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**NEURODYNAMIC CORRELATES OF HIGHER COGNITION AND CONSCIOUSNESS —
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NEURODYNAMIC CORRELATES OF HIGHER COGNITION AND CONSCIOUSNESS — EDITORIAL

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In spite of the explosive growth of experimental research in basic neurobiology and neurophysiology of brain components in the past decade, understanding the integrated functioning of the brain remains a significant scientific challenge. Essential for understanding human brain function is the detailed knowledge concerning the spatio-temporal dynamics of neuronal populations and their intricate interactions during cognitive functions. The aim of the present issue is to examine brain dynamics and cognitive functions from a multidisciplinary perspective and to introduce the most recent results in this research frontier. Topics relevant to the special issue include: (i) Modeling brain dynamics at the mesoscopic and macroscopic scales, including dynamical systems with distributed parameters; (ii) Applying tools of discrete mathematics, statistical and quantum physics, network science to describe the dynamics of brains; (iii) Experimental research on brain dynamics from various aspects, including fundamental neurobiology, evoked potentials, functional brain imaging, and cognitive functions; (iv) Clinical neuroscience issues for improved diagnosis of dynamic brain diseases and their potential therapies. This special issue is dedicated to Professor Walter J. Freeman on the occasion of his 80th birthday. Dr. Freeman produced breakthrough contributions to research on brain dynamics over the past five decades. The present issue covers all aspects of neurodynamics, starting from neural populations of high-level cognition and consciousness, as well as philosophical aspects and practical implementations on digital computers and hardware designs.

Keywords: Neurodynamics; cognition; consciousness; phase transition