

OR404*Ant navigation under constraints of size and photons***Ajay Narendra**, Fiorella Ramirez Esquivel, Chloe Raderschall, Jochen Zeil

Visually guided navigation is crucial for central place foraging insects, an ability that allows them to exploit the resources in their habitat and to reliably return home. The size of the sensory structures and the available light limits the quality of navigational information that is available to animals. Ants, with their dramatic size range coupled with the variety of temporal niches they occupy, provide a unique opportunity to identify the behavioural and sensory adaptations for efficient visual navigation under such constraints. We show in a comparative study across ants from different subfamilies how eye structures scale with body size and with time of activity. More so, by tracking individual ants at different ambient light levels, we demonstrate that navigating at low light is costly, because foragers have to move more slowly, stop more frequently and are less accurate in pinpointing their nest. Using panoramic imagers we quantify the navigational information content of ant habitats and show how much information is available to animals that work at the limits of size and light and discuss the implications for successful visually guided navigation.