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Second SBU Combinatorics Day

Shahid Beheshti University, May 11, 2016

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Honoring 50th anniversary of Behzad's Conjecture

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## Cographs: An Algebraic Characterization

Ebrahim Ghorbani

**A** cograph is a simple graph which contains no path on 4 vertices as an induced subgraph. In this talk, I will review several characterizations of cographs and present a new one based on graph eigenvalues. Also a partial order on the vertex set of graphs  $G$  in terms of inclusions among the open and closed neighborhoods of vertices will be discussed as well as a conjecture that the multiplicity of any eigenvalue of a cograph  $G$  except for  $0, -1$  does not exceed the maximum size of an antichain. In two extreme cases which include threshold graphs, the conjecture is shown to be true.