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Potentially diagonalizable modular lifts of arbitrarily large weight

I will begin this talk by recalling the notion of "potential diagonalizability", and its role in Automorphy Lifting Theorems. Then I will present the main result of this talk, which is joint work with Iván Blanco: existence of modular lifts of arbitrarily large weight (of a given residual modular Galois representation) which are potentially diagonalizable. In the non-ordinary case, the proof of this result requires a combination of local and global results for Galois deformation rings, a local to global principle due to Böckle and a potential variant of the result we want to prove due to Barnet-Lamb, Gee, Geraghty and Taylor.