

## **Well-posedness of mixed-dimensional and nonlocal phase-field models of Cahn-Hilliard type applied to tumor growth**

In this talk, we study various tumor growth models following the hallmarks of cancer. Such systems are based on a multiphase ansatz using constitutive laws and balance laws for single constituents. Biological phenomena such as temporal and spatial nonlocal effects, as well as mixed-dimensional couplings, are taken into account. We investigate these tumor models with respect to their mathematical well-posedness and the existence of weak solutions. Finally, we discuss approximations of the systems and demonstrate numerical simulations.