1067-05-1055   **Michel X. Goemans*** (`goemans@math.mit.edu`), MIT, Room 2-351, 77 Massachusetts Ave., Cambridge, MA 02420. *Thin spanning trees, conductances, nowhere zero flows, and the traveling salesman problem.*

A spanning tree T in a graph G is ϵ-thin if T contains at most an ϵ fraction of the edges of every cut. Goddyn's conjecture says that every $f(\epsilon)$-edge-connected graph contains an ϵ-thin tree for a suitable function f. In this talk, we discuss this conjecture and variants of it, and its implications for nowhere zero 3-flows and for the approximability of the asymmetric traveling salesman problem. In particular, we show that, if the graph is $(c\log(n)/\log\log(n))$-edge-connected, one can select conductances in a corresponding electrical network so that a random spanning tree is ϵ-thin with high probability. We also show that, if we replace the spanning tree requirement by simply having a linear number of edges then Goddyn's conjecture can be proved. (Received September 17, 2010)