1154-05-687 **Joshua Carlson*** (jc31@williams.edu) and **Juergen Kritschgau** (jkritsch@iastate.edu).

Extreme Throttling Numbers.

Zero forcing is a process on graphs that uses a color change rule to force the color of the vertices in a graph to become blue. The throttling number of a graph optimizes the balance between the number of blue vertices at the start of the process and time taken for all vertices in the graph to become blue. Positive semidefinite (PSD) zero forcing is a variant that allows forcing to occur in separate components of a graph. There are also minor monotone floor variants that allow forcing across large distances by "hopping". Each variant gives rise to a different type of throttling number. This talk will present structural and forbidden subgraph characterizations of throttling numbers. (Received September 09, 2019)