



**NEDERLANDS
HERSENINSTITUUT**
Master the mind

NIN Symposium is inviting you to a scheduled Zoom meeting.

Join the Zoom Meeting May 21, 2021 16.00 hrs.

<https://us02web.zoom.us/j/88627099773?pwd=R2Q1S3BNRFdFSHVUajhYRXhBTvJJOQT09>

Meeting ID: 886 2709 9773

Passcode: 027010

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The meeting area will be open at 15.45 hrs.

Host: Eus van Someren, e.van.someren@nin.knaw.nl

Sleep and Cognition.

Guest speaker: Anita Lüthi Associate Professor DNF, University of Lausanne
Switzerland.

Title: When the locus coeruleus speaks up during sleep: impact on arousability, sleep architecture and sleep functions.

Abstract:

There is no doubt that sleep is quite the opposite of wakefulness. Behaviorally, meaningful interactions with the environment are suppressed; neurobiologically, wake-promoting brain areas are silent. However, since decades we know that at least some wake-promoting areas continue to discharge action potentials during sleep – sparsely, but consistently.

My talk will show that sleep-related activity in the locus coeruleus (LC), the major noradrenergic area of the brain known for its powerful wake-promoting actions, has so far been underestimated for sleep's behavioral, architectural, and neurobiological assets. Using closed-loop optogenetic interrogation of LC activity during sleep, imaging of free noradrenaline levels in forebrain and heart rate monitoring in combination with global and local sleep recordings, we find that LC activity leads to pulsatile increases in the levels of noradrenaline on the infraslow (~50-sec) time scale during non-REM sleep, while its levels decline during REM sleep. On this same time scale, LC activity variations play a role in sleep architecture and regulation, spectral dynamics in the forebrain, and the coordination of autonomic output.

Together, my talk will make the case for a renewal of the dichotomous view on sleep and wakefulness, emphasizing that wake-related activity intruding into sleep is inextricably linked to the physiology of mammalian sleep and will, most likely, turn out to be a culprit in its manifold disruptions in pathophysiological conditions.

