The Oliver Club

www.math.cornell.edu/~oliver/

Peter Lax, New York University Hyperbolic Equations and Degenerate Matrices

A real symmetric matrix is called degenerate if it has a multiple eigenvalue. Wigner and von Neumann have shown long ago that the degenerate matrices form a variety of codimension two in the space of all symmetric matrices. I will show that if A, B, C are n x n real symmetric matrices, and n is congruent 2 mod 4, there always exist three real numbers a, b, c, not all zero, such that aA + bB + cC is degenerate. This result can be used to study singularities of solutions of hyperbolic equations. Degenerate matrices are characterized by the single equation discr[S] = 0, where discr[S] is the discriminant of S. I shall present a new proof of the classical proposition that the discriminant can be represented as a sum of squares.



Thursday, April 21, 2011 at 4:25 PM in 406 Malott Hall

Refreshments will be served at 3:55 PM in the Mathematics Department lounge (532 Malott Hall).