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**Stephen J Young\*** ([stephen.young@pnnl.gov](mailto:stephen.young@pnnl.gov)). *The Alon-Boppana Theorem for the normalized Laplacian.*

The Alon-Boppana Theorem gives an asymptotic lower bound for the second largest eigenvalue of the adjacency matrix of a  $d$ -regular graph. We generalize this result to the normalized Laplacian of irregular graphs. (Received August 25, 2015)