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Dynamical frustration versus kinetic enhancement with excitons in strongly correlated bilayers LOUK RADEMAKER, Lorentz-Institute for Theoretical Physics, Leiden University — Recently the condensation of electron-hole pairs in semiconductor bilayers has been achieved. This has opened up the pursuit of exciton condensation in other layered materials. Here I will present recent theoretical work on exciton physics in complex oxide heterostructures. The poorly understood high temperature superconducting cuprates are ideal candidates for bilayer exciton condensation. Therefore we study the dynamics and the phase diagram of bilayer excitons in a Mott insulating p/n heterostructure, which shows rich exciton-spin interaction phenomena. I will discuss the dynamical frustration experienced by an exciton moving through an antiferromagnetic background. In sharp contrast, I will show how in the exciton superfluid phase the magnetic excitations 'borrow' kinetic energy from the excitons. References: L. Rademaker, K. Wu, H. Hilgenkamp and J. Zaanen, EPL 97, 27004 (2012); L. Rademaker, K. Wu and J. Zaanen, New Journ. of Phys. 14, 083040 (2012); L. Rademaker, J. van den Brink, H. Hilgenkamp and J. Zaanen, Phys. Rev. B 88, 121101(R) (2013).

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