

1145-20-2813

Isabella Diaz* (idiiaz16@stac.edu), 6 Stanley Street, Dumont, NJ 07628. *Swarms and Group Theory*. Preliminary report.

Group theory is used describe and predict countless events and swarms will be the next. Many of these biological groups exhibit behaviors that may be able to be connected by guidelines of algebraic group theory. These behaviors include a maximum and minimum distance between group members and a collective between them, such as direction of movement. These behaviors are currently being researched using differential equations. However, we believe that we are the first to study them using group theory. We investigate the group-like structure of swarms and seek to develop how these structures work with each other by taking advantage of the similarity to groups. The symmetrical tendencies behavioral patterns exhibit will be crucial in understanding the way swarms operate. Swarms often depend of environmental conditions and mate recognition with the largest density of individuals concentrated in the center of the swarm according to a 2009 study by Manoukis et. al. (Received September 25, 2018)