◇ European Ceramic Society サマースクール参加報告 ◇

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◆プログラムで印象に残った内容

During the program, I was especially impressed by the way different disciplines were integrated to address sustainability challenges. The lectures and discussions emphasized that the refractories industry is undergoing a transformation, where traditional trail-and-error methods are gradually being replaced by data-driven design and predictive modeling. For example, machine learning techniques can now be applied to analyze large sets of experimental data, providing insights into the mechanisms of corrosion, phase stability, and thermal shock resistance in a much shorter time compared with conventional approaches. At the same time, experimental validation remains essential to confirm these predictions and to explore phenomena that cannot yet be fully captured by computational models. This mutual reinforcement between computation and experiment represents a highly promising pathway toward developing materials with improved performance and lower environmental footprint. What impressed me most was not only the technical content but also the strong awareness of the need to reduce energy consumption and CO_2 emissions in the production and application of high-temperature materials. The program encourages young researchers like me to think critically about how our scientific work can contribute to a more sustainable and innovative future for both academia and industry.
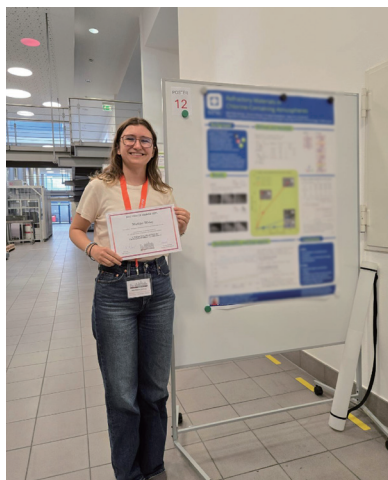
◆今回のサマースクールで得られた成果や今後の研究・活動への影響

The summer school emphasized the importance of integrating scientific research with industrial production, demonstrating how new technologies can be translated into practical applications. A central theme was the role of AI, which is becoming an essential tool not only for advancing research but also for improving efficiency in industrial processes. I was particularly impressed by the discussion that sustainability and environmental responsibility are now core components of both scientific inquiry and industrial practice. In relation to my own work on flash sintering, I aim to develop faster and lower-temperature processing routes for ceramics. Such approaches have the potential to reduce energy consumption significantly while maintaining or even improving material performance. Moving forward, I plan to investigate the fundamental mechanisms of flash sintering in greater depth to establish more efficient and environmentally friendly fabrication methods. The program also inspired me to consider how AI can be effectively integrated into this field. By combining data-driven modeling with experimental research, it should be possible to accelerate the understanding for complex phenomena and guide the design of greener, high-performance ceramic processing technologies. Overall, the Summer school not only broadened my scientific perspective but also motivated me to connect my research more closely with sustainability goals and industrial needs.

◆謝　辞

The last day for lab tour, visiting the Freiberg Silver Mine

Mathilde Meling from Norway, whose poster won the first position in the competition during summer school.