SHORT BIO:

Hélèna Zapolsky is a Professor of Theoretical Physics in the Group of Materials Physics at the University of Rouen, France. She received her PhD from the Institute for Theoretical Physics in Kyiv, Ukraine. Her research lies at the intersection of theoretical solid-state physics, materials science, and computational modelling, with a particular focus on pattern formation and the kinetics of phase transformations. She develops and applies phase-field methods to investigate the formation and evolution of complex microstructures, ranging from ice crystal growth to precipitation kinetics in alloys. More recently, she has extended the phase-field formalism to the atomic scale through the development of the Quasi-particle Approach (QA), opening new perspectives for understanding atomic ordering, grain-boundary structures, and displacive and diffusional phase transformations in complex materials. Her research aims to establish theoretical and computational links between atomic-scale mechanisms and microstructural evolution, providing a multiscale understanding of the non-equilibrium behaviour of materials. She has co-authored two book chapters and numerous scientific articles in materials physics.