

Discrete Mathematics Seminar

Organizer(s): Bernd Sturmfels

Wednesday, 1:00–2:00pm, 939 Evans

Oct. 15 **Caroline Uhler**, UC Berkeley, Statistics

Commuting birth-and-death processes

We are interested in birth-and-death processes on an $n \times m$ grid. At each point in time, a particle wandering on this grid can only make steps of size one either upwards, downwards, to the right, or to the left. The corresponding transition matrix P can be written as a sum of two transition matrices, one for the horizontal moves (P_h) and one for the vertical moves (P_v). It has been shown that P is diagonalizable if P_h and P_v commute, i.e. $P_h \cdot P_v = P_v \cdot P_h$. We will analyze the ideal generated by these constraints, show some nice properties, and discuss possible generalizations to other lattices. No previous knowledge on birth-and-death processes is assumed.