

CRBLM Scientific Day 2022 Keynote – Friday, May 6, 10:30am

Title: How rhythm and timing structure experience: Auditory perception, music and social interaction

Abstract

Rhythms are ubiquitous in biological systems, from motor movements for locomotion to communication signals such as speech and music. I will present evidence that auditory-motor interactions for timing are present early in development and that the human auditory system uses the motor system to accomplish rhythmic timing. Further, I will discuss evidence that fluctuations in the power of brain oscillations measured with EEG in the beta frequency (~20 Hz) entrain to external auditory rhythms and are a neural signature of the prediction of upcoming sounds. Finally, I will discuss the social implications of coordinated movements in human interactions from musical ensembles to pro-social behaviour in infants.

Bio

Laurel Trainor (Ph.D., University of Toronto) is a Professor of Psychology, Neuroscience and Behaviour at McMaster University, Fellow of the Royal Society of Canada (FRSC), Fellow of the Canadian Institute for Advanced Research (CIFAR), Fellow of the Association for Psychological Science, a McMaster Distinguished University Professor, and a Research Scientist at the Rotman Research Institute. She has published over 160 articles on the neuroscience of auditory development and perception of music (<https://trainorlab.mcmaster.ca/>) in journals including *Science* and *Nature* and co-holds a patent for the Neuro-compensator hearing aid. She has held major grants, including from the Canadian Foundation for Innovation, The Canadian Institutes of Health Research, the Natural Science and Engineering Research Council of Canada, the Social Science Research Council of Canada and the Grammy Foundation. Laurel is a frequent keynote speaker at conferences and maintains a high media profile. She has pioneered the study of musical development, showing that infants acquire the music system of their culture without instruction, just as they acquire language. Her work on rhythm perception shows that listening to a beat activates motor networks in the brain even in the absence of movement, and that this multisensory interaction is reflected in oscillatory networks that can be measured with EEG and MEG. She also studies how predictive processes in rhythms and timing shape communication between people, including between musicians, between musicians and audiences and between infants and caregivers. Her studies show further that synchronous movement to a musical beat increases prosocial behavior even in infants. Laurel is the founding and present director of the McMaster Institute for Music and the Mind (MIMM), which houses the LIVElab (<http://livelab.mcmaster.ca/>), a unique research-concert hall with high acoustic control, that is equipped with multi-person motion capture and EEG (and measurement of other physiological responses) for studying how performers and audiences interact, and how music can be used to promote health and well-being. Laurel also has a Bachelor of Music Performance from the University of Toronto and is currently principal flute of the Burlington Symphony.