# World Wide

# NeuRise

## Talks by rising stars of neuroscience

**Measuring behavior to measure the brain**
**Adam Calhoun - Murthy lab**
(Princeton University)

Animals produce behavior by responding to a mixture of cues that arise both externally (sensory) and internally (neural dynamics and states). These cues are continuously produced and can be combined in different ways depending on the needs of the animal. However, the integration of these external and internal cues remains difficult to understand in natural behaviors. To address this gap, we have developed an unsupervised method to identify internal states from behavioral data, and have applied it to the study of a dynamic social interaction. During courtship, Drosophila melanogaster males pattern their songs using cues from their partner. This sensory-driven behavior dynamically modulates courtship directed at their partner. We use our unsupervised method to identify how the animal integrates sensory information into distinct underlying states. We then use this to identify the role of courtship neurons in either integrating incoming information or directing the production of the song, roles that were previously hidden. Our results reveal how animals compose behavior from previously unidentified internal states, a necessary step for quantitative descriptions of animal behavior that link environmental cues, internal needs, neuronal activity, and motor outputs.

Event link:
https://www.crowdcast.io/e/wwneurise/

sponsored by eLife