

STATISTICAL DISTRIBUTIONS ON INTEGER PARTITIONS

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ABSTRACT. In this talk we examine three types of distributions on integer partitions.

- (1) Generalizing a classical theorem of Erdős and Lehner, we determine the distribution of parts in partitions that are multiples of a fixed integer A . These limiting distributions are of Gumbel type, which are used to predict earthquakes! These results have implications in the algebraic geometry of n point Hilbert schemes.
- (2) For a fixed positive integer t , we determine the distribution of the number of hook lengths of size t among the partitions of n . As n tends to infinity, the distributions are asymptotically normal.
- (3) For a fixed integer $t > 3$, we determine the distribution of the number of hook lengths that are multiples of t among the partitions of n . As n tends to infinity, the distributions are asymptotically shifted Gamma distributions. This is joint work with Michael Griffin, Ken Ono, and Larry Rolen.