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International Max Planck-Hebrew University Center "Sensory Processing of the Brain in Action"

Sensory computation is one of the most fundamental functions of any nervous system. The sensory world around us, whether visual, auditory, tactile, or olfactory, must first be encoded by the system using its own internal signals, action potentials (APs) and post synaptic potentials (PSPs). These signals are then processed by specific neuronal circuits and in modules within these circuits, with the aim of generating the appropriate behavior — critical for the survival of the animal.

The development of powerful anatomical, imaging and genetic tools in the study of the nervous system has led to a paradigm shift in the view of the neuronal sensory system. In contrast to the old crude statistical characterization of the underlying circuits, it became clear that these systems contain highly specific sub-circuits (or modules?), which are distinguished by their anatomy, physiology, and connectivity. In addition it has recently become clear that sensory processing in these neuronal circuits even at very early stages very much depends on the task at hand and the action the brain takes.

The mission of the Max Planck-Hebrew University Center "Sensory Processing of the Brain in Action", which was inaugurated in January 2013, is to conduct pioneering research involving groups at Max Planck Institute of Neurobiology and the Hebrew University working at the forefront of sensory neuroscience. It aims to generate groundbreaking research in the organization and function of brain sensory processing, focusing on unraveling the causal relationships between neuronal mechanisms and perception, cognition and behavior, at the neuronal circuit level. A central goal of the Center is to understand at what stage and how sensory processing changes with the behavioral state of the animal. This will be achieved by studying
sensory processing in behaving animals utilizing state of the art experimental, computational and theoretical approaches across different model systems (fly and mouse) and different sensory systems (vision, somatosensation, audition). Research at the Center will shed light on the dynamic nature of sensory processing of the brain in action.
The Jerusalem Brain Sciences Building will provide a state-of-the-art research and teaching facility for the Edmond and Lily Safra Center for Brain Sciences.

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