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# MSP04: Diffusion processes in materials

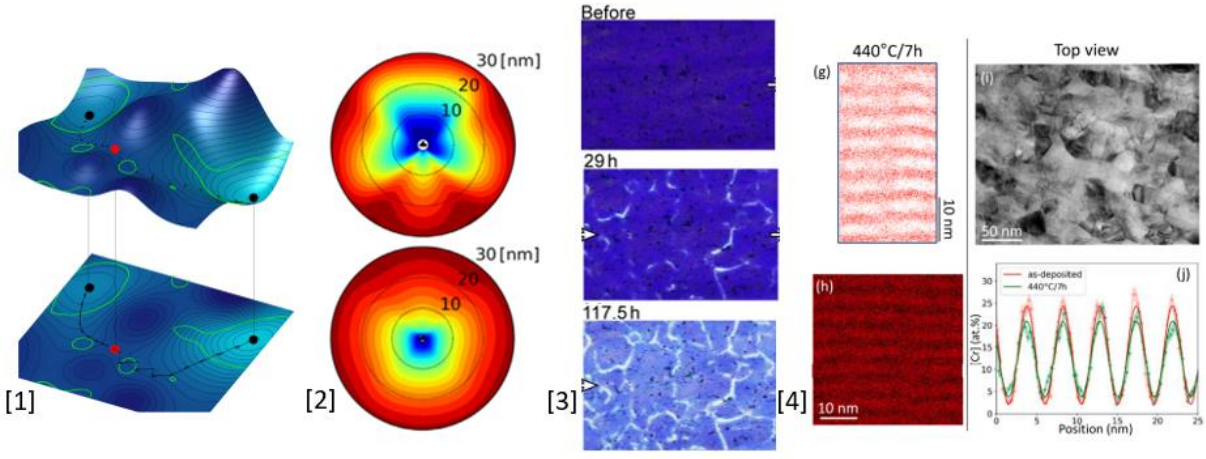
## *From the atomic-scale mechanisms to the long-time behavior of materials*

**Organizers:** Thomas Schuler (CEA/SRMP), Damien CONNETABLE (CIRIMAT), Antoine JAY (LAAS), Anne HEMERYCK (LAAS)

**Invited Speakers:** Alixe Dreano (LGF), Thomas Rieger (CEA), Antoine Jay (LAAS), Salomé Trillot (CEMES), Liangzhao Huang (RUB, Bochum)

**Content:**

Diffusion is a fundamental process from which atoms collectively evolve towards the system's equilibrium state. Phase transformations, defect mobility or corrosion are only a few examples of diffusion-driven phenomena. Diffusion results in the change of macroscopic concentration fields over time, i.e. chemical species redistribution inside the material which can be described from a purely phenomenological point of view. The phenomenological parameters entering such physical description are the transport or Onsager coefficients. The value of these coefficients results from a complex combination of mechanisms at the atomic scale. The diffusion is therefore intrinsically multi-scale. In this symposium, we are interested in all atomic diffusion-related phenomena, in solids, liquids and amorphous materials for instance. Across speaker's contributions, we aim to provide a portrait of the current understanding of the field, state-of-the-art methods and techniques, as well as unsolved questions in theory, modeling and experiments. Contributions putting forward the multi-scale aspect of diffusion and the complementary nature of theoretical, modeling and experimental approaches are particularly welcome.




*[1] A. Jay et al., Les Techniques de l'Ingénieur (2023)*
*[2] L. Huang et al., Journal of Nuclear Materials 570 (2022)*
*[3] H. Kakinuma et al., Acta Materialia 263 (2024)*
*[4] T. Rieger et al., Acta Materialia 258 (2023)*