

Kempner Colloquium  
and  
Joint Math & Applied Math Distinguished Lecture

# THE CENTRAL CURVE IN LINEAR PROGRAMMING

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The central curve of a linear program is an algebraic curve specified by linear and quadratic constraints arising from complementary slackness. It is the union of the various central paths for minimizing or maximizing the cost function over any region in the associated hyperplane arrangement. We determine the degree, genus and defining ideal of the central curve, thereby answering a question of Bayer and Lagarias. These invariants, along with the degree of the Gauss image of the curve, are expressed in the language of matroid theory. This yields new bounds on the total curvature of the central path, a quantity relevant for interior point methods.

Friday December 2, 2011  
3:00 p.m.  
ECCR 245