



# Séminaire ISIR

Mardi 31 mai 2016 à 11H

Mark Latash

Campus Jussieu, 4 place Jussieu, Paris  
Salle de réunion H20

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## The Nature of Unintentional Movements

**Abstract :** I am going to assume that voluntary movements are produced by the central nervous system via changes in referent coordinates (RC) for salient variables, while performance variables emerge given the external forces. Involuntary movements happen when external forces change without changes in RC. Recent experiments have shown that there is a third class of movements, voluntary unintentional movements produced by RC drifts. We assume that these drifts reflect natural relaxation processes in the system involved in movement production. I plan to review a series of recent experiments demonstrating unintentional movements seen when the subject is trying not to change a state or a trajectory of an effector. Such movements can be slow (with typical times of 10-15 s) or fast (with typical times of about 1 s). The results are interpreted assuming a mechanism, addressed as RC-back-coupling, which can be viewed as a reflection of the natural property of physical systems to move toward states with low potential energy. These results and theoretical developments represent a step towards developing a physical approach to motor control.

**Short bio :** Mark Latash is a Distinguished Professor of Kinesiology and Director of the Motor Control Laboratory at the Pennsylvania State University. He received equivalents of B.S. in Physics and M.S. in Physics of Living Systems from the Moscow Institute of Physics and Technology, and a Ph.D. in Physiology from Rush University in Chicago. His research interests are focused on the control and coordination of human voluntary movements and movement disorders in neurological disorders. He is the author of “Control of Human Movement” (1993) “The Neurophysiological Basis of Movement” (1998, 2008), “Synergy” (2008), “Fundamentals of Motor Control” (2012), and “Biomechanics and Motor Control: Defining Central Concepts” (with V.M. Zatsiorsky, 2016). In addition, he edited eight books and published over 350 papers in refereed journals. Mark Latash served as the Founding Editor of the journal “Motor Control” (1996-2007) and as President of the International Society of Motor Control (2001-2005). He has served as Director of the annual Motor Control Summer School series since 2004. He is a recipient of the Bernstein Prize in motor control.