

## Graphs with low Erdős–Gallai differences

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The Erdős–Gallai inequalities are a well known criterion for determining whether a list of integers is the degree sequence of a graph. The threshold graphs have degree sequences for which the first several Erdős–Gallai inequalities hold with equality. In this talk we describe families of graphs for which the degree sequences “almost” satisfy the first Erdős–Gallai inequalities with equality. We discuss generalizations of classic threshold graph characterizations to these larger classes, including forbidden subgraph characterizations, iterative construction algorithms, and degree sequence locations in the majorization order on degree sequences. In particular, we provide each of these characterizations for the class of *weakly threshold graphs*, a new class in which the sides of the first Erdős–Gallai inequalities differ by at most one.

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