

## **Asymptotic structures and fractional interface laws in viscoelastic phase separation**

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In this talk, we discuss gradient structures arising in reduced models of viscoelastic phase separation. In the first part, we perform formal sharp-interface asymptotics in a degenerate Cahn-Hilliard model with cross coupling to a bulk stress variable. This leads to non-local, lower-order counterparts of the classical surface diffusion flow: for a constant coupling function, we recover the intermediate surface diffusion flow, whereas for phase-dependent coupling we obtain a class of fractional interface laws, whose propagation operator, at leading differential order, is given by the square root of the minus Laplace–Beltrami operator. In the second part, we focus on a toy model and demonstrate how its gradient structure can be leveraged to establish well-posedness and relaxation limits. The talk is based on joint works with Moritz Gau, John King, Andreas Münch, and Barbara Wagner.