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**ZHUAN KHYE KOH**, London School of Economics

*An Accelerated Newton-Dinkelbach Method and its Application to Two Variables Per Inequality Systems*

In this talk, I will present an accelerated, or 'look-ahead' version of the Newton-Dinkelbach method, a well-known technique for solving fractional and parametric optimization problems. This acceleration halves the Bregman divergence between the current iterate and the optimal solution within every two iterations. Using the Bregman divergence as a potential in conjunction with combinatorial arguments, we obtain a strongly polynomial label-correcting algorithm for solving linear feasibility systems with two variables per inequality. This extends and strengthens a previous result by Madani (2002).

Based on joint work with Daniel Dadush, Bento Natura and László Végh.