Title: Neuroscience of self-consciousness: embodied and extended

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Abstract : Humans experience a 'real me' that 'resides' in 'my' body and is experienced as the subject (or 'I') of conscious experience and thought. This aspect of self-consciousness, namely the feeling that conscious experiences are bound to the self and are experiences of a unitary entity ('I'), is often considered to be one of the most astonishing features of the human mind. I will present recent work that targets self-consciousness by investigating a minimal form of self-consciousness that is based on the multisensory perception of tactile, proprioceptive, visual signals as well as interoceptive signals and has been studied in cognitive psychology, neuroscience, and in neurological patients (i.e., bodily self-consciousness, BSC). Highlighting a series of studies investigating two fundamental aspects of BSC, referred to as self-location and self-identification with an individual's body, I show that BSC is based on torso-centered signals in a distributed cortical network, centered in temporo-parietal cortex. Such a torso-centered BSC system, by coupling exteroceptive and interoceptive signals, is fundamental for self-consciousness, leading to conscious mental states that are experienced as if by a unitary and embodied subject. In a second part of my presentation I will highlight recent work that explores links between BSC (self-location, the first-person perspective, sense of agency) and so-called extended or narrative self-consciousness (NSC), in particular spatial navigation and episodic autobiographical memory. I will present data showing that changes in BSC impact (1) spatial navigation performance and grid-cell like activity in entorhinal cortex and are of relevance (2) in episodic autobiographical memory, mediated by hippocampal activity coupled with BSC regions. These data link key subjective components of BSC with spatial navigation and the subjective reliving of personal events from one's past.