

The Perron generalized eigenspace and the spectral cone of a cone-preserving map

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The speaker will present a unified treatment to reprove known results on the following four highlights of the combinatorial spectral theory of nonnegative matrices, or to extend (or partly extend) the results to the setting of a linear map preserving a polyhedral proper (or proper) cone: the preferred-basis theorem, equivalent conditions for equality of the (graph-theoretic) level characteristic and the (spectral) height characteristics, the strong majorization relation between the two characteristics, and the relation between the combinatorial properties of a nonnegative matrix and the positivity of the individual entries in its principal components. This is achieved by employing the new concept of spectral cone of a cone-preserving map and combining the cone-theoretic methods previously developed in our sequence of papers on the geometric spectral theory of cone-preserving maps with the algebraic-analytic method introduced by Hartwig, Neumann and Rose and further exploited by Neumann and Schneider for nonnegative matrices.