1151-05-75 **Matthias Beck*** (`mattbeck@sfsu.edu`). *Facing up to Tom Zaslavsky: Making arrangements count (lattice points).*

This semi-expository talk will exhibit the origins and some of the applications of *inside-out polytopes*: one considers a convex polytope P together with an arrangement of hyperplanes that dissects the polytope, and we count points of a discrete lattice, such as the integer lattice, that lie inside of P but not on any of the hyperplanes. The resulting counting functions are generalizations of *Ehrhart polynomials* (which one obtains in the absence of the hyperplane arrangement). Our initial motivation was to interpret colorings and acyclic orientations of graphs within the framework of counting lattice points in polytopes. The same framework turns out to be interesting for a multitude of counting problems in which there are forbidden values or relationships amongst the values of an integral function on a finite set, e.g., graph flows, magic and latin squares, antimagic labelings of graphs, Golomb rulers, and non-attacking queens on a chessboard. (Received August 08, 2019)