

Tracking of ant behavior during colony emigrations

Volunteer student assistance is desired for work on a project directed by Dr. Stephen Pratt in the School of Life Sciences, Dr. Theodore Pavlic in the Fulton Schools of Engineering, and Dr. Sara Walker in the School of Earth and Space Exploration. The student will primarily be under the supervision of Dr. Gabriele Valentini.

Project description. When choosing a new nest site, ants of the species *Temnothorax* are able to gather information from the environment and collectively process this information to determine which potential site offers the best choice for the colony. Despite the lack of centralized coordination, *Temnothorax* ants are remarkably good at making collective decisions and solve this problem by combining a few simple behaviors: exploration of the environment to discover potential sites, recruitment of ants to a site by means of tandem runs, quorum sensing, and transport of colony members between sites [1]. However, little is known about how information is processed collectively by the members of the colony and how the storage and exchange of information influence the behavior of individuals. In this project, we are performing laboratory experiments whereby a colony of individually paint-marked ants is offered with a binary choice between two sites of different quality. In each experimental treatment, we collect high resolution videos of the ants activity at each site. **Volunteer student assistance is desired for the extraction of data from the videos tracking the sequence of behaviors performed by each ant during a colony emigration necessary for information theoretic analysis. Experiments are still ongoing, and there are also opportunities for students to assist in the execution of further laboratory experiments with the ants.**

Students interested in this opportunity should **contact Dr. Gabriele Valentini** (gvalent3@asu.edu) by e-mail. Each interested student should include in the e-mail:

- **An up-to-date resume**
- **A statement of why s/he is interested in this opportunity**

Work on this project may start as early as this summer. Interested students are encouraged to contact Dr. Valentini soon.

[1] Pratt, Stephen C. "Quorum sensing by encounter rates in the ant *Temnothorax albipennis*." *Behavioral Ecology* 16.2 (2005): 488-496.