Heller Lecture - Prof. Xiaoqin Wang

February 12, 2013

On the topic of "Pitch and Harmonicity Representations in Auditory Cortex"

Heller Lecture Series in Computational Neuroscience

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On the topic of

"Pitch and Harmonicity Representations in Auditory Cortex"

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Location: Mishkenot Sha'ananim - Jerusalem

Part of Music and Brains
International Conference - Lectures and Concerts

Abstract:

A fundamental property of sounds that we encounter on the daily basis is the harmonicity. Harmonicity is a unique feature of vocal communication sounds such as human speech and animal vocalizations. It is also an essential component of music found in all cultures. Harmonic sounds are produced by vocal apparatuses of humans and many animal species as well as music instruments of many types whose
designs result in resonances at harmonic frequencies. Harmonics are also produced as a result of non-linear characteristics of acoustic generators and reflectors. Given the widespread existence of the harmonicity in our hearing environment and that of our ancestors, it is natural to expect that it be reflected in the evolution and development of the auditory systems of both humans and animals, in particular the auditory cortex. Recent neuroimaging and neurophysiology studies have identified regions of auditory cortex in humans and non-human primates that exhibit selective responses to harmonic pitches. Accumulating experimental evidence has also shown that neurons in many areas of the mammalian auditory cortex exhibit characteristic responses to harmonically related acoustic components. Together, these findings suggest that a fundamental organizational principle of auditory cortex is based on the harmonicity. Such an organization likely plays an important role in music processing by the brain.

ATTACHMENTS

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