the material's properties. Quantitative characterisation of microstructures is therefore essential for the optimisation of the performance of materials. Machine learning algorithms are promising for image analysis yet are still scarcely applied in our field. In cement research, e.g., clustering algorithms enabled a better understanding of the kinetics of recycled concrete paste carbonation. We will continue in this direction and are gathering more data to make our codes more robust and transversal, and are looking for partnerships and synergies going beyond the lifecycle of the project.

If you are part of an EU project or know one interested in expanding an image database, building case studies and algorithms on all classes of materials, please contact us!

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