

Abstract Submitted
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Superfluidity in the absence of kinetics in spin-orbit- coupled optical lattices¹ HOI-YIN HUI, Virginia Tech, YONGPING ZHANG, Shanghai University, CHUANWEI ZHANG, The University of Texas at Dallas, VITO SCAROLA, Virginia Tech — Recent experiments have succeeded in generating effective spin-orbit coupling for ultracold Bosons in optical lattices. These systems offer the intriguing possibility of generating flat bands when a Zeeman field of suitable strength is applied. In this talk I will discuss possible interesting states that could emerge in such flat band systems. In particular, the fate of superfluidity in the absence of kinetics will be investigated by explicitly constructing a tight-binding model, followed by an unbiased numerical treatment. We find that novel superfluid states can arise entirely from interactions operating in quenched kinetic energy bands, thus revealing a distinct and unexpected boson condensation mechanism.

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