World Wide NeuRise

Talks by rising stars of neuroscience

Structures in space and time - Hierarchical network dynamics in the amygdala
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In addition to its role in the learning and expression of conditioned behavior, the amygdala has long been implicated in the regulation of persistent states, such as anxiety and drive. Yet, it is not evident what projections of the neuronal activity capture the functional roleof the network across such different timescales, specifically when behavior and neuronal space are complex and high-dimensional. We applied a data-driven dynamical approach for the analysis of calcium imaging data from the basolateral amygdala, collected while mice performed complex, self-paced behaviors, including spatial exploration, free social interaction, and goal directed actions. The seemingly complex network dynamics was effectively described by a hierarchical, modular structure, that corresponded to behavior on multiple timescales. Our results describe the response of the network activity to perturbations along different dimensions and the interplay between slow, state-like representation and the fast processing of specific events and actions schemes. We suggest hierarchical dynamical models offer a unified framework to capture the involvement of the amygdala in transitions between persistent states underlying such different functions as sensory associative learning, action selection and emotional processing. * Work done in collaboration with Jan Gründemann, Sol Fustinana, Alejandro Tsai and Julien Courtin (@theLüthiLab)

Event link:
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