1154-60-1342 **Erin Beckman**, **Keisha Cook**, **Nicole Eikmeier**, **Sarai Hernandez-Torres***
(saraiht@math.ubc.ca) and **Matthew Junge**. *Chase-escape with death on trees.*

Chase-escape is a competitive growth process in which red particles spread to adjacent uncolored sites while blue particles overtake and kill adjacent red particles. We can think of this model as prey escaping from pursuing predators. If the red particles spread fast enough, both particle types occupy infinitely many sites with positive probability. Otherwise, both almost surely occupy only finitely many sites. We introduce the modification that red particles die at some rate. When the underlying graph is a d-ary tree, chase-escape with death exhibits a new phase in which blue almost surely occupies finitely many sites, while red reaches infinity with positive probability. Moreover, the critical behavior, which we precisely characterize, is different with the presence of death. Many of our arguments make use of novel connections to analytic combinatorics. (Received September 16, 2019)