A new principal rank characteristic sequence

The principal minors of certain matrices are of interest in several areas of mathematics; as a result, researchers associated two sequences with an $n \times n$ symmetric, complex Hermitian, or skew-Hermitian matrix B. The first of these is the principal rank characteristic sequence (pr-sequence); this sequence is defined as $r_0]r_1 \cdots r_n$, where, for $k \geq 1$, $r_k = 1$ if B has a nonzero order-k principal minor, and $r_k = 0$, otherwise; $r_0 = 1$ if and only if B has a 0 diagonal entry. The second sequence, one that "enhances" (or refines) the pr-sequence, is the enhanced principal rank characteristic sequence (epr-sequence), denoted by $\ell_1\ell_2 \cdots \ell_n$, where ℓ_k is either A, S, or N, based on whether all, some but not all, or none of the order-k principal minors of B are nonzero.

In this talk, known results about pr- and epr-sequences will be discussed, concluding with the introduction of a new principal rank characteristic sequence for Hermitian matrices, which was recently defined by the present speaker. Several results about this new sequence are presented.