

Using bread-and-butter tools from our area, we explore the following general theme: As one progresses from each member of a family of objects  $\mathcal{A}$  being “covered” by at most one object in a random collection  $\mathcal{C}$ , to being covered at most  $r$  times, to being covered at least once, to being covered at least  $r$  times, a hierarchy of thresholds emerge. These are sometimes smooth in their transition from one level to the next, and sometimes feature a gap. Examples that will be presented include packing and covering of  $t$  sets by  $k$  sets; Sidon sets and additive bases; weakly or strongly union free families; coverage in the permutation pattern lattice; and, of course, a well-known progression featuring balls in boxes and the coupon collector problem. This is joint work with Thomas Grubb, Kyutae Han, Zach Higgins, and Zoe Koch.