



## MANHATTAN ALGEBRA DAY

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Henry Bradford

The University of Göttingen

*Short laws for finite groups and residual finiteness growth*

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*Abstract:*

A law for a group  $G$  is a non-trivial equation satisfied by all tuples of elements in  $G$ . We study the length of the shortest law holding in a finite group. We produce new short laws holding (a) in finite simple groups of Lie type and (b) simultaneously in all finite groups of small order. As an application of the latter we obtain a new lower bound on the residual finiteness growth of free groups. This talk is based on joint work with Andreas Thom.