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**Non-equilibrium physics of spinor quantum fluids** LAUREN AY-COCK, SRIVATSAN CHAKRAM, JOHN LOMBARD, MUKUND VENGALATTORE, Cornell University — We are working towards a multispecies ultracold atom apparatus intended for studies of non-equilibrium physics of quantum degenerate spinor fluids. These studies rely on the ability to generate large spatially extended ensembles of ultracold gases. In addition, quantitative studies of the non-equilibrium dynamics require the development of techniques for time-resolved nondestructive images of these gases. We report on experimental progress towards both these goals. We complement these experimental efforts with theoretical studies of spinor gases in non-equilibrium scenarios. In particular, we present results on a dynamical Kosterlitz-Thouless transition in quasi-2D  $F=1$  spinor gases.

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