



Brain State and Changes of Mind. Probing the Neural Bases of Multi-Stable
Perceptual Dynamics
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ENGLISH:

The internal state of our brain changes constantly, affecting the way in which the cerebral cortex processes information. Changes of cortical state have traditionally been associated with slow and largely automatic fluctuations of wakefulness and arousal, but they can also occur on a rapid (sub-second to second) time scale and be triggered in a top-down fashion by cognitive acts – for example, detecting and reporting perceptual changes in a visual stimulus. Neuromodulatory centers in the brainstem might possibly control the global state of the brain, due to their abundant projections to the cerebral cortex. In this thesis, I explore the factors that drive fast state changes in human visual cortex, how these state changes relate to phasic neuromodulatory events, and how they affect perception. Taken together, this work establishes the existence of a novel type of top-down signals in visual cortex around the time of perceptual decisions. These signals have a profound influence on neural activity and the dynamics of perception and might play an important role in higher-level cognitive tasks as well as psychopathological conditions, such as schizophrenia.