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Trees, flow functions, and algorithms in groups

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Abstract:
A bounded flow function is a dynamical system on the Cayley complex of a finitely presented group mapping the set of paths into itself, such that path lengths increase in a bounded way and iteration eventually maps every path into a fixed maximal tree. Although a flow function does not imply solvability of the word problem, if the function can be computed by a finite state automaton (FSA), the group is called autostackable and the FSA can be used to solve the word problem for the group. In this talk I'll discuss autostackability for closed 3-manifold groups and relatively hyperbolic groups. This includes joint work with Mark Brittenham, Conchita Martinez-Perez, and Tim Susse.