

OR409*The active role of confidence in ant colonies***Ofer Feinerman, Amos Korman, Efrat Greenwald**

Animals that live in groups sense their surroundings by direct environmental cues and indirect social interactions. Social information has the capacity to improve both the sensitivity ('many eyes principle') and the accuracy ('many wrongs principle') of the acquired information and lead to increased adaptivity. These advantages become even more pronounced in the case of eusocial insects where lack of conflict can be expected to lead to an increased motivation for information sharing. Interaction rates within a dense insect society can be huge. Although the information conveyed in such interactions is advantageous, its sheer amounts could lead to excessive cognitive loads. We are interested in identifying communication schemes that balance the advantages of sharing large amounts of information with the required conciseness of both memory and messaging. We approach this issue from two very different perspectives: Theoretically, we borrow techniques from the field of distributed computing to rigorously compare between the performances of different communication strategies employed by interacting agents. Experimentally, we track ants that share information regarding their environment during recruitment to a food source and collective load transport. We find that these two, very different, perspectives point to a similar direction: efficient collective performance can be achieved despite huge compression of memory and communication. This is accomplished by individuals that remember and communicate their opinion and a related confidence measure. We therefore suggest that for strongly cooperative groups, confidence expands its classical definition as a passive, internal state: ants actively share their confidence to enhance group performance.