**A short description of the project in lay terms**

Social communication plays an important role in our daily life. When looking for a partner, when working as a team to solve problems at home or at work, or when solving conflicts. While some aspects of social communication are unique to humans, the need to communicate is common to most, if not all, the living creatures. Neuroscientists use animal models such as mice and flies to dissect the neural basis of social communication. Using sophisticated experimental and computational tools, more and more of the principles are being understood.

However, due to experimental constraints, most studies that aim for understanding the neural basis of social behavior are done in very simple environments that do not represent that natural environment that our brains were adapted for during evolution. For example, the way we talk to a friend or colleague depends on the context: other individuals in the surrounding, and the specific place we are at. Similarly, male flies court a female fly, and his behavior depends on the existence of competing males, other females and non-social factors such as the availability of food, that might cause the male to choose feeding over courting.
While the importance of context to social behavior is clear, we know little about the way it is handled by the brain. In this project we are using the vinegar fly Drosophila to ask how social decisions are modulated by the environment. To this aim we will build a novel setup, monitoring 8 males and 8 females for multiple hours in a circular arena with a central food patch. We will use both advanced computational tools to characterize the behavior of each individual fly at a very high resolution: tracking individual body parts. By combining the computational tools with fine genetic manipulations of the fly brain, we aim to understand better how brains handle social communication in complex, natural-like environments.