

# Developments in wave function-based approaches to two-dimensional materials

George Booth<sup>1</sup>, Aldo Glielmo<sup>1</sup>, Laretta Schwarz<sup>2</sup>

<sup>1</sup> *King's College London, Department of Physics, Strand, London, WC2R 2LS*

<sup>2</sup> *University of Cambridge, Department of Chemistry, Lensfield Road, Cambridge, CB2 1EW*

In this talk, we will discuss the development of new computational approaches to deal with low-dimensional systems, and the strong correlation effects which inevitably follow them. Primarily working with lattice model representations, we will discuss the limitations in existing methodologies, and the steps we are taking in order to overcome the complexity of correlated wavefunctions in these models. In particular, we will touch on topics of tensor networks and their optimizations, as well as Monte Carlo techniques and aspects of machine learning in order to make progress in these problems [1].

## References

- [1] L. R. Schwarz, A. Alavi, G. H. Booth, *Physical Review Letters*, **118**, 176403 (2017).